

REPORT

RAPID ECOLOGICAL EVALUATION FOR THE PROJECT ON USE OF REMOTE SENSING TECHNOLOGIES FOR ECOSYSTEM MANAGEMENT TREATIES

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This rapid ecological evaluation of 15-23 March 2004 was developed in the context of the project on Remote Sensing Technologies for Ecosystem Management Treaties, funded by the State Department of the United States of America. This project assesses the use of data from satellite remote sensing instruments in order to improve the efficacy of multilateral treaties for the protection of the environment. The creation of agreements and the designation of sites for the preservation of biodiversity and natural resources of international importance require data for their proper implementation. Therefore, this project intends to prove the use of the data provided by the remote sensing in the management of a specific site which is part of the sites recognized by the Ramsar Treaty and by UNESCO as a Biosphere Reserve in the northeast of the Uruguayan territory and in the Laguna Merín, a freshwater lake located in the cross-border area of Brazil and Uruguay. This area is being affected by pollution from agrochemicals and over-exploitation of fishery resources. For further information and other reports go to: <http://sedac.ciesin.columbia.edu/rs-treaties/laguna.html>.

Introduction

This project is developed in the area of the Laguna Merín basin, which is part of the political-geographical border separating Brazil from Uruguay, situated to the west of Brazil and to the east of Uruguay.

In Brazil, the transects selected for the vegetation sampling were made in the area of the Ecological Reserve of Taim. The landscape consists mainly of plains where the lagoon coast, marshes, rice cultivations and cattle can be seen. In all of them great vegetal and animal biodiversity can be appreciated.

In Uruguay the transects were made in the area of the Biosphere Reserve of Bañados del Este, which is integrated to the MAB program since 1976. The landscape consists of wetlands having different degrees of modification, rivers bordered by natural mounts and vast extensions of rice crops and cattle.

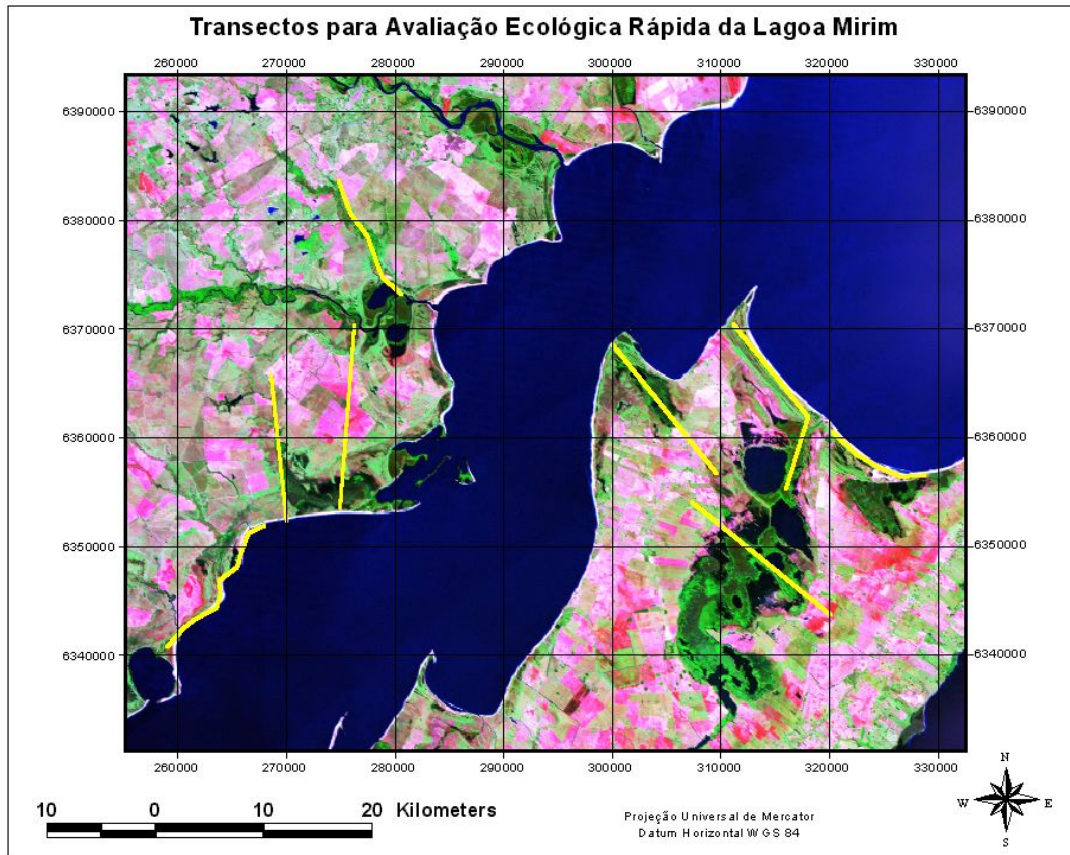
The wetlands constitute a geo-morphological unity which has a plain topography with a very low pendent. This determine that the level of the waters get close to the surface during most of the year, or permanently. Geologically the area of study is located inside the tectonic pit of the Laguna Merín. The pit was formed from appeasing efforts which produced fractures and, as a consequence of this, lava ascended and crystalline rocks descended. This phenomenon started to take place 150 million years ago and the subsidence continues nowadays.

Working Methodology

In total 8 transects were made, 4 for each area of study in Brazil and in Uruguay with an extension of 16 km each. Several points were marked on the transects which were georeferenced. The environment and the use of the soil were described and the flora and fauna of the place was registered. The field work was carried out in 10 days.

Figure 1 shows the planned transects. The field data was registered in data register charts. Samples of vegetal species were collected to be classified later and are displayed at the moment in the herbarium at the Agronomy University (MVFA). The field work intended to relate different environments and its fauna with satellite images at a later phase.

The working team was multidisciplinary, conformed by two geographers and two botanists from Brazil and two zoologists from Uruguay.



The sampling methodology was adjusted for future sampling where the same points mapped in this work will be controlled.

Different kinds of environments were examined, some were in a natural state and some with different degrees of intervention (natural prairies, marshes, natural and artificial mounts, rice plantations, etc).

