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The following is the established format for referencing this article:

Consorte-McCrea, A.G. and Rubin, R. 2009. Attitudes of zoo visitors and professionals towards the conservation of the maned wolf in southeast Brazil. *Canid News* 12.1 [online]

URL: http://www.canids.org/canidnews/12/Attitudes_towards_conservation_of_maned_wolf.pdf.

Research Report

Attitudes of zoo visitors and professionals towards the conservation of the maned wolf in southeast Brazil

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Keywords: attitudes towards carnivores; canid conservation; carnivore-people conflict; maned wolf; *Chrysocyon brachyurus*

Abstract

Issues related to people *versus* wildlife conflict are a worldwide concern for the conservation of endangered carnivore populations. This exploratory study is part of an ongoing research project about the conservation of an endemic threatened species of carnivore in southeast Brazil, where the highest concentration of people meet some of the largest remaining areas of Brazil's biodiversity and endemism. As the maned wolf *Chrysocyon brachyurus* is forced out of its natural habitat by farming, it explores a variety of settings and food sources, increasing the risk of conflict with humans. Questionnaires were distributed to target groups at São Paulo Zoo, to examine: (a) local people's beliefs about and attitudes towards the maned wolf, conservation, and conservation/education agents;

(b) conservation/education professionals' attitudes towards local people, maned wolves, and conservation. Some of the results reinforce previous findings of a high level of misinformation concerning the maned wolf's ecology, and a lack of strong feelings against the wolf and conservation among the general public and students. Results suggest a widespread belief that maned wolves attack chicken pens and livestock; however such beliefs are mostly accompanied by positive feelings about the maned wolf. Other results shed light on target groups' salient beliefs in relation to the maned wolf and conservation, and to other stakeholders. This exploratory study is necessary in the development of future questionnaires and interviews, and crucial in the subsequent targeting of those beliefs in future education programmes aimed at individual target groups.

Introduction

The maned wolf (Figure 1) is an endemic South American canid, large in size (up to 90cm tall at the shoulder, averaging 23.3kg), and atypical in habits (Dietz 1984; Rodden et al. 2004). Maned wolves are solitary and monogamous, and have small litter sizes (two to three on average). They are easily identifiable by their long dark legs, orangey brown coat and dark mane (Consorte-McCrea 1994). Their original distribution is open areas of Paraguay, north Argentina, also Bolivia, Peru and possibly Uruguay, central and southern Brazil, inhabiting grasslands and bush (Cerrado), wetlands and swamps (Pantanal) (Rodden et al. 2004; Paula et al. 2008).



Figure 1. The maned wolf, photo from Questionnaire 1 (The Ark Gallery, Durrell Wildlife Conservation Trust).

The maned wolf displays a largely frugivorous, generalist-opportunist diet which varies seasonally, composed of 60% animal origin and 40% fruits (Ferraz 2000), and seems to play an important role in the dispersion of different species of fruits in the Cerrado, and especially of the "wolf's fruit" *Solanum lycocarpum*, which shows improved germination rates after passing through the maned wolf's digestive system (Lombardi and Motta-Junior 1993).

Each monogamous pair occupies a territory of approximately 25-100 km² (Dietz 1984; Rodrigues 2002) encompassing a variety of vegetation types. The main reasons for the decline of the species seem to be habitat reduction (the

Cerrado, a biodiversity hotspot, has been reduced to 20% of its original area; Miranda et al. 2003) by conversion into agricultural land, and fragmentation, causing the isolation of sub-populations; road kills, competition and attacks by domestic and feral dogs; direct persecution by people due to presumed attacks on domestic stock; and demand on body parts for traditional medicine and as "lucky" charms (Encke 1970; Dietz 1984; Rodrigues 2002).

As the wolf is forced out of its natural habitat by ever-expanding farms (cattle, sugar cane) and re-forestation (pine, eucalyptus), it explores a variety of settings and food sources, increasing the risk of conflict with humans (that is arguably becoming the main threat to its survival) (Rodrigues 2002; Paula et al. 2008). As a result, human social elements play a pivotal role in the present status of the maned wolf.

During recent years the issue of people and carnivore conflict has been discussed at international and regional meetings (e.g., Symposium on Carnivore Conservation, ZSL and ASAB, 2001; Symposium People and Wildlife: Conflict or Co-existence?, ZSL and Wildlife Conservation Society, 2002; Conservation International Meeting, DICE, UKC, 2002; Defenders of Wildlife Carnivores Conference, 2002, Monterey-CA,), and in publications (e.g., Gittleman et al. 2001; Kruuk 2002; Fascione et al. 2004; Woodroffe et al. 2005). However, those discussions seem to have overlooked the maned wolf and the issues that characterise the basis for its conflict with people. The relationship between people and maned wolves seem to be immersed in many misconceptions about the wolf's diet, ecology and behaviour, and surrounded by mystical beliefs. The lack of consistent data on people's attitudes about the maned wolf contributes to its absence from the discussion.

In the south east of Brazil the highest concentration of people meet some of the largest remaining areas of Brazil's biodiversity hotspots (Cerrado, Atlantic Rainforest). Due to the role that people play in the maned wolf's status, efforts to protect it benefit from the inclusion of local communities and a higher understanding of their attitudes towards them. Similar studies developed in other parts of the world suggest that conservation measures have little

chance of succeeding unless the local people approve of them and contribute to their success (Pyrovetsi and Daoutopoulos 1991; Sillero-Zubiri and Laurenson 2001; Ericsson and Heberle 2003).

This preliminary study is part of a research project on the conservation of the maned wolf in a region of the southeast of Brazil, which aims to investigate how people's attitudes to the maned wolf may influence its status and conservation in such area, and to suggest how conservation strategies may be improved by incorporating such knowledge into their efforts to conserve both wolf and habitat.

Methods

Questionnaires were designed to identify selected attitudes, beliefs and knowledge of target groups in relation to the maned wolf, wildlife, conservation and to other target groups; so we could compare these factors in urban and rural areas of São Paulo state; and consider the findings in the context of the maned wolf conservation and planning of conservation strategies. São Paulo is the most populated state in Brazil, of high political and economical importance in the national context, which also houses some of the most significant remnants of maned wolf habitat within conservation areas.

