A Reintroduction Program for the Conservation of the Black Howler Monkey in Belize

by

Robert H. Horwich, Fred Koontz, Ernesto Saqui, Hermelindo Saqui and Kenneth Glander

The reintroduction of black howler monkeys *(Alouatta pigra)* into the Cockscomb Basin Wildlife Sanctuary (CBWS) in Belize was considered as part of a broader effort to conserve the species. The goal was to re-establish a viable population of *A. pigra* in the Cockscomb Basin (a fully protected area where the species had become locally extinct in 1978) by transferring wild-caught animals from the Community Baboon Sanctuary, an area about 100km north of the Cockscomb Basin that contains a healthy population of howlers. The establishment of the CBWS area as a protected area with its recent enlargement to over 100,000 acres created a situation of safety for the species from hunting which caused its earlier local extinction.

The project was preceded by a careful investigation including a trial of the capture technique, a survey of howler populations and habitats surrounding the area of reintroduction, a survey of the availability of food resources and a study of the phenology of the food resources, before a decision was made to proceed with the reintroduction.

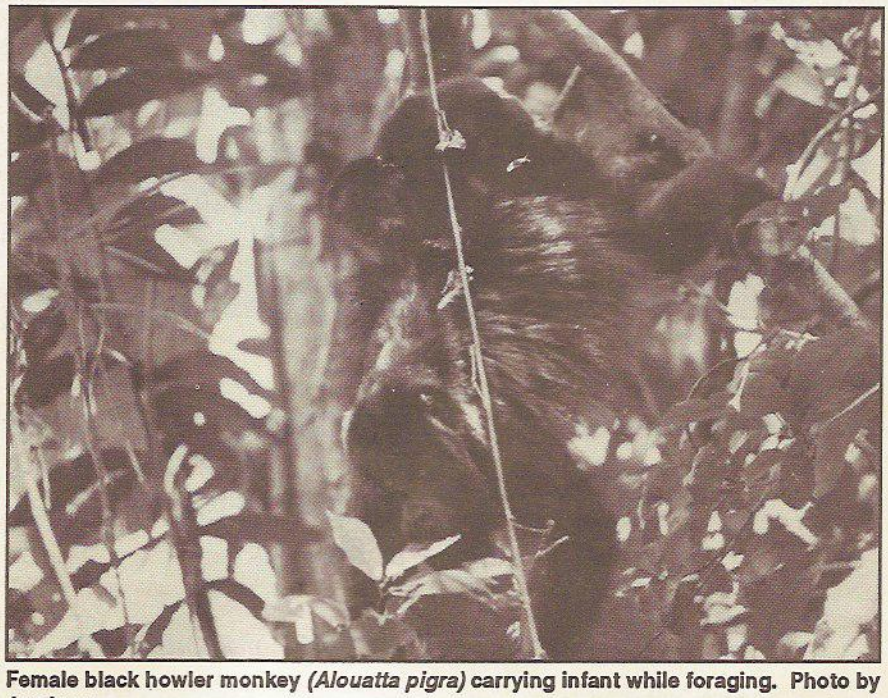
Black Howler Status and Conservation in Belize

While once thought to be a subspecies of the mantled howler *(Alouatta palliata)* which ranges throughout Central America, increasing morphological, behavioral and genetic evidence has defined *A. pigra* as a separate species (Smith 1970; Horwich 1983; James, pers.comm.). Due to its limited range within the Yucatan Peninsular area in southern Mexico, northern Guatemala, and Belize, the species is listed as "threatened" under the U.S. Endangered Species Act, Appendix II of CITES, and "insufficiently known" by IUCN (Wolfheim 1983; IUCN 1990). Although its range has been shrinking into isolated islands (Horwich and Johnson 1984, 1986) there are still healthy, growing populations in Belize.

One of the most populated areas for the black howler occurred on private lands of subsistence farmers along the Belize River in Belize. The Community Baboon Sanctuary was thus established, on the premise that only a limited amount of tropical forest can be maintained in its pristine state, and that management practices of private lands under slash and burn cultivation could insure a better environment for the howler monkeys (Horwich and Lyon 1987). The program included seven basic steps which interwove four main goals of conservation, education, research, and tourism (Horwich 1989,1990). History and details of the program are reported elsewhere (Horwich 1986,1988, 1990; Horwich and Lyon 1987, 1988, 1990).

