

Amphibian Population Decline in a Honduran National Park

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The Central American nation of Honduras currently has an extensive system of national parks and other protected areas. Most are located in mountainous areas, but the largest ones are found in lowland areas (Wilson et al., in press). Nonetheless, most of these protected areas receive scant, if any, real protection. Very few have research and management facilities and/or resident personnel (Wilson et al., in press). Even if facilities and personnel do exist, one of the significant problems in such areas is the lack of sufficient personnel to regularly survey the extent of the areas, especially in their more remote periphery. Such is the case in the Parque Nacional Pico Bonito, located in the central portion of the Cordillera Nombre de Dios in the Departamento de Atlantida in northern Honduras.

Parque Nacional Pico Bonito was established in 1987, and encompasses 564 km square in total, with a nuclear zone of 56 km square (Wilson et al., in press). Representatives of the Lower Moist Forest, Premontane Wet Forest, and Lower Montane Wet Forest formations of Holdridge (1967) are found within the park. A visitor's center sits at 120 m on the windward side of the mountain range, and is reached by a very difficult road branching south from the highway from La Ceiba to Tela. The highest elevation in the park is that of Montana de Corozal at 2480 m.

Over the last 17 years, we have made 7 trips (in 1980, 1982, 1984, 1988, 1989, 1995 and 1996) into the park (beginning 7 years before the area was designated a national park), working primarily on the leeward side of the mountain range at a locality named Quebrada de Oro (for the stream and its tributaries that flow through a section of premontane wet and lower montane wet forest). The Quebrada de Oro flows into the Rio Viejo, which in turn flows into the Rio Cangrejal. The Rio Cangrejal empties into the Caribbean Sea on the eastern end of La Ceiba, a prominent port city. In addition, we have collected in the vicinity of Cerro Bufalo, the highest point in the Cordillera Nombre de Dios in the vicinity of Quebrada de Oro, and we spent one day collecting along the Rio Cangrejal on the eastern periphery of the park. The second author, however, has also worked in the vicinity of the visitor's center, as has our colleague Gunther Koehler. Thus, some fieldwork has been carried out by us in all three of the forest formations found within the park.

It is in the Quebrada de Oro-Cerro Bufalo region that we have witnessed significant declines in populations of several species of anurans. The amphibian fauna in this area is currently known to consist of 21 species, including 5 species of salamanders, 3 species of bufonids, 8 species of leptodactylids (all of the genus *Eleutherodactylus*), 4 species of hylids and one species of ranid.

Of the 16 species of anurans known from the Quebrada de Oro-Cerro Bufalo region, 9 species (56%) appear to have populations adversely affected. Of these 9 species, 4 are apparently gone (at least extirpated, if not extinct). These four species are all members of the genus *Eleutherodactylus*, including *E. aurilegulus*, *E. chrysozetetes*, *E. cruzi* and *E. fecundus*. The last three are endemic to the Cordillera

Nombre de Dios (*E. chrysozetetes* and *E. cruzi* are known only from the Quebrada de Oro-Cerro Bufalo area and *E. fecundus* from the central and eastern parts of the Cordillera Nombre de Dios). An additional 3 species have declining populations, including *Atelophryniscus chrysophorus*, *Eleutherodactylus saltuarius*, and *Duellmanohyla salvavida*. *Atelophryniscus chrysophorus* is endemic to the Quebrada de Oro area, and *E. saltuarius* is restricted to the central and eastern portions of the Cordillera Nombre de Dios. *Atelophryniscus chrysophorus* is also a member of a monotypic genus. The Quebrada de Oro-Cerro Bufalo endemic *Plectrohyla chrysopleura* is still relatively common, although for how long is unclear in as much as some of their tadpoles collected in 1996 have malformed mouthparts. The status of 3 species (*Bufo valliceps*, *Eleutherodactylus chac*, and *Eleutherodactylus laticeps*) is unclear, as all have always been uncommon in the Quebrada de Oro-Cerro Bufalo region. One species (*Rana maculata*) was not seen on the last two trips, although they have been common in past years. Only 2 species, *Eleutherodactylus ridens* (north-central Honduras to western Colombia) and *Ptychohyla spinipollex* (endemic to the Cordillera Nombre de Dios) are still common. Finally, 2 species, the common and widespread *Bufo marinus* and *Smilisca baudinii*, have entered the Quebrada de Oro area, apparently due to habitat destruction caused by deforestation and shifting agriculture.

The population declines are apparently related, in part, to significant environmental modification of the Quebrada de Oro and its vicinity. In November, 1988, a major landslide occurred, which vastly changed the stream and the streamside environment below 940 m. The landslide followed in the wake of major forest destruction due to lightning-caused fire that occurred sometime prior to 1980. The fire opened the precipitous slopes below Cerro Bufalo to erosion and eventual landslide. What had been a mountain stream providing abundant habitat for streamside anurans became a jumble of mud and rock, with all vegetation levelled in a swathe ca. 10 to 20 m wide on either side down to 800 m. The water was initially extremely silty following each rainfall. However, by February, 1995, the damaged area had sufficiently recovered so that siltation of the stream did not occur even after a rise in the stream of ca. 0.5 m caused by a very heavy rainfall lasting for several hours on 21 February 1995. Another landslide took place in November, 1995, resulting from further collapse of the same ridge as involved in the first landslide, further exacerbating the damage. In addition to the second landslide, again damaging the Quebrada de Oro below 940 m, the ridges above this portion of the stream have been cleared for cultivation since February 1995. Only a narrow strip of gallery forest has been left intact.

Landslides and anthropogenic deforestation, however, do not suffice to explain all population perturbations. Above 940 m, the Quebrada de Oro and its surrounding forest is still pristine, but recent survey of this area has not turned up any specimens of the four species of *Eleutherodactylus* mentioned above, thought to be extirpated or extinct. Additionally, population declines of *Atelophryniscus chrysophorus* and *Duellmanohyla salvavida* appear to have occurred in this still pristine stretch of the stream. Regardless of the causes, however, the character of the distinctive anuran fauna of the Quebrada de Oro-Cerro Bufalo area has been changed drastically, perhaps forever.

References

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FROGLOG Number 25, January 1998

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