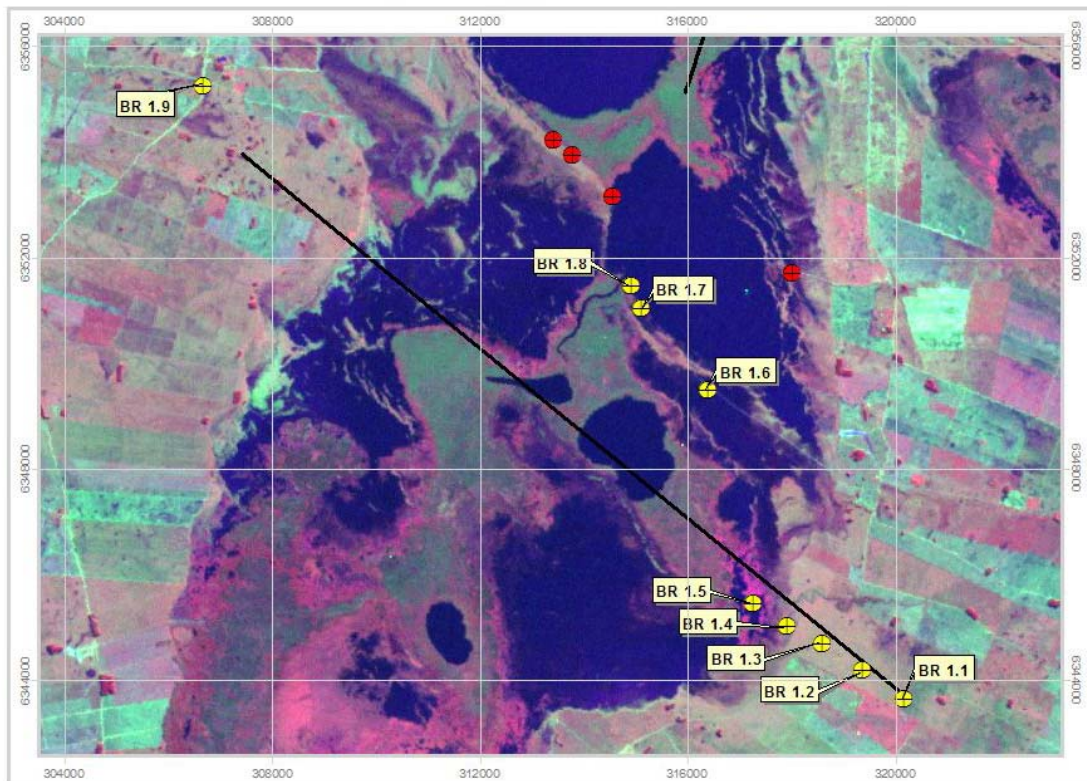
A classifying analysis will be carried out in future samplings together with the obtained results in order to learn the similarities between the points in terms of physiognomy and composition of the vegetation.

Preliminary Results: Vegetation

The following is presented by country and transect.

BRAZIL

BRASIL - Transecta 1



Transect 1

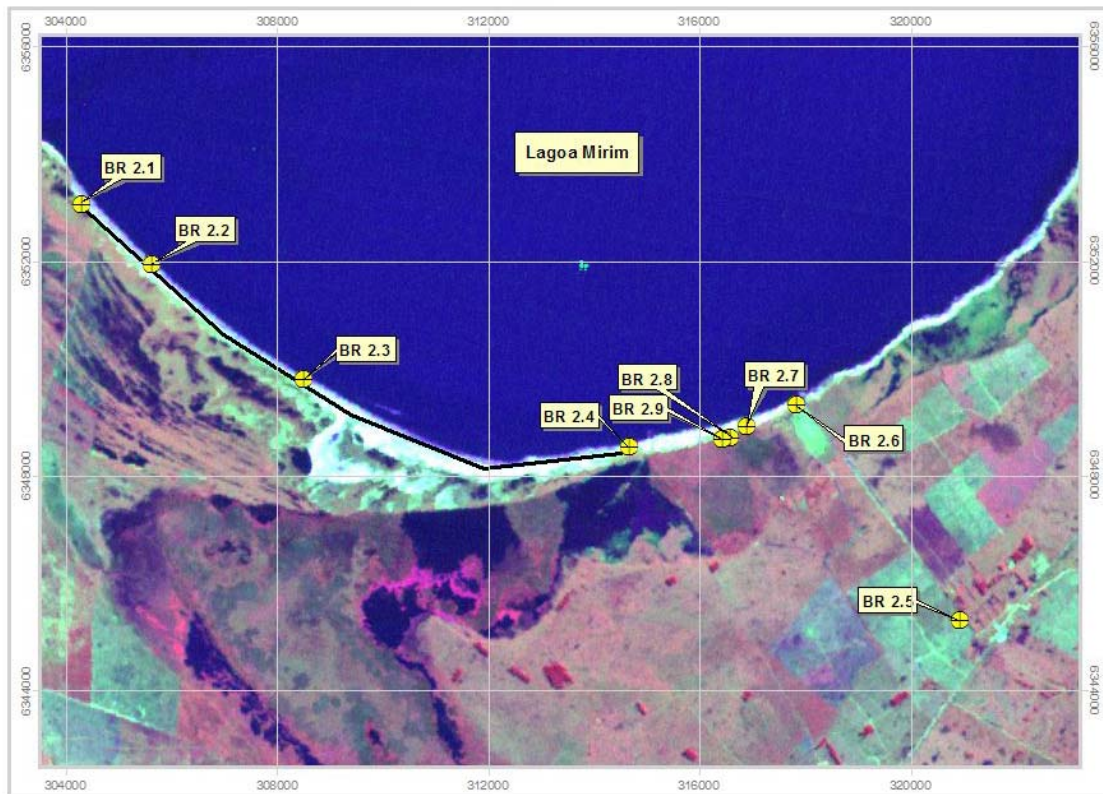
It has a length of 16.5 km, where 6 sampling points and 3 support points were marked. They correspond to pastures in a watered plain. The first end of the transect is in a fallowed rice field. The vegetal cover is wide since it covers between 80% and 100% of sun light. This pastures do not have any bush species, being the *Papalum dilatatum* the greater species found which appears in a low percentage (10% of total vegetation in most point of the transect). The remaining species throughout the transect are of short size (5-20 cm).

Most of the species appear throughout all of the transect's points. The *Cynodon dactylon*, *Conya bonariensis*, *Coniza pampeana*, *Cyperu odoratus*, *Eryngium echinatum*, *Plygala p.* and *Pycreus polystachos* were the ones found more often.

The last end of the transect (point 1.6) is on a water plain or open marsh, with a water height of 50-60 m, with scarce species where the presence of *Schoenoplectus californicus* of 1-2 m height is predominant.

The species that more frequently appear, (the ones that appear in 4 or 5 points of the transect) are: *Aeschynomene rudis*, *Apium leptophyllum*, *Aster squamatus*, *Bacopa monnieri*, *Eryngium echinatum*, which appear in 5 points; *Centaurium pulchellum*, *Conyza bonariensis*, *Conyza pampeana*, *Cuphea glutinosa*, *Cynodon dactylon*, *Cyperus odoratus*, *Dichondra microcalyx*, *Eleocharis geniculata*, *Eryngium nudicaule*, *Euphorbia serpens*, *Glandularia selloi*, *Paspalum dilatatum*, *Phyla canescens*, *Polygala pulchella* y *Pycreus polistachos* which appear in 4 points.

