

GIS application to bird conservation in Puerto Rico

Idelfonso Ruiz, Adrienne Tossas and Ilse Sanders

Environmental Research and Geographic Systems Laboratory (LIASIG)

Inter American University, San Germán



Puerto Rican Vireo



Introduction

- GIS can be used to:
 - show the distribution of focal species
 - assess areas of high ecological value
 - promote the conservation and management of species and their habitats



Adelaide's Warbler

Important Bird Areas in PR

- Program established world-wide by BirdLife International
- Implemented in the island by PR Ornithological Society
- Collaboration established between the LIASIG and NGOs



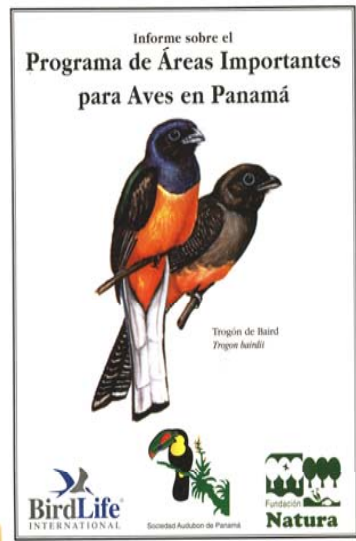
Puerto Rican Spindalis

Objective

- Create a map showing sites in Puerto Rico of international relevance for bird species conservation



Puerto Rican Lizard Cuckoo



Expected outcome

Methods

- Ornithologists selected the sites according to standard criteria
- Available maps were obtained from government agencies
- New polygons were created for private lands



Puerto Rican Woodpecker

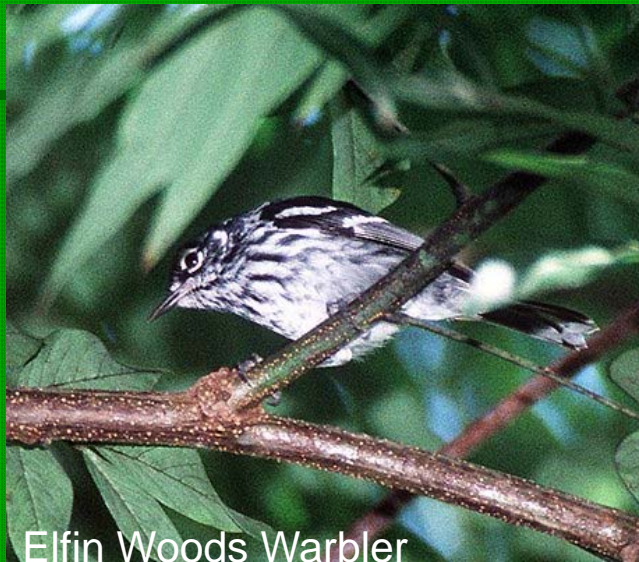
New maps



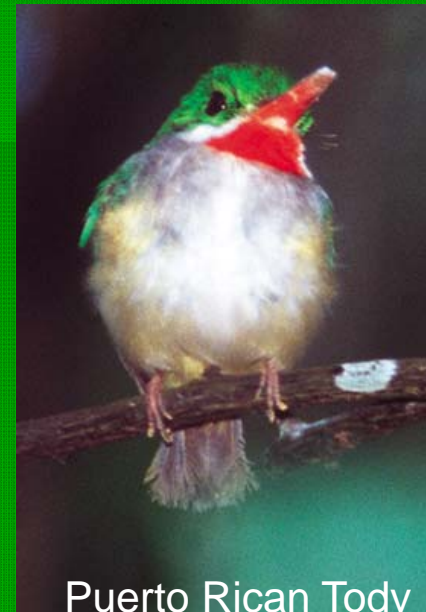
- Created with information on the distribution of critical species
 - Examples:
 - Cerro Planadas- assemblage of endemic species
 - Sierra Bermeja- presence of PR Nightjar

Selection criteria

- 1. Species of global conservation concern
 - Endangered
 - Threatened
 - Vulnerable
- 2. Assemblages of restricted-range species
 - Endemic spp.



Elfin Woods Warbler



Puerto Rican Tody

Selection criteria

- 3. Assemblages of biome-restricted species
 - Endemic to Caribbean



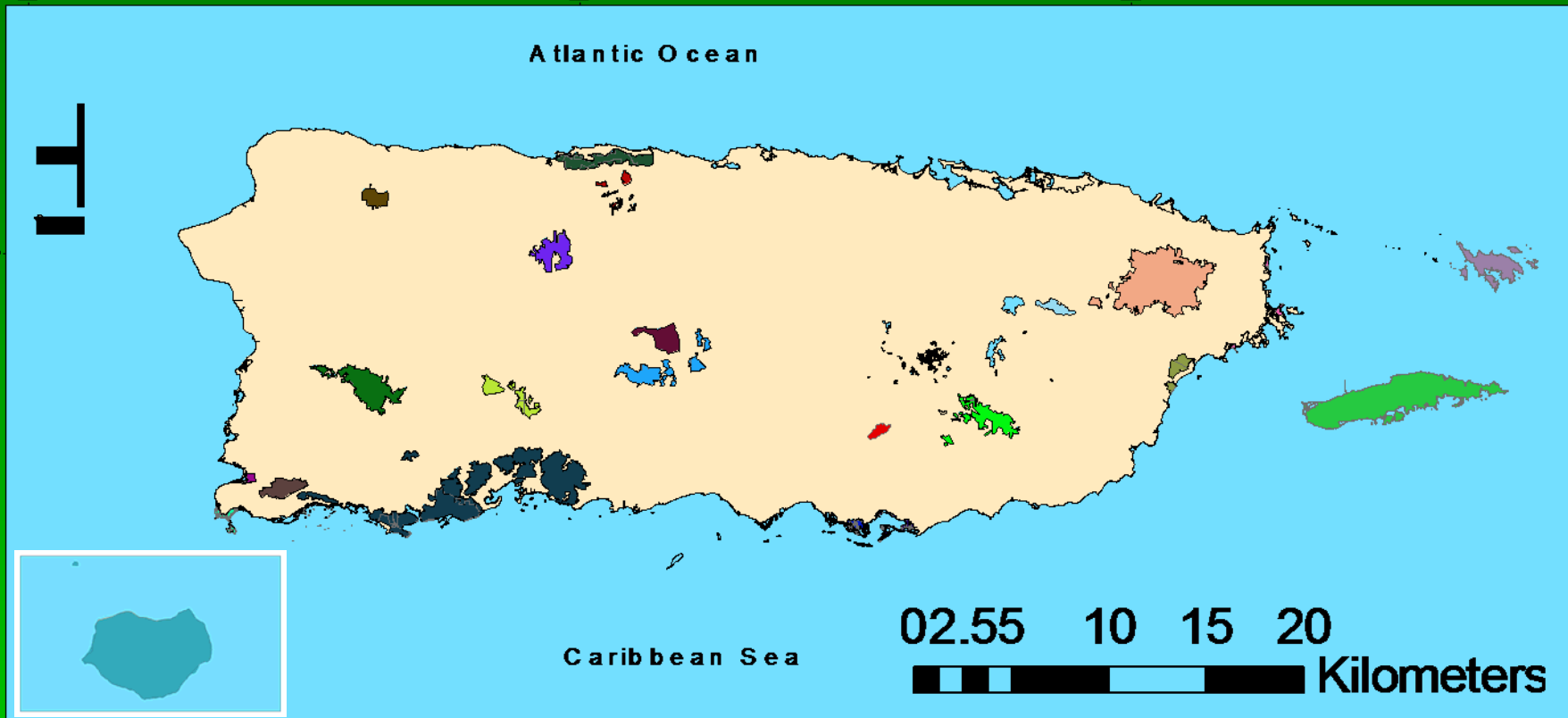
- 4. Congregations
 - Breeding colonies
 - Migration bottlenecks
 - Mainly waterfowl and seabirds



