State and Private Forestry Fact Sheet

Guam 2025

Investment in State's Cooperative Programs

Program	FY 2024 Final
Community Forests and Open Space	$0
Cooperative Lands - Forest Health Management	$0
Forest Legacy	$0
Forest Stewardship	$206,022
Landscape Scale Restoration	$0
State Fire Assistance	$408,995
Urban and Community Forestry	$0
Volunteer Fire Assistance	$0
Total	**$615,017**

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

Guam is the southernmost island in the Mariana Archipelago, with a land mass of 560 km2, a maximum elevation of approximately 405 m, and a total shoreline length of 244 km. The northern half of the island is a flat plateau composed of uplifted coral reefs. It is relatively flat and is a mix of forest, urban, and cultivated land. Beneath the plateau is the island's principal aquifer or freshwater lens. The southern half of the island is volcanic in origin, featuring rolling terrain dominated by grasslands and savannas, and drained by many streams and rivers. The island of Guam is surrounded by coral reefs that provide habitats for large numbers of diverse marine species. Guam is the most heavily populated island in Micronesia, with an estimated population of 168,801 in 2021. However, over half of the island remains forested, with 26% of forests in reserved or protected areas, such as refuges or conservation areas. Land ownership of Guam's forests is divided between private (53%) and public management (47%). Public lands are managed by the Department of Defense, National Park Service, National Wildlife Refuge, and the Government of Guam which manages 20% of the land area.

The Government of Guam Department of Agriculture has primary responsibility for conservation management of local government conservation lands. The Forestry and Soil Resources Division (Guam Forestry) is the central division of the Department that is responsible for protecting and restoring forest ecosystems and soil resources in Guam. The mission of Guam Forestry is "to conserve, protect and enhance Guam's vegetative environment and sustain the natural resources which are dependent on healthy forests". The division works with stakeholders to promote healthy and productive forests in both rural and urban areas throughout the island in partnership with non-governmental organizations, the USDA Forest Service, and other government agencies.

Program Goals

- Strategy 1: Implement highest priority plantings in urban, rural, and undeveloped areas that meet multiple objectives.
- Strategy 2: Protect, conserve, and restore forests on public, private, and other non-military lands.
- Strategy 3: Improve fire prevention, control, suppression and prescribed fire activities through organizing training and equipping staff and resources.
- Strategy 4: Implement a forest health program and unify interagency efforts to control invasive species.

Key Issues

- Issue 1. Wildfire and Public Safety: Wildfires accelerate erosion and the movement of soil pollutants into surface waters and domestic water supplies. Fires also contribute to the decline of the coral reef systems by hastening the delivery of soil sediment into the coastal waters. On average, 4.36% of the

island's total land area was burned each year between 2015 and 2024.

- Issue 2. Water Quality and Water Supply: Movement of sediment from erosion into waterways is one of the most pervasive problems associated with poor land cover, which degrades surface waters, domestic water supplies, and fragile reef systems. Forest management strategies that direct resources toward reestablishing native forests, preventing and reducing fire frequency, and providing rehabilitation of degraded landscapes will improve water quality and assure safe water supplies for the future.
- Issue 3. Deforestation of Native and Old Forests: Approximately 1,000 forested acres have been cleared to support military buildup, including about 80 acres of high-quality native limestone forest. Additional forest areas or fragments may be cleared to accommodate roadways, transmission lines, and other infrastructure related to the buildup, as well as private development associated with the activities.
- Issue 4. Urban Forest Sustainability, Population Growth and Urbanization: Between 1960 and 2019, Guam's population increased 150%. The rapid population growth led to an increase in urbanization, which has resulted in forest degradation and fragmentation. Strategies to mitigate the impacts of urbanization include planting trees along roadways, parks, greenways, and in areas to offset runoff.
- Issue 5. Degraded Lands: Lands that have limited vegetative cover or are barren areas are considered a threat to future ecosystem health as they are more likely to face issues of erosion, soil loss, and increased fire risk. Degraded lands are strategically prioritized for management because they can contribute to higher amounts of eroded sediment to streams and reefs.
- Issue 6. Invasive Species and Forest Health: Invasive plants, insects, and diseases are a serious threat to Guam's forest. The coconut rhinoceros beetle (Oryctes rhinoceros) was first detected on Guam in Tumon in 2007. Its distribution is now island-wide and puts all coconut palms at risk. Little fire ant (Wasmannia auropunctata) was detected in 2011 and has quickly spread island-wide by humans transporting green waste.

