

## **Grant Progress Report Alex C. Walker Foundation**

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**Project name:** Maximizing ecosystem services and biodiversity protection for future land acquisitions of the Children's Eternal Rainforest (Bosque Eterno de los Niños, "BEN")

**Project description:** In November 2022, the Monteverde Conservation League received a grant from the Alex C. Walker Foundation for the amount of \$20,000. The primary goal for this project was to use GIS techniques to map areas adjacent to the Children's Eternal Rainforest (Bosque Eterno de los Niños, "BEN") in order to identify the best places to concentrate land purchases in the future. With GIS technology, we can identify areas that have highest ecosystem services values, biodiversity, and that would increase connectivity to other conservation areas of Costa Rica. These results would allow us to utilize our limited resources to maximize conservation success for the future.

**Project budget:** \$20,000

**Project update:**

- A. GIS.** Since the last progress report in May, we have now all of the proposed maps, including: study area, protected areas, biological corridors, political boundaries of study area, elevation, slope angle, watersheds, land-use, Holdridge life zones, biodiversity, and hydroelectric generation (see figures at end of this document). As mentioned in the May 2023 report, the map for hydroelectric generation took longer than expected due to the difficulty of obtaining necessary data. The biodiversity map also took longer than expected due to the complexity of estimating biodiversity parameters.

After completing all of the maps, we developed an algorithm to calculate priority lands for conservation. This calculation assigns values to each location within our study area to create a ranking of 0, 1, or 2 for each of the following variables, extracted from our maps:

- 1) land-use
- 2) slope angle
- 3) proportion of life zone protected
- 4) biodiversity
- 5) connectivity / biological corridors
- 6) hydroelectric power generation

Based on this ranking system, any given site within the study area could potentially receive a value or “score” for land for conservation between 0 and 12 (12 being the highest). We used these rankings to create our final map, which shows where we should focus conservation efforts in the medium-long term. This map is in revision and is nearly complete.

Next steps: Once we finalize the map showing priorities for land conservation in the region, we will begin the writeup of this study. We also plan to organize a meeting with other conservation partners, including SINAC, regional private conservation organizations, ecotourism operators, and national and international conservation NGOs, with the long-term goal of making the conservation of the Tilarán Mountains eternal.

**B. Camera trap research.** With funds provided by the grant and in consultation with the Alex C. Walker Foundation, the Monteverde Conservation League purchased 18 new wildlife cameras to help in the continued work to monitor mammals within the Children’s Eternal Rainforest. The cameras have been in use since January 2023. 12 cameras are currently in use at long-term monitoring sites throughout the BEN; 2 cameras are in use by our forest rangers and have been crucial in documenting poachers as well as wildlife; and 3 cameras are not working for unexplained reasons and are on their way back to the US for replacement (under warranty). The remaining camera has been deployed since May 2023 at a remote site in the BEN, in collaboration with a local biologist doing video research, and it has given us spectacular footage of wildlife. In August and September 2023, this camera recorded incredible footage of two male jaguars (see photo at end of this report, and videos on YouTube (see links below). Be sure to watch the videos with the sound turned up; the second one is a rare recording of jaguar vocalizations:

<https://youtu.be/uq6ArSEgalg?si=Nrh58BmD9KQrgzsT>  
<https://youtu.be/r7Wm4-cgMKk?si=G13zgL82RVYWzQ0g>

Beginning in January 2024, we plan to temporarily pull the 13 working cameras from the long-term monitoring sites, where they have been for 2 years and have given us great baseline data. The next phase in this program is to deploy cameras to remote areas in the rest of the BEN in order to gather data from this vast and largely undocumented area.

**C. Summary.** We are pleased and excited with the results of this project. In addition to providing valuable information for future land purchase and conservation decisions, the project leaves us with important GIS products that will be useful for research, education, and outreach. The results from the camera traps are not only exciting, but provide important baseline data for future monitoring and research.

Looking forward, we anticipate that the final map will be complete by November 30. At that point, we will move to the writing/publication phase of the project as well as planning discussions with conservation partners.

