



State and Private Forestry Fact Sheet

Puerto Rico 2024



Investment in State's Cooperative Programs

Program	FY 2023 Estimate
Community Forestry and Open Space	\$0
Cooperative Lands - Forest Health Management	\$155,594
Forest Legacy	\$50,000
Forest Stewardship	\$105,000
Landscape Scale Restoration	\$340,190
State Fire Assistance	\$205,000
Urban and Community Forestry	\$435,484
Volunteer Fire Assistance	\$20,000
Total	\$1,311,268

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

Puerto Rico population is estimated in 3,285,874. Is part of the Antillean archipelago, between Caribbean Sea and Atlantic Ocean. Includes the main island, two populated islands, Vieques and Culebra, Mona and Monito, Caja de Muertos, and small islands and cays. Measures approximately 100 miles E to W and 35 miles N to S. Land surface is approximately 3,449 mi². Has wide variations in elevation, climate zones and soil types. Geographical regions and geological primary substrates are: Coastal Plains, Limestone Regions, and Mountainous Interior composed of three main volcanic ranges; and Plutonic batholiths and associated ranges. The 53% is mountainous, 25% plains, 20% hilly, 1% plateaus, and 1% composed of rivers and reservoirs. Is divided in two climatologically regions. Northern two-thirds of the island relatively humid climate, and southern one-third is semi-arid. Mean monthly air temperatures ranging from 27 to 24 °C in coastal areas; and 25 to 22 °C in interior mountainous areas. Spatial distribution of rainfall is greatest in the Sierra de Luquillo rainforest (169 in/yr) and lowest in the southwest (30 in/yr). Land cover is: 59% forest, 13% developed, 10% agricultural, 9% scrub, 4% palustrine wetland, 3% grassland, and 1% estuarine wetlands, water and submerged lands and barren lands. Main cover (59%) is mixed forest dominated by trees generally 16 feet tall, and greater than 20% of total vegetation cover, either deciduous nor evergreen species are greater than 75% of total tree cover. Scrub lands (9%) contains areas dominated by shrubs less than 16 feet tall with shrub canopy greater than 20% of total vegetation. This class includes tree shrubs, young trees in an early succession, or trees stunted from environmental conditions. Developed land or impervious surface is the second land cover class, 12.6%, higher in coastal communities, 13.8% is classified as developed and 16.2% of the coastal zone's inland limit. Third is agricultural land (10%)-crops, grass, hay.

Program Goals

- CONSERVING WORKING FOREST LANDSCAPE

Need to preserve 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. To main objectives under this goal are:

1. identify and conserve high priority forest ecosystems and landscapes in Puerto Rico currently under private control;
2. actively and sustainably manage private forested land.

- 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:

1. identify, manage and reduce threats to forested ecosystems health;
2. reduce risks of wildfire impacts.

- ENHANCE PUBLIC BENEFITS ASSOCIATED WITH TREES AND FORESTS

Maximizing profitable social, environmental and economical services trees and forests provide to the community.

1.protect water quality, quantity; 2.improve air quality, conserve energy; 3.assists communities planning to reducing forest health risks; 4.enhance economics benefits and values of trees; 5.protect, conserve wildlife and fish habitat; 6. connect people to tree and forests; 7. manage to mitigate and adapt climate change.

Key Issues

- DEVELOPMENT AND FOREST FRAGMENTATION
- HYDROMODIFICATIONS
- CONVENTIONAL-LARGE SCALE AGRICULTURAL PRACTICES
- CLIMATE CHANGE
- WILDFIRES
- INVASIVE SPECIES
- PESTS AND DISEASES
- HURRICANES
- DROUGHT