Since the Community Baboon Sanctuary was on private lands which were not totally protected, and since there were no major howler populations on totally protected lands in Belize, a reintroduction of howlers into CBWS was considered as early as 1986. At that time, the project proposed to research a method for translocating howlers and to highlight Cockscomb for both conservation and ecotourism.

However, a survey in March 1991 of known howler habitats in the vicinity of Cockscomb Basin indicated few howlers and a major threat to all rain forests in the area from a rapid expansion of the citrus industry. One small howler population was noted along the Sittee River, in an area only about 10km from the northern boundary of the Cockscomb, but we concluded that the location made these monkeys unlikely migrants into the Basin because of intervening higher areas, >300 meters, altitudes that seem to be avoided by *A. pigra* (Horwich and Johnson 1986). Two howlers were re-



Female black howler monkey *(Alouatta pigra)* carrying infant while foraging. Photo by Jon Lyon.

ported in 1990 to have lived for about a year near Maya Center, a village situated 9km from the sanctuary's eastern boundary, and were thought to have dispersed from the same small population along the Sittee River by outskirting the high Cockscomb Basin's perimeter. These two animals eventually disappeared; one animal was killed by villagers, the other moved east, away from the Basin (Saqui, pers. obs.). No other black howlers have been reported in the area, nor have any howlers been seen inside the Basin since 1978 (Saqui, pers. obs.; Kamstra 1987).

Alouatta pigra is not confined to undisturbed rain forest as was once thought (Smith 1970) but can utilize all successional stages of forest including secondary growth (Horwich and Johnson 1984). The species is highly arboreal, and does not normally travel on the ground, preferring to use aerial pathways. This arboreality makes natural recolonization of disturbed areas difficult or slow at best even when impediments to their survival have been removed as in Cockscomb Basin.

There is a wide variety of reasons to relocate animals, from conservation to compassion (Caldecott and Kavanagh 1983; Campbell 1980). Although rapid forest destruction may be making translocation an unrealistic prospect in many areas (Strum and Southwick 1986), it is still possible in Belize. Since the basic points for reintroduction at Cockscomb were met (Konstant and Mittermeier 1982; IUCN 1992), reintroduction through the translocation of wild animals was deemed a necessary alternative to natural recolonization.

Because howlers are adaptable to small areas and can utilize all ages of forests, reintroduction becomes a distinct possibility once an area has been made safe for them from hunting and major forest cutting. It can also be used when areas become too minimal and when major forest destruction can be foretold. Since howlers can be successfully captured with a very low mortality rate (Glander et al. 1991) and since a great deal of food choices have been recorded, reintroduction has great future potential (Strum and Southwick 1986).

Previous Howler Reintroductions

Despite the favorable possibility of reintroducing howlers, few reintroductions have been carried out (Konstant and Mittermeier 1982). Only 8 species of primates have been translocated with only 3 studied following the translocation (de Vries 1991). *A. palliata* has been successfully captured and marked in a number of situations in Costa Rica (Scott et al. 1976; Glander et al. 1991) and Mexico (Estrada, pers. comm.; Garcia-Orduna et al. 1987; Silva-Lopez, pers. comm.). In Mexico, Garcia-Orduna et al (1987) have moved a troop which was captured in an area of forest which was slated for destruction. The troop proved to be so disease-ridden due to its already deteriorated environment, that they were kept in captivity for a number of months (Silva-Lopez, pers. comm.) but have since been released on an island.

A serendipitous translocation of *A. pigra* was believed to have occurred in Belize. An informant noted that two juveniles were captured and escaped in an unpopulated area which is not very favorable habitat. However, they survived for two years and the informant noted that they are now breeding.

Red howlers have been translocated on large scales in Venezuela and Suriname to rescue them from flooded areas. However, in both cases there was no follow-up to measure the success of the reintroductions (Konstant and Mittermeier 1982).