BRASIL - Transecta 2



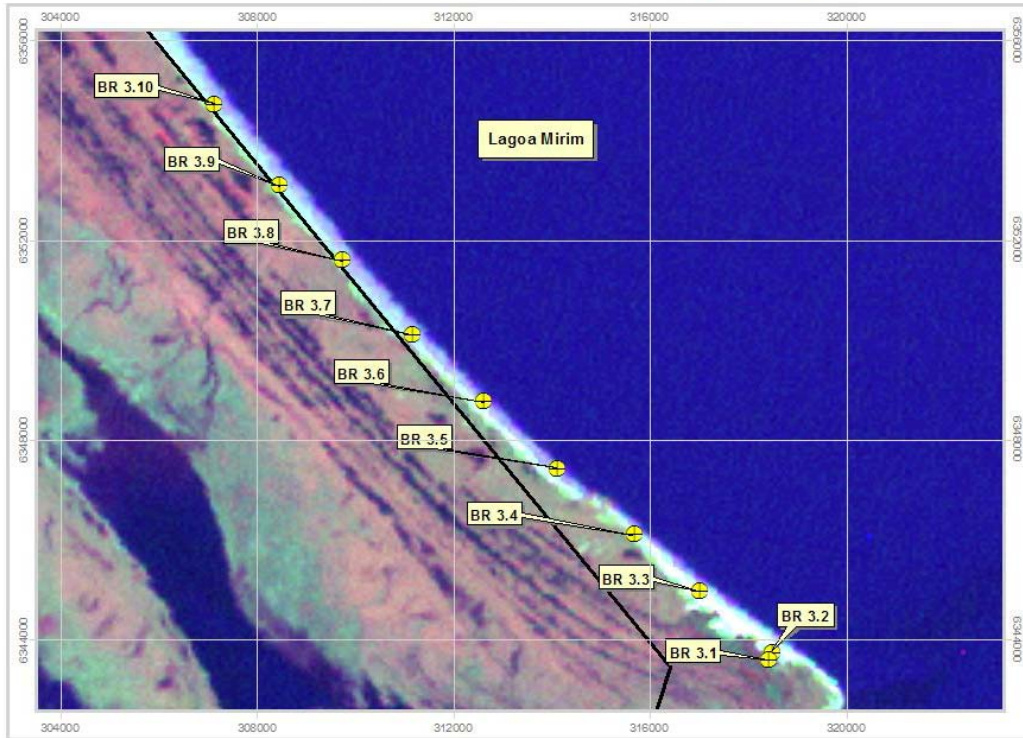
Transect 2

It has an extension of 9,8 km, where 4 sampling points and 5 reference points were registered. The transect passes through a sandy terrain which is possibly flooded in the winter period since the Laguna Merín passes by few metres away and parallel to it. The vegetation is more distant than in transect 1, leaving more exposition to sun radiation since it only occupies 40-60 % of the area.

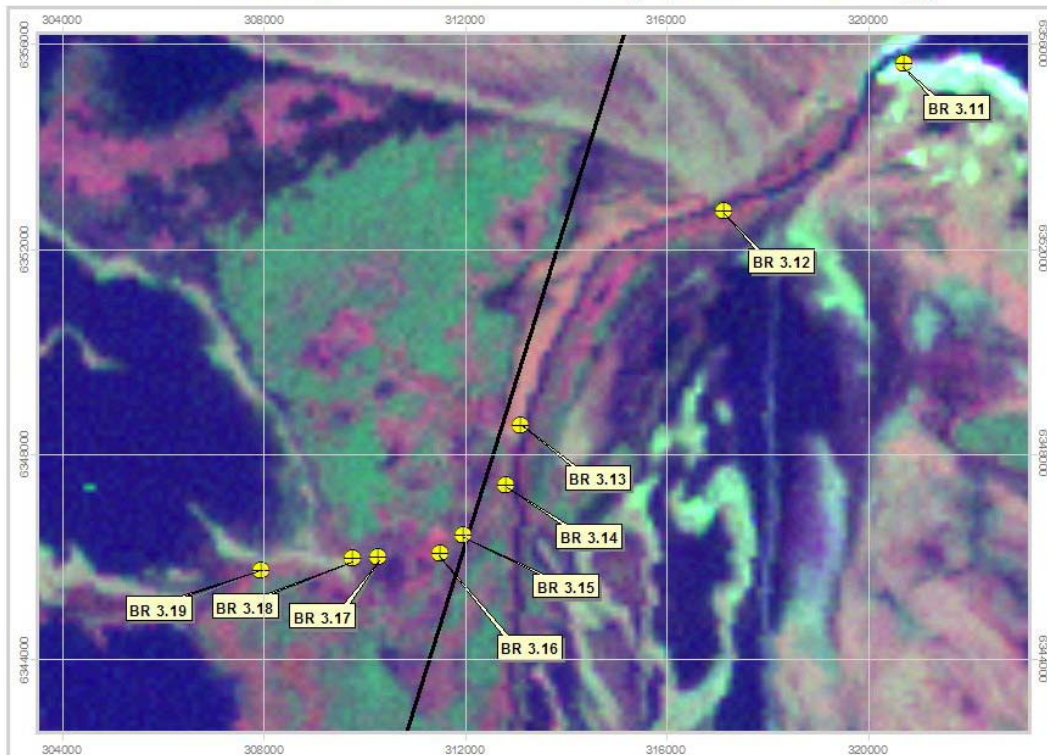
As in transect 1 no bush species are found in a significant number, except for the presence of *Sesbania punicea*, which extends along the transect yet not in important number. In this transect the species observed in most points are less in number compared to the previous transect. The only species that were found along the transect were *Paspalum dilatatum* and *Pterocaulon lorentzii*, while *Amaranthus quitensis*, *Ambrosia tenuifolia*, *Baccharis gnaphalioides*, *Centaurium pulchellum*, *Conyza pampeana*, *Cynodon dactylon*, *Cyperus aggregatus*, *Chenopodium amobrosioides*, *Gomphrena perennis* and *Hydrocotyle bonariensis* were found in 3 points of the transect. It is worth pointing out that this transect

only had 4 points, therefore, the previously named species were found almost throughout the entire transect.

