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Translocation of black howler monkeys in Belize

Because translocations are controversial, difficult, costly, and often fail, they require careful evaluation and planning. While the value of primate translocations has been questioned by some, we believe their use as a management tool will be more important as forests are decimated and rates of hunting increase, leaving isolated primate populations in smaller forest fragments. While at least 10 species of primates have been translocated, there has been little long-term monitoring and evaluation, or reports on the management of such projects.

Planning

This project was part of a broader conservation effort for howler monkeys (Horwich *et al.*, 1993). The goal was to establish a viable population of black howlers (*Alouatta pigra*), listed as threatened under the U.S. Endangered Species Act, Appendix II of CITES, and insufficiently known by IUCN, in the Cockscomb Basin Wildlife Sanctuary (CBWS) where howlers had become locally extinct many years prior. The project involved translocating a founding population from the Community Baboon Sanctuary (CBS) of approximately 50 animals over a relatively short period of two years. Two potential problems influenced planning decisions:

- 1) how to maximize troop cohesion and limit dispersal, and
- 2) how howlers would respond to new foods.

Also, as part of the project, we wanted to develop translocation methods as a tool for howler conservation. We found that careful planning for these potential problems was critical to the success of the project.

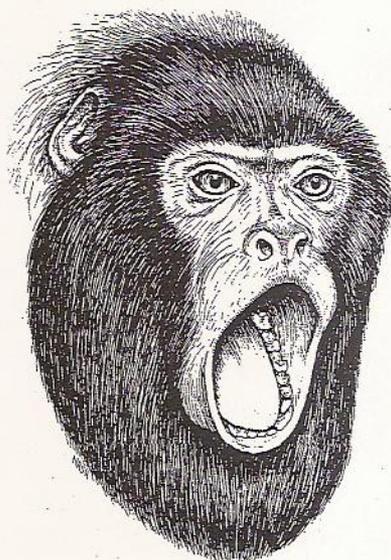
Seven aspects proved essential

1) Proven capture techniques:

As part of another ecology project, 47 black howlers were successfully captured by chemical immobilization without loss or major injury.

2) Howler survey and conservation assessment:

A feasibility study found translocation to be a viable conservation tool because the causes of the prior local extinction (yellow fever, hurricanes, and over-hunting) were no longer present in Cockscomb. Additionally, there had previously been an alarming rate of deforestation in the area (Koontz *et al.*, 1994), which was no longer occurring. Also, natural colonization in the Cockscomb Basin was deemed improbable because howlers had not been seen or heard in the area since 1978. Thus, because hunting was now controlled within the 100,000-acre park, and yellow-fever epidemics had not been reported for nearly 40 years in the immediate area, it seemed reasonable to attempt re-introduction of the species into the protected area.



Black howler monkey
(*Alouatta pigra*)
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3) Evaluation of Release Area:

The Cockscomb Basin Wildlife Sanctuary was selected because it was part of the species' historic range and was large enough for population expansion. Its topography, lack of other primates, adequate food, and park facilities also made it attractive (Koontz *et al.*, 1994).

4) Mapping and selection of release sites:

In January 1992 15 km of paths encompassing 16 km² were mapped. Three release sites, each over 1 km apart, were selected in 1992.

5) Caging and captive care:

Cages (2.4 m x 4.8 m x 3.0 m or larger) were built for observation, health, and acclimation reasons. Howlers were kept in the cages two days in a soft release and three groups were released without caging in a hard release.

6) Telemetry equipment and marking methods:

These were evaluated for the project, as monitoring of the released individuals was deemed essential.

7) Social and legal logistics:

Prior permission was obtained from the Belize Ministry of Natural Resources, the Community Baboon Sanctuary managing committee and local landowners, as well as the Belize Audubon Society, which managed the Cockscomb Basin Wildlife Sanctuary. Permits for blood sample importation were obtained from the Center for Disease Control, CITES, and U.S. Public Health Service (Koontz *et al.*, 1994).

Translocation methods

Transmitters on ball and chain collars were used on females, and ankle chains were used for males following capture, prior to transporting them to the new site. In 1992, transmitters were implanted subcutaneously in some males and juveniles. All implants failed because they worked their way out and were lost and so were not used again in 1993-1994. All adults were tagged with small Plexiglas donuts on ankle chains. Some chains slipped off, and a few caused leg injuries when the chain wore into the skin.

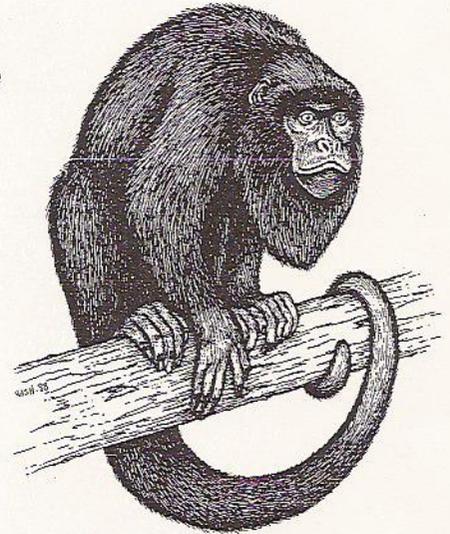
Captures

Groups were located prior to capture and followed until dusk to ensure finding them before dawn the next day. No groups were selected that had juveniles too small to be individually darted (Glander *et al.*, 1991). Groups with large adult female/male ratios were selected. In 1994, four groups were studied three months prior to the capture and monitored continually for one year post-release (Silver *et al.*, 1998 & Ostro *et al.*, 1999).

