DEER SPECIALIST GROUP
NEWS

NEWSLETTER NO. 16 August, 2001

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Some minor changes were made in a few articles. This was done strictly for grammar and comprehension. Please accept our apologies if any errors were made during this process. Also, most of the articles were provided with a bibliography, but for space reasons, they were removed. You may contact the author or Mariana Cosse if you need to see references.

NEOTROPIC

Line-transect sampling method used to evaluate the impact of a flooding dam on marsh deer (*Blastocerus dichotomus*) population in the Paraná River, Brazil.

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The environmental destruction, hunting and diseases have threatened the marsh deer (*Blastocerus dichotomus*). The construction of hydroelectric dams with large water reservoir is the most important factor of the habitat reduction. Despite the drastic environmental destruction, few are known about the impacts caused by such artificial deluge. The Porto Primavera dam (22°25'77"S and 52°58'84"W) is located between São Paulo State and Mato Grosso do Sul State. It was estimated that in the first phase of the flooding process 150000ha would be inundated. Aerial surveys using fixed-wing aircraft associates with the line transect distance-sampling methodology have been used extensively to estimate distribution and abundance of terrestrial ungulates (Guenzel 1986, 1994; Firchow *et al*. 1990; Johnson *et al*. 1991). This methodology provides more accurate estimates which are corrected for animals that should have been detected using data obtained during each survey; provides a confidence intervals and other measures to evaluate the reliability of estimates, and is generally cheaper to conduct than traditional trends (complete) counts in both time and money (Guenzel, 1994). Line transect technique is useful to study marsh deer because they tend to occupy open flat marsh areas and are widely distributed throughout the habitat. In order to study the impact of the flooding we have estimated the distribution and abundance of this species in the Paraná River basin, between the Porto Primavra's and Jupiá's hydroelectric dams, before (September

1998) and after (November 1999) the flooding. All marsh deer sights were recorded following line-transect methodology (Burnham et al., 1980, Buckland et al., 1993), assuming that the visibility decreases as a function of distance. Abundance was estimated according to standard line-transect (Burnham et al. 1980, Buckland et al. 1993). Data analysis was undertaken with the software DISTANCE (Laake *et al.*, 1993). The model that best fitted the data was selected according to the Akaike Information Criterion (AIC) (Akaike, 1985) as implemented by Laake *et al.* (1993). The estimate abundance were obtained by multiplying the density of marsh deers (*D*) by the survey area.

The estimate density result before the flooding was 0.51E-2 ind/ha resulting in the total number of 1038 animals. After the flooding the density increased up to 0.83E-2 ind/ha with the total calculated of 334 individuals. The increase of the density after the flooding shows that part of the population escaped to remaining marsh areas. And the total numbers could indicate the theoretic survival remaining population one-year after the flooding. The impact caused by the dam over the marsh deer population was catastrophic. The line transect distance sampling methodology was used for the first time to study distribution and abundance of marsh deer. Through this study we were able to demonstrate how useful is this techniques to evaluate distribution and abundance of marsh deer. Line-transect sampling method can be applied as an effective tool to understand the dynamic of populations.

This project was financially supported by CESP (Companhia Energética de São Paulo). The logistic support of FUNEP (Fundação de Estudos e Pesquisa em Agronomia, Veterinária e Zootecnia) and UNESP (Universidade Estadual Paulista - Jaboticabal).