# Figures

## Área de estudio (Study Area)

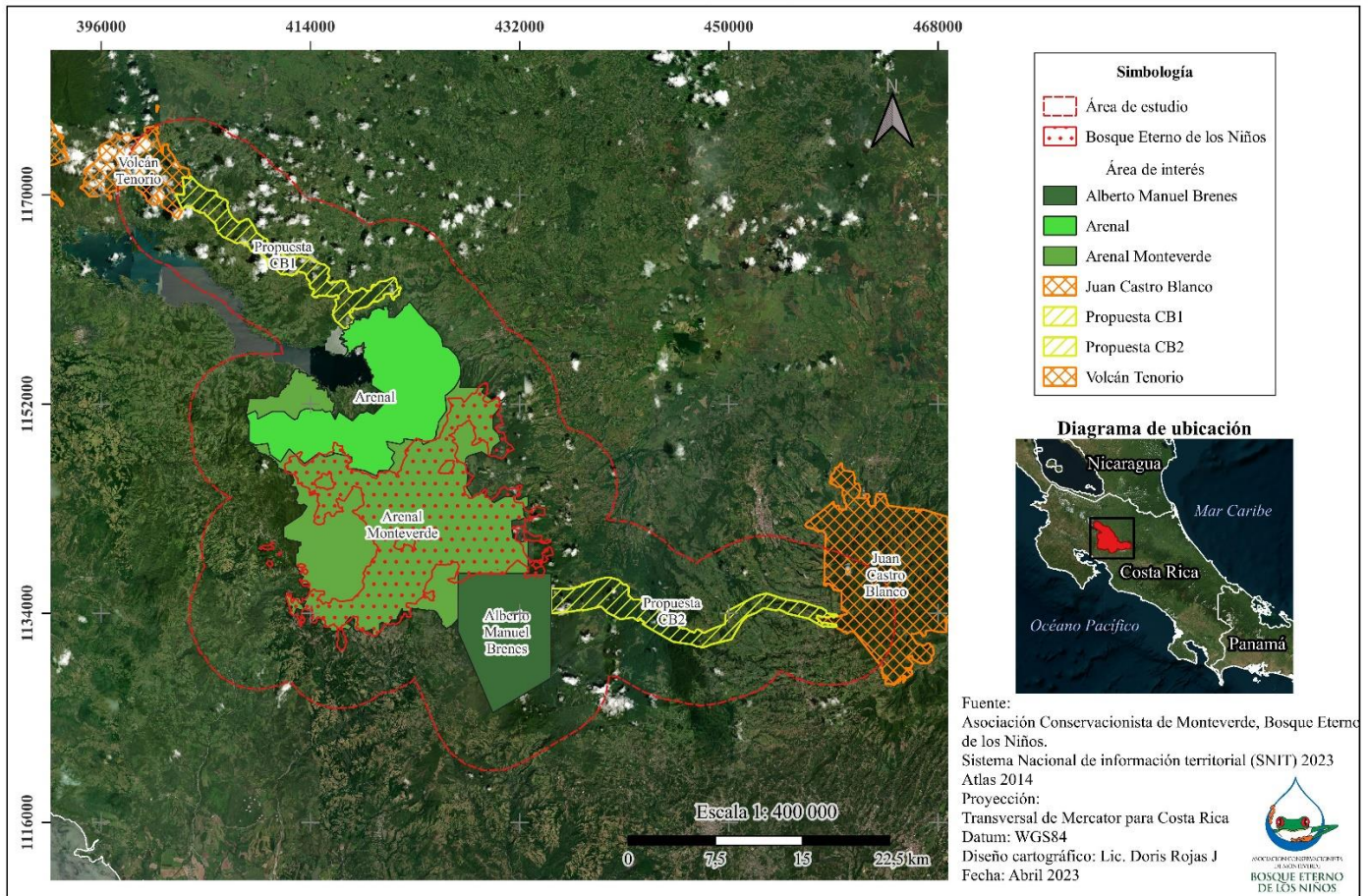


Fig. 1. Area of study showing the current protected areas in the region plus the two biological corridors proposed by Moran et al. 2019. The red line outlines the area designated as our study region.