BRASIL - Transecta 3 (Praia)



BRASIL - Transecta 3 (Arroio Del Rey)



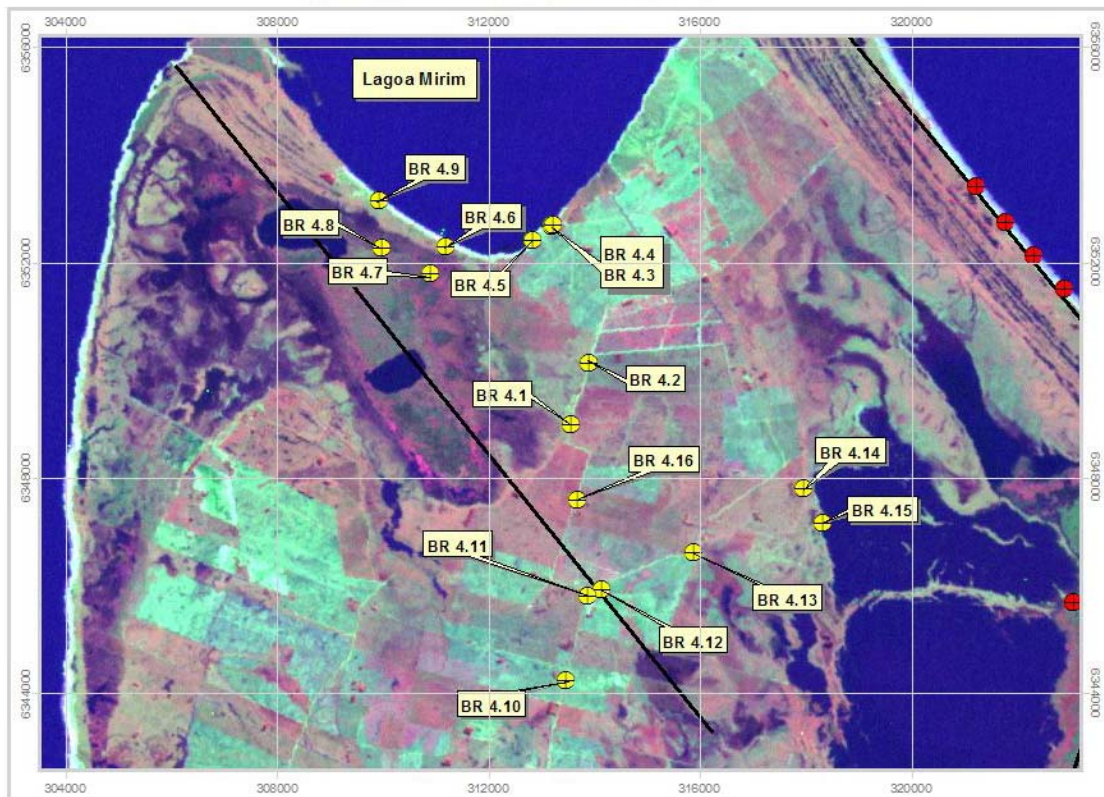
Transect 3

This transect extends along 18 km and 10 points were registered. It differs from the previous (1 and 2) since it presents 2 well – differentiated environments; one that is a natural mount, which is in the beginning of the transect and then, all the rest of the point corresponds to a sandy prairie.

The natural mount is characterized for presenting a low tree stratum (3 – 5 m) and a lower layer that consists of a smaller species that do not exceed 30 cm high.

The species that were found along the transect, that is to say, on the ten points under study were: *Elocharis obtusa* and *Panicum* sp while *Glandularia selloi* y *Phyla canescens* were found in 4 points and *Indogefera sabulicola* was found on 3 an *Sesbania punicea* on 2.

Brasil - Transecta 4



Transect 4

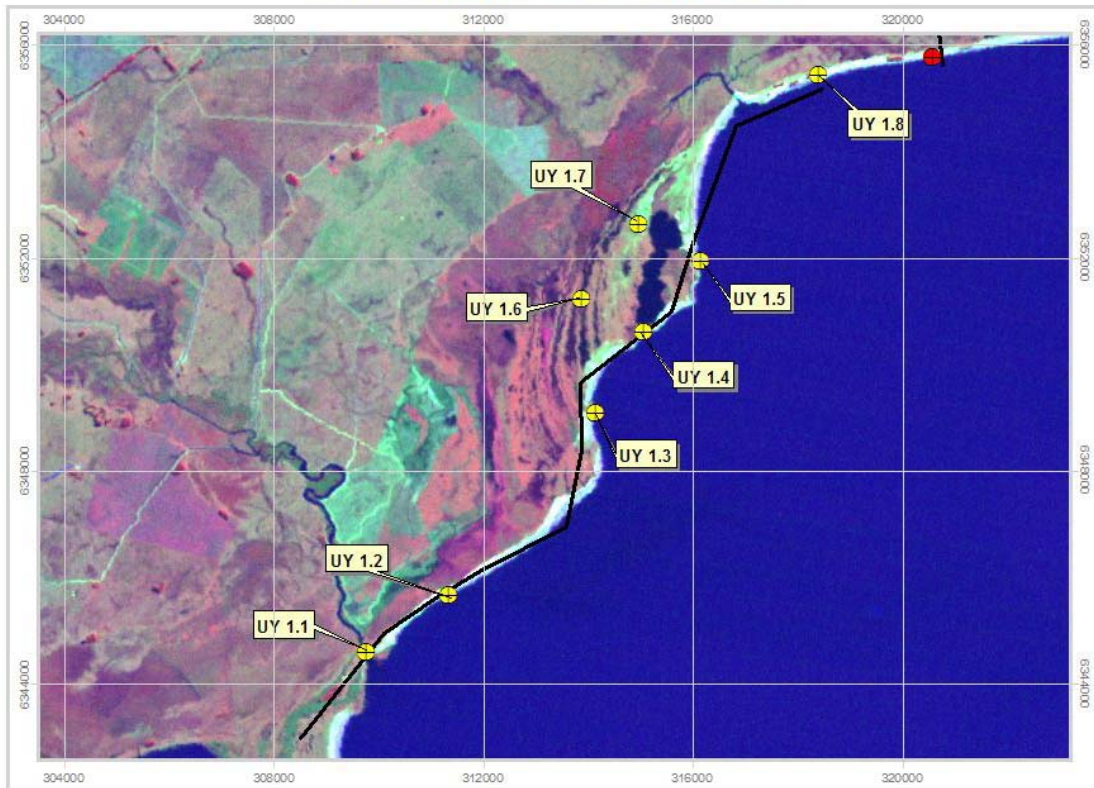
It has a length of 15.3 km, with 3 sampling points and 12 reference points. Its main feature is the wider range of environment found (prairie, rice crops, rice field in rest period, native mount, marsh and sandy prairie) compared to the previous transects. As a consequence other species that had not appear in the other transects were found here such as, *Borreria eryngioides* and *Bulbostylis capillaries*.

Besides, this transect was the only one where zones free of vegetation were found as shown in points 4.2, 4.3, 4.4; corresponding to rice cultivations o fields in rest period (soil recently ploughed).

The species which appeared in larger number of sampling points were *Schoenoplectos californicus* (on three points), *Ludwigia peploides*, *Pluchea sagitalis* and *Polygonum acuminatun* only on two point.

URUGUAY

URUGUAY - Transecta 1



Transect 1

It runs through 15.4 km, where sandy prairies, a natural mount, a sandy terrain with marshes and water plains were found. 5 sampling points were marked on it with 3 reference points.

