

*L500106 CLP project*

## **Green Corridor Consolidation: Biodiversity Conservation with Social Involvement in the Atlantic Forest of Argentina**

*Conservation Leadership Award 2006*

### **Argentina**

Urugua-í – Foerster Biological Corridor, Province of Misiones

May 2006 – March 2013

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## Section 1:

### Summary

The Upper Paraná Atlantic forest still remaining in the Argentinean province of Misiones, with almost 1 million hectares, constitutes one of the world's largest remnants of this ecosystem. During the last century, the Atlantic Forest biome has suffered an intense deforestation and fragmentation process caused by agriculture, cattle, exotic tree plantations, and infrastructure.

The corridor approach to biodiversity conservation seeks to provide a practical and effective solution to the difficulty of maintaining biodiversity and large-scale ecological processes. The Uruguá-í Foerster biological corridor (UFBC) became an example of a corridor's practical implementation.

After 12 years of project, 9 private reserves and one provincial park guarantee the conservation and ecological connectivity of the Uruguá-í Foerster corridor. Ecotourism replaced livestock and tobacco culture as the main economic activity in the corridor area. New eco-lodges and hostels were built, employing local people. Yate-í Nature Reserve (Conservación Argentina) has infrastructure (visitor center, Biological Station) and trails to meet the demands of tourists, researchers and volunteers. Conservation education and training was performed in the Yate-í Visitor Centre. The paving of 101 National Road did not represent a significant impact to the corridor because wildlife crossings were built, and they are working.

Biodiversity monitoring (mammals and birds) shows an amazing recovery of the corridor's wildlife, reappearing species had become locally extinct (like the puma). Herds of white-lipped peccaries begin to move through the corridor. The forest cover is increasing in private reserve, through active restoration measures (reforestation) and natural regeneration. Several stakeholders, public and private, are involved in a long-term conservation and sustainable development of the biological corridor. CLP continued support and subsequently IUCN Netherlands, had a major impact on the sustainability of the project.

#### **Note:**

Maps and photos of all project activities and outputs were shown in a separate report that can be downloaded from this link <http://xurl.es/v56sd>. The attached PDF report available from this link is a necessary complement to the final project report.

### Introduction

The project area is located in the Upper Paraná Atlantic Forest Eco-region, commonly considered as the southernmost and interior portion of the Atlantic Forest biome. From the Atlantic Ocean to the interior land, it passes through the Coastal Brazilian Mountains and extends over the Paraná River basin in eastern Paraguay and of the Misiones province, in Argentina. During the last century, the Atlantic Forest biome has suffered an intense deforestation and fragmentation process caused by the advance of agriculture (soy bean, sugar cane, coffee, tobacco), cattle, exotic tree plantations (pine and eucalyptus), and infrastructure (dams, routes, urbanizations). At the continental level, this region only has near 8% of its original cover. Atlantic Forest biodiversity is

one of the highest in the world, but it is not evenly distributed because different combinations of temperature, altitude, soil, precipitation and distance to the ocean along its range have created local environmental conditions leading to the evolution of unique species in very restricted areas. The Upper Paraná Atlantic forest still remaining in the Argentinean province of Misiones, with almost 1 million hectares, constitutes one of the world's largest remnants of this ecosystem.

The corridor approach to biodiversity conservation seeks to provide a practical and effective solution to the difficulty of maintaining biodiversity and large-scale ecological processes. Existing protected areas are often too small and isolated to maintain viable ecosystems and processes. In such circumstances, conservation efforts must focus on linking major sites across wide geographic areas. Such networks of protected areas and landscape management systems are called biodiversity corridors. The main function of these corridors is to connect biodiversity areas through a mosaic of sustainable land uses, increasing mobility and genetic exchange among individuals, even in the absence of large extensions of continuous natural habitat. In this context, small habitat fragments within corridors perform several related functions, connecting or reconnecting larger areas, maintaining heterogeneity in the habitat matrix, and providing refuge for species that require the unique environments present in these fragments.