## Corredores biológicos (Biological corridors)

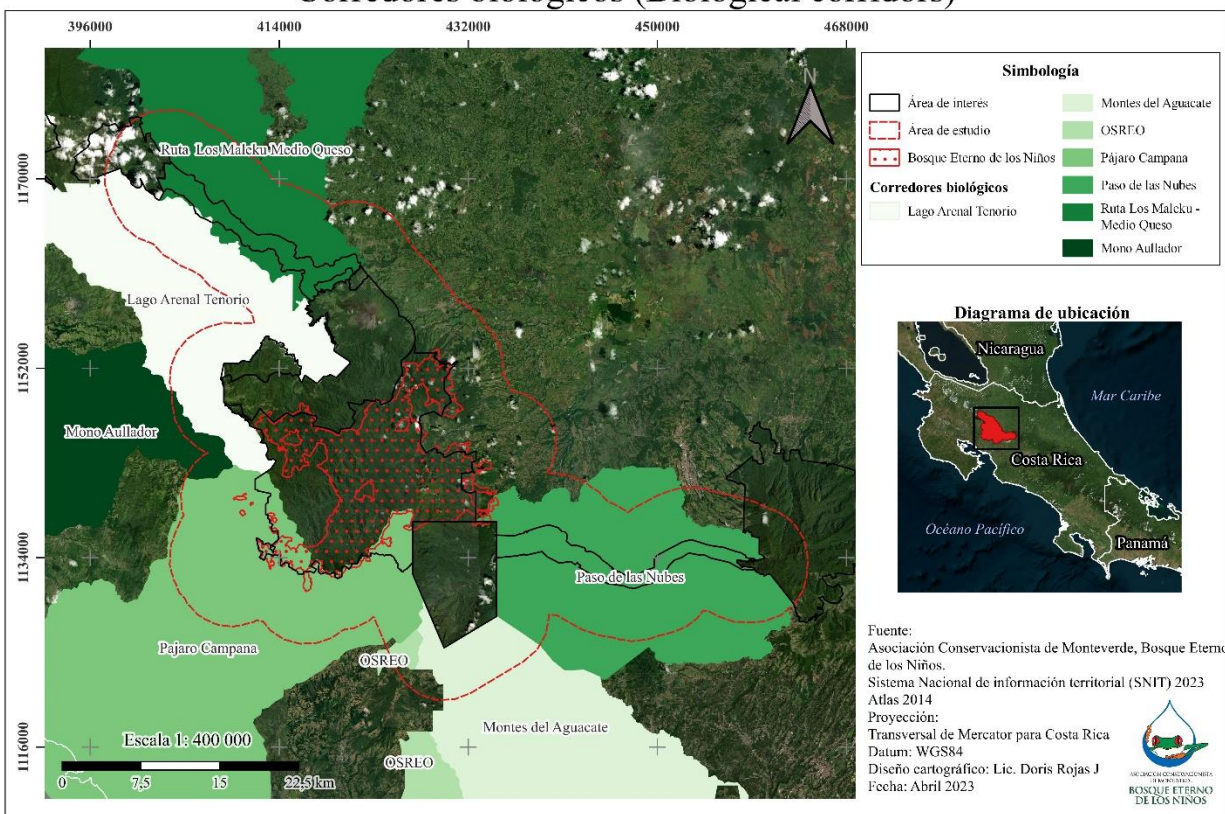


Fig. 2. Map showing the SINAC Biological Corridors and the two corridors proposed by Moran et al. 2019. The Children’s Eternal Rainforest has focused on the Pájaro Campana Corridor in past conservation efforts.

