



 SWIRE PACIFIC OFFSHORE



The Paraguay Forest Conservation Project

Reduction of GHG emissions from
deforestation and forest degradation in the
Chaco-Pantanal ecosystem



Project Design Document
for validation under
Climate, Community and Biodiversity Alliance Project Design (Second Edition)
Standards

Final Version – October 2011

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- Secretariat del Ambiente (SEAM)
- The National Institute for Rural Development and Lands (INDERT)
- The Union of the Communities of the Yshir Nation (UCINY)
- The Municipality of Bahia Negra

Executive Summary

Project Aim

The aim of the Paraguay Forest Conservation Project is to protect sufficient forest demonstrably threatened with clearance to prevent the emission of 840,000 tCO₂e (expressed as Voluntary Carbon Units or VCUs) into the atmosphere over a 20 year period, with a maximum project budget of US\$ 7 million. The protection of forest cover in the Chaco-Pantanal region contributes to that target.

Project Origin

The project proponent is *Swire Pacific Offshore* (SPO), a leading service provider to the offshore oil and gas industry. SPO has a strong corporate social responsibility policy of long standing and has made the policy decision to become ‘carbon neutral’, introducing a comprehensive programme of energy efficiency in its operations. As part of this commitment, SPO seeks to reduce the carbon footprint of its operations as far as possible and to offset its unavoidable emissions, currently estimated at a minimum of 840,000 tCO₂e over a 20 year period.

The *World Land Trust* (WLT) is contracted to develop the project in collaboration with its Paraguayan project partner *Guyra Paraguay* (GP). WLT is an international NGO concentrating on biodiversity conservation, based in the UK but working with a network of partners around the world. It supports GP by providing technical support and channeling of funds into the expansion and management of the GP private reserve network in San Rafael, the Chaco and the Pantanal. It has also entered a tri-partite agreement with GP and the Secretariat del Ambiente (SEAM), the government agency responsible for protected areas, for the long-term management of the Defensores del Chaco, Chovoreca and Río Negro national parks in Alto Paraguay. The Paraguay Forest Conservation Project is part of this broad support programme.

The project design thus marries SPO’s Corporate Social Responsibility (CSR) policy, WLT’s expertise in developing voluntary offset projects with benefits for biodiversity and communities, and Guyra Paraguay’s experience of managing conservation projects on the ground. The following project parameters were laid down at the outset:

- The project must deliver demonstrable social, biodiversity conservation and other environmental benefits, both to demonstrate the broad value of REDD and to ensure sustainability of the climate mitigation benefits attributable to the project. This will be demonstrated by independent validation and verification under CCBA procedures.
- Emissions reduction benefit must be of the highest quality, demonstrated by independent validation and verification using international standards for voluntary emissions reduction. VCSA guidelines will be followed, to be validated as a separate exercise.
- The VCUs produced must be transferred to SPO, in order to meet its corporate policy of carbon neutrality.

Additional considerations are that:

- The primary purpose of the emissions reduction is to counter-balance emissions from the operational activities of Swire Pacific Offshore (SPO), meeting the publicly-declared commitment to carbon neutrality under its Corporate Social Responsibility programme. They are produced to marketable standards as a sign of quality but are primarily destined to be retired rather than traded.
- Nonetheless, SPO retains the right to trade or otherwise dispose of any VCU in excess of its offsetting need. This is seen as part of the demonstration value of the project.
- Project design must allow for expansion and replication, to cover any future needs to cover additional emissions from growth in SPO operations.

Project Design

The project targets two areas, San Rafael in the Eastern (Atlantic Forest) region of Paraguay and the Chaco-Pantanal ecosystems in eastern Alto Paraguay. Both areas are of extremely high conservation value, are of fundamental importance to indigenous peoples and are highly threatened. The fate of both is of national and international concern. It is also broken down into components:

- Reduction of GHG emissions from deforestation and forest degradation in the Paraná Atlantic ecosystem - Forest Protection in the La Amistad Community, San Rafael: validated under CCBA standard in December 2010.
- Reduction of GHG emissions from deforestation and forest degradation in the Chaco-Pantanal ecosystem – this document.
- Reduction of GHG emissions from deforestation and forest degradation in the Paraná Atlantic ecosystem - Forest Protection of key areas in San Rafael: under development.

Within this Project Design Document (PDD), all prices are expressed as US\$. Long-term management Funds are established for both project components in order to maintain project actions beyond over the full 20-year project life.

This project component targets the Quebracho forests of the Chaco-Pantanal transition area in eastern Alto Paraguay. The area lies in the traditional territories of the Yshir (Chamacoco), who have expressed strong support for the initiative.

Project activities include:

Transfer of ownership of forested land, threatened with clearance in the absence the project, to a partnership of GP and the Yshir community

Deforestation rates in the Eastern Chaco are extremely high and it is projected that all wooded land that is not under protective management will be cleared within 20 years. The project targets Tobich (the name chosen by the Yshir community for the area described in the land title as Colonia San Gabriel Arcangel) a privately-owned undeveloped ranch of 4745 ha. Project funds have been used to secure this area under terms specifying its future management for the protection of its environmental and cultural qualities, including its stored carbon, under shared ownership of Guyra Paraguay and the Unión de Comunidades de la Nación Yshir (UCINY). At the end of the project life, full ownership will be transferred to UCINY.

Support for the Yshir community

In recognition that the area lies within the traditional territories of the Yshir, the project will provide 1 US\$/ha/yr for actions benefitting the Yshir community, according to their priorities. These payments will be maintained throughout the 20 year project life.

Capacity building in conservation management

The Yshir will receive training in scientific conservation management (which will be enriched by their own traditional skills) and encouraged to participate in the management not only of the project area but of other protected areas within their territories. The intent is to develop demonstrated expertise in conservation management generally, of wider application than the immediate project area.

Establish a long-term conservation management fund for the western Chaco

The western Chaco includes a complex of national (Defensores del Chaco, Chovereca, Río Negro) and private protected areas of very high conservation value. They are also chronically and grossly underfunded and a tri-partite agreement between SEAM, Guyra Paraguay and WLT provides for the establishment of a trust fund to underpin long-term management. The long-term funding commitment (estimated at US\$ 810,000, exclusive of land purchase and operating costs over the first five years) will facilitate establishment of the fund. Once in place, the fund is also available to receive other support and so augmenting the benefits attributable to the project.

Summary of project component benefits.

The Chaco-Pantanal component of the Paraguay Forest Conservation Project:

- Avoids emissions estimated at 581,000 tCO₂e net of leakage and risk buffer over the project life;
- Protects a representative area of a forest type inadequately covered in the National Protected Area System;
- Returns full participation in the future management (and eventually full ownership) of 4745 ha of its traditional territory to the Yshir community;
- Provides a small but steady and secure revenue stream to UCINY, consolidating its role in promoting the well-being of the Yshir;
- Provides training, employment and experience in protected area management and field survey to Yshir community members, applicable both to this project and similar protected area management initiatives in the region.

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- Annexe 01 :** Chamacoco Yshir communities – characterisation (Karchabalut, Misión Santa Teresita, Puerto Caballo and Puerto Esperanza- Inihta) – in Spanish.
- Annexe 02A:** HCV Methodology – extracted from ‘Analysis of High Conservation Values in San Rafael, Guyra Paraguay and WWF August 2007.
- Annexe 2B:** Biodiversity survey methodology – in Spanish.
- Annexe 2C:** Biodiversity survey matrix – in Spanish.
- Annexe 3 :** *Guyra Paraguay et al. 2003.* Rapid Ecological Assessment – Parque Nacional Río Negro – in Spanish.
- Annexe 4 :** Hansen, P. 2009. Land-use trends in Paraguay and the northern Chaco. Project consultancy report – ‘economic drivers’.
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- Annexe 5 :** INDERT – evidence of authorization for transfer of land title.
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- Annexe 15 :** Ybieta, P. 2009 Legal review (including tenure issues). Project consultancy report.
- Annexe 16 :** Social baseline, Bahia Negra. Project consultancy report.
- Annexe 17 :** Endemic and threatened species – project reference zone
- Annexe 18 :** Huang et al. 2009. Assessment of Paraguay’s forest cover change using Landsat observations.
- Annexe 19 :** Community consultation document – 20.05.11 (Community endorsement)
- Annexe 20 :** A & B - Methodology for developing allometric equation and estimating carbon stock (in Spanish). C – calculation spreadsheets.
- Annexe 21 :** Estimation of leakage.

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LIST OF ACRONYMS

CCBA – Climate, Community and Biodiversity Alliance
CSR – Corporate Social Responsibility
DBH – Diameter at breast height
FAO – Food and Agriculture Organisation
GHG – Greenhouse Gas
GIS – Geographic Information System
GMOs – Genetically Modified Organisms
GP – Guyra Paraguay
HCV – High Conservation Values
IBA - Important Bird Areas
INDERT - The National Institute for Rural Development and Lands
INDI - Instituto Paraguayo del Indígena
IPCC – Intergovernmental Panel of Climate Change
IUCN – International Union for Conservation of Nature
KBA – Key Biodiversity Area
NGO – Non-governmental Organisation
OPIT - Organización Payipie Ichadie Totobiegosode
PDD – Project Design Document
REA – Rapid Ecological Assessment
REDD – Reduced Emissions from Deforestation and forest Degradation
REDD+ - Reduced Emissions from Deforestation and forest Degradation +
SEAM - Secretariat del Ambiente
SPO – Swire Pacific Offshore (Pte) Ltd
tCO₂ – tonne of CO₂ - describes emissions
tCO₂e - tonne of carbon dioxide equivalent – describes offsets
UCINY - The Union of the Communities of the Yshir Nation
UN – United Nations
UNAP – Unión de Nativos Ayoreos del Paraguay
UNDP – United Nations Development Programme
UTM – Universal Transverse Marcator
VCS – Verified Carbon Standard
VCSA – Verified Carbon Standard Association
VCU – Verified Carbon Unit
VER – Verified Emission Reduction
WLT – World Land Trust
WWF – World Wildlife Fund

General Section

G1. Original Conditions in the Project Area

G1.1. Project Location and Physical Parameters

The project zone comprises the Transition zone between the Pantanal wetlands of the Paraguay River and the extensive dry and humid Chaco of the interior of northern Paraguay. It is characterised by a mosaic of mesoxerophytic ‘Quebracho’ forest and palm savannah and has been selected as a homogenous area in terms of natural vegetation cover, physical conditions, economic drivers and patterns of land use change.

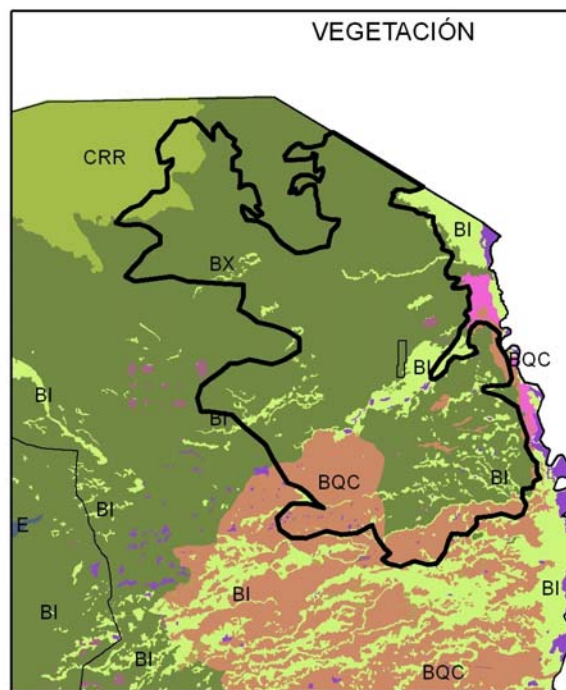
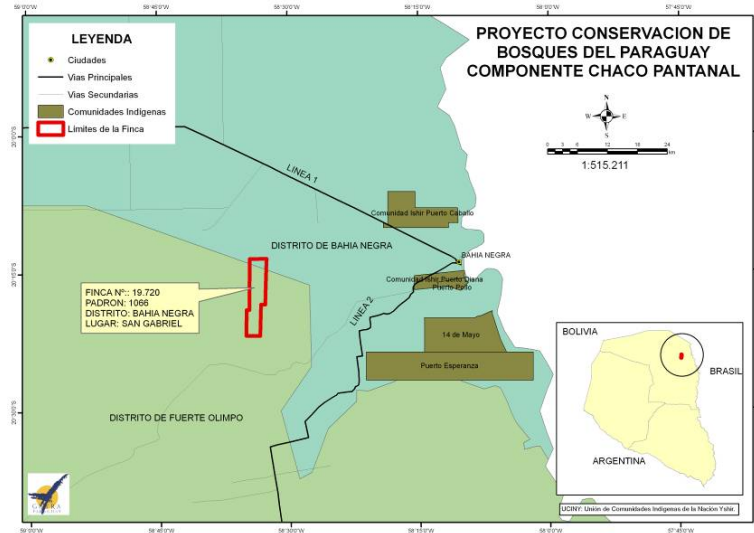


Fig 1: Boundaries of the project zone, delineated in black and characterised by Quebracho forest (type BX).

In the north the zone consists of the eastern half of the District of Bahía Negra, comprising the Defensores del Chaco, Chovoreca and Rio Negro National Parks and the area between, all contained within the core and buffer zones of the Chaco Biosphere Reserve (Fig 1). In the south it extends into the District of Fuerte Olimpo. It reaches the frontier with Bolivia in the north and to the east, along the Río Paraguay, with the frontier with Brazil.

The initiative is designed as a grouped project, with an initial project instance comprising the land parcel formally named Colonia San Gabriel Arcangel on the title deeds, but also designated Ranching Lot No.155 and locally referred to as ‘Salmo 91’. The Yshir community have named it Tobich and that name is used here for preference. Although legally described as covering 4039 ha, it measures 4745.6 ha by

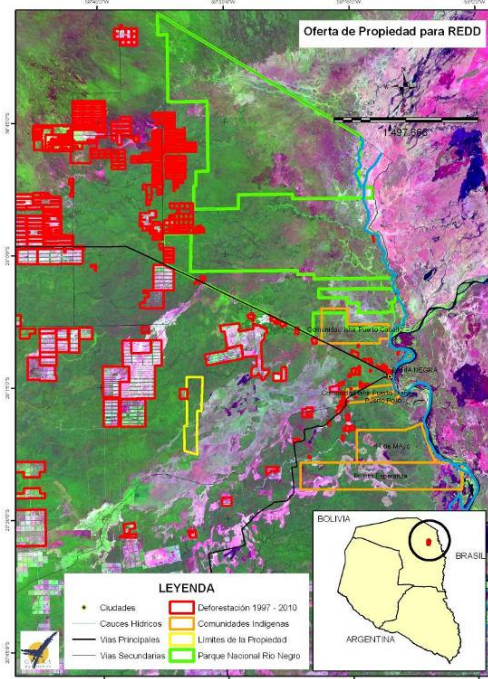
GIS within its surveyed boundary lines. It belongs administratively to the municipality of Bahia Negra though straddling the boundary with that of Fuerte Olimpo.



