

DATE: January 28, 2006
TO: Mr. Ian Giddy, Cloudbridge Preserve. Owner
Mrs. Genevieve Giddy, Cloudbridge Preserve. Owner
FROM: Eugene Paradis, Research Volunteer
SUBJECT: Proposal to conduct research of avian small scale migration patterns within forested corridors that link Chirripo N.P. to the Rio Uran riparian zone.

Purpose

This document serves as a guideline for the study of avian migration between two large forested habitats, and its importance to the continuing effort to bring Reserva Cloudbridge back to its natural ecological state.

Summary

Many places in Costa Rica have been subject to anthropogenic activities that have been detrimental to the health of the nation's forests. The land that encompasses Reserva Cloudbridge has suffered such effects in the past because of the agricultural practice of removing trees for the purpose of creating pastures. The practice of clearing trees leads to a phenomenon called habitat fragmentation. Habitat fragmentation can be viewed on many scales and depending on the inter-relationships of the organisms living in the habitat, fragmentation can have a dramatic effect on the ecological balance. For organisms that rely on moving throughout a large habitat in search of food, mates, or a more acceptable climate, it will be difficult to do so if there are also large tracts of unsuitable habitat caused by human activities. This can lead to lack of gene flow, isolated populations of organisms, the propagation of deleterious mutations, and essentially the eradication of the populations through random natural events.

Fortunately, laws enacted in Costa Rica do not allow the clearing of trees within a certain distance of a waterway. In some areas, including Cloudbridge, this practice has led to the preservation of forested corridors that link large cloud forest habitat patches together. Although landscape fragmentation due to human land use is extensive, it is often believed that the changes in patch composition and configuration can be buffered by corridors connecting patches of suitable habitat which allow plant populations and wildlife to move between one patch and another, thus enhancing the chances of survivorship (Turner et al. 2001). In other words, with the help of corridors, organisms are free to move between habitat patches that once may have made up their historical range. Corridors are usually linear in shape and always take on the characteristics of the patches they connect as they link the suitable habitat patches from the unsuitable human caused matrix.

When dealing with conservation biology, it is helpful to be aware of what kind of corridor is present. For my purposes, I have narrowed it down to two types of corridors. A habitat corridor is a linear landscape element that provides for survivorship, natality, and movement, and may provide either temporary or permanent habitat (Karpati 2003). A facilitated movement corridor is a linear landscape element that provides for survivorship and movement between habitat patches but not necessarily natality within the corridors.

Facilitated movement corridors actively increase patch connectivity. A strip of vegetated land that has edge characteristics could provide a passageway for an interior forest species but not habitat (Karpati 2003).

Proposed Research

I propose to study avian migration patterns through both corridors to see if obligate forest dwelling bird populations are using these areas to get from one habitat patch to another. I will also properly identify if my corridors are habitat or facilitated movement corridors by searching for nests.

Study Area

The study area includes two corridors that link Chirripo N.P. to the Rio Uran. They reside in the N.E. portion of Reserva Cloudbridge on either side of Herbert's Cabana. Both corridors are rectangular in nature with Corridor #1 being around 15 meters wide and Corridor #2 being at least three times as wide as corridor #1. Both corridors are around 175 meters long, and have a small creek running through the length of them. The coordinates of the corridors have been recorded and sent to John Tingerthal.

Methods

Task 1: Compile an inventory of the species of birds that are using the corridors to get from the park to the riparian region or visa versa.

I have set up two point count locations on each corridor close to where the corridors come into contact with the park and the riparian habitat patch. Point counts will be performed by me and an assistant from 7:00 am until 9:00 am. Each person will take their positions at the two different point count locations and start counting each bird that crosses an imaginary line which runs the width of the corridor. This method will allow us to see each bird entering and exiting the corridor to and from each habitat patch. It stands to reason that if a bird is using the corridor for small scale migration between two habitat patches, than that bird should be counted by each counter at the opposite ends of the corridor. If the bird is not counted twice, it will be recorded as using the corridor for something other than moving from one patch to another. The bird could be using the corridor for shelter, food, or the bird or flock of birds could be a species that doesn't use the forest as an exclusive habitat.

Task 2: Distinguish if the corridors resemble habitat or facilitated movement corridors by means of searching for bird nests.

This part of the research will begin to answer the question of how wide does a corridor have to be in order for natality to take place. If a corridor is too narrow, it will experience "edge effects", or a decrease in fecundity due to an increase in nest predation. This takes place on the forest edges where nests can easily be identified by predators. A corridor will not be suitable for natality if it is not wide enough to overcome the edge effects.

I will search for nests after each point count is completed for the morning. The nest searching methods will include using a vantage point that is above the canopy to look down into the nesting area or using the tree climbing equipment that is currently at Cloudbridge.

Project Schedule

Both point counts and nest searching begin on January 30th and will end on March 30th.

Qualifications and Experience

The following is a list of my qualifications.

- Four year BS degree in biology
- Independent GIS study with the USGS
- Two weeks of ornithology classes specializing in Costa Rican avifauna

References

Karpati A., 2003. Dynamics of wildlife corridors as a result of land use changes.
Landscape Ecology

Turner, M.G., R.H. Gardner, and R.V. O'Neill. 2001. Landscape Ecology in Theory and Practice. *Springer-Verlag*, New York, USA.