



Environmental perception and use of fauna from a Private Natural Heritage Reserve (RPPN) in Brazilian semiarid

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ABSTRACT. This paper analyzes the Environmental Perception about the potential use of wildlife resources by the population surrounding the RPPN Stoessel de Britto. Through open and closed questions, we interviewed 90 residents at Laginhas community (87% of domiciles), which performed 367 citations for 79 species, belonging to 78 genera and 55 families. The interviewees showed the utility of 41 species, for various purposes, the feeding purpose was the most mentioned. The most cited animal (27) was *Tolypeutes tricinctus* (Linnaeus, 1758), the three-banded armadillo. The knowledge of this community is rich and could be considered and used to define conservation strategies and as subsidies to elaborate the Plan of Management of Conservation Units.

Keywords: traditional knowledge, Ethnozoology, RPPN Stoessel de Britto, Seridó, Rio Grande do Norte State.

Percepção ambiental e usos da fauna de uma Reserva Particular do Patrimônio Natural (RPPN) no semiárido brasileiro

RESUMO. Este trabalho analisa a Percepção Ambiental e o uso potencial de recursos faunísticos pela população do entorno da RPPN Stoessel de Britto. Através de questões abertas e fechadas, foram entrevistados 90 moradores da comunidade de Laginhas (87% dos domicílios), que efetuaram 367 citações, para 79 espécies, inseridas em 78 gêneros e 55 famílias. Os entrevistados mostraram conhecer a utilidade de 41 espécies, para diversos fins, sendo o uso alimentício o mais citado. O animal mais citado (27) foi *Tolypeutes tricinctus* (Linnaeus, 1758), o tatu-bola. O conhecimento dessa comunidade mostrou-se rico e poderia ser considerado e utilizado para definições de estratégias de conservação e como subsídios para a elaboração do Plano de Manejo da UC.

Palavras-chaves: conhecimento tradicional, Etnozoologia, RPPN Stoessel de Britto, Seridó, Estado do Rio Grande do Norte.

Introduction

The growing environmental problems have required concrete measurements towards the nature protection; in this context we highlight the creation of the National System of Conservation Units (SNUC). The Conservation Units (UC's), created from this system, are one of the strategies of nature protection that aims to conserve and preserve natural resources. However, Diegues (2001) states that the mere lack of UC's does not mean the absence of biodiversity conservation, as the implementation of new conservation areas, alone, has not produced expected results. This author also mentions that, besides this alternative, should consider the relationship man - nature, as well as the analysis of socio-cultural knowledge characteristic of traditional societies, which may point more appropriate ways to occupy the space based on the sustained management of the environment. Hence the relevance of the studies about environmental

perception of communities that keep direct contact with the environment and depend on it (MAROTI et al., 2000, SANTOS et al., 2000, WHYTE, 1978).

The concept of Environmental Perception (PA) employed in this study, encompasses the awareness and understanding of the environment by the man, in a broadest sense, involving much more than a single sensory perception, such as vision or hearing, as indicated by Whyte (1978).

Coupled to this concept of PA, will be used tools from ethnozoology research to better understand the relationship between man and animals and his knowledge about the fauna. Studies about the use of animals by rural communities are essential to adequately manage these resources, preventing their exhaustion.

The communities living surrounding the UC's, which had already lived before their creation, have their customs and practices of uses related to native species. As Tuan (1980) says, the life of these farmers is linked to the great cycles of nature; is rooted in the

birth, growth and death of living things. Still according to Arruda (2000), the knowledge from these communities may point more suitable ways to occupy the based on the sustained management of the environment.

Therefore, the present study analyzed the Environmental Perception and the faunistic use from the community surrounding a Private Natural Heritage Reserve (RPPN), in order to recover the popular knowledge of this community about the fauna and its uses, aiming to define conservation strategies and subsidies the elaboration of the Management Plan for this RPPN.