Results: Sites selected

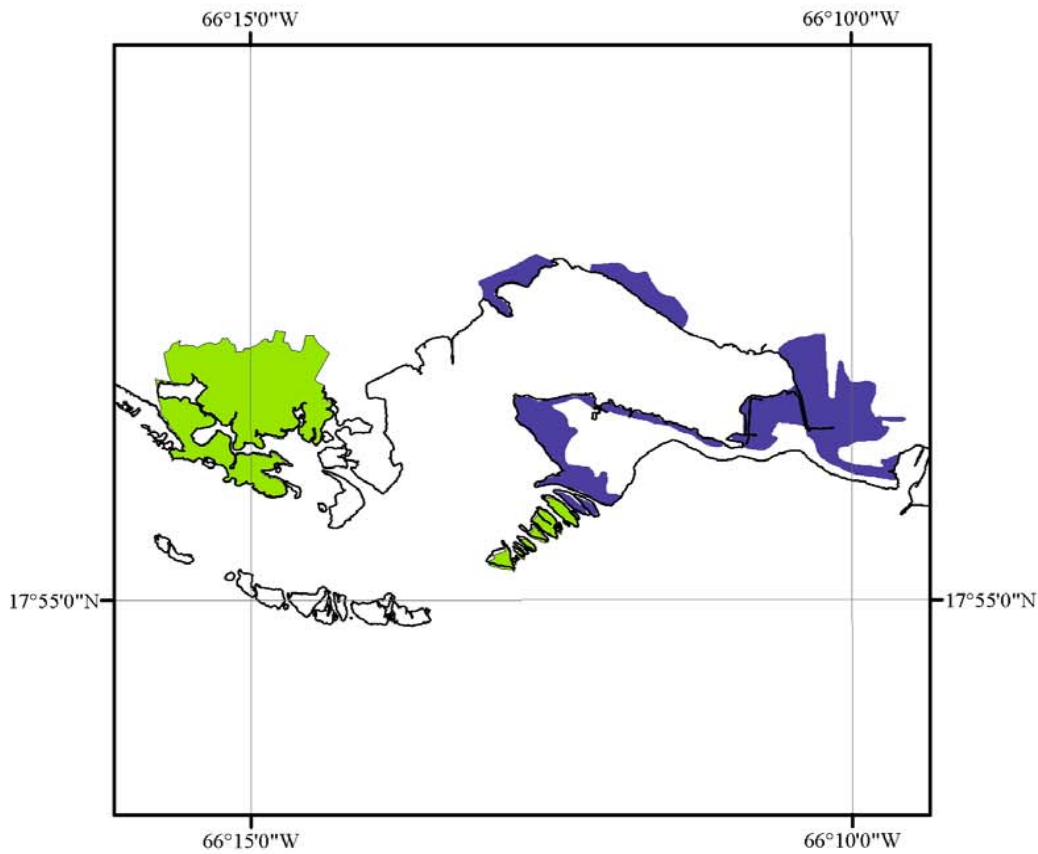
- Aguirre (1)
- Boquerón (1,2)
- Boquerón/ La Parguera (1,2)
- Cabo Rojo Salt Flats (1,4)
- Cambalache (2)
- Caño Tiburones (1,2,3)
- Carite (1,2)
- Ceiba (1,2,3)
- Cerro Planadas (2)
- Culebra (4)
- El Yunque (1,2)
- Guajataca (2)
- Guánica (1,2,3)
- Guilarte (1,2)
- Humacao Lagoons (1)
- Jobos (1)
- La Cordillera (4)
- Maricao (1,2,3)
- Mona Island (1,2)
- Río Abajo (1,2)
- Sierra Bermeja (1,2)
- Susúa (1,2)
- Tres Picachos (2)
- Toro Negro (2)
- Vieques (1,4)

