

Simposio de Cuencas Hidrográficas de Puerto Rico 2022

Gerencia y Manejo de Cuencas Hidrográficas en Puerto Rico

10 de marzo de 2022

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Protectores de Cuencas Inc.





¿Quienes Somos?

- Organización sin fines de lucro, no gubernamental y de base comunitaria.
- Dedicada a establecer proyectos de conservación desde una perspectiva de manejo integrado de cuencas hidrográficas.
- Oficinas en Yauco
- Fundada en enero de 2012



INSTITUTIONAL CAPACITY BUILDING

Native Plants Nursery

- More than 60,000 plants produced yearly
- Restoration Projects across the Island

Monitoring Equipment

- HACH 2100Q Portable Turbidimeter
- HACH SL1000 Portable Nutrient Multiparameter
- YSI Multiparameter
- HANA Ammonia Medium Range Portable Photometer - HI96715
- IDEXX Quanti-Tray System for bacteria

Restoration Equipment

- 12 4x4 Pick up trucks
- 6 4x4 6m Dump Trucks
- 1 4x4 Service Truck
- 2 20m Dump Trucks
- 2 Backhoes
- 2 Crawler Dozers
- 2 Compacting Rollers
- 2 Skid Steer
- 6 water trucks
- 6 trailers
- Hydromulcher
- 2 Mini excavators
- 1 Mid Excavator
- 2 Boats

Staff:

- 8 Technical Personnel
- 30 General Labor experts in BMP and Green Infrastructure



Colaboradores



Yauco



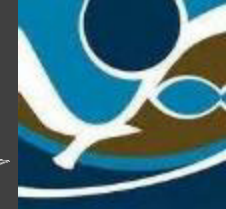
Guánica



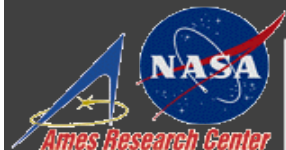
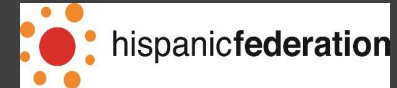
Guayanilla



