

Potential distribution of the huillín (*Lontra provocax*) In the middle and lower basin of the Chadmo river, X Region, Chile.

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Abstract

The river otter (*Lontra provocax*) is an endangered species that currently has a limited distribution in Chile. This distribution is mainly due to land use change, increased human colonization and channelization of watercourses. The difficult direct observation and apparent low population density has generated a scarce ecological and geographic knowledge of the species. Our objective is to determine the potential geographic distribution of *L. provocax* in the middle and lower basin of the Chadmo River, Quellón, Los Lagos Region, Chile. We used the MaxEnt algorithm to model suitability habitat in the middle and lower basin of the Chadmo River with six uncorrelated environmental variables and 7 presence records without spatial correlation. The results indicate that suitable areas for the species are scarce, with suitability values between 0.428 and 0.685, and no areas of high suitability. The variables of greatest contribution to the model were elevation and slope, aligning with conditions that favor the presence of freshwater and marine macrocrustaceans, the main food of the species. In addition, possible anthropogenic threats were raised, such as cattle ranching and forest clearing, which would degrade the habitat and limit the distribution of *L. provocax*. It is recommended that research be conducted in areas that were marked as highly suitable for the species but lacked occurrence data. This would allow us to confirm or rule out the presence of the otter in these areas. In addition, it is recommended that other variables be incorporated to refine and adjust the models, such as the distribution of river macrocrustaceans that make up the diet of the species, pollutants in the water and flow velocity.



Figure 1. Huillín (*Lontra provocax*).

Methodology

The research was conducted in the middle and lower basin of the Chadmo River in Quellón, Chile, characterized by a temperate climate and temperate evergreen forest. Data on the occurrence of the otter *L. provocax* were collected through direct sightings, tracks and scats, and MaxEnt software was used to perform the DEM and analyze the contribution of environmental variables such as elevation, slope, precipitation and temperature in its distribution. The model allowed us to evaluate the probability of occurrence of the species according to each variable, helping to identify potential areas for its conservation.

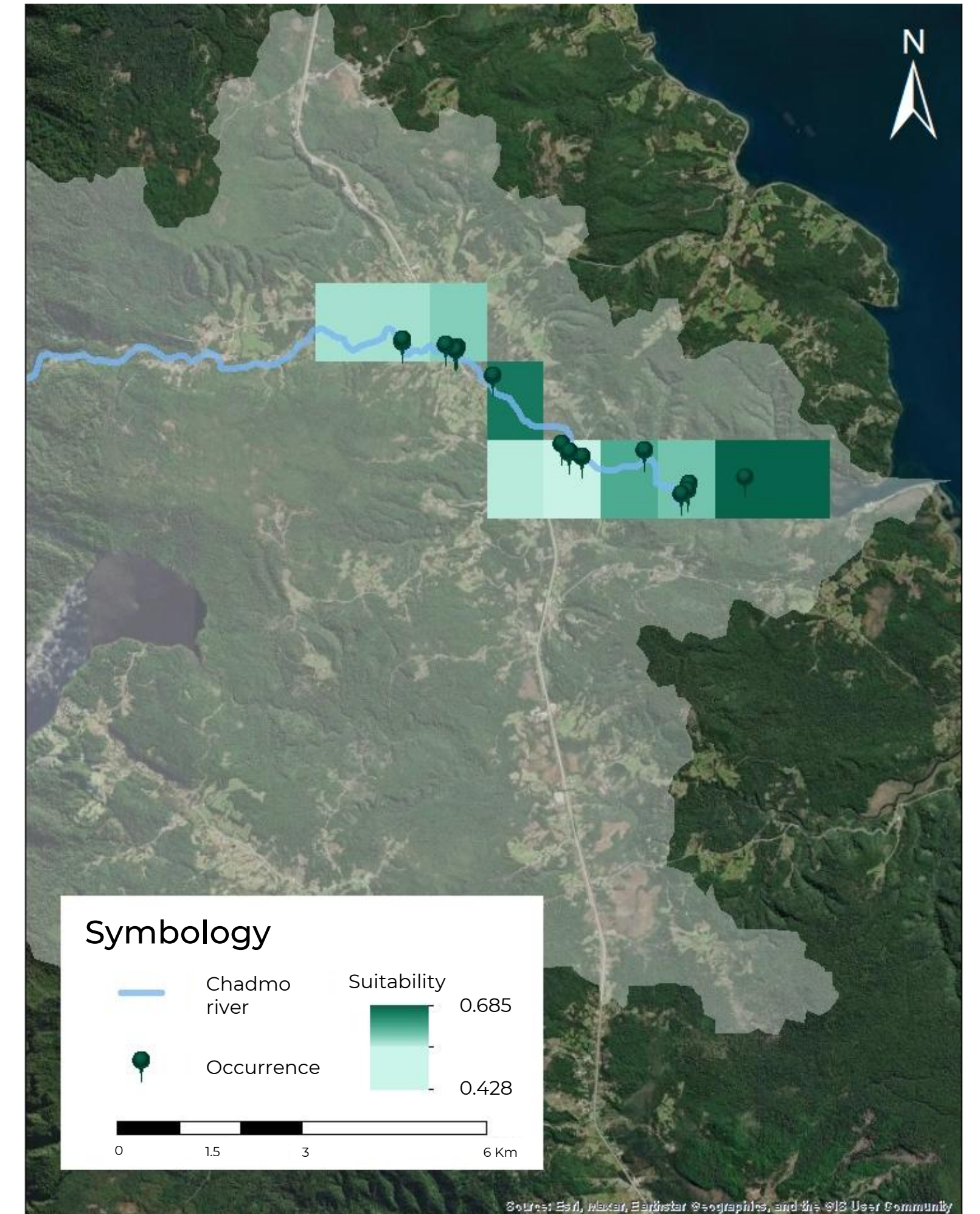


Figure 3. Model of potential distribution of *L. provocax*.

