

**REPORT ON THE MISSION TO IGUAÇU NATIONAL PARK, Brazil
FROM 08 TO 12 MARCH 2015**



Photo © Elena Osipova

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IUCN

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EXECUTIVE SUMMARY AND LIST OF RECOMMENDATIONS

At its 38th Session in (Doha, 2014) the World Heritage Committee requested the State Party of Brazil to invite an IUCN reactive monitoring mission to assess the status and potential impacts of the Baixo (low) Iguazu project and the overall state of conservation of Iguazu National Park, including the areas previously affected by the Colono ('Settler's') Road.

The mission took place from 08 to 12 March 2015. The mission visited the Iguazu National Park and held extensive discussions with national park staff and other representatives of Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) which is the agency responsible for the management of the property. The mission also met with representatives of Instituto Ambiental do Paraná (IAP). In Brasília discussions were held with representatives of Agência Nacional de Águas (ANA), Ministry of the Environment and Ministry of External Relations.

The mission had the opportunity to discuss the Baixo Iguazu hydroelectric project extensively and was also provided with detailed documentation. The conclusion of the mission is that over a number of years the project has undergone significant changes, both in its design and the foreseen regime of its operation, and particularly in the way that ICMBio has been and will continue to be involved in the decision-making process. The construction of the dam began in 2013 after a licence for construction was granted by IAP (the licensing agency in this case) whose decision was based, inter alia, on the results of the Environmental Impact Assessment (EIA) prepared for this project. However, in 2014 a court decision suspended the construction of the dam based on the fact that ICMBio had not been sufficiently consulted on the project that could potentially affect Iguazu National Park for which ICMBio is the responsible agency. The most significant change therefore is that ICMBio has now been given the opportunity to elaborate a list of conditions which will be imposed on the company responsible for the project by including them into the new licence for construction which will need to be re-issued by IAP. These conditions are extensive and include development of a number of studies and monitoring programmes (e.g. on water quality), as well as, importantly, restrictions on the minimum river flows and water flow fluctuations of the River Iguazu that the operator of Baixo Iguazu will be required to ensure.

There is already a cascade of dams further upstream on the Iguazu River and, as observed by the previous reactive monitoring mission and also expressed by national park staff, water level fluctuations, mainly caused by the operation of Salto Caxias dam which is the closest one further upstream on the Iguazu River, have so far been substantial, sometimes to such an extreme degree that the aesthetic values of the Iguazu waterfalls have been affected. This also has had impacts on the natural conditions of the Iguazu River and possibly also on the biodiversity values of the property although these effects have not been studied well enough to come to a conclusion to what extent the biodiversity values of the property have been affected. If built, the Baixo Iguazu hydropower plant would, according to this special regime, operate as a 're-regulating' dam offering the potential for reducing the river flow fluctuations and avoiding extreme variations. However, since Baixo Iguazu is planned very close to the property's boundaries, it also could present additional risks, which should be carefully considered. It is, therefore, recommended to prepare, in addition to the existing EIA, a specific assessment of all potential impacts of the construction and operation of the hydropower plant specifically on the OUV and integrity of the property. This assessment should additionally consider the OUV and integrity of the Iguazu National Park in Argentina, which is a separate, but adjacent World Heritage property sharing the same river and the same waterfalls. This assessment should be submitted for review to ICMBio who will need to confirm whether they would still give their authorization for the construction of the hydropower plant and/or whether the conditions already elaborated by them should be further amended or completed based on the results of the assessment.

In making their assessment it will be essential that ICMBio consult with the relevant authorities in Argentina with regards to potential impacts on the Iguazu National Park World Heritage property in Argentina. The completed assessment as well as the conclusions of ICMBio should be submitted to the WHC and reviewed by IUCN, prior to re-issuing the authorization by ICMBio. In case authorization is given by ICMBio, it will be essential that the conditions set by them, including development of the Plan for Conservation of the Aquatic Fauna of the Lower Iguazu Basin, further elaboration of monitoring programmes foreseen under the Basic Environmental Plan of the Baixo Iguazu project and development of additional studies, are duly fulfilled before the construction of the dam can proceed. Whether the conditions have been fulfilled will need to be evaluated and confirmed by ICMBio and it is recommended that their conclusions are also submitted to the WHC for review by IUCN. The project should not proceed unless it is clearly demonstrated that it will not impact the OUV of the property, or of the adjacent Iguazu National Park World Heritage property in Argentina.

As for the Colono Road, this has been closed since 2001 and the mission observed almost complete recovery of the area formerly crossed by the road. However, a recently introduced bill number 7.123/2010 has raised serious concerns. The bill was approved by the lower House of Parliament (Câmara dos Deputados) in August 2013 and would, if also accepted by the Senate, provide a legal basis for the reopening of the Colono road. Its reopening would represent a clear ascertained danger to the Outstanding Universal Value and integrity of the property and would lead to the inscription of the property on the List of World Heritage in Danger. Illegal reopening of the road was the reason why the property was inscribed on the List of World Heritage in Danger in 1999. The Bill has not been proposed for voting at the Senate yet and there appears to be no deadline for such a vote to take place. It is understood by the mission, based on comments heard during the visit, that reopening of the Colono Road has been repeatedly raised as a political issue that attracts attention of local people without there being a real justification from an economic perspective for the reopening of the road, or likelihood of implementation. The Ministry of Environment has also publicly expressed its opposition to the Bill. Even in the event that the Bill were to be approved by the Senate, there are also a number of mechanisms that could be used to prevent it from becoming applicable law. It can, therefore, be concluded that the immediate possibility that the road will actually be reopened is low. However, the situation where the proposed Bill remains pending and the property continues to be threatened by the reopening of the road is unacceptable. It is, therefore, recommended that the State Party of Brazil ensures that the proposed Bill is not approved, even if positively voted on by the Senate, through the available legal mechanisms.

The mission also had an opportunity to discuss the management of the property and other relevant issues. Since the inscription of the property on the World Heritage List, transboundary cooperation between the Iguazu National Park and the neighbouring Iguazu National Park in Argentina has been subject to a number of Committee Decisions and requests. It is understood by the mission that the Brazilian legislation does not provide for creation and management of transboundary protected areas and that a high-level agreement between Brazil and Argentina is not being perceived by the Brazilian authorities as a solution that would enhance the management of the property. At the same time, transboundary cooperation on the ground appears to be good. Joint patrolling and law enforcement efforts represent one of the most crucial needs in the field of transboundary cooperation in this area. It is recommended that an action plan for joint patrolling activities is developed together with the Iguazu National Park in Argentina and that these activities are undertaken on a regular basis. Development of such a plan could be linked to the currently ongoing review and development of a new Management Plan for the Iguazu National Park. Another field of cooperation where joint efforts could achieve significant results is monitoring of key species. As information on the current population status of the majority of species is extremely scarce, a monitoring programme for key species within the property needs to be developed as a matter of priority and expanding such a programme to the broader region in cooperation with the Iguazu National Park would increase its effectiveness.

Recommendations

Regarding the Colono Road

1. Ensure that the proposed Bill 7.123/2010 that would provide legal basis for the reopening of the Colono Road is not approved or applied, even if positively voted on by the Senate through the legal mechanisms that may be available.

Regarding the Baixo Iguazu hydroelectric project

2. In addition to the existing EIA, develop a specific assessment of any potential impacts of the construction and operation of the Baixo Iguazu hydropower plant specifically on the OUV and integrity of the property, and also on the OUV and integrity of the adjacent Iguazu National Park World Heritage property in Argentina.
3. Ensure that ICMBio have the opportunity to review this assessment and undertake appropriate consultation with the relevant Argentinian authorities, in order to confirm whether ICMBio would still give their authorization for the construction of the dam and/or whether the conditions already elaborated by them should be further amended or completed based on the results of the assessment.
4. Ensure that further development of the project does not proceed until a copy of the assessment and the conclusions of ICMBio have been submitted to the WHC and reviewed by IUCN.
5. In case authorization is given by ICMBio, ensure that the conditions set by them are duly fulfilled before the construction of the dam can proceed, and submit to the WHC the conclusions of ICMBio on the degree to which the conditions have been fulfilled.

Regarding the management of the property

6. Prepare a new management plan for the Iguazu National Park as a matter of priority and provide a copy of it to the World Heritage Centre, when it becomes available.
7. Together with the neighbouring Iguazu National Park in Argentina develop an action plan for joint patrolling activities and ensure that these activities are undertaken on a regular basis.
8. Establish a monitoring programme for key species within the property and, in cooperation with the Iguazu National Park, within the broader region.

List of acronyms and abbreviations

ANA	National Water Agency (Agência Nacional de Aguas)
IAP	Environmental Institute of the State of Paraná (Instituto Ambiental do Paraná)
IBAMA	Brazilian Institute for the Environment (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis or IBAMA)
ICMBio	Chico Mendes Institute for Biodiversity Conservation (Instituto Chico Mendes de Conservação da Biodiversidade)
IUCN	International Union for Conservation of Nature
MW	Megawatts
ONS	Operator of the National Electricity System (Operador Nacional do Sistema Eléctrico)
OUV	Outstanding Universal Value
UHE	Large hydropower plant (Usina hidrelétrica)
WHC	World Heritage Centre

1 BACKGROUND TO THE MISSION

Inscription history, criteria and World Heritage values

Iguaçu National Park was inscribed on the World Heritage List in 1986 under criteria (vii) and (x) for its outstanding natural beauty and important biodiversity values. The property shares with the neighbouring Iguazú National Park in Argentina “one of the world’s largest and most impressive waterfalls”. The World Heritage property comprises 170,086 ha and preserves the largest area of *Máta Atlantica* (Atlantic Forest) in southern Brazil and contains habitats of rare and endangered species, including jaguar (*Panthera onca*), margay (*Leopardus wiedii*), giant otter (*Pteronura brasiliensis*), giant anteater (*Myrmecophaga tridactyla*), black-fronted piping-guan (*Pipile jacutinga*) and solitary tinamou (*Tinamus solitarius*).

The inscription of the property was first discussed at the 9th Session of the World Heritage Committee in 1985 where the Committee suggested that it could be “considered as a single transfrontier property together with the continuous Iguazu National Park in Argentina, inscribed on the World Heritage List in 1984”. The State Party of Brazil requested to postpone the examination of the nomination so that they could consider the raised points.

