Recovering the habitat of the green dotted treefrog (Dendrosophus molitor) in the Bogota Savannah

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Recovering the Habitat of the Green Dotted Treefrog (*Dendropsophus molitor*) in the Bogota Savannah

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The Andean region in Colombia has lost over 73% of its original vegetation covers, causing severe fragmentation (*1*). This situation has pushed many Andean species to reduced habitats without the chance to migrate, creating isolated populations as in the case of the Green Dotted Treefrog (*Dendropsophus molitor*). Even if it is very common, because of its distribution, it is facing several threats that might affect their population and the populations of other anuran species in the Andean region. Likewise, the wetlands this species inhabits are facing a rapid rate of loss, due to anthropogenic activities related to demographic growth and its consequences like urban expansion and industrial development. Many wetlands in the Bogota Savannah are polluted, reduced or dry, making it difficult for this frog to survive.

Wetlands in Tocancipá, an industrial municipality of Cundinamarca, present similar conditions. For that reason, in 2017 the Foundation Parque Jaime Duque declared two wetlands inside its property as nature reserves. To make this happen, the foundation ceased the farming production carried out in the zone where over 200 cows were present. This is how the Ecoparque Sabana Nature Reserve was created.

Considering all the consequences caused by the farming systems and the environmental problems in our region, the Foundation developed a restoration process that includes the protection of 60 ha of native Andean forest and the recovery of two wetlands (*Fig. 1*). The aim of the project is to provide habitat for native, resident and migratory species, helping to reduce negative impacts generated by industries and others, and to promote community participation. At that moment, it was possible to listen to some Green Dotted Tree Frogs singing in small temporal puddles of water that remained in the area in rainy seasons. However, in the dry season, it was very usual to find dead or dehydrated individuals trying to head from one puddle to another.

The Green Dotted Treefrog is an endemic species of Colombia, only found in Cundinamarca and Boyacá from 1600 to 3600 m asl. The species presents different color patterns (*Fig. 2*) depending on temperature and hormones levels (*2*). It is very common in wetlands, high-altitude scrublands and little ponds surrounded by vegetation as well as in disturbed areas such as grasslands, roadsides and human settlements.

With that in mind, the removal of livestock was crucial, and the first restoration action included the hydrogeomorphological reconfiguration of the wetlands, modifying its size, shape, depth, and the reduction of slopes. We also recovered the open water habitat of the wetlands, since aquatic vegetation totally covered them. The domi-

Fig. 1: A, Arrieros Wetland before the interventions. B, wetland slope and beach after the intervention. C, aquatic vegetation reintroduced in the wetlands. D, Trees planted in the border of the wetland. Photo: Darwin Ortega-Chamorro

Figure 2. Coloration patterns found in Ecoparque Sabana of the Green Dotted Treefrog. Photo: Fernando Castro-Vargas.

nant species were Kikuyo (*Cenchrus clandestinus*) and Common water hyacinth (*Eichornia crassipes*). As we controlled the invasive species, we reintroduced other typical aquatic species of wetlands of the Bogota Savannah like Broadleaf Cattail (*Typha latifolia*), Lamp Rush (Juncus effusus), California Bulrush (*Schoenoplectus californicus*), Dotted Smartweed (*Persicaria punctata*), Water Primrose (*Ludwigia hexapetala*) and Smooth Beggarticks (*Bidens laevis*). Other restoration actions included: creation of islands in the bodies of water, and plantation of over 70,000 native plants. These actions have provided habitat to several species of invertebrates and vertebrates, including *D. molitor*.

The role of the Green Dotted Treefrog in the Bogota Savannah ecosystems is essential to achieve our goals of restoration. The species contributes to the ecosystem structure and function. It supports decomposition and nutrient cycling and also controls annoying and dangerous pests. In other wetlands, where this species is absent, it is full of pest species as mosquitoes and other insects (*3*), changing the perception of the communities about wetlands, who can consider them just as dirty waters. We chose this frog as our conservation value object because of its endemism, the threats it is facing, and the investigation possibilities that could help other amphibian species in the region regarding the chytrid fungus (*4*). Besides, because it is our only amphibian species and the assessment of its population can give us an idea about the impact of the restoration process in the ecosystem's state. The selection process was arranged with the local community and the nature reserve team. To monitor its population, we have developed monthly surveys. In the Arrieros wetland, we have implemented a 1km transect across the border of the water body. While we go through the transect, we count all the individuals we can see and hear obtaining a measure of relative abundance. After increasing the open water area, an outstanding number of frogs appeared in the Arrieros wetland. Our counts rose from 7 to 10 individuals per month at the end of 2017 to over 30 individuals in 2019. At the beginning of the samples, most of the frogs concentrated in the aquatic vegetation inside the wetlands, making it harder to count them. Nevertheless, in the last samples we executed, the Green Dotted Treefrog has begun to use the trees we planted, as its name indicates (*Fig. 3*). We have also noted that more males vocalize before nightfall, a behavior that was not common before. Other important features, like the increase in the recording of tadpoles and amplexus, and the decrease of dead and dehydrated records, show us we are in the right way in the restoration process.

Fig. 3: A, an individual perching on *Oreopanax floribundum* planted in Arrieros wetland. Photo: Yerson Cruz-Mendivelso. B, Amplexus recorded in the Arrieros wetland. Photo: Fernando Castro-Vargas.

We have several questions about the natural life history of the species that have not been resolved. In the short-term, our goal is to mark the individuals found to estimate the size of the population.

In the eastern hills of Bogotá and in wetlands similar to those found in Ecoparque Sabana, up to eight species of amphibian have been reported. The richness of these sites, in comparison with our reserves, allows us to think that in the future, the richness and abundance of amphibians should tend to increase. This will be only possible if the restoration processes advance and if we improve the connectivity of the natural reserves of the Parque Jaime Duque with other natural spaces. Additionally, the establishment of the understory and the growth of the layer of leaf litter could trigger the arrival of other amphibians from the region which, in certain cases, require soils that conserve humidity and leaf litter to hide.

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References:

1. D. Armenteras, F. Gast, H. Villareal, *Biol. Conserv.* 113, 245 (2002).
2. C. Guarnizo, O. Armesto, A. Acevedo, in: Catálogo de Anfibios y Reptiles de Colombia, Asociación Colombiana de Herpetología, Eds. (Antioquia Univ., Medellín, 2014), vol 2 (2), pp. 56-61.
3. D. Hocking, K. Babbitt, *Herpetol. Conserv. Biol.* 9, 1 (2014)
4. S.V. Flechas et al., ISME J 13, 361 (2019).