This exploratory study had the supplementary aim to test the questionnaires and the efficiency of questions in relation to the aims and objectives of the research project. All questionnaires were administered within São Paulo Zoo, in December 2005. Questionnaires to visiting schools and zoo staff were distributed by the Education Department of the Zoo. Questionnaires to visitors were handed out in front of the maned wolf's enclosure, by the researcher (see questionnaires in [Appendix 1](#)), adding up to a total of 181 questionnaires.

The target groups were:

- the staff and volunteers at the Conservation Centre and the Environmental Education Centre of São Paulo Zoo;
- students of visiting primary and secondary schools (12-13 and 16-17 year olds);

- teachers of visiting primary and secondary schools;
- zoo visitors.

Most questions were closed ([Appendix 1](#)), and language was simple (no technical or scientific terms). Questionnaires were two pages long and designed to take no longer than six minutes to complete.

Students' age groups were chosen according to their 'readiness', in terms of developmental stage (following Jean Piaget Cognitive Theory; Lin 2002).

Socio-economic questions were asked to establish a profile of respondents, since it has been suggested that people within some profiles may favour conservation more than others (Kellert et al. 1996).

Different sets of questions were devised to target (1) general public and students' beliefs and attitudes towards the maned wolf, nature/wildlife, and (2) conservation/education professionals' beliefs and attitudes towards the maned wolf and about public/students, and conservation/education professionals. Beliefs were targeted as they are guides for actions, convey people's knowledge about objects, and may express desires. Attitudes were targeted as they convey positive and negative feelings about objects and they might be expressed into behaviour on appropriate occasions (Ajzen and Fishbein 1980).

Questions raised by similar studies have contributed to the design of the present questionnaires (Mankin et al. 1999; Silva 2000; Anic 2002; Lackey and Ham 2003).

According to Kellert et al. (1996), peoples' attitudes towards large, charismatic carnivores depend on four interacting variables, which relate to (1) physical and behavioural characteristics of a species, such as size, perceived intelligence and personality, hunting techniques; (2) peoples' basic values about animals and nature, which affect their perception of individual animal species; (3) people's knowledge and understanding of a species, including facts, concepts, conservation awareness; and (4) past and present experiences of interaction with species, including conflict, recreation, material use, etc. Kellert et al.

(1996)'s variables are discussed in relation to the results from questionnaires 1 and 3, addressed to zoo visitors and students, in the Results and discussion section next.

Results and discussion

Zoo visitors and students from primary and secondary schools

(1) Perceived physical and behavioural characteristics of the maned wolf

Zoo visitors and students in this urban sample had mostly positive attitudes in relation to physical and behavioural characteristics they associated with the maned wolf, corresponding to 57.4% of responses, while negative responses equalled 28.2%. The maned wolf was mostly considered *brave* (5.2%, n=58), *worthy* (4.7%, n=53), and *beautiful* (4.5%, n=50), but high scores were also reached for *dangerous* (2.5%, n=28), and above all *ferocious* (3.8%, n=43) (see Table 2, in [Appendix 2](#)). It is important to question if such beliefs came from misinformation or from fact and personal experience – questions that must be addressed in future questionnaires.

People seemed to identify the maned wolf as a large, powerful animal and associated such qualities with being dangerous and ferocious, in accordance with peoples' perceptions of other large, charismatic carnivores (Kellert et al. 1996).

(2) People's basic values about animals and nature

All respondents to Questionnaire 3 (n=20) seem to find nature highly important to them and stated they would miss wildlife-related activities if no longer available. 80% believed that wild animals are as important as people; 55% believed that wild animals are as important as pets, 55% believed that wild animals are as important as livestock, and 45% believed in all three statements. The numbers, albeit small, suggest overall positive attitudes towards wild animals and reflect the general importance of wildlife.

All respondents had some type of contact with wildlife during the previous year. Their par-

ticipation in wildlife-related activities may be an indication of their interest in wildlife conservation, although people do not have to participate actively to have strong feelings about wildlife conservation (Mankin et al. 1999).

When asked about wild predators most responses indicate positive beliefs, the most popular being "wild predators are part of the ecological web", and "wild predators are essential to maintain nature's balance". Most also believed hunting prohibition is fair. Although hunting wild animals has been banned from Brazil for at least 30 years, hunting for food is a strong tradition practiced by indigenous peoples and readily adopted by colonisers (who used to hunt in Europe) for many centuries (Arruda, in Diegues 2000; Miranda 2003). Consultations with reserve managers suggest that poaching seems to be a reality to the day.

Overall, results suggest positive attitudes towards wildlife and its protection, or conservation.

(3) People's knowledge and understanding of the maned wolf

Most respondents (80.5%, n=103) were able to identify the maned wolf at some level, by its name or picture (see Figure 1).

Studies on the feeding ecology of the maned wolf in the south-east Brazil indicate that the "wolf's-fruit" (*Solanun lycocarpum*) is the most common item in the wolf's diet, followed by small mammals (Ferraz 2000; Motta-Junior 2000; Belantani 2001; Bueno et al. 2002; Santos et al. 2003). However, when respondents were asked to choose only one item as the maned wolf's favourite food, the only major group to chose "wolf's fruit" over other items had also seen the maned wolf live in nature (a minority group in this sample, see Table 1, [Appendix 2](#)). Favourite choices were rats or chicken. Rats make up the most of the maned wolf's animal food source intake in nature. TV and radio were the most popular sources of information about the maned wolf among respondents, establishing a position of important opinion maker (see Table 1, [Appendix 2](#)).

The general ratio between chosen favourite foods of animal and plant origin was biased towards animal origin (78.3%), which does not reflect maned wolves' feeding habits in nature

and may indicate a lack of knowledge of respondents about the maned wolf's ecology. The belief that maned wolves favour chickens as prey has important conservation consequences, related to direct persecution and retaliation to alleged attacks to chicken pens, in rural locations, which may be an ingrained belief that needs addressing further.

Most respondents (79.6%, n=82) believed that the number of maned wolves is decreasing. Although there are no accurate estimates of the maned wolf's numbers in the wild, such belief is consistent with the recognised threatened status of the species. The Brazilian IBAMA lists the maned wolf as *endangered*. The IUCN lists it as *near threatened*, and the species is included in CITES - Appendix II. Respondents showed an overall positive attitude towards maned wolf conservation.

Importantly, the great majority of respondents, 82.5% (n=85) believed that parts of the maned wolf's body can be used for some purpose (45.6%, n=47, fashion accessories; 21.4% remedies; 15.5% lucky charms). Such belief suggests a strong element of mystical and possibly commercial value attached to parts of the maned wolf's body, which could contribute to its persecution.