Iguaçu National Park was then inscribed at the next Committee Session in 1986 as a separate property. At that time the State Party of Brazil indicated its wish to list the property independently and not as a transboundary property. They further indicated that the Brazilian legislation did not provide for any “commitment regarding joint management of national parks”. Noting IUCN’s position that it would be preferable to list the two national parks as one transboundary property, the Committee endorsed the concerns of Brazil and inscribed Iguaçu National Park as a separate property.

At the time of nomination, IUCN’s evaluation report also noted a number of threats facing the property, including tourism developments in the area of the waterfalls, agricultural development in the surrounding areas, a highway cutting through the park and upstream hydroelectric development.

Examination of the State of Conservation by the World Heritage Committee and its Bureau

The World Heritage Committee has at several times since the inscription of the property expressed concerns about a number of issues:

- At the 13th Session of the World Heritage Committee, measures undertaken by the States Parties of Argentina and Brazil to coordinate their management efforts were commended by the Bureau. However, the issue of having two separate properties was again raised and was responded to by the representative of Brazil stating that the Brazilian government “had not changed its position on this matter and that the two sites should be indicated separately on the World Heritage List”.
- At the 15th Session in 1991 the Bureau expressed its concerns about the helicopter overflights of the area causing acoustic disturbance.
- At the subsequent Session in 1992 the issue was further discussed and the actions undertaken by the States Parties of Argentina and Brazil to study and regulate the matter were noted.
- In 1993 it was further noted that the relevant authorities in two countries were exploring opportunities for establishing common regulations for helicopter traffic.
- At the 21st Committee Session in 1997 concerns were raised about the situation with the Colono (Settlers’) road going through the Iguaçu National Park which a local organization was campaigning to re-open after it was closed in 1986. It was reported that a camp had been illegally set up within the property to begin unauthorized work on the re-opening of the road. The road had then subsequently closed again.

- At the 22nd Session the situation with the Colono Road was again discussed. It was reported that in early 1998 the park had been invaded again and the road had been illegally reopened. The Brazilian National Congress had established a Task Force to investigate the issue. Damages to the park associated with the road reopening were also reported. The WHC and IUCN were requested to jointly undertake a mission to the property.
- The issue was subsequently discussed at the 23rd Committee Session in 1999 following the WHC/IUCN mission to the property. The mission highlighted damages to the property caused by the reopening of the Colono road, including destruction of parts of the forest, interrupted wildlife movement and opening up the park to illegal logging and poaching. In the absence of satisfactory progress in addressing the issue, the Committee decided to inscribe the property on the List of World Heritage in Danger.
- In 2000 the Bureau noted the actions undertaken by the State Party to close the road, including a decision by the Supreme Court. The Committee requested the State Party to provide a report on the progress to enforce the closure of the road and decided to retain the property on the List of World Heritage in Danger.
- At its 25th Session in 2001 the Committee noted that the Colono road had been effectively closed since June 2001 and decided to remove the property from the List of World Heritage in Danger. The Committee also requested that a mission was undertaken by the WHC and IUCN to prepare a status report for submission to the 27th Committee Session in 2003.
- In 2003 the Committee expressed its regret the State Party of Brazil had not invited a joint WHC/IUCN mission to the property, but welcomed the invitation by the State Party for a mission to take place in time to provide a report for submission to the 28th Session.
- At its 28th Session in 2004 the Committee expressed its concern that the situation with the Colono Road had again escalated in 2003 and that the reopening of the road continued to be a potential threat to the property. Due to the situation with the road the mission had been postponed.
- The 29th Session of the Committee in 2005 examined the findings of the mission which confirmed that the Colono road remained closed and also reported on a number of other issues, including illegal cutting of heart of palm, hunting and plans for construction of a new hydroelectric dam - Baixo (low) Iguazu - in the proximity of the property.
- At its 30th Session the Committee reiterated its concerns about Baixo Iguazu hydroelectric project and about other hydroelectric project proposals and requested the States Parties of Argentina and Brazil to submit a detailed report on all existing and proposed hydroelectric projects and their potential impacts on both Iguazu and Iguazu National Parks.
- In 2007 the 31st Session of the Committee commended the State Party of Brazil for its decision not to authorize the construction of the Baixo Iguazu dam.
- Following a joint WHC/IUCN monitoring mission which visited the property in 2008, the Committee at its 32nd Session requested the State Party of Brazil, in coordination with the State Party of Argentina, to implement the recommendations of the mission, including carrying out a study on the oscillation of water levels in the Iguazu River and addressing a number of tourism related issues.
- In 2010 the Committee welcomed the information provided by the State Party of Brazil that an agreement between Argentina and Brazil covering joint management of Iguazu and Iguazu National Parks had been developed and was in process of being signed and invited the States Parties to submit a copy of the agreement to the World Heritage Centre once it had been signed.
- At its 36th Session the Committee expressed its regrets that no agreement on the joint management of the two properties had been signed, despite the earlier information that such an agreement had been developed. The Committee also expressed its concern that the Baixo Iguazu hydroelectric project and the reopening of the Colono Road appeared to again be actively discussed.

Justification of the mission

A number of issues, particularly the potential reopening of the Colono road, hydroelectric projects with potential impacts on the property and transboundary cooperation between Argentina and Brazil, have been repeatedly examined by the World Heritage Committee since the inscription of the property.

These issues were again discussed at the 38th Committee Session where it was reported that the construction of the Baixo Iguaçu dam had commenced, but was then suspended. The Committee also expressed its concern that proposed legislation (a bill before the parliament and senate) represented a continued risk that the Colono Road could be reopened. The Committee requested the State Party of Brazil to invite an IUCN reactive monitoring mission to assess the status and potential impacts of the Baixo Iguaçu project and the overall state of conservation of the property, including the areas previously affected by the Colono Road.

Terms of reference, mission programme and itinerary are provided in Annexes 1 and 2.

2 NATIONAL POLICY FOR THE PRESERVATION AND MANAGEMENT OF THE WORLD HERITAGE PROPERTY

2.1. Protected area/national legislation

Iguaçu National Park was established in 1939 by Federal Decree 1035. The Decree was subsequently amended twice to extend the area of the park – in 1944 (Decree 6587) and in 1981 (Decree 86676).

The federal laws that apply to the property include the Federal Law on Environmental Protection (1991) and the Federal Law on Specially Protected Natural Areas (2002).

Federal Law 9.985 of 18 July 2000 created the National System of Nature Conservation Units (Sistema Nacional de Unidades de Conservação da Natureza - SNUC) and its regulation.

2.2. Institutional framework and management structure

The Chico Mendes Institute for Biodiversity Conservation - Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) – manages all Federal conservation units. ICMBio was created under the Ministry of Environment in 2007 and took over the responsibility for managing federal protected areas from the Brazilian Institute for the Environment (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis or IBAMA).

A number of other federal and state organizations also play an important role in the processes described in this report and therefore will be briefly described in this chapter.

The National Water Agency or, in Portuguese, Agência Nacional de Águas (ANA), is a federal agency responsible for the regulation of the use of water resources and implementation of the national policy on water resources established by the Law 9.433/1997 or “Water Law” (Lei das Águas). ANA grants permission (“outorga” in Portuguese) for the use of water resources, including for the hydroelectric power plants.

The Operator of the National Electricity System (Operador Nacional do Sistema Eléctrico) is a non-profit private entity responsible for the coordination of the generation and transmission within the National Interconnected Electricity System.

Iguaçu National Park is located in the federal state of Paraná. Since Iguaçu River is a “state” river (a river passing through one federal state only), the Instituto Ambiental do Paraná (IAP) is the body responsible for issuing licences to hydroelectric companies planning to operate on the Iguaçu River. In case of federal rivers (crossing more than one federal state), such licences are issued by IBAMA.

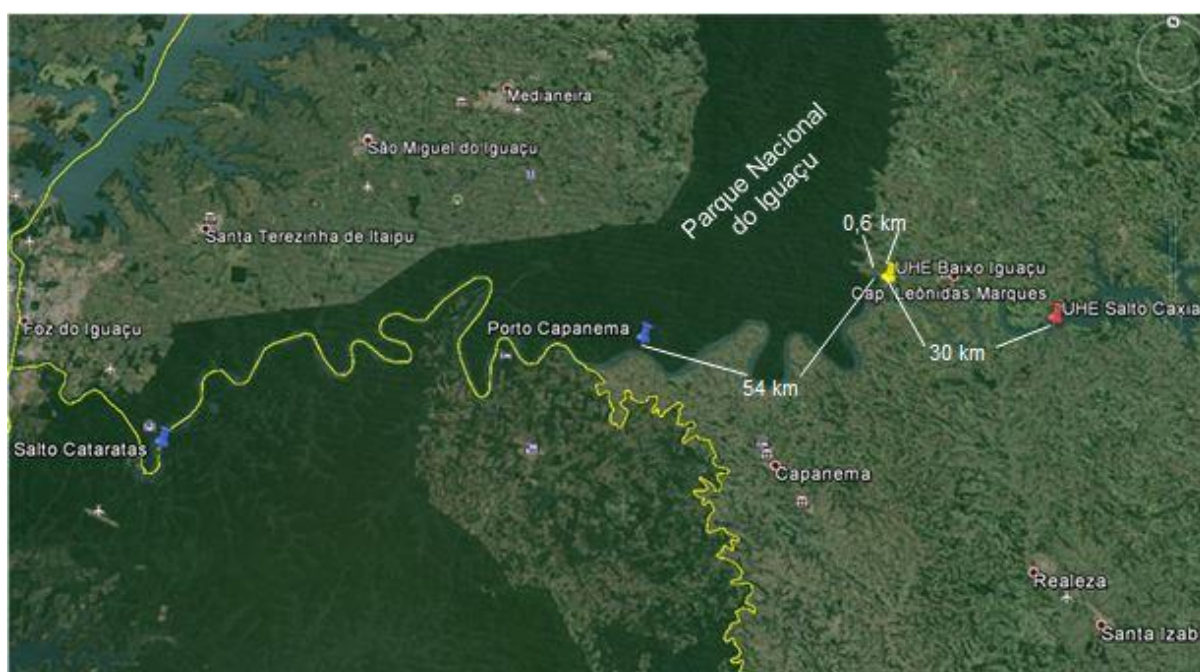
3 IDENTIFICATION AND ASSESSMENT OF ISSUES / THREATS

3.1. Baixo Iguaçu hydroelectric project

A key purpose of this monitoring mission has been to assess the current status of the dam called Baixo (low) Iguaçu and its potential impact on the Outstanding Universal Value and integrity of the property.

