Population Structure and Abundance of Understory Birds in the Peruvian Amazon

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As a result of seasonal variation in rainfall in the Andean headwaters, the rivers of the Amazon basin are subject to large fluctuations in water levels throughout the year that flood the surrounding forest. The Loreto region of the Peruvian Amazon is no exception, with as little as 2% of land in the reserve above water at the height of the flooded season. The ecology of both the aquatic and terrestrial wildlife revolves around these seasonal changes. The forests of the reserve flood as the waters rise between December and June, reducing the land available for terrestrial mammals but vastly increasing the aquatic habitat available to fish, which move into the forest to feed on the abundant vegetation and to breed.

In recent years these normal seasonal changes have become more intense. Both the wildlife and local people are affected by these extreme events, which are tentatively being attributed to climate change. The flooded forests are particularly important for understanding the impacts of climate change in the Amazon, since the aquatic and terrestrial interface between high and low water seasons makes this habitat sensitive to greater seasonal variations. In 2009 the water levels of the Amazon river and its tributaries reached unprecedented heights, flooding huge area of Amazonian forests, yet in 2010 the water levels were at a historic low, resulting in extreme dry conditions. In 2011, 2012 and 2015 the rivers again reached record highs, whilst in 2014 the water levels dropped to same low levels as 2010.

The Lower Yarapa River in the buffer zones of the Pacaya-Samiria National Reserve and the Tamshiyacu-Tahuayo Regional Community Reserve contains a mosaic of different forest types namely terra firma forest (broadleaf rainforest with abundant food supply year round, varzea forest (seasonally flooded with peaks of fruit production during the onset of rainy season) and palm swamp (permanently flooded forest close to the river edge with palm fruit and abundant insect life). These different forest types offer different feeding and nesting opportunities for understory birds and their relative availability changes over the year with the annual flood cycles of the region. Although understory birds are able to avoid the direct impacts of flooding, often their food sources will be affected by these changing water levels. Insectivores may still have abundant food sources during high water season, but those which forage on the ground for seeds (granivores) may find their food resources limited during certain periods of the year.

Mist-netting involves the capture of birds in fine-mesh nets from which they are removed by trained bird ringers, identified, ringed, and then released. Students will learn how to survey and handle birds. You will be able to use the mist net datasets generated in the course of your study season as well as from previous years. Extensive pre-existing habitat structure datasets are also available which could be used to answer a range of research questions examining relationships between bird community composition and forest type. These comparisons could look at abundance and richness of avifaunal communities as a whole, or focus on occupancy and abundance of key species or feeding guilds.

Methods

Data will be collected in the Loreto region of the Peruvian Amazon Basin, specifically at the Lower Yarapa River basin in the extensive forest belonging to the indigenous Cocama Indians that connects two major protected areas: the Pacaya-Samiria National Reserve and the Tamshiyacu-Tahuayo Regional Community Reserve. Community-based conservation dominates the landscape of Loreto with large community-based reserves, community co-managed reserves and indigenous territories covering 98,800 km2.

The abundance and diversity of understory birds will be assessed using mist nets. Narrow (< 1 m wide) trails will be cleared in suitable patches of forest for ten mist nets 2.5 meters high to be placed at each site 20 meters away from each other. Each site sampled will consist of a single forest type. Forest types are subcategories of seasonally flooded (varzea) forest that flood to varying degrees resulting in variation in proximity to water, forest structure, tree species composition and the availability of different food sources (e.g. fruit, flowers and insects).

The nets will be set up as close to dawn as realistically possible, between 6:30am and 7:00am, and checked every 30 minutes for birds throughout the day. When birds are found in the net, the time of capture will be noted. The birds will be taken out of the net, placed in a cotton bag for holding whilst other birds are being processed. Each bird will be identified and ringed using colour coded plastic rings. The birds will be weighed (to the nearest gm) and standard morphological measurements taken. The birds will be released close to the net site but far enough away to avoid them being immediately re-trapped.

All the species will be further categorised into foraging guilds, based on the food they consume, their choice of substrate and their foraging method. Based on researching relevant literature resources all the species where classified into one of nine foraging guilds. The guilds consist of 5 insectivorous guilds, bark-gleaner, foliage-gleaner, ground-gleaner, flycatcher and ant-follower; a nectivore guild; a frugivore guild and an omnivore guild. The data will be analysed by comparing both the number of species and the number of individuals per species in each foraging guild, across the studied habitats.

Suggested Reading

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