Material and methods

Study area

The Private Natural Heritage Reserve (RPPN) Stoessel de Britto, created by the Federal Ordinance 0052/94-N, in May 05, 1994, is located at 6° 13'4" S and 37° 2' 25" W and has an area of 756 ha, in the municipality of Jucurutu (Rio Grande do Norte State), Mesorregião Central Potiguar.

In the vicinity of this RPPN, about 3 km, we found a rural community of Laginhas (06°14' S and 37°03' W), municipality of Caicó (Rio Grande do Norte State) (Figure 1). This community has 434 inhabitants (214 men and 220 women), with the economy based on subsistence farming and livestock and goat creation (IBGE, 2008).

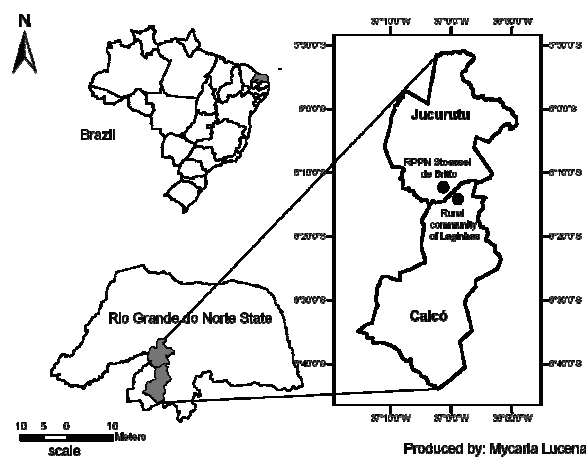


Figure 1. Location of the municipalities of Caicó and Jucurutu, in Rio Grande do Norte State, Brazil, where are inserted the rural community of Laginhas and the RPPN Stoessel de Britto, respectively.

This field is inserted in the Caatinga domain, covered by a dry tropical vegetation of the type tree-shrub hiperxerófila Caatinga, with a well defined herbaceous extract during the rainy period (VARELA-FREIRE, 2002). In the Reserve area,

there is the Serra do Estreito, with 637 meters high, creating a unique environment that contemplates rich mountain biodiversity.

Methodological procedures

Preliminary exploratory study of the Laginhas community was accomplished through field visits, for a subsequent development of forms to be applied to the residents of the community (one person from each domicile) aged over 18 years, and with time housing over 10 years (CUNHA et al., 2007)

Afterwards, based on the tools from the Environmental Perception applied by Whyte (1977), and used in researches with communities around Conservation Units by Maroti et al. (2000) and Santos et al. (2000), were used forms with open and closed questions.

Between the months of January and February 2009, we applied the forms with 90 persons in the Laginhas community, which corresponds to 87% of occupied domiciles (n = 104). The forms about the perception of the fauna existing within the RPPN were composed by the following questions: do you know the animals present at the RPPN? If so, what? Have you already caught any of these animals? If so, what? For what these animals serve? Food? Trade? For creating at home? Medicine? Others? What do you think about the hunting of animals at the RPPN?

All informations provided were transcribed literally into the forms. The names of the animals were recorded as pronounced by the interviewees, and then they were identified with the aid of experts in each zoology field and named according to scientific standards. The official list of species endangered species from the Ministério do Meio Ambiente was also consulted to verify whether the most used species in the community is listed as threatened.

From the obtained results we performed quantitative and qualitative analyses with the data. For the quantitative analysis we used the Excel software to tabulate the data and to calculate simple percentage.

Results and discussion

Among the 90 interviewees from the rural community of Laginhas, 30% demonstrated knowledge of the animals from the RPPN. 367 citations were made of animals with occurrence for the RPPN, classified into 79 species (81 vernacular names), 78 genera and 55 families. Among the 79 species, the community uses 41 for several purposes.

These results reflect the popular wisdom and show the knowledge about the animals, as well as the uses of wildlife by humans, as suggested by Costa Neto (2000).