Figs 2A. B: Location of Tobich/San Gabriel in relation to the north-eastern portion of the project zone. A – above: administrative boundaries; B – right: roads and land-use change.

Topography and hydrology

The project zone constitutes a level plain at c. 100 m asl, rising slightly (to c. 120 m asl) in the west of the reference area, and to 220 m in the extreme north-west on the Bolivian frontier. Inland, surface water is sparse but brackish groundwater approaches the surface especially along the lines of ‘palaeo-streams’, marked by taller woodland. Water availability, accessed by bore-holes in the Adrian Jara and Agua Dulce aquifers, is an important consideration in controlling potential land-use in the vicinity of the project area.



The Río Paraguay is the only permanent water-course, forming the international frontier and navigable by large vessels. The river has a markedly different seasonal flow to the Chaco as a whole, being dependent on upstream conditions and reaching highest levels in the southern autumn. This controls the seasonality of the wetlands of the Pantanal and the seasonal flooding of the immediate hinterland in the Chaco-Pantanal transition, where the project area is located.

Geology and soils

The Chaco is essentially a plain made up of material eroded from the Andes since their uplift in the late Cretaceous. Downward movement in the Chaco area has allowed these deposits to accumulate to great depth, often under shallow marine or lacustrine conditions. They comprise a series of sandstones with some limestone, clay and silt strata, dating from the Cenozoic through to the Quaternary. Surface exposures become younger from west to east, culminating in recent alluvia on the banks of the Río Paraguay. In the west of the reference area the soils tend to be sandy and free-draining. In the east (including the project area in the Chaco-Pantanal transition) they tend to be poorly-draining clays.

Climate

In general terms the climate is categorised as humid tropical and the average annual temperature is, at 24.5°C, the highest in the country. Rainfall decreases from east to west, with c. 1000-1200 mm p.a. by the Río Paraguay (i.e. in the project area) but diminishing to 800-1000 mm p.a. at the western end of the project zone in the central Chaco (Map 3). Conditions shift from moist to semi-arid across this range.

The climate is markedly seasonal. The dry season covers the June-August season when rains are rare or absent – as potential evaporation can be 2000-2200 mm p.a., water deficits are usual. During the remainder of the year the Chaco-Pantanal transition area may be waterlogged for long periods, due to local rainfall and/or high river levels.

Temperatures average 23°C but also show wide variation. The highest temperature recorded is 46°C. Frosts have never been noted but recorded temperatures have dropped to 1°C.

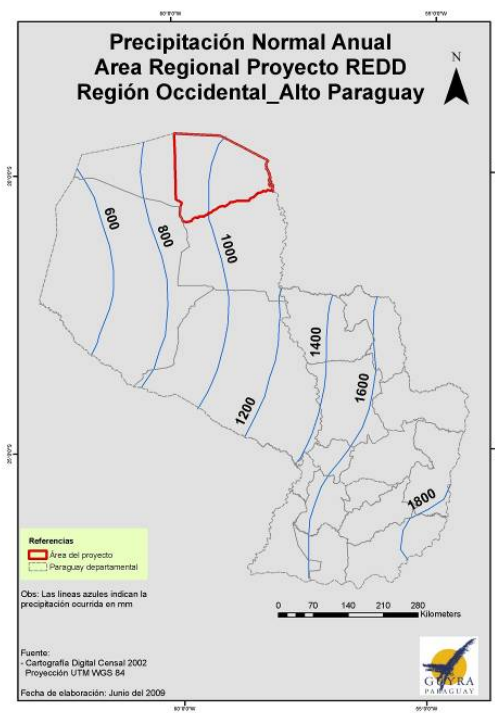


Fig 3: Average annual precipitation across Paraguay

G1.2. Vegetation Types and Condition

Some 10 vegetation types are distinguished in the general area, of which 5 are forests.
- They are also described in more detail in Annexe 20A.

The two types typical of the Dry Chaco interior are:

- Xerophytic semideciduous woodland.
- Transitional mesoxerophytic woodland.

The first is 20-25 m tall with an open understory and the second, forming on more sandy soils, is taller (30-35 m) but sparser. These vegetation types have been excluded from the project zone.

Three more types develop on the better soils and in more humid conditions closer to the Río Paraguay and are thus the forests of the project area:

- Dense mesoxerophytic woodland
- Transitional dense mesoxerophytic woodland
- Seasonally-flooded woodland

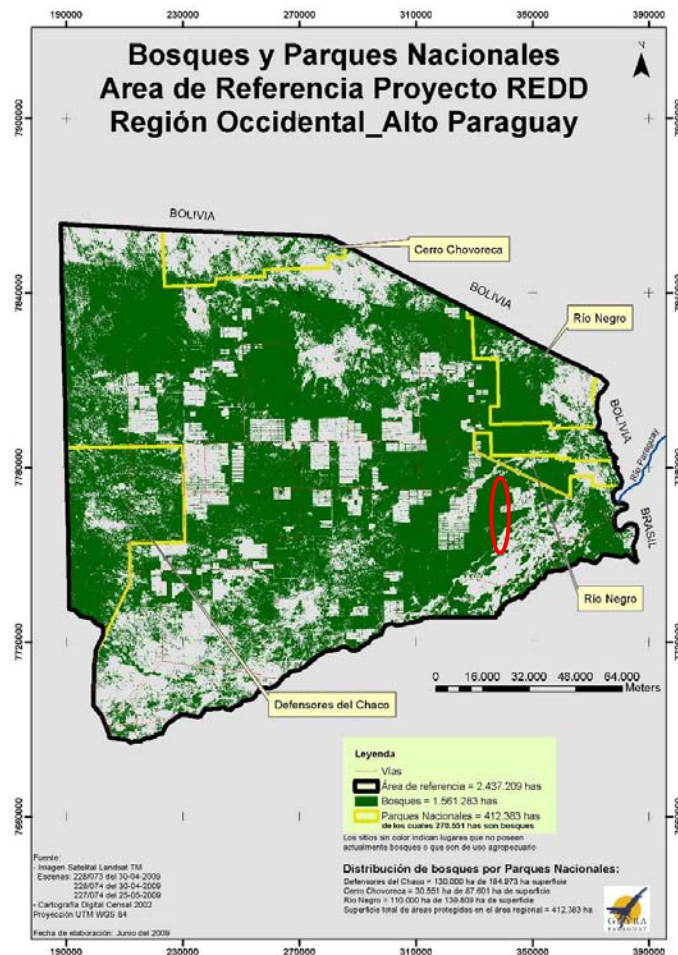


Fig 4: Forest cover in the northern project zone

The dense woodland has a canopy height to 25+ m, with up to 74 tree species including some reaching 80-100 cm diameter breast height (dbh). The transitional type is similar, developing on sandier soils but with a denser understory and a community with more species typical of the riverine area. Collectively they are known as Quebracho forests, forming a mosaic with White Quebracho (*Aspidosperma quebracho-blanco*) on better drained rises and Red Quebracho (*Schinopsis balansae*) on lower ground with poor drainage, flooded for some months of the year. Both quebracho species are heavy-timbered – the name translates as ‘axe breaker’. The more regularly flooded forests are less tall and occur in even lower-lying areas, typified by a Palo Santo – Labon association (*Bulnesia sarmientoi* and *Tabebuia nodosa* respectively). Following field inspection, the taller flooded forests are grouped with the dense woodland as ‘high mesoxerophytic forest’ for the carbon inventory, as are the taller forests following the ancient drainage lines (palaeocauces). The lower-canopied flooded forest is retained as ‘low mesoxerophytic forest’. These ‘Quebracho’ formations dominate the project area, covering 86% of the total area. They are in excellent condition and assumed to be primary.

The more open vegetation types of the project zone include the following:

- Palm Savannah

This consists of almost pure stands of the palm *Copernicia alba* with a grassy/brushy understory, on low areas subject to periodic flooding. As a savannah ecotype they are naturally susceptible to fire which can also reach into the adjoining Quebracho forest, degrading their edges. The transitional zone between the palm savannah and low mesoxerophytic forest, comprising a mix of bushy vegetation and scattered trees, has been treated as a separate stratum for the carbon inventory.

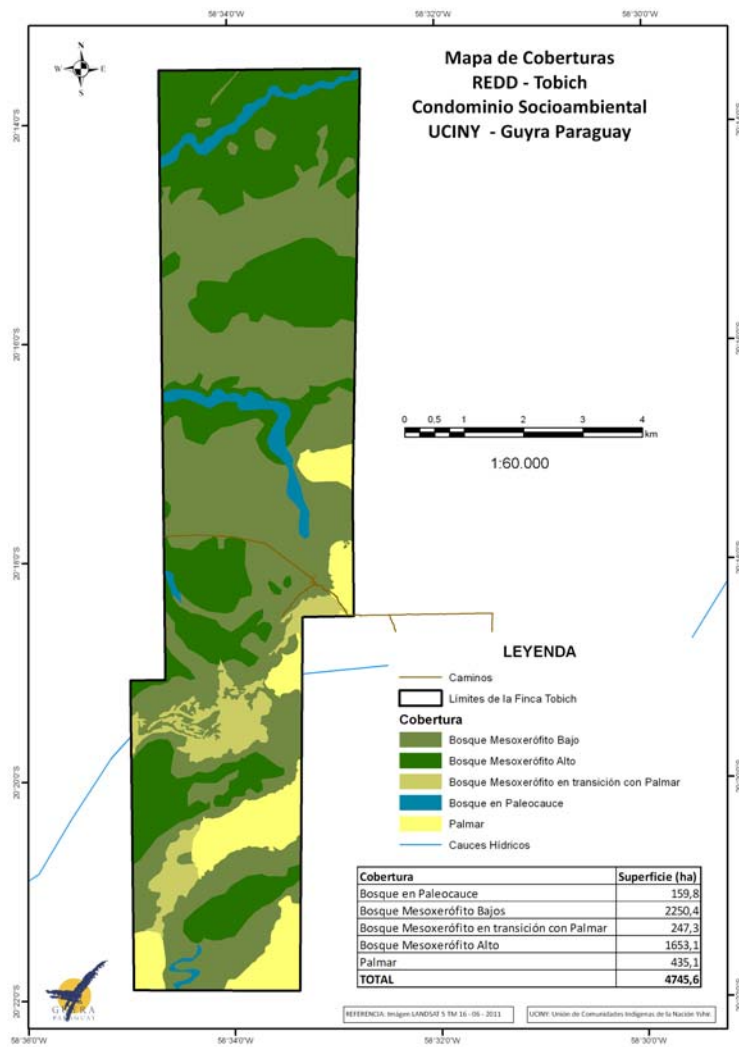
The xerophytic woodlands of the central Dry Chaco grade into more open Cerrado and Chiquitania vegetation types in the north-west of the reference area. These are categorised as:

- Open wooded savannah transitional with woodland
- Open wooded savannah transitional with wood-and scrubland
- Park Savannah

Of these, the Chiquitania ‘park savannah’ is the most open, consisting of grassland with scattered woody species on hill crests. These open formations have also been excluded from the project zone.

Marshy grasslands border the river and the lower stretches of its tributaries, grading into the true wetlands and aquatic systems of the Pantanal. These give the seventh vegetation type, again excluded from the project zone:

- Wet grassland.



| <i>Vegetation type</i> | <i>Area (ha)</i> |
|--|------------------|
| High mesoxerophytic forest | 1653.1 |
| High mesoxerophytic forest in drainage-line | 159.8 |
| Low mesoxerophytic woodland and thicket | 2250.4 |
| Mesoxerophytic forest/palm savannah transition | 247.3 |
| Palm savannah | 435.1 |
| Total | 4745.6 |

Fig 5: *Vegetation types on Tobich (Colonia San Gabriel Arcangel)*



Fig 6A: East-west view across northern part of project area – recent clearance in distance



Fig 6B: Tall Quebracho forest – west part of project area



Fig 6D: Transitional savannah-forest – note large scattered trees, here Quebracho Colorado



Fig 6E: low woodland – palo santo & labon common



Fig 6F: High mesoxerophytic forest interior

Fig 6: Tobich vegetation types

G1.3. Project Zone and Project Area Boundaries

The project zone (Fig 1) is an extensive area (c. 1.68 million ha) comprising the area of the ‘quebracho forests’ of the Chaco-Pantanal transition zone. This is homogenous in terms of vegetation (mosaic of mesoxerophytic forest and palm savannah) and thus carbon stocks, rainfall (1100 mm p.a.) and its agro-pastoral potential, and displays a similar pattern of land use change. The northern part of the project zone, which includes the project area, lies over the Agua Dulce aquifer which is an important determinant of land-use potential.

The project area lies in the approximate centre of the project zone. Its boundaries are legally defined in the title deeds, which also note they are contained within the following UTM coordinates: 21K 338584 7753614, 337717 7753594, 337575 7747320 and 334781 7747320. Ground-truthing has shown the boundaries to be clearly delineated by survey lines. These have been traced using GPS and transferred to the Guyra Paraguay GIS for project purposes (e.g. Fig 5). The boundary coordinates themselves are given in Fig 7.

