

TCD FIELD RESEARCH REPORT 2015:

Effects of Rainfall on Phenology of Plants, Invertebrates and Birds in Tropical Montane Forests of Northern Peru

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Summary

In 2015 six study sites were selected in northern Peru, and I placed climate data loggers at each site. Five months of initial field work were conducted in which 1,367 birds of 149 species were banded. Multiple month differences in avian breeding phenology were identified among sites. Seven Peruvian field assistants participated in the research. I worked with five Campesino Communities in Amazonas, providing bird lists and posters to 15 families. Networking included meetings with more than a dozen individuals from different organizations. Outreach included a banding demonstration, two presentations, and participation in an NCI field tour. I worked on identification and protocol development for invertebrate sampling, foraging and plant phenology.

Site Selection

In 2015 field research was initiated at 6° latitude in the departments of Amazonas and San Martin in northern Peru. We conducted a 10-day tour of the area to identify potential study sites. Six study areas were selected within 10–50 km of each other, with three wet sites on the eastern slope and three sites at similar elevation in the drier intermontane valleys (wet: 1,670-1,960 m, 2,230-2,410 m, 3,030-3,070 m; dry: 1,840-2,220 m, 2,360-2,510 m, 2,670-2,940 m). Climate sensors were placed at each site (Onset HOBO temperature, relative humidity, light and rainfall data loggers). Based on rainfall data for the area (UTRM, 2015), the eastern slopes of the mountains receive 2,000–3,000 mm of rainfall per year whereas drier intermontane valleys receive 1,000–2,000 mm. Preliminary data show correlated weather patterns but reduced humidity and rainfall at western sites.

Initial Data Collection

From Jun-Nov 2015, we used monthly passive mist-netting to identify breeding seasons and potential study species to focus intensive efforts in the future. Six sites were sampled 2–5 times, with additional sites added as we became familiar with the region. We captured 1,367 individuals of 149 species during 5,228 mist-netting hours. Each bird was measured (wing, tarsus, and bill length, bill width, mass and fat) and uniquely color-banded for field identification. We also collected 829 fecal and 1,214 feathers samples for dietary analysis. We assessed breeding condition of birds in the hand based on brood patches and cloacal protuberance; all breeding characteristics were documented using photographs. To identify peak abundance of juvenile and first-year birds, we examined juvenal plumage, skull ossification, and molt limits; for hummingbirds we also examined bill striations. We scored active flight feather molt to document timing and progression of molt, which typically occurs post-breeding. Sample sizes are small,

but preliminary data for common species suggest multiple month differences in phenology among sites associated with both temperature and rainfall.

Additional field activities included learning bird vocalizations, as well as initial development of insect sampling, foraging, and phenology monitoring protocols. Although not actively nest searching, we opportunistically found 41 nests of 25 species which provided additional evidence of breeding. We also collected >100 foraging observations to examine feasibility of observing different species. Fecal samples were collected for examination of diet. Preliminary insect sampling included branch beatings, pitfall traps, and sticky traps. In 2015 we collected ~1,000 insect samples which were measured and identified to order with common groups including Arachnida, Neuroptera, Phasmida, Lepidoptera (Geometridae), Orthoptera and Hemiptera. We also collected >30 plant specimens to identify species for phenological monitoring. An assistant is currently working with a botanist at HUPCH to identify specimens.

Conservation Application

Initial work in 2015 provided an opportunity to network and build relationships with conservation and research organizations throughout the region. In 2015 we met with more than a dozen contacts and collaborators from Universidad Torribia Rodriguez de Mendoza (Wagner Guzman, Aaron Savitt), CORBIDI (Antonio Brava, Diego Garcia), leadership for the network of private conservation areas in Amazonas (Jose La Torre, Perrico Heredia, Leyda Rimarchin), Nature and Culture International (Mike Murphy), ABC/ECOANN (Dan Lebin, Walter Cosio), APECO (Mariella Leo Luna), BPAM (Yvonne Paico), Peace Corps (Maddy Stokes), Yunka Wasi (Fanny Cornejo), Conservamos por la Naturaleza (Christel Scheske).

In 2015, I worked with five Campesino Communities in Amazonas. I met with and obtained permission from the president and individual *posesionarios* to work on land belonging to the communities of Taulia-Molinopampa, Choctamal, Corosha, Levanto, and Pomacochas. I am working with individuals and local community associations to provide food, lodging, and guides. Outreach in 2015 included a banding demonstration for ~20 school children from the community of Levanto, as well bird identification and banding demonstrations for families who provided food, lodging and guides. Bird lists and a poster were given to ~15 families who participated in the research. In conjunction with Nature and Culture International, a presentation and outreach were conducted as part of a two day field tour of private conservation areas for leaders from Campesino Communities in Cajamarca and Piura. Research was also presented at Universidad Torribia Rodriguez de Mendoza for 'El Dia del Biologo'. We are currently using photos to build a project website. Over the next few months I will be developing species guides.

Seven Peruvian research assistants participated in the project in 2015. Four undergraduate students came for six weeks from a CORBIDI banding station around Lima. Three research assistants came for five months. An experienced bander from Piura working with CORBIDI and NCI was trained on aging and molt. Two new banders were trained as banding assistants. Assistants learned a variety of data collection methods including banding, foraging, nest searching, and insect collection. Assistants also participated in community outreach. One assistant organized the field tour of private conservation areas with NCI and is also painting a logo for the project. Several assistants are applying for international training and certification opportunities in the US while others may return in future years to conduct thesis projects.