A recent translocation of howlers occurred in Costa Rica in 1989 (de Vries 1991) as a rescue operation due to the construction of a hydroelectric dam. Two or three partial troops were captured with drugs, held overnight for 1–2 nights and released at two sites about one kilometer from each other. They were released in areas where there were no howlers residing but the area was adjacent to resident troops. De Vries (1991) noted a breakdown of the troop structure and a return to solitary living which he attributed to foraging technique and secondarily to interactions with resident howlers. The translocated animals also exhibited a high degree of movement following translocation and some had to

Endangered Species UPDATE

A forum for information exchange on endangered species issues
April 1993 Vol. 10 No. 6

Judy Tasse .....Editor
Otto Gonzalez .....Associate Editor
Terry Root .....Faculty Advisor

Instructions for Authors:
The *Endangered Species UPDATE* welcomes articles related to species protection in a wide range of areas including but not limited to: research and management activities and policy analyses for endangered species, theoretical approaches to species conservation, and habitat protection. Book reviews, editorial comments, and announcments of current events and publications are also welcome.

Readers include a broad range of professionals in both scientific and policy fields. Articles should be written in an easily understandable style for a knowledgeable audience. For further information, contact the editor.

Subscription Information:
The *Endangered Species UPDATE* is published approximately ten times per year by the School of Natural Resources and Environment at The University of Michigan. Annual rates are $23 for regular subscriptions, and $18 for students and senior citizens (add $5 for postage outside the US). Students please enclose advisor's signature on university letterhead. Send check or money order (payable to The University of Michigan) to:

Endangered Species UPDATE
School of Natural Resources
and Environment
The University of Michigan
Ann Arbor, MI 48109-1115
(313) 763-3243

Cover: A black howler monkey *(Alouatta pigra)* in Cockscomb Basin Wildlife Sanctuary in Belize. Photo by Andrew Goldberg.

The views expressed in the *Endangered Species UPDATE* are those of the author and may not necessarily reflect those of the US Fish and Wildlife Service or The University of Michigan.

Production of this issue was made possible by major support from the National Fish and Wildlife Foundation, with additional support from Chevron Corporation and the International Association of Fish and Wildlife Agencies.

Chevron

printed on recycled paper

be recaptured as they moved out of the study area.

De Vries (1991) mainly discussed the ecological follow-up of the translocated animals in comparison with some residents. The release was a hard release and there was little description of how the animals were held overnight. There was no mention of a survival rate or how long each was under observation. Of the 13 animals captured, 3 died in the translocation process and a fourth died at an estimated 2 months post-release. Four of the 10 originally released were recaptured after 6 months; no others were mentioned and presumably died or dispersed out of the study area.

Trial Howler Capture

Two major aspects of howler monkey biology were investigated before the reintroduction program could be carried out. We wanted to be sure that the capture technique used by Glander (Glander et al. 1991) could be successfully used on *Alouatta pigra*. Secondly, we wanted to investigate what type of food plants were available at Cockscomb, how many of them overlapped with available food at the Community Baboon Sanctuary, and what was the seasonal availability of fruits at both areas.

In 1990, using Glander's (Glander et al. 1991) methodology, 47 black howlers were captured without a loss or major injury. Once a monkey was darted and drugged, it was caught in a net by a team of people on the ground. In some cases, a monkey remained clinging to the branch and had to be captured by climbing the tree and releasing the grasping limbs. The howlers were then quickly weighed and measured and limb prints were taken. Pelage and other body marks were noted for later field identification. Each monkey was then marked by attaching a plastic tag on a metal chain around the leg. Additionally, blood was taken from all animals by Dr. Roxie James to begin gathering a genetic base for the population.

Howler Ecology and Selecting Release Time

The black howler, like the other five howler species found throughout Central and South America, is the most folivorous of the new world primates (Eisenberg et al. 1972). Although they lack a modified digestive tract found in many herbivores to accommodate a high cellulose leaf diet (Milton 1980), howlers do maintain a sluggish lifestyle, resting often over 70% of the day, allowing microbial fermentative digestion (Milton and McBee 1983) to better utilize its food resources (Milton 1980; Milton et al. 1979). *A. pigra* conforms to the howler lifestyle resting at times as much as 80% of the day (Horwich and O'Connell, unpubl. data).