Forest Facts and Accomplishments

Selected Facts	Value
Population	153,836
Acres of Forest Land	69,703
Acres of Nonindustrial Private Forest Land	28,771
Number of NIPF Landowners	2,877
Acres of Federal Land Under State Fire Protection	0
Acres of Private Land Under State Fire Protection	81,000
Number of Rural Fire Departments	12
Cities and Towns	19
Forest Based Employment	1
Economic Impact of Forestry (by rank)	0
State Forestry Budget (All Sources)	1,150,318

FY 2024 Accomplishments	Value
Landowners Receiving Educational or Technical Assistance	7
Acres Covered by New or Revised Forest Stewardship Plans	0
Acres in Important Forest Resource Areas Covered by New or Revised Stewardship Plans	0
Volunteer Fire Departments Assisted	0
State Fire Communities Assisted	0
Coop Forest Health Acres Protected	0
Forest Legacy Project Acquisitions	0
Communities Provided Urban Forestry Program Assistance	19
Population Living in Communities Provided Urban Forestry Program Assistance	153,836
Urban Forestry Volunteer Assistance	4,090

Program Highlights

Conservation Education

The Guam Department of Agriculture, Forestry and Soil Resources Division (Guam Forestry) had a successful 5-year Program Review with the USFS and partners. Guam Forestry met with USFS program managers and over 30 local natural resource and fire partners who shared their experiences and support of Guam Forestry and the mission this small division tackles every day for the people of Guam, supported by amazing collaborations and partners. Additionally, Guam Forestry maintains an engaging social media presence on Facebook and Instagram (@DOAG.Forestry) with 2,412 followers and growing. Weekly

posts such as #TREErific Tuesday's, #Wildfire Wednesday's and #Forestry Fact Friday's, are the common themes every week and showcase the wide range of their audiences and information.

Cooperative Fire Protection

Guam Forestry is responsible for initial attack operations in wildland firefighting island-wide. In 2024, Guam experienced a substantial increase in wildfire activity, with 267 fires burning a total of 8,440 acres - equivalent to 6.22% of the island's total land area. Guam Forestry wildfire records show that crews directly responded to 42 of these fires, which burned 1,782 acres. Guam Forestry crews worked in 4 member teams for 5-day shifts from 0800-1700, and logged approximately 700 hours to wildfire suppression efforts in 2024, reporting to work on regular days off when Red Flag Warnings were issued, ensuring coverage during heightened fire danger conditions. Concurrently, the Guam Fire Department (GFD) responded to 862 grass fire alarms, with 654 incidents occurring between February and May. The GFD operates from 12 fire stations with two shifts to provide 24/7 coverage with an average response of 35 grass fire alarms during this period. The 2024 surge in wildfire activity was driven by increased fuel loads from Typhoon Mawar and exacerbated by severe drought conditions and human activities such as debris burning and arson fires for poaching. Guam Forestry intensified efforts to address these challenges and provided educational presentations that reached 1,493 students; and performed a 1wk Smokey Bear Blitz comprised of sightings and visits across the island for Smokey's 80th birthday that concluded with a finale event attended by over 130 participants. The Guam CFPP program addressed hazardous fuel load reduction projects, maintained over 7,000 linear feet of fuel & firebreaks, purchased essential PPEs for responders, repaired critical firefighting equipment, and hosted a fire prevention and arson investigation training for fire and local conservation organizations. These initiatives bolster community preparedness, align with the Guam Forest Action Plan's strategic goals & underscores the importance of a One-Guam approach to wildfire prevention and response.

DACUM: Developing a Certification Program in Forest Conservation and Management in Micronesia

The DACUM project seeks to develop a curriculum in forest health management through capacity building throughout Micronesia. The University of Guam (UOG), Forest Solutions Inc. (FSI), and Micronesia Conservation Trust (MCT worked together in Phase I of the project to establish a conceptual framework and best practices to promote workforce development in the Pacific Island Region in Forest Conservation and related topics. This was largely accomplished through a sub contractual agreement between UOG and FSI, the latter who took the lead in: (1) identifying key stakeholders throughout Micronesia for project development; (2) compilation of a list of Pacific Island forester contacts, UOG contacts, project partners; (3) compilation of a list of department heads, professors, specialists, and experts in the environmental education field in the Pacific Islands. Forest Solutions Inc. DACUM project manager, completed the DACUM International Training Center course which taught how to plan, organize and conduct a virtual DACUM (Developing a Curriculum) workshop. Forest Solutions Inc. also generated a research database containing all existing Land Grant Institutes, universities, colleges, and programs in the Pacific Islands. Institutions that partner with Pacific Islands or support students from the Pacific Islands were also included. The database details departments offering degrees and certifications in natural resources, agriculture/ agroforestry, and other related fields. Additionally, FSI collected data on certificates and degrees awarded in natural resources to analyze educational and workforce trends. Given limited public data, FSI conducted direct outreach to universities and professors to gain deeper insights. Phase II of the project, which involves convening workshops with stakeholders, was scheduled to begin in December 2024.

