



CONSEJO DE
CAMBIO CLIMÁTICO

PUERTO RICO

Roberto Viqueira

Protectores de Cuencas

Manejo Integrado de Cuencas Hidrográficas para Mitigar los Efectos del Cambio Climático

Robert Viqueira Ríos
Protectores de Cuencas, Inc.
19 de mayo de 2023

XII Reunión Cumbre del Consejo de Cambio Climático de Puerto Rico





Protectores de Cuencas

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



Colaboradores:

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 U.S. DEPARTMENT OF COMMERCE
NOAA

ESTADO LIBRE ASOCIADO DE PUERTO RICO
 DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES
DRNA

U.S. FISH & WILDLIFE SERVICE
 DEPARTMENT OF THE INTERIOR
U.S. FISH & WILDLIFE SERVICE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA

DISTRITO DE CONSERVACION DE SUELOS Y AGUAS DEL SUROESTE, INC.

Puerto Rico Wire Group
Puerto Rico Wire

MACCAFERRI

sartorius stedim biotech

CEFI
 Equipándote para crecer.

Yauco

Guánica

USGS

National Fish and Wildlife Foundation

NRCS
 Natural Resources Conservation Service

Lajas

Guayanilla

GLM
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NASA
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Horsley Witten Group

ridge to reefs

Autoridad de Acueductos y Alcantarillados
 GOBIERNO DE PUERTO RICO

COLEGIO PRO BOSQUE ECO
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 OFICINA DEL PATRÓNIMO NATURAL HISTÓRICO Y CULTURAL
 MANAQUEZ

Vigilantes del Planeta
 Capítulo de Borlén

Ferrería MADERAS
3CC

FOREST SERVICE
US
 DEPARTMENT OF AGRICULTURE

The University of Texas at Austin
 Teresa Lozano Long Institute of Latin American Studies