Howlers utilize flowers, leaves, and fruit, specifically selecting the new leaves and ripe fruit when available. However, they are capable of eating mature leaves as well, especially before the main fruit production in April-May (Lyon, Young and Horwich, unpubl. data). Despite their use of mature leaves, the howlers' food supply is not unlimited as once thought since they only utilize about 20% of the available tree species and then select only specific individual trees from any species (Glander 1977, 1982). The new leaves contain high protein content and low cellulose (Milton 1979).

Research on *A. pigra* indicates it uses a low number of plant species per month, depending on them for most of its needs (Horwich and O'Connell, unpubl.). The part of the plant they feed on depends on the season, and the species variety may increase during periods of low fruit production in December and January. A list of species at the Community Baboon Sanctuary was compared with that known from the Cockscomb Basin (Kamstra 1987). An assessment of the environment of Cockscomb indicated an estimated 60% tree species overlap between the Community Baboon Sanctuary and the Cockscomb Basin (Young, pers. comm.) Lists of flora used by howlers in other areas were also used to help in determining potential food sources within the sanctuary (Coelho et al. 1976; Schlichte 1978; Estrada 1984; Estrada and Coates-Estrada 1986a & b).

Four years of phenology from the Community Baboon Sanctuary was

Adult, female black howler with a ball-chain radio collar used to track and monitor the monkeys after release. The transmitters were designed to have a longevity of 12 months. Photo by Fred W. Koontz.

available indicating a high level of fruiting in May. Additionally, the Cockscomb staff began a similar phenology study a year previous to the 1992 translocation. Data similarly indicated that May should be a good time for the translocation.

Individual Marking and Radio Telemetry

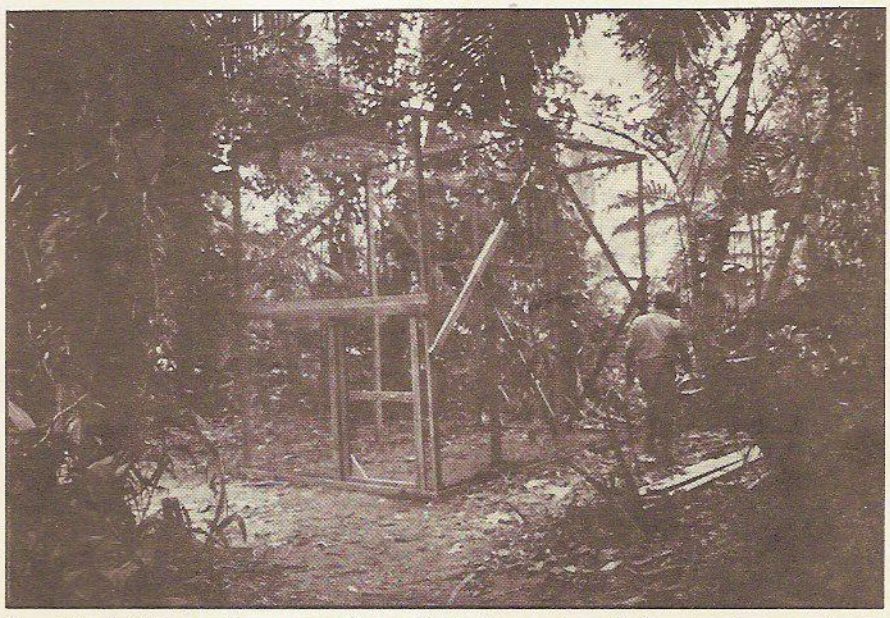
We tagged all adult monkeys with small (2.75cm diameter) Plexiglas donuts on ankle chains. This type of marking is moderately successful; some chains may slip off and a few may cause superficial leg injury when the chain wears into the skin which may scar around it. Individuals from each of the three troops were tagged with a troop color (blue, yellow, orange) for ease in sighting changes in troop cohesion.