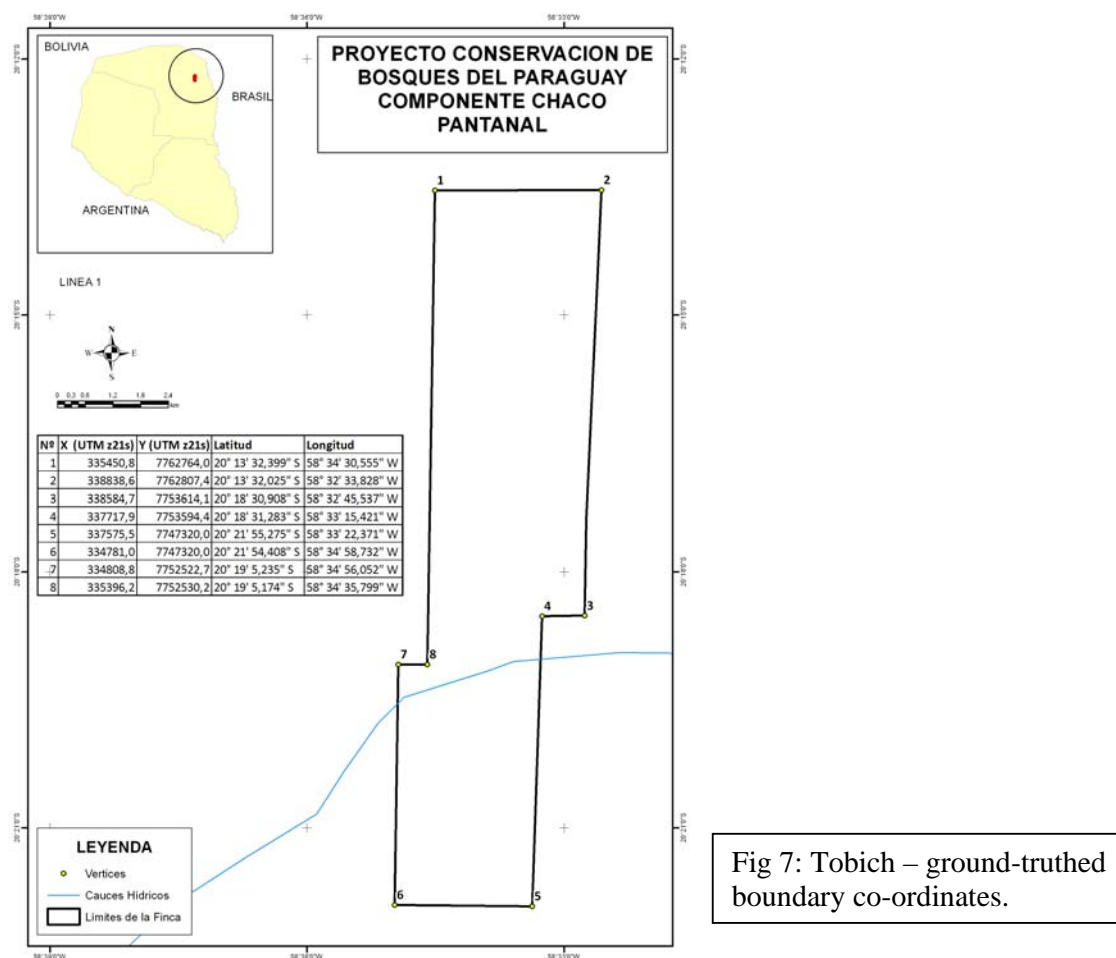


Fig 7: Tobich – ground-truthed boundary co-ordinates.

G1.4. Carbon Stocks and Methods

Prior to this project, three studies gave carbon inventory data relevant to the project zone:

- *The FAO permanent plot array*. Inventory of two 1 ha plots give figures of 33tC/ha in Dry Chaco and 56 tC/ha in the transition to Humid Chaco (i.e. more relevant to the project area), in above-ground woody biomass.
- *Lauterer 2004*. This is the most relevant data for the project area, consisting of a carbon inventory in a 1 ha plot in Quebracho forest c. 70 km south of Bahia Negra. It gives a working figure of 43tC/ha for this habitat type, using IPCC Tier 2 and 3 data.
- *Leiva 2010*. An estimation of the carbon stock in the Rio Negro National Park.

These studies were used for preliminary estimates during project development but are superseded by a site-specific carbon inventory using Avoided Deforestation Partners methodology for planned frontier deforestation (Annexe 20 A, B, C).

Carbon in above- and below-ground biomass in the live tree pool was estimated using fixed area (1 ha) plots, with all trees of 10+cm DBH measured (Annexe 20C). A total of four plots were established in two of the strata, two in high and two in low mesoxerophytic forest – the original target was for 10 plots, prevented due to difficulties of access. Forest in the fossil drainage lines was conservatively assumed to be the same as high mesoxerophytic forest. Carbon stocks in *Copernicia* palm savannah were derived from information from the Rio Negro National Park (Leiva 2010), within the project zone. Those in transitional palm savannah-low mesoxerophytic forest are assumed to be intermediate between the two.

The allometric equation was derived by destructive sampling (Annexe 20A, B) of ten specimens of the eight species with the highest Index of Importance, representing 30% of the species occurring.

Below-ground biomass was derived from the above-ground measure by applying an expansion factor of 28%, as recommended (IPCC 2003) for dry/humid subtropical forest.

In summary, carbon stocks in living woody biomass (dbh 10+ cm) are:

| Stratum | Area | Above-ground | Below-ground | Total | Total for site |
|--------------------------------|---------------|--------------|--------------|--------|-----------------|
| | ha | tC/ha | tC/ha | tC/ha | tC |
| High mesoxerophytic forest | 1653.1 | 162.3 | 63.12 | 225.42 | 372641.8 |
| Forest in ancient drainages | 159.8 | 162.3 | 63.12 | 225.42 | 36022.1 |
| Low mesoxerophytic forest | 2250.4 | 42.37 | 16.48 | 58.85 | 132436.04 |
| Mesoxerophytic-palm transition | 247.3 | 39.18 | 15.23 | 54.41 | 13455.6 |
| Palm savannah | 435.1 | 35.98 | 13.99 | 49.97 | 21741.9 |
| Totals | 4745.6 | | | | 576297.4 |

The carbon in the low mesoxerophytic forest is in the same order as that from previous studies. That in the high forest is substantially greater, reflecting the denser, taller, forest formation.

Estimation of carbon stocks in dead wood followed the approved VCS module VMD0002 (CP-D). Standing dead trees were measured as living trees with a deduction for the state of decomposition. Fallen dead wood (10+ cm diameter) was measured using two 50 m transects, again with a deduction for decomposition as assessed using the 'machete test'. Unfortunately, problems encountered at the laboratory meant that this data could not be used. However, an estimate for the Rio Negro National Park (Leiva 2010) does provide a guide from the project zone, of 6.92 tC/ha in dead wood and 2.8 tC/ha in litter for the high forest. Nonetheless, this carbon pool must be conservatively ignored as the methodology does not conform to the VCS-approved CP-AD.

Organic soil carbon was assessed from samples taken from the permanent plots following VCS-approved methodology VMD0004 (CP-S). The proportion of organic material varied from 0.6-3.8%, giving values of 7.8 – 49.4 tC/ha. In the absence of equivalent data after conversion to pasture, this carbon pool is also conservatively ignored.

G1.5. Community Characteristics

The Department of Alto Paraguay (82,349 sq km) has the lowest population density in Paraguay – 2004 census data gives a population density of 0.12/sq km, in 2598 households. The District of Bahía Negra covers the entire northern Chaco but only has c. 1800 inhabitants, mostly in the town and its immediate vicinity.

Four types of community can be identified within this small population:

- *Ranchers*: this consists of the large land-holders and, where ranches are already operational, their employees. The field-staff is small – a few tens at best – even in very large holdings. Non-Paraguayan investors are increasingly prominent amongst the proprietors.
- *Bahía Negra*: This is the only settlement in the entire area, holding the majority of the population of the municipality. Historically the town looked primarily to the river for communications and access. The river communications and transport remain important but the airstrip and roads (Linea 1 to the interior of the District, Linea 2 to the neighbouring centres) are becoming pre-eminent, though still access is still precarious in wet conditions.
- *The Ayoreo*: The Ayoreo are the indigenous inhabitants of the Paraguayan and Bolivian Dry Chaco, and maintained a wholly traditional culture and hunter-gatherer life-style through to the late 1950s. A small number have avoided contact and still maintain the traditional lifestyle in voluntary isolation, including a group straddling the Paraguay-Bolivia frontier and using part of

the project zone. Most, however, were induced to enter missionary settlements and live a sedentary lifestyle. The Instituto Paraguayo del Indígena (INDI) has assigned one 20,000 ha parcel to the Ayoreo within the project zone, in its north-western sector.

There are c. 2000 Ayoreo in Paraguay, living largely in poverty on the margins of main-stream society. The history of settlement is, however, recent and the cultural heritage and outlook remains strong with recovery of territory a central issue. They are also well-organised, represented by two main groups – the Unión de Nativos Ayoreos del Paraguay or UNAP (associated with the Coordinadora por la Autodeterminación de los Pueblos Indígenas de Paraguay or CAPI) and the Organización Payipie Ichadie Totobiegosode (OPIT).

- *The Yshir*: The Yshir (or Chamacoco) are the indigenous inhabitants of the Río Paraguay and its hinterland, with a similar (but earlier) history of cultural pressure. Traditionally their area of activity extended to some 50 km from the river. Within the project zone the communities comprise Puerto Caballo, Puerto Diana and Puerto Esperanza - Inhita, with 14 de Mayo-Karchabalut and Misión Santa Teresita further to the south, with a total population of c. 1600.

The Yshir engage in small-holder farming, fishing and hunting while artisanal goods provide supplementary incomes (Annexe 1). The communities obtain an important proportion of household needs from natural woodland while regaining access to, and control of, the lands they traditionally ranged over is a deeply-felt cultural need. They have organised themselves under the Unión de Comunidades de la Nación Yshir (UCINY), based in Bahía Negra.

Guyra Paraguay has (initially with UNDP support, now broadened) maintained an outreach project in Bahía Negra that includes the neighbouring Yshir communities. It therefore has long-standing and positive relations with them. This is reinforced by the employment of community members in Guyra Paraguay conservation management initiatives.

The socio-economic baseline survey for the Rio Negro National Park Rapid Ecological Assessment (Annexe 16) covers the District. Amongst other information it notes that there are no paved roads and that it is placed in the national category of poorest provision of basic household needs – 12.8% with electricity, 0.5% with running water, 11.4% to sewage facilities and no waste management system. It also notes high illiteracy rates. While conditions are now somewhat improved, the general lack of basic services is still a characteristic of the area and the indigenous communities are the least well-provided within this context.

G1.6. Land Tenure and Land Use

Protected Areas

Parts of the Defensores del Chaco National Park, Chovoreca National Monument and Río Negro National Park lie within the project zone. These protected areas consist of national land and thus have clear legal status.

An extension area has also been identified for the Rio Negro National Park. This is in private holdings, creating a situation comparable to that in San Rafael – i.e. licenses to clear for ranch development have not been issued pending transfer to national ownership for inclusion in the national park, but this has been prevented by lack of financial resources. The legal status of the extension is thus ambivalent and Guyra Paraguay has therefore pursued a policy of purchasing areas in the extension area to secure them under conservation management. A large proportion of the Fortin Patria property is also treated as a private reserve and can be considered protected. The remainder, however, is now at risk – in the past year licenses to clear forest have been issued for private holdings, over-riding whatever protection was afforded by identification as potential additions to the Rio Negro National Park.

Taken together, the national parks and private reserves cover some 19% of the northern project zone. The 14,700 ha of the Rio Negro National Park extension, which was considered unthreatened, should now be treated like other private land since licenses to clear have been issued.

Indigenous community and other restricted lands

Land transferred by government to an indigenous community is inalienable and there is no restriction on the way the community may use it. The Paraguayan constitution also gives indigenous people the right to maintain traditional use (for hunting, materials etc) of all lands in their historic territory that have been regularly used in this way in the past. This finds its fullest expression in the Ayoreo in voluntary isolation, maintaining a wholly traditional life-style in the extensive natural habitat remaining in both protected areas and private holdings. In practice, though, access is restricted and widespread clearance removes the qualities of cultural and material importance to the indigenous peoples. Land transactions taken without reference to their interests are therefore of serious concern. The Yshir dispute land sales in Puerto Ramos (an earlier target for the project area, lost to a competing offer) and adjacent areas lying between their settlements of Puerto Diana and Puerto Pollo. These claims have been pursued legally for several years, thus far unsuccessfully.

In addition to the land titled to indigenous communities, some areas are restricted to the military. The total in these two categories is 51,000 ha, 2% of the northern project zone.

Private lands

The remainder of the project zone consists of large private holdings, typically of several thousands and in many cases tens of thousands of hectares. These are either free-hold or were redistributed (typically in 4-5000 ha parcels) from national lands under the agrarian reform programme. In the latter case, the land cannot be disposed of until 10 years after completion of payments to INDERT, the National Institute for Rural Development and Lands.

By 2009, 288,000 ha of the northern project zone (Agua Dulce area) had already been converted into cattle ranches by 2009 while the remainder, retained natural cover. This included 1.22 million ha of densely wooded land, with the rest under the more open formations. Land use change is concentrated on these forested lands, with richer, less sandy soils that are both less prone to wind erosion when cleared and more suitable for establishing exotic pasture grass.

All this land is classed as agro-pastoral but development of ranches is subject to regulation. A reserve of 25% of the forest cover must be retained whilst individual pastures must be a maximum of 100 ha, separated by 100 m wide wind-breaks. The wind-breaks are additional to the forest reserve. Individual plans follow different patterns but retain these basic features - in the best examples, drainage lines remain forested, smaller forest blocks are retained in the centre of the pastures and, most recently, larger trees are retained scattered across the pasture. Permits for clearance are issued by SEAM on the basis of the plans submitted by the owner. Compliance with regulations was sometimes dubious in early ranch developments but better oversight, especially with remote sensing, means that they are now well-observed. Typically 45% of the woody vegetation will now be retained in a ranching development.

The project area was a private holding, in this case acquired through the Agrarian Reform. As the payment schedule had been completed nine years ago, INDERT retained a residual interest in the property until the 10 year post-payment period had run its course.

Fig 8: Chaco ranch development patterns



Fig 8A: Older clearance near the project area – note large individual pastures.



Fig 8B: Effect of new regulations – pattern of smaller pastures with wind-breaks adjacent to newer clearance also retaining scattered trees and wooded drainages.



Fig 8C: Variant with central patches – note the forest reserve alongside pastures.

G1.7. Biodiversity Characteristics

North-eastern Paraguay spans two ecoregions – the extensive wetlands of the Pantanal and the xerophytic woodlands and scrubs of the Dry Chaco. It also includes elements of two other ecoregions – the Humid Chaco and, in the north-west, the open wooded savannah areas with affinities to Cerrado and Chiquitania formations. These ecosystems range from arid to wetland habitats and still display high levels of ecological integrity and connectivity at the landscape scale. As a result, the biota is exceptionally diverse on a large scale but remarkably homogenous over wide areas within a given vegetation type. The project area actually lies in the relatively moist transition zone between the Dry Chaco and Pantanal, with strong Humid Chaco characteristics. The project zone is defined by the area supporting the Quebracho-Palm Savannah mosaic.