In 2000, the Misiones province government legally created a conservation and sustainable development area called "Green Corridor", covering one million hectares of Atlantic forest. In order to contribute to this strategy, since early 2002 we have been working continuously for the long term conservation of a biodiversity corridor located between Urugua-í and Foerster provincial parks, which has been pursued by the combination of scientific research, environmental education, restoration, agroforestry, local community participation, communication and political lobby.

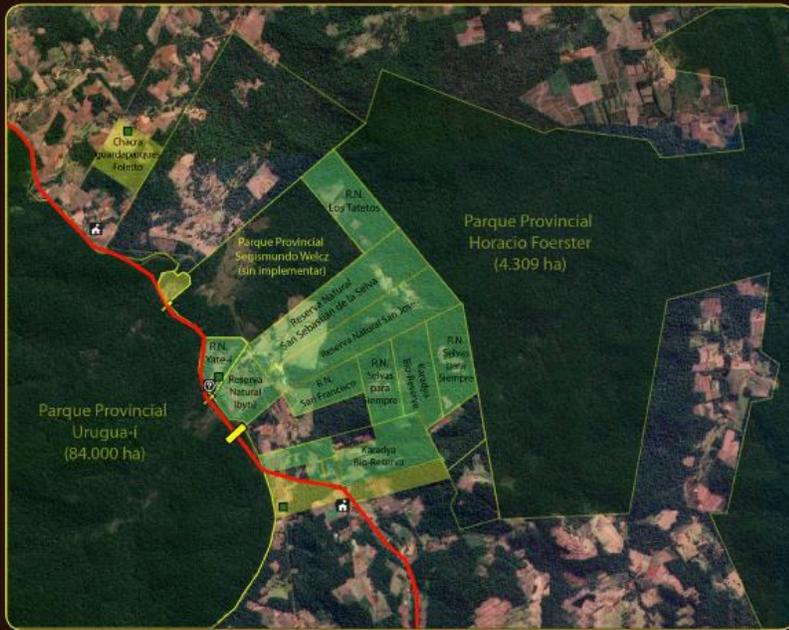
The Urugua-í- Foerster biological corridor (UFBC) became an example of a corridor practical implementation. Conservation Argentina, thanks to the support of CLP (Gold Award 2002 and Follow up award 2004) could consolidate its work in Misiones, strengthening alliances with other national and foreign institutions that contribute to the long term implementation of the project.

# Project area



Misiones Province, Argentina

- ▭ Urugua-í - Foerster Biodiversity Corridor
- ▭ Upper Paraná Atlantic Forest Remnants
- Departamentos and protected areas limits



- 1 - Yate-í Nature Reserve (27 ha)
- 2 - Los Tatetos Nature Reserve (59 ha)
- 3 - Teresa Muñoz's Nature Reserve (32 ha)
- 4 - San José Nature Reserve (92 ha)
- 5 - San Francisco Nature Reserve (21 ha)
- 6 - Forests for Ever (lot 1) Nature Reserve (26 ha)
- 7 - Karadña Bio-Reserve (lot 1) (40 ha)
- 8 - Forests for Ever (lot 2) Nature Reserve (33 ha)
- 9 - Forests for Ever (lot 3) Nature Reserve (14 ha)
- 10 - Karadña Bio-Reserve (lot 2) (50 ha)
- 11 - Hummingbirds Nature Reserve (5 ha)
- 12 - Yacupa-í Camp Nature Reserve (5 ha)
- 13 - San Sebastián de la Selva (92 ha)

Others productive farms protected from hunting with forests and agro-forests.