Survey of *Ozotoceros bezoarticus* at Paraná State, Brazil

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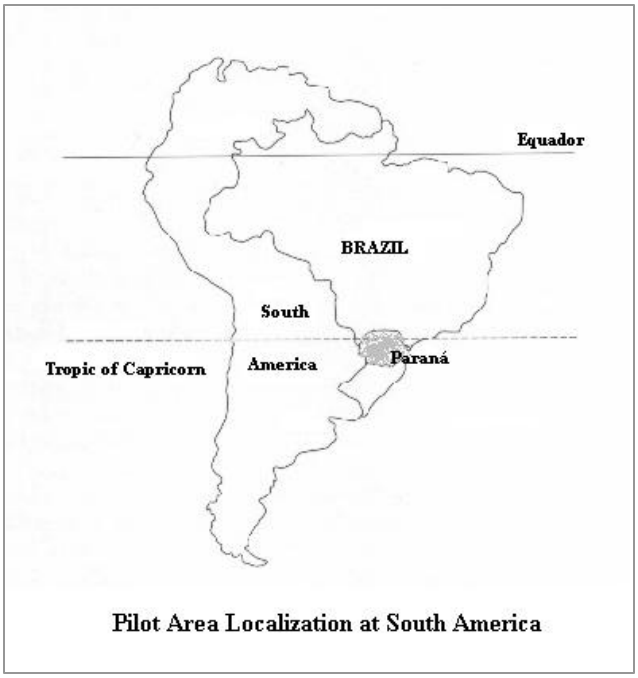
Pampas deer, *Ozotoceros bezoarticus* (Linnaeus, 1758) is the most endangered species of South American deer. A long time ago their populations were formed by a great number of individuals that cover of beauty open areas of grasslands and "cerrados" at part of Brazil, Paraguay, Argentina, Uruguay and Bolivia, from 5° to 41° S. Habitats' destruction to agriculture introdu–cing created a vegetation mosaic, decreasing space and isolating populations in natural islands behind areas of complete alteration. This "mosaic effect" had a great influence on savage species, and with pampas deer was not different. Habitat conversion for agriculture, poaching and possibly bovine disease are the main causes of their decline, and the main presents threats.

Paraná is a brasilian south state (Map 1) and grasslands were its primitive floristic form. This vegetation cover originally 30.532Km^2, that represents 15% Paraná's area (Map 2), of which just a little still remain conserved. Pampas deer lived at all these grasslands areas. An archaeological site found at Ponta Grossa region (2.000 years) shows a pampas deer ancient image (A. Pontes-Filho, com. pers.); this is the older species register for Paraná. Since 50's there were no prouves about their actual occurrence at Paraná but a relictual population have been found at Lapa in 1996.

This proposal was born on december 98, during a training course offered by Deer Specialist Group/SSC/IUCN. Since March 1999 we have been developing this survey of *Ozotoceros bezoarticus* at Paraná State, with a grant of The Small Grant