The species mentioned as occurring at the RPPN are distributed in percentage into the following zoological groups: birds (52%), reptiles (19%), mammals (17%), fishes (9%), arachnids (2%) and insects (1%; Figure 2).

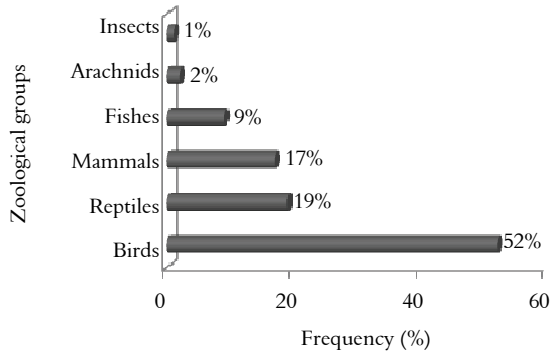


Figure 2. Percentage of zoological groups mentioned by the residents of the Laginhas community, as occurring at the RPPN Stoessel de Britto, Rio Grande do Norte State.

The birds compose the group with the highest number of vernacular names identified by the

interviewees (42); however, the mammals had the greatest number of citations (210) for 14 vernacular names identified. According to Razera et al. (2006), this result may be the result of the visibility of the mammals and greater utility for them, both from the feeding point of view as for other uses. The reptiles were cited 101 times for 15 identified names. The least cited were the arachnids with 2 names and the insects with 1 (Table 1). The latter are usually not remembered by the interviewees since they have no use. Therefore, we observe that the vertebrates are the most cited than the invertebrates, corroborating the data obtained by Razera et al. (2006) and Costa Neto and Resende (2004), which report that the larger-sized animals are easier to be noted, have usefulness and greater contact in daily life. The invertebrates are smaller, less visible and are not so useful. Still according to these authors, in the perceptions from the interviewees, small bugs that may cause diseases and hazards are considered as “insects”.

Table 1. Animals mentioned by the rural community of Laginhas, according to vernacular name, scientific identification, number of citations, categories of value or use (1- feeding, 2- trade, 3- create at home, 4- medicinal, 5- only occurrence, without value or use).

Vernacular name	Scientific name	n°. cit	Use					
			1	2	3	4	5	
Bird	BIRD							
	Fam. Accipitridae							
Savanna Hawk	<i>Heterospizias meridionalis</i> (Latham, 1790)	3						3
	Fam. Anatidae							
White-faced Whistling-Duck	<i>Dendrocygna viduata</i> (Linnaeus, 1766)	3	3					
Southern Pochard	<i>Netta erythrophthalma</i> (Leach, 1820)	4		4				
	Fam. Aramididae							
Limpkin	<i>Aramus guarana</i> (Linnaeus, 1766)	2	2					
	Fam. Ardeidae							
Rufescent Tiger-Heron	<i>Tigrisoma lineatum</i> (Boddaert, 1783)	2	2					
Snowy Egret	<i>Egretta thula</i> (Molina, 1782)	1						1
	Fam. Bucconidae							
Spot-backed Puffbird	<i>Nystalus maculatus</i> (Gmelin, 1788)	1						1
	Fam. Columbidae							
White-tipped Dove	<i>Leptotila verreauxi</i> Bonaparte, 1855	5	2					3
Picui Ground-Dove	<i>Columbina picui</i> (Temminck, 1813)	3	3	1	3			
Eared Dove	<i>Zenaida auriculata</i> (Des Murs, 1847)	6	4	5				1
Scaled Dove	<i>Columbina squammata</i> (Lesson, 1831)	12				6		6
Picazuro Pigeon	<i>Patagioenas picazuro</i> (Temminck, 1813)	4	2					2
	Fam. Corvidae							
White-naped Jay	<i>Cyanocorax cyanopogon</i> (Wied, 1821)	2	1	1				
	Fam. Cariamididae							
Red-legged Seriema	<i>Cariama cristata</i> (Linnaeus, 1766)	1						1
	Fam. Cuculidae							
Smooth-billed Ani	<i>Crotophaga ani</i> Linnaeus, 1758	2						2
Guira Cuckoo	<i>Guira guira</i> (Gmelin, 1788)	1						1
	Fam. Charadriidae							
Southern Lapwing	<i>Vanellus chilensis</i> (Molina, 1782)	2						2
	Fam. Cracidae							
White-browed Guan	<i>Penelope jacucaca</i> Spix, 1825	2	1					1
	Fam. Cathartidae							
Black Vulture	<i>Coragyps atratus</i> (Bechstein, 1793)	4						4
	Fam. Emberizidae							
Chopi Blackbird	<i>Gnorimopsar chopi</i> (Vieillot, 1819)	3		2				1
White-throated Seedcater	<i>Sporophila albogularis</i> (Spix, 1825)	1						1
Red-cowled Cardinal	<i>Paroaria dominicana</i> (Linnaeus, 1758)	3		3	3			
Saffron Finch	<i>Sicalis flaveola</i> (Linnaeus, 1766)	5		4	5			
	Fam. Falconidae							
Southern Caracara	<i>Caracara plancus</i> (Miller, 1777)	3						3