Baixo Iguaçu dam is not yet built. The construction work began in 2013, but was suspended by a court judgment, in the circumstances described below.

The location of Baixo Iguaçu is the Iguaçu River upstream of the property and downstream of the existing Salto Caxias dam. The location of both dams is shown on the Map 1 below.



Map 1. Location of the planned Baixo Iguaçu (yellow) and the existing Salto Caxias (red) dams and the Iguaçu Falls (Salto Cataratas, in blue). 'UHE' is short for '*usina hidrelétrica*' in Portuguese referring to a large hydropower plant above 30 megawatts (MW). © Map was provided by ONS and ANA.

Salto Caxias is one of five dams on the Iguaçu River that were built in the 1970s-1990s. Salto Caxias itself was completed in 1999. Like Salto Caxias, if built, Baixo Iguaçu will generate hydro-electricity, although it will be smaller: 350 megawatts (MW) of installed capacity as compared with the 1,240 MW of Salto Caxias. Baixo Iguaçu is to be a 'run-of-river' dam¹ with a smaller reservoir and less land flooded: 3,200 hectares (1,800 hectares of existing river and 1,400 hectares of newly flooded area) as compared with the larger reservoir at Salto Caxias which extends over 18,000 hectares, with substantially greater storage of water for electricity generation. The dams further upstream are (in ascending order): the Salto Osório (1,078 MW), the Salto Santiago (1,420 MW), the Salto Segredo

¹ Run-of-river dams use, predominantly, the flow of the river, instead of storing water in (large) reservoirs.

(1,280 MW) and Foz do Areia (2,500 MW). The River Iguazu is, in other words, one of the rivers in Brazil on which a 'cascade' of dams has been built.

In 2008, the World Heritage monitoring mission noted that the existing five river Iguazu dams were causing variations in water levels downstream, including within the Iguazu National Park. The report of the 2008 mission referred to these as 'weekly' variations (page 19), as compared with the natural variations in river levels between the dry and rainy seasons. The 2008 monitoring mission expressed concern that fluctuation of the volumes of water flowing over the falls was resulting in degradation of the scenic and biological qualities of the property. In its 2012 State of Conservation report, the State Party also referred to this issue of varying river flows, saying that it had not yet been able to arrive at any conclusions regarding their impacts on aesthetic values and biodiversity of the property. The State Party was, however, talking to the 'national operator [i.e. regulator] of hydroelectric dams' to look for ways to 'reduce the more extreme variations in the water flow' in the Iguazu National Park (WHC-12/36.COM/7B.Add).

Generally, when a large dam is built across a river and brought into operation for generation of hydroelectricity, it is the turning on-and-off of the turbines and the opening-and-closing of the release gates in the dam that causes the water flows downstream to oscillate. In a dammed river, the water flows are not natural, so the question becomes whether it is possible to moderate the changes in the flow regime caused by the built infrastructure.

In the case of the Iguazu National Park, the current variations in flow are due, at least most closely, to the mode of operation of the Salto Caxias dam, as the lowest in the cascade, at present. According to staff at Iguazu National Park, the time it takes, typically, for river waters to flow between Salto Caxias and the Park is about 24 hours. The Park staff report that they have, at times, observed abrupt changes in the levels of the river Iguazu, occurring from one day to the next. Where water levels are very low (i.e. at extreme moments), this has been seen to deprive much of the Iguazu Falls of water thereby reducing the visitor experience.

The task of this 2015 monitoring mission has, therefore, been to assess the status and impact of an issue which is not new, and which has been a concern for a number of years prior to the project to build the Baixo Iguazu hydroelectric plant. What is a new element, however, is the proximity of Baixo Iguazu to the National Park as compared with Salto Caxias at approximately 30 kilometres from the boundary of the Park. Baixo Iguazu is planned very close to the eastern boundary, while strictly outside the boundaries of the property. The question is, therefore, how far this additional dam will affect the volume of, and variation in, river flows into the property and what are the impacts of variation in water flows on the aesthetic values and biodiversity of the property.

As noted above, the State Party has been looking for a conclusive answer to the degree of impacts. The preliminary approval to the Baixo Iguazu project was made in 2008 and in 2013 a licence for construction was granted by the environmental licensing body at state level, the *Instituto Ambiental do Paraná* (IAP) whose decision was based, inter alia, on the results of the Environmental Impact Assessment (EIA) prepared for this project. The construction of the dam started in 2013. However, after a court action by a civil society organisation that argued that ICMBio as the agency responsible for the management of Iguazu National Park which could potentially be affected by the new dam had not been properly consulted, in 2014 the court suspended the construction subject to agreement being reached between ICMBio and the licensing authority.

In answer to the first question relating to the volume/variation of river flows, ICMBio have been able to reach an agreement on a mode of operation of Baixo Iguazu which has the potential to minimize water flow fluctuations in the Iguazu National Park. The conditions that ICMBio have elaborated will be imposed on the operator of the hydropower plant by including them into the licence which will need to be re-issued by IAP. Every hydropower plant in Brazil is subject to minimum and maximum flow requirements, but, following the conditions proposed by ICMBio, Baixo Iguazu would be subject to a

special regime designed to minimize water flow fluctuations affecting the National Park. The agreement has been reached with the agency that manages the Brazilian national electricity grid (ONS) for the future Baixo Iguaçu hydro-electric dam to be operated in such a way as to ensure a minimum flow level of 350 cubic metres per second into the Park. That is an increase from the current minimum level of 200 cubic metres per second which applies to the existing dam Salto Caxias and which would have applied to Baixo Iguaçu. To ensure that minimum flow, the operator of Baixo Iguaçu will have to maintain 1.03 metres of the reservoir as a margin for managing the flow. This would also reduce the maximum daily water flow fluctuations from approximately 2,000 m³/s to 400 m³/s. According to the original design of Baixo Iguaçu that volume of water (1.03 metres of depth across the width/length of the reservoir) would have been usable for electricity generation, but after the discussions with ONS, the margin has been designated for environmental flows and made part of the official authorisation (“outorga” in Portuguese) granted by the federal water agency (ANA).

To inform the discussion, ANA had carried out modelling based on historic flow data of the river Iguaçu, presenting a range of possible scenarios of reservoir levels at offered different margins, between 0.71 and 1.15 metres, for attenuation of flows and the figure of 1.03 metres emerged as a compromise. As part of the authorisation to continue the project the company leading the Baixo Iguaçu project has to accept this condition.

The purpose of the special regime is that Baixo Iguaçu is operated as a ‘re-regulating’ dam at the bottom of the ‘cascade’ of existing dams (with, currently, Salto Caxias as the lowest). That said, for that prospect to be realised, the Baixo Iguaçu dam would require to be operated in accordance with the terms of the agreement. Since the agreement would form part of the official licence, its terms will have legal effect and therefore the agreement could, if necessary, be enforced through court action.

In addition to the special regime which could offer the potential for reducing water flow fluctuations, the official authorisation to the company to pursue the Baixo Iguaçu project would be conditional on the carrying out, under the direction and approval of ICMBio, of a number of studies and elaboration of a Plan for conservation of the aquatic fauna of the lower Iguaçu River basin in line with conditions and timeframes set by ICMBio. The Plan will apply to the reach of the river between Salto Caxias and within the National Park down to near the Iguaçu Falls. The Plan will also need to include a specific project for conservation of the fish species “surubim-do-iguazu” (*Steindachneridion melanodermatum*) endemic to the river.

As well as setting out the hydrograph² for Baixo Iguaçu for its operation as a re-regulating dam (as noted above), development of a ‘Programme of Ecological Flow’ also forms part of the conditions elaborated by ICMBio. Regimes for managing the ecological flow (*vazão ecológica* in Portuguese) go further than just water levels to take account of the ecology of the river (see Box 1 below for further details).

Further conditions that the operating company will need to comply with include expansion of monitoring programmes or development of new ones, development of a study for modelling of sediment transport in the Iguaçu River. The full list of conditions can be found in Annex 6.

The mission programme included a meeting with the representatives of IAP who confirmed that IAP agreed with all conditions proposed by ICMBio and were ready to include them into the licence for construction.

² A hydrograph is a graph showing the rate of flow (discharge) versus time past a specific point in a river, or other channel or conduit carrying flow, with the rate of flow typically expressed in cubic meters/feet per second.

Box 1**Programme of Ecological Flow to apply to the Baixo Iguazu dam**

The Programme will take account of hydrological and geo-morphological parameters (simulated and documented) as well as the ichthyofauna and macro-invertebrates. The studies will evaluate the populations and habitats of species which are resident in and endemic to the river Iguazu and its tributaries in the Iguazu National Park so as to determine their relations with the principal characteristics of the hydrological regime (the magnitude and frequency of flows/flood pulses and water levels) and the geomorphology of the river. That will include, in particular, the relation between variations in flows and their effects on the associated forest formations in the flood plain. The Programme will extend the current monitoring effort to tributaries of the river Iguazu as well as its main stem. The monitoring in relation to limnology and water quality will be intensified to include monthly samples of water for biological, chemical and physical testing, as well as bi-monthly tests of sediment levels. The Programme will include monitoring of the river from the Baixo Iguazu dam down to the Falls to capture/portray the transport of sediment from the dam and in the tributaries, monitoring of changes in river depths and providing river bed data for inclusion in modelling of flows of water and sediment. The work will thereby evaluate the effect of variations of the flows from Baixo Iguazu on the processes of erosion and sediment deposit in the river in the Park (main-stem and tributaries).