Important Bird Areas in Puerto Rico





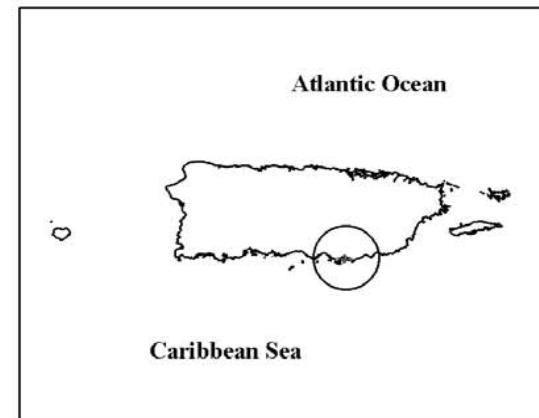
Important Bird Area (criteria)	
■ Aguirre (1)	■ Guánica (1,2,3)
■ Boquerón (1,2)	■ Guílaré (1,2)
■ Boquerón/ La Parguera (1,2)	■ Humacao Lagoons (1)
■ Cabo Rojo Salt Flats (1,4)	■ Jobos (1)
■ Cambalache (2)	■ La Cordillera (4)
■ Caño Tiburones (1,2,3)	■ Maricao (1,2,3)
■ Carle (1,2)	■ Mona Island (1,2)
■ Ceiba (1,2,3)	■ Río Abajo (1,2)
■ Cerro Planada	■ Susúa (1,2)
■ Culebra (4)	■ Sierra Bermeja (1,2)
■ El Yunque (1,2)	■ Tres Picachos (2)
■ Guajataca (2)	■ Toro Negro (2)
■ Plain Pigeon Habitat	■ Vieques (1,4)

Aguirre State Forest and Jobos Bay National Estuarine Reserve

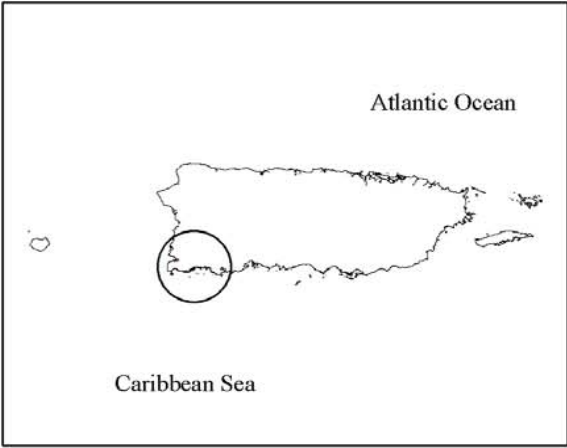
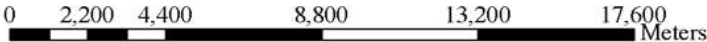
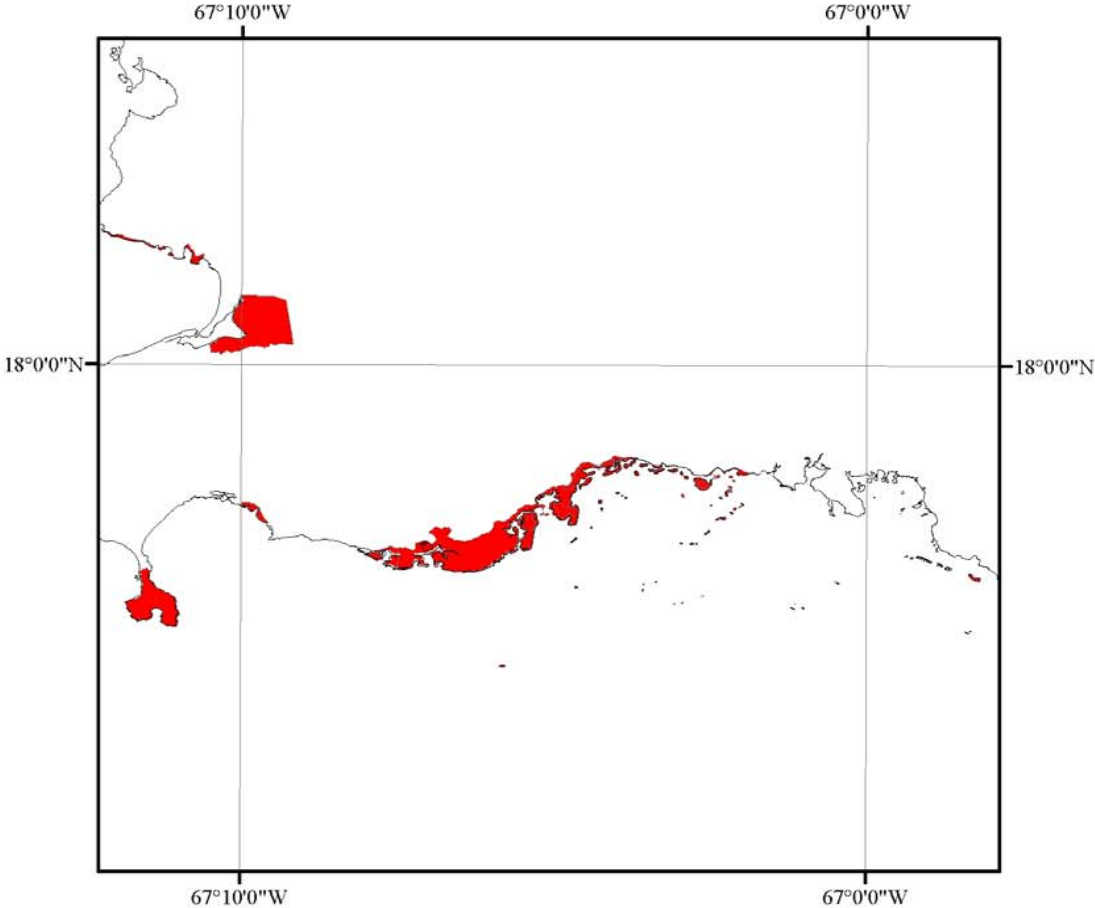