Lajas



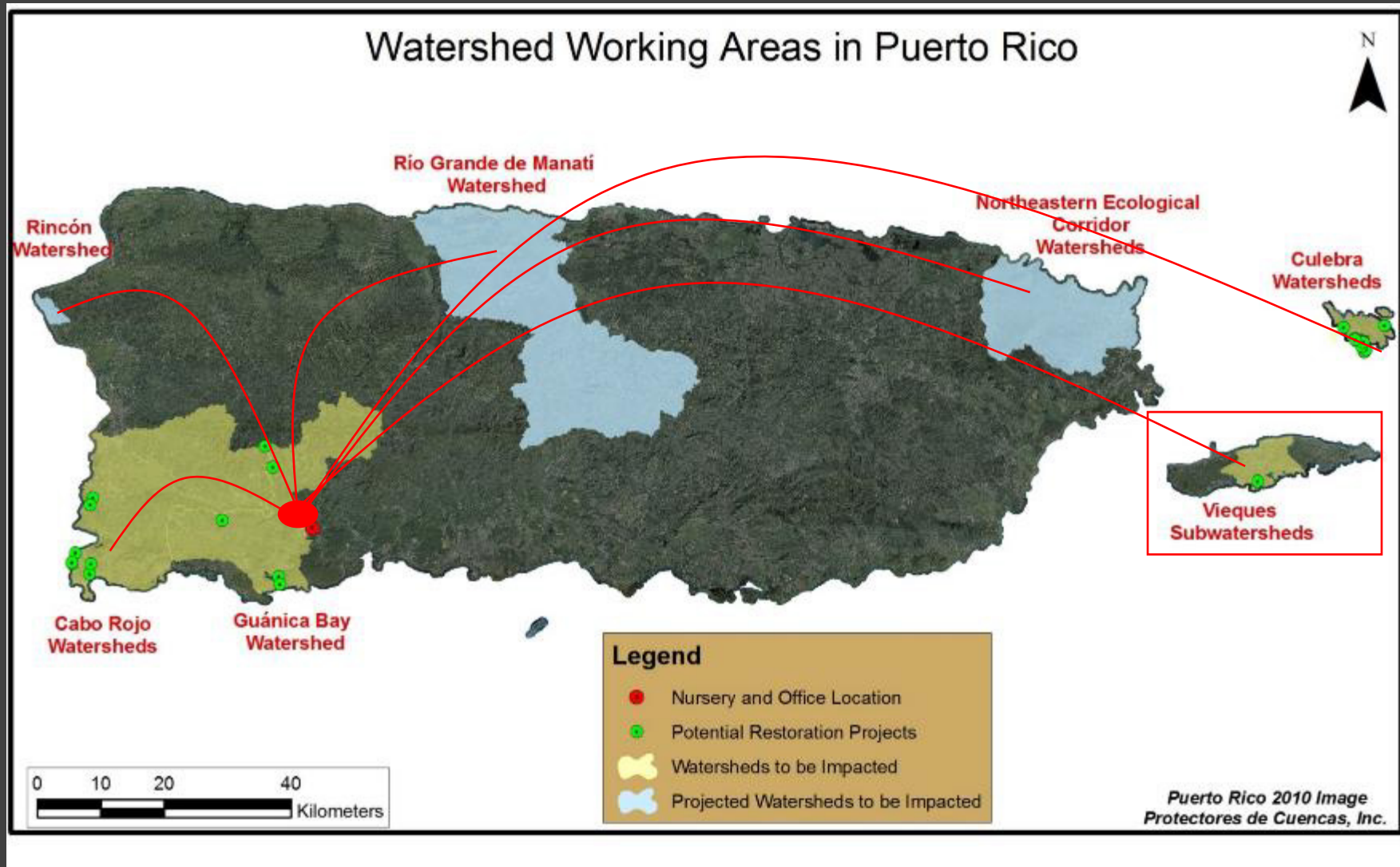
GlobalGiving



FUNDACIÓN COMUNITARIA DE PUERTO RICO

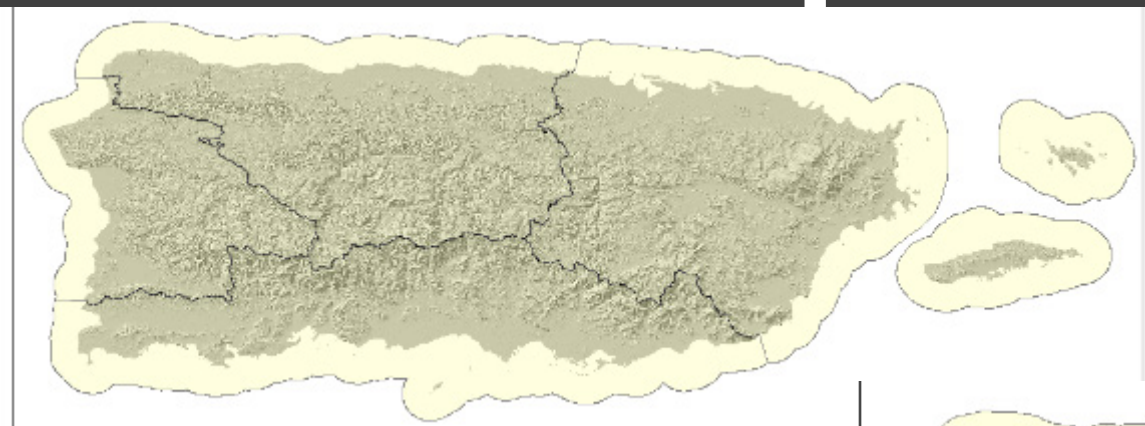


Áreas de Trabajo de PDC



Preguntas Guías

1. ¿Cómo se establece un plan de manejo y cómo se puede incorporar medidas de mitigación?
2. ¿Cuáles son los retos de la implementación de un plan de manejo y a quién le toca resolverlos?
3. Estructuras de gobernanza. ¿Cómo se desarrollan? ¿Ejemplos en PR? ¿Lecciones aprendidas? Sugerencias o plataforma de gobernanza sugerida.