Due to the large hyoid bone which occurs both in females and especially in males, attaching radio transmitters to black howlers is problematic. Six females were fitted with ball-chain collars and modest-sized transmitters (Model 125, Telonics, Inc., Mesa Arizona). This design allowed the transmitter canisters to rest posterior to the hyoid bone. Gas sterilized implantable transmitters were surgically placed between the shoulders of four males, one female, and one juvenile female by veterinarian Dr. Wendy Westrom (Configuration 2A, Telonics, Inc., Mesa, Arizona). Signals from all six subcutaneous transmitters were lost at about six weeks post-release. Two of the subcutaneous units were found on the ground, suggesting that despite being sutured in place under the skin, the units came out. The ball-chain collars, however, performed well for 6–10 months post-release, because they enabled us to locate the monkeys while they were establishing their new home ranges. Twelve of the original 14 translocated animals have been followed on a regular basis for ten months, by a combination of radio tracking and visual searching for the monkeys.

Mapping and Selection of Release Sites

Prior to release, in January 1992, approximately 15 kilometers of paths encompassing 6 square kilometers were mapped with tape measures and compasses. Trees along the trails were tagged with trail numbers approximately every 50 meters and other landmarks and waterways were mapped as well. Additionally, many trees labelled for the phenology study were included in the map.

Three release sites were selected which were thought to be over one kilometer apart. We hoped this distance between the release sites would prevent initial troop interactions and the consequent stress from having to immediately defend territories before having sufficient time to orient themselves to the area and its food sources. Once the mapping had been accomplished, two of the sites turned out to be only a half kilometer apart but since cages had already been built, the sites were used anyway. All sites contained known food trees nearby.



One of the holding enclosures used to acclimate the monkeys for two days before release. These are built in advance at the release site. Photo by Fred W. Koontz.

Caging, Transport and Captive Care

Two transfers were made a week apart, first using vans and then a British RAF helicopter. Capture proceeded as in 1990. The troop to be translocated was located the evening before for ease in location and capture the next morning. Following measurements, blood removal, health checks, ankle tagging and transmitter attachment, all howlers were placed singly (except for females with infants) in air kennels (used for pets). The kennels were then loaded in the vans and driven 5 hours to the site. In the second move, the kennels were carried to the helicopter for the 45 minute flight to Cockscomb.

Although we intended to keep the newly captured howlers less than a week in the release cage, we felt strongly that a short period of captivity would accomplish the following goals: 1. allow observation of animals for health reasons and observation of transmitter collar placement, 2. acclimate the troop to the new environment, and 3. reduce a stressful dash for freedom and encourage group cohesion upon release.

Cages 8' x 12' x 10' (width x length x height) were constructed from lumber and chicken wire at each of the three release sites. Each cage had a front door and an upper release door. Cages were provided with a series of branches and shelves including a feeding shelf which was located in front of the release door. Animals were provided with wild foods collected at the Community Baboon Sanctuary as well as fruits and vegetables purchased at a market. Dishes of water were also provided.

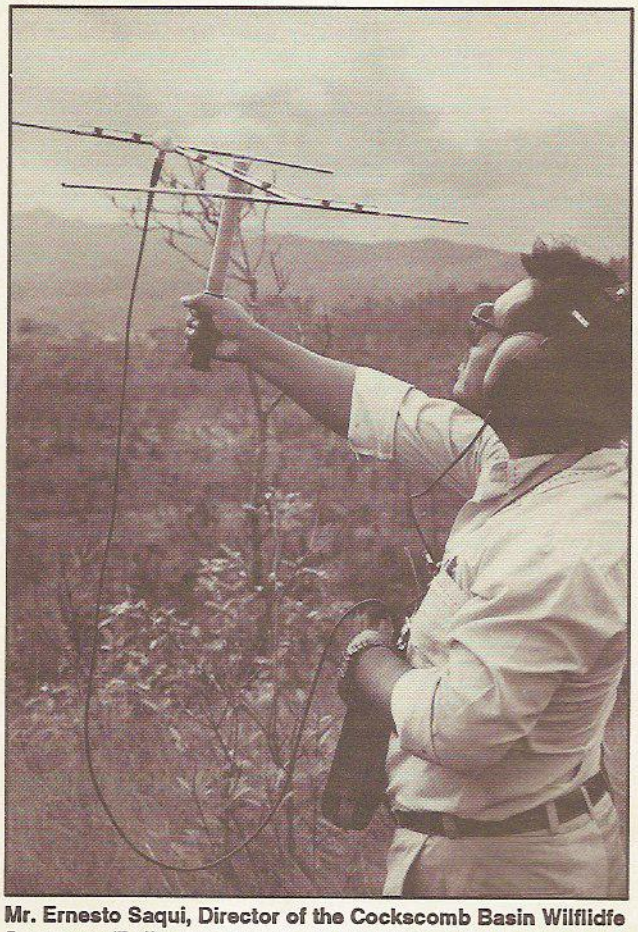
All troops were maintained for two days and nights, then released in the late afternoon. One troop was kept an additional night in traveling cages at the Cockscomb office because of lateness of arrival at Cockscomb. Observations were made on all troops from a blind. Most of the animals ate some of the wild and market foods and drank some water. All attempted to push against the wire to escape but this became more reduced during the second day. We decided to release them, because they were settling down, and, before any depression set in. We released them by opening the release door and allowing them to leave at their will. This occurred slowly but was sometimes hampered by one animal's escape which caused the others to push at the wire again, not knowing about the open door. In one case, all animals left the cage except for an infant who pushed at the cage corner crying. He was quickly captured and released to his mother who was waiting 15 feet above.