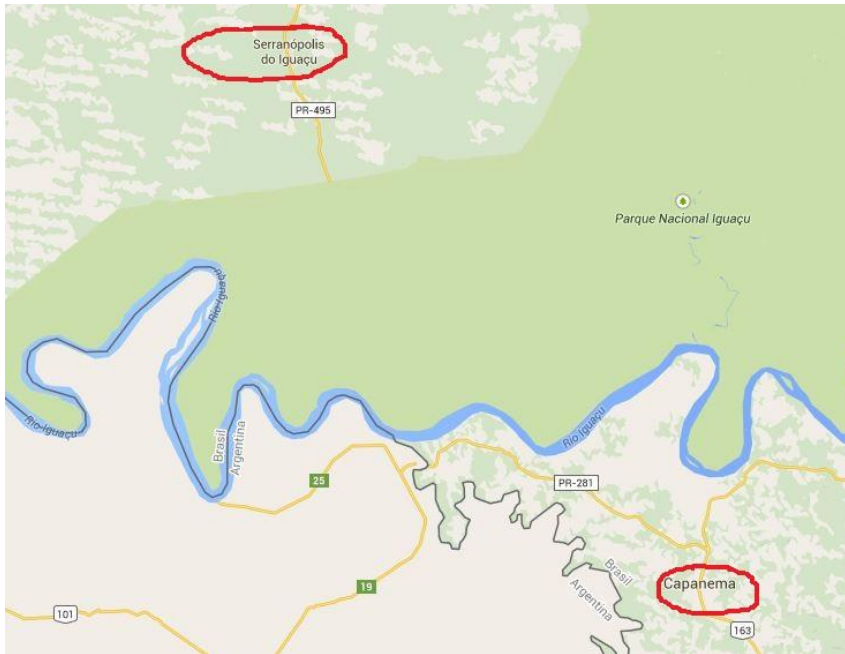
In summary, therefore, the assessment of this mission in relation to the Baixo Iguazu dam, and the Salto Caxias and other existing dams on the river Iguazu, is as follows. The special regime developed for the Baixo Iguazu dam for moderating variation in river flows could provide the means to reduce the water level fluctuations caused of the cascade of existing dams. That will – as noted above – depend on the Baixo Iguazu dam being operated in accordance with the negotiated agreement.

However, since Baixo Iguazu is planned very close to the property's boundaries, it also could present additional risks, which should be carefully considered. It is also essential to gain a better understanding of the potential impacts of the construction of the Baixo Iguazu dam and the foreseen operation of the dams cascade on the biodiversity values of the property.

It is, therefore, recommended to prepare, in addition to the existing EIA, a specific assessment of all potential impacts of the construction and operation of the hydropower plant specifically on the OUV and integrity of the property. This assessment should additionally consider the OUV and integrity of the Iguazu National Park in Argentina, which is a separate, but adjacent World Heritage property sharing the same river and the same waterfalls. This assessment should be submitted for review to ICMBio who will need to confirm whether they would still give their authorization for the construction of the hydropower plant and/or whether the conditions already elaborated by them should be further amended or completed based on the results of the assessment. In making their assessment it will be essential that ICMBio consult with the relevant authorities in Argentina with regards to potential impacts on the Iguazu National Park World Heritage property in Argentina. The completed assessment as well as the conclusions of ICMBio should be submitted to the WHC and reviewed by IUCN, prior to re-issuing the authorization by ICMBio. In case authorization is given by ICMBio, it will be essential that the conditions set by them, including development of the Plan for Conservation of the Aquatic Fauna of the Lower Iguazu Basin, further elaboration of monitoring programmes foreseen under the Basic Environmental Plan of the Baixo Iguazu project and development of additional studies, are duly fulfilled before the construction of the dam can proceed. Whether the conditions have been fulfilled will need to be evaluated and confirmed by ICMBio and it is recommended that their conclusions are also submitted to the WHC for review by IUCN. The project should not proceed unless it is clearly demonstrated that it will not impact the OUV of the property, or of the adjacent Iguazu National Park World Heritage property in Argentina.

3.2. Colono Road

The Colono Road, or Estado do Colono or Settler's Road, is a 17,6 km long road that previously crossed the Iguaçu National Park and linked the towns of Serranópolis do Iguaçu and Capanema. The information about the time when the road was initially built varies, but it was probably in early fifties and in 1954 it was included in the road network of the State of Parana (as part of PR-495). It was a non-paved road, but it was accessible by regular vehicles. The location of the two communities is shown on the Map 2 below.



Map 2. Location of Serranópolis do Iguaçu and Capanema previously linked by the Colono Road.
Map data © 2015 Google, Inav/Geosistemas SRL

As seen on the map, the town of Capanema is located on the other side of the Iguaçu River and when the road was open there used to be a ferry that crossed the river. A similar type of ferry was observed at a different location during the mission and is shown on the Photo 1 below.



Photo 1. A ferry crossing the Iguaçu river.

The road was closed in 1986 following a court decision and remained closed until 1997 when it was illegally reopened by a group of local people. In 2001 the road was closed again following a decision by the Supreme Court which had to be enforced with the support of Brazilian Army and Federal Police. Another attempt to illegally reopen the road was made in 2003, but the situation had been quickly taken under control.

Since then the reopening of the road has been a subject of ongoing discussions. Recently a new Bill has been proposed (Bill 61 of the Câmara or Bill 7.123/2010 as originally proposed by a federal representative) that would provide legal basis for the reopening of the road. The Bill has been approved in the Lower House of the Parliament (Câmara dos Deputados) and is now with the Senate. However, it has not been proposed for voting at the Senate yet and there appears to be now deadline for such a vote to take place, meaning that the Bill can remain pending indefinitely and potentially for a long period of time. If positively voted on by the Senate, the Bill can still be rejected by the President or challenged in the Court. The Ministry of Environment has also expressed its opposition to the Bill.

The mission visited the area of the former road and could also assess its status during an overflight (by helicopter) over the relevant part of the property. The area has almost completely recovered and the traces of the former road can hardly be seen from above as shown on the Photo 2 below.



Photo 2. The road that now stops at the park boundary used to continue through the park. Its former route can hardly be seen anymore.

On the ground the almost complete regrowth of the vegetation could be observed, although in some areas it can still be perceived where the former road was passing through (what is now) the trace of a narrow path, as shown on the Photo 3 below.



Photo 3. Former Colono Road.

The reopening of the road would certainly represent a very high threat to the integrity and biodiversity values of the park. As documented in a number of Committee Decisions and other official documents, the previous reopening of the road was associated with significant damages to the vegetation and with hindrance to wildlife movement. Moreover, reopening of the road would greatly increase other threats to the property, particularly spread of invasive species, illegal hunting and potentially other illegal activities in this border region, such as smuggling and drug trafficking. The reopening of the road would represent a clear ascertained danger to the Outstanding Universal Value and integrity of the property and would therefore lead to the inscription of the property on the List of World Heritage in Danger. It is worth recalling that the illegal reopening of the road by local activists was the reason why the property was inscribed on the List of World Heritage in Danger in 1999.

It is understood by the mission, based on the comments heard during the visit, that reopening of the Colono Road has been repeatedly used as a political issue that attracts attention of local people. The main reasons behind the demand to reopen the road are the cultural ties between the communities on both sides of the former road and the fact that the Colono Road used to provide a shorter connection between Serranópolis do Iguaçu and Capanema. There are otherwise no significant potential uses for the road and one study concluded that the reopening of the road cannot be justified from an economic perspective (Ortiz, 2010). The damages to Iguaçu National Park, on the other hand, would be very serious. Given these reasons, as well as the existing mechanisms to block the recent Bill at other levels, even it were positively voted on by the Senate, the immediate possibility that the road will actually be reopened is low. However, the situation where the proposed Bill remains pending and therefore the property continues to be threatened by the reopening of the road is unacceptable. It is therefore recommended that the State Party of Brazil ensures that the proposed Bill is not approved, even if positively voted on by the Senate, through the available legal mechanisms.

3.3. Water pollution

The over-flight of the Iguazu National Park (by helicopter) organised for the mission by ICMBio showed the boundaries of the property clearly delineated. Within the property, the forest covers the entire ground with just a few very small open patches of wetland and a smaller natural clearing used by the park staff as a helicopter landing point. No areas of deforestation, for agriculture or other land use, were seen.

North of the property, there is an agricultural zone. The northern boundary of the property is clearly marked by the limit of the forest and the start of farming. The agriculture is intensive, with soya, corn and wheat grown on fertile soils and in large fields, with few terraces and hedges to limit run off and reduce soil erosion. The result is that the streams that run from the agricultural zone into the property and down to the river Iguazu are heavy with sediment. At the time of year of this mission, after the start of the rainy season, the colour of the river is itself a deep red/brown colour. As the Park staff pointed out, however, the sediment load of those streams carrying the agricultural run-off is greater than that of the tributary whose entire catchment areas lies within the Park (in the eastern part). The difference is clearly visible from the air: the Photo below (4) shows the darker water colour of the streams from the agricultural zone as they arrive at the main stem of the river.



Photo 4. Sediments from the streams from the agricultural zone

What exactly the sediment carries with it, in terms of agricultural pollutants (pesticides and nitrates) is an issue that has been noted in previous communications of the State Party to the World Heritage Committee. During the present mission, Park staff reiterated that this was a concern. Other potential sources of pollution to the river are the public use activities within the Park.

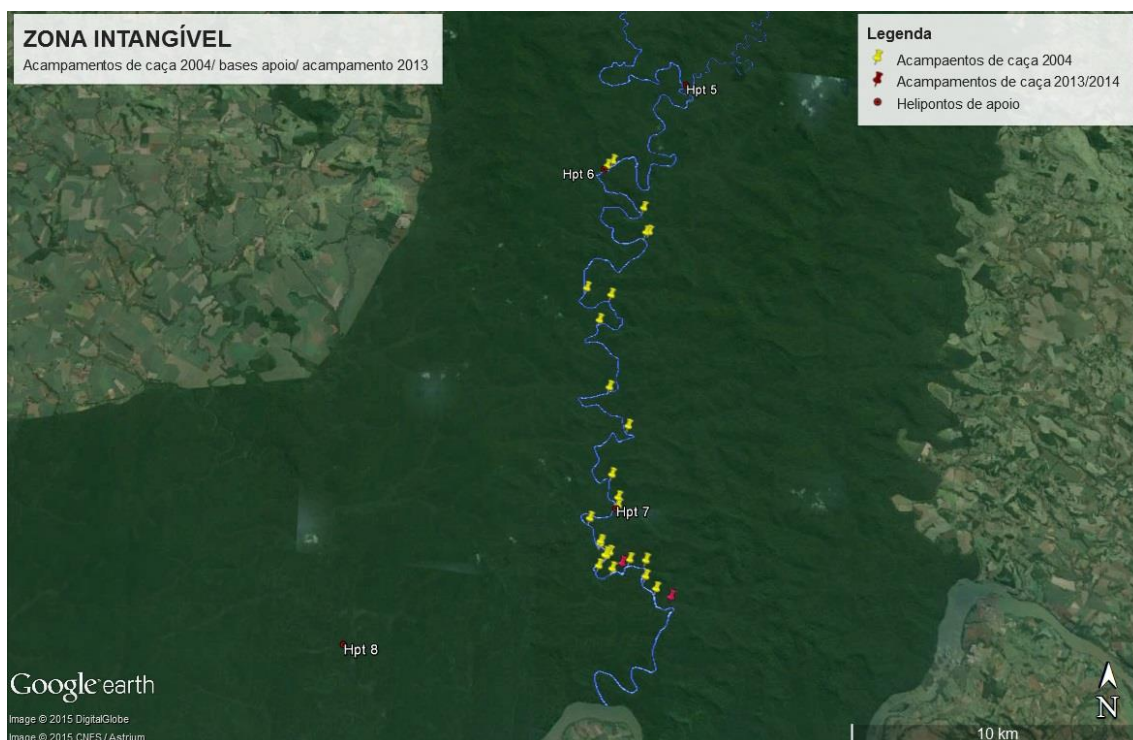
By way of response, the Park Management has established a programme of monitoring of water quality called the 'AqualGUAÇU Programme'. Samples of water are taken from 11 effluent treatment plants in and near the Park, including two stations close to the waterfalls. Samples are also collected from receiving water bodies, for example the streams in the catchment area of the 'Represa Grande' river which runs from the agricultural zone into the Park. The water samples are tested for levels of acidity, phosphates, sulphates, nitrates, chlorine, dissolved oxygen and sediments. The results of the sampling are communicated to the concessionaire companies operating in the Park. However, pollution from the agricultural zone is a far more serious issue over which the Park management has little control. Park staff mentioned to the mission the possibility of exploring the feasibility and means of establishing with local farmers a certification and labelling system to promote more sustainable agricultural practices in the surrounding areas.