FUNDACIÓN COMUNITARIA DE PUERTO RICO

FUNDACIÓN TOYOTA

USDA



Ciclo de Manejo Integrado de Cuencas Hidrográficas



Definir límites geográficos



Integración de partes interesadas



Conocer la Cuenca



Identificar y priorizar problemas



Proponer proyectos



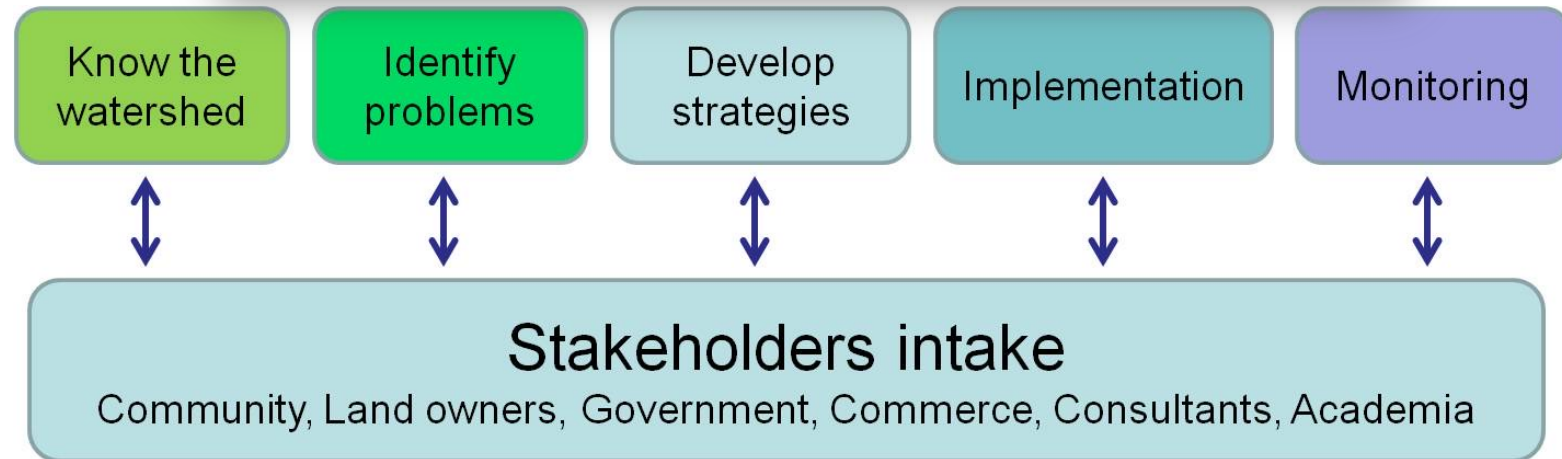
Implementar



Medir efectividad



Adaptar





Nuestra
Filosofía

- Educación
- Integración Comunitaria
- Justicia Ambiental



Algunos Proyectos Implementados por PDC



- Permeable parking
- Wooden boardwalk
- Green infrastructure

Tres Palmas Marine Reserve, Steps Beach



- Restoration
- Trail rehabilitation
- Erosion and sediment reduction



- Dirt road stabilization
- Coral nurseries and outplanting

Northeastern Ecological Corridor

El Yunque



- Wetland restoration
- Shoreline stabilization



- Green infrastructure
- Dirt road stabilization
- Coastal reforestation



- Dirt road stabilization
- Sediment detention ponds
- Rainfall-runoff research



An aerial photograph of a coastline. The image shows the ocean on the left, with waves breaking onto a sandy beach on the right. The water is a deep blue, and the sand is a light tan color. The waves are white and foamy as they crash onto the shore. The overall scene is serene and natural.