In spite of the above, responses suggest a definite positive image trend in relation to knowledge and beliefs about the maned wolf. The most popular beliefs were *the best place for the maned wolf is nature* (19.1%, n=73), and *the maned wolf needs to be protected* (15.9%, n=61), depicting positive beliefs about conservation of the species. The most popular negative beliefs, however, were *the maned wolf attacks chicken pens and livestock* (6.5%, n=25), and with a low score *the maned wolf must be hunted* (2%, n=8), which on one hand confirms the suggestion by previous authors that this is the main issue that needs addressing in maned wolf conservation (Dietz 1984, Rodrigues 2002, Anic 2002). On the other hand, almost 2/3 of respondents who demonstrated the belief that maned wolves attack chicken pens and livestock have identified the maned wolf with positive image attributes, rather than negative, which implies that they have positive feelings about the animal in spite of its alleged poaching habits (see Table 2, Appendix 2).

The belief that maned wolves may attack chicken pens is also based on some evidence of chicken pen raids, although highly exaggerated (Dietz 1984; Anic 2002). Although maned wolves are believed to predate on poultry, such remains were only found in 0.6-1.4% of analysed scat samples (Dietz 1984; Motta-Junior et al. 1996; Rodrigues 2002). Rare attacks seem to be carried out by nursing females, particularly during the winter when pups are born (births occur between June and August in the Brazilian winter). Maned wolves may be blamed for attacks carried out by less conspicuous species that are less shy, such as feral dogs (common near humanized areas of the southeast), and other smaller carnivores.

Not all respondents who believed *the maned wolf must be hunted* have also shown negative attitudes towards the species. Considering the small sample, it is not possible to infer that such belief is related to maned wolf image attributes. However, it is intriguing that the remaining 46% (n=31) have mostly shown positive attitudes towards the maned wolf, identifying the species as *brave*, *defensive*, *useful*, and *worthy*. If hunting is not related to negative attitudes towards the maned wolf it might be connected with different justifications that need further exploration, such as the attribution of such values to maned wolves body parts and a belief that they can be passed on to the person who carries them. Would the belief that *the maned wolf must be hunted* be related to beliefs concerning the use of maned wolf's body parts, or the belief that their numbers are increasing? People who believed *the maned wolf must be hunted* were divided as to what is happening to maned wolf's numbers (increasing 37.5%, staying the same 25%, decreasing 37.5%). All respondents who believed the maned wolf must be hunted **also** believe that parts of its body may be used for some purpose. The correlation between hunting and use of body parts may be one to be further explored in future questionnaires.

(4) Past and present experiences of interaction with the maned wolf

Past and present experiences of interaction with the species were a rare occurrence in this urban sample, and they need to be further explored in future questionnaires.

Zoo Staff: Biology and Education Professionals and Degree Students, Volunteers, Apprentices

Most responses (73.9%, n=17) reflected a negative image of the general public and students. The most popular belief is that they *know nothing or close to nothing about the maned wolf*, followed by *they are not interested in the conservation of the maned wolf*. 21.7% believe they *feel sympathy for the maned wolf*.

In the open questions (6, 7, 8, and 9) of Questionnaire 5 (see [Appendix 1](#)) respondents in this sample suggest a lack of receptivity and support from the public/students when trying to spread conservation/environmental education ideas to them. They also suggest a lack of awareness of maned wolf's importance in nature, from the public/students, and a lack of support from government, as obstacles to the task. They suggest that more effort and quality on the part of educators/biologists would help improve relations between conservation and environmental education professionals and public/students, and also suggest that better education in the population would help by raising interest in nature from childhood.

Negative attitudes from conservation/education professionals towards the public might interfere with relationships between the two groups, and might contribute to the alienation of the general public from conservation initiatives. Attitudes of the public in relation to conservation/education professionals should also be investigated in future questionnaires to verify how both sides perceive the relationship.

Conclusions

Following Kellert et al. (1996)'s variables, this preliminary survey suggests that the zoo visitors and students in this urban sample (1) have mostly positive attitudes in relation to physical and behavioural characteristics they associated with the maned wolf; (2) they valued wild animals and nature, which may affect their perception of the maned wolf in a positive way; (3) although most of their attitudes and beliefs towards the species were positive, some negative beliefs relating to the maned wolf's feeding habits and to special properties

associated with parts of its body were evident and may play an important role in the species conservation, as persecution and retaliation for chicken pen raids (real and attributed), and killing and mutilation of maned wolves due to mystical attributions have been cited as added reasons for decline (Puglia 1978; Silva 2000; Anic 2002); (4) past and present experiences of interaction with the species need to be further explored in future questionnaires so that reasons behind negative attitudes and beliefs may be better understood. Identification between the maned wolf and the European wolf *Canis lupus* may also be a cause for negative images being associated with the native species, as suggested by some authors (Kellert et al. 1996, Anic 2002; Kruuk 2002; Ribeiro 2003) and such association may be further explored in future questionnaires.

It has been suggested that "to preserve a species, people must be able to recognize it and to associate itself with it" (Dietz and Nagagata, in Padua and Tabanez 1997), and that prejudices need to be identified and de-mystified before attitudes can change (Macdonald and Sillero-Zubiri 2004). The results suggest a need for the dissemination of accurate information about the maned wolf and for the creation of opportunities to familiarize people with the species.

Traditionally, carnivore education has focused on fighting misinformation and improving people's understanding of the biology and management of carnivore species. Some authors suggest that this approach must shift to include human dimensions, as conflicts between people and carnivores tend to centre on issues such as culture, economic interests, moral values and beliefs (Padua and Tabanez 1997; Diegues 2000; Macdonald and Sillero-Zubiri 2004; Fascione et al. 2004). Although urban people, represented by this sample have mostly indirect contact with wildlife, they tend to be the ones with decision-making power, while rural people are often alienated from the process (Knight 2000).

D. Taylor (in Sillero-Zubiri et al. 2004) sees education as having a key role in conflict mitigation, and points out to a lack of multidisciplinary cooperation between stakeholders. He suggests that the key issue is "who needs education, and why?" and points out that "the general public may need it to develop attitude

and behaviour changes in society” as well as “conservationists may need it to foster co-existence”. The preliminary findings about the beliefs of conservation and education professionals towards the public and students support such suggestions. Such relationships will also be further explored in future questionnaires.