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Vernacular name	Scientific name	n°. cit	Use				
			1	2	3	4	5
Laughing Falcon	<i>Herpetotheres cachinnans</i> (Linnaeus, 1758) Fam. Fringillidae	1					1
Purple-throated Euphonia	<i>Euphonia chlorotica</i> (Linnaeus, 1766) Fam. Hirundinidae	1					1
White-winged Swallow	<i>Tachycineta albiventer</i> (Boddaert, 1783) Fam. Icteridae	1					1
Yellow-rumped Cacique	<i>Cacicus cela</i> (Linnaeus, 1758)	1					1
Campo Troupial	<i>Icterus jamaicaii</i> (Gmelin, 1788) Fam. Jacanidae	5		3	3		2
Wattled Jacana	<i>Jacana jacana</i> (Linnaeus, 1766) Fam. Mimidae	1					1
Chalk-browed Mockingbird	<i>Mimus saturninus</i> (Lichtenstein, 1823) Fam. Nyctibiidae	2	2				
Common Potoo	<i>Nyctibius griseus</i> (Gmelin, 1789) Fam. Podicipedidae	1					1
Least Grebe	<i>Tachybaptus dominicus</i> (Linnaeus, 1766) Fam. Psittacidae	1					1
Cactus Parakeet	<i>Aratinga cactorum</i> (Kuhl, 1820)	3			3		
Blue-winged Parrotlet	<i>Forpus xanthopterygius</i> (Spix, 1824)	2			2		
Blue-fronted Parrot	<i>Amazona aestiva</i> (Linnaeus, 1758) Fam. Picidae	5		3	4		1
Ochraceous Piculet	<i>Picumnus limae</i> (Leach, 1820) Fam. Rallidae	1					1
Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus, 1758) Fam. Tinamidae	3	2				1
Small-billed Tinamou	<i>Crypturellus parvirostris</i> (Wagler, 1827) Fam. Tyrannidae	2	2				
Great Kiskadee	<i>Pitangus sulphuratus</i> (Linnaeus, 1766)	1					1
Common Tody-Flycatcher	<i>Todirostrum cinereum</i> (Linnaeus, 1766) Fam. Trochilidae	1					1
Glittering-bellied Emerald	<i>Chlorostilbon lucidus</i> (Shaw, 1812)	2					2
REPTILE	REPTILE						
Rainbow boa	<i>Epicrates assivi</i> (Wagler, 1830) Fam. Boidae	7					7
Red-tailed boa	<i>Boa constrictor</i> Linnaeus, 1758 Fam. Colubridae	17		6			11
Chicken Snake	<i>Spilotes pullatus</i> (Lineu, 1758)	2					2
Brown Vine Snake	<i>Oxybelis aeneus</i> (Wagler, 1824) Fam. Chelidae	2					2
Geoffroy's side-necked turtle	<i>Phrynops geoffroanus</i> (Schweigger, 1812) Fam. Dipsodidae	1	1				1
Paraguay Green Racer	<i>Philodryas nattereri</i> (Steindachner, 1870)	10					10
Mussurana*	<i>Boiruna sertaneja</i> (Zaher, 1996) Fam. Elapidae	9					9
Caatinga Coral Snake	<i>Micrurus ibiboca</i> Merrem, 1820 Fam. Iguanidae	4					4
Common Green iguana	<i>Iguana iguana</i> (Linnaeus, 1758) Fam. Polychrotidae	3	2			1	
Brazilian Bush Anole	<i>Polychrus acutirostris</i> Spix, 1825 Fam. Teiidae	1					1
Argentine Black and White Tegu	<i>Tupinambis merianae</i> (Duméril et Bibron, 1839)	10	8			2	
Spix's Whiptail	<i>Cnemidophorus ocellifer</i> (Spix, 1825) Fam. Viperidae	1					1
Rattlesnake	<i>Caudisoma durissa</i> (Linnaeus, 1578)	19		9			10
Caatinga lancehead viper	<i>Bothropoides erythromelas</i> (Amaral, 1923) MAMMAL	15				9	6
MAMMAL	MAMMAL						
Spix's Yellow-toothed Cavy	<i>Galea spixii</i> (Wagler, 1831) Fam. Caviidae	14	7	6		1	
Rock Cavy	<i>Kerodon rupestris</i> (Wied, 1820) Fam. Callithrichidae	11	6			1	4
Common Marmoset	<i>Callithrix jacchus</i> (Linnaeus, 1758) Fam. Canidae	1					1
Common Fox	<i>Cerdocyon thous</i> (Linnaeus, 1758) Fam. Cebidae	5				2	3
Black-striped Capuchin	<i>Cebus libidinosus</i> Spix, 1823 Fam. Dasypodidae	9	1		5		3
Three-banded armadillo	<i>Tolypeutes tricinctus</i> (Linnaeus, 1758)	27	16	8		1	2
Nine-banded armadillo	<i>Dasypos novemcinctus</i> (Linnaeus, 1758) Fam. Didelphidae	6	5				1
White-eared Opossum	<i>Didelphis albiventris</i> Lund, 1840 Fam. Felidae	3					3
Jaguarundi	<i>Puma yagouaroundi</i> (È. G. Saint-Hilaire, 1803)	3	1				2
Oncilla	<i>Leopardus tigrinus</i> (Schreber, 1775)	5	1	2			3