La CUENCA es una
perspectiva...una manera
de interpretar el paisaje

¿Plan de Manejo de Cuenca?

- El Plan debe ser una Guía flexible y adaptativa que exponga las necesidades principales de la cuenca y como atenderlas.
- Nace de problema o interés común identificado por residentes locales, academia y/o gobierno.
- Recoge los problemas ambientales asociados a los usos y recomienda soluciones para resolverlos.
- Debe ser elaborado en conjunto con las personas que viven en la cuenca.
- Es un esfuerzo multisectorial.



Ciclo del Plan de Manejo



Definir límites
geográficos



Integración de
partes
interesadas



Conocer
Cuenca



Identificar y
priorizar
problemas



Proponer
proyectos



Implementar



Medir
efectividad



Adaptar

Criteria minimums for watershed management plans of the EPA



- | | |
|----|--|
| a. | • Identify causes and sources of pollution |
| b. | • Estimate load reductions expected |
| c. | • Describe management measures and targeted critical areas |
| d. | • Estimate technical and financial assistance needed |
| e. | • Develop an information and education component |
| f. | • Develop a project schedule |
| g. | • Describe interim, measurable milestones |
| h. | • Identify indicators to measure progress |
| i. | • Develop a monitoring component |

Problemas principales de plan de manejo para la Bahía de Guánica

A number of critical issues were identified in the GB/RL watershed related to the impact of land based sources of pollutants on the near shore coral reefs in the areas surrounding the Guánica Bay. These include:

1. Upland erosion in the coffee growing regions;
2. Reservoir sedimentation and transport;
3. In-stream channel erosion;
4. Loss of Historic Guánica Lagoon;
5. Legacy contaminants;
6. Sewage treatment.

Table 5. Implementation Recommendations for Guánica Bay/ Rio Loco watershed				
Recommendation	Rationale	Cost	Partners	Location
#1 Rio Loco streambank riparian plantings and removal of historical irrigation infrastructure (likely have a willing farmer and existing USDA programs for funding)	Farmers are losing land and excess nutrient rich sediment and topsoil is being exported to the Guánica Bay and reefs	\$50k-100k depending on length	USDA, NOAA, DRNA	Demo area that was visited on farm tour just downstream of Yauco before Rio Loco crosses under Rt. 116
#2 Demonstration project where sewage effluent is treated in a series of treatment wetlands or living machine to reduce nitrogen export (2 nd most important recommendation after Restoration of the Guánica Lagoon)	Nutrients particularly nitrogen are not significantly removed in a primary or secondary treatment system – a treatment wetland would result in increased denitrification of sewage effluent	\$50-100k	UPR, PRASA, NOAA	Guánica STP, Cana Gorda STP
#3 Hydroseeding of areas with bare soil associated with roads or clearing of home sites in high elevation erodible soil areas	Sediment loss of highly erodible clay is filling reservoirs and remaining in suspension and reaching Guánica Bay	\$20-30k	USFWS, USDA, Ag Consultants	High elevation areas in Loco and Lucchetti

Guánica Bay Watershed Management Plan

A Pilot Project for Watershed Planning in Puerto Rico



10/12/08

Prepared for

NOAA Coral Reef Program
Office of Ocean and Coastal Resource Management
Silver Spring, Maryland

Departamento de Recursos Naturales y Ambientales (DRNA)
Estado Libre Asociado de Puerto Rico



Prepared by

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CENTER FOR
WATERSHED
PROTECTION



Figure 64. Soil stabilization recommended projects in the NEC.

Table 16. Soil stabilization Practices proposed projects list description.