Acknowledgements

Many thanks to Dr Mike Nicholls (University of Greenwich at Medway) and Dr Peter Vujakovic (CCCU, director of the Dept. of Geographical and Life Sciences), for the feedback and revision. Many thanks to Dr Ray Godfrey for advising on data analysis. We would like to express our gratitude to Katia Cassaro, Mammals' Curator of São Paulo Zoo, and Dr Mario Borges, Director of Environmental Education of São Paulo Zoo for their help and support – this preliminary study would not have been possible without them; we also would like to thank the staff, schools and public at São Paulo Zoo who took their valuable time filling in the questionnaires; Rogério de Paula, from CENAP and Pró-Carnívoros, for his support; Dr Josildeth Gomes Consorte, PUC- São Paulo, for her insightful input on the questionnaires. This research was supported by a studentship from Canterbury Christ Church University.

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Rona Rubin is a chartered psychologist with a developing interest in the interface between people and their environment, in particular conservation education.

Appendix 1- Questionnaires

QUESTIONNAIRE ABOUT THE MANED WOLF 1 STUDENTS/GENERAL PUBLIC

1) The animal in the photo is the maned wolf. Had you ever heard of it before? () Yes () No

2) Were did you see or hear about the maned wolf?
(YOU MAY MARK MORE THAN ONE ANSWER)

- () Television, radio
- () News papers, books, magazines
- () School
- () Zoo, museum
- () I saw it live, in nature
- () Through my family, friends
- () Never heard of it
- () Other: _____



3) What is the maned wolf's favourite food?
(MARK ONLY ONE ANSWER)

- () rats () people
- () chicken () birds
- () steak () fruits
- () wolf's fruit () armadillo

4) Do you think the number of maned wolves is:

- () decreasing?
- () increasing?
- () staying the same?

5) Do you believe that (

- () parts of the maned wolf's body are good for making remedies
- () to carry a piece of the maned wolf's pelt bring luck
- () the maned wolf's skin is good for making accessories

6) Do you agree with the following statements? (YOU MAY MARK MORE THAN ONE STATEMENT)

- () The maned wolf must be hunted
- () The maned wolf lives in the grasslands and savannahs of Brazil
- () The maned wolf hunts rats that attack plantations
- () The maned wolf does not harm anyone
- () The maned wolf needs to be protected
- () The best place for the maned wolf is the zoo
- () The best place for the maned wolf is nature
- () The maned wolf is not worth anything
- () The maned wolf scares and attacks people
- () The maned wolf attacks chicken pens and livestock
- () The maned wolf helps nature to grow
- () The maned wolf makes my country more beautiful
- () I don't care about the maned wolf
- () I don't like the maned wolf

7) What do you think about the maned wolf? (ON EACH LINE, MARK YOUR ANSWER WITH AN X IN THE SPACE THAT BEST REPRESENTS YOUR OPINION):

GOOD:___:___:___:___:___:___:___:___:___:___:BAD
 BEAUTIFUL:___:___:___:___:___:___:___:___:___:___:UGLY
 BRAVE:___:___:___:___:___:___:___:___:___:___: Coward
 DANGEROUS:___:___:___:___:___:___:___:___:___:___: HARMLESS
 STRONG:___:___:___:___:___:___:___:___:___:___: WEAK
 AGGRESSIVE:___:___:___:___:___:___:___:___:___:___: DEFENSIVE
 NICE:___:___:___:___:___:___:___:___:___:___: DREADFUL
 FAST:___:___:___:___:___:___:___:___:___:___: SLOW
 USEFUL:___:___:___:___:___:___:___:___:___:___: USELESS
 WORTHY:___:___:___:___:___:___:___:___:___:___: WORTHLESS
 AGITATED:___:___:___:___:___:___:___:___:___:___: CALM
 FUNNY:___:___:___:___:___:___:___:___:___:___: SCARY
 SOFT:___:___:___:___:___:___:___:___:___:___: COARSE
 INCONVENIENT:___:___:___:___:___:___:___:___:___:___: WELCOME
 POWERFUL:___:___:___:___:___:___:___:___:___:___: POWERLESS
 BIG:___:___:___:___:___:___:___:___:___:___: SMALL
 FEROUTIOUS:___:___:___:___:___:___:___:___:___:___: TAME

8) What do you think should be done with the maned wolves in Brazil?

- () Get rid of these animals
- () Control their numbers in nature
- () Send them to the zoo
- () Leave them alone
- () Protect and preserve them
- () Other: _____

9) What would you do to help the maned wolf (YOU MAY MARK MORE THAN ONE ANSWER)

- () I would tell my family and friends that the maned wolf needs protection
- () I would join a group to help protect wild animals such as the maned wolf
- () I would contribute with money
- () Nothing
- () I would not harm to the maned wolf
- () I would try to find out more about the maned wolf and where it lives
- () Other: _____

10) Do you have any other comments to make about the maned wolf?

Personal data: Sex: () male () female

City: _____

Occupation: _____ Student: () yes () no

Year/class: _____ School: _____

MANY THANKS FOR YOUR HELP!

QUESTIONNAIRE ABOUT THE MANED WOLF 3

STUDENTS/GENERAL PUBLIC

- 1) Is nature important for you? (MARK YOUR ANSWER WITH AN X IN THE SPACE THAT BETTER REPRESENTS YOUR OPINION)

Very important: : : : : : : : not important

- 2) To you, wild animals are as important as:

- people
 pets
 livestock
 all of the above
 none of the above

- 3) During the last years did you:

- Observe wildlife
 Feed wildlife
 Photographed wildlife
 Visited the zoo to see wild animals
 None of the above

- 4) How much such wildlife-activities would be missed if no longer available?

Very much: : : : : : : not at all

- 5) It is prohibited to hunt wild animals in Brazil. In your opinion:

- the prohibition is fair, all hunting should be banned
 it should be prohibited to hunt animals that are disappearing
 hunting dangerous animals should be allowed
 hunting animals for food should be allowed
 hunting animals for pelt, medicines and talismans should be allowed
 the prohibition is unfair, all hunting should be allowed

- 6) In your opinion wild predators (YOU MAY MARK MORE THAN ONE ANSWER):

- are part of the ecological web
 are essential to maintain nature's balance
 are a threat to safety
 are a threat to livestock
 have the right to live
 are inconvenient, a bother, only cause damage
 transmit disease to domestic animals
 need to be protected from people
 are valuable as game
 inspire curiosity
 are beautiful, fascinating, strong and powerful
 are the source of stories, tales, legend, songs

- 7) The maned wolf is a Brazilian species threatened with extinction. Their numbers are decreasing because of: (YOU MAY MARK MORE THAN ONE ANSWER):

- destruction, fragmentation, reduction of habitat
 hunting
 retaliation in defence of livestock
 being run-over
 cannot find mating pair

- () disease
- () competition with humans and other animals
- () lack of food
- () difficult access to water sources
- () demand for body parts (to make accessories, medicines, talismans)
- () other _____

8) In your opinion which of the following statements refers to the maned wolf or to the grey wolf?

