

New record of the Neotropical otter (*Lontra longicaudis*) in the forests of the Río Sapo basin, El Salvador

Nuevo registro de la nutria neotropical (*Lontra longicaudis*) en los bosques de la cuenca de Río Sapo, El Salvador

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The Neotropical otter *Lontra longicaudis* is an understudied species in El Salvador and our knowledge about it is scarce. The aim of this contribution was to record the occasional presence of *L. longicaudis* in the Río Sapo basin, El Salvador. The fieldwork was carried out between August and September 2022 using 20 camera traps in the Río Sapo basin. We recorded the first photographs and video of 2 individuals of *L. longicaudis* within the forest in the Río Sapo basin. We confirmed the occurrence of *L. longicaudis* in the Río Sapo basin using the forest, showing the importance of considering adjacent forests of body waters for the study and monitoring of this species.

Key words: Biological corridor; camera traps; citizen science; conservation; endangered species.

La nutria neotropical *Lontra longicaudis* es una especie poco estudiada en El Salvador y nuestro conocimiento sobre la especie es escaso. El objetivo de esta investigación fue registrar la presencia ocasional de *L. longicaudis* en la cuenca de Río Sapo, El Salvador. El trabajo de campo se llevó a cabo entre agosto y septiembre de 2022 usando 20 cámaras trampa en la cuenca de Río Sapo. Reportamos las primeras fotografías y video de 2 individuos de *L. longicaudis* dentro del bosque en la cuenca de Río Sapo. Confirmamos la ocurrencia de *L. longicaudis* en la cuenca de Río Sapo utilizando el bosque, mostrando la importancia de considerar bosques adyacentes a cuerpos de agua para el estudio y monitoreo de esta especie.

Palabras clave: Cámaras trampa; ciencia ciudadana; conservación; corredor biológico; especie en peligro.

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El Salvador is one of the countries with less forest cover in América and has been severely deforested in the last decades (Carr *et al.* 2006; Dull 2008), and now, most of their cover is a secondary forest in private land and coffee plantations (Blackman *et al.* 2012; MARN 2018). In our study area, at the northern Morazán department, many forests were resurged by natural succession on abandoned agricultural and ranching lands during 12 Civil War years (Hecht *et al.* 2006; Hecht and Saatchi 2007; Valencia *et al.* 2011; Redo *et al.* 2012) and now have connected secondary forest (degraded forest) under no protection status where many endangered species live such as Neotropical otter (*Lontra longicaudis*) and other wildlife species (Morales-Rivas *et al.* 2020; Rivera *et al.* 2020). However, these forests are undergoing deforestation due to the rapid development of tourism projects and new human settlements due to the return of owners claiming their lands after the war.

In El Salvador, due to the loss and fragmentation of the landscape, *L. longicaudis* is classified as endangered (MARN 2015). Also, it is considered a Near Threatened species by the International Union for Conservation of Nature, IUCN (Rheingantz *et al.* 2021). Despite this species being considered has priority of conservation in El Salvador, *L. longicaudis* has been little studied, a widespread problem for this species

in many countries within its distribution (de Almeida and Pereira 2017). However, to our knowledge, there are only 3 scientific papers published with 14 *L. longicaudis* records in El Salvador (Owen and Girón 2012; Funes and Pocasangre-Orellana 2020; Rivera *et al.* 2020) and 1 unpublished record in the online portal of Global Biodiversity Information Facility (GBIF; <http://www.gbif.org>). This shows gaps in information that make it difficult to understand the basic aspects of the ecology of *L. longicaudis* and make it difficult to make decisions for the conservation of this species. Therefore, herein we contributed to the knowledge of *L. longicaudis* in El Salvador and reported the first Neotropical otter record using camera traps in the Río Sapo basin. Also, we make notes on habitat use and make recommendations for the study and protection of the species.

The fieldwork was carried out in the Río Sapo basin, municipality of Arambala, near the town of Arambala (13° 55' 13.34" N; 88° 8' 1.01" W), department of Morazán, El Salvador. The area has a well-defined dry season from November to April and a rainy season from May to October. The biophysical characteristics of the Central American Dry Corridor influence the area. Therefore, it is susceptible to drastic changes such as low precipitations or prolonged periods of drought (Quesada-Hernández *et al.* 2019). The

study area has secondary forests that have resulted from a natural forest recovery process on abandoned agricultural and livestock lands. The predominant vegetation is pine-oak forest and deciduous forest. The fieldwork was part of an exploratory study on mammal activity in the study area and as part of local community people training for biodiversity monitoring in the Río Sapó forests under a citizen science approach. Also, 5 unstructured interviews of local people were carried out to identify wildlife activity in the area. The fieldwork was carried out between August and September 2022. Twenty camera traps were placed within the forest at a minimum distance of 300 m between each camera. The records were added to the database of the National Mammal Collection of the Institute of Biology of Universidad Nacional Autónoma de México (UNAM 2023).