Forest Facts and Accomplishments

Selected Facts	Value	FY 2023 Accomplishments	Value
Population	3,285,874	Landowners Receiving Educational or Technical Assistance	2,590
Acres of Forest Land	1,141,901	Acres Covered by New or Revised Forest Stewardship Plans	1,703
Acres of Nonindustrial Private Forest Land	1,247,890	Acres in Important Forest Resource Areas Covered by New or Revised Stewardship Plans	588
Number of NIPF Landowners	13,159	Volunteer Fire Departments Assisted	32
Acres of Federal Land Under State Fire Protection	26,660	State Fire Communities Assisted	134
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	74	Communities Provided Urban Forestry Program Assistance	30
Forest Based Employment	1,541	Population Living in Communities Provided Urban Forestry Program Assistance	1,045,473
Economic Impact of Forestry (by rank)	20	Urban Forestry Volunteer Assistance	1,245
State Forestry Budget (All Sources)	4,089,319		

Program Highlights

2023 Maricao State Forest Fire

On March 29, 2023, the Maricao State Forest Manager, Brian Ramos Güivas reported a fire near road PR-120. The fire started the day before. By March 31 the fire was covering a bigger area. All Wildland Fire Crews from the Puerto Rico Fire Department (PRFD), volunteer wildland firefighters from the Department of Natural and Environmental Resources (DNER), Municipal Emergency Management Officers from the Municipalities of Maricao, Sabana Grande, and San German were dispatched. The PRFD Wildland Fire Program established and led the ICS for the wildland fire suppression operation. The incidence was declared contained and concluded on April 14. This incidence included the use of 4 wildland fire engines acquired by the Cooperative Fire- State Fire Assistance Program, 3 water trucks, 2 helicopters from the PR National Guard, two Bambi Buckets, 1 D3, and 1 Traxcavator. The fire was covered by the major news media including articles in local newspapers and Telemundo PR. Approximately 35 acres of forest were burned. The PRDNER and the US Fish and Wildlife Service completed an assessment on the impact to flora and fauna. The fire occurred in an area which is a critical

habitat for the *Crescentia portoricensis* which is threatened species due to habitat loss. The Arbimon Acoustic Monitoring Program reported 14 bird species in the area. Given the fact that the fire occurred during the breeding season, many nesting areas were probably affected by loss of eggs, chicks, nest structures, and habitat destruction. The 14 bird species documented in the area included endemics, threatened, and endangered species. The endemic reptiles identified as affected by the incidence included important endemics species. The area is a suitable habitat for endemic amphibians that were reported using the Arbimon Acoustic Monitoring Program. Three coqui species, all endemic, were documented. The area is similar where the *Eleutherodactylus richmondi*, a critically endangered species has been sighted.

Cambalache Tree Nursery Rehabilitation Project, a Disaster Recovery Initiative

In September 2017, two major Hurricanes, Irma and Maria impacted Puerto Rico and the US Virgin Islands. The tree nurseries managed by the Puerto Rico Department of Natural and Environmental Resources (DNER) and the Virgin Islands Department of Agriculture were practically destroyed. Disaster Funding- Public Law 115-123- Disaster Supplemental: Hurricanes Harvey, Irma, and Maria assigned funding to support necessary expenses related to the consequences of Hurricanes Harvey, Irma, and Maria. The State, Private, and Tribal unit put together a plan to rehabilitate the nurseries and provide other important components needed to increase the territories capacity to produce the plant material needed for the forest restoration projects in the urban and rural zones. Funding provided the means to restore the Cambalache Tree Nursery, managed by the DNER. The first phase of the project was completed in July 2020 and included the installation of 13 hoop houses, rehabilitation of a water well and installation of a new water pump, irrigation system, equipped a seed laboratory and seed bank, and training on nursery management to all DNER employees. The second phase included the acquisition and installation of a potting machine and training in its use for all DNER and Cambalache Tree Nursery staff.. The potting machine arrived on January 16, 2023. The acquisition and installation costs added to \$456,430 plus \$84,500 used to cover improvement to the electrical system. This potting machine has the capacity to produce 2,500 one-gallon containers per hour. Installation of the potting machine was completed in February 2023. State, Private, and Tribal Unit, Project Inspector, along with representatives from the DNER conducted an inspection and a dry run to test the machine. It was a success, and the process ran smoothly. The contractor coordinated and offered two training sessions on the use and maintenance of the potting machine.

