

THE GEOGRAPHIC DISTRIBUTION OF THE BLACK HOWLER MONKEY (Alouatta pigra) IN CENTRAL AMERICA AND EFFORTS TO CONSERVE IT IN BELIZE.

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ABSTRACT. The geographic range of the black howler, Alouatta pigra, in Mexico, Belize, and Guatemala was established through first hand observations and by talking with area residents. All sites and probable sites of the species were under 1000 feet in altitude with a mean annual temperature above 25°C and a mean annual rainfall over 1000mm per year, coinciding with tropical evergreen and semi-evergreen rain forests. Alouatta pigra was most plentiful in reverine areas which showed flooding for some of the year.

Two areas of possible sympatry with A. palliata were noted. In all cases, troop sizes of A. pigra were extremely small, under 10 individuals, and infants could be easily sexed, in contrast to A. palliata which is known to occur in troops of 15-18, and is difficult to sex at an early age. The habitat of A. pigra is disappearing fast in Mexico due to logging and consequent cultivation. Howlers are commonly sold there as pets and for consumption. In contrast, the species ranges throughout Belize and may even be increasing in numbers. The pet trade is less obvious there although some howlers are kept as pets.

We have thus begun an experiment in conserving the tropical rainforest howler habitat on 18 square miles of private lands on the Belize River in Belize. Seven villages are participating and over 60 landowners have signed pledges to abide by a management plan for their land which would maintain a continuous network of forest strips for the conservation of the black howler monkey. Seven steps were involved in creating the Community Baboon Sanctuary which could be used in similar future projects: 1) identify the area for conservation, 2) contact the local people, 3) formalize a plan, 4) develop the site, 5) publicize the sanctuary, 6) expand the sanctuary, 7) formalize a self-sustaining structure for the sanctuary. Education helping the local people to understand and benefit from the sanctuary is the basis for sanctuary. Hiring a local person to act as sanctuary coordinator, collect data for wildlife management, continue an education program, and help develop tourism should help maintain a balance between land use and conservation of natural areas on sanctuary lands.

#### INTRODUCTION

Before 1970, it was thought that only one species of Alouatta inhabited Central America. Smith's (1970) investigations separated out two sympatric populations of howlers based on skull size, pelage coloration, and dentition differences, into Alouatta pigra which

inhabited the Yucatan Peninsula and A. palliata which inhabited the rest of Central America. Although A. pigra's species status is still not full accepted, those who have studied A. pigra see no conflict in accepting the two species. Besides the characteristics observed by Smith (1970) Horwich (1983a) has since noted the extremely small troop sizes, with a tendency toward one male groups, the easy sexing of young A. pigra, and the very different howling sounds between the two species.

A survey was conducted in 1983 (Horwich & Johnson, 1984, 1986) to establish a range for the species. Since that time Watts et al (1986) and Rico-Gray & Watts in press) have confirmed some of the range and added additional sites in the Yucatan to our original range map. A. pigra additionally occurs in areas around Puerto Barrios in Guatemala (J. Bucklin, pers. comm.). Figure 1 indicates an optimistic estimated range of the species based on these studies. Most probably most of the larger island areas which are shown are in effect, complexes of smaller isolated island populations separated by large cleared areas, which are often adjacent to roads. The population range of A. pigra follows the distribution of tropical rainforest in the area (Fig. 2a, from Horwich & Johnson, 1986), and seems to be limited to areas under 1000 feet in altitude (Horwich & Johnson, 1986). It had been hypothesized that the species was limited from expanding its range and perhaps isolated from A. palliata by the higher altitudes. Figure 2b shows areas over 1000 feet in altitude. During the 1983 survey, it became very evident that the range of the black howler was shrinking rapidly and especially in Mexico. Although we only visited the Tikal region of Guatemala, our impression was that although that population was thriving and well protected, other areas in that vicinity didn't appear very secure.