Herein, 3 photographs and 1 video of *L. longicaudis* were recorded for the first time using camera traps in the Río Sapó basin with catalog number of the video IBUNAM-CFB-78952. The records were taken in the forest (Figure 1), not near the banks of the rivers, streams, or burrows, sites where usually put camera traps in specific otter studies. Two individuals of *L. longicaudis* of unknown sex were recorded on August 18, 2022, during daylight hours (15:19 hr) at 13° 56' 3.36" N and 88° 6' 22.19" W at an elevation of 720 m. The individuals were recorded moving within the forest at 740 m from the main river, 325 m from a seasonal stream, and 115 m from another small seasonal stream. The individuals did not leave traces of excrement or food scraps. Probably, this record corresponds to 1 female and

her cub, evidencing parental care and reproductive activity in the Río Sapó basin. We identified *L. longicaudis* by the morphological characteristics of the body of a semi-aquatic mammal such as an elongated body, uniformly dark brown fur above and slightly lighter below, long pointed tail, and short ears (Kruuk 2006).

This is the first photographed record of *L. longicaudis* using the forest within the Río Sapó basin. According to local people, this species has been seen occasionally crossing the forest between rivers. Previous studies in El Salvador about this species only recorded feces, sightings, and photographs in main rivers and streams, but not in the forest (Funes and Pocasangre-Orellana 2020). It is well known that *L. longicaudis* can use riparian zones for scent marking, holt areas, grooming, or foraging activities (Kruuk 2006; Rheingantz et al. 2017). However, the interactions of this species inside the forest, outside the water, or outside of riverbanks are little understood. Therefore, it is imperative to know the interaction of this species with the forests to formulate better conservation strategies.

Lontra longicaudis distribution has been restricted to a few rivers in El Salvador (Funes and Pocasangre-Orellana 2020). Our record confirms the activity of the species in the Río Sapó basin within the upper Lempa River basin (trans-boundary basin) near the borders with Honduras (Figure 2), therefore this record can be relevant for the southeastern region of Honduras, a region where not have records yet. Factors such as seasonality probably contribute to the movement patterns of *L. longicaudis* in our study area (Are-



Figure 1. New record of 2 individuals of *Lontra longicaudis* of unknown sex within the forest in the Río Sapó basin municipality of Arambala, department of Morazán, El Salvador. Collection of Biological Photocollections; catalog number of the video: IBUNAM-CFB-78952.