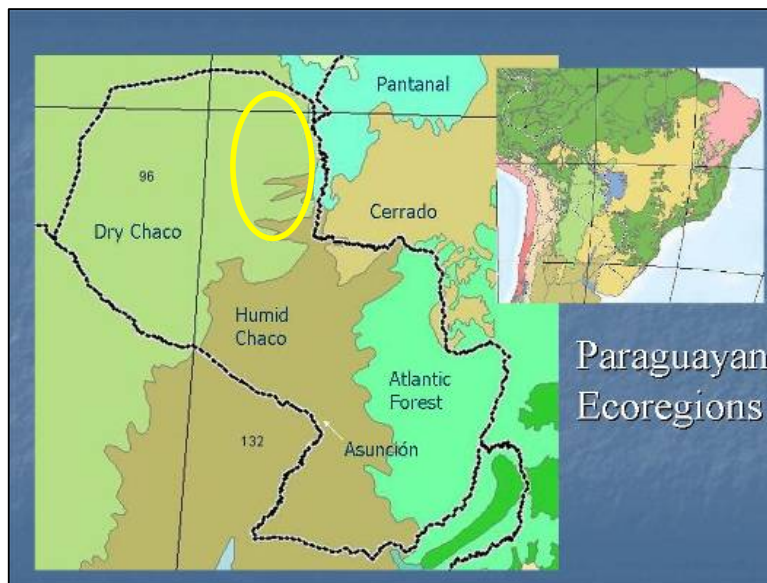


Fig 9: Ecoregions of Paraguay

The size of the project zone leads to patchy coverage by biodiversity surveys, which have tended to concentrate on the protected areas and their immediate environs. The relative importance for biodiversity conservation by 20 km square, as far as is known, is given in Fig 10 for the northern part of the project zone. This uses a scoring system on a range of values including distribution of key species, habitats and ecosystems plus threats (Annexe 2B,C).

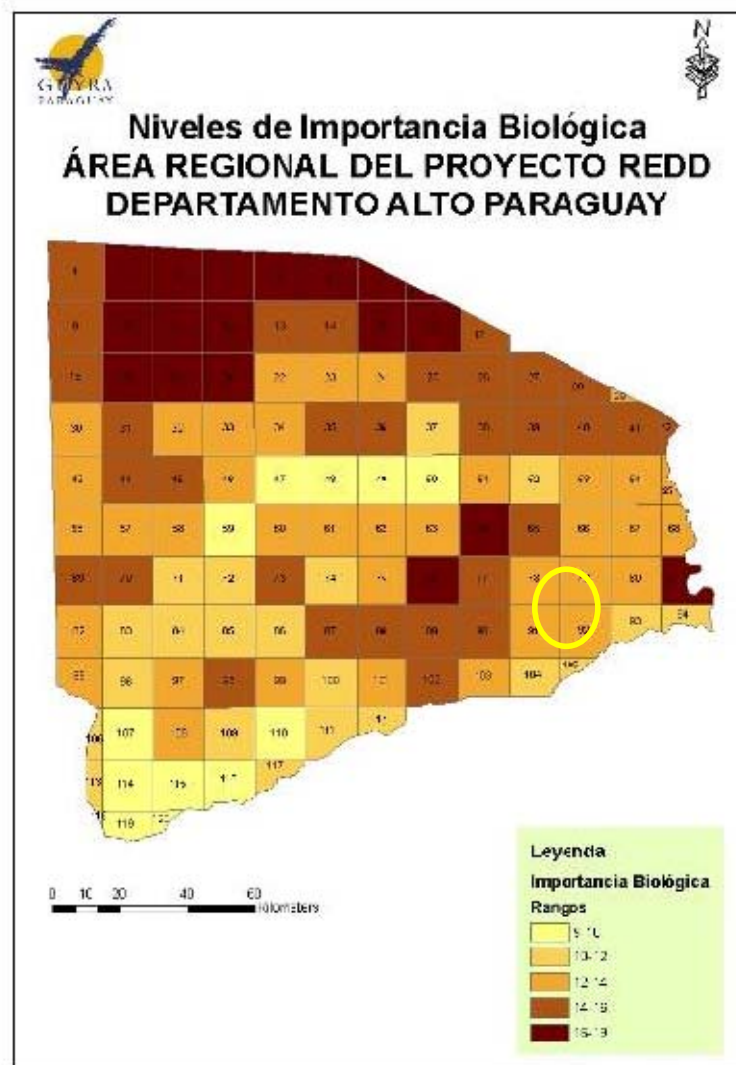


Fig 10: Relative biodiversity conservation importance across the project zone.

The relative importance is weighted towards the protected areas (due to their status and better state of knowledge) or, in the south, their position as surviving corridors at a landscape level. Lowest values are given to areas where clearance is already heaviest. Note also the high value attributed to the Puerto Ramos area near Bahia Negra, resulting from the attention devoted to it at an earlier stage in project development.

A formal Rapid Ecological Assessment has been carried out for the Rio Negro National Park area (Annexe 3). This also spans the Dry Chaco – Pantanal transition and the results can therefore be extrapolated across the eastern part of the project zone, including the project area itself. A gap analysis identifies ‘Quebracho’ forest as a primary conservation target, inadequately represented (indeed unrepresented) in any protected area. It is also noted as ‘emblematic’ – Quebracho Colorado was an important commercial species in the past, used for durable building timber and tannin from the bark. Historically, exploitation of accessible stocks was the main economic activity in the area. Conservation of Quebracho forest was one of the reasons for proposing the Rio Negro National Park Extension, now rendered void by the re-issue of clearance permits. This gives one of the key biodiversity values of the project area, given that Quebracho is the most important vegetation type on Tobich and will be protected there.

The most important pressures on Quebracho Forest are identified as altered physical structure (largely historical from exploitation) and, more importantly, fire damage. The other important threat is physical clearance – though this was not widespread at the time of Rapid Ecological Assessment, it is now becoming so. Fragmentation and subsequent loss of landscape connectivity also constitutes a growing pressure. The sources of these pressures (i.e. the threats themselves) are identified as large-scale engineering projects that can radically alter habitats, transformation of land-use to ranching (and potentially agriculture) facilitated by the engineering work, increased incidence of fire through human activity, and ranching practices incompatible with maintained conservation values in the transformed landscape. The threat is classed as high for each threat, although the practices now employed in new ranch developments are greatly improved.

Wind erosion on cleared land is also a recognised problem – forest protection in ranch development is largely premised on limiting its potential to degrade pastures.

G1.8. High Conservation Values in the Project Zone

Guyra Paraguay conducted a formal HCV evaluation for San Rafael in the Atlantic Forest region, using a methodology developed from the Proforest High Conservation Value Forest Toolkit. The methodology (Annexe 2A) is now used more widely by Guyra Paraguay for biodiversity survey and monitoring at a national level, including site assessments e.g. identification of Important Bird Areas (IBAs) and Key Biodiversity Areas (KBAs), Rapid Ecological Assessment etc. (Annexe 2B). Its application to the project zone (Fig 10) is given in Annexe 2C. A listing of endemic and nationally/internationally threatened species recorded from the project zone (updated to include current threat assessments) is given in Annexe 17.

G1.8.1. Globally, regionally or nationally significant concentrations of biodiversity values:

a). Protected areas.

The project zone includes parts of Defensores del Chaco National Park, the Chovoreca National Monument and Rio Negro National Park. These sites are all core

areas within the Chaco Biosphere Reserve, designated in 2005. The remainder of the northern part of the project zone lies within the biosphere reserve buffer zone.

Though these protected areas are extensive, they are still considered inadequate to fully capture the biodiversity values of the region, hence the identification of the Rio Negro extension area. Guyra Paraguay has secured title to eight land parcels in the extension, totaling 14,271 ha and now managed as private reserves. The quebracho forests constitute an important gap in this coverage, now addressed by the project area.

Both Defensores Del Chaco and the Rio Negro National Park and its extension are internationally recognized as Important Bird Areas (IBAs). In effect this is because they represent the protected areas within the region – their values are shared across the entire zone, wherever extensive natural cover remains intact.

b). Threatened species

International and national Red Listed species recorded from the project zone are given in Annexe 17. The number of species in each of the higher threat categories is given below:

| Group | International | | | National | | |
|----------|---------------|----|----|----------|----|----|
| | CR | EN | VU | CR | EN | VU |
| Flora | 0 | 0 | 2 | 4 | 10 | 46 |
| Avifauna | 0 | 2 | 0 | 1 | 2 | 3 |
| Mammals | 0 | 2 | 2 | 1 | 5 | 5 |

CR – Critically Endangered, EN – Endangered, VU - Vulnerable

c). Endemic Species

The project zone is characterized by broad ecotones, transitional between a number of ecoregions spanning the Argentine, Bolivian and Brazilian frontiers with Paraguay. Endemicity is thus best based on specificity to a particular ecoregion, a natural rather than a political unit.

A total of 46 reptile, bird and mammal species are endemic to one of the five ecoregions associated with the project zone, predominantly to the Chaco but with strong representation from the Pantanal and Cerrado. The biodiversity survey uses 33 endemic species (Annexe 2C, 17). It also lists a further 41 with limited ranges within Paraguay – these may be more widespread outside the country (e.g. at their range limit).

The higher mesoxerophytic forest formations and *Copernicia* palm savannahs are the most important habits for the endemic species.

c). Significant concentrations of species

During the dry season, birds concentrate on the wetlands and tributaries of the Pantanal. During the Rio Negro REA it was noted that a count of 700 American Wood Stork *Mycteria americana* represented some 1% of the total population – this is a significant concentration, meeting the criteria for Important Bird Area and Ramsar Site listing.

G1.8.2. Significant landscape-level areas.

The most characteristic feature of the Project Zone is the presence of intact ecosystems of vast scale, supporting fully functional patterns of species distribution and abundance. In applying the HCV methodology to San Rafael in the Atlantic Forest area of Paraguay, a single block of 10,000 ha of natural habitat was considered sufficient to conserve ecosystem characteristics at landscape scale. In the case of the project zone, the area of natural habitat (forested and non-forested) covered over 2 million ha in 2009. Despite the clearance for ranching, the natural habitat still retained broad connections over its entire area.

G1.8.3. Threatened or rare ecosystems

The Chaco is considered of regional and the Pantanal and Cerrado as globally outstanding ecoregions (Annexe 17). All three are classed as vulnerable and placed in the highest level of regional conservation priorities.

The Rio Negro REA identifies Quebracho forest as a specific conservation target, due to threat and non-representation in the protected area system.

The ‘paleo-cauces’, fossil stream-lines that still carry groundwater and are marked by taller wooded cover, and lagoons retaining water in the dry season, may also qualify as threatened or rare ecosystems and are important features in a seasonally arid environment.

G1.8.4. Provision of critical ecosystem services.

The Agua Dulce aquifer underlies the northern project zone, and provides the most important hydrological service to its interior. The aquifer essentially controls the development pattern of the entire region.

The Rio Paraguay, its tributaries and associated wetlands, all associated with the Pantanal, provide key economic services (river transport, access, fisheries) at a national and regional level. Its tributaries and seasonally flooded hinterland are also the spawning areas for fish populations that are both biologically and commercially important, especially for the Yshir.

The Rio Negro National Park REA also notes wind erosion (in open areas exposed to the prevailing north-westerly winds) and fire, suppressing herbaceous vegetation especially under palm savannahs. Retention of natural cover plays a generalised protective role in both cases – c.f. the need to regulate to retain wind-breaks in ranch developments.

G1.8.5. Areas meeting basic needs for local communities.

The indigenous communities use the areas adjacent to their settlements to supply basic needs, being denied alternatives both by lack of access and by poverty. Typically these include grazing, firewood, and building materials, which may significantly impact the immediate surroundings. Hunting, fishing and some other resources (e.g. gathering of bromeliads for weaving fibre, in the case of the Ayoreo) require a wider field of activity. The Ayoreo in voluntary isolation, of course, represent the extreme in which all human requirements are supplied from the natural

habitat. Within the project zone the area known to be used by indigenous groups in voluntary isolation are in the north, spanning the Bolivian frontier.

G1.8.6. Areas critical for cultural identity.

The areas traditionally used by the indigenous people are of fundamental importance to their cultural identity and recognition of that basic interest in the land becomes increasingly important as clearance erodes, and ultimately destroys, the cultural connection with the landscape. This loss of cultural rootedness is generalised across the project zone, with both the Yshir along the Rio Paraguay and the Ayoreo further inland. The line between the two groups is blurred through historic rivalry but in practice lies approximately 50 km from the river bank.

The project area is within the traditional Yshir area and important to them for that reason. More specific importance is attached to the areas around Puerto Diana (Puerto Pollo, Puerto Ramos – for that reason the original project target areas) and the most significant site of all actually lies to the south, towards Fuerte Olimpo.

G2. Baseline Projections

G2.1. 'Without Project' Land-Use Scenarios

Historic trends of land use change and deforestation

Until recently, rates of land use change were relatively low in the Chaco (averaging 0.6% p.a. from 1994 to 2004 according to Huang et al 2009 (Annexe 18) and concentrated in the more accessible south-western Dry Chaco, outside the Project Zone. The process has now changed dramatically, with extensive clearance expanding in a north-eastern direction – i.e. into the northern project zone (Fig 11A-D).