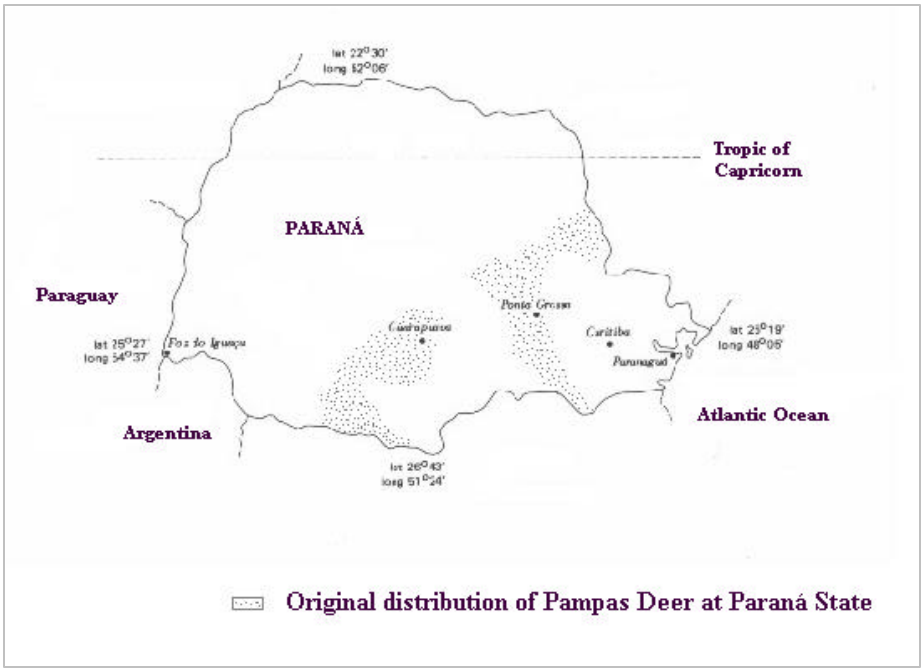


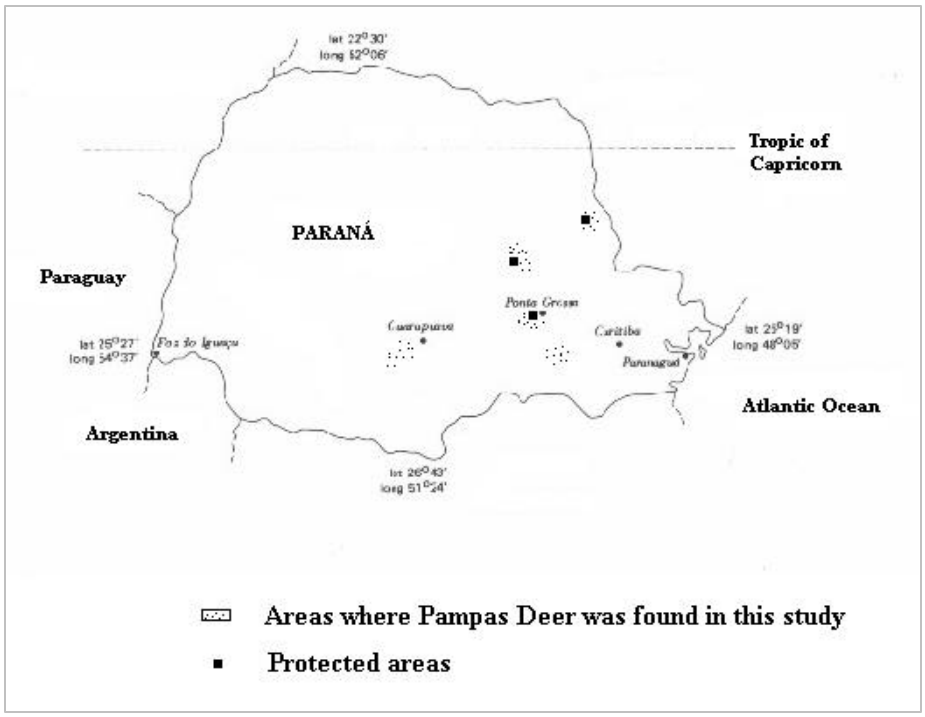
Pilot Area Localization at South America

Program of Deer Specialist Group (DSG)/SSC/IUCN. A questionaire survey was performed and sent to veterinarians and agronomic engineers of EMATER (Parana's employ of technique assistance and rural extension) because they work in a great number of rural properties distributed in all regions of the State and could contribute with a relative certain our doubts.

So, we decided to send these questions to veterinarians and agronomic engineers of EMATER (Parana's employ of technique assistance and rural extension

We have sent 457 questionnaires of whose we've received 181 (39,4%) representing all biomes of the State. The answers were divided in two groups based on their information: 1) affirmative answers (or doubts) about pampas deer presence in some locality, and 2) negative answers about pampas deer presence in some locality. Based on this classification we received respectively 84 and 97 answers. The first group information's we plotted in a map 24 districts where there was the possibility of the species occurs. These professionals indicate pampas deer occurrence at different biomes, like grasslands, "cerrados" and forested ones, indicating that some of them have no conditions do identify the species, confounding to others. Excluding areas where we knew that pampas deer occurrence were improbable, basing on the answers we define the pampas deer occurrence to 11 districts: Guarapuava, Candói, Ventania, Piraí do Sul, Jaguariaíva, Contenda, Sengés, Ribeirão Claro, Piên, Balsa Nova and Lapa.





In the same time that the answers arrived, we went to the areas to confirm the information. We visited all these areas and confirmed the species presence (Map 3) at six of them: Candói, Piraí do Sul, Jaguariaíva, Sengés, Balsa Nova and Lapa. Species are at particular areas where agriculture and cattle breeding are the main activity.

To complement this information, we search on Management Plans of all State

Conservation Units[1] verifying their fauna lists. More two districts were increased in our list: Ponta Grossa and Tibagi, showing species possible occurence, but not confirmed. We went some times to these areas and verify pampas deer there. At protected areas, we confirmed an occasional presence at Cerrado State Park (Jaguariaíva), Guartela State Park (Tibagi), and Vila Velha State Park (Ponta Grossa) but none residual group were found there.