Legenda

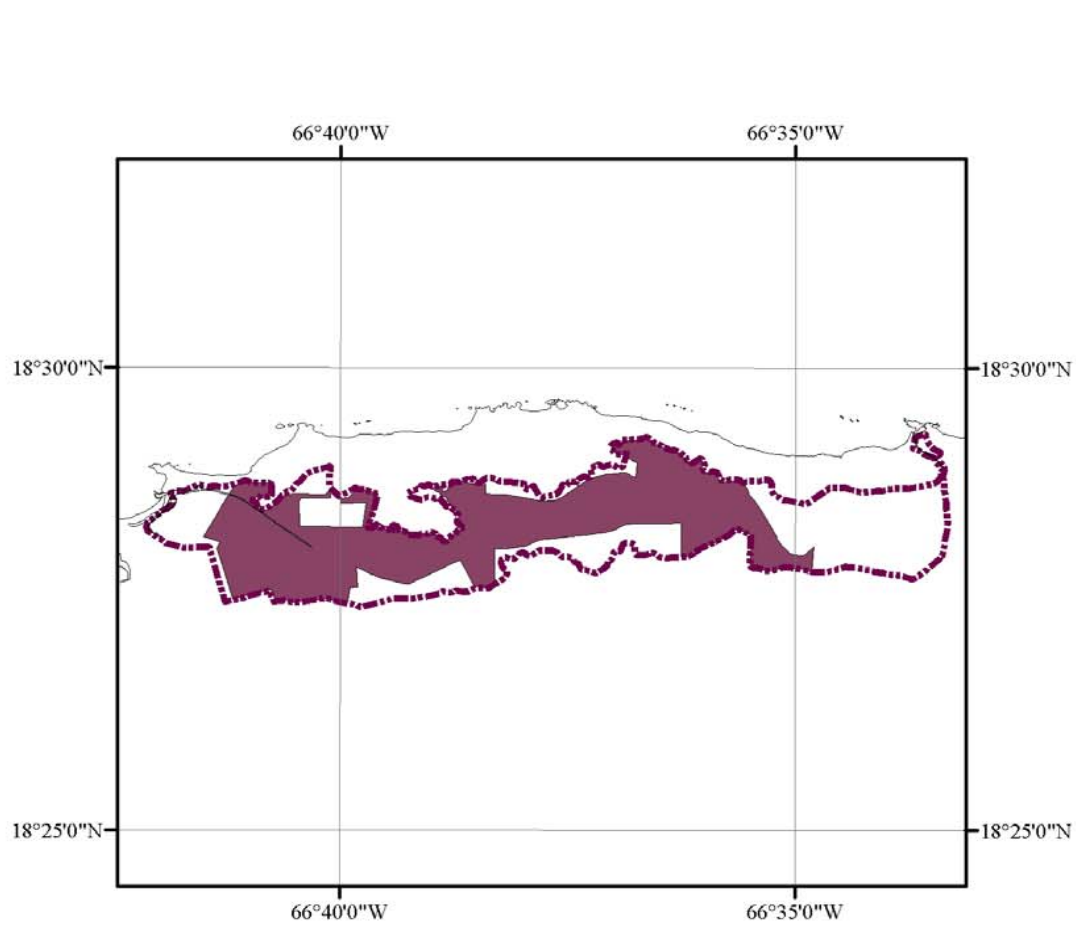
-  National Estuarine Reserve
-  Aguirre State Forest





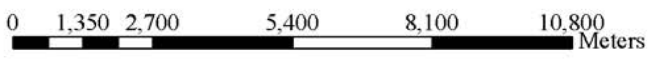
Boqueron State Forest



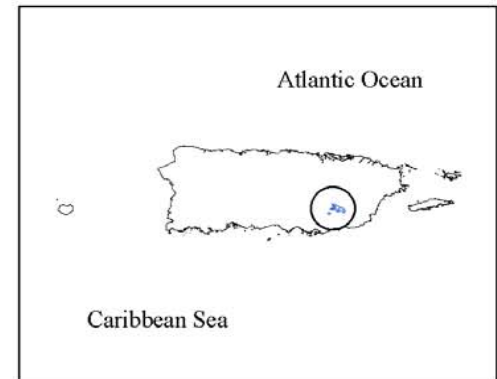
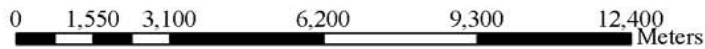
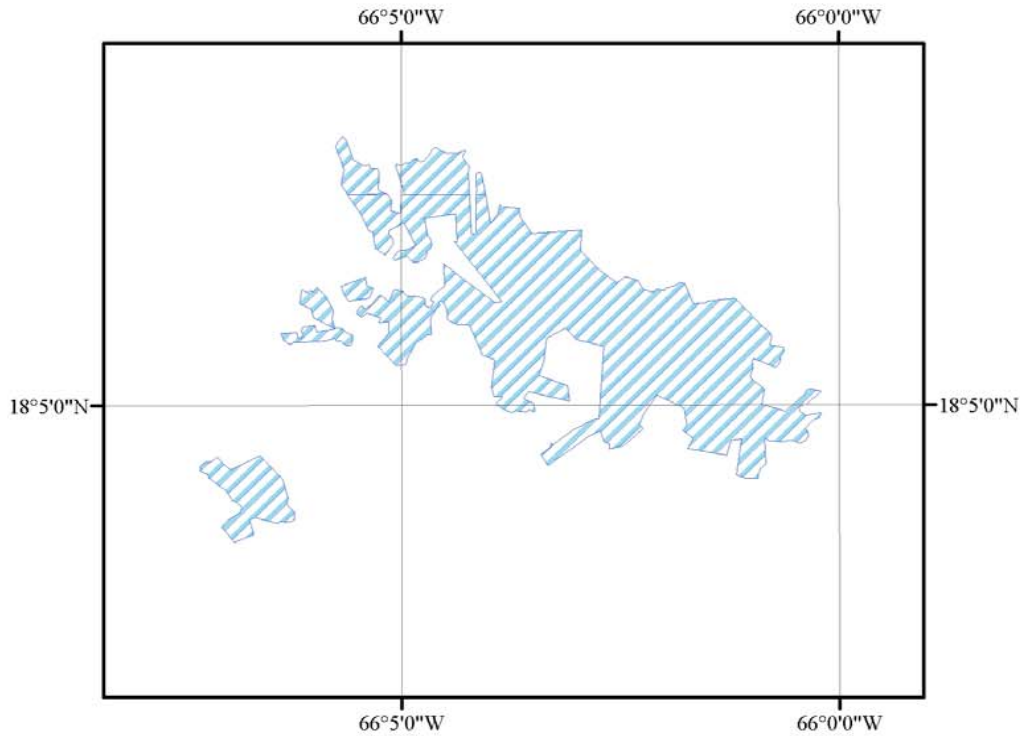
Caño Tiburones Reserve and extension recomended