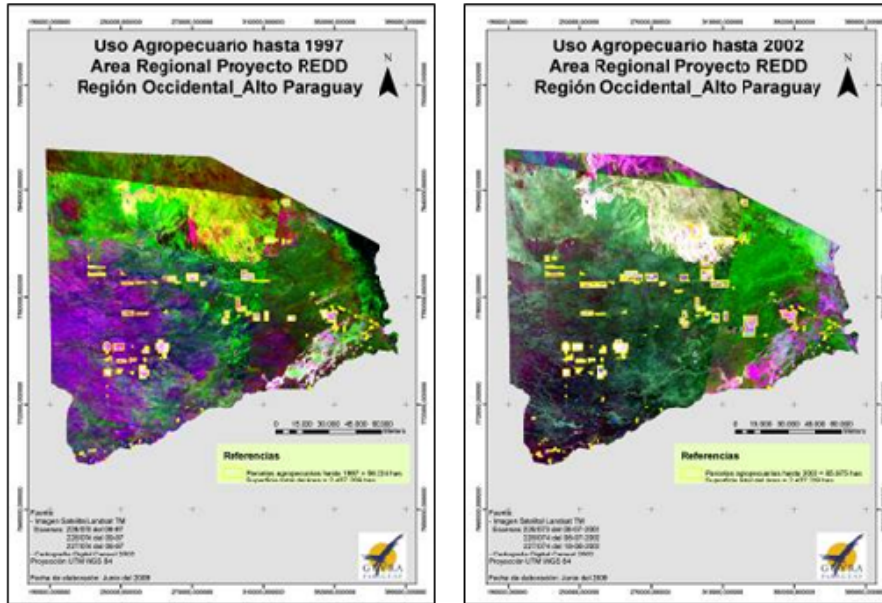


Fig 11A and B: Forest Clearance in the northern project area 1997 and 2002

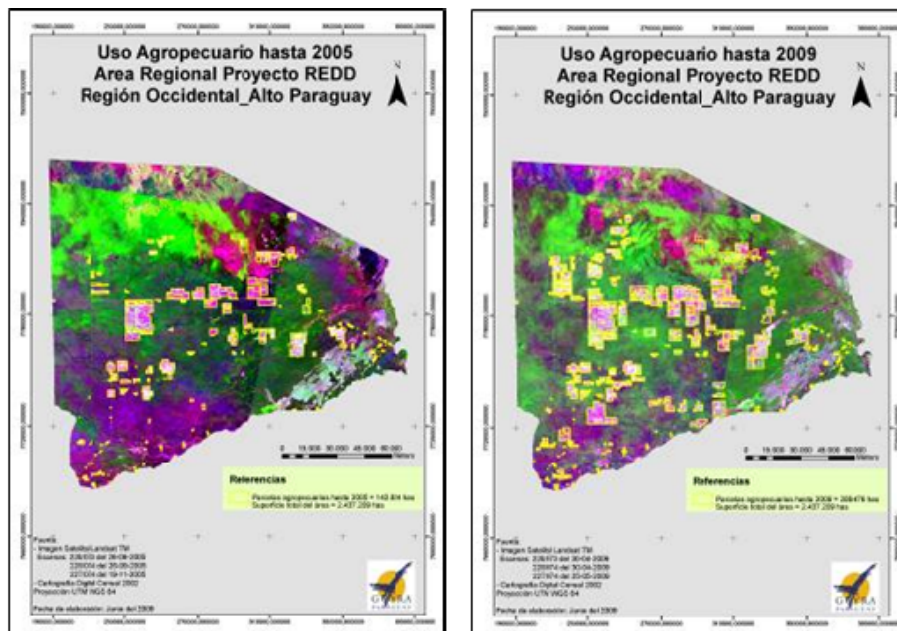


Fig 11C and D: Forest Clearance in the northern project area 2005 and 2009

The drivers behind the expansion are analysed in Annexe 4. In summary, rising beef prices on the international market have catalysed the development of a modern export-orientated beef industry resulting in the transfer of 6.4 million ha into the agropastoral domain between 1991 and 2008, almost entirely for cattle-ranching and at the expense of natural habitat. The trend accelerated between 2005 and 2009 and is ongoing. Monitoring (conducted by Guyra Paraguay and shared with SEAM) has tracked the process from 8.9% forest loss in 1997-2002 (1.78% p.a.), to 18.7% in 2002-2005 (6.2% p.a.) and to 19% in 2005-2008 (4.75%). At times, the rate of loss has exceeded 1000 ha/day. Typically clearance of land in a given ranching development is completed within 10 years.

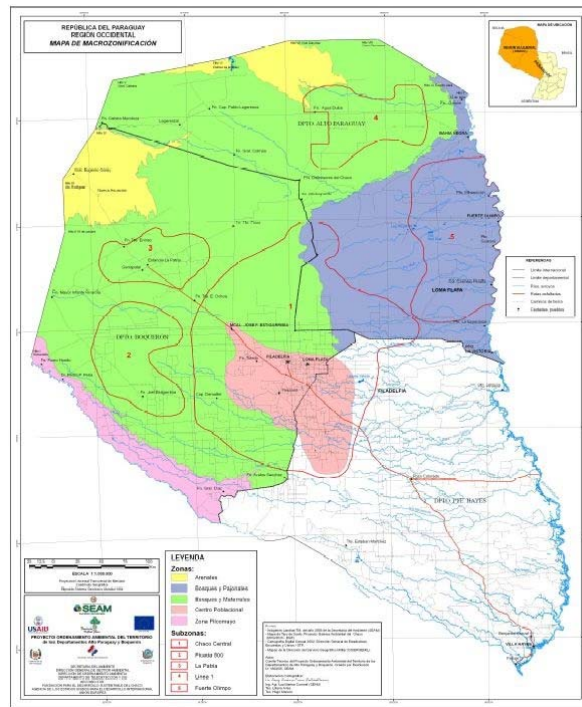


Fig 12: Zonation for proposed Chaco land-use planning

Proposed land use plans for the Chaco (Fig 12) shows the northern project zone contains an important development area ('Linha 1') for ranching, primarily due to the availability of water in the Agua Dulce aquifer. Although the plan is not officially adopted, the pattern of land use change shows it is broadly followed by the ranching interest – the process can certainly be clearly placed as planned frontier deforestation. Clearance is legal and indeed expected, and in practice private owners of many of the properties still under natural vegetation have already secured authorisation for forest clearance. Land is now rapidly changing hands and demand has driven land prices up from c. US\$ 30 in 2006 to US\$ 200-250/ha (and still rising) in 2010.

The southern part of the project zone is also identified as a development area (Fuerte Olimpo), shares the characteristics of the northern area and has a similar deforestation pattern (Fig 13).

were still sufficiently strong to justify new ranching operations in untried areas. The same forces would still push for deforestation despite the ‘low case’ factors, especially when economic viability is now proven.

High case – *sharply higher beef prices, implementation of currently proposed infrastructure projects.*

A higher beef price will maintain and even accelerate deforestation rates, with complete clearance possibly as early as 2016. In terms of infrastructure, road upgrade is already predictable under the base case but three other major projects are proposed:

- The Carmelo Peralto – Puerto Murtihno bridge, providing direct access to the Brazilian meat market. Brazilian interests are already heavily involved in investments in ranching in Alto Paraguay and the Brazilian government has signalled its intention to finance the project.

- The water pipeline from the Paraguay River to the Central Chaco. This has been mooted for some time but financing has not been secured. At the same time, there is mounting pressure for this development, which is seen to overcome the key restraints to economic growth in the region. Eventual construction is likely.

- A river port in the Bahía Negra area, overcoming the constraints of long-distance trucking costs. Apart from cattle, river transport would open the way to commercial soya production, already successfully tested in the area.

Any of these projects would greatly accelerate land use change. Indeed, the port would allow it to change its nature from ranching to ranching plus agriculture. Although it is the least-studied project, the possibility of building a port was reportedly a consideration by private investors in acquiring the key land parcel in Puerto Ramos, just south of Bahía Negra.

In sum, the base case is considered the most appropriate scenario for forward projections at this time, but there is a reasonable probability that at least one of the factors triggering the ‘high case’ will come into play during the project life-time. The probability of the ‘low-case’ scenario is considered low.

G2.2. Forest Protection in Absence of Project (Additionality)

Under the most likely ‘no project’ scenario, therefore, all forested land within the project zone that is not under protective management will be developed for ranching within 20 years. At that time only the three national parks and areas treated as private reserves (i.e. Fortin Patria and the present Guyra Paraguay properties within the Rio Negro National Park Extension) are expected to remain under natural forest cover. Although there is no legal assurance that military and community lands will remain forested, it is also assumed that they will remain unaltered in order to be conservative. Any land use change in non-forest habitats (notably the dry cerradones and wet pantanal grasslands) is likely to follow a different dynamic to the forested areas and are not taken into account further here at the scale of the project zone. Given that licenses have been issued for ranching development on other private properties within the proposed Rio Negro National Park Extension, these must now be considered on the same basis as any other private holdings in the Project Zone.

Guyra Paraguay has pursued a policy of purchasing land for conservation management, especially within the Rio Negro National Park extension. This, however, could only be pursued when land prices were in the US\$ 50/ha range. No new properties have been added since 2008, due to the four-fold increase in land prices attributable to investor pressure. The programme has therefore hit a financial barrier and, in the absence the project, would not secure protection of additional land.

The project area, Tobich (San Gabriel Arcangel), represents a prime candidate for a ranching development under the 'no project' scenario, being forested private holding within the Agua Dulce area. Extensive ranches have been established to the east and west (i.e. it is already behind the deforestation frontier) and offers by investors have been made to the owner to purchase the property. The only constraint is the residual interest of INDERT, preventing transfer of title to a new owner until the legal ten-year period after completion of payments to INDERT has elapsed. This is due within one year.

The only protection in the forested private properties of the project zone in the absence of the project, including San Gabriel Tobich, is that afforded by the regulations and practices retaining forest cover during ranching development. These include the statutory 25% forest reserve and wind-breaks, and the wooded drainage lines and scattered trees left under current best practice. Some 45% of the forest on a ranching development is retained – 25% in the forest reserve, 15% in the windbreaks and 5% in drainage-lines and retained trees. This area is considered protected even in the absence of the project and thus non-additional to its benefits. It should, however, be noted that the wind-breaks, wooded drainage lines and retained trees are part of the silvo-pastoral system so the cover is likely to degrade in quality over time through under-grazing and soil compaction.

The benefits attributable to the project thus consist in retaining the 65% of natural cover that would have been transformed to cattle pasture in the absence of action.

G2.3. Carbon Stocks under the 'No-Project' Scenario

The economic drivers of deforestation are analyzed in Annexe 4 and summarized above in section G2.1. The most likely 'No-Project' scenario is that 55% of the present natural cover of the project area will be converted to pasture within the 20-year project life.

It is assumed that clearance will affect all vegetation types equally – this is indeed the usual pattern created by imposing a rectilinear development pattern on the vegetation. An exception could be made for the forest in the ancient stream lines but the riparian buffers are normally associated with permanent surface streams only. Furthermore the ancient stream lines are a very small proportion (3%) of the whole area.

Under these circumstances, 45% of the carbon stocks in above- and below-ground woody biomass (dbh 10+cm) will remain under the no-project scenario, equivalent to 259, 300 tC of the 576,300 tC currently estimated on the project area.

Clearance also involves removal of dead wood and litter. In the no-project scenario it is estimated that some 20,700 tC will remain in these two pools combined, of the 46,000 tC assumed to be currently present.

Organic soil carbon is assumed to remain constant in the no-project scenario and is not taken into account. Research from the Argentine Dry Chaco (Bonino, 2006) does show a decrease with conversion into grazing land but is not significantly significant.

G2.4. Community Impacts under the ‘No-Project’ Scenario

The development of the Chaco will have a profound effect on the Paraguayan economy. The long-term effects of such large-scale operations in a fragile ecosystem may well be negative but the immediate socio-economic effects, at least for most of the project life, are likely to be positive. The degree these economic gains will be distributed to the population as a whole, however, remains uncertain, in particular for the indigenous peoples of the area. Meanwhile, the change in land use effectively eliminates those material forest resources currently used to supplement their domestic economies.

Even more importantly, the ancestral territories are of profound cultural significance to both the Ayoreo and Yshir people. Expansion of ranching across the project zone will alter the qualities of these areas fundamentally and seriously hinder aspirations to regain a measure of control over them. Furthermore, the ability of the groups in voluntary isolation to continue their life-style is dependent on tracts of continuous woodland in which to move – this is already becoming difficult and will become untenable as the landscape linkages are lost.

Finally, loss of forested land outside the park to private interests intensifies the pressures on what remains under other tenure, much of which is contained in the national parks. At issue is whether this land can both fulfil biodiversity conservation objectives and satisfy indigenous aspirations to control former territory. In theory the interests of biodiversity conservation and indigenous people are compatible but in practice the two groups have different priorities and approaches. The most likely (and welcome) outcome is an accommodation requiring compromise and collaboration on both sides. It is not, however, a foregone conclusion that the partnership will be easy although it is achievable with good project governance.

G2.5. Biodiversity Impacts under the ‘No-Project’ Scenario

In effect, the process now taking place and projected to continue represents the fragmentation of globally and regionally important but vulnerable ecosystems representing one of the last great South American wilderness areas. In terms of biodiversity the principal concern is that ecological integrity will be compromised on a landscape level, with extensive habitat loss and loss of connectivity between the protected areas substantially raising threat levels to the habitat and its biota. Invasion by exotic species associated with ranching activity has also been noted in both the REA and the surveys undertaken for this study. The specific results of these pressures

are hard to foresee and are most likely to be displayed as a generalised weakening of habitat quality and population health.

The Río Negro REA identifies some 14 threats operating at a medium to very high level on one or more key conservation targets and that will be realized under a no-project scenario. Three of the threats are specific to the Quebracho forest, all impacting on ecosystem services:

- Soil degradation through loss of forest cover and conversion to grazed pasture;
- Loss of water quality;
- Higher incidence of fire.

Both fire and degradation of soils will affect Quebracho forest to a high degree. Loss of water quality will be more serious in wetland systems.

All these threats affect ecosystems identified in the Rapid Ecological Assessment gap analysis as poorly represented in the National Protected Areas System. Apart from the Quebracho formations ('south-eastern Chaco woodlands on poorly drained soil', 'south-eastern Chaco flooded woodlands' under this analysis), others in the project zone include 'poorly drained Cerrado on non-alkaline uplands', 'flooded riverine forest' and 'sub-humid semi-deciduous chiquitanian woodland transitional with Chaco'.

The biota is threatened along with its habitat. Habitat fragmentation and loss will worsen the status of the 77 species already considered at risk at a national level, including the 6 under global threat. Furthermore the national Red List will swell dramatically as the many less common and/or localised species are affected by intensified threat.

G3. Project Design and Goals

G3.1. Project Objectives

The objective of the Chaco-Pantanal project component is to secure an area of threatened Quebracho forest, thereby continuing to sequester the carbon that would otherwise be emitted by planned clearance on the forest frontier. In the process this will:

- Make a significant contribution to an overall emissions reduction target of 840,000 tCO₂e over 20 years;
- Ensure conservation of an area of a habitat type characteristic of the Chaco-Pantanal transition, along with its biota, that is poorly represented in the protected area system and at risk;
- Meet the aspirations of local communities in regaining influence over activities in areas they have traditionally used.