ID	Sub Water-shed	Observations	Est. Unstable Soil Area (acres)	Est. Distance from a stream (meters)	GPS Coordinates	Type	Owner ship	Existing Land Use	Slopes Type
SS-1	MP	Active construction site since year 2013 or earlier for urbanization expansion. Appears to be inactive at the moment	40	230	18.373525° -65.743184°	Land Clearance	Private	Urban	Low
SS-2	RJM	Dirt parking area very close to shore.	3	130	18.364917° -65.692986°	Dirt Parking	Private	Urban	Low
SS-3	RP	Land clearing for housing development since year 2004 or earlier.	10	60	18.335131° -65.703936°	Land Clearance	Private	Low Density Urban	High
SS-4	RP	Active farmland	6	560	18.343473° -65.719539°	Land Clearance	Private	Agriculture	Moderate
SS-5	BF	Land clearing for tourism development since year 2004 or earlier.	30	60	18.344919° -65.641706°	Land Clearance	Private	High Density Urban	High to Moderate
SS-6	BF	Land clearing for tourism development since year 2004 or earlier.	2	20	18.346237° -65.638976°	Land Clearance	Private	Low Density Urban	High to Moderate
SS-7	BF	Land clearing for construction of urbanization. Abandoned lot remnant with severe erosion rates.	2	375	18.345016° -65.651108°	Land Clearance	Public	High Density Urban	High to Moderate
SS-8	BF	Land clearing for tourism complex development. Active construction site.	100	1	18.302392° -65.627740°	Land Clearance	Private	Low Density Urban	High to Moderate
DRS-1	RP	Dirt access road in sever erosion conditions that drains to adjacent water bodies that	5	1	18.358593° -65.698015°	Dirt Road	Public	Conservation	Low



Ejemplo del Plan de Manejo Integrado de Cuencas del Corredor Ecológico del Noreste

¿Cuáles son los retos de la implementación de un plan de manejo y a quién le toca resolverlos?