Introduction

The habitat of a species is determined by several environmental variables that influence its distribution and population size (Elith & Leathwick, 2009; Irving et al., 2020; Nyström et al., 2013).

For endangered species such as the river otter *L. provocax*, Species Distribution Models (SDM) allows mapping habitat suitability using occurrence data and specific variables (Phillips et al., 2006).

Therefore, this study will determine the potential geographic distribution of *L. provocax* in the middle and lower basin of the Chadmo River, Quellón, Los Lagos Region, Chile.

Studying the potential distribution of the species will help to identify conservation areas and to understand its role as an indicator species of the health of the local ecosystem.

Results

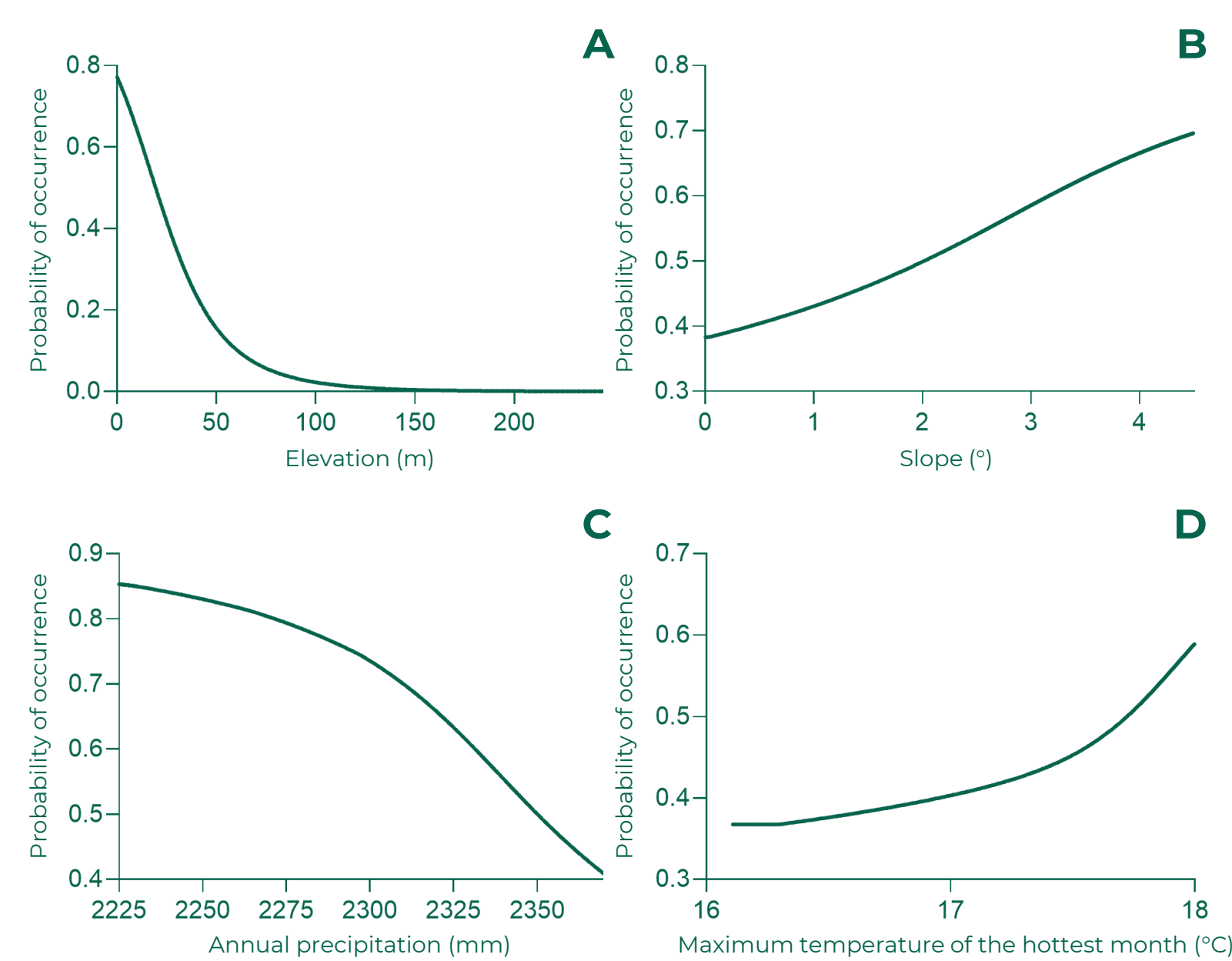


Figure 2. Probability of occurrence as a function of variables.

Conclusion

- The model indicates that suitable areas for the otter *L. provocax* in the study area are limited, without detecting areas of high suitability.
- The sites where the species was found have low elevation and slope characteristics, as well as temperature and precipitation conditions that favor the availability of prey in its diet.
- Anthropogenic threats, such as cattle ranching and logging, degrade the habitat, limiting suitable areas and affecting the distribution of the species.
- It is recommended that additional research be carried out in areas of low suitability to confirm or rule out the presence of *L. provocax* and include additional variables to optimize SDM thus facilitating the identification of conservation areas for the species.