Cooperative Fire Protection

Puerto Rico is facing the arrival of the dry season, which will influence the vegetation accumulated throughout 2023, which was a wet fall season. The PR Fire Department (PRFD) has been working on the preparedness for wildland firefighting in the event of a possible early drought scenario in 2024. In 2023, the PR Fire Department responded to 3,337 wildland fires. The geographic of Puerto Rico makes the vegetable fuel susceptible to burning from the beginning of January to the end of August. The South and Southwest regions have the highest fire activity due to the type of vegetation and the minimum amount of precipitation. With the assistance of the office of IITF-USDA Forest Service and federal and state agencies, the PRFD implements the prevention, mitigation, and response programs to wildfires, establishing strategies under interagency efforts to work together in the planning process, response phase, resources coordination, and fire monitoring. The PRFD has an operations center in the municipality of Juncos, from where wildland fires, mitigation works, and other specialized operations are managed. The PRFD incorporated five fire crews during the 2023 fire season, covering the complete island of Puerto Rico. These PRFD fire crews implement fuel mitigation processes through controlled burning, fire breaks in abandoned and state lands, and fighting wildland fires. These strategies have been implemented using heavy equipment and techniques with multiple tools and equipment subsidized by the Cooperative Fire Program, which has made possible the control of fires and prevention of spread to other areas, allowing the protection of flora and fauna. The 2024 fire season is expected to be a very active year for wildfires due to vegetal combustible material available in the fields to burn. PRFD will establish 6 fire crews: 1 in the North, 2 in the West, 2 in the South, and 1 in the East to respond to wildfires and perform fuel mitigation efforts.

Forest Health Protection

As of Aug 2023, there has been an administrative change in the Forest Health Program within the Department of Natural and Environmental Resources. Yohaira M. Ayala Torres, previously in the position, was replaced by Brian Ramos-Güivas, who is the new coordinator for DNER. During 2024 a Request for Proposal will be issued to hire a part-time entomologist and a field technician that will be monitoring the

traps and working on sample identification. The program continued monitoring the Boqueron, Guanica, and Cambalache State Forests where the collection of samples was conducted by Dr. Edda Martinez. Sampling ended by Nov 2023. For 2024 the program will expand the monitoring to Maricao and Susua State Forests. At the Maricao SF a fire affected approximately 35 acres of the forest land where the dominant species (*Pinus caribaea*). The fire reached native plant populations affecting many individuals in the area. Multiple dead or dying trees showed the characteristic holes made by beetle larvae. To monitor a potential outbreak beetle traps will be placed in the area affected by the fire. The Susua SF manager reported trees with the characteristic holes of beetle larvae. Beetle traps will be placed in the affected areas by 2024.

Training was completed early in the year, where six forest fire fighters participated. The training consisted of the identification of diseases and pests. Coordination to include more forest fire fighters was coordinated for Dec 12, 2023. Unfortunately, the forest firefighters could not participate, and the workshop had to be reprogrammed for 2024. Since this workshop was canceled just five days prior to the date and the speaker confirmed, the workshop was offered to Forest Health Support Group consisting of NGO's, scientists and federal government agencies. Due to late notification only five people could schedule for the workshop. Members that could not participate showed interest and a future workshop will be offered during 2024.

Forest Legacy

In 2023, the Puerto Rico Department of Natural Resources (PRDNER) focused on advancing acquisition efforts under projects "Expanding the Guánica State Forest" and "Protecting the Central Mountain Range". The PRDNER completed the acquisition in fee of Los Gutierrez 2 tract which consists of 8.364 acres. Los Gutierrez 2 tract is one of four tracts proposed within Los Gutierrez area. This area has been divided by lots with development pressures for residential and or vacation homes. This acquisition guarantee the conservation in perpetuity of 8.364 acres that will be added to the delimitation of the State Forest of Guánica. PRDNER is close to completing the fee acquisition of 5 additional proposed forested tracts located in the south, north and west boundaries of the Guánica State Forest under the Expanding the Guánica State Forest Project. The acquisition of these tracts will increase the forest protected area and promote connectivity among critical habitats for federal endangered and threatened species. 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.

