



State and Private Forestry Fact Sheet

Puerto Rico 2019



Investment in State's Cooperative Programs

Program	FY 2018 Final
Community Forestry and Open Space	\$0
Cooperative Lands - Forest Health Management	\$55,000
Forest Legacy	\$1,375,000
Forest Stewardship	\$120,631
Landscape Scale Restoration	\$369,340
State Fire Assistance	\$244,190
Urban and Community Forestry	\$153,348
Volunteer Fire Assistance	\$26,000
Total	\$2,343,509

NOTE: This funding is for all entities within the state, not just the State Forester's office.

Puerto Rico's population is estimated at 3.9 million people and it is part of the Antillean archipelago located between the Caribbean Sea and the Atlantic Ocean. PR consists of the main island of Puerto Rico and a variety of keys and islands such as Culebra and Vieques to the east, and Mona, Monito and Desecheo to the west. The main and largest island is about one hundred eleven miles (160 km) long, thirty six miles (60 km) wide, and approximately nine thousand square miles (9,000 km²) of land area. The geographical regions and its geological primary substrates are divided into: Coastal Plains, Limestone Regions, and the Mountainous Interior that is composed of three main volcanic ranges; and the Plutonic batholiths and associated ranges. Fifty-three percent (53%) of the island is mountainous, twenty-five percent (25%) is plains, twenty percent (20%) is hilly, one percent (1%) is plateaus, and one percent (1%) is composed of rivers, lakes and reservoirs. According to Gould et. al. (2008) land cover in Puerto Rico today consists of 53% forest, woodland and shrub land vegetation; 32% dry and wet grasslands and pasture; 3% herbaceous agriculture, 4% saline and freshwater wetlands, 1% barren land, 1% fresh water, and 10% developed land. The history of land use is typical of most Caribbean islands. There are six Subtropical Holdridge Life Zones present in Puerto Rico (Figure 4) (Ewell and Whitmore 1973). At 62%, the Subtropical moist forest life zone contains the most land in mainland Puerto Rico. (Brandeis et. al. 2007). The Lower montane wet forest and the Lower montane rain forest zones combined are only slightly over 1%. Land area in the dry forest zone is almost 14%, and the combined wet forest and rain forest zones account for about 23%.

Program Goals

- Conserve working forests landscapes encompasses the need to perpetuate the multiple values, uses and services provided by the Puerto Rico forest cover. These benefits may be protected or increased by implementing better conservation practices. Two main objectives under this goal are: •identify and conserve high priority forest ecosystems and landscapes in Puerto Rico currently under private control; to manage private forested land actively and sustainably.
- Protect forests from harm: recognition of real threats or harm causes affecting forested lands, and to identify ways to control or reduce substantially their harmful effects. Two main objectives under this goal are: •identify, manage and reduce threats to forested ecosystems health; •reduce risks of wildfire impacts.
- Enhance public benefits associated with trees and forests: maximizing services of trees and forests: protect and enhance water quality and quantity; improve air quality and conserve energy; assists communities reducing forest health risks; maintain and enhance economic benefits and values of trees; protect, conserve and enhance wildlife and fish habitat; connect people to trees and forests, and promote stewardship activities; manage forests to mitigate and adapt to global climate change.

Key Issues

- Fragmentation of forest ecosystems.
- Water resources and watershed conservation strategies.
- Information needs related to ecosystem services and other benefits from public and private forest land.
- Disturbances affecting forests (hurricanes, floods, fires, pests, etc.).
- Concerns over invasive species.
- Economic opportunities and alternative market development.

Forest Facts and Accomplishments

Selected Facts	Value	FY 2018 Accomplishments	Value
Population	3,725,789	Landowners Receiving Educational or Technical Assistance	433
Acres of Forest Land	1,200,322	Acres Covered by New or Revised Forest Stewardship Plans	1,609
Acres of Nonindustrial Private Forest Land	1,247,890	Acres in Important Forest Resource Areas Covered by New or Revised Stewardship Plans	1,609
Number of NIPF Landowners	19,951	Volunteer Fire Departments Assisted	0
Acres of Federal Land Under State Fire Protection	26,660	State Fire Communities Assisted	54
Acres of Private Land Under State Fire Protection	1,900,000	Coop Forest Health Acres Protected	0
Number of Rural Fire Departments	80	Forest Legacy Project Acquisitions	0
Cities and Towns	78	Communities Provided Urban Forestry Program Assistance	10
Forest Based Employment	1,541	Population Living in Communities Provided Urban Forestry Program Assistance	920,099
Economic Impact of Forestry (by rank)	20	Urban Forestry Volunteer Assistance	38,084
State Forestry Budget (All Sources)	4,089,319		