## Límites políticos (Political limits)

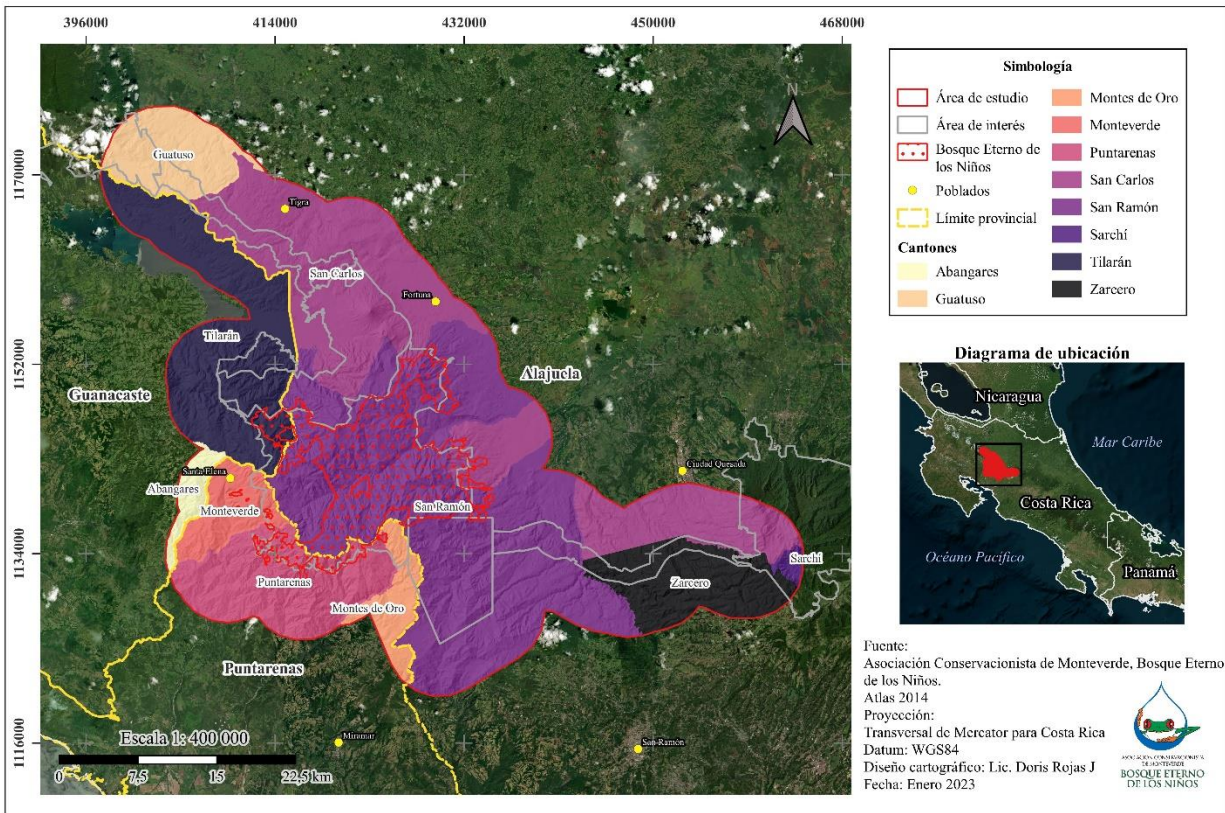


Fig. 3. Map showing the political boundaries within our study area. While not a direct factor in determining future land conservation efforts, these boundaries may indicate conservation partners.

## Modelo de elevación (Elevation model)

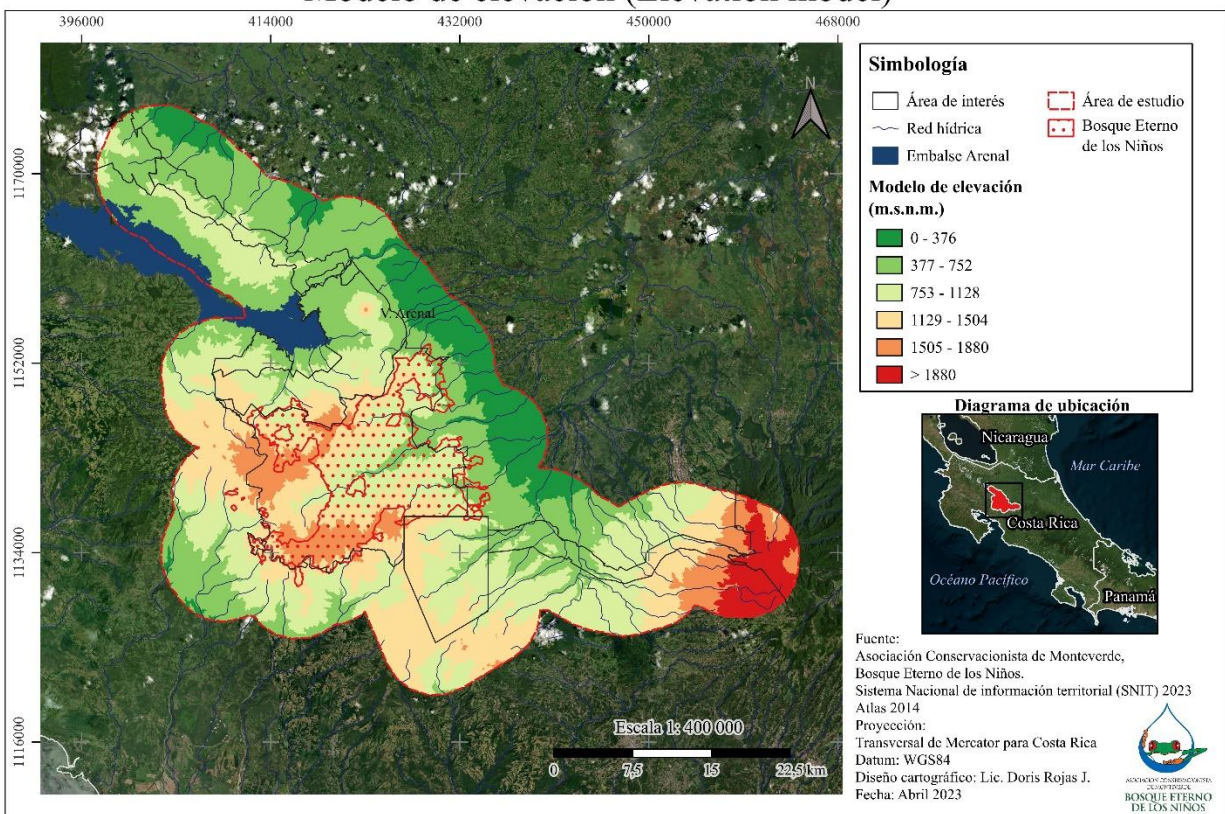


Fig. 4. Map showing elevation (m) and protected areas.

