

The Use of Green Iguanas in Fonseca, Colombia

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BACKGROUND

In Fonseca, a small town in La Guajira, in the Caribbean Region of Colombia, consumption of the meat and eggs of the Green Iguana *Iguana iguana* is well established in the local diet. The meat is in great demand owing to its apparent good flavour and the common belief that consumption confers medicinal and aphrodisiacal benefits; the eggs are also widely eaten. In the last 30 years, the hunting of and trade in Green Iguanas in La Guajira have reportedly declined by up to 80% according to the only investigation undertaken in this town into the harvest and trade of this species (Palacio *et al.*, 1999). This decline has been compounded by low rates of reproduction and the rapid transformation of the species's habitat (Peters, 1993). To make up for this shortfall, specimens are brought to Fonseca from neighbouring regions which, in turn, has contributed to a decline of the species in other parts of the Caribbean region by some 40% to 50%, according to Palacio *et al.*, 1999. The Green Iguana is listed in Appendix II of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), which includes species not necessarily yet threatened, but which could become so if trade is not strictly controlled. Although the species is classified in the Colombian Red Book of Reptiles as of Least Concern (LC) nationally (Castaño-Mora, 2002), it is highly exploited (Muñoz *et al.*, 2002) and trade in the species is a profitable business (Echeverri, 2004). A government permit is required for all forms of hunting of this species in Colombia, apart from hunting for subsistence purposes to allow indigenous groups and poorer members of the community to continue to use wildlife in traditional ways. The law in relation to commercial hunting is seldom enforced however (B. Bock, *in litt.* to TRAFFIC International, 1 February 2013), and consumption of iguanas is widespread in the town, with specimens commonly available in Fonseca's restaurants.

A study into the status of the Green Iguana has never been undertaken in the department of La Guajira in any detail and



GREEN IGUANA. IGUANA IGUANA. DAVID LAWSON / WWF UK

no qualitative data are available. The authors set out to determine the extent of the trade and to find ways to establish a management strategy based on the perceptions of Fonseca's residents and scientific knowledge of the species and its habitat requirements. They explored a range of measures following Ojasti and Dallmeier, 2000, with a view to developing a project to ensure that use is linked to the region's cultural traditions, enabling communities to manage this resource sustainably and legally.

INTRODUCTION

The principal market for the trade in Green Iguanas is along the Atlantic coast, mainly in the municipalities of San Marcos, Cienaga, and Talaigua Nuevo, where wholesalers handle iguana meat and an estimated 18 million iguana eggs a year (Baptiste *et al.*, 2002). While the consumption of the meat takes place year-round, eggs are only available during the animals' reproductive period (February to April). The high income derived from these sales has resulted in an increased interest in this commodity from traders in the region, and an apparently thriving illegal trade.

Research for this study was carried out in the municipality of Fonseca, south-east of La Guajira in northern Colombia, approximately 120 km from Riohacha, the capital of La Guajira. The municipality has a population of 30 000 inhabitants, 78% of whom live in urban areas



Fig. 1. Location of the municipality of Fonseca, La Guajira, Colombia.

and the remainder in rural locations. The department of La Guajira shares a border with Venezuela at the city of Maicao (118 km from Fonseca), creating an economic bridge between the two nations (Alvarez *et al.*, 1998). In cities near the border, many struggle for a secure livelihood, which adds to the appeal for quick and easy business, boosted by a black economy, thereby increasing illegal street sales (Alvarez *et al.*, 1998).

METHODS

Surveys were conducted between 24 July and 12 August 2011 by way of direct observation of the study area and semi-structured interviews (Bonilla-Castro and Rodríguez, 1997) designed to determine the general knowledge, perception and use of the species by the inhabitants of Fonseca. Some 90 surveys were undertaken in urban areas throughout the town, and a further 90 surveys took place in the rural villages of Potrerito, Hatico and Confusión.

Nine people with an apparent deeper understanding of this species in the region were selected for interview, including a police officer, a veterinarian, three people who profit from the preparation and sale of iguanas, an illegal trafficker, a former iguana hunter, and an animal trader; a Catholic priest was questioned about any religious beliefs attached to the consumption of iguanas during Easter. The small number of people selected for these more in-depth interviews was owing to the fact that most people appeared uneasy discussing the subject, and believed the authors to be police or environmental control officials. The interviews were documented in written form as the respondents did not allow the use of voice recorders.