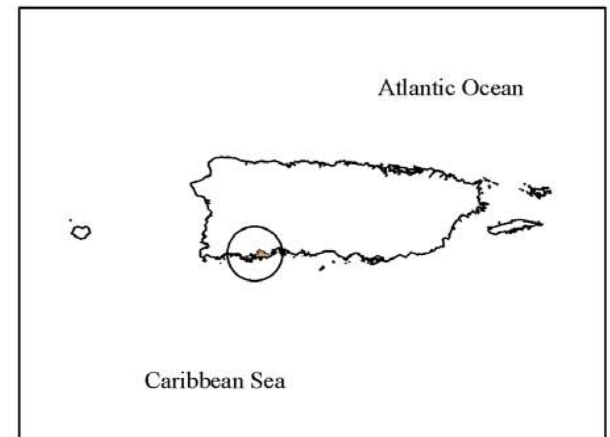
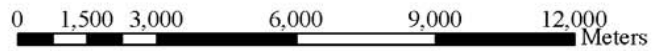
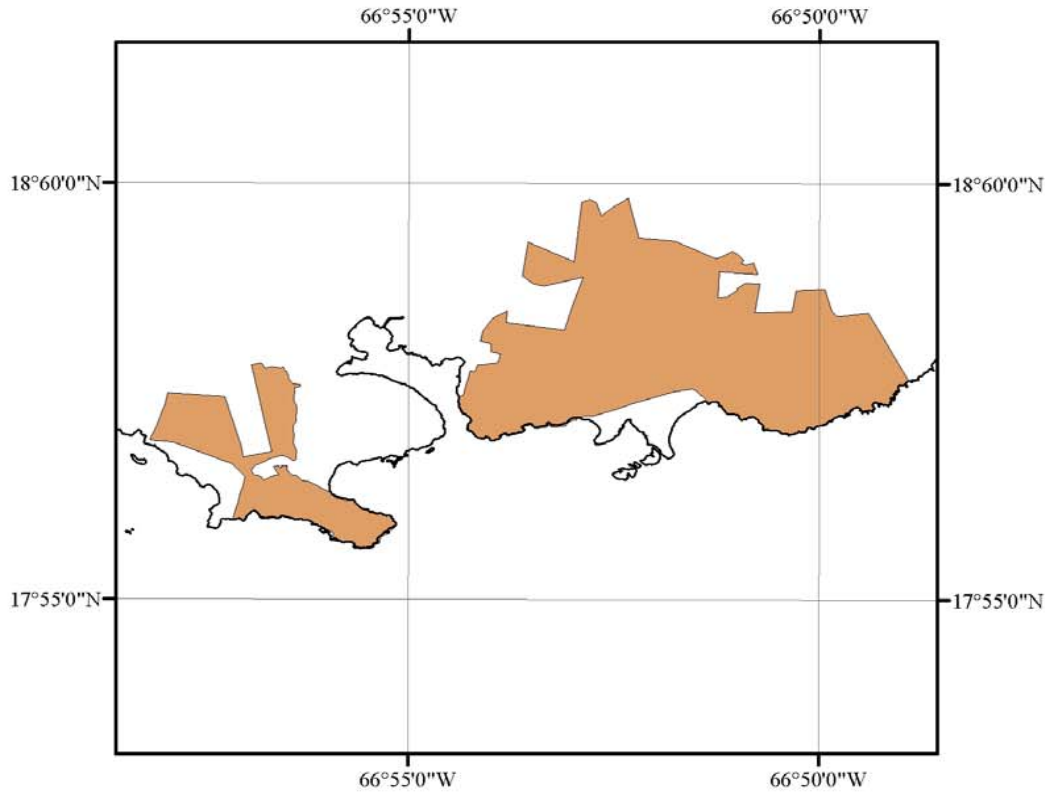
- Legenda**
-  Extension recomended
 -  Caño Tiburones Reserve