Proyecto de Restauración Costera Playa María en Rincón





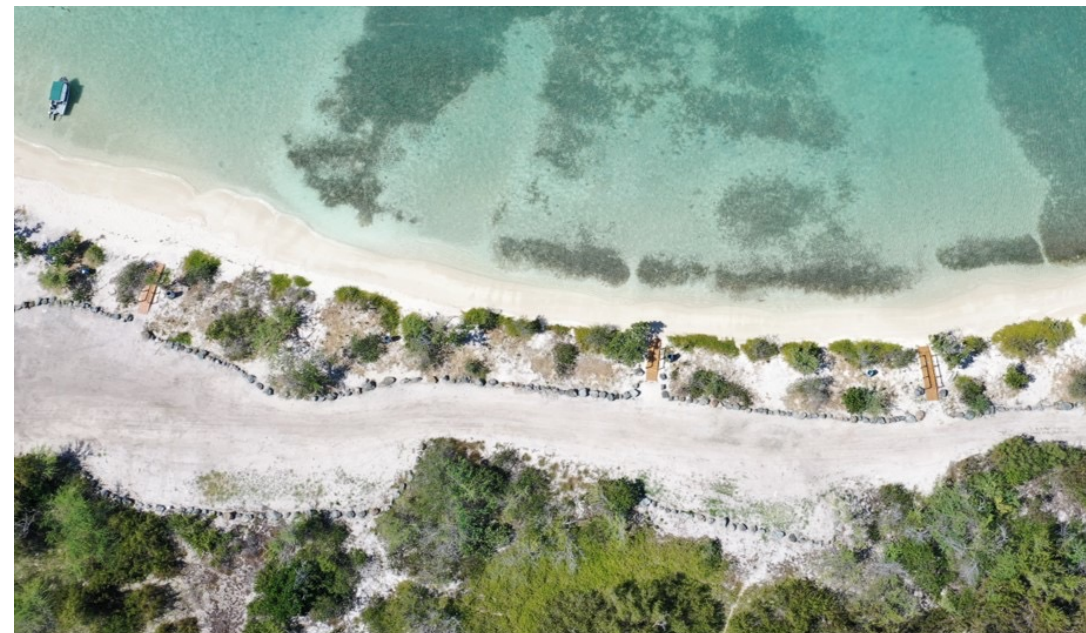


La Jungla Bosque Seco de Guánica





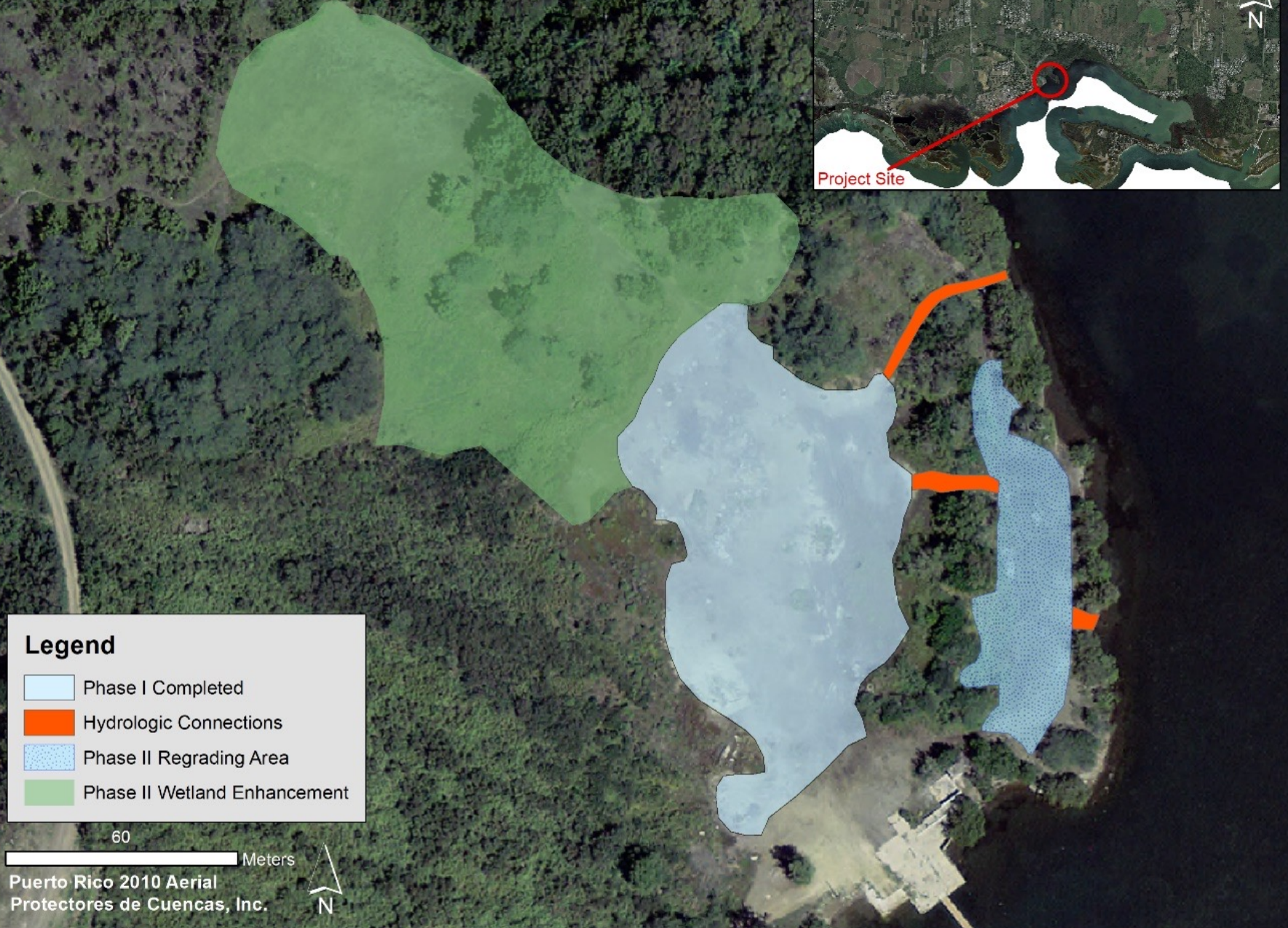










Wetland Restoration in the
Jobos Bay Natural Reserve
for Estuarine Research

Re-establishment of Wetland Hydrological Connectivity at the Jobos Bay National Estuarine Research Reserve, Puerto Rico




Legend

-  Phase I Completed
-  Hydrologic Connections
-  Phase II Regrading Area
-  Phase II Wetland Enhancement