# Pendientes (Slopes)

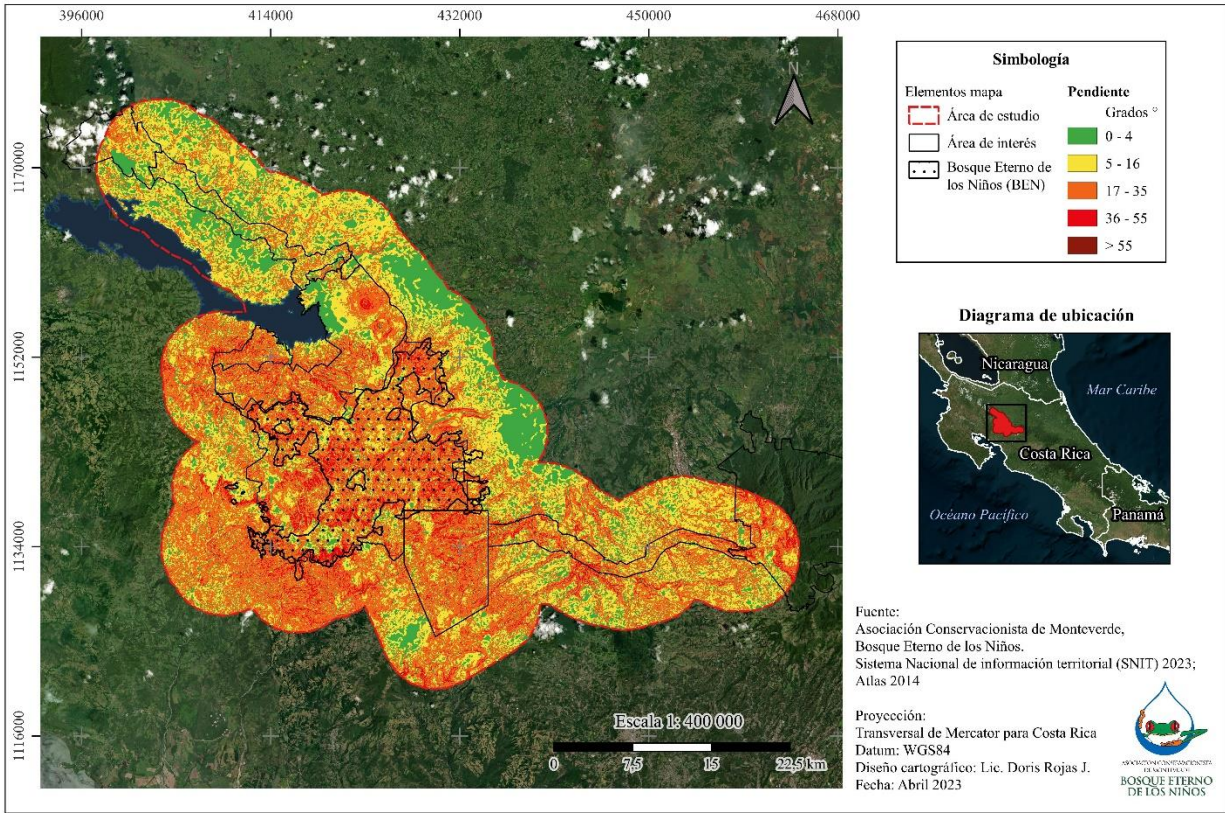


Fig. 5. Map showing slope angle, protected areas, and proposed corridors.