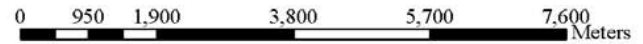
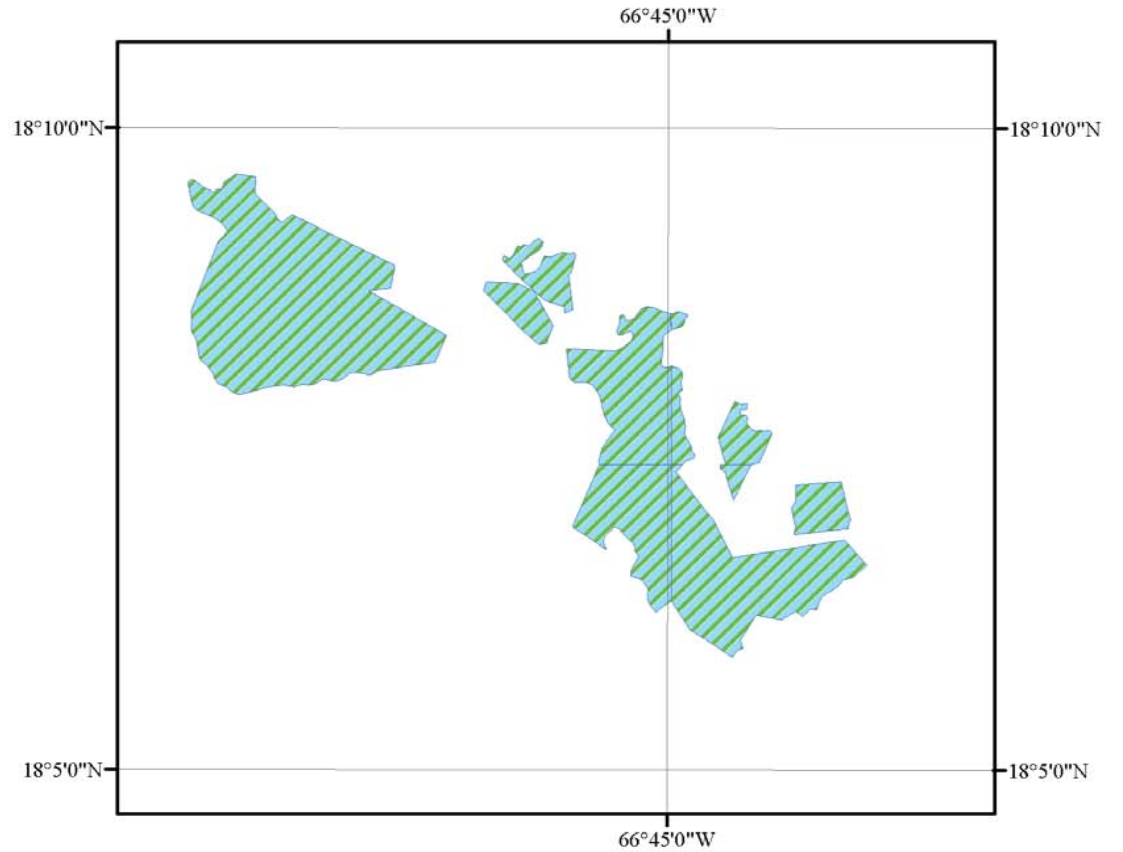
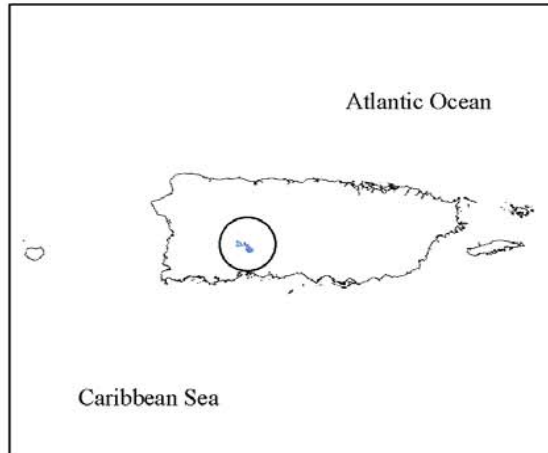
Carite State Forest



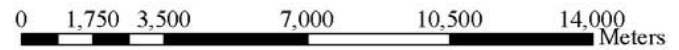
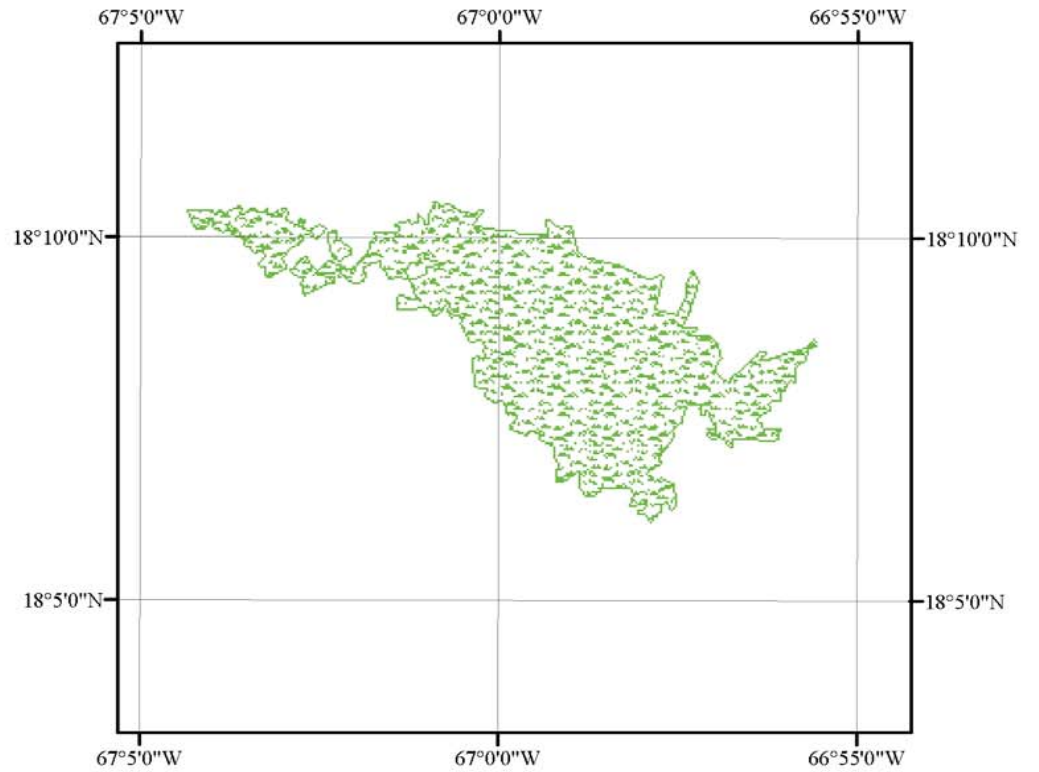
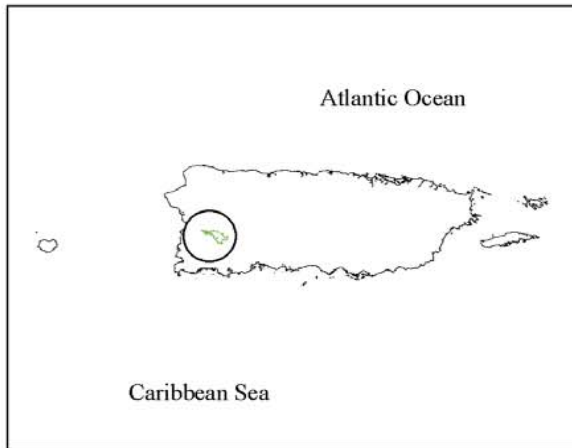
Guanica State Forest