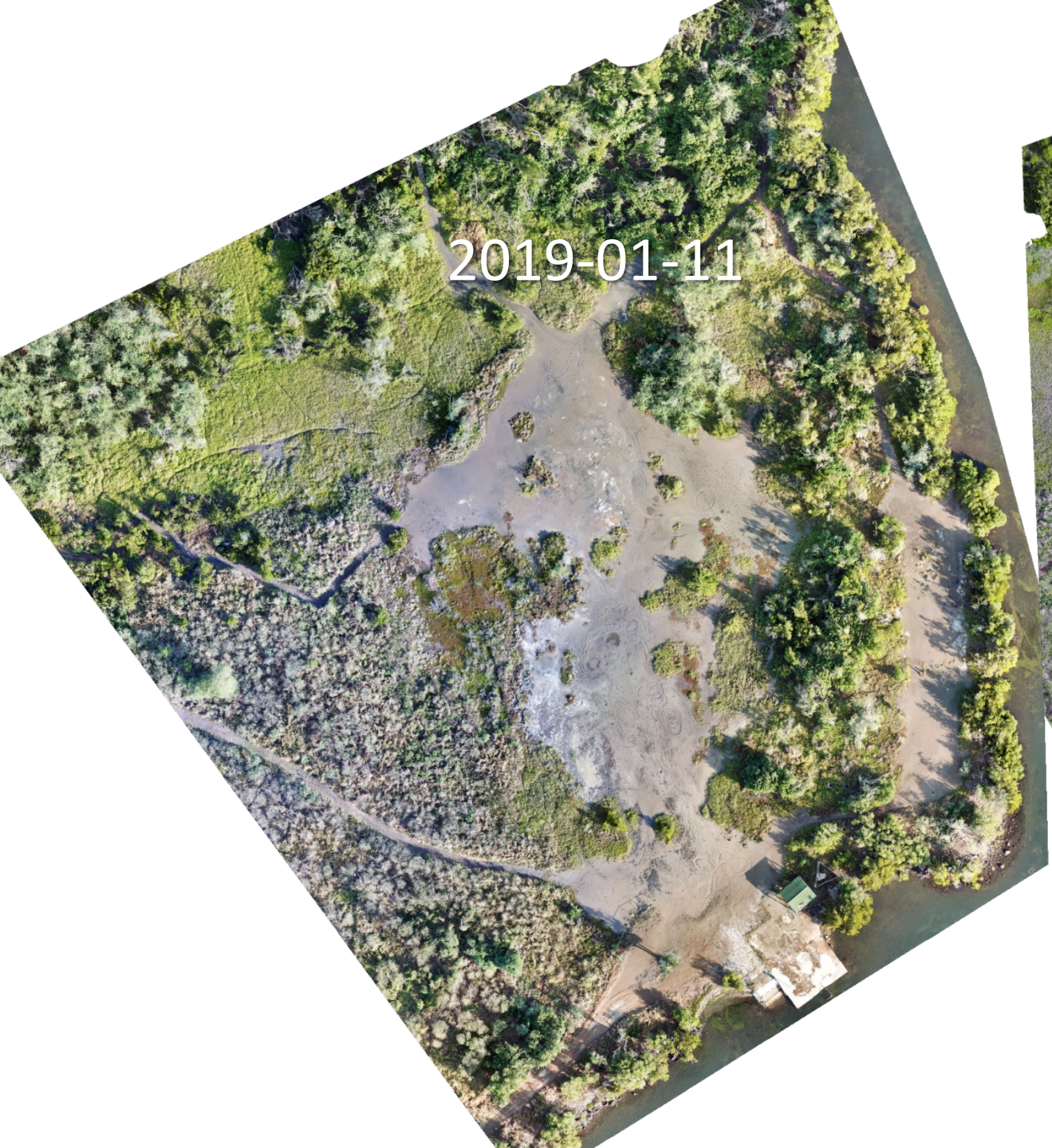
60 Meters

Puerto Rico 2010 Aerial
Protectores de Cuencas, Inc.