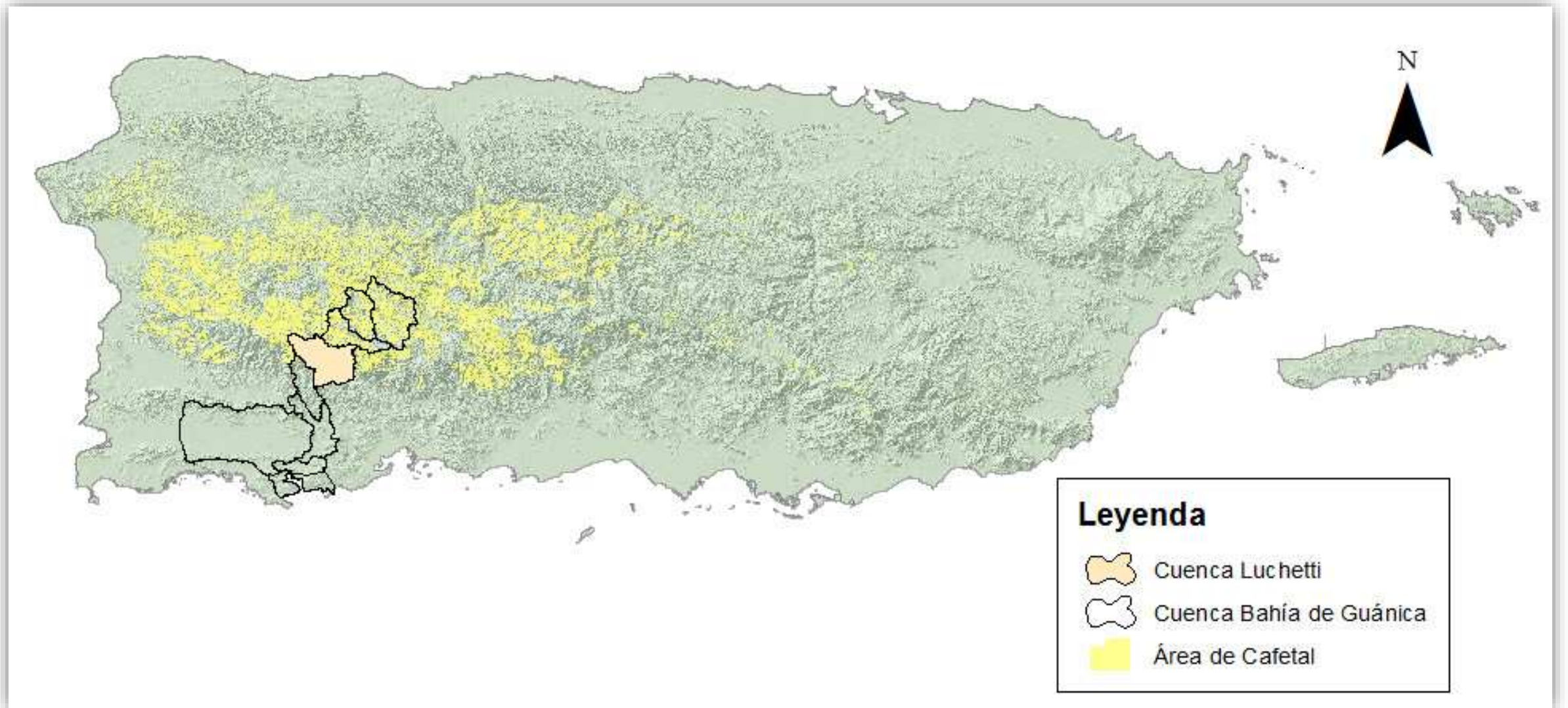
Retos
filosóficos

Retos
económicos