Acknowledgments- To DSG by the grant, Environmental Institution of Paraná by the logistic support. To Dr. Chris Wemmer, Dr. William McSchea, Dra. Susana Gonzalez, Dr. Mauricio Barbanti, M. Sc. Mauro de Moura Britto, M. Sc. Ubiratan Piovezan, M. Sc. Artur Andriolo, Biól. Tatiane Uchôa and Ademar Cabeças Filho by the incentive in all phases of this work. To all veterinarians and agronomic engineers of EMATER by their fundamental information, and all landowners to permit my work at their areas.

Conservation status of the Pampas Deer in the Semiarid Pampa of Argentina.

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The pampas deer was originally distributed in the open grasslands of central and South America. In the Argentine Pampas, two small populations of the endemic *O.bezoarticus celer* subspecies persist in the east and west extremes of its original distribution. One of the populations is in Samborombón Bay, province of Buenos Aires, and the other one is in the semi-arid grassland of San Luis province.

We employed terrestrial and aerial census and personal interviews with farmers to study the distribution and abundance of San Luis population. In accordance with our results the pampas deer were distributed over near 500.000 ha but the population was concentrated on 145.000 ha. This distribution is coincident with areas where the vegetation this constituted predominantly by natural grassland, which possesses the best conservation state inside the existent natural grassland in San Luis.

Population density in San Luis province ranges between 0.43 and 0.83 deer/Km^2 (500 to 1200 animals). Even taking into account the eastern population (near 200 animals) we can observe that the total number of pampas deer is actually scanty and very near to extinction.

At present, pampas deer hunting is forbidden (banned) all over the country (although we cannot deny furtive hunting exists). Two provincial natural reserves (still poorly implemented) and a small private ONG reserve have been created in Samborombon Bay. In San Luis an agreement to keep a protected area was signed in 1997 between national and provincial authorities. However, since the then more than 45,000 ha of natural grasslands have been lost to the habitat of the San Luis deer population. On the other hand, plans have been elaborated to intensify cattle production and create car routes in the area without considering the protective designation. It is necessary to develop policies to regulate the type of use of the land according to the agricultural aptitudes and the conservation priorities.

[1] State Conservation Units- denomination of the protected areas administrated by Parana government. There are 56 units, divided in 9 different management categories.

Predators of brown brocket deer (*Mazama gouazoubira*) in a secondary rainforest of Premontane Forest in the Norwest of Argentina

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Deer of the *Mazama* genus are one of the most common representatives of the Neotropical ungulate fauna. They are an important part of the diet of large carnivores such as the jaguar (*Panthera onca*), and the puma (*Puma concolor*), in areas they share (Young, 1946; Emmons, 1987; Aranda, 1993). The red brocket deer (*M. americana*), and probably the brown brocket deer (*M. gouazoubira*) are occasionally part of the diet of minor predators such as the ocelot (*Leopardus pardalis*) (Ludlow and Sunquist, 1987; Konecny, 1989) and probably of the jaguarundi (*Herpailurus yaguarondi*) (Richard et al.,

1995b). The breed could be caught by the eira (*Eira barbara*), by the king vulture (*Sarcoramphus papa*), by the yacare (*Caiman latirrostris*) and by foxes (*Pseudalopex* sp and *Cerdocyon thous*) (Richard et al., 1995b). Most of these statements, referred to small predators, come from speculations or other people´s remarks, more than from careful registers. The only predation register is that of *M. americana* by the ocelot (Ludlow and Sunquist, 1987; Konecny, 1989) in the few studies performed about the diet of small neotropical carnivores.

The present study describes four cases of brown brocket deer predation by small and medium size carnivores in the Reserva Experimental Horco Molle (REHM). This protected area depends on the Faculty of Natural Sciences and Miguel Lillo Institute of the National University of Tucumán; it is located in the oriental foot of the hills of San Javier (between 26º 38' and 26º 57' South latitude and 65º 26' and 65º 20' West longitude) in the province of Tucumán (Argentina). The vegetation belongs to the Premontane Forest (Richard 2000).