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Vernacular name	Scientific name	n°. cit	Use					
			1	2	3	4	5	
	Fam. Mustelidae							
Striped Hog-nosed Skunk	<i>Conepatus semistriatus</i> (Boddaert, 1785)	13	4	5				4
Lesser Grison	<i>Galictis cuja</i> (Molina, 1782)	1						1
Lesser Grison	Fam. Myrmecophagidae							
Southern Tamandua	<i>Tamandua tetradactyla</i> (Linnaeus, 1758)	9	3		3			3
	Fam. Procyonidae							
Crab-eating Raccoon	<i>Procyon cancrivorus</i> (Cuvier, 1798)	5						5
FISH	FISH							
	Fam. Anostomidae							
Piau	<i>Leporinus steindachneri</i> (Eigenmann, 1907)	4						
	Fam. Auchenipteridae							
Driftwood catfish	<i>Parauchenipterus galeatus</i> (Linnaeus, 1766)	3						3
	Fam. Cichlidae							
Peacock bass	<i>Cichla ocellaris</i> (Schneider, 1801)	6	6	6				
	Fam. Characidae							
Piranha	<i>Serrasalmus</i> sp.	2						
	Fam. Erythrinidae							
Wolf fish	<i>Hoplias malabaricus</i> (Bloch, 1794)	9	9	9				
	Fam. Loricariidae							
Pleco	<i>Plecotomus</i> (Walbaum, 1792)	3						3
	Fam. Prochilodontidae							
Curimatã	<i>Prochilodus</i> spp.	9	9	9				
ARACHNID	ARACHNID							
	Fam. Scolopendridae							
Centipede	<i>Scolopendra</i> spp.	1						1
	Fam. Theraphosidae							
Bird-eater spider	<i>Lasiodora</i> sp.	3						3
Insect	Insect	5						5