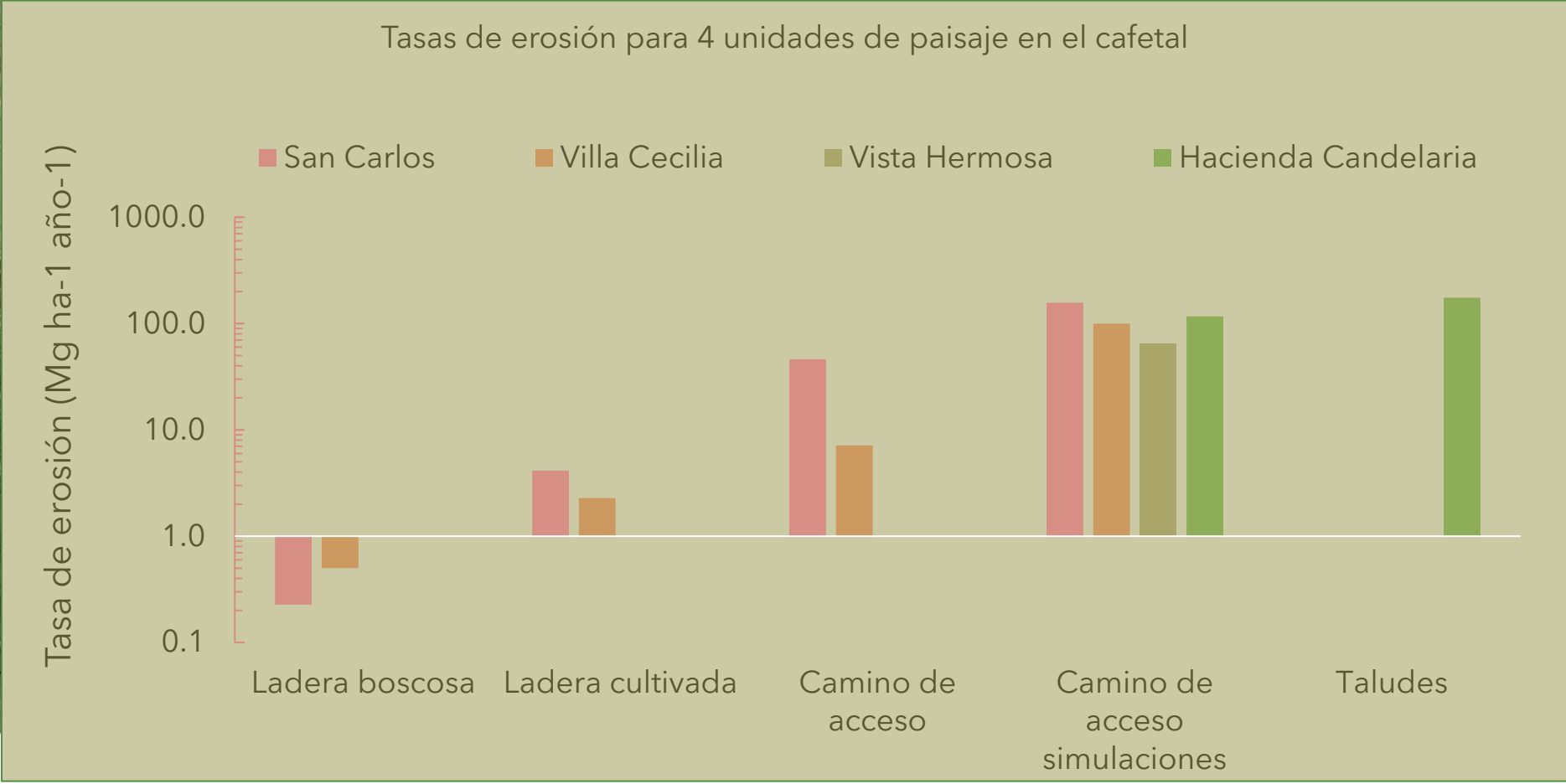
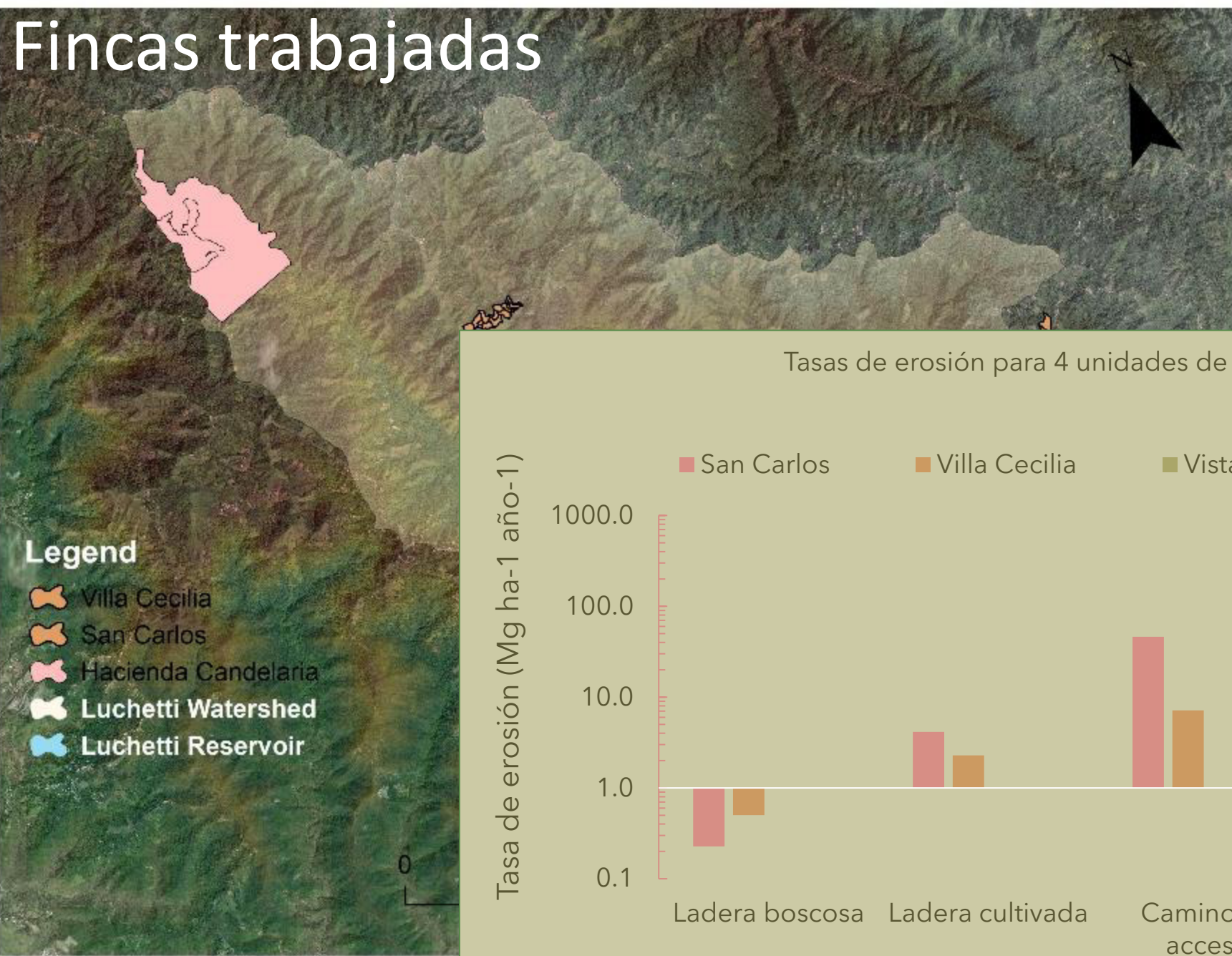
Retos
políticos