Several specimens of brown brocket deer were predated in the REHM fields, within an area of about 70 ha, between September 1997 and February 2000. The observations were performed into an out of an enclosure of 24 ha, devoted to the management of brocket deer, tapir (*Tapirus terrestris*) and peccaries (*Tayassu tajacu*). The predators were identified through a comparative analysis of the characteristic marks left by the predators (Roy and Dorrance, 1976; Hawthorne, 1987) on brocket deer body and through the collection and comparison of foot prints in the places where the preys were found with the collection of reference foot prints of REHM.

A three month old breed was killed by a fox (*P. gimnocercus*); it was observed from a couple of meters far of it, a few minutes after its death. The prey was torn in its legs and eviscerated, both wounds characteristic of cnid attacks (Roy and Dorrance, 1976; Hawthorne, 1987). The breed´s body was still warm when it was found (4 p.m., March 3, 1998). Another time (11 a.m., July 7 1999) we observed the body of adult brocket deer were eaten by foxes, though it died of other causes. A adult female was killed by a feline (probably an ocelot), showing marks of claws on the side and face and bleeding under the skin of the throat cause by a bite. The body lacked of the muscles of legs and the abdominal cavity was open. The dead probably took place during the nigth because it was last seen alive before at 7 p.m. (September 2, 1997); the body was found at 7 a.m. Both attacks took place into the management enclosure. A third brocket deer specimen, an adult male with velvet antlers was hurt by wild dogs. The attack caused ligament fracture in front foots; parts of the ears and antlers were snatched away and there were light wound on the rest of the body. This specimen was rescued from the dogs by fauna keepers at about 2 p.m. (January 16, 1999); it died few days after. A second young male of about 7 months old was attacked by dogs and rescued by villagers near REHM (February 25, 2000); it had tearing wounds on its legs. In both cases dogs attacked out of the management enclosure.

It is rather difficult to observe brocket deer breeds, because they remain hidden into the vegetation during their first months of life and perform scarce activity (Richard et al., 1995b). Predators such as foxes, with good sense of smell, have good chances to find this kind of prey and they are probably their main threat.

The death of an adult brocket deer (female) by an ocelot is not frecuent, because this feline does not hunt frequently preys above 1 kg (Emmons, 1987; Konecny, 1989). The presence of jaguarundis in REHM (Richard, 2000), prevents to find out the predators nature. Nevertheless, the small size of jaguarundi, the lack of antecedents of their predation on brocket deer, and their diet- apparently based on birds and micromammals (Konecny, 1989)- let us suppose, almost certainly, that the death of the brocket deer was caused by an ocelot (eventually the only feline observed into the management enclosure of REHM).

The impact of dogs on brocket deer populations was not yet evaluated. Its incidence seems to be important in periurban areas, in the Norwest of Argentina (Richard and Juliá, 1998), were they would be the main predators of brocket deers.

Announcements

In situ conservation of Neotropical Deer Workshop, Cartagena, Colombia (10 - 14 september)

The Deer Specialist Group SSC/IUCN, shall to contribute to the biodiversity conservation through the improvement of the welfare of viable deer populations in the world. The DSG will also conduct and participate in scientifically based conservation programs that benefit deer species at in situ and ex situ levels. Assess all deer taxa with the IUCN Red list categories, for identify and understand the real threats and human impacts on local populations of deer and their habitats.

The workshop will be at Cartagena de Indias - Colombia, in the **V International Conference on Wildlife Management in Amazonía and Latin America**. The workshop will take 1 to 2 days during the Conference 10- 14 September

Wildlife Trust is supporting

All the congress information in: http://www.vcongresofauna.org

III Deer Workshop in Uruguay at the Sociedad Zoológica del Uruguay Congress (17-21 de septiembre, 2001 Facultad de Ciencias)