G3.2. Project Activities

G3.2.1. Secured management control of threatened forest.

The characteristics of a suitable project area were defined during project development as:

- Predominantly covered by high-quality forest of recognised value for biodiversity conservation;
- Within the traditional territories of indigenous people supportive of the project;
- With high likelihood of being converted to agro-pastoral use under the transformation pattern prevailing in the project zone.

During project development (i.e. since 2008) several potential areas were examined, using these basic criteria.

The original target was in the western part of the project zone, to secure better landscape connectivity between the Defensores del Chaco National Park and Chovoreca National Monument. At that time the Ayoreo, the indigenous people of that part of the project zone, were reticent about a REDD funding mechanism, seeking more time to consider the implications. Dialogue has therefore been maintained but in respect for the Ayoreo position, and recognising the potential to return to the area at a later stage if circumstances were favourable, the focus was shifted to the Chaco-Pantanal transition in the eastern part of the project zone, in the area traditionally used by the Yshir.

The Yshir were supportive of the project concept and attention was directed towards Puerto Ramos, a priority area for the Yshir and also carrying extensive Quebracho forest. By this time (2009) the land speculation boom was under way and, though a purchase agreement was under negotiation, the owner sold to an investor willing to pay cash-down at a relatively high price. This constituted a severe setback to project development and a disappointment to the Yshir.

Alternative suitable sites were now sought but availability was becoming limited as those on the market were already being bought up. The transaction for Tobich (San Gabriel Arcangel) was made in the face of a competing bid by a group of investors, emphasising the imminence of threat in a heated climate of speculation under the economic drivers already identified in the economic assessment. It was further complicated by the fact that a sale agreement could be made but transfer of title could not take place for a year, when the 10-year period after completion of payments to INDERT, as required under the laws governing the Agrarian Reform programme, had elapsed. In order to take the area off the market, it was agreed on February 25 2011 to make full payment immediately, even though transfer of title would be delayed. From this time negotiations were solely between the seller and Guyra Paraguay, signalling the lifting of threat from competitors - the commitment to buy is therefore taken as the project start. In the event, completion of the transaction proved protracted, primarily due to the need for firm safeguards against risks between making payment and receiving title. This issue was resolved by authorisation by INDERT on May 19 2011 for early transfer of title (Annexe 5). The transfer of title was then signed on May 23 2011 (Annexe 6).

The transfer of title sets out the dispositions for the future ownership and use of the area. Summarised, these are as follows:

- The land is bought by Guyra Paraguay, which assumes all property rights from the seller.

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- The intent is to manage the area in perpetuity to conserve the quality of its forest cover, the carbon stored in living matter, dead matter and soils, and its importance for biodiversity and the cultural identity of the Yshir. Management will be in collaboration with the Chamacoco-Yshir via UCINY and using funds channelled through the Paraguay Forest Conservation Project.
 - Property rights to the carbon are offered to Swire Pacific Offshore. The offer is open for 12 months, on reimbursement of pre-financing of purchase costs arranged through World Land Trust.
 - If Swire Pacific Offshore takes up the offer to the carbon rights, Guyra Paraguay will give an indivisible 50% share in ownership of the area to the Chamacoco-Yshir and transfer full ownership within a 20 year period (i.e. within the project life). The area will then become a community heritage reserve, under customary management and retaining its natural and cultural qualities.
 - Meanwhile, the area will be managed jointly by Guyra Paraguay and the Yshir under an agreement reflecting the guidelines set out under the PFCP Project Description Document (i.e. this document). The experience so gained, and the capacity-building/training involved, prepares for future management by UCINY as the community heritage reserve.

Project implementation is therefore premised on Swire Pacific Offshore taking up the carbon rights, which confer carbon credits that it can retire against unavoidable emissions from its international operations.

G3.2.2. Land and conservation management.

The management objective for the land is to retain its present natural and cultural qualities – i.e. protective management to maintain its ecological integrity. The principal project activities therefore centre on:

- Survey, research and monitoring, to quantify, understand and track those qualities;
- Protection, against external threats to those qualities;
- Capacity-building, to allow the Yshir to develop and demonstrate their management skills in scientific conservation management, both in the project area and in other areas of conservation importance (including protected areas) in the project zone.
- Optimisation of project benefits, especially leverage for wider biodiversity conservation and community gains beyond the project area boundary.

Central to the strategy is that the Yshir, organised under UCINY, assume full ownership and management of the project area within the project life. Shared ownership will therefore be backed up by:

- A shared management agreement between Guyra Paraguay and UCINY, stating the joint aim to maintain the area in perpetuity under a conservation regime that retains its biodiversity and cultural values. The agreement will also confirm that:
 - Both parties have free access to the entire area for the purpose of conservation management, environmental monitoring and research, and the exercise of customary usage and lawful rights.
 - Ownership rights to all carbon and associated credits are vested in the project proponent, SPO.

-
- A management plan, developed jointly by Guyra Paraguay and UNCINY, based on the principles set out in this PDD and with provision for regular update and review at appropriate intervals.

Management planning and implementation is a participatory and adaptive process throughout the project life – specific site management prescriptions are therefore avoided here, beyond setting out the principles involved. In addition to land purchase costs, Swire Pacific Offshore funding (channelled through the Long-term Management Fund - see below) will support these activities within an overall operational budget of US\$ 69,200 p.a., maintained in real terms over the 20-year project life. Budget headings within this overall sum include provision for:

- Guyra Paraguay staff member based in Bahia Negra, responsible for coordinating participatory management planning and implementation, including capacity-building within the Chamacoco community;
- A regular income stream equivalent to 1 US\$/yr per ha of project area over the project life to the Yshir, to be used at their discretion for purposes improving quality of life of the general community.
- A field operations budget.

Expected benefits from these activities are:

- Climate: avoided emissions of 581,000 tCO₂e (net of leakage and risk buffer) over 20 years, through protection of natural forest cover;
- Community:
 - Management control and part-ownership, with eventual full ownership, of an additional 4700 ha of traditional territory, so consolidating cultural identity;
 - Demonstrable participation in land use decision-making, extendable to other protected areas (and land use decision-making) within traditional territory;
 - A regular income stream to UCINY, maintained over 20 years, to underpin community representation and actions promoting community well-being, according to communal priorities.
 - Supplementary livelihoods, through full- and part-time work opportunities in conservation management.
- Biodiversity:
 - Conservation of a representative area of Quebracho forest, otherwise under-represented in the national protected area system.
 - To date, biodiversity survey has been superficial. It has, however, already demonstrated the presence of the following species of conservation concern within the project boundaries, which will be conserved there:
 - Both Palo Santo *Bulnesia sarmientoi* (nationally endangered/vulnerable) and Quebracho Colorado *Schinopsis balansae* (nationally vulnerable) are common constituents of their characteristic formations. This is a good indicator of ecological integrity, both species being sought for timber.
 - Definite occurrence of Tapir *Tapirus terrestris*, Giant Armadillo (International VU) and Jaguar *Panthera onca* (national VU). A number of nationally ‘near-threatened’

species have also been recorded close to the project area boundary and may be expected within it.

G3.3. Project Location and Boundaries

A map of the project zone is given in section G1.3 as Fig 7. It is believed that project impacts, including leakage, will occur entirely within the zone. Maps of the project area are also given in G1.3, as Figs 5 and 2. All data (including boundary data) has been transferred into the Guyra Paraguay Geographical Information System.

G3.4. Project Lifetime and Implementation Schedule

The project life (which also corresponds to the accounting period) will be 20 years.

Project development – identification and characterisation of the project zone, community consultations, definition of project strategy – took place in 2008-2010.

The first milestone was alleviation of threat and securing of management control of the project area – alleviation of threat was achieved on February 25 2011 (giving the project start date), consolidated by the purchase agreement on May 23 2011.

The second milestone was the agreement on management principles with UCINY. These have been written into the land title.

The third milestone was completion of the carbon inventory using appropriate VCS-approved methodology, in October 2011.

The fourth milestone is the completion of the CCB and VCS validation process, timed for November-December 2011.

The fourth milestone, triggered by the second, is the formal donation of shared ownership to UCINY and the start of full project activities (capacity building, protection and survey programme, monitoring programme), as defined under an agreed management framework. This will be fully in place in December 2011.

Annual verification will then be carried out for the next five years, moving to every five years thereafter.

G3.5. Risks and Risk Mitigation

The VCSA risk assessment guidelines have been used for the project component (Annexe 7), giving an overall ‘low risk’ assessment and a 10% buffer allocation. Some elements are, however, worth high-lighting.

Management capacity of implementing agencies: Guyra Paraguay has a proven track-record in protected area management, demonstrated in its network of private reserves, and has earned international respect for its capabilities. This carries a very low risk rating under the VCSA guidelines. Meanwhile, the Yshir are the traditional custodians of the land and its qualities reflect the underlying compatibility of traditional types

and levels of land use. Nonetheless they have no track record of conservation land management in its modern sense – indeed, an important aspect of the project is to confer one. An element of risk must therefore be accepted in terms of project delivery. Furthermore, lack of economic alternatives for the Yshir may stimulate forms of land-use incompatible with management aims, such as charcoal production.

Mitigation of these risks is built into project design in the following ways:

- Management precepts for the area will be agreed formally with UCINY prior to donating shared ownership, including commitment to maintain natural qualities in perpetuity – i.e. after transfer of full ownership.
- The project structure allows for a full 20 years of capacity building and participation in protected area management supported by the long-term management fund before the area of avoided deforestation is transferred to full Yshir ownership.
- The project aims to strengthen other areas of economic activity, notably through livelihoods opportunities in protected area management and those promoted via UNCINY and facilitated by project funding, diversifying options and reducing pressure for incompatible land-use practices.

Under these conditions, potential risks to project benefits are greatly reduced.

Fire: The high Quebracho forest interior is not fire-prone and the risk of devastating fire is therefore ranked ‘low’. Nonetheless the effect of fire in the neighbouring savannah in degrading the forest edge is a recognised threat to habitat integrity. Guyra Paraguay is a national centre of expertise in fire management and will bring this to bear in the management of the project area, significantly mitigating the risk.

Political and social risk: Earlier assessments classed these as medium risks, as a default category applied prior to acquiring a specific project area. They are now classed as low, given that the land is now legally secured with full consent (and participation) of the indigenous community.

Infrastructural developments: Again, earlier assessments gave this as a medium risk. However, when considered in relation to the specific project area, likely developments will not affect it now that it is secured. They will, however, have a profound impact on the land use trends of the wider project zone.

G3.6. Maintenance of High Conservation Values

The project aims to maintain an extensive area of unaltered natural habitat. The High Conservation Values inherent to the project area and summarised in section.3.2.2. will therefore be maintained.

It is, however, recognised that even a 4,700 ha area is unlikely to support a fully functioning example of the Quebracho ecosystem in isolation. This will be conferred by landscape corridors (the purpose of the forest set-aside required by law) in which the area will act as a significant refuge. The initiative is also seen as an initial project instance within the project zone, allowing further project instances to build up the landscape connectivity over time.

G3.7. Permanence of Project Benefits

The land secured for conservation management under the project will be incorporated as a reserve under shared management with the community within the existing complex of Guyra Paraguay private protected areas and statutory national parks in the eastern Chaco/Chaco-Pantanal area. This status is permanent, secured by the terms of the purchase agreement (Annexe 6). Land titles for all Guyra Paraguay stipulate that the land is to be used solely for habitat protection and conservation management – i.e. carry a legal conservation easement.

The financial arrangements underpin site conservation over the next 20 years. The capacity building programme and UCINY participation in management undertaken through this period is designed to assure permanence of benefits beyond the project life.

The financial commitment by SPO, as project proponent, also creates a financial framework that can attract further funding to maintain the entire Chaco-Pantanal protected area complex, into which Tobich (San Gabriel Arcangel) is integrated, into the future. In a parallel initiative to the PFCP, WLT already channels funding into conservation management of the Rio Negro, Defensores del Chaco and Chovoreca protected areas under a tri-partite agreement with Guyra Paraguay and SEAM. Establishing a fund is included in that agreement, an aim achieved and seeded through the PFCP Long-term Management Fund. This in turn levers conservation benefits attributable to the project far beyond the immediate project area and indeed beyond the project zone, given that both Chovoreca and Defensores del Chaco extend into the central Dry Chaco.

G3.8. Stakeholder Participation

During the project design phase, experts in social issues have been engaged to organise initial meetings with local community members and their representatives, conducted in the appropriate language. These meetings set out project aims and the issues surrounding the use of carbon financing mechanisms, and solicit community views. The outcome has then been used to modify the project concept, re-iterating the process as many times as necessary to reach an outcome acceptable to all parties. The process follows CCBA guidelines for preliminary consultations. It will also continue into project implementation, as the basis of an adaptive management approach then strengthened by co-ownership and active collaboration in land management on mutually-agreed principles. The outcomes of the participation process illustrate how the procedure has worked in practice.

The original concept was in fact to locate the project further west in the Dry Chaco, in the traditional area of the Ayoreo. This had advantages both in terms of biodiversity benefit (helping to maintain landscape connectivity through linkages between the state protected areas in a rapidly fragmenting ecosystem) and in social gain (securing lands, here also used by indigenous groups in voluntary isolation). At that time the Ayoreo expressed the need for more time to understand and consider the issues involved prior to any form of commitment of support to a REDD-based project. To respect that position, the original concept was abandoned and immediate focus re-directed to the

Chaco-Pantanal. At the same time, discussions were maintained and have since matured into concrete collaboration between Guyra Paraguay and UNAP, with WLT support, on a range of projects. Indeed, the options are now open to return to REDD-based initiative if the project enters a second phase of expansion.

Guyra Paraguay already had a well-developed relationship with the Chamacoco-Yshir. It has a long-standing outreach programme, supported by UNDP, in the Bahía Negra area and community members are directly employed by Guyra Paraguay in conservation management activities. Furthermore, as is their constitutional right, the community enjoy unimpeded access to Guyra Paraguay private conservation areas in pursuit of traditional activities – here primarily fishing and, in the hinterland, hunting – whilst Guyra Paraguay has a history of supporting the Yshir in pursuing their various concerns including those involving land. The project strategy was re-arranged to respond directly to community concerns expressed to Guyra Paraguay concerning the future of Puerto Ramos. This was presented to Yshir leaders in early August 2009, resulting in a signed agreement in support of the initiative (Annexe 8). In the event, Puerto Ramos was lost as a prospective project area to a competing bid from an agribusiness investment group. Following subsequent consultations, Yshir support was therefore transferred to a search for alternative areas (Annexe 9), culminating in the acquisition of the project area. This too was subject to prior consultation and informed consent (Annexe 19) – the name Tobich conferred by the Yshir means ‘the place of meetings’ and actually refers to the consultation process.