Solid waste removal and soil regrading





2019-01-11



2019-09-23



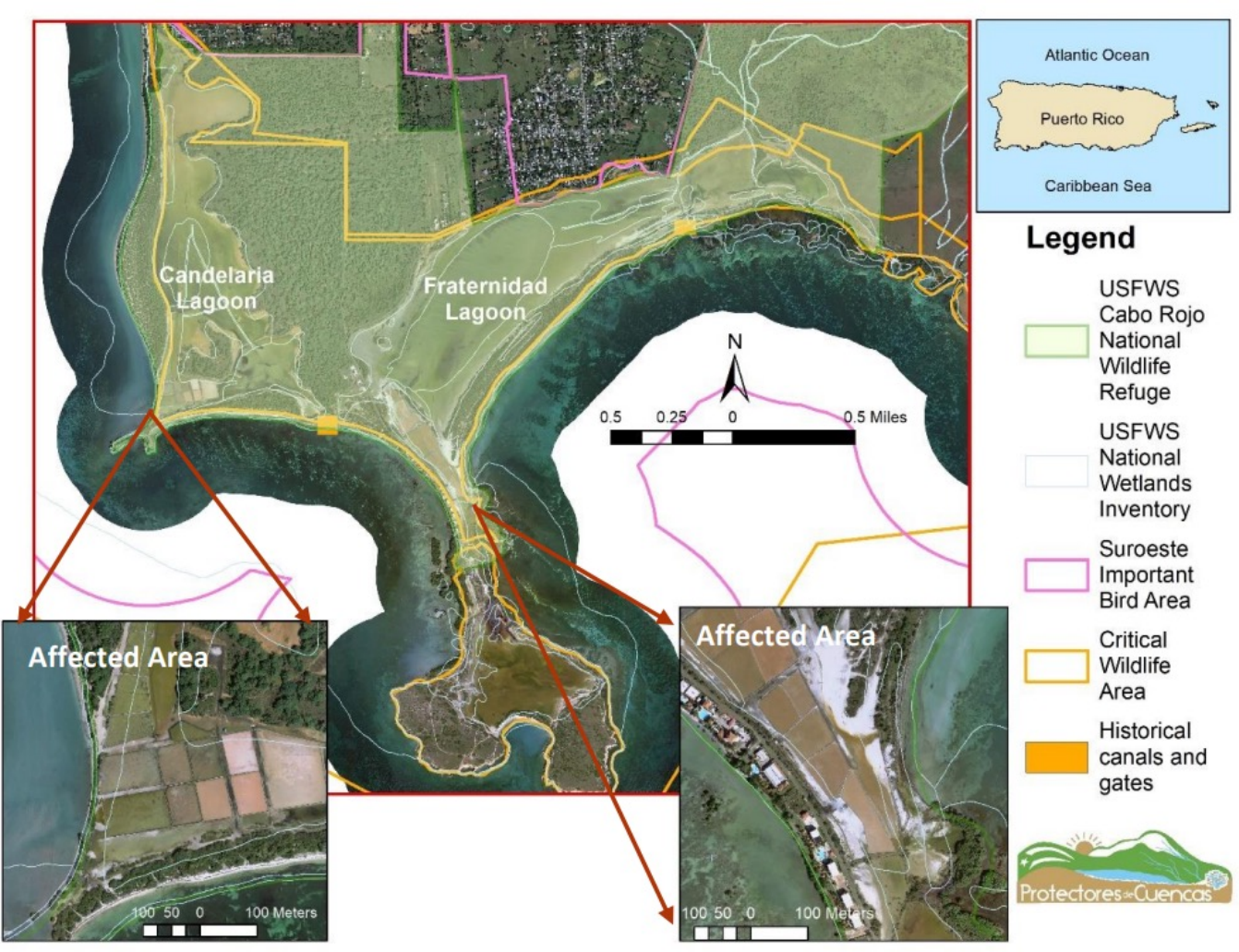
Delimitation of critical habitat areas and delineate pedestrian access