Forest Health Protection

This year, the Guam Department of Agriculture (DOAG) compound which comprises of the Guam Forestry Arboretum and the Forestry Cetti Bay Nursery is being surveyed for little fire ant (LFA), Wasmannia auropunctata and placed under an 8-month treatment program to mitigate the spread of LFA during out-planting events. In addition, the COTAL conservation area (~200 acres) was surveyed and found LFA encroaching into the southern border of the property. DOAG Biosecurity will be working with the Center for Environmental Management of Military Lands and NAVFAC Marianas to control little fire ant within the southern border of COTAL.

Forest Inventory and Analysis

The 2024 Guam Forest Inventory and Analysis (FIA) was successfully completed between January 18,

224 and November 1, 2024. Sixty-two USFS inventory plots and 116 Micronesia Challenge plots were field measured. Field measurements occurred on all land ownership types (private, public and federal) with the addition, in 2024, of non-forest vegetation plots to better understand ecosystem succession and wildfire dynamics on Guam. During this period, over 45 personnel from USDA Forest Service, Micronesia Conservation Trust, University of Guam - Guam Plant Extinction Prevention Program, Island Ecoservices, Forestry Offices of the Republic of the Marshall Islands and the Federated States of Micronesia – Pohnpei State, and Guam Forestry, worked over 3,080 hours across an island-wide plot grid and spent an additional 1,795 hours traveling and to connect with landowners to secure access across properties and overall logistical support. This intense effort would not have been possible without the field support and permitting assistance from the partners previously listed, and the following additional agencies: Mayors' Council of Guam, United States Department of Defense (Andersen Air Force Base, Marine Corps Base Camp Blaz, and Naval Base Guam). Data from the FIA have been uploaded to the USFS-FIA internal data management system and preliminary data reports are expected to be available the first half of 2026 after the quality assurance process is completed.

Forest Stewardship

It was a busy year filled with trainings for the Guam Forestry staff. First, Forestry personnel attended the Pacific Islands Forestry Committee (PIFC) Technical Training workshop in Hilo, Hawaii. Delegates from Region 5 such as American Samoa and Yap as well as members from the USFS gave presentations on topics such as Capacity Building, Fire, Invasives and using Technology for forestry work in the Pacific region. Following the workshop, Guam Forestry personnel and partners participated in a weeklong Forest Inventory & Analysis (FIA) training in preparation for Guam's scheduled FIA and Micronesian Challenge surveys. These important surveys were completed later in the year with help from Forestry partners from Pohnpei and the Marshall Islands. Technical assistance to landowners and increase in agency partnerships between USDA-NRCS-EQUIP and their cooperators were notable successes this year. Additionally, the FSP Program Manager conducted two "Tree Pruning Best Practices Workshops" for village mayoral staff. A total of 30 staff attended and learned good cuts versus bad cuts and trimming for dead, decaying and diseased branches. With this training, the expectation is for more village trees to grow healthier as they receive corrective pruning rather than being removed for the wrong reasons. Receiving and giving trainings makes Guam Forestry staff well rounded in serving our community. Numbers for the year: 248 volunteers (992 hours of service) planted 575 trees on a total of 5-acres.

Landscape Scale Restoration

Guam received 2 LSR grants, one to Guam Forestry directly, and one endorsed by Guam Forestry to the University of Guam (UOG). The Guam Forestry LSR project addressed the restoration of riparian corridors and upland forest stands in the Manell-Geus Watersheds. It is estimated that 72,000 tons of sediment enter streams annually from this watershed, harming stream water quality, coastal systems, and community. Guam Forestry, partners and volunteers, removed invasive species, prepared planting sites, planted trees, maintained fuelbreaks, provided field trips, hands-on learning, and thousands of hours-of-service learning opportunities for students across the island. Guam Forestry for a 2nd year, offered stipend funding for vegetation management and site preparation for tree plantings. Funding was exhausted but expanded upon even further through the support of the Guam Bureau of Statistics and Plans and their NFWF grant award which provided watershed-level support providing stipends for tree planting participants. Stipends covered: site preparation assistance, planting, and site maintenance; all while learning the goals of the project and the long-term benefits for the community: 114 volunteers (456 hours of service) planted 1,835 trees within a 7-acre footprint which is a restored site that had been planted and burned previously, a smaller portion of the 77 acres reforested since 2018. The UOG LSR, prioritized converting grasslands to forest cover at the Ugum watershed field site. Over 7,348 trees, 380 of which were comprised of 11 different native species, were planted across 21 events. Activities included monitoring; planting; timber stand improvement; nursery operations (propagating 6,000 new seedlings); watershed tours, outreach events, school visits, printing of outreach and educational materials, and planting events. Hundreds from the local community participated and have all contributed to the growing sense of ownership and stewardship in support of the project.