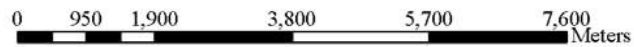
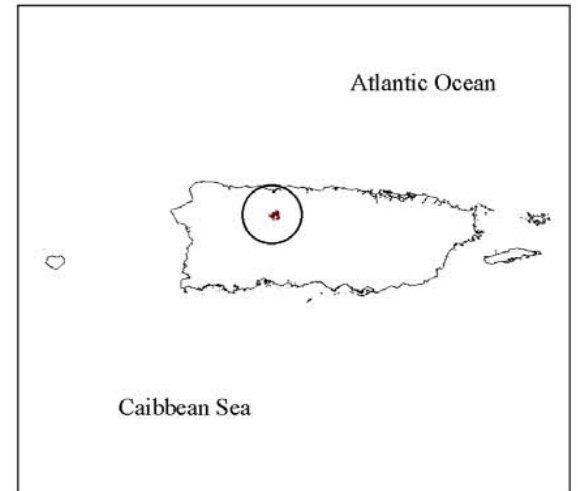
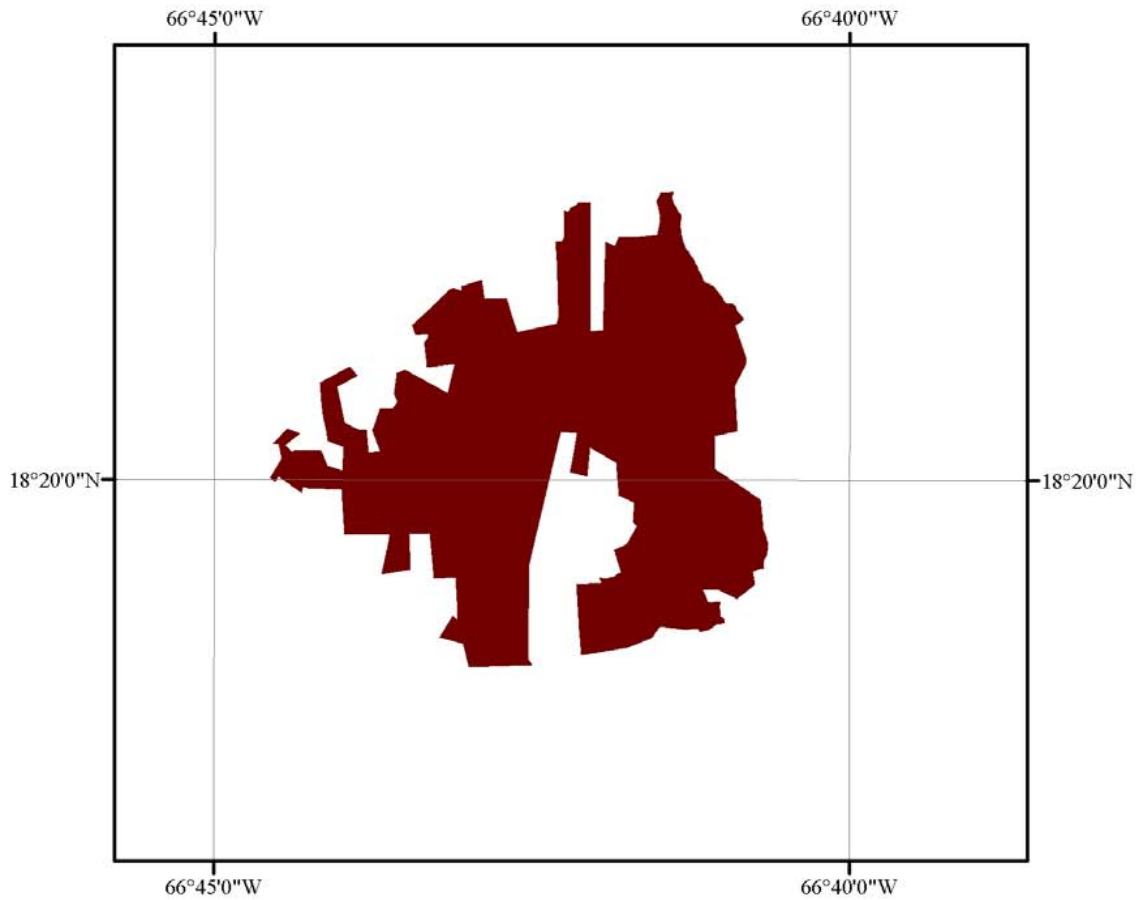
Guilarte State Forest



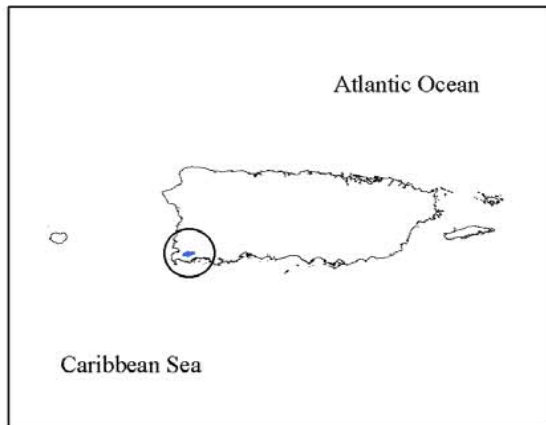
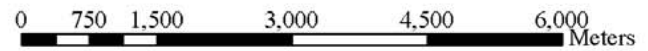
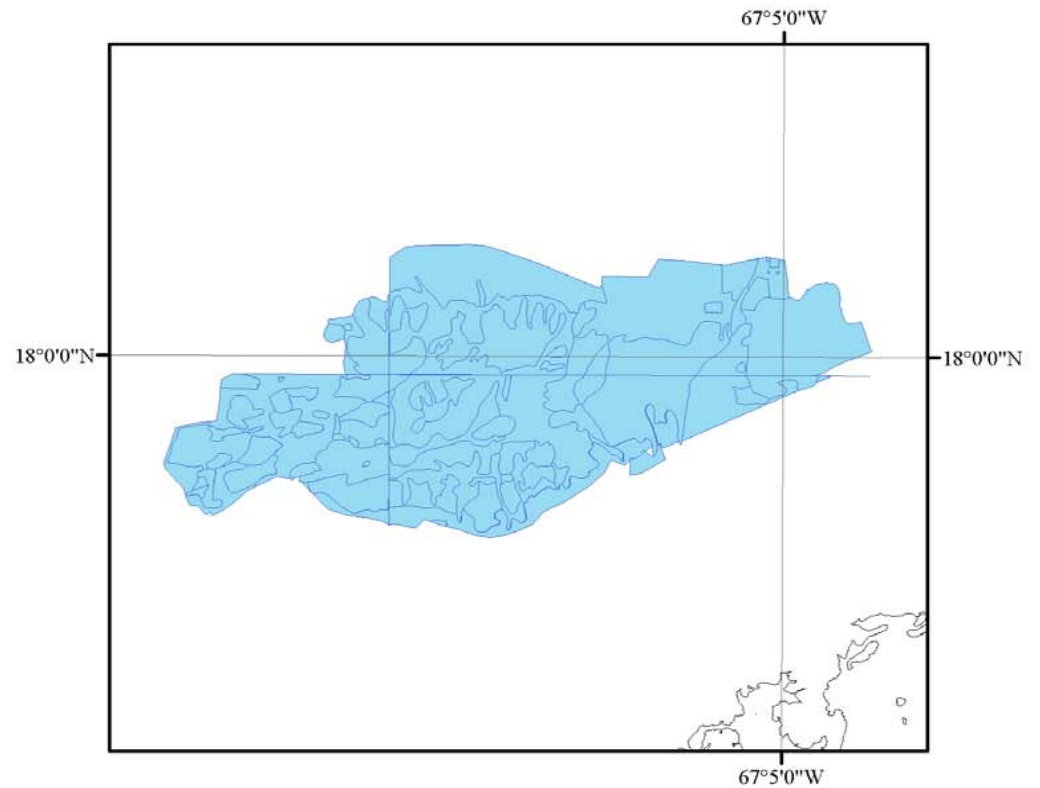
Maricao State Forest