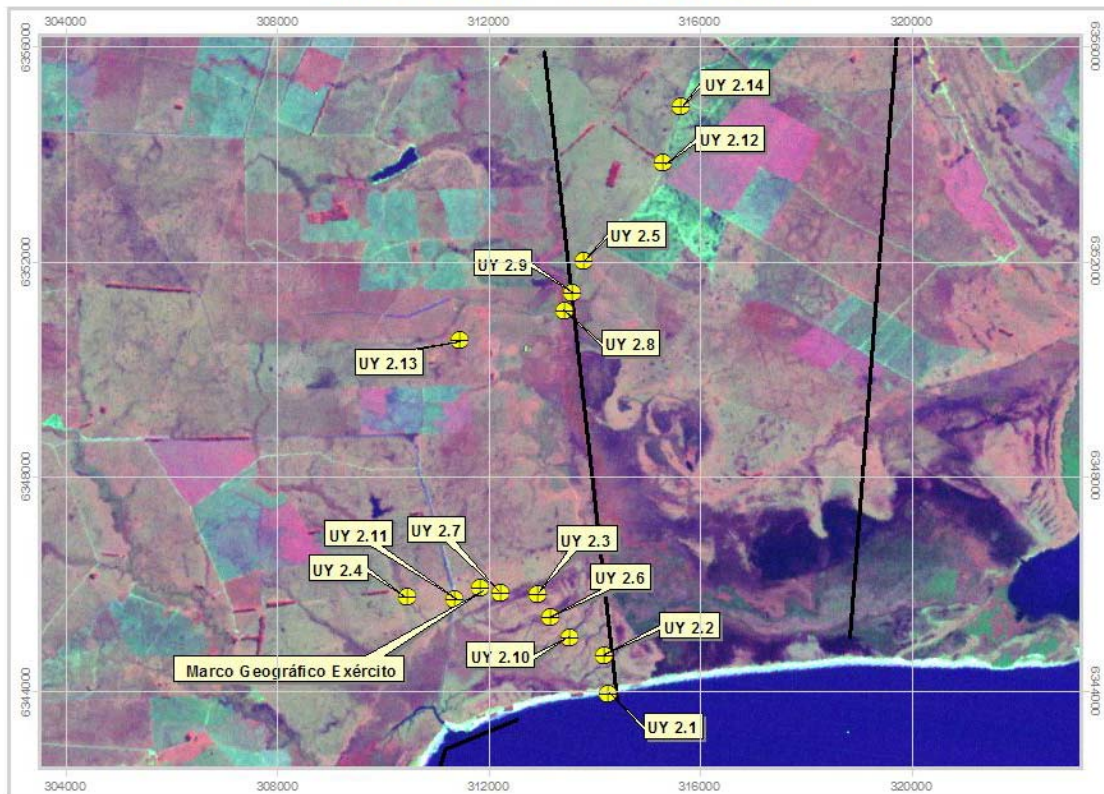
A curtain of wind-breaking *Eucalyptus sp* can be observed at nearly 200 m from the starting point (point 1.1). It is worth pointing out that point 1.3 corresponds to the beginning of the “Laguna del Tigre” or “Laguna Guacha” (orphan lagoon) – this last name is due to the fact that the summer period generally causes a separation with the “Laguna Merín”-, in an area where the *Shoenoplectus californicus* was predominant. Point 1.4 is characterized for presenting a high dune that appears in the map with an altitude of 10 m, when the point measured showed 5m.

Regarding the vegetal species, the transect is characterized for presenting a great number of species but on a very low frequency, on many occasions species appear just at the beginning of the transect not doing so on the other points or on any of the other transects.

The species which was found in most points was the *Sesbania punicea* which was present in four of the five points of this transect. *Chenopodium retusum* was found in the three first points and not in any of the other transects and *Cynodon dactylon* which was found at the beginning at in the end of the transect, also being found in the other transects.

Other species that were found only once were: *Collaea stenophylla*, *Erythrina crista-galii*, *Gomphrena perennis*, *Hydrocotyle bonariensis*, *Hyptis mutabilis*, *Ludwigia peploides*, *Mikania micrantha*, *Osmunda regnalis* var. *spectabilis*, *Paspalum pumilum*, *Psidium incanum*, *Salix humboldtiana*, *Sapium glandulosum*, *Schoenoplectus californicus*, *Sida rombifolia*, *Smilax campestris* and *Stenotaphrum secundatum*.

URUGUAY - Transecta 2



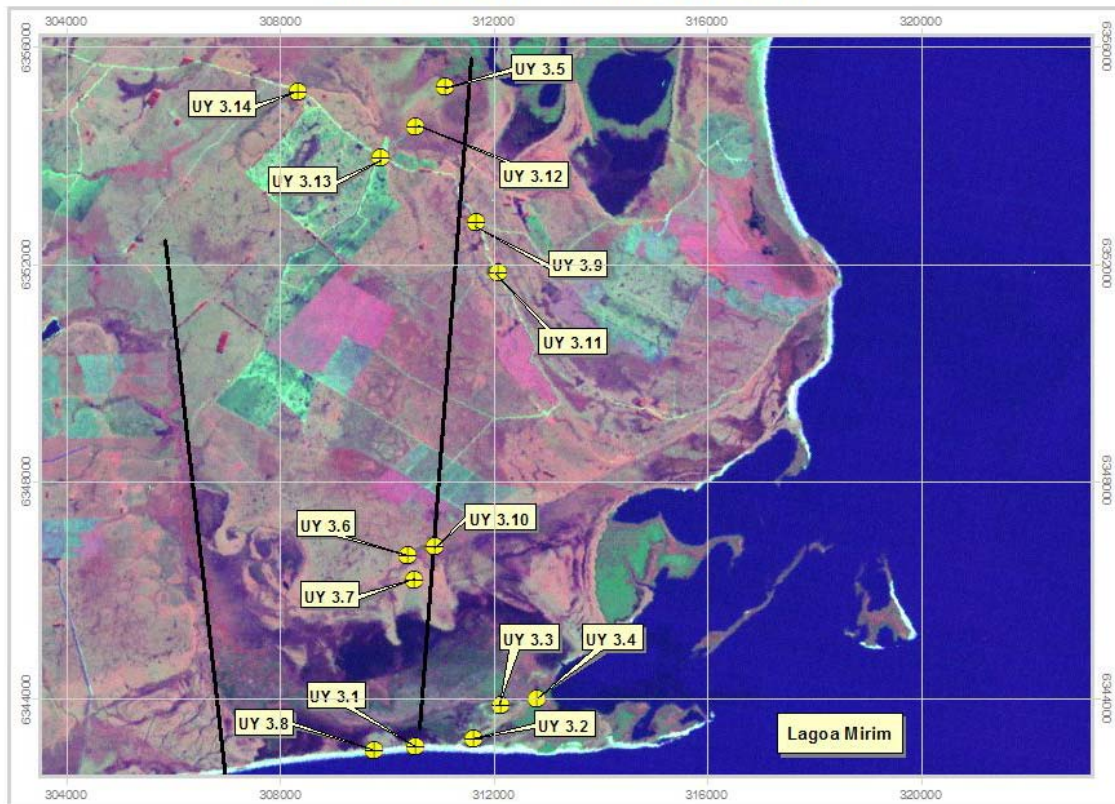
Transect 2

It has a length of 13.5 km. It is characterized for presenting marshes, water meadows, and native mounts. It has 5 sampling points and 10 reference points.