Tropical Forest Ecology Course - Pohnpei 2024

Seventeen individuals from across Micronesia were selected to participate in the 2024 Tropical Island Ecology Course convened in Pohnpei from 14 July – 3 August 2024. Participants attended lectures providing essential background information on Pohnpei's ecological, cultural, and social history, and learned about agroforestry, invasive species management, and iNaturalist as a conservation tool. A

lecture was provided on Pohnpei's agricultural history and the transition from agroforestry to modern farming, which has affected native forest and ecosystem health due to invasive species. A critical lecture linked these efforts to the Protected Areas Network and how it addresses invasive species. The Invasive Species Taskforce of Pohnpei provided updates on their active management and eradication efforts. These foundational sessions set the stage for the development of student research projects.

Participants were mentored by a team of scientists, who guided them through the scientific process from hypothesis development to research execution and results presentation. Six research groups were formed, each addressing specific topics related to invasive species, native species richness, growth impacts and public perceptions of invasive species in Pohnpei.

Another highlight of the course was the hands-on training in Geographic Information Systems (GIS) provided by the US Forest Service, which helped students learn about basic GIS and enabled them to map their research sites. The course concluded with a public symposium where students presented their research findings. As an implementing partner, COM-FSM provided not only the venue to make this event possible but also live streaming so that the presentations could reach a wider audience. The recording can be found on COM-FSM's Facebook page (link: https://fb.watch/uRX3GH7_YY/).

UOG Drone Corps Assists Forestry with Site Mapping

The University of Guam Drone Corps program continues to provide high-quality products and resources to aid the Guam Department of Agriculture - Forestry and Soil Resources Division (Guam Forestry). From February 2024 to June 2024, UOG Drone Corps pilots conducted five remote flight missions at two reforestations sites -- Quinene and As Gadao -- to document Guam Forestry's tree planting progress.

In March 2024, the Quinene plantation site unfortunately experienced an intense wildfire event, which destroyed portions of the reforestation area. To assess the extent of the burns, UOG Drone Corps members captured aerial imagery of the site after the wildfire to produce a before-and-after comparison for Guam Forestry. This composite can help inform future wildfire management of reforestation efforts in southern Guam, such as determining which areas within the site are more susceptible to fire spread.

To support technical capacity for the department, the UOG Drone Corps trained Guam Forestry's Cooperative Fire Protection (CFP) Program Manager to become a Federal Aviation Administration certified remote pilot. The CFP Program Manager has collaborated with UOG Drone Corps on various flight missions and will soon be able to lead drone surveys for Guam Forestry.

Urban and Community Forestry

Guam Forestry participates in urban planting in public and private schools, public parks, public rights-of-way, government agencies and private businesses. In addition to planting efforts, Guam Forestry coordinates with public and private entities on Arbor Day activities, pest eradication efforts, and educational events with themes that range from wildfire risk to the importance of planting trees in urban settings.

Throughout the year, the UCF program supported 275 community volunteers, planted 2,930 trees, donated 67 trees, provided 140 hours of technical service, and awarded $28,224 in community subgrant awards. The program staff also attended two professional development and training opportunities, the World Forum on Urban Forests in Washington D.C. and the Pacific Island Forestry Committee Training in Hilo, Hawaii. Guam Forestry Division Chief joined them for both of these opportunities, and the Guam Forestry staff joined them for the Forestry Committee Training in Hilo. Something else to highlight is that this year concluded the pilot round of the UCF Fina'maolek Subgrant Program. Each of the four grantees successfully completed their projects and continue to nurture their trees and related programs. Grantee project goals ranged from native reforestation, creating a healing space for those dealing with trauma, growing traditional medicinal plants, and educating the youth about fruit trees. In its pilot year, the Fina'maolek Subgrant Program produced over 1,000 volunteer hours, planted 233 trees, and created and printed several educational and outreach materials. Fina'maolek's second year has awarded $27, 038 to four community organizations. Their projects range from developing a fruit tree nursery, planting native trees in a schoolyard to incorporate local botany and culture into the curriculum, and planting trees to solve ongoing erosion issues and create more shade in a widely used community space.

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