Monitoring and Success Rate

Once released, troops were radio tracked and observed with short visual checks every 1–3 days and with prolonged observations after a month. There was some indication that close following of the first troop may have encouraged flight and consequent troop breakup and dispersal. After 6 months, four of the 6 ball-chain collars had failed but monkeys could still be visually located within their established range.

Continual monitoring indicated successful long term survival rate of most of the animals translocated. After 10 months of observation, at least 12 of the 14 howlers are alive. Only one male and a juvenile were not seen again after 2 months. The juvenile is believed dead but the male was displaced and not seen again although roaring was recorded in the direction of his flight. Additionally, two infants, conceived in their original habitat, were born at Cockscomb in August 1992 and two other infants were born in January 1993. A total of 16 black howlers are now living in the Cockscomb Basin.

In contrast to the Costa Rican translocation, dispersal from the release sites was low. All animals remained within 2km of the release site and often moved in the vicinity of the release site. Although their total home ranges varied from 100–400 acres, they spent most of their time in considerably smaller core areas, especially after they became established at about three months post-release.



Mr. Ernesto Saqui, Director of the Cockscomb Basin Wilflidfe Sanctuary (Belize Audubon Society) radio tracking the released black howlers. The animals have been monitored for the ten months since release. As of March 15, 1993 at least 12 of the 14 translocated animals are alive, and an additional four babies have been born. Photo by Fred W. Koontz.

The first troop (one male, a female and her infant, and an old female) showed initial dispersal, possibly because we followed too closely after release. The old female dispersed about one kilometer and has been living alone. The other female and male came together again, but at eight weeks post-release, when they had an aggressive interaction with the large second group (two males, three females, one juvenile, and an infant), the male from the first troop left and was never seen again. This early interaction could probably have been avoided had the release sites been one kilometer apart as planned. The second troop, along with the female from the first troop, have formed a loose association within a core area. Four have stayed together and the females with young (including the two infants born in August) have formed an association at times. The third troop (one male and two females) have been very cohesive and remained in a core area of about 60 acres. They conceived and gave birth in January to two infants at Cockscomb.

We feel two factors led to less dispersal and more troop cohesiveness than occurred in the Costa Rican translocation: a lack of resident howlers in the area and the use of holding cages for acclimation. The holding cage seemed to allow the howlers to assess that they were in a totally different forest and to settle down before release. It also allowed us to adjust the collar of one female who had worked it partially off which might have caused her major problems. We feel the cohesiveness would have been even better had we been able to keep troops from meeting early after the reintroduction. Thus far, there has been little howling due to this lack of intertroop interactions.

Future Releases

We are encouraged by the survival of at least 12 of the 14 animals translocated (86%). We will carry out two additional translocations into the same area in May 1993 and in 1994, after which we hope to have about 60–70

howlers living in the Basin. Following that we will continue to monitor the situation for a few years to assess whether additional moves are necessary.