Salinas de Cabo Rojo

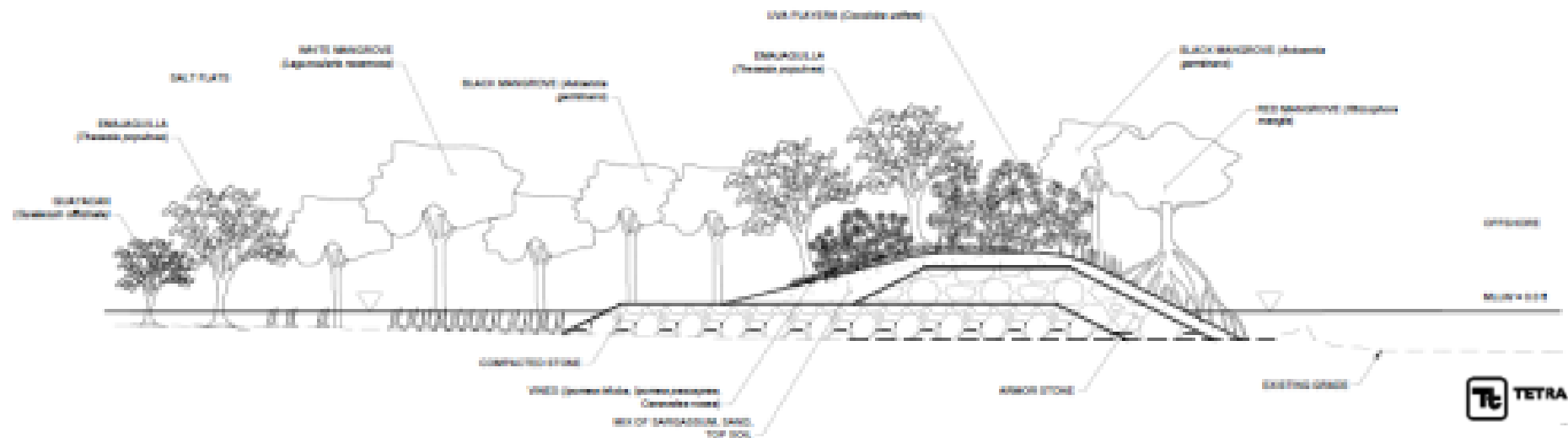
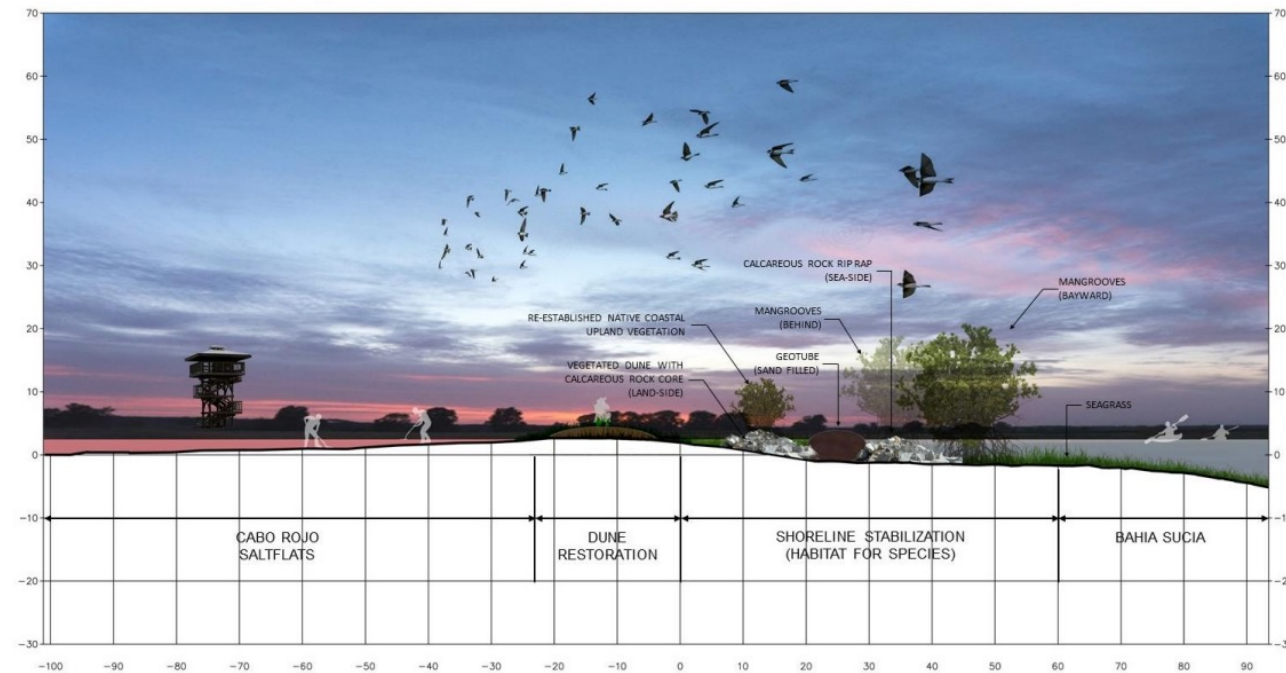
Proyecto de Restauración Costera Salinas de Cabo Rojo