The programme of studies to be carried out by the company responsible for the Baixo Iguaçu hydropower project (see the section on the Baixo Iguaçu dam) would include an extension of the water monitoring to other tributaries of the river.

3.4. Poaching

Illegal hunting remains an issue in the Iguaçu National Park. However, significant efforts undertaken by the park staff in the fields of patrolling and law enforcement have helped improve the situation in the recent years.

Illegal hunting appears to have particularly serious impacts on the population of Jaguar (*Panthera onca*) as poachers often target its prey species. In the recent years, however, a very slight increase in the Jaguar population in the Iguaçu National Park has been observed by the park staff. This can be attributed to the significant enforcement efforts. The map below (3), provided by ICMBio, shows illegal hunting camps within the property in 2003 (yellow markers) and 2013-2014 (red markers). These efforts need to be continued and it is essential that sufficient human and technological resources are available in order to continue effective patrolling and law enforcement.



Map 3. Location of illegal camps of poachers within the property in 2013-2014 compared to 2003.

Nonetheless, the population of Jaguar in the area remains low with about 20 individuals estimated within the property and 120-150 in broader region. Ensuring connectivity of protected areas in the region is crucial for conservation of this species. Joint patrolling activities with the neighbouring Iguazu National Park are also essential to ensure better law enforcement and protection of endangered species across their habitat. According to the park staff of Iguazu National Park joint patrolling activities have been undertaken several times. It is recommended that an action plan is developed for joint patrolling activities with the staff of the Iguazu National Park and that these activities are undertaken on a regular basis.

3.5. Public use

The Iguazu Falls reception and viewing area is operated by a private company under a long-term concession (20 years). The concessionaire built the buildings and facilities according to designs approved by the Park Management. Concessions are referred to as for 'public use' (*uso público* in Portuguese), referring to the strict protection status of the national park whereby, in the absence of a concession, public entry is not permitted.

The standard entrance fee³, for Brazilians, to the reception and viewing area is 31.30 Brazilian Reais for adults of 12 to 60 years, and 8 Reais for children and persons over 60 years, including within the price the cost of transport from the reception area to the Falls viewing area at 8 Reais and a donation to the Iguazu fund of 1.30 Reais. The price for visitors from other Mercosur countries (i.e. Argentina, Paraguay, Uruguay and Venezuela) is 41.30 Reais and for nationals of all other countries 52.30 Reais, with, in each case, the same contribution from every standard adult ticket to the Iguazu fund. The Fund is for development and promotion of Iguazu as a tourist destination, managed by a committee representing the local tourism trade including hotels and restaurants.

The bus ride from the reception area to the Falls viewing area, on specially adapted double-decker buses, takes approximately 15 minutes with stops at the sites of optional extra activities, for example the boat trips to see the Falls from the river, as well as guided bicycle and walking tours in the forest. The buses have low emission engines and the vehicles for transporting visitors to the departure point for the boat trips are electric. The Falls viewing area includes a restaurant, cafes, shops and auditorium.

Visitor numbers have increased substantially in the past decade, from 645,000 in 2002 to c.1,550,000 in 2013 and 2014. Half (54%) are Brazilians with 24% from Mercosur countries and 22% from other countries. This level of visitation is seen as positive confirmation of the beauty and significance of Iguazu, the second most visited tourist site in Brazil (after the Statue of Christ the Redeemer in Rio de Janeiro). Current visitor numbers at Iguazu are reported to be manageable in the aggregate. On peak visiting days, however, the pressure on the Falls viewing area becomes intense, e.g. on national holidays, with up to 13,000 visitors a day recorded. Park management is aware that, at such levels, congestion can detract from visitor enjoyment, particularly on the walkways down to and beside the Falls. Currently, the gates to the reception area are simply opened at the start of the day, allowing visitors to enter as they arrive. The Park management is considering how a booking system could be established at peak times, such as operates in many popular tourist destinations (e.g. the Statue of Christ the Redeemer in Rio de Janeiro) in order to manage the timing of arrivals - to spread them out. Such a system would have to be carefully conceived and discussed/negotiated with tour operators and other stakeholders.

The impression is that Park management are generally satisfied with the performance of the current concessionaires, subject to detailed discussion and negotiation of terms. Management of increasing visitor numbers needs to be carefully considered in order to develop solutions that would both

³ Source: the Park website.

maintain visitor experience and ensure that the outstanding scenic values of the property are preserved in the long-term.

3.6. Management

The National Park Management Plan is – as the Park staff reported – to be reviewed and revised soon. Since the current version of the Management Plan dates back more than 12 years, it is recommended that the State Party ensures that a new Management Plan is prepared as a matter of priority and provides a copy of the new plan to the World Heritage Centre when it becomes available.

Since the inscription of the property on the World heritage List, transboundary cooperation between the Iguazu National Park and the neighbouring Iguazu National Park in Argentina has been subject to a number of Committee Decisions and requests. The position of the State Party of Brazil which was expressed to the World Heritage Committee at a number of sessions is that Iguazu National Park should remain a separate World Heritage property and that creation of a joint transboundary property with the contiguous Iguazu National Park in Argentina was not desirable.

It is understood by the mission that the Brazilian legislation does not provide for creation and management of transboundary protected areas and that a high-level agreement between Brazil and Argentina is not being perceived by the Brazilian authorities as a solution that would enhance the management of the property. At the same time, transboundary cooperation on the ground appears to be good and a number of patrolling and law enforcement activities have been undertaken jointly. Joining patrolling and law enforcement efforts represents one of the most crucial needs in the field of transboundary cooperation in this area. It is recommended that an action plan for joint patrolling activities is developed together with the Iguazu National Park in Argentina and that these activities are undertaken on a regular basis. Development of such a plan could be linked to the currently ongoing review and development of a new Management Plan for the Iguazu National Park.

Another field of cooperation where joint efforts could achieve significant results is monitoring of key species. A monitoring programme for key species within the property needs to be developed and expanding such a programme to the broader region in cooperation with the Iguazu National Park would increase its effectiveness.

4 ASSESSMENT OF THE STATE OF CONSERVATION OF THE PROPERTY

4.1. Criterion (vii)

At the time of the present monitoring mission, the aesthetic values of the Falls were not diminished by low river flows and the mission could witness the outstanding scenic beauty of the property. Park staff reported, however, of times when the aesthetic beauty of the Falls had been reduced by very low river flows.

As described in other sections of this report, the aim of the special regime which has been elaborated for the operation of the Baixo Iguaçu dam could offer the potential for reducing extreme variations in river flows so as to stop that from happening and thereby maintain the aesthetic value of the Falls.

Another issue which needs to be considered due to growing visitor numbers (and which is described in more detail in Section 3.5) is the need to develop measures in the field of public use management that would maintain visitor experience and ensure that the outstanding scenic values of the property are preserved in the long-term.

4.2. Criterion (x)

From the helicopter overflight and visits to several locations the mission could observe that the forest cover of the property has been very well preserved. The contrast between the forest areas within the property and the surrounding agricultural land starting right at the property's boundaries is striking.

Illegal logging does not appear to be a problem at the moment. As described above, illegal hunting remains a problem, but the situation has been gradually improving and the significant patrolling and law enforcement activities undertaken by the park staff need to be continued to address the issue.

Data on the current status of populations of key species is very scarce. The 2010 census undertaken in the framework of the Iguaçu Carnivores project revealed the existence of 18 jaguar specimens on the Brazilian side of the park. According to the information provided by the park staff the current size of the population is at least 20 individuals, but potentially more, with 120-150 individuals estimated to be present in the broader region.

As for other endangered and rare species data, no comprehensive data exist and it is therefore recommended to develop a comprehensive monitoring programme for key species within the property and, in cooperation with the Iguazu National Park in Argentina, within the broader region.

4.3. Conclusions

The mission concludes that the Outstanding Universal Value of the property remains well preserved, although some concerns exist, particularly with regards to the conservation of the Jaguar. Efforts to combat illegal hunting need to continue.

The reopening of the Colono (Settler's) Road would certainly result in severe damage to the integrity of the property and would represent a clear ascertained danger to its OUV and, therefore, would lead to the inscription of the property on the List of World Heritage in Danger.

As for the outstanding aesthetic values of the property, these are currently being impacted, although only occasionally and temporarily, by the low water levels caused by the operation of the Salto Caxias dam, which is described in more details in Section 3.1.

5 CONCLUSIONS AND RECOMMENDATIONS

The mission had the opportunity to discuss the Baixo Iguaçu hydroelectric project extensively and was also provided with detailed documentation. The conclusion of the mission is that over a number of years the project has undergone significant changes, both in its design and the foreseen regime of its operation, and particularly in the way that ICMBio has been and will continue to be involved in the decision-making process. The construction of the dam began in 2013 after a licence for construction was granted by IAP (the licensing agency in this case) whose decision was based, inter alia, on the results of the Environmental Impact Assessment (EIA) prepared for this project. However, in 2014 a court decision suspended the construction of the dam based on the fact that ICMBio had not been sufficiently consulted on the project that could potentially affect Iguaçu National Park for which ICMBio is the responsible agency. The most significant change therefore is that ICMBio has now been given the opportunity to elaborate a list of conditions which will be imposed on the company responsible for the project by including them into the new licence for construction which will need to be re-issued by IAP. These conditions are extensive and include development of a number of studies and monitoring programmes (e.g. on water quality), as well as, importantly, restrictions on the minimum river flows and water flow fluctuations of the River Iguaçu that the operator of Baixo Iguaçu will be required to ensure.