Conservation In Belize. Following the survey, a decision was made to work at conserving the black howler through creating a sanctuary for it. The two most populated areas we observed for A. pigra were in the Chable-El Joval area of Mexico and the Bermudian landing area of Belize. In Mexico at that time there were few Mexicans interested in conservation or conservation of primates. Monkeys were being killed for food and commonly being sold on the roads as pets between Palenque and Villahermosa (Horwich & Johnson, 1984). The forests were rapidly being destroyed, initially through logging whose roads then opened up the areas for consequent slash-and-burn agriculture by migrants. Estrada (1983) noted that the only major area left in Mexico was in the Lacandon Forest in Chiapas and has since noted a tremendous decrease in forested areas in the "Los Tuxtlas" area of Veracruz (Estrada & Coates-Estrada, In press). At El Joval, the monkeys lived in a very low forest and were evidently easy to capture as we noted one man who had eight infants which were supposedly being shipped to a zoo. The very disheartening lack of interest in Mexican wildlife led us to pursue conservation in Belize instead. In Belize, the human population level is still low and much of the country was and is still forest. The black howler, which was thought to have been decimated in the 1950's by yellow fever, seemed to be making a comeback and the Bermudian Landing area, in particular, had a thriving howler population, and historically had been known for its howlers (Hartshorn et al, 1984).

The one main obstacle to working with the area was that the land was all privately owned or leased for ownership by small landowners and farmers. Thus, the project took on a unique aspect by dealing with private landowners and since there was no precedent for how to act on such a project, we had to evolve our plan based on flexibility and creativity. In retrospect, there were seven steps which we took in creating the sanctuary. Sometimes the steps overlapped each other chronologically (Horwich & Lyon, 1987).

1) Identify the area. We selected the Bermudian Landing area because of the high population level, its adjacency to a large continuous area of active or potential howler habitat and the positive attitude the local villagers had toward the black howler which they call the "baboon" in creole English. Most of the villagers felt the howler was harmless to man because it did not disturb any food crops except occasionally to feed on cashew fruits in the area. Additionally, most of the creole people identified with the howlers as very human-like and therefore not aesthetically suitable for consumption. Many people often had stories they, or someone else had witnessed about behaviors which the howlers had performed which were very human like.

2) Contact the local people. Since I had already used the area for research in 1981 (Horwich & Gebhard, 1983, 1986), I already knew some of the local people knew some of the local people in the area. However, in 1983 we approached the village council of Bermudian Landing to see if they had an interest in a sanctuary for the howlers. We obtained a petition, signed by 16 landowners on whose lands the howler lived and the complete village Council, stating an interest in our pursuing the sanctuary idea. With that support we were easily able to get the approval from the Government of Belize, Area representative and the Ministry of Natural Resources to go ahead with the project.

3) Formalize the plan. We then placed the sanctuary on the agenda of a village meeting in 1985 and received formal approval from the village of Bermudian Landing to begin the "Community Baboon Sanctuary" in Bermudian Landing. The local people especially became excited by the prospect, when I noted that it was all voluntary. These small landowners, many who are subsistence farmers and who have chosen the area and its lifestyle, know the sense of freedom which come from owning your own land. This, the voluntary nature of what we were doing, appealed to them. We then mapped the lands of 11 landowners on the west side of the Belize River up and down river from Bermudian Landing. This initial three square miles became the original land of the Community Baboon Sanctuary (Fig. 3). We mapped each land parcel individually and approached the landowners with a map and a management plan for their land and asked them to sign a witnessed voluntary pledge to abide by our management plan. Although each was an individual plan, what we asked of the landowners were the following main requests: 1) leave a strip of forest along the river, which was already required legally by the government of Belize, 2) leave a strip of forest between property boundaries, 3) leave a forest strip surrounding their cut milpa areas, 4) leave an aerial pathway across any large cut areas, and 5) leave certain food trees

which are especially important for the howlers, such as fig trees. Many of these same trees are equally good feed for livestock as well, which eat whatever the monkeys drop to the ground.

4) Develop the site. We prepared vegetation maps of the area (Fig. 3), began developing an education program for the area, and located resources and the potential for tourism. Although I had initially not promised the landowners or villagers anything, I asked during the creation of the sanctuary, what they would like from the project. They all agreed that they would like me to pursue tourism which has been a goal ever since.

5) Publicize the sanctuary. With the interest in attracting tourism, we began publicizing the sanctuary both locally and in the U. S. We started the publicity slowly since there are only minimal facilities for tourists and we wanted the changes to occur slowly in the village.