# Subcuencas hidrográficas (Watersheds)

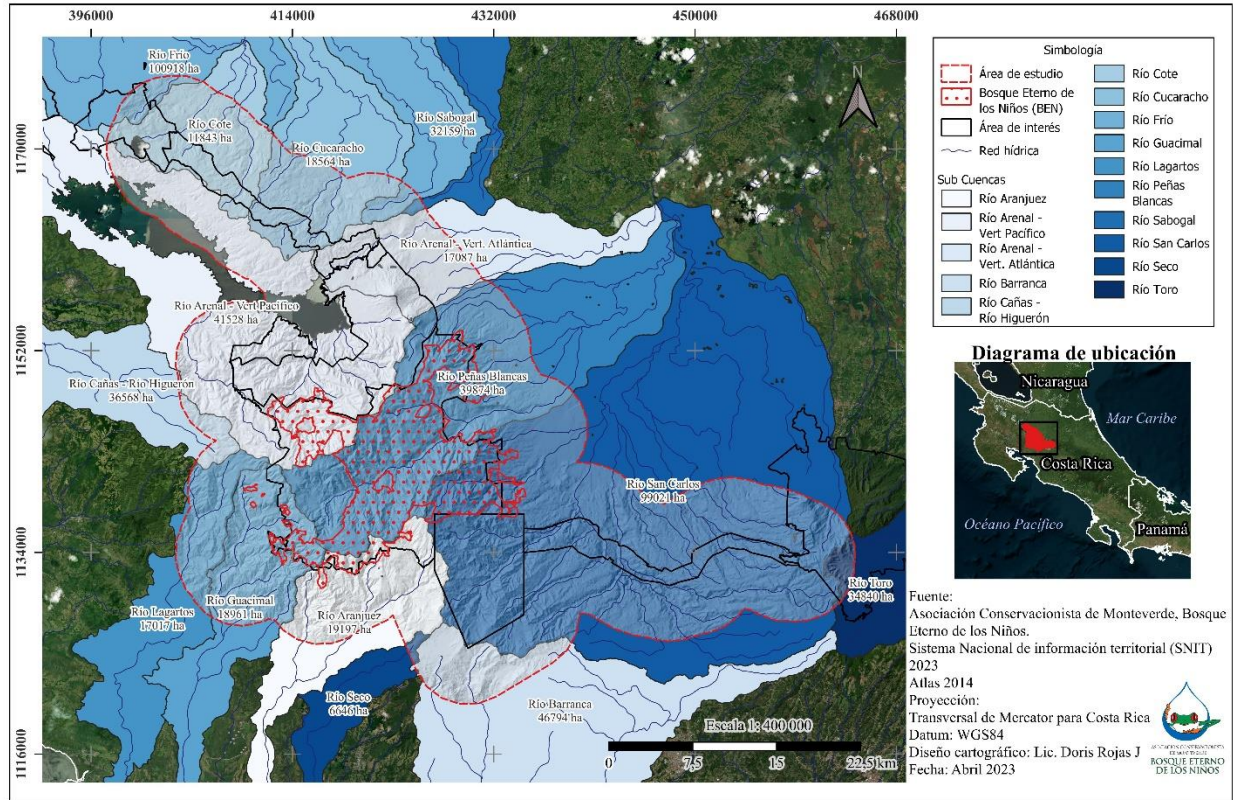


Fig. 6. Map of watersheds present in the study area.



