PP219 Amphibian diversity and abundance in Pacaya-Samiria

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The Samiria River of the Pacaya-Samiria National Reserve is situated in the Peruvian Amazon. It has a tremendous diversity of frogs and is an ideal location to monitor the effects of amphibian decline due to climate change, chytridiomycosis and other impacts. This study examines anuran abundance and diversity at the Samiria River research sites and investigates ecological trends across different habitat types. Data collected are compared with that of previous studies to get a more accurate picture of species abundance and this baseline data can be used to help long-term monitoring.

Over the past few decades scientists have observed a significant number of population declines and extinctions, which suggests a general Global Amphibian Decline (GAD) is taking place. At present almost one-third of the worlds 5,743 described amphibian species are threatened with extinction, at least 122 species are believed to have already gone extinct since 1980, and 130 species have not been found in recent years and are presumed extinct. Declines have spread geographically and the numbers of species involved is still increasing.

This study will examine the diversity and abundance of anurans between four different habitat types, open varzea, liana, flooded meadows and agujal at the Samiria River research sites. The climate is seasonal and typical of a humid lowland tropical forest. There is a high annual precipitation averaging between 2000mm to 3000mm. December to March are often the wettest months of the year with June, July and August being the driest. The annual mean temperature is constant throughout the year at 24-26°.

The Amazon basin is going through dramatic climate changes that will impact the largest rainforest on Earth. In 2010 the water levels of the Amazon River were at a historic low resulting in extreme dry conditions. In 2009, the same river was at a historic high, flooding huge area of Amazonian forests. More recently in 2011, the high water was again at historic highs, and then drained to historic low levels. Each year the Amazon River goes through seasonal changes between the flooding period from December to June and the low water period between July to November. However, these normal seasonal changes are now becoming more intense, which is impacting the wildlife and local people. Research on wildlife populations is being conducted on the frogs to understand how the ever increasing climatic changes are impacting their ecology, and populations.

The wildlife of the Samiria River lives in an ecosystem that is driven by the large seasonal fluctuations occurring between high and low water seasons. The ecology of the aquatic and terrestrial wildlife revolves around these seasonal changes in water level. The ecological conditions of long periods of flooding, up to 6 months, are very harsh on much of the floral and faunal community. The normal cycles in the Amazon forests are now being disrupted by the extreme flooding and drought events that are occurring. The flooded forests are particularly important at 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.

Methods

Transects of 500m will be surveyed in four habitat types – open varzea, liana, flooded meadows and aguajal. Transects will be conducted night and day. Transects will be conducted during the period when amphibians are most active. Diurnal transects will be carried out between approximately 7:00am-2pm and night transects between approximately 7:15pm-1am.

Two - three people will conduct surveys including a guide to help direct the team through the forest and assist in amphibian detection. To maximise anuran detection the length of time spent on each 500m transect will be relatively long, between 1h 30min-4h. Visual encounter surveys (VES) during the day will be carried out using a probe to disturb leaf litter and vegetation. During the VES all possible microhabitats will be searched, including leaf litter, tree trunks, decayed logs, fallen palm leaves and bromeliads. Due to the cryptic nature of anurans the disturbance of this vegetation using a probe is the most systematic method of detection. This will be achieved by methodically probing through the area directly in front of the observers, including up to approximately 3m on either side of the trail. To identify anurans during night transects instead of probing through leaf litter, torches will be used to catch the reflection of light from the eyes of anurans.

Before each survey information on date, name of observer, place, area searched, weather conditions, start time and finish, and habitat description will be noted. When individuals are encountered information is recorded on species type and the time of capture.

Upon detection and capture of an individual the perpendicular distance of first sighting will be taken. Each specimen will be handled carefully with clean latex gloves and morphological characteristics, such as webbing between fingers, iris and pupil colour, presence of tympanium, will be examined and photographed. This was followed by the recording of morphometric measurements; snout to vent length (SVL) measured with a calliper to the nearest 0.1mm, sex (if possible), stage (juvenile, adult), distance along and from the transect, vegetation type and microhabitat use, time recorded and species when possible. The body weight will also be taken.

When identification of an individual is not possible in the field, photographs and recorded observation can be used and compared to identification guide. To distinguish between species the following characteristics are observed: body size and shape; iris colour and shape; number and length of toes and phalanges; presence and patterning of dorsolateral, cranial, belly, ventricular, leg and feet markings and presence of webbing.

Statistical analyses will compare the frog diversity between habitat types, using density, abundance and diversity analyses. Density will be determined using DISTANCE analysis. Both macro and micro habitat classifications will be analysed. Morphometric data and body weights will be compared for common species found in different habitats. Diversity indices will be used to combine species richness and abundance measures in a single analysis. In addition, data from previous years will be available and allow for a longitudinal comparison between years to look at changes in diversity and abundance.