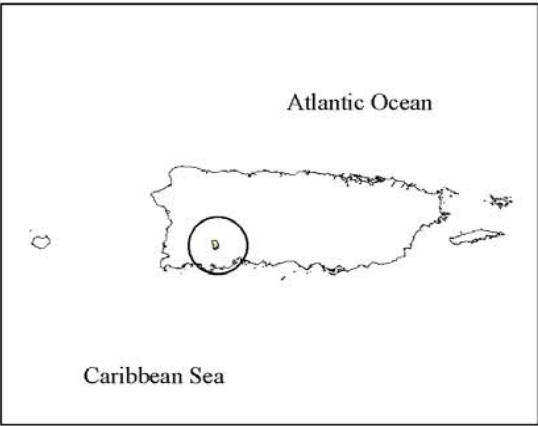
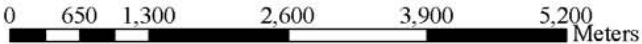
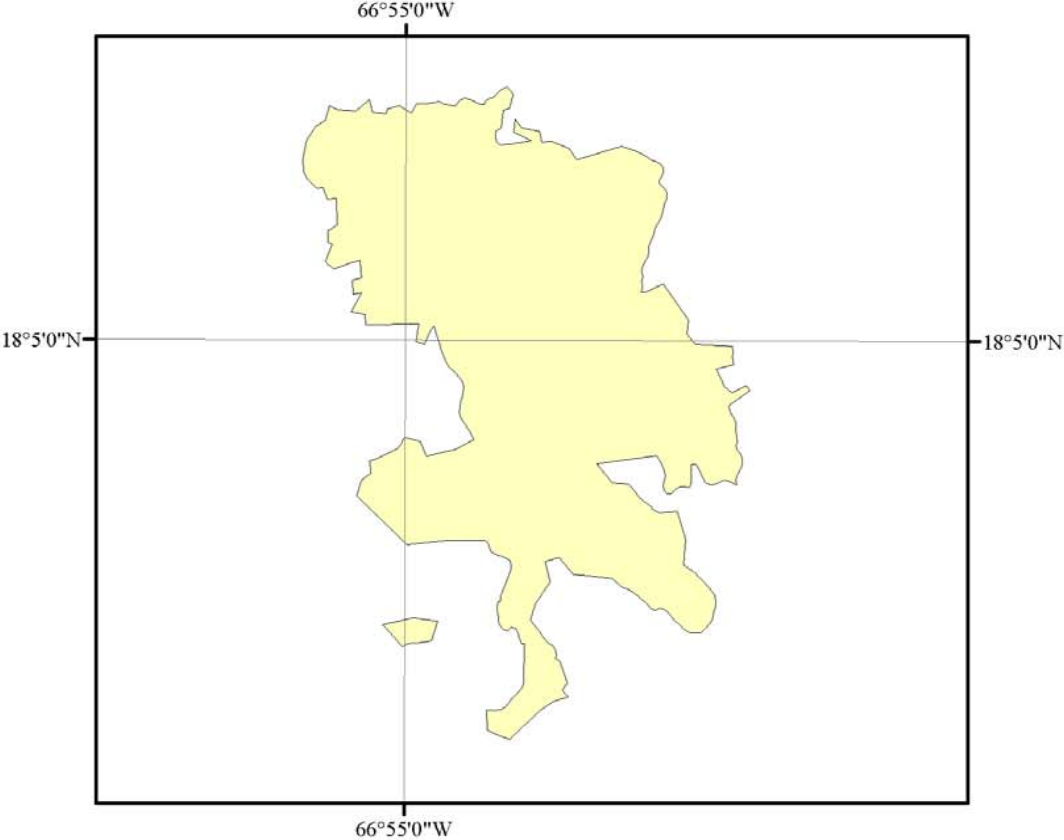
Rio Abajo State Forest



Sierra Bermeja



Susua State Forest



Conclusion



- GIS proved to be an useful tool to demonstrate the distribution of important sites for bird conservation in PR
- These sites represent the most critical habitats according to international standards
- The conservation of these sites will ensure the preservation of the island's biodiversity

Acknowledgements

- Glenis Padilla, William Hernández and Manuel Cruz- preparation of maps
- Government agencies- for providing map layers
- BirdLife International
- PR Ornithological Society



Puerto Rican Screech Owl