The consultations have introduced ideas optimizing community benefits – notably the appointment of an Yshir to a Guyra Paraguay ranger position who also acts as liaison with community members (which has been acted upon – there are now six Yshir designated by UCINY involved in project activity). Emphasis has also been placed on the importance of the fishing interest as a stakeholder group in collaborative actions with the community.

As a post-script, the new owners of Puerto Ramos have since approached Guyra Paraguay to discuss forest management issues on the land not included in their approved development plans. This may offer a new route to address community concerns.

G3.9. Communications

The Chamacoco community have been informed (by writing and verbally) of the activities proposed under the project through direct communication with community elders both as a council and assembled under UCINY. In addition to the consultations, the principles have been commented upon and endorsed at a public meeting attended by independent observers (including the Rainforest Alliance validation team - at that time a specific project area had not been identified so validation could not be combined with the La Amistad project component as originally hoped). This process will be repeated for the validation with the PDD and a summary (in Spanish) distributed in advance. Community members will also be informed via UCINY of the opportunities to express comment both directly to the validators/verifiers during their site visits and under the CCBA public comment period.

All project documentation (PDD, procedures, consultations, progress reports, associated research reports) are regarded as in the public domain and will be available through the WLT and Guyra Paraguay web-sites. In the case of WLT, this will form a dedicated section of its 'Ecosystems Services' site <http://eco-services.worldlandtrust.org/>.

G3.10. Conflict Resolution

Grievances and unresolved issues associated with the project may be notified at any time, via UCINY and the local Guyra Paraguay Project Officer representing community members and the project implementers respectively.

In the first instance, resolution will be sought by negotiation at a formal consultation meeting, which may be called within 10 days by either the community representatives or the project implementer and, if requested, mediated by a mutually acceptable and independent third party. The grievance and result of the negotiation, including measures of redress for issues found to have substance, will be included in the records of the meeting. The written record must be disseminated to all interested parties within 20 days (i.e. 30 days of the original notification). Any remedial action must be initiated within 14 days, with results that must be reported (and recorded) in the subsequent consultation meeting.

G3.11. Financial Structure

The budget for the Chaco-Pantanal PFCP component (Annexe 10) is separated into:

- *Capital costs*: acquisition and transaction costs for the project area, San Gabriel Arcangel, totaling US\$ 1,151,719. This has been committed, with pre-financing by WLT to be reimbursed by Swire Pacific Offshore in 2011.
- *Operating costs*: Costs directly associated with San Gabriel field operations (i.e. field staff, operating budget, project monitoring and a 10% administrative overhead) are estimated at US\$ 61,600 p.a. (in 2010 US\$ values). These are disbursed through the Chaco-Pantanal Long-term Management Account.

Financial flow for project operations is mediated through a structure designed to provide sustained support for Guyra Paraguay conservation projects in general and the PFCP in particular (Annexe 11). It also accommodates SPO accounting treatment for project costs and the VCUs accruing from them.

Swire Pacific Offshore Ltd invests US\$ 4.2 million in PFCP operations as a whole (exclusive of land transactions) over the five years 2011-2015 (the 'investment period'). These funds are transferred to a Financial Manager, managing an investment portfolio to set investment guidelines and operating manual. Financial projections are based on a 5% return – this is considered conservative, the Conservation International/Global Conservation Fund (see below) using 5% for planning purposes.

Guidelines for disbursement are set out in the Operating Manual. Essentially, WLT and Guyra Paraguay agree on the budget for the annual project work plan to achieve PCFC objectives set out in the PDDs of its various components. SPO then authorises

release into the PFCP Long-term Management Fund bank account. The finances are treated as a sinking fund – the disbursements therefore include investment income and a portion of the capital, drawing down the money from the investment period over the remainder of the 20-year project lifetime.

Disbursed funds are allocated to general project operations (validation/verifications, VCU insurance, fund management etc), the Chaco-Pantanal PFCP component (described in this document, and amounting to US\$ 1,232,180 over the 20-year project life), and the San Rafael components (including Component 1 – La Amistad). The project is validated/verified by both CCBA and VCS – VCUs from the VCS process are transferred to SPO. The social and biodiversity benefits, including the land, remain in-country.

These arrangements are underpinned by service agreements between SPO and WLT, WLT and Guyra Paraguay, and the operating and investment guidelines developed by SPO, WLT and Guyra Paraguay. The budget is part of the agreement and provides for annual disbursements of US\$ 57,200 plus US\$ 4721 to UCINY over the full project life, sustained by the funds set aside during the investment period.

G4. Management Capacity and Best Practices

G4.1. Project Participants

The project proponent is Swire Pacific Offshore (Pte) Ltd. It has commissioned the project to meet its corporate social responsibility goals, provides the necessary financing and is the recipient of all VCUs delivered through project activity.

Contact: Simon Bennett, General Manager – Corporate Social Responsibility
Address: 300 Beach Road, 12-01 The Concourse, Singapore 199555, Republic of Singapore
Comms: tel +65 6309 3632 / fax +65 6294 3211 /e-mail
simon.bennett@swire.com.sg

Guyra Paraguay is responsible for project implementation. It has developed the project and is responsible for all project activities leading to delivery of VCUs for transfer to Swire Pacific Offshore.

Contact: Alberto Yanosky, Executive Director, Guyra Paraguay
Address: Gaetano Martino No 215 es. Tte Ross. CC 1132 Asuncion, Republic of Paraguay
Comms: tel +595 2122 3567 / fax +595 2122 9097/ email yanosky@guyra.org.py

World Land Trust provides technical support to Guyra Paraguay in project design and implementation, and acts as the liaison with Swire Pacific Offshore. It is envisaged that this role becomes redundant after five years.

Contact: Roger Wilson, Special Project Development, Blyth House, Bridge Street, Halesworth, Suffolk IP19 8AB, United Kingdom.
Comms: tel +44 1986 874422 / fax +44 1986 874425/
email rwilson@worldlandtrust.org

The project governance structure is based on a contract chain between SPO and WLT, WLT and GP, and GP with local partners – e.g. UCINY - for specific actions under the project strategy. Annual operational plans and spending requirements, based on this PDD and conditioned by the performance of the investment portfolio, are drawn up by Guyra Paraguay in consultation with UCINY (as co-owner of the property) and WLT. They are presented, with the recommendation of WLT, to SPO which controls the release of funds from the investment portfolio and bank account, for disbursement directly to Guyra Paraguay. The disbursements are quarterly, made on receipt of progress reports.

G4.2. Key Technical Skills

Project implementation is relatively simple, involving protective management and monitoring. Key skills for project implementation comprise:

- *Practical protection and conservation land-management skills.* Guyra Paraguay has a long-standing and internationally recognized expertise in this area, including projects involving community engagement covering areas equivalent to that proposed in this initiative.
- *Carbon inventory and monitoring.* Guyra Paraguay already has a fully-developed land-use and biodiversity monitoring system, both used to inform national policy. These will be maintained in the service of the project. Specialist expertise has been recruited locally in carbon inventory and social, legal and economic issues for project development and remain available for the implementation phase. It also has an established system of collaboration with SEAM (and its Climate Change Office), the University of Asunción Forestry School and other partners (including UNDP).

G4.3. Orientation and Training

The Yshir are integral to the project, both as co-owners (and eventual full owners) of the project area and in site management. An initial capacity building plan (developed in consultation with the community) is given in Annexe 12. Training in protected area management is in-service, through Guyra Paraguay personnel. Orientation in the REDD concept and participation in carbon inventory and monitoring is a priority area.

The training is on-going and, in the case of carbon monitoring, each measuring period is always preceded by an orientation/induction period. The process thus allows for training of new participants.

G4.4. Employment Policy

The need for community participation is reinforced by preferential opportunity for employment on project-related activities for local community members wherever skills and aptitudes are appropriate.

For more specialised, skilled and/or administrative tasks, absolute priority is given to the involvement of the available pool of in-country expertise. Recruitment follows Guyra Paraguay employment norms and is open to all. Outside expertise is only called on where there is a demonstrable need, or where deemed desirable by Guyra Paraguay to enrich in-country resources through skills transfer or knowledge exchange.

Provisions on employment policy are re-iterated in the management contracts between SPO-WLT and WLT-Guyra Paraguay, to conform to SPO Corporate Social Responsibility policy. The contracts have specific provisions against employment of minors, absence of barriers to women and minority groups, and preferential employment of local people. These provisions cover project and contractor staff, who must be fully informed, provide for independent audit of observance, and include the sanction of suspension of funding for uncorrected non-compliance.

G4.5. Worker's Rights

All Guyra Paraguay employees are fully covered by the legal requirements for employment and workers rights. As all project employees are recruited by Guyra Paraguay, these conditions automatically extend to project personnel. At the outset of project implementation a hand-book will be produced setting out employee's rights and employment conditions, for distribution to staff engaged on the project (and indeed more widely, as appropriate).

The management contracts stipulate that PFCP operations (including those undertaken by contractors) conform to ISO 9001:2008, 14001:2004 and 26000:2010. The standard provisions for independent audit and potential sanctions apply.

G4.6. Safety

Project actions revolve around protected area management and do not involve substantial risk to worker safety. Health, safety and associated issues are stipulated in the management contract. These include formal policies:

- 'no fire-arms' while engaged on project activity;
- 'no drugs or alcohol' while engaged on project activity;
- Health and safety codes and regular reporting, to meet the standards used by SPO in its international shipping operations.

SPO, as project proponent, regards the project as within its international reporting requirements on health, safety and ethical conduct.

G4.7 Financial Soundness

Project financing is via the project proponent, Swire Pacific Offshore. The project budget indicates that project activities can be covered within the overall funding limits set by Swire Pacific Offshore. Swire Pacific Offshore itself is an extremely well-established international company, with reported 2009 annual turnover of c. US\$ 500 million. It is therefore fully capable of maintaining its financial commitments for project implementation, which is only one aspect of a wide-ranging Corporate Social

Responsibility programme. Full details of the company are available at www.swire.com.sg.

G5. Legal Status and Property Rights

G5.1. Relevant Law

Transfer of title prior to 10 years after completion of payments to INDERT requires special dispensation – this has been obtained (see Annexe 5).

The legal aspects of the project have been examined by two legal experts. The project is compliant with all relevant legislation and has been endorsed at the levels of Central Government, Municipality and Community Council. A list of legislation relevant to this project as of early 2009 is given as Annexe 13. Subsequent relevant legislation comprises Resolution 82/09 – which repeals Resolution 1616 and modifies Resolution 1625, giving the current framework for land use change in the project reference area as described in sections G1.6 and G2.2.

Compliance with Paraguayan labour law is mandatory but reinforced by the terms of the project management contracts. These specify provisions against employment of minors, absence of barriers to women and minority groups, and preferential employment of local people. They cover both project and contractor staff, allow for independent audit of observance and include the sanction of suspension of funding for uncorrected non-compliance.

In this case, the land title carries clauses restricting permissible use to ensure the long-term protection of their carbon and high conservation values. These represent conservation easements, routinely used by Guyra Paraguay in its own transactions and here undertaken jointly with the Yshir community.

The project concept has been developed with specific reference to the United Nations Declaration on the Rights of Indigenous Peoples, which with it conforms. The requirement to do so is included in the management contracts.

All projects require an environmental impact statement – in effect the analyses undertaken to meet CCBA and VCSA requirements within the PDD fulfill that function.

G5.2. Approvals

The project has been endorsed by SEAM (i.e. at the level of central government - Annexe 14) and, following consultation, by the Yshir community (Annexe 8, amended by Annexes 9 & 19).

G5.3. Consent

The project does not encroach uninvited on private, community or government property and has been preceded by consultations leading to approval based on informed consent.

G5.4. Involuntary Relocation

The project does not involve relocation of any form.

G5.5. Impacts of Illegal Activity on Project Benefits

No form of illegal activity has been identified in the project area.

G5.6. Carbon Rights

Legal advice (Annexe 15) demonstrates that under Paraguayan civil law the carbon integral to a tree on private property belongs to the land-owner, as is any carbon credit it represents. Here the carbon is therefore initially in the hands of the landowners, Guyra Paraguay and the Yshir community. Transfer to SPO of carbon credits arising from the project is specifically included in the contractual agreements between the various parties governing project activities and financing, and is recognized in the SEAM endorsement.

Climate Section

CL1. Net Positive Climate Impacts

CL1.1. Net Change in Carbon Stocks under the ‘With-Project’ Scenario

The ‘with project’ scenario maintains the status quo against a ‘no-project’ scenario estimated to incur a reduction in carbon stocks in above- and below-ground woody biomass of 316,900 tC (Annexe 10 worksheet 8). Stocks in dead wood and litter will also be retained but are not included in carbon accounting in this instance.

CL1.2. Net Change in Emissions of Non-CO₂ GHGs

Baseline and monitoring is limited to CO₂ emissions from carbon stock change. It is recognised that modern ranching techniques involve other potential sources of emissions – from livestock rearing, fertiliser use in pasture improvement and fossil fuel use – that are avoided by the project. It is conservative to exclude them and they are not taken into account in the baseline.

CL1.3. Other GHG Emissions from project Activities

The most likely source of additional emissions from project activity involving conservation management is from transport. This is considered insignificant in a REDD project.

CL1.4. Positive Net Climate Impact

The gross benefit through the 20 year project is to avoid emissions from the oxidation of the 316,900 tC as 1, 162,000 tCO₂. A 10% reserve is applied for project risk. Some 468,880 tCO₂ is also deducted (Annexe 21, also section CL2) giving net benefit of 581,000 tCO₂ over the project life (Annexe 10 worksheet 8).

CL1.5. Avoidance of Double Counting

No emissions cap is applied to Paraguay but we expect a procedure for REDD-generated emissions reductions, with appropriate provisions for voluntary credits, to develop as the international discussions continue. Meanwhile, all emissions reductions attributable to the project will be lodged with an independent third-party registry, by SPO and under its name. An account has already been opened in anticipation of the

project with TZ1, allied to the New Zealand Stock Exchange. This is done to demonstrate their quality as tradable credits – the primary objective is retirement against emissions attributable to SPO international operations, so meeting voluntary corporate social responsibility commitments. The scope of the project is indeed designed to match that self-imposed emissions reduction target.