6) Expand the sanctuary. Using the same methods, we approached the village councils of Flowers Bank, Isabella Bank, Double Head Cabbage, Willows Bank, St Pauls Bank, and Big Falls and brought the Community Baboon Sanctuary issue to the agenda of each village meeting. Each of the villages then formally agreed to participate in the sanctuary. We have since mapped and drawn up voluntary pledges and land management plans for the rest of the sanctuary which now includes about 18 square miles along 20 miles of the Belize River (Fig. 3). It now includes over 60 landowners and seven villages and we have plans to extend the area even further toward the Mussel Creek area which is a biologically import area for conservation. (Hartshorn et al, 1984). The present sanctuary area is estimated to include approximately 800 howler monkeys.

7) Formalize the structure. The most important step was that we have hired a local Belizean man to act as the Sanctuary Manager. The most important job he will do will be to continuously remind the landowners to live up to the conservation goals of their pledges. He will also teach, carry on management research, help in a riverbank reforestation program, census howlers, and manage a rural museum we are now building. A second main formalized structure we are imposing, is the writing of an operations manual for the sanctuary. This is needed because the sanctuary is so different from existing ideas of traditional sanctuaries that no one has been sure how to treat the sanctuary as a traditional park, writing guidelines for visitors and employees to follow, much as they would the laws of a traditional national park.

#### Description of the Community Baboon Sanctuary

Although the "ideal" sanctuary would be the protection of a virgin area of forest from all invasion against the flora and fauna of the area, we no longer have the luxury to consider just these kinds of sanctuaries. We are at a point where forests are being lost at such a rapidly increasing rate that we must look to every possible method and idea which will preserve any type of forest, even if it means

that it is a disturbed or even cultivated forest, which is a preferred situation to large expanses of cattle raising grasslands.

The Community Baboon Sanctuary is a very disturbed area. It is a mosaic of many habitats, dominated by young forested areas which are successionaly returning from milpas cut 30-35 years ago. The main area within the Community Baboon Sanctuary is riverine forest termed subtropical moist (Hartshorn et al, 1984) or medium high semi deciduous forest (Pennington & Sarukhan, 1968), ranging from one to 75 years in age (Lyon, MS). There are occasional large trees, especially tubroos (Enterolobium cyclocarpum) which have been left for some economic reason or because the tree is too difficult to fell. Some may be well over a hundred years of age. The pine ridge is where most of the villagers live. These town centers rest on sandy soil, and are more open with less insects.

The villagers move out from these areas to farm their milpas on the richer riverine and cohune forest soils. There are also pastures or cohune palm (Orbignya cohune) pastures which are of little value to the howlers and other wildlife unless they have water runoff areas with trees or if special food trees have been left which the howlers might feed on. Finally, much of the river edge which has been cut, has grown back into bamboo thickets (Guadua spinosa), a very fast and dense growing bamboo with dangerous thorns. It is a very water loving species and is mainly found along the riverbanks.

Human use is very much a part of this sanctuary and it is taken into consideration in all aspects of the sanctuary work. We have incorporated it into studies of succession and into an education program to show foreign tourists how the local creole people live and farm in the area. The creole villagers use traditional slash-and-burn methods of agriculture which are presumably learned from the Mayans. It is a successful method if enough land is available. In the Community Baboon Sanctuary, each landowner has about 50-200 acres, averaging 85 acres per landholder (Lyon, MS), which is enough to allow forest regrowth and nutritional recycling which takes about 15-20 years following slash-and burn agriculture. The forest is cut and the debris piled in mid to late dry season. After a drying period the cut materials are burned. Although cutting reduces the use of the full amount of nutrients, burning concentrates the remaining nutrients for the initial growing season. The seeds of corn or rice are planted by hand using a sharpened stick to make a shallow hole where a number of seeds are placed. Herbicides are often used to keep down the forest regrowth allowing the new plants to grow (Lyon, MS). Eventually we would like to look for alternatives to the use of herbicides and pesticides, some of which are not sold in the U.S. because they are considered too dangerous. Although the land is basically in a healthy cyclic balance, there are many instances of riverbank erosion which we hope to rectify by replanting cut riverbanks with seedlings and living fenceposts. In addition, many hardwood tree species have been logged from the area. We hope to replant or reintroduce some of them for eventual harvesting by future generations.