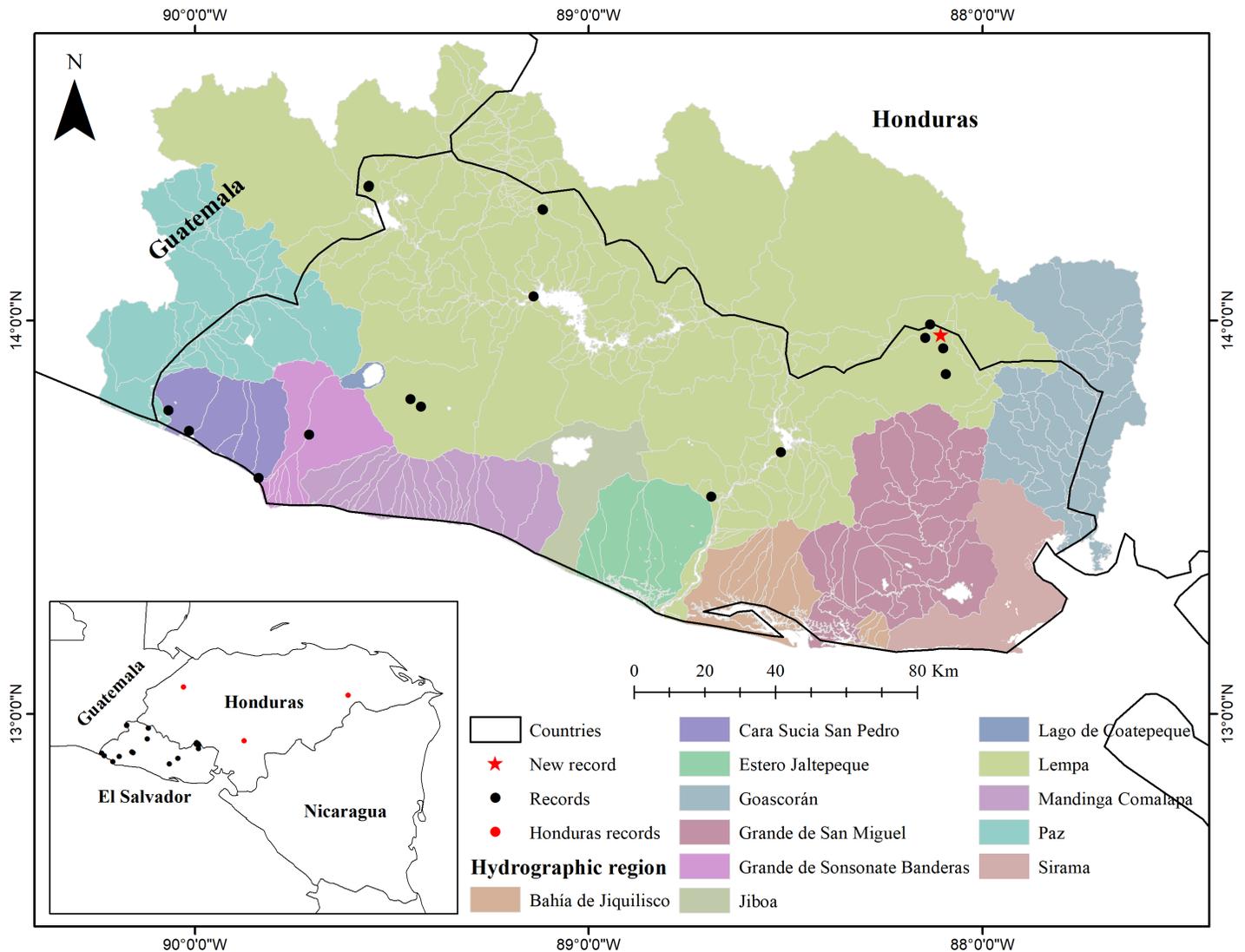


Figure 2. *Lontra longicaudis* records distribution map in El Salvador. Black and red points show *L. longicaudis* records in El Salvador and Honduras, respectively (see Funes and Pocasangre-Orellana 2020; GBIF.org 2023).

llano Nicolás *et al.* 2012; Santiago-Plata *et al.* 2013; Cianfrani *et al.* 2018). Probably during the rainfall season, the otter moves through the forest between rivers and small streams to search for food or shelter or such as activities for parental care. However, more studies will be necessary to determine the factors that affect the movement patterns of this species in the basin. On the other hand, many rivers and streams dry up during the dry season in our study area, then the main river is often used for water extraction and tourism, which is a potential threat to the availability of habitat for the species during the dry season. Also, our study area is located within the Central American Dry Corridor, therefore it is susceptible to drastic changes in precipitation and temperature (Quesada-Hernández *et al.* 2019). Additionally, climatic phenomena such as ENSO (El Niño–Southern Oscillation) and climate change can influence the habitat availability of the species by reducing river flow due to prolonged periods of drought, decreased precipitation, and increased temperature (Cianfrani *et al.* 2018). Therefore, it

is probable that the species can use forests as a temporary refuge or feeding site during these less favorable conditions.

Therefore, the conservation of adjacent forests and their connectivity will be a key strategy for the conservation of *L. longicaudis* in El Salvador, specifically in the Río Sapó basin, and will be necessary to create strategies that encourage forest owners to protect these lands and avoid deforestation. Due to the small percentage of Salvadorean protected areas (UNEP-WCMC 2023), conservation strategies based strictly on protected areas will not guarantee the conservation of species such as the Neotropical otter, where the most of records do not occur in protected areas (Funes and Pocasangre-Orellana 2020). Therefore, will be necessary to create conservation strategies that include not only the protection of riparian forests but also the expansion of these areas that allow the establishment of biological corridors (Crespin and García-Villalta 2014) that connect basins and conserve areas that have critical ecological requirements for developing and conserving *L. longicaudis* (Latorre-Cardenas *et al.* 2021).

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