	Maned wolf	Grey wolf	Both of them	Neither of them
1) Live in groups of 10 or more animals				
2) Eats mainly meat				
3) In the absence of wild prey it may hunt livestock (sheep, goat, pig)				
4) Hunts in group				
5) Eats more rats than chickens				
6) Attacks children and elderly people to eat				

9) Do you associate **conservation** (initiatives to maintain/increase the numbers of a species in nature) of the maned wolf with (ON EACH LINE, MARK YOUR ANSWER WITH AN X IN THE SPACE THAT BEST REPRESENTS YOUR OPINION):

- BACKWARDNESS: _: _: _: _: _: _: PROGRESS
- NECESSITY: _: _: _: _: _: _: USELESSNESS
- TRADITION: _: _: _: _: _: _: MODERNITY
- CITY: _: _: _: _: _: _: COUNTRY
- THREAT: _: _: _: _: _: _: PROTECTION
- IGNORANCE: _: _: _: _: _: _: KNOWLEDGE
- POLITICS: _: _: _: _: _: _: ECOLOGY

10) What would you do to help the maned wolf (YOU MAY MARK MORE THAN ONE ANSWER)

- () I would tell my parents, family and friends that the maned wolf needs protection
- () I would join a group to help protect wild animals such as the maned wolf
- () Nothing
- () I would not harm to the maned wolf
- () I would try to find out more about the maned wolf and where it lives
- () Other: _____

11) Do you have any other comments to make about the maned wolf?

Personal data: Sex: () male () female

City: _____

Occupation: _____ Student: () yes () no

Year/class: _____ School: _____

MANY THANKS FOR YOUR HELP!

QUESTIONNAIRE ABOUT THE MANED WOLF 5

PROFESSIONALS CONSERVATION/EDUCATION

1. In your opinion the general public/students (YOU MAY MARK MORE THAN ONE ANSWER):
 - are against the conservation of the maned wolf
 - are not interested in the conservation of the maned wolf
 - know nothing/close to nothing about the maned wolf
 - have a good knowledge about the maned wolf
 - want to protect the maned wolf
 - feel sympathy for the maned wolf

2. In relation to conservation, please mark the statements you most agree with:
 - the maned wolf is not relevant enough within a conservation/environmental education context
 - maned wolf conservation includes several habitats and many wild species of animals and plants
 - the conservation of the maned wolf relies on research, training personnel, legal support, law enforcement, and environmental management.
 - environmental education is necessary for the conservation of the maned wolf and wild animals
 - maned wolf conservation depends on ecological research
 - maned wolf conservation depends on research in the areas of social sciences, psychology and economy
 - support for the conservation of the maned wolf is rising
 - cultural values are important in the conservation of the maned wolf and wild animals
 - long-term support from the public is important for the conservation of the maned wolf and wild animals
 - human element is an important part of the conservation of the maned wolf and wild animals
 - an interdisciplinary approach is important in the conservation of wild animals
 - long-term solutions for the conservation of the maned wolf involve changes in people's culture and attitudes
 - long-term solutions for the conservation of the maned wolf involve changes in conservation professionals/educators culture and attitudes
 - bureaucracy is an obstacle to our involvement with maned wolf conservation
 - lack of funds is an obstacle to our involvement with maned wolf conservation
 - zoos and schools help to form opinions about wildlife conservation
 - the general public/students are not interested in conservation/environmental education
 - the general public/students must be involved in conservation initiatives

3. In your opinion (YOU MAY MARK MORE THAN ONE ANSWER)
 - the biologist/educator is an authority, an expert, who practices an objective and impartial science
 - the biologist/educator is a professional with personal points of view
 - it is necessary to concentrate efforts in the co-existence between people and maned wolves to guarantee the future of the species
 - conflicts with people causes mortality amongst maned wolves
 - maned wolves need to be protected from people
 - programmes to decrease conflict between people and maned wolves must take into consideration all parts involved
 - captive breeding maned wolves for economic ends could be a good way to meet the demands for maned wolf body parts for medicines, accessories and good luck charms
 - the maned wolf causes serious damage to plantations and livestock
 - maned wolves are dangerous e may attack people in the wild
 - maned wolves hunt rats and insects that attack p[plantations and carry disease
 - environmental protection/improvement are linked to improvements in people's quality of life
 - environmental education may strengthen local a community's self-esteem
 - conservationists/educators can alienate the public/students

4. People kill the maned wolf because of (YOU MAY MARK MORE THAN ONE ANSWER)

- | | |
|--|---|
| <input type="checkbox"/> ignorance | <input type="checkbox"/> poverty |
| <input type="checkbox"/> pleasure | <input type="checkbox"/> superstition |
| <input type="checkbox"/> revenge | <input type="checkbox"/> traditional medicine |
| <input type="checkbox"/> fear | <input type="checkbox"/> self-defence |
| <input type="checkbox"/> economical gain | <input type="checkbox"/> intolerance |
| <input type="checkbox"/> accident | |
| <input type="checkbox"/> other: _____ | |

5. In your opinion, in the context of the conservation of the maned wolf, educational initiatives can help: (YOU MAY MARK MORE THAN ONE ANSWER)

- the general people/students to find out more about the maned wolf and its importance, and about the importance of its conservation
- politicians to support legal measures to protect the maned wolf
- the general public to develop change in attitudes and behaviours within society in favour of wild-life conservation
- conservationists to co-exist with other segments of society
- to rise the self-esteem of local communities and to integrate local culture and local natural resources
- other: _____

6. What is your standpoint as a conservationist/educator?

1. What sort of problems/obstacles do you find to spread conservation/environmental education ideas to the general public/students?

2. In your opinion in what way can the relationship between educators/educators and the general public/students be improved?