Despite hunting, which has depleted populations of specific hunted species, such as whitetail deer, red brocket deer, collared peccary, guan, and curassow, an incomplete survey shows that the forested area supports a rich diversity of over 170 bird species as well as most of the area mammals, reptiles, and amphibians. We are interested in beginning to work with some of the other depleted and endangered animals.

We have started a study to gather baseline reproductive information on the Central American river turtle or hickety (Dermatemys mawii) which is commonly eaten, especially during the Easter season. This species has the same limited range as the black howler and is the only remaining species in its family. One problem is that these animals are hunted during the dry season when they seem to congregate in areas which are more easily accessible to divers who can capture 100-200 in a few days. We will try to monitor the hunting of this species, take reproductive biological data to determine the breeding season, and attempt to establish guidelines which could be used in maintaining seasons and methods of hunting the turtles. We would also like to establish methods to attract or encourage other wildlife species and perhaps reintroduce species that were once in the area but have since disappeared.

Finally, the howlers which are the main emphasis of the sanctuary, will be censused twice per year to determine population trends for their continued management. We have already taken some baseline ecological data and plant phenology data which will help in the knowledge and management of the species.

### Sanctuary Functions

The sanctuary will serve four main functions of conservation, research, education, and tourism.

**CONSERVATION-** The sanctuary was established primarily to preserve the black howler monkey but by maintaining a continuous webwork of forest throughout the area, it will also provide continuous habitat for many smaller animals including migratory birds from North America. As noted, we will work with other plant and animal species to make sure they are maintained or reintroduced. We will work to manage this network of forest to maintain the riverbanks and the river, which will consequently maintain a higher water table for the area, and allow a continuous area for genetically continuous populations of monkeys, birds, and other animals. This forest network should also provide for continuous reseeding of the cut areas and reduce the time during which nutrient regeneration can take place. Finally, we hope that by managing the forest, we will be able to retain a higher quality of rural life for those local residents who choose to live there.

**RESEARCH-** We hope that research will integrally combine with education and conservation. We will be taking baseline data on forest phenology, succession of the riverine forest, including soil analysis of the successional process, continual population censusing of the

howler population, baseline ecology of the howler, and we will begin taking baseline data of the productive seasonality and growth processes of the Central American river turtle. We may attempt to institute an experimental rearing of the turtles for possible "farming" of the species to reduce some of the pressure produced by hunting of the wild population. We will also encourage other research projects, including ones on how to make more efficient use of the land by upgrading farming practices to reduce the amount of forest needed to be cut.

**EDUCATION-** Education at many levels has been at the basis of the project. The process of creating the sanctuary was done by one-on-one talking to and educating the villagers about the growing conservation needs for the area. We have begun developing booklets, lectures, and curricula for school children to be used and taught both in the classroom and the sanctuary as a field classroom. We have developed and will continue to improve a trail system which will be used for teaching tourists and local school classes. We have written a series of sign texts which we have numbered in the forest for reference by the tourists to a handout.

**TOURISM-** At the interest of the villagers, we have begun to develop tourism in the area. Despite the lack of many amenities which tourists often require, we have been offering a "bed-and breakfast" tourism in which tourists stay with and take their meals with the local creole families. Tourists have been increasing in numbers in 1987 and this rural experience for tourists has been successful on a small level. We will now try to formalize it by setting prices and by having the Sanctuary Manager work as a liason between the tourists and their local hosts. We have also been encouraging local craftsmen to provide crafts to be sold to tourists. Once we have an office in our museum, which is to be built this year, we will have a place to sell these crafts which should further encourage the trade.