Following measurements, blood sampling, health checks, ankle tagging, and transmitter attachment, all howlers were placed singly in air pet kennels. These were then loaded in vans and driven five hours to the release site. On two moves, the kennels were carried by a helicopter for the 45-minute flight to Cockscomb.

Captivity and release

Each year, three cages were constructed 1 km apart and over 1.5 km from core areas containing other howlers. In most cases groups were maintained in captivity for two days and released during the late afternoon. Most animals took some food and water. All pushed against the wire to try to escape initially, but these attempts declined rapidly. A cage door was then opened, allowing them to leave at will.



Black howler monkey on branch
(*Alouatta pigra*)
© Stephen Nash / Conservation International

During 1993-1994, three groups of three individuals each were released the same late afternoon in a "hard release." Individuals were placed in their traveling cages in a circle at the foot of a large tree, in view of each other and vines hanging from the tree, and with a guard posted nearby. At 5 pm the doors were opened simultaneously, allowing the animals to escape up the vine into the tree. Once released, all groups were radiotracked and observed with short visual checks every one to three days and with prolonged observations after a month.

"Because translocations are controversial, difficult, and costly, and often fail, they require careful planning and evaluation"

Results

Of the 68 animals selected for translocation, two died in capture; one infant was abandoned by its mother and three escaped capture. Sixty-two animals from 14 groups were translocated, including 19 adult males, 30 adult females, and 13 immatures.

Data were recorded on a continual basis through mid-1996. A final survey in 1997 identified 56 individuals within the 9 km² study area. Of these, 32 were from the founding population. An additional 13 other founders had been located in 1996. The location of 14 of the founder monkeys in the western population could not be confirmed, but it was assumed most were alive. Thirty-four births occurred from 1992 to 1997, six of which died or disappeared. Only three adults were known to have died. During this period, the population, excluding the additions of translocated animals, increased at a rate of 14.7% per year bolstered by a high infant survival rate (82%). The founding population male:female ratio was 44:56 immatures. By 1997, the ratio had

somewhat evened to 40:49.

Of the 14 groups released, three immediately disbanded. Two groups moved away from the study site, one of which was located intact a year later. Some adults dispersed from their groups within three months, resulting in 14 groups having one adult male and one or two adult females with their young (Ostro *et al.*, 1999). Four new groups formed after the translocation. Two or three groups left the study area to settle 12 km west of the study area and have not been seen or heard by Cockscomb staff and tourists.

Groups dispersed on an average of 3 km from the release site; however, two groups dispersed 15 km. Within six months, all groups had settled into a core range, but continued to explore their range boundaries for up to a year (Ostro *et al.*, 1999). By the end of the second or third year the home ranges had reduced in size and centered around streams and rivers.

Some of the dispersal may have been related to food selection. However, although the discrepancy between food resources in the two habitats was greater than originally thought due to follow-up studies, the translocated monkeys adapted immediately to their new habitat and food sources (Silver *et al.*, 1998). Thus, their diet composition changed radically in the new Cockscomb Basin Wildlife Sanctuary habitat.

Conclusions and recommendations

1. Careful planning is critical for primate translocation success.
2. For howlers, a release site close to rivers is probably beneficial due to the occurrence of figs and other riverine tree species.
3. Release during a peak fruiting season also contributed to the success.
4. Capture and release of smaller, complete social groups improved group stability and cohesion and limited

dispersal.

5. Release within uninhabited areas or over 1 km from other groups reduced stress and maintained troop cohesion. Distances of greater than 1 km would be better but distances greater than 1 km were logistically not practical in Cockscomb.
6. Release late in the day reduces initial wandering. With small groups, caging is unnecessary but prudent to ensure full recovery from chemical immobilization, fitting of telemetry devices, and transport.
7. Careful long-term monitoring is very important. Pre-release monitoring is also advised

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AFRICA

Translocation of three wild troops of baboons in Kenya

In the midst of the controversy over whether to subsume translocation under re-introduction (IUCN 1998 & 2002), the reality is that there have been very few primate translocations (*sensu* Konstant & Mittermeier, 1982) where an intact wild group of primates has been moved from one part of their historical range to another without routing through captivity. The acceleration of the biodiversity crisis has produced an increasing number of primate re-introductions and introductions, the majority of

which are humanitarian efforts to get captive animals back into the wild.

In 1984 we conducted a successful translocation of three wild groups of baboons (*Papio anubis*) in Kenya. Preliminary results are reported in Strum & Southwick (1987) and in Strum (1987, reprinted 2001). Details of long-term adaptation, survival, sources of mortality, reproduction, foraging strategies, and home range use are currently in