## Usos del suelo (Land use), 2017

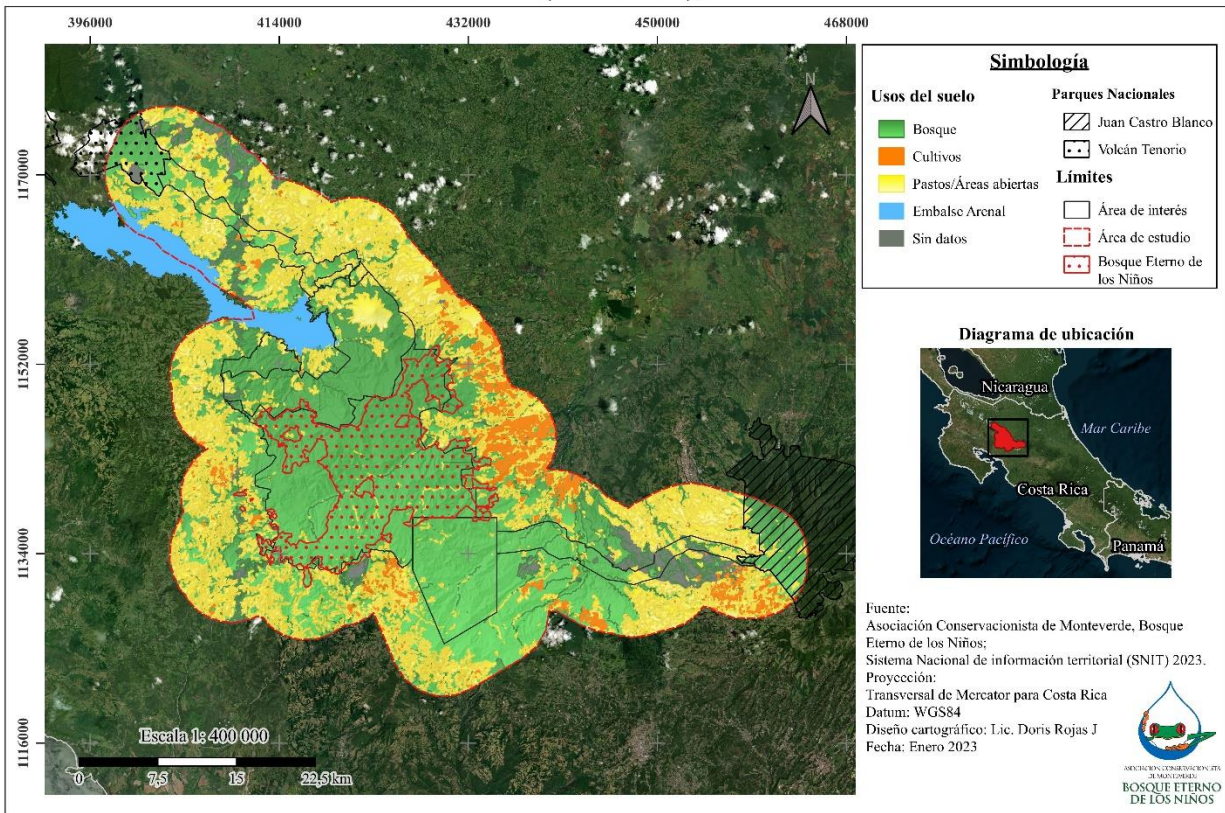


Fig. 7. Map showing current land-use within study area.