*The species that corresponds to this vernacular name *Lachesis muta* (Viperidae), does not occur at Caatingas. As in other locations of caatingas, this name is applied to *Boiruna sertaneja*, herein we used this name.

The most mentioned animal by the community was the three-banded armadillo with 27 citations, followed by rattlesnake with 19, scaled dove with 12 and the curimatã and wolf fish with 9 citations. All these animals belong to daily life of studied community and are related to the uses of feeding, medicinal and trade.

The three- armadillo is one of the most wanted mammal species for feeding and trade in the studied community, corroborating the studies from Rocha-Mendes et al. (2005) and Costa Neto (2000), which also mention the armadillo as very wanted by people both for feeding as for trade.

The rattlesnake presents medicinal use by the residents of this community, since its lard is employed in the treatment of throat, spine and even to heal other animals. In the studies carried out by Costa Neto (2000, 2006), Almeida and Albuquerque (2002) and Barbosa et al. (2007), the snakes were also included in medicinal item, serving to cure diseases. According to Alves et al. (2007), in study about the use of snakes in folk medicine of Northeastern of Brazil, the rattlesnake was the most cited.

The most mentioned birds by the birds were the scaled dove and picazuro pigeon; the latter being for feeding and trade, and the first indicated by some as valueless or use, and by others for creating at home.

The most mentioned fish were the wolf fish and curimatã, quite used by the community for feeding.

The use of faunistic resources by the community

The categories selected for the identifications of the faunistic use by the residents of the Laginhas community were defined according to the uses mentioned for the animals from the RPPN: 1- feeding, 2- trade, 3- create at home, 4- medicinal and 5- without value or use (Figure 3). The category 5 with the highest representativeness was the number (without value or use), with 149 citations. This because the informant quoted the animal, but he did not know the use, and immediately said that it was good for nothing.

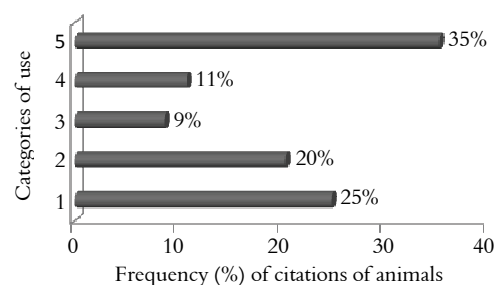


Figure 3. Percentage of animal species occurring at the RPPN, mentioned by the residents of the Laginhas community, according to the following categories: 1- Feeding, 2- Trade, 3- Create at home, 4- Medicinal, 5- Without value or use.

The second most mentioned category was the number 1 - feeding: with 25% of the answers and 105 citations (Figure 3). The most cited animals in this category were the three-banded armadillo, Spix's yellow-toothed cavy and rock cavy, which

are commonly consumed as food by this community. This category is also quoted as the most representative in the studies of (RAZERA et al., 2006; SILVA et al., 2010). Apparently the consumption of these animals by the community has a significant nutritional relevance, considering the low economic resources and the consequent lack of material conditions for the purchase of beef.

The trade category was third, with 86 citations and 20% of the answers (Figure 3). The most mentioned animals for the trade were the Spix's yellow-toothed cavy, three-banded armadillo and rattlesnake. These are much sought species by the people to buy, especially in neighboring cities due to their medicinal relevance. According to Alves et al. (2008), in Brazil, as in other countries, the rural communities developed an accurate knowledge of the therapeutic and medicinal properties of the animals. The existence of trade of biological resources with medicinal property also in the cities reveals that the traditional use of biodiversity for therapeutic purposes has been incorporated by urban communities (ALVES et al., 2008).