All the congress informationat: http//www.lapiedra.com/szu/

CONSERVATION OF MARSH DEER IN PARANA DELTA, ARGENTINA

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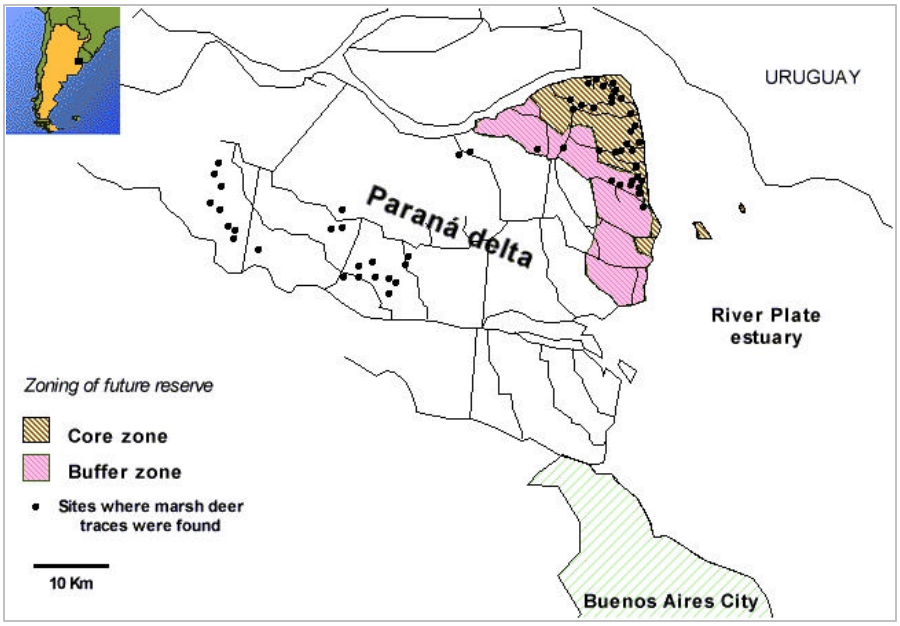
The marsh deer (Blastocerus dichotomus) is included as 'Vulnerable' in the Red Data Book of IUCN and in Argentina it is considered 'Endangered'. The marsh deer once inhabited wetland areas in northeast of Argentina, along the Paraguay and the Paraná Rivers and their tributaries. Nowadays, has a very scarce distribution in some areas of Formosa, Chaco, Corrientes, Entre Ríos and Buenos Aires, being the most important population in the Iberá marshes (Corrientes) and the Paraná River delta (Buenos Aires and Entre Ríos). The Paraná delta population is also its most southern distribution limit.

Scarce studies exist about the marsh deer in Argentina (Schaller & Tarak 1976, Beccaceci 1994, Beccaceci 1996) and even fewer less in the area of the Paraná delta. The pioneer reports of Schaller & Tarak (1976) recommended the need of establishing protected areas for the marsh deer in the Paraná delta. There is no natural reserve preserving the marsh deer in the Paraná delta, in Buenos Aires Province. The Otamendi Natural Reserve (2600 has.), is

located nearby but it does not house a stable population. There is neither information about the area of distribution nor numbers that enable us to design a proper strategy for the preservation of the species.

The Paraná delta is a group of flooded areas next to the River Plate, it presents an intricate web of rivers, and streams and marshes, which delimit islands in a washbasin shape. Because of it's ecological and biogeographical characteristics it is considered a unique area in Argentina, with a high biodiversity at regional scale. The central portion of these islands (80 % of its total surface) is located on a flooded depression covered by singular communities of marsh vegetation and constitute the main habitat for the marsh deer. The "embalsados" (floating marshes) are real floating islands of vegetation and accumulated sediments on which mixed communities of flooded grassland and even some woody species grow, and it takes place on the extensive and unmodified isles next to the River Plate estuary. These lands constitute the refuge for the marsh deer during floods produced by strong winds coming from the Southeast ("sudestada"), as the embalsados float with their wildlife during the tides. The drainage of the inner marshes, due to canalization work have made disappear most of the "embalsados", which formerly constituted the natural scenery of the area. The disappearance of the floating marshes is closely related to the decrease of the marsh deer in the region and should be considered as a priority in future conservation strategies.



In 1999, the Marsh Deer Project of ACEN (a Argentinean NGO) commenced a population survey of the species in 160,000 hectares of the Low Paraná delta, in Buenos Aires province, in order to get the necessary scientific information to produce conservation recommendations to facilitate the creation of new protected areas.

Due to cryptic characteristics of marsh deer in Paraná delta habitats, indexes of relative abundance based in indirect traces, as tracks or dung, was used for each grid of the study area; allowing comparisons to determine the best areas for conservation. The results of our work was the first ones of quantitative character about marsh deer in this region and was integrated in a GIS-based map with vegetation communities and others wildlife species distribution maps.