- El Huracán María, comprometió las características costeras que protegen estas lagunas por erosión y mortalidad masiva de manglares.
- Se afectaron las operaciones artesanales de salinas y los hábitats intermareales a lo largo del refugio de vida silvestre.



Diseño Preliminar de Implementación

- El USFWS ha identificado la necesidad urgente de gestionar los niveles y la calidad del agua, incluidos los gradientes de salinidad.
- Este proyecto se basa en el Plan Integral de Conservación del Refugio Nacional de Vida Silvestre de Cabo Rojo (2011) y el Estado de Emergencia declarado para Las Salinas en 2019.
- El Proyecto tiene un costo estimado de \$6M.
- Se ha identificado \$6M en fondos.



Guánica Wastewater Treatment wetlands



GUÁNICA TREATMENT WETLANDS

Completed Steps

- 100% engineering designed
- 100% of permit process completed
- Environmental compliance
- 78% construction completed
- MOU PRASA for Phase 2 Signed
- Final Construction Phase in progress
- **Expected completion date September 2023**

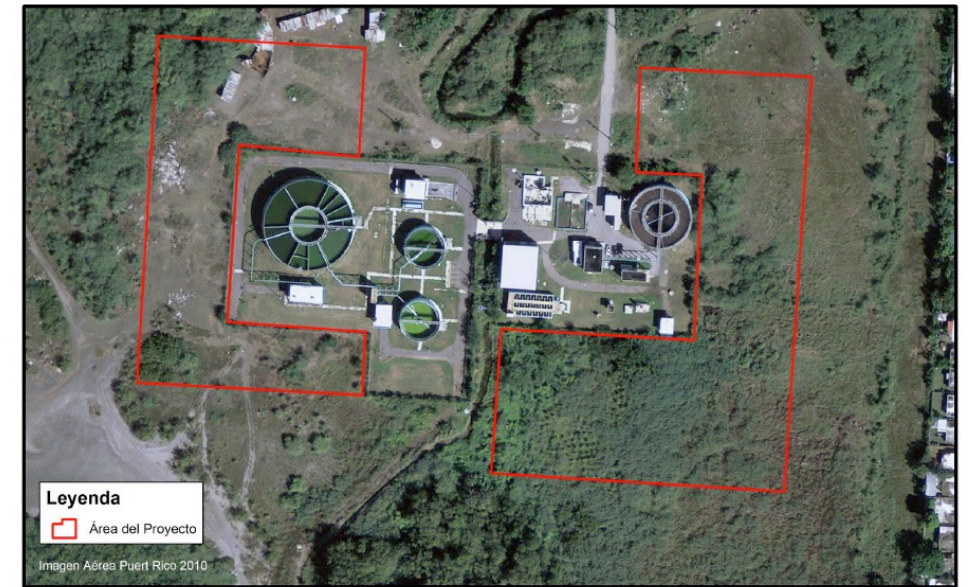
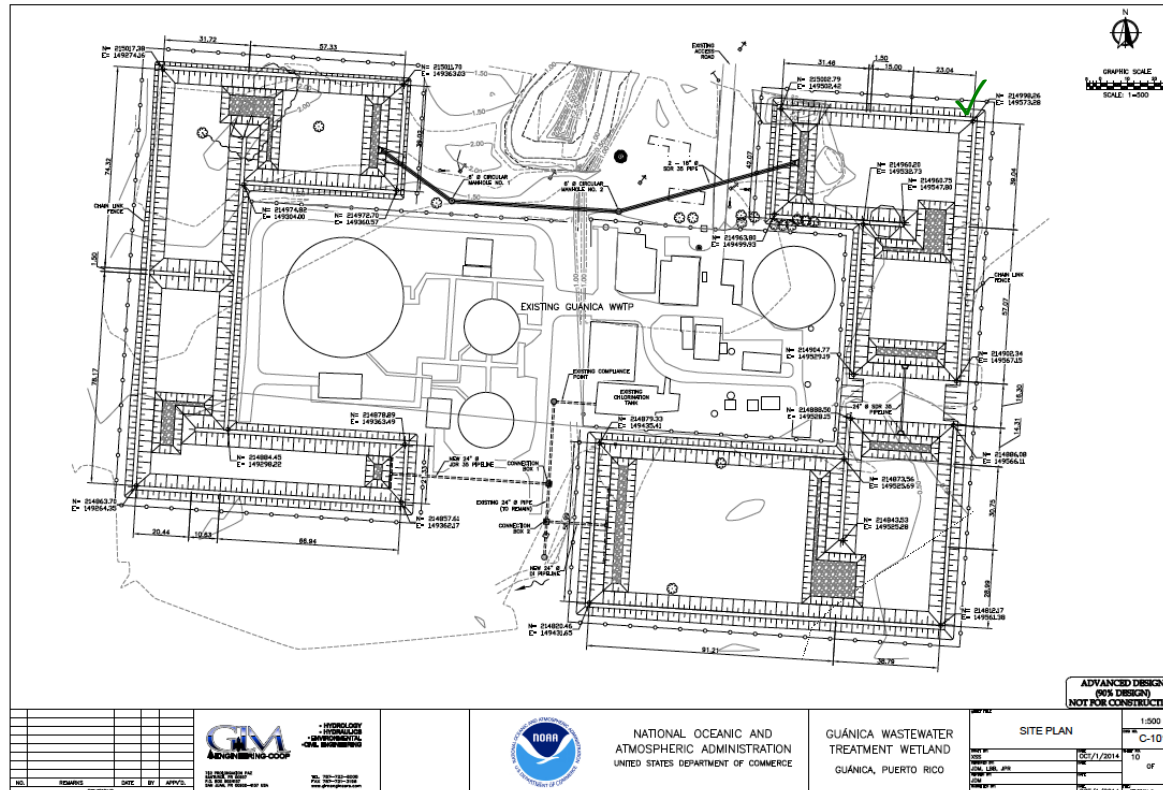