A project management software programme, Miradi, was used to design conservation strategy methodologies to define the scope and objectives of the project. Data were analysed and the results adapted into a work plan that could be shared with the community to enable more effective and efficient implementation (FOS, 2008).

In addition to a literature search in libraries, the authors undertook research for the study at the Ministry of Environment and Sustainable Development.

DISTRIBUTION AND STATUS

The Green Iguana is a herbivore that feeds on leaves, fruit and seeds. It is found mainly in forests of the countries of the Caribbean Sea, from Mexico through the Orinoco and Amazon drainages and into Paraguay (Bock, 2013), and can grow to 1.65 m and weighs about 3.5 kg. Sexually mature at two years, mating occurs in October and November, with young usually produced between January and February. The reproductive season varies but is always timed so that eggs are laid in mid-dry season so that hatchlings emerge just as the rainy season begins (Bock, 2013); initially eight eggs are produced on average, but mature adults can lay up to 60 eggs; the average is 30.

LEGISLATION

The Green Iguana is classified in the Colombian Red Book of Reptiles as LC (Least Concern) (Castaño-Mora, 2002). The species is listed in CITES Appendix II which includes species not necessarily yet threatened, but which could become so if trade is not strictly controlled. In Colombia, all forms of hunting, with the exception of hunting for subsistence purposes, requires the issuance of a permit under *Decree Law 2811* of 1974 of the Código Nacional de los Recursos Naturales Renovables y de Protección del Medio Ambiente (National Code for Renewable Natural Resources and Protection of the Environment). This law recognizes six types of hunting: subsistence; commercial; “promotion” (to obtain stock for zoos or farms); scientific; sport; and for the control of pest species (B. Bock, *in litt.* to TRAFFIC, 1 February 2013).

Despite the ban on commercial sale without a licence, legislation in Colombia relating to the harvest and trade in bushmeat is rarely implemented, and violations are seldom prosecuted. Green Iguanas and their eggs are openly on sale in local markets; animals that are being transported or offered for sale are confiscated only occasionally and fines/imprisonment for such offences are rarely imposed. According to *Decree Law 906* of 2004, offenders are not permitted to be kept in custody for more than 36 hours without being prosecuted.

CONSERVATION AND ENFORCEMENT EFFORTS

In order to mitigate the human impact on the species, some non-governmental organizations, government wildlife agencies and the national police have sought solutions to the trafficking. Non-commercial animal breeding farms have introduced individuals into their natural habitats to replenish populations. These farms are a conservation tool (Primack, 2001), however illegal trafficking has not been successfully eradicated. An investigation into the conservation value of iguana farming in Central America concluded that it is extremely unlikely that the release of iguanas (*Iguana iguana* and *Ctenosaura* spp.) have benefited local populations (Stephen *et al.*, 2011). The report cites the potential for spread of disease into wild populations, genetic mixing of populations and outright futility of releasing captive-bred iguanas into areas where they already exist, as meriting consideration owing to their potential negative impact on iguana conservation.

Decree Law 611 of 2000, Article 3 (ADA, 2000), refers to the farms as being used for maintenance, breeding, promoting and/or use of wildlife species in an area clearly determined, for scientific, commercial and industrial, rehabilitation or subsistence purposes. This has led some authors to believe that it is possible to achieve a balance between conservation and the sale of products from animals raised in captivity (Damania and Bulte, 2006; Abbott and van Kooten, 2011). This strategy promotes conservation from the generation, promotion and implementation of sustainable productive alternatives (Ministerio del Medio Ambiente, 2002).

In the region of La Guajira, there are often reports of arrests of people involved in the illegal trade of iguanas or iguana eggs that have been imported from neighbouring departments owing to the local shortage of specimens. These individuals are taken into custody but released after a short time and the meat and eggs are confiscated.

RESULTS

In the rural and urban areas of the town, the authors implemented a survey of 180 people on the uses, perceptions and illegal trade of Green Iguanas. Nine people with greater knowledge of the subject were later interviewed in more depth to provide any additional insights and to elaborate the information gathered from the surveys.