3. Do you have any further comments to make about the maned wolf and its conservation?

Personal data:

Sex: male female Age: _____

City: _____

Occupation: _____

MANY THANKS FOR YOUR COOPERATION

QUESTIONNAIRE ABOUT THE MANED WOLF 6
PROFESSIONALS CONSERVATION/EDUCATION

1. What do you see as the advantages or good things that would happen if you try to involve the general public/students in the conservation of the maned wolf?

2. What do you see as the disadvantages or bad things that would happen if you try to involve the general public/students in the conservation of the maned wolf?

3. Who do you think would object or disapprove if you try to involve the general public/students in the conservation of the maned wolf?

4. Who do you think would approve or support you if you try to involve the general public/students in the conservation of the maned wolf?

5. What makes it difficult or impossible for you to involve the general public/students in the conservation of the maned wolf?

4. What makes it easier for you to involve the general public/students in the conservation of the maned wolf?

Personal data:

Sex: () male () female Age: _____

City: _____

Occupation: _____

MANY THANKS FOR YOUR COOPERATION!

Appendix 2- Summary of the data

Zoo visitors and students from primary and secondary schools

Questionnaire 1;128 respondents (visitors + schools) compose this sample, representing urban residents.

Have you heard of the Maned Wolf? (question 1)

80.5% of respondents (n=103) were able to identify the maned wolf at some level, by its name or picture (see photo appendix 1).

Source of Information and Feeding Habits (questions 2 and 3)

Graph 1. Source of information by 'What is the maned wolf's favourite food?' (mean) (questionnaire 1, questions 2 and 3).

Table 1. Table cross-referencing responses from questions 2 (Where did you hear about the maned wolf?) and 3 (What is the maned wolf's favourite food?). Total respondents=76 (Questionnaire 1)

Respondents were asked to choose only one item as the maned wolf's favourite food. The only source of information to reflect knowledge about the wolf's fruit as maned wolf's favourite food item was "I've seen the maned wolf live in nature" (3.1%, n=5) (see table 1.). All other sources favoured rats (29.2%, n=46) or chicken (26.7%, n=42). Rats make up the most of the maned wolf's animal food source intake in nature, and were the top choice for "TV or radio", "papers, books, magazines", and "zoos and museums".

Beliefs about maned wolf's status (question 4)

79.6% (n=82) of respondents believe that the number of maned wolves is decreasing.

Mystical and Commercial Properties (question 5)

The great majority of respondents, 82.5% (n=85) believe that parts of the maned wolf's body can be used for some purpose (45.6% (n=47) fashion accessories; 21.4% remedies; 15.5% lucky charms).

Beliefs and knowledge about the maned wolf (question 6)

There were 6.7 times more positive responses (87.7%) than negative (12.8%), suggesting a definite positive image trend in relation to knowledge and beliefs about the maned wolf.

The most popular beliefs were "the best place for the maned wolf is nature" (19.1%, n=73), and "the maned wolf needs to be protected" (15.9%, n=61), depicting positive beliefs about conservation of the species. The most popular negative beliefs were "the maned wolf attacks chicken pens and livestock" (6.5%, n=25), and "The maned wolf must be hunted" (2%, n=8).

Attitudes towards the maned wolf (question 7)

Attitudes and feelings were mostly positive in relation to the maned wolf, corresponding to 57.4% of responses, while negative responses equalled 28.2%. The maned wolf was mostly considered BRAVE (5.2%, n=58), WORTHY (4.7%, n=53), and BEAUTIFUL (4.5%, n=50), but high scores were also reached for DANGEROUS (2.5%, n=28), and above all FEROCIOUS (3.8%, n=43).

Respondents believe the maned wolf to be STRONG (4.8%, n=54), BIG (3.7%, n=41), and POWERFUL (3.2%, n=36), which may indicate overall feelings of respect, or of being overwhelmed by it. Such beliefs may also be associated with the feelings that the maned wolf is "ferocious" and "dangerous".

The maned wolf was also believed to be FAST (5.6%, n=63) and AGITATED (3%, n=34). 'Agitated' in this context may also reflect the fact that the maned wolf perambulates for much of its wake time (in captivity as well as in nature), or it may reflect a perception of its shy nature: it will move away if dis-

turbed or approached by people.

Conservation of the maned wolf (questions 8 and 9)

Respondents were asked “what do you think should be done with the maned wolves in Brazil?” The most positive statement in terms of conservation (“Brazil should protect and preserve them”) was also the most popular response (64%, n=74). The most negative statement (“Brazil should get rid of these animals”) scored less than 1%.

When asked “what would you do to help the maned wolf?” 94.4% (n=137) replies indicate a positive attitude towards “helping the maned wolf”; only 0.5% (n=8) would do “nothing to help the maned wolf”. “Contributing with money” has also reached a low response score (0.5%). There might be an issue with whose perceived responsibility it is to ‘help’ the maned wolf, which may be further explored on future questionnaires.

Attitudes and Beliefs about the maned wolf (questions 6 and 7)

Total >4/positive beliefs= 1471; total >4/negative beliefs= 194; total <4/positive beliefs= 554; total <4/negative beliefs= 138 (table 2).

Table 2. Table cross-referencing responses from questions 6 (Do you agree with the following statements?) and 7 (What do you think about the maned wolf?), questionnaire 1, which relate to attitudes and beliefs about the maned wolf.

Total of positive beliefs/positive attitudes responses equal 62% (n=1471) of all responses (n=2357), while negative beliefs/negative attitudes equal 6% (n=138) of all responses, showing a definite tendency for positive attitudes from public and students towards the maned wolf, based on beliefs, knowledge and image.

Graph 2. Do you agree with the following statements? (questionnaire 1, question 6)

All positive beliefs scored higher than negative beliefs. The most popular positive belief was “the best place for the maned wolf is nature” (19%, n=438), followed by “the maned wolf must be protected” (15%, n=354); the most popular negative belief was “attacks chicken pens and livestock” (7%, n=155).

The second most popular negative belief is “the maned wolf must be hunted” (3%, n=68); approximately 54% of respondents who supported such belief show negative attitudes.

7.7% (n=8) of respondents believe “the maned wolf must be hunted” and their opinion was divided as to what is happening to maned wolf’s numbers (increasing 37.5%, staying the same 25%, decreasing 37.5%). All respondents who believe the maned wolf must be hunted **also** believe that parts of its body may be used for some purpose: 50% of them (n=4) believe “the maned wolf’s skin is good to make accessories”, 50% (n=4) believe that “parts of the maned wolf are good for remedies”, and 12.5% (n=1) believe that “the maned wolf’s skin is good for accessories”.