## Project members

<i>Full Name (current age)</i>	<i>Experience</i>	<i>Team Role</i>	<i>Current occupation</i>
Diego Varela (40)	Conservation biologist (University of Buenos Aires). Mammalian and bird ecology and conservation. Corridor Ecology. Restoration Ecology. Founder member of the NGOs Conservación Argentina (CA) and Atlantic Forest Research Centre (CeIBA). Member of IUCN/SSC Deer Specialist Group and Tapir Specialist Group. Leader of CLP projects: Marsh Deer Project (1999), Uruguay Green Corridor (2002), Green Corridor Project (2004), and Green Corridor Consolidation (2006).	Project's leader	Associated researcher in the Instituto de Biología Subtropical (IBS), Puerto Iguazú, Universidad Nacional de Misiones/Conicet.  Road Ecology Program, principal researcher.  NGO Conservación Argentina, director  Uruguay – Foerster Corridor Project, project coordinator
Gustavo Zurita (36)	PhD. Ecology, University of Buenos Aires. Functional ecology of birds and dung beetles. Ornithology.	Bird surveys	Researcher in IBS/CONICET in Puerto Iguazú. Universidad Nacional de Misiones, teacher.
Sergio Casertano (45)	Biologist, Universidad de Mar del Plata. Entomologist. Insect curator. Experience in environmental education.	Conservation education. Manager of Visitor Centre and field research station.	Entomology curator (Instituto Nacional de Medicina Tropical, Misiones). Teacher.
Mariana Villagra (37)	PhD. Biologist (Universidad de Buenos Aires). Forest ecology, forest restoration, tree physiology. Graphic designer	Forest restoration, conservation education	CONICET Postdoctoral fellowship. IBS researcher in Puerto Iguazú.
Ana Vivaldi (37)	Anthropologist (Universidad de Buenos Aires). Environmental educator. PhD British Columbia, Canada.	Conservation education	CONICET Postdoctoral fellowship. Researcher British Columbia, Canada.
Maria de la Paz Isola	Expert in nature interpretation. Master in environmental education (Universidad de Malaga, España).	Conservation education	Teacher
Alejandro Gato (36)	PhD. Biologist (Universidad de Buenos Aires). Nature interpreter and conservation educator.	Conservation education	CONICET Postdoctoral fellowship in Patagonia

			Argentina.
Mauricio González (26)	Local community member. Graduated for local agrarian high school. Courses in nature interpretation and ecotourism.	Tree nursery, forest restoration, ecotourism	
Fernando Foletto (30)	Local community member. Agrarian technician. Courses in agroecology and agroforestry in Brazil and Argentina. Experience in tree nursery management and biodiversity survey.	Tree nursery, biodiversity surveys	Park ranger in Foerster Provincial Park.
Leonardo Raffo (44)	Biologist (Universidad de Buenos Aires). Master in Management and conservation of tropical biodiversity (Spain). Work in National Park Administration. Expertise in protected areas and management plan design.	Corridor Management Plan	Argentina National Park Administration
Cecilia Arienti (35)	Biologist (Universidad de Buenos Aires). Master in University of Alberta (Canada). GIS expert. Birds and mammals surveys.	Bird surveys and GIS	Biologist in New Zeland

## Section 2:

### Aim and objectives

Main goals:

- A) The long term consolidation of a biological corridor between Uruguáí and Foerster provincial parks.
- B) The consolidation of Conservación Argentina as one of the leading NGOs working in the conservation of the Atlantic forest in Misiones Province.

To achieve the first goal we pose several specific objectives which include:

- 1) To develop a participative management plan of the corridor and its implementation;
- 2) To initiate a long term monitoring program of biodiversity (particularly of endangered species);
- 3) To create community centre for the promotion and support of sustainable income alternatives for the local community (including agroecology, agroforestry, ecotourism and others);
- 4) To create an education program with the local Agricultural High School and to publish an environmental manual with local contents for schools and protected areas located in the corridor. (This objective was not met as it was formulated. Part of the team of educators left the project to begin postgraduate studies outside of Argentina. This objective was reformulated to perform training courses in the new corridor visitor centre.)

For the second goal we expected to

- 1) Capacitate members of CA in fundraising;
- 2) Reinforce strategic alliances with other NGOs and GOs,
- 3) Implement a communication strategy for the project and the NGO.

### Methodology

- a) *Management plan and reserve implementation:* to create the management plan we will compile biological and social information relevant to the area. We will perform participative workshops with stakeholders (local farmers, NGOs and GOs). All this information and their opinions will be incorporated into a report that will be distributed throughout the region. The infrastructure for the reserve will be designed and built in cooperation with the provincial government and Fundación Vida Silvestre Argentina using the IUCN-Netherlands funds. The reserve will be co-managed by the provincial government and our NGO.