From the surveys conducted in urban areas, 82% of respondents believed that iguana numbers in the region were depleted, which they attributed to overhunting (62%), consumption (35%) and other factors (3%), including poor regulation by the authorities and a lack of education in the population. In rural areas, 77% of the people thought that iguanas were depleted, which they attributed to hunting (77%) and consumption (23%); 87% of respondents stated that they would be willing to purchase captive-bred specimens to eat if this took pressure off wild populations.

Consumption of Green Iguanas for food was the most common use given by respondents: some 97% of those surveyed eat or had eaten the reptile's meat or eggs; all of this meat was derived from hunted specimens. While egg consumption was a recognized practice by those approached during the surveys, this study was not conducted during the egg harvesting season, so little information on this harvest was gathered, with the exception that 66% of people related the time of iguana reproduction to the period for iguana egg consumption.

Robinson and Redford (1997) and Ojasti and Dallmeier (2000) noted that Green Iguanas are kept as pets, but the authors found such use to be uncommon in the survey area, occurring only when an individual had hunted very small specimens which were raised for consumption once the animal had reached a suitable size; some eight per cent of respondents (14 people) kept an iguana in captivity at home for such purposes. The use of the skin appeared to be non-existent in the town. One respondent said that the iguana was heavily hunted and that because so few remained in Fonseca, specimens were brought in from Valledupar, in north-east Colombia; he felt that if the hunting of iguanas continued at the current rate, the species would become extinct. One of the main reasons for the depleted numbers was, he maintained, that the iguana is an important, free source of food for many poor people with few alternative resources.

Furthermore, the perceptions of the nine people interviewed in depth were diverse, which contributed to the data collected from the surveys. Three of them believed that the reptiles contain aphrodisiacal properties, while another four believed that the consumption of the animal's fat could treat coughs and asthma.

Some 83% of all respondents believed that tourism would help the conservation of the iguana by providing

USES OF GREEN IGUANA IN FONSECA:



DAVID MARTINEZ

Food: Three of the nine respondents interviewed reported that they prepare the traditional dish of iguana stewed in coconut milk. According to one, the animals are thrown into boiling water to remove the skin; the meat is returned to the pot, together with tomato, onion, paprika and annatto—an orange seed which grows in the area, and coconut milk. The dish is served with Cassava *Manihot esculenta*. Stewed iguana can cost the equivalent of between USD1.5 and 2.5. During the course of discussions with people in the street, it was stated that iguana stew is the main dish served at the Festival of Return, which is celebrated at the end of August. The eggs are usually boiled for consumption.

Medicinal: The animal's fat is sometimes taken to alleviate coughs and asthma. According to one respondent, the fat from adipose tissue is extracted from the iguana with boiling water, heated with garlic, and a tablespoon of the oil is taken orally. Another said the fat is used to treat a "tight chest".

greater controls in relation to iguana consumption. They believed that increased tourism would generate development of iguana breeding farms, which would provide individuals with job opportunities.

Hunting

The Green Iguana is hunted year-round. It was mentioned that children are often seen gathering to hunt iguanas. One woman, who cooks iguanas for sale, said that during the week she would sometimes purchase iguanas from children for between three to four dollars each, depending on the animal's size, and then cook and sell them over the weekend. While the first author was told that there were no restrictions on hunting during the breeding season, some of those interviewed spoke of the "rules of hunting". A local shopkeeper interviewed mentioned that guns and slingshots are most commonly used to hunt specimens. Dogs were also frequently used to catch iguanas falling out of trees that the hunter shakes in order to dislodge specimens. Another hunting technique described the use of a long pole with a rope



Top: iguanas prepared for cooking;

Bottom: policeman talking to iguana street seller.

noose at the end that is placed around the neck of the sleeping animal and tightened. The animals are also killed with bow and arrow, and stones, which are among hunting methods described by Corpogujira (1993) and Palacio *et al.* (1999).

The authors interviewed an illegal dealer who explained aspects of the trade in detail, from methods of transport, prices, and earnings. For example, he had been arrested eight times for committing illegal wildlife trade offences and had been in and out of gaol. He became involved in the illegal trade of iguanas owing to the lack of job opportunities in the area: “Selling iguana is like selling gasoline, it is illegal but people do it”, he said. In Fonseca, the lizards are typically sold to restaurants and he is responsible for bringing specimens to Fonseca from the municipalities of Cesar, Atlántico, Bolívar and Magdalena. He explained that most iguanas come from Magdalena, in the municipality of Tenerife, which he claims to be the major source of iguanas. He purchased small specimens for USD0.50 and larger specimens for USD1.00, which he sold in Fonseca for USD3.00 and USD5.00, respectively. He said he spent USD250 bringing the iguanas into Fonseca, which covered the costs of petrol and other transport costs, leaving him with a profit of 120%. “How can I say that this is not good business?”, he said.