For the May translocation, three larger cages, 8' x 16' x 10' have been constructed about one kilometer from each other, and over 1.5 km from the core areas of all other howlers in the park. Larger cages will be used because larger troops were found in the new donor area. Currently, observations on social behaviors, food utilization, and territory size are being made on 4–5 troops located in the donor area. Three transports are planned, two by van, and one by helicopter. We will attempt to capture 3–4 troops totaling 25 animals. We will monitor all adult females by ball-chain collars, we will try to do the same on several males as well. As before, continued monitoring will be done on all animals during the year to follow.

Literature Cited

Caldecott, J., and M. Kavanagh. 1983. Can translocation help wild primates? Oryx 17:135–139.

Campbell, S. 1980. Is reintroduction a realistic goal? In: Conservation Biology: An Evolutionary-Ecological Perspective, pp.263–269. M.E. Soule and G.A. Wilcox (eds.). Sinauer. Sunderland, MA.

Coelho, A.M., L.S. Coelho, C.A. Bramblett, S.S. Bramblett, and L.B. Quick. 1976. Ecology, population characteristics, and sympatric association in primates: A socio-bioenergetic analysis of howler and spider monkeys in Tikal, Guatemala. Yearbook of Physical Anthropology 20:96–135.

de Vries, A. 1991. Translocation of mantled howling monkeys *(Alouatta palliata)* in Guanacaste, Costa Rica. M.A. thesis. University of Calgary, Alberta, Canada.

Eisenberg, J.F., N.A. Muckenhim, and R. Rudran. 1972. The relation between ecology and social structure in primates. Science 176:863–874.

Estrada, A. 1984. Resource use by howler monkeys *(Alouatta palliata)* in the rain forest of Los Tuxtlas, Veracruz, Mexico. Int. J. Primatol. 5:105–131.

Estrada, A. and R. Coates-Estrada. 1986a. Use of leaf resources by howling monkeys *(Alouatta palliata)* and leaf-cutting ants *(Atta cephalotes)* in the tropical rain forest of Los Tuxtlas, Mexico. Amer. J. Primatol. 10:51–66.

Estrada, A. and R. Coates-Estrada. 1986b. Frugivory by howling monkeys *(Alouatta palliata)* at Los Tuxtlas, Mexico: Dispersal and fate of seeds. In: Frugivores and Seed Dispersal, pp.93–104. A. Estrada and T.H. Fleming (eds.) Dr. W. Junk Publishers, Dordrecht.

Garcia-Orduna, F., D. Canales-Espinosa, E. Rodriguez-Luna, G. Silva-Lopez, J. Jimenez-Huerta, J. Benitez-Rodriguez, and J. Hermida-Lagunes. 1987. Translocation program for the howler monkey *(Alouatta palliata)*: A report. Amer. J. Primatol. 12:363–364.

Glander, K.E. 1977. Poison in a monkey's garden of eden. Nat. Hist. 86:34–44.

Glander, K.E. 1982. The impact of plant secondary compounds on primate feeding behaviors. Yearbook of Physical Anthropology 25:1–18.

Glander, K.E., L.M. Fedigan, L. Fedigan, and C.A. Chapman. 1991. Field methods for capture and measurement of three monkey species is Costa Rica. Folia Primatol. 57:70–82.

Horwich, R.H. 1983. Species status of the black howler monkey, *Alouatta pigra*, in Belize. Primates 24:288–289.

Horwich, R.H. 1986. A community baboon sanctuary in Belize. Primate Conservation 7:15.

Horwich, R.H. 1988. The Community Baboon Sanctuary: An approach to the conservation of private lands, Belize. In: Saving the Tropical Forests. J. Gradwohl and R. Greenberg (eds.). Earthscan. London.

Horwich, R.H. 1989. The geographic distribution of the black howler monkey *(Alouatta pigra)* in Central America and efforts to conserve it in Belize. In: Primatologia en Mexico: Comportamiento, Ecologia, Aprovechamiento, y Conservacion de Primates No Humanos en Mexico, pp.191–201. A. Estrada, R. Lopez-Wilchis, and R. Coates-Estrada (eds.). Universidad Autonoma Metropolitana, Mexico.