## Zonas de vida (Life Zones)

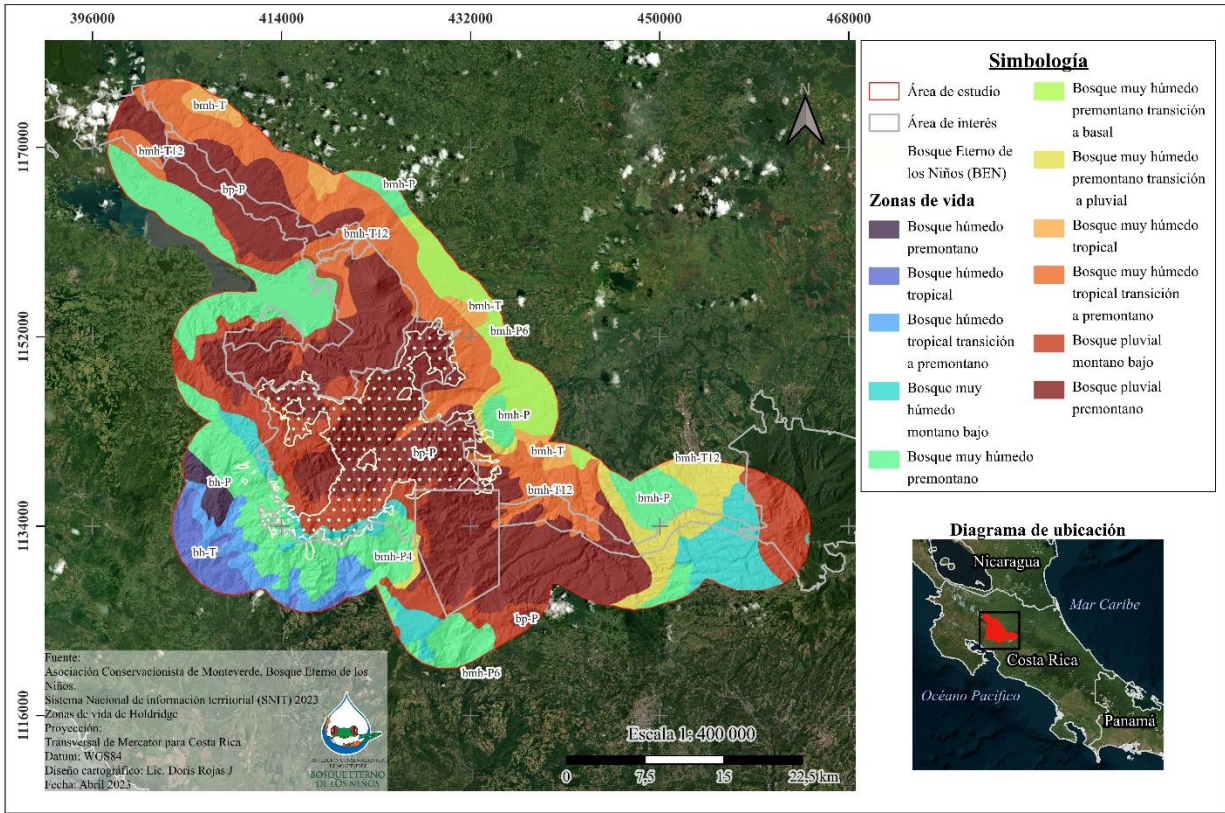


Fig. 8. Map of Holdridge Life Zones in study area.

# Proyectos hidroeléctricos (Hydroelectric projects)

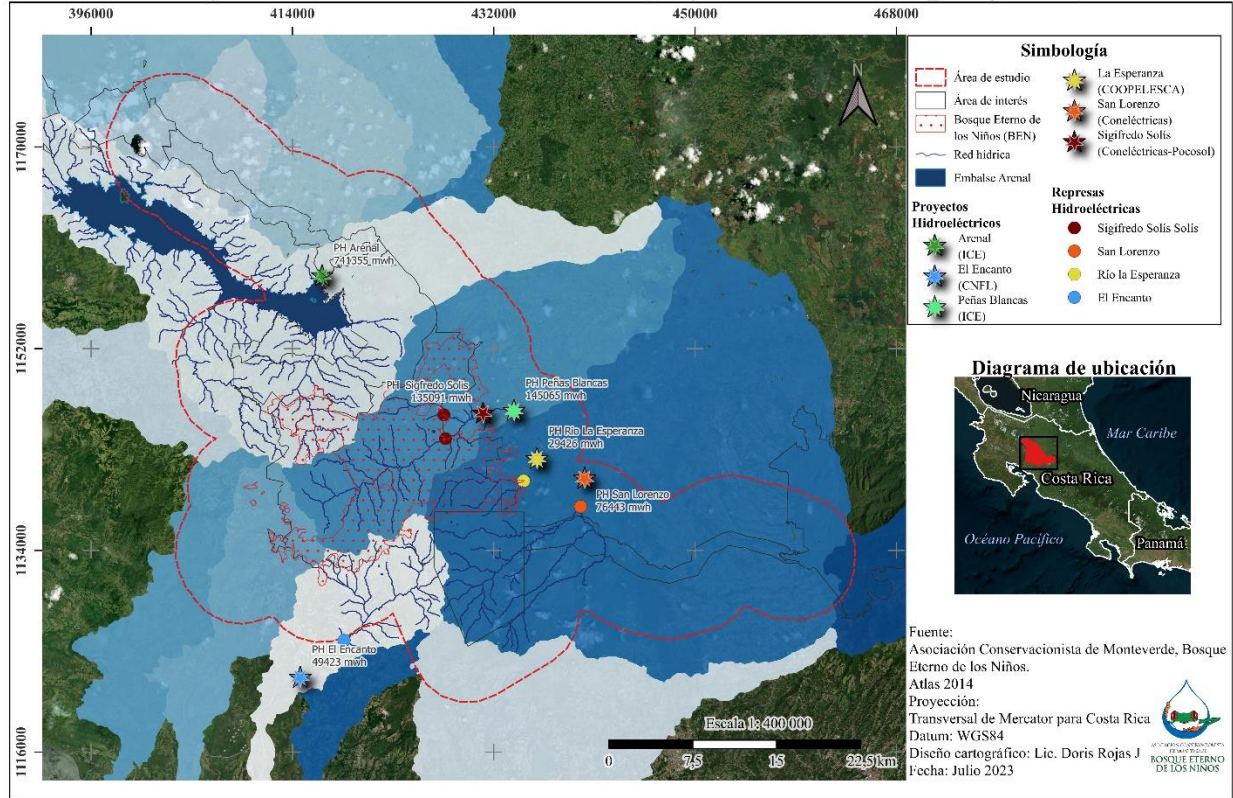


Fig. 9. Map of hydroelectric projects in study area.



Fig. 10. Screen capture from video of a male jaguar in a remote highland area of the BEN, taken using a camera trap purchased with funds from the Alex C. Walker Foundation.

## References

Moran, M. D., Monroe, A., & Stallcup, L. (2019). A proposal for practical and effective biological corridors to connect protected areas in northwest Costa Rica. *Nature Conservation*, 36, 113-137.