When the primary author first met this dealer, he had just received a shipment of 170 dead iguanas, with 200 specimens arriving on the day of the interview, less than three weeks later. The authors were told that during the egg-laying season—between December and February—it was possible to obtain 3000 eggs for USD50.00 and sell them for USD200 in Fonseca, which the dealer had done the previous season. Up to 36 000 eggs were once offered to him to sell, he stated, but he had declined the offer owing to fears of being gaoled.

In order to transport the iguanas, this dealer would either tape up the specimens so that they can be closely packed into suitcases, or live animals are placed under ice in styrofoam coolers to kill them, and fish are placed on top to prevent the iguanas being detected during any police checks. He indicated that this method was used to transport specimens from the municipality of Tenerife (Magdalena) to Fonseca.

When asked whether he would continue trafficking iguanas if he was arrested again, he said that the business was “100% profitable” and that if he were to be caught with live specimens, he believed that the iguanas would be released in the wild and he would be allowed to go free; if the animals were dead, he said that he would be taken into custody but released within 36 hours. He stated that the business was essential to enable him to support his family and that he would be glad if the trade was legal without the fear of being caught and convicted of a crime. He also hoped that the trade in meat and eggs could be managed as specimens were not reaching the age of reproduction. “In Magdalena, iguanas are killed and thrown into the river as they eat crops”, he explained. “Why can’t they just eat them if they are going to do that? In Fonseca people are dying of hunger, and not everyone has the chance to eat every day.”

Five of the nine people interviewed in depth said that the resource had been exhausted by overuse, while others believed that hunting had not depleted populations. Two of the people interviewed considered that the resource was still viable since the lizard produces many eggs, and consequently many iguanas. The illegal dealer said that while iguana populations had been depleted in La Guajira, there were still many iguanas in other departments such as Cesar, Magdalena, and Bolívar, which meant that iguanas would never become extinct, he said.

The iguana dealer was the only respondent to mention that consumption of iguana in the departments of Magdalena, Bolívar, Atlántico, among others, was believed to be akin to eating dog meat (which is considered to be a lesser meat), and that this animal is not hunted to be eaten, but rather because it is considered a crop pest in these locations.

DISCUSSION

In the municipality of Fonseca, the nine interviewees were aware of the hunting of iguana for meat and eggs that occurs in the area and a number mentioned the importance of the iguana in Fonsequero culture. An 89-year-old former iguana hunter said that a Fonsequero can forego any meat dish for one of iguana, which is considered unique, stating that “he who does not eat iguana is not Fonsequero”.

Many of those interviewed said that the tradition of iguana consumption was passed down from the Wayuu, an ethnic indigenous group, many of whom inhabit mountainous areas where the iguana is commonly available and the animal of choice for hunting.

One person explained how the culture of eating iguana was viewed with mixed feelings by the people of the municipality. Fifty years ago, eating iguana was looked down upon by the upper classes, who viewed its consumption to eating dog food, practised only by the poor, and carried out in secret. Today, however, everyone consumes iguana regardless of social class, the man stated.

When polled, fewer than half of the 180 respondents attributed eating iguana meat or eggs with conferring aphrodisiac effects. In Fonseca, fat derived from iguanas, and also from shark *Carcharhinus* species, is used to treat coughs and asthma; there is evidence that similar customs have been preserved in other cultures: in Brazil, it is reported that fat from the following species is extracted to treat asthma: *Dasyatis* sp., *Boa constrictor*, *Eunectes marinus*, *Caiman latirostris*, *Trichechus inunguis*, *Dasyatis novemcinctus*, *Sotalia fluviatilis*, *Sotalia guianensis*, *Inia geoffrensis* (Alves and Rosa, 2007). There is evidence that Honduran Indians used iguana oil to protect their skin from the sun (Flores, 1994).