- b) *Monitoring biodiversity:* The objective is to assess wildlife use of protected areas and the corridor, which will be conducted in cooperation with park rangers. Trees, birds, mammals and important insect groups (ants and beetles) will be included and used as indicators of the ecological value of the corridor. Permanent sampling transects and plots will be established inside protected areas and the entire corridor. In these transects, birds will be periodically (every 3 months) sampled through the use of auditive sampling points and mist nets, mammals will be surveyed by signs (tracks and faeces) and camera traps, and insects with pitfall traps. Also, a complete tree survey will be performed in the new reserve. This information will be included in a georeferenced database to create maps of biodiversity value. Wildlife corridor use will be monitored into the new reserve.
- c) *Support and promotion of scientific research in the corridor area:* we will use our biological field station to promote scientific research and biodiversity inventories within the reserve and the entire corridor. Field station facilities will be promoted on the CA website. Partnerships with other research groups (i.e. University of Buenos Aires) will be reinforced.
- d) *Geographic information system:* a complete spatial database for the corridor will be created, including biological and social information. Thematic maps will be created using satellite images and aerial photographs (currently available) and updated every year.
- e) *Support to Agrarian High School students:* the objective is to design and implement small research projects with students of the local agrarian school as part of their academic requirements. Members of the team will advise students in methodological and theoretical aspects of ecology (i.e. restoration, vegetation sampling). The designed projects will be implemented in the corridor area with the logistical and technical support from members of the project.
- f) *Participative school textbook with local contents:* contents, experiences and activities related to forest, species, land use and local environmental problems gathered by local teachers and park rangers will be compiled, edited and included in a textbook which will be distributed in local and provincial schools.
- g) *Implementation of experimental and demonstrative plots of sustainable alternatives productions in the community centre:* different experiences will be implemented in the new protected area with the objective of enhancing local interest in sustainable activities. Agroecological and agroforestry plots will be implemented as alternatives for deforested and degraded areas. Alternative non-timber forest products (native fruits collection), honey production from native bee species, ecotourism, production of ornamental palms and other species from the native forest and alternatives will be promoted.

## Outputs and Results

Maps and photos of all project activities and outputs were shown in a separate report that can be downloaded from this link <http://xurl.es/v56sd>

Objectives	Outputs achieved
To develop a participative management plan of the corridor and its implementation	<ul style="list-style-type: none"> <li>a) Two management plan workshops.</li> <li>b) A long term Corridor Vision was developed in a participative process.</li> <li>c) Nine private protected areas were created in the UFBC.</li> <li>d) Yate-í Nature Private Reserve (owned by Conservación Argentina) was fully implemented.</li> <li>e) UFBC was recognised for Province authorities.</li> <li>f) A new provincial park was created in the UFBC.</li> <li>g) Mitigation measures (wildlife crossing) were built along the main corridor's road.</li> <li>h) A geographic information system (GIS) of the corridor was created, including biological and social spatial database.</li> </ul>
To initiate a long term monitoring program of biodiversity (particularly of endangered species)	<ul style="list-style-type: none"> <li>a) The bird inventory reaches to 350 species.</li> <li>b) A systematic camera trap monitoring of large- and medium-size mammals was implemented.</li> </ul>
To create community centre for the promotion and support of sustainable income alternatives for the local community (including agroecology, agroforestry, ecotourism and others)	<ul style="list-style-type: none"> <li>a) A Visitor Centre was built in the Yate-í nature reserve (two large rooms for conservation education and nature interpretation, public bathrooms, office and a apartment for reserve's managers).</li> <li>b) A native tree nursery was built in the Yate-í nature reserve for agroforestry and restoration projects.</li> <li>c) A Research stations was built in the Yate-í</li> </ul>
To perform training courses in the new corridor visitor centre (new objective)	<ul style="list-style-type: none"> <li>a) Three Conservation Courses for Latin American students was performed in the visitor centre of the Yate-í nature reserve.</li> <li>b) 1 workshop about native stingless bee-keeping students was performed in the visitor centre of the Yate-í nature reserve for local farmers.</li> <li>c) 1 workshop about ecotourism was performed in the visitor centre of the Yate-í nature reserve for local people and entrepreneurs.</li> </ul>
Capacitate members of CA in fundraising	<ul style="list-style-type: none"> <li>- No training course about fundraising was conducted for member of CA.</li> <li>- Nevertheless, in past years, CA has received new funds for the biological corridor from IUCN Netherlands Committee (Ecosystem Grant</li> </ul>