The beginning of the transect (point 1.1) corresponds to a sandy prairie, possibly flooded during winter. No bush species were observed and the top height of the cover is the one of the *Sesbania punicea*. Point 2.1 follows with a water meadow and a marsh. On the next point (1.3) two well-differentiated stratum are noticed. One up to 15 cm and another of 5-6 m high that correspond to species that form the native mount (indígena). At the end of the transect (point 2.5) there is a marsh in recovery by the side of the road; rice used to be planted on this area.

Regarding the present vegetal species, only *Sesbania pumicea* was registered in all the transect points and *Cestrum parkii* was registered only on the last point. As well as the previous transect, this one has shown some of the species in only one of the points. These species are: *Baccharis articulata*, *Baccharis spicata*, *Canna glauca*, *Cynodon dactylon*, *Eichhornia crassipes*, *Erythrina crista-galli*, *Hydrocotyle bonariensis*, *Lithraea molloides*, *Maitenus ilicifolia*, *Myrcianthes cisplatensis*, *Myrsine laetevirens*, *Pheralsea bonariensis*, *Syagrus romanzoffiana* and *Vitex megapotamica*.

URUGUAY - Transecta 3



Transect 3

It is 16,7 km long and 7 sampling points and 7 reference points were marked on it. It shows different environments such as marshes, water plains, native mount, and natural prairie. On this transect all points showed two well-differentiated stratum, one that oscillated between 5-70 cm and another that reached 7 m high.

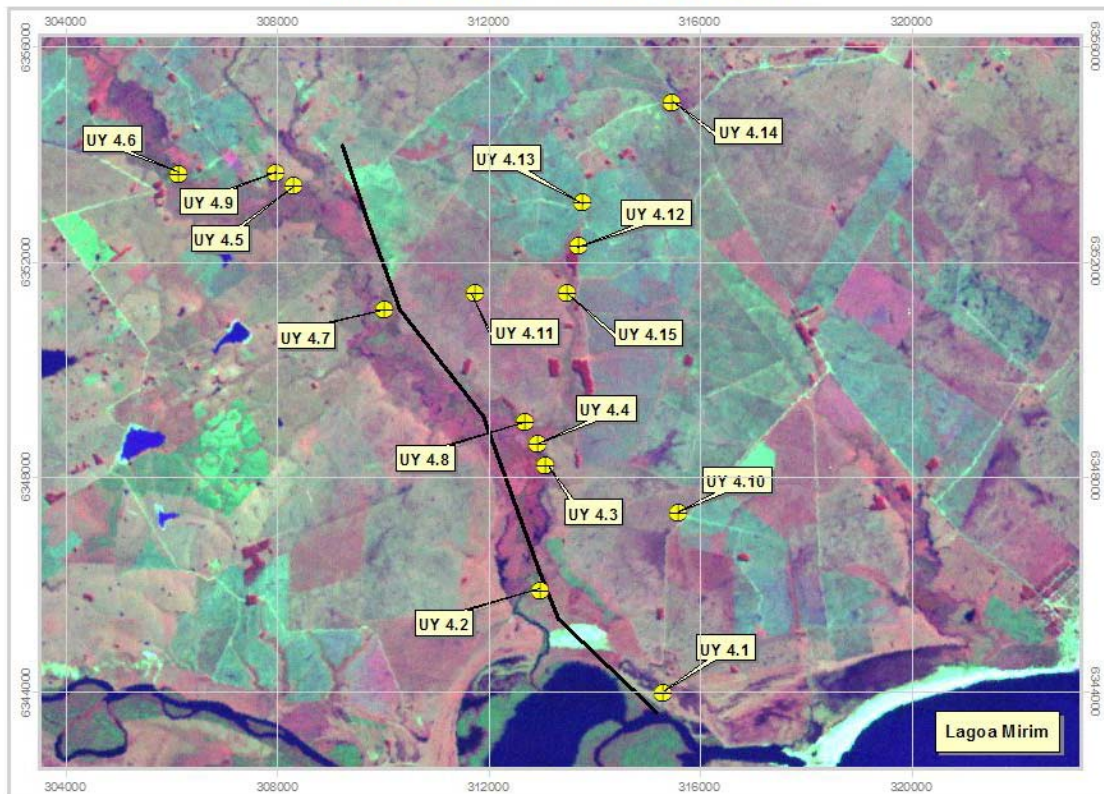
As well as the previous transects, very few species were found in most points; only *Cestrum parkii* appears in four points and *Cynodon dactylon*, *Mikania micrantha*, *Sapium glandulosum*, and *Solanum glaucophyllum* were registered in three points.

The species which were found only once were: *Abutilon grandifolium*, *Aeschynomene rudis*, *Allophylus edulis*, *Arecastrum romanzoffianum*, *Azolla* sp., *Baccharis gnaphalioides*, *Bitneria urtisifolia*, *Blepharocalyx salicifolius*, *Cardiospermum grandiflorum*, *Cardiospermum helicacabum*, *Citharexylum montevidensis*, *Cleome titubans*, *Cuphea campilocentra*, *Cuphea glutinosa*, *Cupania vernalis*, *Daphnopsis racemosa*, *Eryngium* sp., *Eugenia uruguayensis*,

Euphorbia rochaensis, *Euphorbia serpens*, *Fagara hyemalis*, *Guettarda uruguensis*, *Lipia alba*, *Ludwigia* sp., *Myrsine laetevirens*, *Muehlenbeckia sagittifolia*, *Nectandra megapotamica*, *Ocotea ocutifolia*, *Oenothera* sp., *Paspalum dilatatum*, *Paspalum pumilum*, *Pavonia sapium*, *Pharadendron falciformis*, *Pouteria salicifolia*, *Psychotria cartaginensis*, *Sapium montevidensis*, *Schoenoplectus californicus*, *Sebastiania commersoniana*, *Setaria* sp., *Syderoxylon obtusifolium*, *Solanum bonariensis*, *Setaria* sp., *Stenotaphrum secundatum*, *Struthantus uruguayensis* and *Thillandsia aeranthos*.

Of the species found on this transect *Euphorbia rochaensis* was only mentioned for the Department of Rocha.

URUGUAY - Transecta 4



Transect 4

It has an extension of 12.2 km. 8 sampling points and 7 reference points were marked. Throughout its route a big marsh was observed (in 7 of the 8 marked points) and at the end a native mount was observed.

Point 4.2 pointed out as a water plain, corresponds to a part of the marsh which represents 75% of the sampling point, belonging the remaining 25% to a bush plain.

The species registered in a larger number of points along the transect were: *Polygonum punctatum* (present in 6 of the 8 points), *Eichhornia crassipes* and *Eryngium pandanifolium* which were found in 5 points. The rest of the species were found in three or two points and, like on the previous transects, most of the species were present in only one of the assessed points.

