

# Caribbean Area Provisional Ecological Sites Descriptions

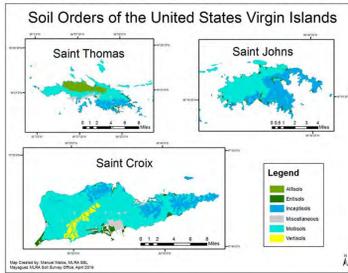
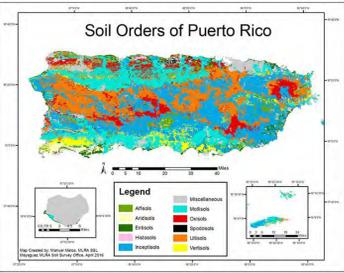
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## Abstract

In the U.S. Caribbean (Puerto Rico and U.S. Virgin Islands) Provisional Ecological Sites have not yet been described. A well-known description of the Ecological Sites in these islands is a major need to support land use management decisions (e.g., reforestation), severely affected by extreme weather events including hurricanes and droughts. A multi-data source approach was used to develop PES for the Caribbean Area including: land cover and landscape unit maps, soil catenas, published literature, Forest Inventory Analysis (FIA) data, and the U.S. National Vegetation Classification (USNVC). A total of twenty-four PES were identified for Puerto Rico, while to describe PES for the Virgin Islands are in progress. This combined resource effort will result in the development of a planning tool necessary to support land planning.



## Background

- Provisional Ecological Sites (PES) consist in a conceptual and general division of the landscape based on its distinctive characteristics to produce a unique kind and amount of vegetation, and to respond similarly to disturbances.
- An Interagency Agreement between USDA Natural Resources Conservation Service and Forest Service seeks to compile and summarize the high quality ecological data available for the development of PES for the Caribbean Area.
- The identification and broad grouping of PES across the landscape is based on multiple environmental indicators including soil-vegetation associations occurring within Major Land Resource Areas (MLRA) defined by The United States Department of Agriculture Natural Resources Conservation Service across the United States and its territories (USDA-NRCS, 2006).
- Four MLRA occur in Puerto Rico, and only two of these in the U.S. Virgin Islands (Table 1).



**Major Land Resource Areas**

- Humid Coastal Plains
- Humid Mountains and Valleys
- Semi-arid Coastal Plains
- Semi-arid Mountains and Valleys



Table 1. Major Land Resource Areas identified for Puerto Rico and the US Virgin Islands.

MLRA Name	Puerto Rico		U.S. Virgin Islands	
	km <sup>2</sup>	%	km <sup>2</sup>	%
MLRA 270-Humid Mountains and Valleys	5,533	62	---	---
MLRA 272-Humid Coastal Plains	1,696	19	---	---
MLRA 273-Semi-arid Coastal Plains	671	7	84	24
MLRA 271-Semi-arid Mountains and Valleys	1,051	12	265	76

## Project goal and objectives

The goal of this project is to develop PES descriptions for the U.S Caribbean within each of the following MLRA:

- MLRA 270, the Humid Mountains and Valleys of Puerto Rico
- MLRA 271, the Semi-arid Mountains and Valleys of Puerto Rico and the U.S. Virgin Islands
- MLRA 272, the Humid Coastal Plains of Puerto Rico
- MLRA 273, the Semi-arid Coastal Plains of Puerto Rico and the U.S. Virgin Islands

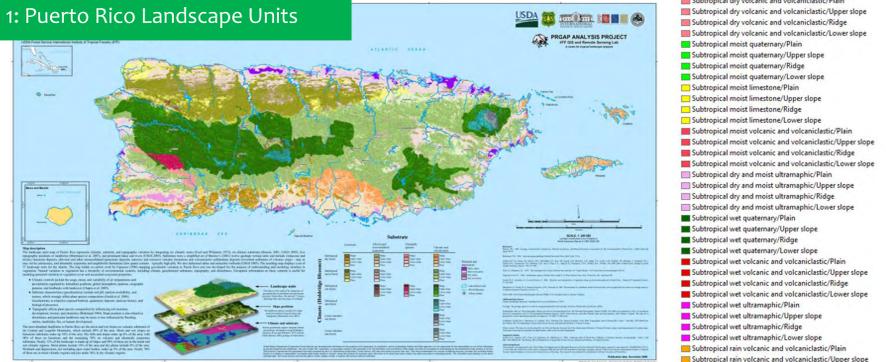
### SPECIFIC OBJECTIVES

- To conduct and prepare a literature review.
- To develop the initial draft ES legend.
- To develop Provisional Soil-Site Key.
- To develop Provisional Ecological Site Information, including a State and Transition Model.