	<p>Program) and the NGO Aves Argentinas.</p> <ul style="list-style-type: none"> <li>- New negotiations with some national companies are being initiated to finance ecological restoration activities in the corridor.</li> </ul>
Reinforce strategic alliances with other NGOs and GOs	<p>In recent years, CA generated strategic alliances with the following organizations:</p> <ul style="list-style-type: none"> <li>a) Fundación Vida Silvestre Argentina (National NGO, WWF local partner).</li> <li>b) Aves Argentinas (National NGO, BirdLife local partner).</li> <li>c) IUCN Netherlands Committee (EGP grant).</li> <li>d) Fundación Banco de Bosques (National NGO devoted to land purchase for conservation and the creation of protected areas).</li> <li>e) Misiones’s Road Agency (Dirección Provincial de Vialidad) (agreement for road wildlife crossing construction and monitoring in the corridor).</li> <li>f) Ministry of Ecology and Natural Renewable Resources, Government of Misiones Province.</li> <li>g) AECID (International Cooperation Agency from Spain).</li> <li>h) National Park Administration of Argentina.</li> </ul>
Implement a communication strategy for the project and the NGO.	<ul style="list-style-type: none"> <li>a) CA has participated in news stories in newspapers, radio and TV, at local and national levels.</li> <li>b) Video about land acquisition for conservation together with Fundación Vida Silvestre Argentina.</li> <li>c) Facebook fan page with more than 2400 fans.</li> </ul>

## Achievements and Impacts

### Corridor’s Vision

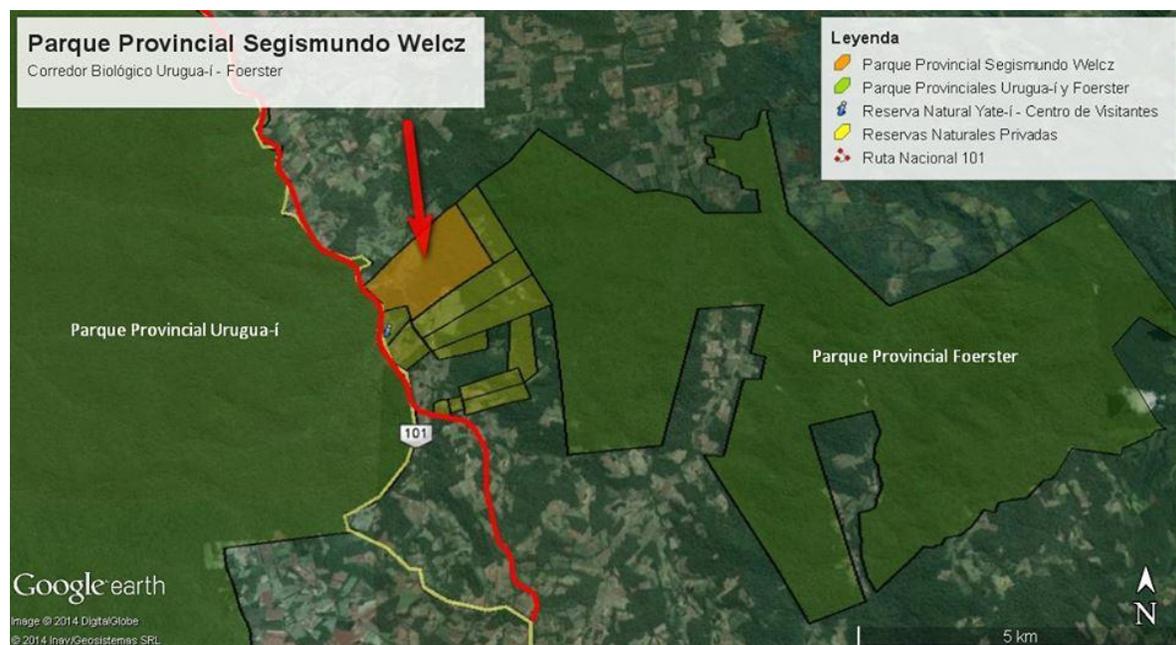
A long term “Corridor’s Vision” was developed in a participative process by technicians from governmental and private institutions, local people and other stakeholders during 2 workshops addressed to build UFBC Management Plan.