PRDNER has also advanced efforts under the Protecting the Central Mountain Range Project. This project seeks to acquire in fee 712 forested acres within four properties in the Puerto Rico Central Mountain Range. In 2023 two of four offer letters were sent. The acquisition of these tracts ensures the conservation in perpetuity of buffer zones and biological corridors that connect two important life zones and expands habitat protection for two State Forests.

Forest Stewardship

At the end of 2023, the Forest Management Program achieved the progress of approving, with the technical assistance of the associated NOG collaborators (Cafiesencia, Centro para la Conservación del Paisaje, Distrito de Conservación del Caribe, Protectores de Cuencas, Inc.), 20 new management plans, totaling 1,040.9 acres of forest in priority zones, impacting 20 new participating landowners. This, according to the data collected on the SMART platform, thus placing the program in a much better represented position than in previous years. This, thanks to the valuable technical participation of the collaborators, is an advance that without their assistance would not have been possible to achieve. The number of total management plans in effect through December 31, 2023, is 176 equivalents to 26,744.6 acres of private lands.

These management plans included specific recommendations with the following forest practices that serve the focal points of the program, for example: 1) commitment of the owners in actions aimed at protecting and conserving the forested areas in the highest areas of the priority hydrographic watersheds to help maintain and improve the quality of water bodies. 2) improvements in habitat for wildlife through the reintroduction of tree species that provide food and shelter, 3) control fires in prone areas of the island's semi-arid ecoregion, 4) promote ecotourism and educational activities that allow owners of land obtain additional economic income.

On the other hand, the DRNA managed to sign two (2) contracts with the non-profit entities Cafiesencia and MC Environmental Specialists, LLC., last September 2023, to provide technical assistance through

the development of plans. of new management, to owners of private forests.

Joint Chiefs' Landscape Scale Restoration Partnership Eastern Puerto Rico

Project proposes a landscape-scale level approach to increase conservation practices in private lands to improve ecosystem function and health while improving economic and ecological services for local communities. The effort includes planting *Eugenia haematocarpa* on El Yunque National Forest land to increase the population of this species. Other species that were distributed among private landowners were *Libidibia monosperma*, *Goetzea elegans*, and *Calyptrotrichia rivalis*. The project includes technical assistance and forest management planning, production of plant material, implementation of activities included in the conservation plans and the forest management plans, long-term monitoring, and education and outreach.

The main objectives of the project are:

1. Improve habitat conditions for at-risk species.
2. Protect water quality and supply for communities and industry.

Joint Chiefs' Landscape Scale Restoration Partnership Southwest Puerto Rico

This project is an extraordinary example of collaboration between state and federal agencies, non-governmental groups, and communities. Our working group has representation of the US Forest Service providing three-year funding for the implementation of the initiative including contracting professional services to deliver technical assistance and forest management planning, plant materials, monitoring, and education and outreach. US Fish and Wildlife Service providing technical assistance. NRCS provided technical assistance, Conservation Plans (CP) and annual funding for the implementation of the CP. The Puerto Rico Fire Department- Wildland Fire Program, provided educational opportunities to private landowners and forest managers on fire prevention practices. Cafiesencia and Envirosurvey, NGO's developed outreach materials, provided technical assistance and developed the Forest Stewardship Management Plans (FSMP) in collaboration with the private landowners. Protectores de Cuenca, an NGO produced close to 40,000 native trees to be used in the implementation of the plans. Para La Naturaleza established long term monitoring plots in participants' lands to monitor the long-term benefits of the practices implemented in private lands. The project included an important educational component offering training sessions on conservation practices, reforestation, wildland fire prevention, and many others. As part of this initiative, the SWSWCD created the event, De la Escuela al Bosque (From School to the Forest) and hosted educational opportunities in the forest with pre-elementary and elementary students in the Susua State Forest. The event included the participation of the Puerto Rico Fire Department, Smokey, educational tables and field laboratory experiences. The project in volunteering time and effort to rehabilitate the trails at the Susua State Forest.