There is already a cascade of dams further upstream on the Iguaçu River and, as observed by the previous reactive monitoring mission and also expressed by national park staff, water level fluctuations, mainly caused by the operation of Salto Caxias dam which is the closest one further upstream on the Iguaçu River, have so far been substantial, sometimes to such an extreme degree that the aesthetic values of the Iguaçu waterfalls have been affected. This also has had impacts on the natural conditions of the Iguaçu River and possibly also on the biodiversity values of the property although these effects have not been studied well enough to come to a conclusion to what extent the biodiversity values of the property have been affected. If built, the Baixo Iguaçu hydropower plant would, according to this special regime, operate as a 're-regulating' dam offering the potential for reducing the river flow fluctuations and avoiding extreme variations. However, since Baixo Iguaçu is planned very close to the property's boundaries, it also could present additional risks, which should be carefully considered. It is, therefore, recommended to prepare, in addition to the existing EIA, a specific assessment of all potential impacts of the construction and operation of the hydropower plant specifically on the OUV and integrity of the property. This assessment should additionally consider the OUV and integrity of the Iguazu National Park in Argentina, which is a separate, but adjacent World Heritage property sharing the same river and the same waterfalls. This assessment should be submitted for review to ICMBio who will need to confirm whether they would still give their authorization for the construction of the hydropower plant and/or whether the conditions already elaborated by them should be further amended or completed based on the results of the assessment. In making their assessment it will be essential that ICMBio consult with the relevant authorities in Argentina with regards to potential impacts on the Iguazu National Park World Heritage property in Argentina. The completed assessment as well as the conclusions of ICMBio should be submitted to the WHC and reviewed by IUCN, prior to re-issuing the authorization by ICMBio. In case authorization is given by ICMBio, it will be essential that the conditions set by them, including development of the Plan for Conservation of the Aquatic Fauna of the Lower Iguaçu Basin, further elaboration of monitoring programmes foreseen under the Basic Environmental Plan of the Baixo Iguaçu project and development of additional studies, are duly fulfilled before the construction of the dam can proceed. Whether the conditions have been fulfilled will need to be evaluated and confirmed by ICMBio and it is recommended that their conclusions are also submitted to the WHC for review by IUCN. The project

should not proceed unless it is clearly demonstrated that it will not impact the OUV of the property, or of the adjacent Iguazu National Park World Heritage property in Argentina.

As for the Colono Road, this has been closed since 2001 and the mission observed almost complete recovery of the area formerly crossed by the road. However, a recently introduced bill number 7.123/2010 has raised serious concerns. The bill was approved by the lower House of Parliament (Câmara dos Deputados) in August 2013 and would, if also accepted by the Senate, provide a legal basis for the reopening of the Colono road. Its reopening would represent a clear ascertained danger to the Outstanding Universal Value and integrity of the property and would lead to the inscription of the property on the List of World Heritage in Danger. Illegal reopening of the road was the reason why the property was inscribed on the List of World Heritage in Danger in 1999. The Bill has not been proposed for voting at the Senate yet and there appears to be no deadline for such a vote to take place. It is understood by the mission, based on comments heard during the visit, that reopening of the Colono Road has been repeatedly raised as a political issue that attracts attention of local people without there being a real justification from an economic perspective for the reopening of the road, or likelihood of implementation. The Ministry of Environment has also publicly expressed its opposition to the Bill. Even in the event that the Bill were to be approved by the Senate, there are also a number of mechanisms that could be used to prevent it from becoming applicable law. It can, therefore, be concluded that the immediate possibility that the road will actually be reopened is low. However, the situation where the proposed Bill remains pending and the property continues to be threatened by the reopening of the road is unacceptable. It is, therefore, recommended that the State Party of Brazil ensures that the proposed Bill is not approved, even if positively voted on by the Senate, through the available legal mechanisms.

The mission also had an opportunity to discuss the management of the property and other relevant issues. Since the inscription of the property on the World Heritage List, transboundary cooperation between the Iguazu National Park and the neighbouring Iguazu National Park in Argentina has been subject to a number of Committee Decisions and requests. It is understood by the mission that the Brazilian legislation does not provide for creation and management of transboundary protected areas and that a high-level agreement between Brazil and Argentina is not being perceived by the Brazilian authorities as a solution that would enhance the management of the property. At the same time, transboundary cooperation on the ground appears to be good. Joint patrolling and law enforcement efforts represent one of the most crucial needs in the field of transboundary cooperation in this area. It is recommended that an action plan for joint patrolling activities is developed together with the Iguazu National Park in Argentina and that these activities are undertaken on a regular basis. Development of such a plan could be linked to the currently ongoing review and development of a new Management Plan for the Iguazu National Park. Another field of cooperation where joint efforts could achieve significant results is monitoring of key species. As information on the current population status of the majority of species is extremely scarce, a monitoring programme for key species within the property needs to be developed as a matter of priority and expanding such a programme to the broader region in cooperation with the Iguazu National Park would increase its effectiveness.

Recommendations

Regarding the Colono Road

1. Ensure that the proposed Bill 7.123/2010 that would provide legal basis for the reopening of the Colono Road is not approved or applied, even if positively voted on by the Senate through the legal mechanisms that may be available.

Regarding the Baixo Iguazu hydroelectric project

2. In addition to the existing EIA, develop a specific assessment of any potential impacts of the construction and operation of the Baixo Iguazu hydropower plant specifically on the OUV and integrity of the property, and also on the OUV and integrity of the adjacent Iguazu National Park World Heritage property in Argentina.
3. Ensure that ICMBio have the opportunity to review this assessment and undertake appropriate consultation with the relevant Argentinian authorities, in order to confirm whether ICMBio would still give their authorization for the construction of the dam and/or whether the conditions already elaborated by them should be further amended or completed based on the results of the assessment.
4. Ensure that further development of the project does not proceed until a copy of the assessment and the conclusions of ICMBio have been submitted to the WHC and reviewed by IUCN.
5. In case authorization is given by ICMBio, ensure that the conditions set by them are duly fulfilled before the construction of the dam can proceed, and submit to the WHC the conclusions of ICMBio on the degree to which the conditions have been fulfilled.

Regarding the management of the property

6. Prepare a new management plan for the Iguazu National Park as a matter of priority and provide a copy of it to the World Heritage Centre, when it becomes available.
7. Together with the neighbouring Iguazu National Park in Argentina develop an action plan for joint patrolling activities and ensure that these activities are undertaken on a regular basis.
8. Establish a monitoring programme for key species within the property and, in cooperation with the Iguazu National Park, within the broader region.

6 ANNEXES

Annex 1. Terms of Reference and composition of the mission team

Mission team: Elena Osipova, IUCN and Peter Newborne, independent researcher/consultant (ODI Research Associate)

TERMS OF REFERENCE IUCN Reactive Monitoring Mission Iguazu National Park - Brazil 08 – 15 March 2015

At its 38th session, the World Heritage Committee requested the State Party of Brazil to invite an IUCN reactive monitoring mission to Iguazu National Park World Heritage Site “to assess the status and potential impact of the Baixo Iguazu dam and the overall state of conservation of the property, including the area previously affected by the “Settler’s Road” (Decision 38 COM 7B.79). The mission will be conducted by Peter Newborne (leading on dam aspects) and Elena Osipova.

In particular, the mission should undertake the following:

1. Assess the current status of the Baixo Iguazu Hydroelectric Project and its potential impact on the property’s Outstanding Universal Value and integrity;
2. Assess the progress made by the State Party in the elaboration of a detailed Environmental Impact Assessment (EIA) in view of the re-evaluation of the Baixo Iguazu Hydroelectric project;
3. Assess the state of conservation of the property and the extent to which its Outstanding Universal Value is affected by existing and potential threats, including ongoing impacts of any existing dams on the River Iguazu, past impacts of the "Settler's Road" and the continued risk of the latter’s reopening;
4. Review (based on the visit to Brazilian territory) the progress achieved by the States Parties of Argentina and Brazil in fostering transboundary cooperation;
5. In line with paragraph 173 of the *Operational Guidelines*, assess any other relevant issues that may negatively impact on the Outstanding Universal Value of the property, including the conditions of integrity and protection and management, and make relevant recommendations.

2

The most recent version of the management plan of the property;

- a) The latest available Environmental Impact Assessment for the Baixo Iguazu Hydroelectric Project, as well as any other relevant project documentation;
- b) Any re-evaluation of the Baixo Iguazu Hydroelectric Project subsequent to the major flooding incident in June 2014 (including any rethinking of design of the dam or construction site);

- c) A plan/description of the intended positioning of the Baixo Iguaçu Hydroelectric Project relative to the boundaries of the property including, in particular, the tail race canal ('*vertedouro*' in Portuguese);
- d) Any relevant documentation related to the possible reopening of the Settler's Road;
- e) Any relevant documentation relating to the proposed ecological discharge programme (*vazão ecológico*) applying to the of the Baixo Iguaçu Hydroelectric Project, in its phases of construction and operation, including its role as a re-regulating dam for reduction of oscillations in water flows downstream in the context of rainfall and hydrological conditions, in particular with regard to minimum and maximum water flows over the Iguaçu Falls;
- f) A copy of Bill 7123/2010, including its proposed changes that would enable road construction in protected areas.

The mission should, within the limits of the time available during the visit to Brazil, hold consultations with the Brazilian authorities at national, regional and local levels, including representatives of the Ministry of the Environment and the Chico Mendes Institute for Conservation of Biodiversity. In addition, the mission should hold consultation with a range of relevant stakeholders, including i) researchers; ii) NGOs; iii) representatives of the companies involved in the Baixo Iguaçu Hydroelectric Project; iv) representatives of local communities. Based on the results of the above-mentioned assessments and discussions with the State Party representatives and stakeholders, the mission will develop recommendations to the Government of Brazil and the World Heritage Committee with the objective of providing guidance to the State Party on actions to be taken to ensure the long-term conservation of the property's Outstanding Universal Value. It should be noted that recommendations are made within the mission report (see below), and not while the mission is still on-going.