CONCLUSIONS

The high consumption of Green Iguanas in Fonseca has generated a widespread perception that the species is in decline, a concern that needs to be investigated. It is clear that this species is exploited and almost all respondents, both in urban and rural areas, agreed that consumption for food was the primary use for this species in Fonseca. The animal is considered to be of cultural importance, with both medicinal and aphrodisiacal properties. It is therefore important that, as well as the value of this species as a food resource, its cultural significance be taken into account in any conservation strategy.

The apparent widespread decline of the Green Iguana in this area has prompted suggestions by residents about how to conserve this resource (Fig. 2). In urban locations, the establishment of breeding centres has been proposed and rural communities have suggested that regulation and public awareness need to be improved. These perceptions show that in both areas, people are aware of the need for conserving this species.

Conservation strategies obtained by implementing the methodology of The Conservation Measures Partnership (CMP, 2013), include environmental education, breeding farms, the use of coal-fired ovens (to prevent deforestation of

the iguanas' habitat for the purposes of wood burning), and ecotourism strategies. These are the most viable strategies in the area and should be implemented simultaneously. Funding for these should be sought from corporate environmental funding groups such as the Ministry of Environment and Sustainable Development and NGOs.

In conclusion, it is apparent that the trade in iguanas is having an impact on populations in other departments of the Colombian Atlantic coastal region, where the animal is not consumed but captured to meet the demand in La Guajira. The problem is exacerbated by the fact that offenders are not permitted to be kept in custody for more than 36 hours without being prosecuted, which means that law enforcement relating to this issue is negligible.

RECOMMENDATIONS

Owing to the extirpation of Green Iguanas in Fonseca, a study of the country's population of Green Iguanas needs to be undertaken to determine the impact of the trade and to establish which conservation strategies are required. To perform such a task, it is important to conduct a financial feasibility study so that the effectiveness of the strategy can be established.

The cultural importance of this species needs to be taken into account in any conservation strategy. If all social and political parties can be more united on the matter of wildlife management, these resources have a better chance of being sustained. However, it must also be considered that a growing population will make it increasingly difficult to manage the area's natural resources.

Environmental education programmes must be promoted in order to sensitize and engage civil society on the issue. This will help to control the resource and reflect the points made in the National Strategy of Illegal Traffic (Ministerio de Medio Ambiente, 2002), where it states that improving environmental education and teaching people how to assist in the conservation of the resource will help address overexploitation of this reptile species. An education strategy is one of the most important tools that can be used to mitigate the problem of overharvesting and one which can be applied to other species.

Ecotourism would be a valuable tool for conservation of the species as it would control the use of this resource, bring a new source of employment for local people and generate economic development of the region.

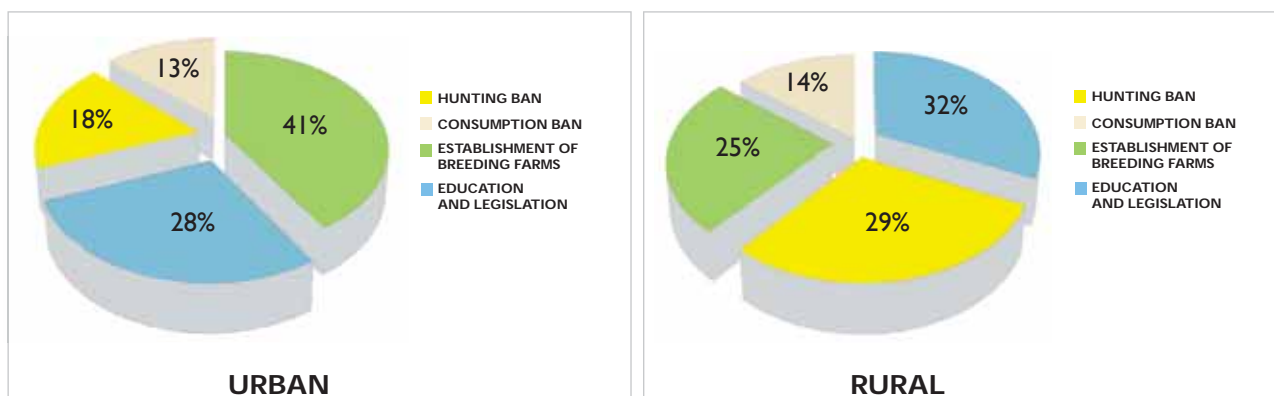


Fig. 2. Proposals for conservation strategies by respondents living in urban (n=90) and rural (n=90) areas.

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