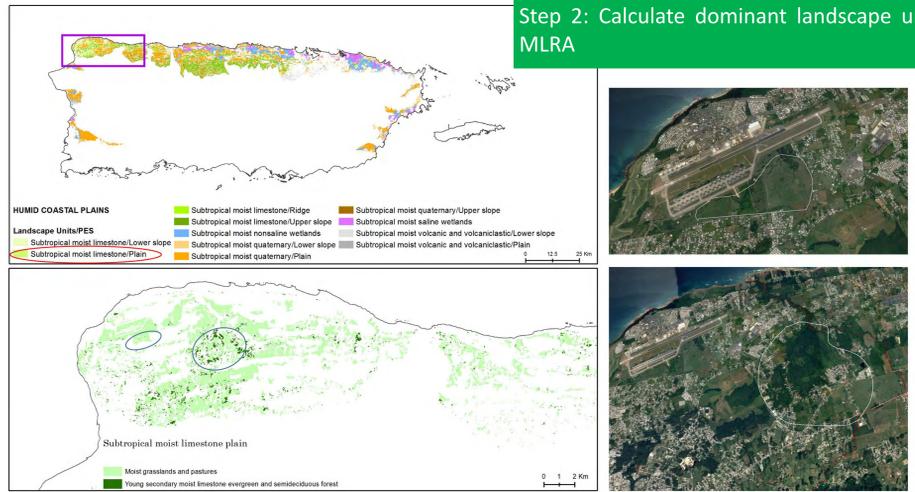
## Methods and Preliminary Results

- A total of 58 landscape units identified by the USDA Forest Service (Gould et al. 2008a), based on Holdridge Ecological Life Zones (Ewel and Withmore 1973), parental material (Bawiec 2001), landforms (Martinuzzi et al. 2007), and topography (Gould et al. 2008b), were used as the starting point to develop the PES for Puerto Rico.
- Dominant landscape units for each MLRA were intersected to a land cover map of the island (Gould et al. 2007) and the US NVC (US NVC 2017) in order to identify the dominant vegetation communities.
- Published literature, expert opinion, and FIA plots were used to describe the species composition for each dominant vegetation community.
- Soil catenas were tied to individual vegetation community.

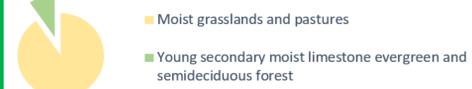
### Step 1: Puerto Rico Landscape Units



### Step 2: Calculate dominant landscape units within each MLRA



### Step 3: For each landscape unit, calculate dominant vegetation communities as described in the Puerto Rico Land cover map and the US NVC.



Landscape units names	Dominant vegetation					
	D094	G454	7	0	0	0
Subtropical moist quaternary/Plain	D094	G454	7	0	0	0
Subtropical moist quaternary/Upper slope	D094	G454	0	G455	0	0
Subtropical moist quaternary/Lower slope	D094	G454	0	G455	0	0
Subtropical moist non-saline wetlands	D094	G454	7	0	0	0
Subtropical moist saline wetlands	D094	0	0	0	G004	MO41
Subtropical moist limestone/Upper slope	D094	0	0	G455	0	0
Subtropical moist limestone/Plain	D094	0	0	G455	0	0
Subtropical moist limestone/Lower slope	D094	0	0	G455	0	0
Subtropical moist limestone/Ridge	D094	0	0	G455	0	0
Subtropical moist volcanic and volcanoclastic/Plain	D094	G454	0	0	0	0
Subtropical moist volcanic and volcanoclastic/Lower slope	D094	G454	0	G455	0	0

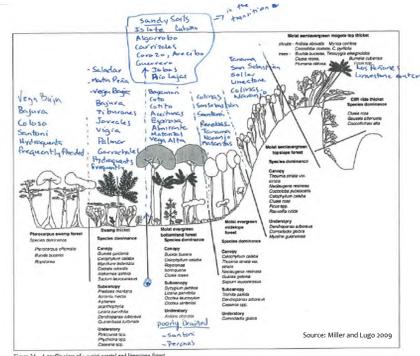
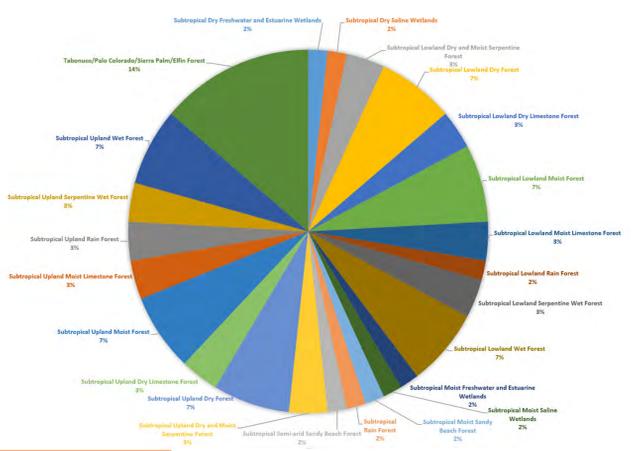
D094=Caribbean-Mesoamerican Lowland Grassland, Savanna & Shrubland Division  
 G454= Caribbean Moist Lowland Submontane Forest Group  
 G455= Caribbean Seasonal Evergreen Moist Lowland Forest Group  
 MO41= Caribbean Central American Freshwater Marsh  
 G004= Caribbean Mangrove Tidal Swamp  
 7= Agriculture

### Step 4: Description of the species composition within each vegetation community available in the literature, expert opinions, and FIA plots.

### Step 5: Soil catenas were assigned to each vegetation community.

### Step 6: Group discussion to collapse the most similar communities

### 24 PROVISIONAL ECOLOGICAL SITES



- ### NEXT STEPS
- Continue developing PES for the Virgin islands.
  - Site concept and vegetation community descriptions.
  - Complete state and transition models for all PES.

### Acknowledgements

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