Additional data was obtained from informal interviews with local residents (islander, forestall producers and local hunters) about the principal conservation problems. This community-based research has been also used as a way to make relations with local people, permitting a deeper and a richer dialogue. We consider this aspect of our project of great importance, as it will allow us to make recommendations about the management of the local wildlife taking into account the perception of the islander about the situation of marsh deer and socioeconomic aspects of local community.

The difficult economic situation that faces great part of the islanders of the Paraná delta, force them to practise subsistence hunting of numerous wildlife species. The poaching of marsh deer together with the habitat loss, are the major threat for deer population in the Paraná delta (D'Alessio et al. 1997); these effects are very often powered by floods episodes (Varela et al. 1998).

The results would show the existence of three core populations. The most important population of marsh deer was located in a narrow patch of land next to the River Plate estuary, the last remnant of the Low Paraná delta in

relatively natural condition. The other two populations was located in private forestall areas. Even though deer habitat in this area is highly modified due to drainage of marshes for plantation of Salicaceae (willow and poplar) and cattle rearing activity, populations seem to find shelter inside big plantations when hunting pressure is low.

In June 2000, the Paraná delta and marsh deer conservation became a reality when the MAB-Unesco Argentinean Committee gave their approval for the area to become a Biosphere Reserve. The results of Marsh Deer Project of ACEN were used to zoning the core area and the buffer zone of the future reserve. Now the proposal has gone to France, where it will be evaluated by MAB-Unesco International Committee.

Acknowledgments: We would like to thank the IUCN/Deer Specialist Group and the BP Conservation Programme (Birdlife International, Fauna & Flora International and British Petroleum) for the financial support of the project.

Management of brown brocket deer (Mazama gouazoubira) under conditions of strict control in Reserva Experimental Horco Molle (Tucumán, Argentina)

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CIUNT Project 26/G130.

This study summarizes twelve years of experience in the management of the brown brocket deer (*M. gouazoubira*) in the Reserva Experimental Horco Molle (REHM), a protected natural area under universitary administration (Faculty of Natural Sciences, National University of Tucumán). REHM is located in the west side of San Javier hills (between 26º 38' and 26º 57' South latitude and 65º 26' and 65º 20' West longitude), Yerba Buena department, province of Tucumán (Argentina) (Richard 2000).

Up to date there is no antecedent of the handling of the brown brocket deer under conditions of strict control. On the other hand there exists isolated references about the handling of the red brocket deer (*M. americana*) in captivity (Macnamara and Elddridge,1987) and of generic type (Fädrich, 1987; Foose, 1987; Gasparini et al. 1997). Its breeding and handling under conditions of strict control is a priority in reference to productive alternatives and policy of conservation of the species in the Northwest of Argentina (Richard and Juliá, 1998; Dellafiori et al., 1999 Juliá and Richard, 1999). The manage of the specie is performed in an enclosure of 24 hectares, with different secondary environments of Premontane Forest, a pool and a low hill with a Cebil forest (*Anademanthera colubrina*). In this enclosure a combined manage of lowland tapir (*Tapirus terrestris*) and peccaries (*Tayasu tajacu*) is performed (Richard 2000), with a view to a sustained usage. The number of brocket deer in that enclosure was stabilized between10 to 16 specimens; 3 to 4 of them are adult males, resulting from the intraspecific competence between them; the surplus is periodically relocated in other institutions. The natural feeding in wild conditions and within the enclosure is especially based on fruits and shrubs according to availability (Richard et al., 1995a). At present, their diet consists of 74 vegetal species (54,6% of the fanerogamic biodiversity of the enclosure) and of two mushrooms (Richard et al., 1995a; Richard and Juliá, *in press*). Due to their preference for fruits, shoots and tender leaves (Richard et al., 1995a), the increase of fruit species of high productivity within the enclosure (like *Morus* sp., *Psidium guajaba*, *Prunus persica* and *Psychotria cartagenensis*) and the presence of low secondary woods, contribute to the increase of charge capacity. Births take place all year round and especially during hot and rainy months (fig. 1). The chasing of animals is difficult