CL2. Offsite Climate Impacts (‘Leakage’)

CL2.1. Determination of Leakage Type and Extent

The deforestation pattern in the project area is planned and undertaken by a single class of deforestation agent, cattle ranchers. The existing pattern is for a ranching development to progressively clear land up to the legal limit within a 10 year period and a cattle rancher is assumed to find land of equivalent quality throughout the project zone as an alternative to acquiring Tobich for this purpose. Within the project zone there are 793,476 ha of forested land available for clearance (i.e. in private hands with no legal restrictions) – this information has been used for the leakage assessment (Annexe 21 using VCS module VMD0009 LK-ASP methodology).

CL2.2. Leakage Mitigation Measures

Management and mitigation of leakage attributable to cattle ranching (the identified deforestation agent) is addressed by Guyra Paraguay as a general conservation issue in the Chaco, associated with but not specific to this project. The organisation is promoting sustainable ranching compatible with environmental objectives, actively seeking support for a demonstration project (which may be integrated with new project instances if demonstrated to be justifiable), and has joined the Rural Association of Paraguay (the land owner’s, primarily the ranchers, association) to facilitate these actions.

CL2.3. Carbon Benefit Deductions for Leakage

A deduction of **464, 879 tCO₂** has been made for project leakage (Annexe 21).

CL2.4. Leakage Deductions for Non-CO₂ Gases

Non-CO₂ emissions are considered insignificant and no deduction is made.

CL3. Climate Impact Monitoring

CL3.1. Monitoring Plan

The climate impact monitoring plan is detailed in the VCS PD for the area, following Approved VCS Module VMD0015 (M-MON).

Members of the Yshir community will participate in the field measurements, ensuring full awareness and engagement in the process. Results will also be posted regularly on the Guyra Paraguay and WLT web-sites. A budget of US\$ 10000 p.a. has been allocated for the monitoring programme for the Chaco-Pantanal, maintained after the fifth year by the long-term management fund.

CL3.2. Development of Full Monitoring Plan

The Monitoring plan will be brought into action within the first six months of project activity, including revision to meet VCSA requirements. It will then be maintained for 20 years (i.e. the project life) – as the ‘without-project’ scenario indicates the deforestation process in the Chaco-Pantanal will be complete within 20 years, the approach should capture residual leakage after project actions have taken effect. If not, monitoring of land use change will be maintained for a further 5 years.

Community Section

CM1. Net Positive Community Impacts

CM1.1. Community Impact Estimates

The project component directly addresses the concerns of the Yshir regarding recognised rights and interests in ancestral territory. The main concern, originally expressed at the consultation meeting held in August 2009, is access to, and integrity of, these areas. The project:

- Confirms recognition of Yshir rights to continue traditional use of land, and to ownership in ancestral territory;
- Gives practical form to these principles, under terms set out in the legal co-ownership agreement and shared land-management agreements;
- Consolidates the approach by ensuring immediate 50% shared ownership within the shared management framework – this is a direct response to the perceived negative impact of unfulfilled promises, against a historical background of such situations;
- Gives opportunity to the Yshir to develop and, most importantly, demonstrate their land-management capability, demonstrated through the project carbon and biodiversity monitoring system and confirmed (assuming maintenance of positive impacts) by transfer of full title to the entire area.

Overall, the project component explicitly affirms the role of the Yshir community both in its interests in this part of its ancestral territories and in the maintenance of the qualities of an area of significance both to themselves and to the world at large.

These positive impacts are grounded in concerns of cultural identity rather than material benefit. An easement is attached to the title that limits use of the area to conservation alone – the land itself cannot therefore be used in ways giving direct economic benefit to the community. This is mitigated by indirect benefits:

- An income stream equivalent to US\$1 per ha p.a. through the project life - i.e. directly related to the area of traditional territory involved and thus emphasising further the Yshir interest in its management. The target is therefore US\$ 4,712 p.a., maintained over 20 years. The sum is relatively modest (reflecting the greater symbolic value of the land) but adequate to make a substantial difference to the quality of life of the community.
- Participation in conservation management and monitoring, providing additional paid work opportunities.
- Capacity building and training in conservation management, applicable to other sites and thus extending the opportunities for paid employment in this field (e.g. in other protected areas in the Chaco-Pantanal region).

The main negative impacts are potential, primarily related to social divisiveness if one Yshir community derived more benefits from the project than others (Annexe 12). This risk is mitigated by working through UCINY, which represents all the communities concerned. This issue must be tracked carefully nonetheless, and may require additional measures introduced under the adaptive management approach. Overall, however, net foreseeable community impacts under the project scenario are positive in relation to the ‘no-project’ scenario. This, however, is a qualitative assessment and benefits must be quantified – this is covered in section 8.3.

CM1.2. Impact on HCVs

The project does not affect existing community actions and so does not affect any existing community HCVs, while enhancing access to resources and areas of cultural significance.

CM2. Offsite Stakeholder Impacts

CM2.1. Negative Offsite Stakeholder Impacts

No negative off-site community impacts are foreseen, excepting the potential (noted above) for exclusion from benefits of the more distant Yshir communities. There is potential for positive impacts:

- The component is built on pre-existing good relationships between the Yshir and Guyra Paraguay, themselves ultimately founded on recognition, confirmed by established practice, of compatible aims in the management regime on lands already held by Guyra Paraguay. It therefore confirms the importance of collaboration between community and conservation organisations as a point of principle. This project greatly strengthens that relationship, which in turn allows pursuit of opportunities outside the project framework (e.g. Guyra Paraguay-UCINY actions for secure provision of watering for livestock, supported by the German Embassy but facilitated through PFCP development).
- It gives a practical demonstration of possibilities offered by extending of such cooperation, using REDD as a financing mechanism for actions benefitting biodiversity and community interests. This opens the way to replication in a broader context.

CM2.2. Offsite Stakeholder Impacts Mitigation Strategy

As potential offsite stakeholder impacts are positive, no specific mitigation strategy is contemplated.

CM2.3. Negative Impacts on Other Stakeholder Groups

The primary negative impact on other stakeholder groups is to take a significant area of land out of the scope of economic development. It is believed that this will be amply offset by retaining a measure of environmental quality within a landscape that is likely to be fundamentally altered in the foreseeable future.

CM3. Community Impact Monitoring

CM3.1. Community Monitoring Plan

Community impact monitoring will follow the approach outlined in Annexe 12:

- Establishing a baseline in the first six months of the project, using quantifiable measurements of set socio-economic indicators under an appropriate methodology;
- Re-measuring annually, to demonstrate and quantify benefits;
- Full review at 5 year intervals (i.e. alongside the carbon monitoring programme).

Community members will participate fully in the monitoring process, including assessment of the net benefits claimed by the project. Updated results will be posted on the WLT and Guyra Paraguay websites.

Key elements to be monitored are:

- Degree of participation of community members in project-related activity;
- The level of project-related revenue streams into the community, their distribution and their proportion relative to other income sources;
- Use of project-generated revenues for general community benefit, 'quality of life' indicator scores and the role of project-generated revenues in reaching those scores.

CM3.2. Monitoring Plan for HCVs

The community HCVs are primarily cultural, in that shared ownership reinforces the connection between the community and its traditional area. The key indicator is the degree to which the Yshir are, and perceive themselves to be, involved in the management of the area. This will be tracked in the monitoring plan.

CM3.3. Development of Full Monitoring Plan

Working from the outline agreed with the community (Annexe 12), the full monitoring programme will be defined and implemented within six months of the project start date, i.e. as allowed for under CCBA guidelines.

Biodiversity Section

B1. Net Positive Biodiversity Impacts

B1.1. Biodiversity Impacts Estimates

Positive biodiversity impacts come from two sources:

- The Río Negro Rapid Ecological Assessment (Annexe 3) identifies Quebracho forest as an important conservation target inadequately captured by the existing protected area system. The project component conserves a significant tract of this habitat type, supplementing the Guyra Paraguay private reserves on the Rio Negro and the area within the Fortin Patria property. Other areas within the proposed extension of the Rio Negro National Park can no longer be considered secure.
- The project should not be seen in isolation but in the wider context of conservation management in Alto Paraguay. The lands secured will form part of the broader complex of protected areas in the region, with project management staff, equipment and programmes contributing to the larger effort. This area covers over 1 million ha, with annual management costs still being assessed but in excess of US\$ 100,000. The proportion of the project funding contributing to the broader conservation effort thus makes a small contribution but is still a major step forward over present operational investment – which is essentially nonexistent, excepting for the Three Giants ecotourism facility established by Guyra Paraguay, community outreach activities in Bahía Negra, and financing from World Land Trust, via Guyra Paraguay, to maintain a basic protection presence). It also has the advantages of being regular and sustained over 20 years. Most importantly it establishes the structure for a long-term management fund to which other parties may contribute, and seeds it with an input of US\$ 900,000.

Positive project impacts are thus elevated to landscape and even ecosystem level, in an area (Dry Chaco, Chaco-Pantanal, Pantanal, Río Paraguay) of extremely high conservation value and exposed to extreme threat. This applies to the project as it stands, with the expectation of yet greater benefits through the multiplier effect of its demonstration value. Furthermore, no convincing negative biodiversity impact can be identified to set against these benefits.

B1.2. Impact on HCVs

Similarly, retention of a significant area of natural habitat will retain high conservation values in a landscape where those values will be seriously eroded by clearance and transformation.

B1.3. Tree Species to be used in Project Activities

The project is based on protection of native habitat, thus by definition based on the use of native species. No reforestation activities are envisaged.

B1.4. Impacts of Non-Native Species

Non-native species form no part of the project strategy.

B1.5. Statement on GMOs

The project makes no use of genetically modified organisms.

B2. Offsite Biodiversity Impacts

B2.1. Negative Offsite Biodiversity Impacts

No negative offsite biodiversity impacts are identified. The establishment of the long-term management fund, however, gives potential for significant positive impacts across the region – Defensores del Chaco National Park, for instance, extends beyond the project reference zone.

B2.2. Offsite Biodiversity Impacts Mitigation Strategy

In the absence of negative offsite biodiversity impacts, no mitigation strategy is appropriate.

B3. Biodiversity Impact Monitoring

B3.1. Biodiversity Monitoring Plan

Guyra Paraguay maintains a national biodiversity survey and monitoring programme, using criteria derived from the formal HCV system to identify and monitor Important Bird Areas/Key Biodiversity Areas across the country (Annexe 2). It also uses the formal Rapid Ecological Assessment methodology (Annexe 3). These give both baselines and an objective, measurable system for monitoring both temporally at a given site and spatially between sites. They will therefore be applied to the project site and used as the monitoring system, with formal re-assessments at 5 year intervals (i.e. running alongside the carbon and community monitoring), allowing direct comparison of performance in terms of threat alleviation spanning the pre- and post-implementation periods. This will be maintained throughout the 20 year project life which, given the projected rate of deforestation, should capture delayed effects. However, if the deforestation process is not complete by the fifteenth year the monitoring will be continued for a further five years beyond the project life.

B3.2. Monitoring Plan for HCVs

The HCVs are captured within the monitoring methodology outlined above.

B3.3. Development of Full Monitoring Plan

The monitoring plan is already developed, applying methodologies that have been both developed and accepted internationally.

Gold Level Section

GL1. Climate Change Adaptation Benefits

The projections of underlying climate change for Paraguay indicate a dryer climatic regime developing over the next century, provoking an eastward shift of ecotypes – i.e. the westward part of the reference zone will tend towards xerophytic scrub and the mesoxerophytic forest moving into the Quebracho formations of the Chaco-Pantanal

transition zone. Vulnerability to drought is already an issue in the Dry Chaco, hence the pressure for a water pipeline. It should be noted, however, that the projections are based on temperature and rainfall only and do not take into account the effects of low-lying topography, less permeable soil and the seasonality of water-levels in the river, all of which also influence water availability in the project zone.

The key point is that Quebracho forest, as one of the Chaco vegetation types, is already adapted to withstanding extremes of heat, drought and flooding, all predictable consequences of climate change. It is unlikely, therefore, that there will be significant impact on project benefits, certainly within the project life-time and probably in the foreseeable future thereafter. Conversely, replacement of such vegetation by open ranch-land enriched with exotic pasture grass is likely to increase vulnerability.

Retaining significant areas of vegetation adapted to climatic extremes confers resilience. Indeed, conservation and improved understanding of the ecological dynamics of the various Chaco habitats is a valuable resource in developing adaptation strategies to climate change and attracts increasing scientific attention for that very reason. The project area, as a good example of one of the characteristic Chaco communities otherwise poorly represented in the protected area system, is particularly important in that respect.

GL2. Exceptional Community Benefits

Alto Paraguay has the lowest population density and highest levels of illiteracy and inadequate provision of basic necessities in the country. The Yshir, in common with the other indigenous communities, represent the most marginalized and socio-economically disadvantaged sector of Paraguayan society. They thus represent the most ill-served grouping within an ill-served area. The project is specifically designed to create a benefit flow targeted on this community. The direct and indirect economic benefits of the project thus have a major impact. Two characteristics of community benefits attributable to the community are, however, exceptional:

- The 20-year project life, giving a dependable revenue stream that allows the community to organize itself durably and at its own pace, so escaping from dependence on unreliable and short-term project/grant support;
- Re-assertion of direct possession and management responsibility, initially shared but eventually total, of land in traditional territory. The exceptional feature here is that it is land that has passed into private ownership, previously unattainable to the Yshir, rather than a grant of national land. This private land-holding status considerably strengthens the ability of UCINY to influence the economic development of the municipality.

GL3. Exceptional Biodiversity Benefits

Two globally vulnerable species have been noted on the project area – Lowland Tapir *Tapirus terrestris* and Giant Armadillo *Priodontes maximus*. The population levels have not been determined but an area of 4700 ha is likely to be large enough to support populations, particularly when remaining connected to contiguous habitat as provided for in the regulations for land clearance.

The Río Negro National Park and its extension are an Important Bird Area and thus also a Key Biodiversity Area (KBA). The southern border of the IBA is artificial, following the line of the road (Linea 1) into Bahía Negra – it was designed to cover the protected area complex and its proposed extensions as they stood at the time of the IBA designations. The project site is located immediately to the south, shares the ecological characteristics of the IBA and will also be treated as part of the same larger protected area complex. Under these circumstances, Gold Level criteria appear to be met.