Horwich, R.H. 1990. How to develop a community sanctuary: An experimental approach to the conservation of private lands. Oryx 24:95–102.

Horwich, R.H. and E.D. Johnson. 1984. Geographic distribution and status of the black howler, *Alouatta pigra*. IUCN/SSC Primate Group Newsletter, March 4:25–27.

Horwich, R.H. and E.D. Johnson. 1986. Geographic distribution of the black howler, *Alouatta pigra*, in Central America. Primates 27:53–62.

Horwich, R.H. and J. Lyon. 1987. Development of the "Community Baboon Sanctuary" in Belize: An experiment in grass roots conservation. Primate Conservation 8:32–34.

Horwich, R.H. and J. Lyon. 1988. An experimental technique for the conservation of private lands. J. Med. Primatol. 17:169-176.

Horwich, R.H. and J. Lyon. 1990. A Belizean Rain Forest - The Community Baboon Sanctuary. Orang-utan Press. Gays Mills, WI.

IUCN. 1990. 1990 IUCN Red list of threatened animals. IUCN. Gland, Switzerland.

IUCN 1992. Draft guidelines for re-introductions. Re-introduction News, May:2–3. IUCN, Gland, Switzerland.

Kamstra, J. 1987. An Ecological Survey of the Cockscomb Basin, Belize. M.S. thesis. York University, Ontario, Canada.

Konstant, W.R. and R.A. Mittermeier. 1982. Introduction, reintroduction, and translocation of Neotropical primates: Past experiences and future possibilities. Int. Zoo Yrbk. 22:69–77.

Milton, K. 1979. Factors influencing leaf choice by howler monkeys: A test of some hypotheses of food selected by generalist herbivores. Amer. Nat. 114:362–378.

Milton, K. 1980. The Foraging Strategy of Howler Monkeys. Columbia Univ. Press, NY.

Milton, K., T.M. Casey, and K.K. Casey. 1979. The basal metabolism of mantled howler monkeys *(Alouatta palliata)*. J. Mamm. 60:373–376.

Milton, K. and R.H. McBee. 1983. Rates of fermentative digestion in the howler monkey, *Alouatta palliata* (Primates: Ceboidea). Comp. Biochem. Physiol. 74A:29–31.

Schlichte, H.G. 1978. A preliminary report in the habitat utilization of a group of howler monkeys (Alouatta villosa pigra) in the National Park of Tikal, Guatemala. In: The Ecology of Arboreal Folivores, pp.551–556. G.G. Montgomery (ed.). Smithsonian Institution Press, Wash. D.C.

Scott, N.J., A.E. Scott, and L.A. Malmgren. 1976. Capturing and marking howler monkeys for field behavioral studies. Primates 17:527–534.

Smith, J.D. 1970. The systematic status of the black howler monkey, *Alouatta pigra* Lawrence. J. Mamm. 51:358–369.

Strum, S.C. and C.H. Southwick. 1986. Translocation of primates. In: Primates–The Road to Self-Sustaining Populations, pp.949–957. K. Benirschke (ed.) Springer-Verlag, NY.

Wolfheim, J.H. 1983. Primates of the World. University of Washington Press. Seattle, WA.

Robert H. Horwich is Director of Community Conservation Consultants/Howlers Forever, Inc., RD 1, Box 96, Gays Mills, WI 54631; Phone: 608–735–4717; FAX: 608–735–4717.

Fred Koontz is Curator of Mammals, Wildlife Conservation Society, Bronx, NY; Phone: 212–220–7112; FAX 212–365–0307.

Ernesto Saqui is Director of the Cockscomb Basin Wildlife Sanctuary which is under the management of the Belize Audubon Society, P.O. Box 1001, Belize City, Belize; Phone 2–77369; FAX 2–78562.

Hermelindo Saqui is a Warden at the Cockscomb Basin Wildlife Sanctuary.

Kenneth Glander is Director of the Duke University Primate Center, 3705 Erwin Road, Durham, NC 27705; Phone: 919–684–2535; FAX 919–490–5394.