“Our long-term vision is Biodiversity Corridor where people from local farms are included in a protected landscape where land use is planned taking into account the conservation of ecosystem’s products and services and the ecological processes. Agroforestry systems and other agroecological practices protect soil productivity, enhance biodiversity and do not pollute streams’ water. New protected areas (Welcz Provincial Park and Yate-í Private Reserve) are well managed and deforested areas are restored. Eco-tourism grows in the UFBC thanks to new protected areas and new infrastructure (visitor’s centre, trails); local community gets benefits direct and indirectly from this activity. Tourism in the UFBC stimulates the commerce of the agro-ecological and

organic products, including yate-í (local stingless bee) honey and jam with native tree's fruits. Wildlife crossing structures are built mitigating environmental impacts caused by the pavement work in the route 101. Research on agroecological and biodiversity topics in the UFBC grows. Finally, native forest cover and landscape ecological connectivity inside the UFBC increase, rare species records increase (like White-lipped peccaries and tapirs). Local people improve the life quality level”.

## Land conservation

The project directly and indirectly contributed to the creation of 9 private nature reserves in the biological corridor, totaling 412 hectares protected. Together, these reserves physically connect Urugua-í and Foerster Provincial Parks, one of the main goals of the project. With the support of IUCN Netherlands, CA acquired two properties for conservation; and 7 other farms were acquired for the creation of reserves by other stakeholders. Furthermore, the Misiones's Government created a new protected area, Segismundo Welcz Provincial Park, although it has a small area (209 ha), this area contribute to corridor connectivity. In addition, 6 private farms (110 ha) was converted to agro-ecological practices without hunting.



## Ecotourism

Ecotourism has become the main economic activity within the biological corridor, with 3 operating enterprises (eco-lodges) in private reserves. Several local farmers are working in ecotourism activities, guarding and maintaining private reserves and as tour guides or as cooks. Currently, the corridor is one of the best places for birdwatchers and nature photographers in the Atlantic Forest of Argentina. Some past members of our team have started to work in ecotourism enterprises within the biological corridor.

## **Corridor infrastructure**

In the Yate-í Nature Reserve (owned by CA) a complete infrastructure for visitors was built.

- Apartment for reserve's manager or park-ranger
- Two large rooms for corridor interpretation exhibition, conservation education and agroecology training.
- Public toilets
- Office
- Native tree nursery for forest restoration activities
- Panoramic tower for nature observation
- Trails

In all other private reserves has been built lodging facilities (eco-lodges and cabins), plus an extensive network of more than 20 km of trails for different corridor's ecosystems.

## **Forest restoration**

Currently, about 90 hectares of forest were restored in the new private reserves. In 50 hectares, different experiences of active restoration were performed, while another 40 hectares are recovering through natural regeneration. Before starting with the project, these areas were farms with annual agriculture (tobacco, maize) and livestock. The project's tree nursery played a key role in restoration activities. The process of restoration and natural regeneration continues to add new hectares of forest each year.

## **Wildlife monitoring**

A systematic survey of the biological corridor was implemented, with nearly 200 camera trap sampling stations. Over 40,000 photos of animals were recorded. More than 26 species of medium- to large-sized mammals were identified in the area around biological corridor. After 10 years of protection in the area, species like the tapir, the giant anteater, the puma and the white-lipped peccary have reappeared in the corridor. The corridor was permanently monitored by camera traps for 5 year.

The inventory of Corridor's bird species exceeded 350. It is considered one of the most diverse bird areas in Misiones and was declared IBA (Important Bird Area) by Aves Argentinas / BirdLife. Many ornithologists and bird photographers visit the biological corridor every year. Some Corridor's bird species are not found anywhere else in the Argentina.