The species that were found only once were: *Acacia bonariensis*, *Acianthera riograndensis*, *Allophylus edulis*, *Arecastrum romanzoffianum*, *Asplenium brasiliensis*, *Baccharis microcephala*, *Baccharis spicata*, *Begonia cuculata*, *Biden laevis*, *Bilbergia* sp., *Blechnum* sp., *Cayaponia* sp., *Celtis iguanea*, *Celtis spinosa*, *Commelina difusa*, *Cupania vernalis*, *Cyperus eragrostis*, *Cyperus giganteum*, *Equisetum giganteum*, *Eugenia uruguayensis*, *Eupatorium ivaefolium*, *Euphorbia serpens*, *Galium hypocarpicum*, *Gymnocoronis spiranthoides*, *Heimania salisifolia*, *Heliotropium elongatum*, *Hypericum brasiliense*, *Oxalis pudica*, *Peperomia* sp., *Phyla canescens*, *Phyllanthus sellowianus*, *Pluchea sagittalis*, *Polygonum acuminatum*, *Pontederia cordata*, *Pistia stratiotes*, *Psychotria cartaginensis*, *Pterocaulon balansae*, *Pterocaulon cordobensis*, *Sapium glandulosum*, *Schinus salicifolius*, *Scirpus giganteus*, *Sebastiania brasiliensis*, *Sebastiania commersoniana*, *Solanum glaucophyllum*, *Stenotaphrum secundatum*, y *Vernonia* sp.

The important presence of plants in the marshes provides a great support to a great diversity of animal species; which distribution patterns are ruled by the fluctuation of the water level what causes the continuous changes in the habitats throughout the year.

In the case of birds, the seasonal fluctuations in the different sectors will be due to: a) the time of the year (migratory birds); b) the contribution of rains to the ecosystems; c) the existing flood patterns and d) the fluctuation caused by men (rice fields).

It is because of this factor that that the areas covered by or close to the wetlands expand and contract, producing a border with communities of plants adapted to marshy and dry conditions; establishing a variety of habitats for different bird species.

Due to this fact we were able to register, on the different transects, species of aquatic, pasture (*Sporophila* sp) and closed environments of native mount kind (*Passeriforme*). Likewise, in some sampling points the presence of introduced tree species plantations were found (*Pinus* sp. and *Eucalyptus* sp.) that showed the species were adapted to this kind of environment created by men.

Several bird species were registered feeding, nesting or resting in the observed wetlands. Around 38 species were registered on the Brazilian side and 96 on the Uruguayan side. Prevailing the species used to aquatic environments (43), for its relative abundance. Some of the groups registered, in order of importance were: *Passeriformes* (30), *Anatidae* (8), *Charadrius* (chorlo) and *Calidris* (playeros) (7) and some species of coast birds (4).

On the Uruguayan side sampling points 1.1, 1.4, 2.2, 3.1, 3.3 and 4.B were of particular importance since species such as *Charadrius* (chorlo) and *Calidris* (playeros) of pastures were registered, which use Uruguay as a stopping or winter place during their migration from the reproduction places located on the North hemisphere (USA and Canada).

Many of which are in danger of extinction mostly due to the loss of habitat.

Points 3.4 y 4.3 also showed species of interest, in this case birds of the *Sporophila* type which, as well as *Charadrius* and *Calidris* of pastures, find themselves in a conservation problem due to the decay or disappearance of their propitiate habitats.

On the Brazilian side on points 2.2 and 3.9 some species were found which were interesting from the conservation point of view such as the *Charadrius* and the *Calidris*.

The registered fauna showed a clear evidence of human interaction on the Brazilian side. In the specific case of birds, the safe distance was seriously increased; this made difficult the registration work at first and therefore the methodology was changed into an estimation of distance to the sampling point and to the previous registers of arrival to the point of the rest of the team. This situation was not the same on the Uruguayan side.

Despite the fact that on the Brazilian side a large number of birds was registered of the Ciconiidae and Threskiornithidae and *Coscoroba coscoroba* families, no birds of prey were registered, which integrate important positions in the trophic chains which can be used as quality indicators of the environments under study.

On the Uruguayan side a large number of birds of the same families were registered as well as some other anatidae, of *Tryngites subruficollis* and of *Phaeoprogne tapera* (grouped and feeding in rice fields and natural fields) and an important number of diurnal birds of prey: *Polyborus plancus*, *Milvago chimango*, *Cathartes aura*, several *Heterospizias meridionales*, algunos *Parabuteo unicinctus* and some nocturnal such as *Asio flammeus* and *Bubo virginianus*.

There was an important development of rice fields on the Brazilian side not found on the Uruguayan side.

Among the Uruguayan rice plots some spaces of native mount were found with characteristics of atlantic bush and with fauna and flora typical of these environments.

Amphibians, Reptiles and Mammals

BRAZIL

In Brazil 5 Mammal families, 1 of Reptiles and 1 of Amphibians were detected with 5, 1 and 2.

Mammals

The mammals include species such as the Otter (*Myocastor coypus*) (Myocastoridae) and the Capybara (*Hydrochoerus hydrochoeris*) (Hydrochoeridae) with a high pressure from furtive commercial and subsistence hunting; the Canidae (foxes) and the Procyonidae with the *Procyon cancrivorus* and the (*Felis sp.*) depending on the environmental units of riverain forests and wetland vegetation for its subsistence.

Reptiles and Amphibians

Reptiles of the Chelidae family were present by the *Phrynops hilarii* (tinkerbell turtle) of which mainly large females were detected despite the late date after the breeding's birth. All of the turtle species of the Laguna Merín were: *P. hilarii*, *P. williamsi*, *Hydromedusa tectifera*, *Acantochelys spixii* and *Chrysemys dorbignyi* and have gone through intense capture for pet selling by youngsters.

The Amphibians with 1 family (Leptodactylidae) and 2 species: the *Leptodactylus ocellatus* (local frog) and the (*Pseudopaludicola falcipes*) (in reproduction). The remark about the sampling date is also applicable to the amphibians and reptiles.

URUGUAY

In Uruguay 7 mammal families were detected, 3 of reptiles and 2 of amphibians; with identical numbers in relation to the represented species: 7, 3 and 2.

Mammals

The mammals that were found presented low or no degree of danger such as the Dasypodidae (armadillos), the Myocastoridae such as otters (*Myocastor coypus*) and the Canidae (foxes). The Hydrochoeridae species was represented by the capybara (*Hydrochoerus hydrochoeris*) with a population drastically reduced by furtive hunting pressure, commercial and subsistence hunting.

Others that were introduced such as the Leporidae with the hare (*Lepus europaeus*) or the Boar (*Sus scrofa*) and its mixture with domestic kinds. The Felidae family (*Felis* sp.) appeared with a threat degree that is related to environmental units of riverain forests which depends highly on furtive tree felling for commercialization or expansion of rice fields.

The reptiles were represented by the Chelydidae family by the *Phrynops hilarii* which makes use of the sandy margins for nesting and is potentially endangered for its commercialization as pets (this situation is much more serious in Brazil than in Uruguay).