Retos
logísticos

Implementaciones en caminos de tierra en cafetales



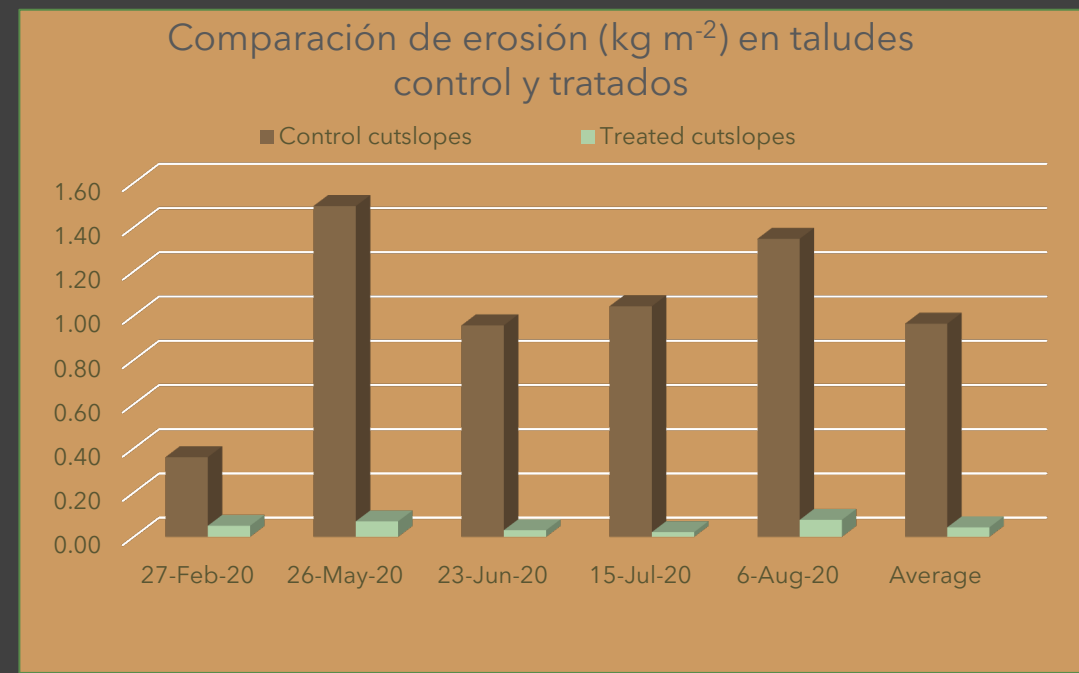
Fincas trabajadas







Evaluación de efectividad de prácticas de control de erosión



**Estructuras de
gobernanza.**

**¿Cómo se
desarrollan?
¿Ejemplos en PR?**

**¿Lecciones
aprendidas?**

**Sugerencias o
plataforma de
gobernanza sugerida.**

**Modelo
Comunitario**

**Juntas de
Co-Manejo**



An aerial photograph of a rural landscape. A paved road runs diagonally from the top left towards the center. To the right of the road, there is a small, light-colored house with a dark roof. The surrounding area is covered with dense green vegetation, including many small, young trees planted in rows, suggesting a reforestation or agricultural project. The terrain appears to be hilly or uneven. The word "Gracias" is overlaid in the center in a large, white, sans-serif font, with a thin white horizontal line underneath it.

Gracias