The mission will prepare a concise mission report on the findings and recommendations of this reactive monitoring mission no later than 6 weeks after the end of the field visit, following the standard format.

Annex 2. Mission programme and itinerary

Sunday March 08	Morning: Arrival in Foz do Iguacu Afternoon: Meeting at the Iguacu National Park Headquarters to review the agenda; presentation about Iguacu by the Park staff
Monday March 09	Morning: aerial tour of the park with focus on the Colono Road, Baixo Iguacu site, park boundaries and the Falls. Afternoon: car trip following the boundaries of the park till the place where the Colono Road entered the park
Tuesday March 10	Morning: Visit to the Iguacu Falls area Afternoon: meeting at Park Headquarters to evaluate previous day activities and the necessity of other discussions and activities
Wednesday March 11	Morning: discussions with Park staff and ICMBio representatives Visit to Parque das Aves Afternoon: Flight to Brasilia
Thursday March 12	Meetings with MMA, MRE e ICMBio

Annex 3. List of people met

Representatives of ICMBio met in the Iguazu National Park

- Sergio Brant Rocha, Director, Creation and Management of Conservation Units
- Jorge Pegoraro, Park Superintendent, Iguazu National Park
- Apolonio Rodrigues, Deputy Head of the Iguazu National Park
- Ivan Carlos Baptiston, Analista Ambiental, Iguazu National Park
- Jorge Madeira Nogueira, Coordinator, Department of visitation support services
- Igor Soares, Analista Ambiental, Department of Environmental Impact Assessment

Representatives of the State of Paraná and the Environmental Institute of Paraná (IAP)

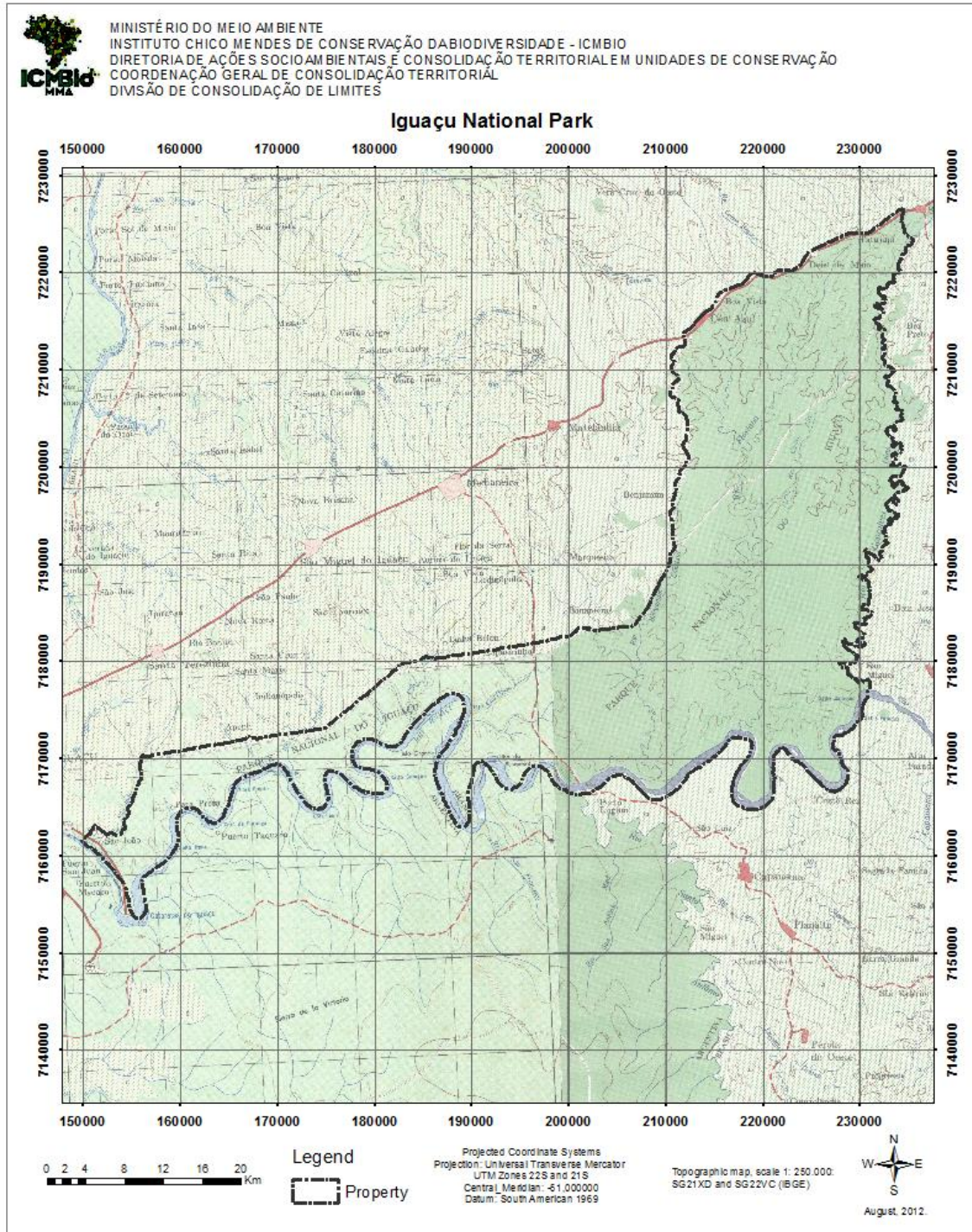
- Ricardo José Soavinski, Secretary of the State
- Luiz Tarcísio Mossato Pinto, President of IAP

List of people who attended the meeting held at the Ministry of Environment in Brasilia – Thursday 12th March

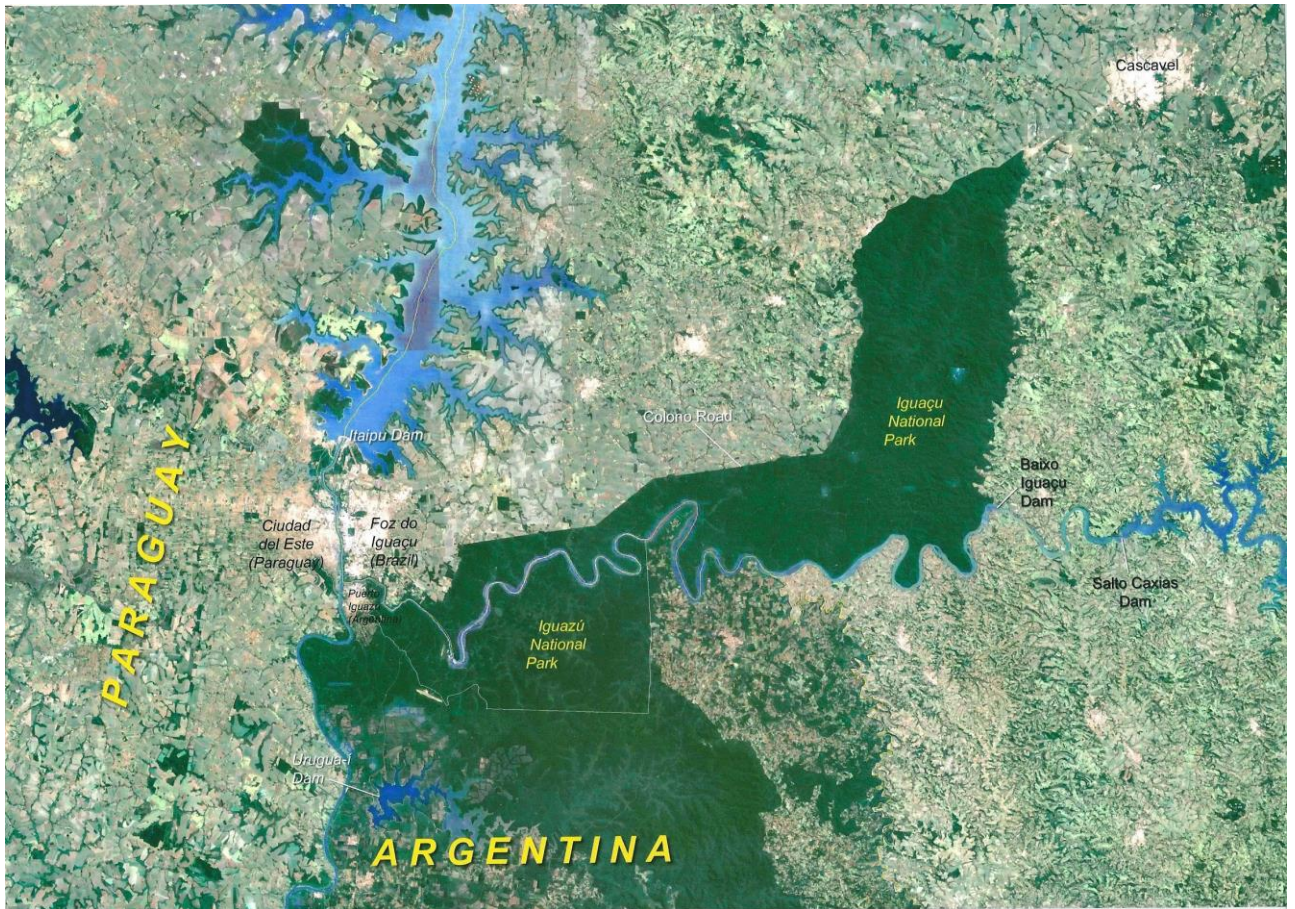
- Sergio Henrique Collaço de Carvalho, Director, Secretariat of Biodiversity and Forests, Department of Protected Areas, Ministry of the Environment
- André Rosa Bueno, Secretary, Department of Multilateral Cultural Affairs, Ministry of External Relations
- André Luis Lima, Department of Protected Areas, Ministry of the Environment
- Fernando Coimbra, Head of the Office for International Affairs, Ministry of the Environment
- André Raymundo Pante, National Water Agency (ANA)
- Rodrigo Flecha, National Water Agency (ANA)
- Flavia Lemos, Office for International Affairs, Ministry of the Environment

- Sergio Brant Rocha, ICMBio
- Jorge Nogueira, ICMBio
- Igor Soares, ICMBio

Annex 4. Maps



Map 4. Map of the inscribed property. © ICMBio
 (Source: <http://whc.unesco.org/en/list/355/documents/>)



Map 5. Location of the Iguazu National Park, Baixo Iguazu Dam and Salto Caxias Dam, as well as the Iguazu National Park in Argentina. © ICMBio

Annex 5. Photographs



Photo 5. Black-fronted piping-guan (*Pipile jacutinga*)⁴. Photo taken during one of the patrols, December 2014. © ICMBio



Photo 6. Materials seized from a poachers' camp. © ICMBio



⁴ EN according to the IUCN Red List of Threatened Species. <http://www.iucnredlist.org/details/22678429/0>

Annex 6. List of conditions elaborated by ICMBio for the Baixo Iguaçu

ICMBio/CDoc



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	SERVIÇO PÚBLICO FEDERAL MINISTÉRIO DO MEIO AMBIENTE INSTITUTO CHICO MENDES DE CONSERVAÇÃO DA BIODIVERSIDADE	
AUTORIZAÇÃO PARA O LICENCIAMENTO AMBIENTAL		

Autorização nº 01/2015 – Sede	Processo nº: 02070.002271/2008-67
O Instituto Chico Mendes de Conservação da Biodiversidade, seguindo os trâmites da Instrução Normativa ICMBio nº 07/2014, e, atendendo a decisão proferida pela 4ª Turma do Tribunal Regional Federal da 4ª Região, uma vez atendidas as limitações ou restrições abaixo listadas, AUTORIZA o licenciamento ambiental na etapa de Instalação da Usina Hidrelétrica de Baixo Iguaçu , no que diz respeito aos impactos ambientais sobre as unidades de conservação afetadas.	