Attitudes towards nature and wildlife

Questionnaire 3: 20 respondents (zoo visitors)

Importance of nature (question 1)

All 16 respondents who have answered this question find nature highly important to them.

Are wild animals as important as... (question 2)

Out of all 20 respondents, 80% believe that wild animals are as important as people; 55% believe that wild animals are as important as pets, 55% believe that wild animals are as important as livestock, and 45% believe in all 3 statements

Contact with wildlife (question 3)

All 20 respondents had some type of contact with wildlife during the past year. Most of such experience (65.2%, n=15) was visiting a zoo, an urban experience, and 34.7% (n=8) involved either observing, feeding or photographing wildlife.

Wildlife-related activities (question 4)

When asked "how much would you miss wildlife-related activities if no longer available?" all respondents stated they would miss wildlife-related activities if no longer available.

Beliefs about wild predators (question 6)

97.2% of responses indicate positive beliefs, the most popular being "wild predators are part of the ecological web", 22.2% (n=16), and "wild predators are essential to maintain nature's balance", 19.4% (n=14).

Attitudes towards hunting (question 5)

The majority of respondents (80%, n=16) believe the hunting prohibition is fair, while 10% (n=2) believe that animals that are disappearing shouldn't be hunted, and 10% believe hunting for food should be allowed.

Zoo staff: biology and education professionals and degree students, volunteers, apprentices.

Questionnaire 5: 12 respondents; questionnaire 6: 7 respondents.

Positive and negative beliefs towards general public/students (question 1)

Most responses reflect a negative image (73.9%, n=17) of the general public and students. The most popular belief is that they "know nothing or close to nothing about the maned wolf" (47.8%, n=11), followed by "they are not interested in the conservation of the maned wolf" (26%, n=6). 21.7% believe they "feel sympathy for the maned wolf".

Relationships between professionals and public/students (questions 7 and 8)

Respondents were asked "what sort of problems/obstacles do you find to spread conservation/environmental education ideas to the general public/students?" Most respondents cited a "lack of receptivity/ support from public" (33.3%, n=4) and "lack of awareness of maned wolf's importance in nature" (33.3%, n=4). 25% (n=3) of respondents cited "lack of support from government", and 25% found no obstacles to the task.

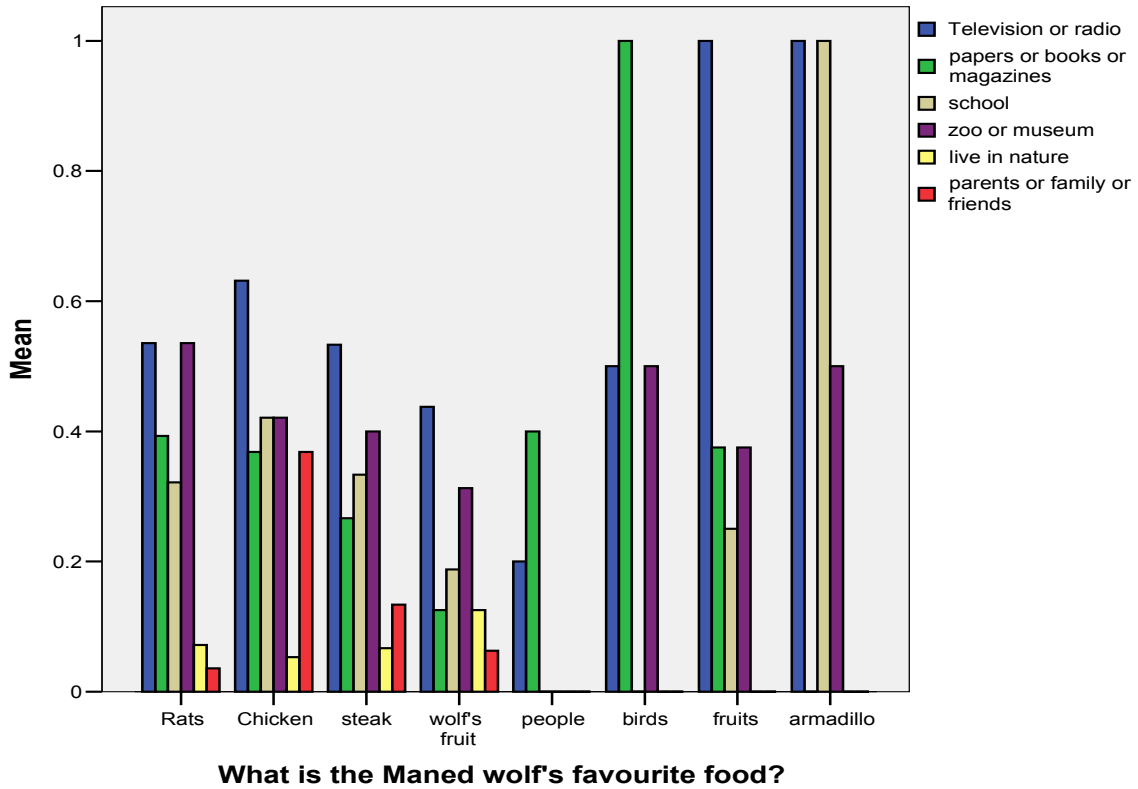
When asked "how to improve relations between conservation and environmental education professionals and public/students" the most popular replies suggested "more effort and quality on the part of educators/biologists" (50% of respondents, n=6) and "better education to raise interest in nature from childhood" (50%, n=6).