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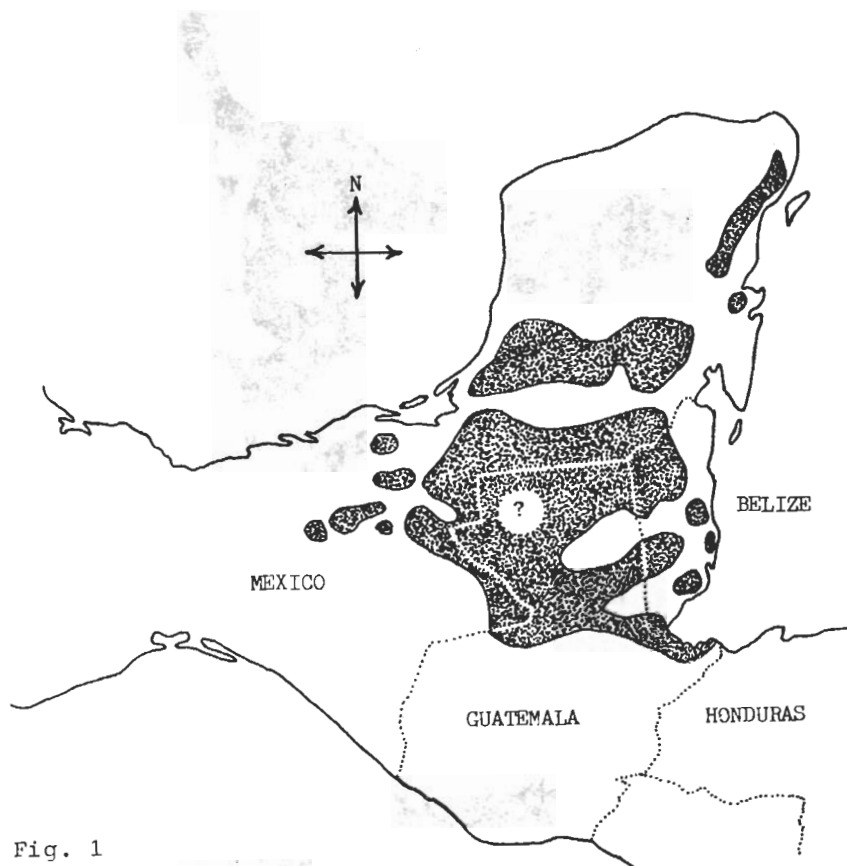


Fig. 1

Geographic Distribution of the Black Howler Monkey in Central America

Fig. 2

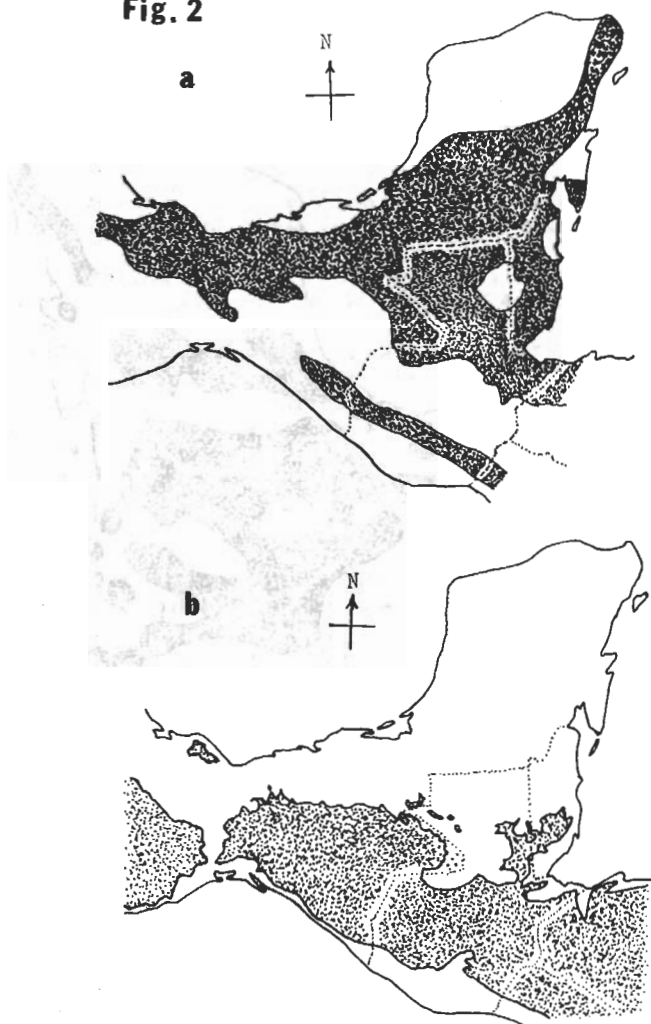


Fig. 2 a) The distribution of the tropical rainforest in México, Guatemala and Belize. b) The distribution of areas over 1000 feet in altitude.

# COMMUNITY BABOON SANCTUARY

1987

Fig.3