(relative freedom in an enclosure of 24 hectares); therefore, only registers of observation of just born specimens or about one month old are included (data corrected between the first observation of a young specimen and its estimated real date of birth are shown in fig. 1). It is estimated that the number of births which could have taken place would have doubled those registered in records, on the basis of the observation of juvenile specimens with no certain date of birth. In three opportunities, abortions were observed, two of them related to stress situation in specimens kept in isolation. Predation was observed twice by ocelots and foxes which intruded into the enclosure subreptitiously. The care strategy of the breed is included in the "hider type" of Lent (1974), the fawn are kept hidden most of the time during their first month; this circumstance difficulted their observation and chase. The strategy of care of the youngs, in which the female uses to go far from the den every time a stranger comes close, and including the habit of beating the floor with their front legs to call attention, permitted finding them sometimes. In order to safeguard the survival of the youngs, pregnant females are isolated in a lateral enclosure of 3 hectares, monitoring their development, whenever it is possible. The survival rate of youngs is comparatively low up to their first year of life; afterwords, the mortality diminishes considerably. Considering all monitored specimens, 26.7 % died during their first year of life. Accidents are the main cause of youngs death (falls, ruptures, usually because of sudden escapes), sicknesses, unknown causes and predators (foxes).

The territorial character of these animals limits the number of specimens within the enclosure; male territorial fights are frequent (and more dangerous for the animals), and also between not related females. The presence of other individuals has sanitary importance due to their habit of eating ticks mutually (allogroming), as part of a behaviour of pacifying their intraspecific aggressivity (Juliá and Richard, 1996). This behaviour is also observed in relation to other animals sharing the management enclosure, as the tapir (Juliá and Richard, 1996), though in this case it is observed only from the brocket deer to the tapir, with no reciprocity. The males are very aggressive during the heat period (occurring any time during the year); they could even attack the staff in charge of their management and seldom other animals (a male tapir was hurt this year).

In order to keep high reproductive rates, it is necessary to take new specimens out of the enclosure during the first year of life, especially males (in our case, three males is the ideal number). As far as they are relatives, males are tolerant with females and the latter between them (mothers with youngs of previous years) (Richard et al., 1995b). It is possible to keep high reproductive rates with animals under control in the lateral enclosure of 3 hectares in the above mentioned conditions (between 1.6 and 1.7 youngs per female and per year) and densities of brocket deers (0.4 to 0.7 specimens per ha.) higher than that in nature.

Births of Brown Brocket Deer in the REHM (1988-2000)

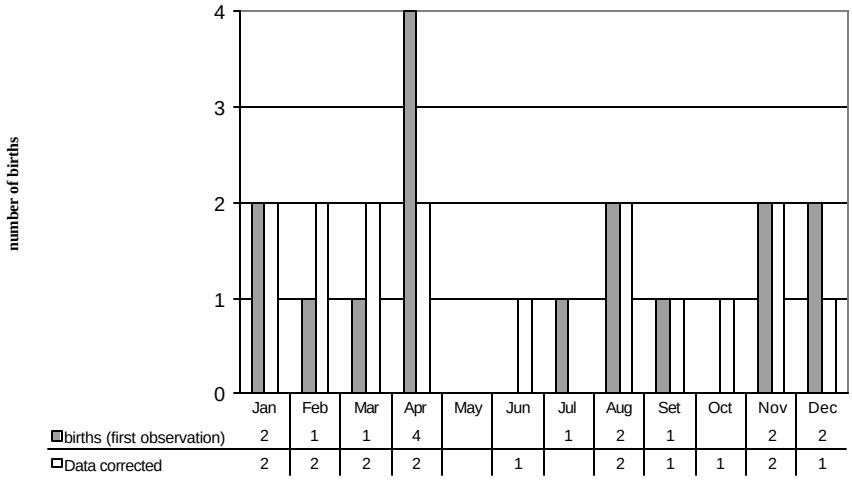

Figure 1. *Births of Brown Brocket Deer in the Reserva Experimental Horco Molle, between 1988 and 2000. Only registers of observation of just born specimens or about one month old are included (data corrected is between the first observation of a young specimen and its estimated real date of birth).*