Unidades de Conservação afetadas e atos de criação: Parque Nacional do Iguaçu – Decreto Lei nº 1.035 de 10 de janeiro de 1939 / Decreto nº 86.676 de 01 de dezembro de 1981
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Empreendimento/Atividade: Usina Hidrelétrica (UHE) de Baixo Iguaçu

Órgão Licenciador: Instituto Ambiental do Paraná – IAP

Empreendedor: Geração Céu Azul S.A.	CNPJ: 09.136.816/0001-55
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<p>1. Condições Gerais:</p> <p>1.1. Esta Autorização não dispensa outras Autorizações e Licenças Federais, Estaduais, Distritais e Municipais, porventura exigíveis no processo de licenciamento.</p> <p>1.2. Mediante decisão motivada, o Instituto Chico Mendes poderá alterar as recomendações, as medidas de controle e adequação, bem como suspender ou cancelar esta Autorização, caso ocorra:</p> <ul style="list-style-type: none"> a) Violação ou inadequação de quaisquer condicionantes ou normas legais; b) Omissão ou falsa descrição de informações relevantes, que subsidiaram a expedição da presente Autorização; c) Superveniência de fato excepcional ou imprevisível ao pedido de Autorização. <p>1.3. O Instituto Chico Mendes deverá ser imediatamente comunicado em caso de ocorrência de acidentes que possam afetar o Parque Nacional do Iguaçu.</p> <p>1.4. Encaminhar ao Instituto Chico Mendes todas as licenças ambientais para o empreendimento assim que forem emitidas.</p> <p>1.5. O não cumprimento das disposições deste documento poderá acarretar seu cancelamento, estando ainda o solicitante sujeito às penalidades previstas na Legislação Ambiental vigente.</p> <p>1.6. Os programas e planos de estudos solicitados neste documento devem ser aprovados pelo Instituto Chico Mendes.</p> <p>2. Condições Específicas:</p> <p>2.1. Elaborar e implementar, em até 365 dias (um ano), um plano de conservação da fauna aquática da bacia do baixo rio Iguaçu, no trecho localizado a jusante da UHE Salto Caxias até o Parque Nacional do Iguaçu, nas proximidades das cataratas do Iguaçu, em consonância com diretrizes e cronograma estabelecidos pelo Instituto Chico Mendes.</p>

1ª Via: Órgão Licenciador, 2ª Via: Processo Administrativo, 3ª Via: Sede do ICMBio

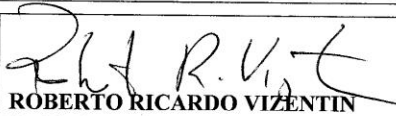
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- 2.1.1. O plano deverá conter, um projeto específico de conservação e manejo da espécie surubim-do-iguazu (*Steindachneridion melanodermatum*).
- 2.1.2. O plano deverá conter, em caráter permanente e com contínuo monitoramento, um Programa de Vazão Ecológica defluente da UHE Baixo Iguazu, de forma a contemplar a sua sazonalidade de vazões ao longo do ano.
- 2.1.3. O Programa de Vazão Ecológica deverá determinar a vazão ecológica do rio Iguazu, levando em consideração os parâmetros hidrológicos e geomorfológicos (simulados e coletados), bem como os bióticos (ictiofauna, macroinvertebrados e as formações florestais associadas à planície de inundação), considerando ainda:
 - 2.1.3.1. Avaliação da reprodução, recrutamento, abundância relativa, estrutura populacional, e a formação e distribuição de *habitats* das espécies de peixes endêmicas e sedentárias que ocorrem no rio Iguazu e tributários, dentro do Parque Nacional do Iguazu, de modo a determinar suas relações com as principais características do regime hidrológico (magnitude e frequência de vazões e níveis d'água) e parâmetros geomorfológicos.
 - 2.1.3.2. Avaliação da relação entre a distribuição de *habitats* e estrutura de comunidades de macroinvertebrados aquáticos existentes no rio Iguazu e tributários, dentro do Parque Nacional do Iguazu, com as variações no regime hidrológico e nos parâmetros geomorfológicos;
 - 2.1.3.3. Avaliação da relação entre as alterações no regime hidrológico (magnitude e frequência dos pulsos de cheia) e seus efeitos nas formações florestais associadas à planície de inundação, ao longo do rio Iguazu e tributários dentro do Parque Nacional do Iguazu;
- 2.3. Ampliar o Programa de Monitoramento do Meio Aquático – Subprograma de Monitoramento da Ictiofauna, previsto no Plano Básico Ambiental, contemplando também pontos nos tributários do rio Iguazu no interior do Parque Nacional do Iguazu, a jusante da UHE Baixo Iguazu.
- 2.4. Alterar o Programa de Monitoramento do Meio Aquático – Subprograma Limnologia e da Qualidade da Água, previsto no Plano Básico Ambiental, devendo as amostragens das variáveis físicas, químicas e biológicas da água serem feitas mensalmente e as variáveis sedimentológicas bimensalmente.
- 2.5. Incluir no Programa de Monitoramento Hidrossedimentológico, previsto no Plano Básico Ambiental, o trecho do rio Iguazu desde o barramento até as proximidades das cataratas do Iguazu e apresentar, em até 60 (sessenta) dias, documento com detalhamento e alteração do referido programa, devendo ser levantados nesta área os mesmos parâmetros previstos no PBA, além de se prever a:
 - 2.5.1. Instalação de estações de monitoramento pluviométrico, fluviométrico e sedimentométrico, distribuídas espacialmente e em quantidade de modo a representar o transporte de sedimentos defluente do barramento, bem como a contribuição dos tributários existentes dentro do Parque Nacional do Iguazu ao longo do rio Iguazu.
 - 2.5.2. Realização de levantamento topobatimétrico neste trecho, com distribuição espacial e em quantidade que permita: i) identificar as principais mudanças geomorfológicas ao longo do canal; ii) representar a morfologia de fundo como condição de contorno necessária aos estudos de modelagem numérica hidrodinâmica e de transporte de sedimentos. O monitoramento deve ser iniciado previamente às intervenções no rio, e deve se repetir periodicamente enquanto perdurar a operação da UHE.
- 2.5.3. O documento deverá ser avaliado e aprovado pelo ICMBio e sua execução deverá ser iniciada no prazo máximo de 30 (trinta) dias após sua aprovação



- 2.6. Apresentar, em até 60 (sessenta) dias, um plano de estudo de modelagem numérica de transporte de sedimentos no rio Iguaçu, desde o barramento até as cataratas do Iguaçu, com o escopo do estudo, detalhamento metodológico, estratégia amostral e cronograma de execução, com os seguintes pressupostos:
- 2.6.1. Levar em consideração as informações do programa de monitoramento hidrossedimentológico.
 - 2.6.2. Simular os períodos de instalação e operação da usina, sendo esta última equivalente à escala temporal de 20 (vinte) anos.
 - 2.6.3. A modelagem hidrodinâmica tomada como base deve ser calibrada e validada com séries de dados independentes.
 - 2.6.4. Avaliar o efeito das variações diurnas e sazonais de vazão defluentes da UHE Baixo Iguaçu sobre os processos de erosão e deposição no rio Iguaçu e afluentes existentes dentro do Parque Nacional do Iguaçu, de modo a subsidiar a proposição de plano operativo que mitigue ao máximo os impactos ambientais sobre a unidade de conservação.
 - 2.6.5. O plano deverá ser avaliado e aprovado pelo ICMBio e a execução do estudo deverá ser iniciada em 180 dias após o início do Programa de Monitoramento Hidrossedimentológico.
- 2.7. Implantar, de imediato, as medidas emergenciais solicitadas via ofício ao Instituto Ambiental do Paraná (IAP) e implantar, em até 60 dias, o Programa de Proteção ao Parque Nacional do Iguaçu, conforme estabelecido pelo Instituto Chico Mendes (Parque Nacional do Iguaçu).
- 2.8. Realizar, em até 60 dias, reuniões com a equipe do Parque Nacional do Iguaçu para elaborar as adequações nos programas de interesse da unidade de conservação constantes no Plano Básico Ambiental, uma vez que deverão estar em consonância com os programas já desenvolvidos pelo Parque.
- 2.9. Apresentar em até 60 dias, Programa de Gerenciamento de Riscos, prevendo melhorias nas ações de contingenciamento, para as fases de instalação e operação da usina.
- 2.10. Identificar o material depositado no rio Iguaçu, no Parque Nacional, decorrente da destruição da enseadeira, propondo solução para o passivo existente, devendo obter a aprovação deste ICMBio, antes do início das obras.
- 2.11. Apresentar qualquer alteração no projeto da UH E Baixo Iguaçu, em especial no que se refere à enseadeira e ao vertedouro, tendo em vista as sugestões apresentadas pela Agência Nacional de Águas (ANA).
- 2.12. A UHE Baixo Iguaçu deve operar como uma usina de re-regulação, com hidrograma proposto pelo programa de vazão ecológica.

Brasília – DF, 08^o de janeiro de 2015.


ROBERTO RICARDO VIZENTIN
Presidente