## **GIS Corridor**

A Geographic Information System (GIS) was built on ArcGIS and Google Earth infrastructure. The thematic GIS layers include cadastral boundaries of all lots of the corridor (measured in the field), land use type, camera traps sites, roads, trails, houses, protected areas, etc.

## Road wildlife crossing

In 2006, the paving of the National Road 101 signified a major threat to the ecological connectivity of the biological corridor. Negotiations with Misiones's government authorities allowed us to propose environmental mitigation measures for the corridor area. As a result, two wildlife underpasses and the first ecoduct (wildlife overpass) of Latin America were built in the corridor. These wildlife crossing are being monitored permanently by the project team through camera traps.

## Stakeholder's involvement

The long term commitment of CA team in the corridor area allowed that new stakeholder's have been involved with the project objectives and the corridor's vision.

Ministry of Ecology and Natural Renewable Resources, Government of Misiones Province	Misiones's Road Agency (Dirección Provincial de Vialidad) and National Road Agency
Fundación Vida Silvestre Argentina (WWF partner)	Fundación Banco de Bosques (National NGO devoted to land purchase for conservation)
Aves Argentina (BirdLife partner)	Conservación Argentina
National Parks Administration	Centro de Investigaciones del Bosque Atlántico (Atlantic Forest Research Centre)
Red Argentina de Reservas Naturales Privadas (Argentine's Network of Private Nature Reserves)	Municipality of Andresito, Province of Misiones
Ecotourism entrepreneurs: <ul style="list-style-type: none"><li>- San Sebastián de la Selva inn</li><li>- Karadya Ecolodge &amp; hostel</li></ul>	18 private reserves landowners
Park rangers	Local schools

## Section 3:

### Conclusion

After 12 years of project, 9 private reserves and one provincial park guarantee the conservation and ecological connectivity of the Urugua-í – Foerster corridor. Ecotourism replaced livestock and tobacco culture as the main economic activity in the corridor area. New eco-lodges and hostels were built, employing local people. Yate-í Nature Reserve (Conservación Argentina) has infrastructure (visitor center, Biological Station) and trails to meet the demands of tourists, researchers and volunteers. The paving of 101 National Road did not represent a significant impact to the corridor because wildlife crossing were built, and they are working.

Biodiversity monitoring (mammals and birds) show an amazing recovery of corridor's wildlife, reappearing species had become locally extinct (like the puma). Herds of white-lipped peccaries begin to move through the corridor. The forest cover is increasing in private reserve, through active restoration measures (reforestation) and natural regeneration. Several stakeholder's, publics and privates, are involved in a long-term conservation and sustainable development of the

biological corridor. CLP continued support and subsequently IUCN Netherlands, had a major impact on the sustainability of the project.

## **Problems encountered and lessons learnt**

Although the project team was changing over the past 12 years, the long term vision and compromise of part of the project team, along with the continuous external funding, were key to the sustainability and success of the project.

Some achievements of the project took more than 5 years of negotiations with government authorities. Currently, the main conservation problem in the corridor is the lack of implementation of the Segismundo Welcz Provincial Park (created in 2007), which is illegally occupied. CA and other Argentinean NGOs are negotiating since 7 years ago for that the government of Misiones resolve this conflict.

## **In the future**

Our project left a long-lasting legacy by establishing a several reserves in the corridor, which will consolidate its connectivity. We believe that the consolidation of Conservación Argentina as a small but leading NGO in the region is an important contribution to the conservation of the Atlantic Forest.

The development of the corridor as an ecotourism destination (including infrastructure and services), will constitute a key step toward the consolidation of long term solutions. For both, farmers and the NGO, this is going to reinforce our economic autonomy. Being self-sufficient is an indispensable condition for thinking in any reliable long-term solution. By strengthen our NGO we support the continuity of a coordinated process leading to re-establish the ecological conditions in the UFBC, by reinforcing farmer's economy in a sustainable way we will contribute to guarantee a reliable long term commitment with conservation.

A recent national forest law provide funds for conservation and restoration to private reserve owners. Now, Conservación Argentina is raising funds from an important private company for the corridor conservation.

### **Address list and web links**

[www.conservacion.org.ar](http://www.conservacion.org.ar)

<https://www.facebook.com/pages/Conservación-Argentina/101498336588733>