Figura 4
Imagen Aérea Ampliada
 CONSTRUCCIÓN DE HUMEDALES DE TRATAMIENTO EN
 PLANTA DE AGUAS USADAS DE GUÁNICA
 Guánica, Puerto Rico











A wide-angle photograph of a lagoon restoration project. The foreground is filled with dense, tall green grasses and smaller aquatic plants growing in shallow, dark water. The middle ground shows a larger body of water with some low-lying vegetation along the shore. In the background, there are rolling hills covered in dense green forest under a cloudy, overcast sky. The text "Guánica lagoon restoration" is overlaid in the center of the image in a white, serif font.

Guánica lagoon restoration



Guánica Lagoon: Historical Landscape

Cartagena.

- The Guánica Lagoon was approximately 1,200 acres of freshwater wetland and shallow lagoon system, and provided habitat for various native, endemic, and migratory bird species in Puerto Rico.
- It provided food for local communities, including fish and waterfowl, opportunities for hunting and recreational activities, and irrigation of adjacent farmland.
- The lagoon also served as a natural treatment wetland for upland pollution and provided flood control by absorbing discharge peaks during flood events from the Loco River, protecting downstream communities.



Guánica Lagoon Drainage

- In 1955, the Guánica Lagoon was drained as part the Southwest Project.
- In addition to the direct loss of habitats, the draining of the lagoon significantly affected the ability of the watershed to filter and prevent sediments and nutrients from reaching the Guánica Bay.
- The lands within the Guánica Lagoon have had low agriculture production , due to the persistent wetland conditions, frequent inundation, and challenging soil conditions. Therefore, drained wetlands have mainly been used as low-quality hay and pasture for cattle.

Guánica Lagoon Drainage Effects





Guánica Lagoon: A Milestone Project

- Milestone project since 2008.
- Recently secured \$7.4M from the Bipartite Infrastructure Law to implement the Project.
- NOAA will provide the funding.
- Need to update several studies prior to implementation.



THANK YOU!

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