The Teiidae family was represented by the *Tupinambis merinae* (spotted lizard) and the *Liophis miliaris* (water dinky snake). The variety is wider and a sampling made in late spring and summer would show this.

This happens also with the amphibians due to the time of the year when the sampling was performed and the severe drought that the region was undergoing. Only 2 of the 30 (at the least) species that are thought to be present in the region were encountered: the *Hyla sanborni* (Sanborn frog) and the *Leptodactylus ocellatus* (Local frog).

Human Impact

Three degrees were used as an intensity scale, high, medium and low for the study of anthropic interactions and the evaluation of environmental alterations caused by such interactions. The environments that were classified as with high intensity were the ones that apart from having suffered a shallow cut of the native vegetation have gone through consecutive periods of rice plantation where chemical fertilizers and biocides were used, and cattle raising. The ones classified as with medium intensity were the ones that suffered a shallow cut of the native vegetation and cattle raising but were not used to grow crops. Areas where the cutting was selective and no crop growing or cattle raising took place were classified as with low intensity degree of human impact.

BRAZIL

In Brazil, transect 1 was the one that showed a greater environmental alteration, all of the points with high impact intensity are rice field in rest at the moment being used for cattle pasturage.

On transect 2 no presence of rice fields was detected, the environmental impacts were originated as the result of the substitution of native vegetation with artificial prairies for cattle use, therefore all of the points showed a medium impact intensity.

On transect 3, with exception of point 3.1, all the points presented medium impact intensity due to the substitution of the natural vegetation for artificial prairies and the fact that the area was not used for rice growing. On point 3.1, which is next to the Arroyo Del Rey's mouth (Del Rey Stream), a fragment of vegetation of restinga was observed, the impact intensity was considered low, since the cutting of the native vegetation was selective, with low presence of cattle. It has signs of transit and fires cause by fishermen campings.

On transect 4, points 4.7 and 4.9 showed a medium level of impact intensity due to the presence of artificial prairies and not rice. Point 4.8, showed to have low impact intensity due to the presence of native vegetation with a slight impact from cattle.

URUGUAY

Transect 1 showed medium impact intensity due to the absence of rice crops and to the presence of artificial prairies and small eucalyptus forests.

Likewise, on transect 2, points showed a medium impact level with artificial prairies with exception of point 2.5, which was an abandoned rice field planted with eucalyptus, which was considered to have a high impact degree.

Transect 3, as the previous ones, with the exception of points 3.5 and 3.6, suffered a shallow cutting of the vegetation, therefore having a medium impact level. Point 3.5, is an abandoned rice field and has a high impact level. Point 3.6, of a low intensity degree, showed a selective cutting of vegetation and the presence of garbage.

Transect 4 was the one which showed the greatest degree of anthropic alteration in Uruguay. High impact points 4.1, 4.5, 4.6, and 4.7, showed not only the rice plantation (4.1 and 4.7) but also trails of hunting acts (4.5 and 4.6) and a great proximity with the old city's (Río Branco city) garbage dump which is close to point 4.5. The rest of the points showed a medium impact level with a shallow cutting of vegetation and in one of them (4.8) a eucalyptus plantation and urbanization was observed.

Main consequences of these Human Impacts on the Environment

When substituting native vegetation, the breaking up of the native ecosystems and the decrease of local biodiversity occurs, a process that is intensified by illegal hunting.

When rice cultivation makes use of chemical fertilizers and biocides, it provokes the salinization of the soil, the contamination and eutrofization of the water flows, apart of favouring its sedimentation what is worsened by the construction of irrigation channels.

The cultivation of artificial prairies derives in, the compaction and reduction of soil porosity and the intensification of the erosion and sedimentation processes. As well as rice cultivation, this practice also contributes to the loss of biodiversity through the homogenization of the landscape, after the substitution of the original vegetation. This fact, consequently, decreases the percolation of rainwater, reducing the water table depth and causing the alteration of the water flow levels.

The presence of liquid (fuel) and solid (garbage) waste deposited on inadequate regions near to floodable regions causes the contamination of the soil and of the hydric resources intensifying the eutrofization, loss of biodiversity, erosion and sedimentation processes.

The construction of embankments and irrigation channels alter the hydrologic regime with direct consequences on the flora and fauna.

Finally, these production practices drastically reduce the multiple uses of the region resources, with negative impacts on the fishing, recreation and tourism.

Physical Description

The geologic and geomorphologic characteristics as well as the types of soils of the visited regions are concisely described since there were no specific studies for this aim.

The whole zone is situated in the southeast border of the south American crystalline shield, the specific zone of study is represented by plain zones with low altitudes that form the lacustrine and marshy zones around the Laguna Merín, with top elevations close to 11 metres of altitude in relation to sea level, with values that oscillate around 7 metres.

The soils are, in general, poorly drained and of a medium natural fertility and very clayish, the elevated plains are intensively used for the cultivation of rice and the areas that most time of the year are submerged are many times used for pasturing.

The hydrologic system of an environment shows very clearly the geomorphologic behaviour, in this case the hydrologic system in which the areas of study are located present the characteristics of a flat relief and a slope medium-low of 1%, what permits the flooding of diverse areas and consequently the formation of marshes mainly in the Brazilian territory.

The geologic and geomorphologic characteristics for the Uruguayan area of study are very similar, the rivers that come from regions more elevated than the Uruguayan territory, as they approach the Lagoon they found a quite flat relief and as a consequence present meandric characteristics and this fact generates the formation of marshes on its margins, feature that is presented gradually in relation to the proximity to the river's outlet.

Despite the marshes present varied formation characteristics, they have many similarities since they are both regulated by the hydric dynamics of the Laguna Merín's hydrologic system.

Reflections of the team

A recognition of the main vegetal formations was made during the sampling. Due to this, the form designed will be fully completed on further studies as the rapid estimation of the species will be possible.

It is important to highlight that it is convenient to separate the flora and fauna samplings, in order to avoid interference on the field work, for example the study of fauna requires a careful approach to the sampling point that takes away time from the flora sampling.

Possible solutions may be: a) to separate the fauna and vegetation sampling (for example study the fauna on transect 1 and vegetation on transect 2) or b) to separate in time the two samplings, that is to say, that the people in charge of fauna studies the sampling in one point of the transect and moves on to the next while the people in charge of vegetation studies that point.

Another suggestion for following samples is the acquisition of a digital camera that allows the registration of all sampling points which might later make easier the interpretation of the information.

On the next vegetal samplings, with all the gathered information we will proceed to carry out a classification an organization analysis to summarize the main spatial patterns and establish similarity relations between sampling points.

We would also like to point out the outstanding integration of the working team, which was formed by people who had never met before or that knew each other but never worked together.

Finally, the members of this team agree on the idea that the day off should not be the same used for travelling from one country to another but a different one. Of course this does not imply a greater cost for the project.

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