Table 1. Table cross-referencing responses from questions 2 (Where did you hear about the maned wolf?) and 3 (What is the Maned wolf's favourite food?). Total respondents=76 (Questionnaire 1)

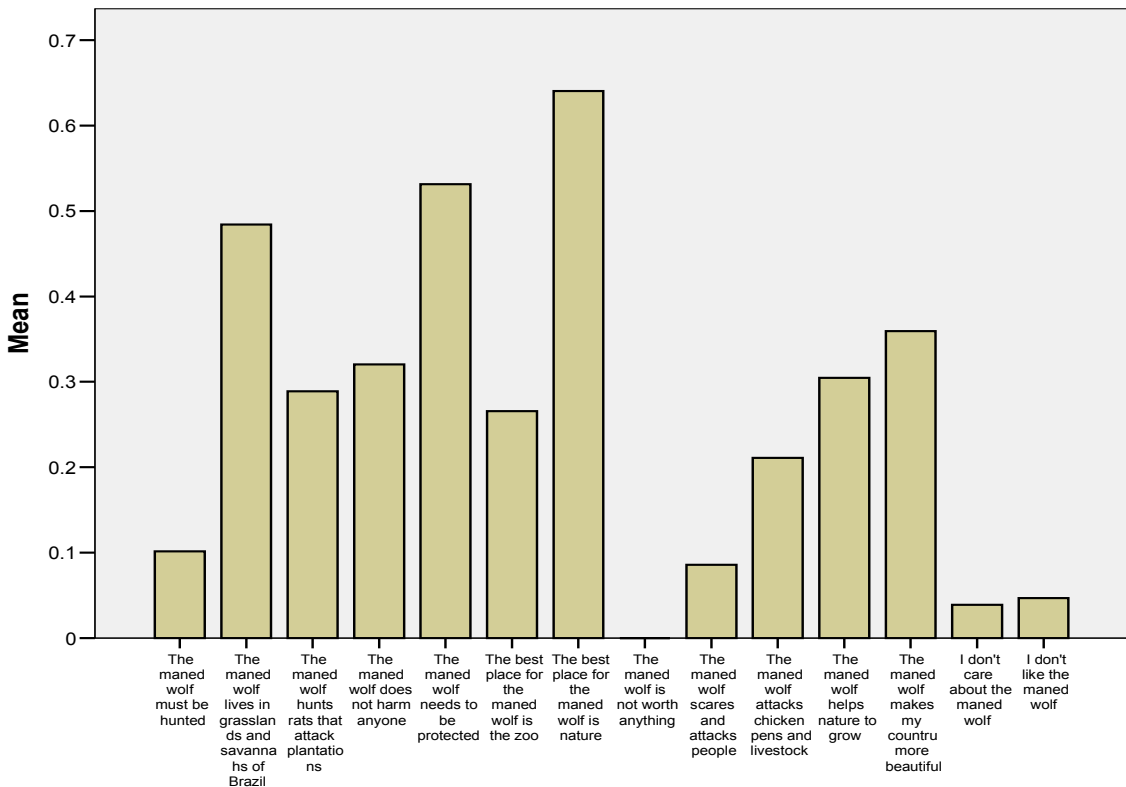
	What is the maned wolf's favourite food?								Total
	animal origin					plant origin			
Source of information	Rats	chicken	steak	people	birds	Arma-dillo	wolf's fruit	fruits	
Television or radio	13	11	8	1	1	2	6	8	50
papers or books or magazines	11	7	4	2	2	0	2	3	31
school	8	8	4	0	0	2	3	2	27
zoo or museum	12	8	4	0	1	1	4	3	33
live in nature	1	1	1	0	0	0	2	0	5
parents or family or friends	1	7	2	0	0	0	1	0	11
Total	46	42	23	3	4	5	18	16	157
Total animal/vegetal origin	123						34		

Table 2. Table cross-referencing responses from questions 6 (Do you agree with the following statements?) and 7 (What do you think about the maned wolf?), questionnaire 1 which relate to attitudes and beliefs about the maned wolf.

Beliefs/ Attitudes & feelings- positive image	positive beliefs										negative beliefs						Total responses
	lives in grass lands and savannahs of Brazil	hunts rats that attack plantations	does not harm anyone	needs to be protected	best place is nature	helps nature to grow	makes my country more beautiful	must be hunted	not worth anything	scares and attacks people	attacks chicken pens and livestock	I don't care about the maned wolf	I don't like the maned wolf	Total responses			
Good	27	18	23	32	38	17	23	3	0	0	13	2	3	199			
Beautiful	29	14	19	34	38	17	24	2	0	4	13	1	2	197			
Brave	31	24	18	32	42	18	24	6	0	6	16	3	4	224			
Harmless	14	9	13	16	19	9	10	3	0	1	5	2	3	104			
Defensive	14	10	11	17	22	12	12	4	0	1	6	2	2	113			
Nice	18	14	15	23	26	14	17	1	0	0	7	1	2	138			
Useful	23	19	16	26	29	16	22	5	0	2	9	2	1	170			
Worthy	28	22	19	34	39	18	24	4	0	4	13	2	2	209			
Funny	14	13	9	13	20	9	11	1	0	2	7	2	2	103			
Welcome	16	12	16	22	23	12	13	1	0	1	6	1	0	123			
Tame	12	6	11	13	17	8	9	1	0	0	5	2	1	85			
Total>4	226	161	170	262	313	150	189	31	0	21	100	20	22	1665			
Beliefs/ Attitudes & feelings- negative image	lives in grasslands and savannahs of Brazil	hunts rats that attack plantations	does not harm anyone	needs to be protected	best place is nature	helps nature to grow	makes my country more beautiful	must be hunted	not worth anything	scares and attacks people	attacks chicken pens and livestock	I don't care about the maned wolf	I don't like the maned wolf	Total responses			
Bad	4	4	2	5	6	4	2	3	0	1	3	0	1	35			
Ugly	7	6	2	7	11	6	4	5	0	1	6	1	2	58			
Coward	2	0	2	1	2	1	3	1	0	0	0	0	0	12			
Dangerous	14	12	6	13	17	9	12	4	0	4	10	1	1	103			
Aggressive	14	10	8	13	17	7	10	3	0	4	8	1	2	97			
Dreadful	9	6	4	10	12	6	5	5	0	2	6	1	2	68			
Useless	5	3	3	2	6	3	3	2	0	1	2	0	1	31			
Worthless	4	4	3	2	5	3	3	3	0	1	2	1	2	33			
Scary	5	3	3	7	7	5	3	4	0	2	2	0	1	42			
Inconvenient	8	5	5	9	12	5	5	1	0	2	4	1	2	59			
Ferocious	20	15	13	23	30	11	16	6	0	5	12	1	2	154			
Total <4	92	68	51	92	125	60	66	37	0	23	55	7	16	692			
Overall total	318	229	221	354	438	210	255	68	0	44	155	27	38	2357			



Graph 1. Where did you hear about the maned wolf? Sources of information (mean) about the maned wolf, as indicated by respondents in questionnaire 1 (question 2).



Graph.2. Visitor and schoolchildren's beliefs about the maned wolf.