Program Highlights

Best Management Practices Field Guide for Puerto Rico and the US Virgin Islands

Best Management Practices Field Guide for Puerto Rico and the US Virgin Islands

UPR Mayaguez, Oscar Abelleira, PhD, received a grant to develop a document that provides clear guidelines for forest owners, managers, and professionals to comply and implement practices that minimize the environmental impacts of forest use, harvest, and development. This project will review the current state of knowledge on the Best Management Practices (BMP) applicable to forested lands throughout the geological substrates and climates of Puerto Rico and the US Virgin Islands. This BMP review will focus on methods to implement forest management and development activities, such as road development, harvesting operations, and chemical applications, so as to minimize the impact on forest soils (for example, compaction and erosion) with the overarching goal of ensuring water resource protection.

Community Forestry and Open Space

The Puerto Rico Municipality of Mayaguez, in partnership with the community-based nonprofit organization "Rio Hondo Community Forest", acquired 67.9 acres of land last September for the establishment of a community forest. This forest is the first one of its kind in Puerto Rico to receive funds from the Community Forest and Open Space Program through State and Private Forestry.

This project is a result of community and local government efforts to acquire, manage and preserve the forest for long-term basis. It is the only large block of continuous forest in the area. The property is 90% forested and consists of post- abandonment secondary forest as a result of abandonment of previous

agricultural uses. The community forest will serve the Rio Hondo Community in Mayaguez and the rest of the island.

After the establishment of the project, the multiple community, economic, environmental, social and recreational benefits will be maximized. The community around is densely populated and there are ongoing housing development projects. The project can save the land from threats related to non-forest uses. With the project, the development of a one-of-a kind agro-ecotourism project will take place to promote eco-friendly practices and sustainable forest management to the general public. Business opportunities will also be created through the possibilities of rental of conference room facilities, guided tours and bird watching, among others.

The University of Puerto Rico in Mayaguez and the Rio Hondo Community Forest are working on the development of the community forest management plan, expected to be completed by the end of December.

Cooperative Fire Protection

During the 2016, the Puerto Rico Fire Department responded to 2,104 fires, which affected 807 acres. The Puerto Rico Fire Department has, by law, the responsibility of suppressing fires, including wildland fires and fires in the natural protected areas managed by the Department of Natural and Environmental Resources (DNER). Wildfires within a State Forest jurisdiction, the Puerto Rico Fire Department teams with the DNER to assist in the suppression efforts and train the DNER wildland firefighters that are volunteers to the PR Fire Department to suppress fires in state land wildland fires.

As part of our Prevention and Education Campaign the Puerto Rico Fire Department works directly with communities at risk of wildland fires, and places where annually are affected by these incidents. The Department of Natural and Environmental Resources' firefighters assisted and participated in all educational activities that were hosted by the Fire Department. During the activities local wildland firefighter distributed educational comics books based on safety and prevention on wildland fires and mitigation efforts, we enforced the education of our citizens in conjunction of a fire wise program focus on prepare fire adapted communities.

Forest Health Protection

During this year:

1. Completed 26 field trips for post Irma and Maria Hurricanes forest conditions assessments.
2. Initiated Urban Forest Health conditions monitoring work visiting 11 sites, Survey 123 Program completed.
3. Initiated Forest Health Program assessment for partnership growth and pollinator corridors contract.

Harrisia Cactus Mealybug Monitoring on Caja de Muertos- Field data collection has concluded. A suppression project was designed and submitted to the APHIS HCM workgroup. This proposal was also presented for comments at the Spray Managers Meeting.

Digitalization of forest health conditions monitoring- Arc collector and Arc 123 are currently being used in all SPF-FH field data collection, Urban forest conditions monitoring and I-tree projects in the Dominican Republic (in cooperation with International Programs). Projects. A half day training was provided to cooperators and UPR-RP graduate students. IITF Research Staff and the Climate Sub-Hub and Itree group in the Dominican Republic.

Plant Trait to Improve Plant Resiliency to Drought and Hurricanes PR and US Virgin Islands.- A grant was developed in cooperation with Northern Arizona University to improve the conservation and management of forest resources in Puerto Rico. Initial field work will begin in FY 2019,

Pollinator Corridor Conservation Outreach- A grant was developed with University of Puerto Rico in Mayaguez, Agricultural Extension to develop two demonstration gardens to highlight the use of regionally indigenous trees/shrubs and plants to promote pollinator habitats and invasive plant control. Demonstration plot construction will begin in FY 2019.