The medicinal use was a very important category for the community, with 46 citations (11% of the answers) and 11 animals indicated for medicinal uses. The most prominent animals were the snakes (rattlesnake, Red-tailed boa, Caatinga lancehead viper and rainbow boa), and Argentine Black and White Tegu. These are recognized by the community as good medicinal resources (Table 2). These animals were also recorded for medicinal uses in the studies from Costa Neto (2006), Almeida and Albuquerque (2002) and Silva et al. (2010), especially for the treatment of diseases as the rheumatism, asthma, and throat, among others.

Table 2. Medicinal uses of animals occurring at the RPPN, according to citations from the community and related by vernacular name, indicated diseases and part of the animal used.

Vernacular name	Indication	Used part of the animal
Rattlesnake	Throat/spine/animal swelling	Lard
Red-tailed boa	Throat	Lard
Caatinga lancehead viper	Throat/snake bite	Lard/Venon
Rainbow boa	Rheumatism	Lard
Common Green iguana	Throat	Lard
Geoffroy's side-necked turtle	Antiinflammatory/Throat	Meat/Lard
Rock cavy	Antiinflammatory	Meat
Spix's yellow-toothed cavy	Hair loss	Lard
Common Fox	Hemorrhoids/cracked feet/inflammation of the uterus	Lard
Argentine Black and White Tegu	Throat	Lard
Nine-banded armadillo	Rheumatism	Meat

The most used part of the animals for medicinal purposes by the rural community of Laginhas was the lard, with nine citations; this lard is used to take or apply on the local of the disease. The disease with the highest number of citations (6), for the animal use, was the throat inflammation. The animal with more medicinal indications was the rattlesnake and the fox, each one with three healing indications. In a study similar to this in the ESEC-Seridó, the fox is also used for several medicinal uses (SILVA et al., 2010).

The hunting of animals at the RPPN

Ninety per cent of responses from the interviewed residents of the Laginhas community stated that they do not agree with the hunting at the RPPN, and 10% agree. When they are questioned if they ever had caught any animal at the RPPN, 100% said that they never hunted in the RPPN, since it is prohibited by the IBAMA (Brazilian Institute of Environment and Renewable Natural Resources) and by the owner of the reserve, but they had already hunted in the area before it become a reserve, because the owner released the hunting and there was no problem. Although they assure that there is no hunting at the RPPN, there are evidences of the entry of hunters in the area, according to information from the owner of the RPPN. Furthermore, the own residents of the community say that the hunt occurs at the RPPN, but neither identifies or points the hunter.

The interviewees say that they think is wrong practice hunting in the reserve, but sometimes is the only way to get food. They think is right, hunt for feeding, however they do not agree with the practice when just for fun or to sell. All are aware that in the reserve, the hunting is not legally released.

Species as the Southern tamandua, rock cavy, oncilla, Argentine Black and White Tegu, nine-banded armadillo and the three-banded armadillo are species endemic of the Caatinga and are the prime targets for hunters. According to MMA (2003) - Ministério do Meio Ambiente, two species from these, the *Leopardus tigrinus* (oncilla) and the *Tolypeutes tricinctus* (three-banded armadillo) are included in the national list of Brazilian species threatened with extinction.

Conclusion

The commercial use of animals is important for this community, because is an activity that supplements the income of families that, mostly, are needy. This fact is corroborated by the uses for feeding and as medicine uses, stemming from the lack of income, but also reveals the traditional customs in this community.

Despite the low percentage of informants from the community that knew the animals from the RPPN, the knowledge about faunistic species and their uses were high. Therefore the knowledge from this community in relation to the use of animals should be considered and used to define conservation strategies and to subsidize the elaboration of the Management Plan for the RPPN Stoessel de Britto.

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