Landscape Scale Restoration

Landscape Scale Restoration Project: Forest Fire Prevention in Fire Prone Landscapes in Puerto Rico Phase 1. Protectores de Cuenca, Inc. (PDC) received funding from the Landscape Scale Restoration Program (LSR) to manage and restore forest in the Guanica State Forest (GSF) to reduce wildfire risk in this area which has a high incidence of wildland fires. The GSF is of high ecological importance and is within a Joint Priority Landscape delimited in the Puerto Rico Forest Action Plan (PRFAP). The project proposed to restore 50 acres of forest along road PR-333 which is a high incidence of forest fires, mostly due to human intervention. The project activities include eradication of invasive grasses and reforestation with 20,000 native trees suitable for the dry conditions in the area. An important component of this project includes the development of a Community Wildfire Protection Plan with the participation and input from government and NGO's stakeholders and community members. As of November 2023, the project planted 4,918 native trees and manage 9 acres of important wildlife habitat. PDC owns and manage a nursery in Yauco and propagated the plant material needed for the reforestation component of the project. Some of the species propagated include: *Bucida buceras*, *Chrysobalanus icaco*, *Pictetia aculeata*, *Citharexylum spinosum*, *Colubrina arborescens*, and *Cordia rickseckeri*. PDC received funding for collecting seeds, germinate, and prepare soil mix to plant the seedlings. PDC completed 14 reforestation events and educational workshops including high school students from the area. PDC has a co-management agreement with the Puerto Rico Department of Natural and Environmental Resources to co-manage the Guanica State Forest including restoration and management of recreational areas.

Nursery Best Management Practices Workshop for Reforestation and Restoration on Plant Production Pra

This workshop was offered in Hacienda Esperanza in Manati, Puerto Rico and the Company Hotel in St. Croix, US Virgin Islands. The training was offered by J. B. Friday, PhD, Extension Foresters from the University of Hawaii and Diane Haase, PhD, Nursery Specialist from the Reforestation, Nurseries, and Genetics Resources Team (RNCR). These training sessions were offered in person and online via Teams. Our unit design these training opportunities responding to requests from our cooperators. The workshops covered topics related to species selection, container and growing media characteristics, nursery environment, irrigation systems, propagation protocols, pests and diseases management, seed collection and storage, and successful outplanting. This event was an excellent networking opportunity for the attendees. Participants had the opportunity to participate of planning sessions, and site visits to nurseries and planting sites.

Urban and Community Forestry

During this year we have been carrying the message of the importance of reforestation and education about the importance of trees and their maintenance. In December 2023 four entities submitted their applications to the Tree City USA Program. We are celebrating that the municipality of Caguas, the municipality of Bayamón, the Interamerican University Metro Campus and the U. S. Army Fort Buchanan, are part of the program. During 2024 the municipality of Caguas will celebrate 15 years in the Program. Due to this, several celebrations will be held, and we hope that more municipalities and entities will join the Program through these activities.

The Urban and Community Forestry Program continues to work with the non-governmental entities selected under the Cost Share Program to ensure that they can carry out all the proposed activities. In this proposal cycle six entities were considered and accepted into the Cost Share Program. We are in the process of finalizing the agreements so that they can begin their activities. Among the selected entities are the municipalities of Ponce, Coamo, Hormigueros and Barceloneta; the entity CARAS con Causa and the Consejo de Vecinos de las Urbanizaciones Río Piedras Hights and El Cerezal. All proposed projects will be of benefit to the public but especially to underserved communities.

We continue to visit schools and communities to spread the message about the importance of reforestation, tree maintenance and above all the appropriate tree for their communities or residences. The latter is of utmost importance for electrical services, especially during hurricane season. In addition, we continue with our activity of exchanging Christmas trees for trees to plant in homes or communities. This time the activity was carried out in collaboration with the Municipality of San Juan.

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