Forest Legacy

Guanica State Forest- Reducing Forest Fragmentation

The Guánica State Forest (GSF) was designated in 1981 as the 2nd UNESCO Biosphere Reserve in Puerto Rico (PR). GSF has been protected from deforestation, goat grazing and farming for more than 140 years, and is perhaps the best example of natural vegetation in Sub-tropical Dry Forest anywhere in the World. Fragmentation of the in-holdings is of special concern, since habitat fragmentation is one of the greatest threats to natural ecosystems and global biodiversity. Private forest lands adjacent to the GSF are threatened with fragmentation and development preventing future expansion. The fee acquisition of 220 acres in 10 proposed forested parcels located in the south, north and west boundaries of the GSF will increase the forest protected area, and promote the connectivity among critical habitats for federal endangered and threatened species. Currently, all of the parcels are for sale. These tracts provide diverse wildlife and critical habitat for both endangered Puerto Rican Crested Toad (PRCT) and Puerto Rican Nightjar, as well as 16 other listed species. Private lands and previously approved urbanization plans, located inside the designated area, put at risk the continuity between marine and terrestrial ecosystems.

The Department of Natural and Environmental Resources received funding to complete the Guánica State Forest Project receiving \$2,375,000 FLP funds and providing \$479,000 in cost share state/local funds.

Forest Stewardship

Forest Restoration Plan

DOI and FEMA convened the Natural and Cultural Resources Team comprised of federal, state, and local agencies as well as NGO's. The team worked on issues related to recovery practices in our museums, recreational areas, coasts, wetlands, soils, public and private forests in urban and rural settings, and to recover habitats of threatened and endangered species, among others, IITF SPF was designated Lead of the Forestation group assisting local agencies, including the Department of Natural and Environmental Resources and were charged to prepare the Forest Recovery Plan for Puerto Rico. Nicole Balloffet, NFS Nursery Program Manager, assisted IITF and facilitated several meetings to develop the plan. The Forest Recovery Plan was submitted on May 13, 2018 to RAND, a private consultant contracted to put together the Natural and Cultural Resources Recovery Plan for Puerto Rico.

Priority Areas Identified in the plan are:

- 4.Rehabilitate protected natural areas and state forests from damage caused by hurricane.
- 5.Rehabilitate private forests in rural areas and rehabilitate their functions and services.
- 6.Rehabilitate urban forests and rehabilitate their functions and services.
- 7.Rehabilitate our nurseries, establish seed banks, and guarantee the conservation of germplasm of important species.
- 8.Monitoring infestation of pests and diseases and the detection of invasive species.
- 9.Take advantage of the material resulting from fallen trees with logging potential.
- 10.Promote effective communication networks among interest groups and collaborators.

Hurricane Recovery- Nurseries' Rehabilitation

Hurricanes Irma and Maria destroyed the Cambalache nursery in Arecibo, Puerto Rico and the nurseries in St Croix, St John, and St Thomas, US Virgin Islands. These nurseries facilities are administered by the state/territorial government. Other private nurseries operating in Puerto Rico and the US Virgin Islands were also destroyed. SPF assessed damages and estimated costs for rebuild the nurseries, collect seeds, develop germination protocols, and have material available for reforestation projects in both urban and rural landscapes.

Disaster Supplemental Funds will be used to rebuild the Cambalache nursery including 12 hoop houses, growing area, seed bank, and a seed lab. Estimated rebuilding costs is \$254,000 and \$37,000 on materials for the seed lab/seed bank.

Landscape Scale Restoration

Landscape-scale Restoration Initiative to Establish Biological Corridors and Restore Ecosystem Functionality after the Impact of a Major Hurricane in the Caribbean Area.

Project address the following resources concerns: Reduce Soil Erosion and Improve Water Quality and Soil Health, Mitigate Fire Threats to Communities and Landowners and Improve Habitat Quality for At-risk Species by implementing conservation practices such as: establishment of vegetation and tree planting, erosion control measures, nutrient and waste management, establishment of fire breaks and wind breaks, propagation of native species for agroforestry practices and forest enhancement, habitat restoration for targeted species, debris and obstruction removal, among others. These actions will mitigate the impacts of extremes events such as hurricanes that not just are predicted to increase its frequency but also that has recently directly affect the targeted area. Conservation actions will be implemented at a regional landscape-level, based on watershed conservation approach treating multispecies and working on multiple habitats.

Urban and Community Forestry

Hurricanes Irma and Maria extensively damaged urban forests in Puerto Rico and the US Virgin Islands. Trees were lost and many hazard trees are still standing. SPF and the Department of Natural and Environmental Resources assessed damages and estimated costs for managing urban hazard trees and planned new reforestation projects. Estimates were submitted but no urban funding was allocated for urban forestry in the Disaster Supplemental.

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