

# DACUM Phase I Synthesis

## *Evaluating Education and Workforce Capacity for Natural Resource Management in the Pacific Islands*

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# 1. Executive Summary

## 2. Educational Analysis

### 2.1. Higher Education for Pacific Islanders

Asian American and Native Hawaiian Pacific Islander (AANHPI) students make up a growing share of the enrollment population at numerous U.S. institutions. Recognizing the importance of this group for enhancing diversity and perspective within educational institutions—and ultimately in the workforce—federal agencies have prioritized support for AANHPI students.

In 2020, data highlighted the high proportion of Native Hawaiian and Pacific Islander (NHPI) adults not enrolled in postsecondary education, with 57.9% of Samoans, 56.8% of Tongans, 53.0% of Native Hawaiians, and 49.3% of Guamanians or Chamorros not enrolled. The top five institutions by NHPI enrollment—College of Micronesia, University of Guam, Guam Community College, American Samoa Community College, and College of the Marshall Islands—are located in the Pacific Islands and together enroll nearly 20% of NHPI college students nationwide. On the U.S. mainland, NHPI undergraduate enrollment (53,066) is nearly four times that in Hawai‘i and the Pacific (14,748).

A significant portion of NHPI students enroll in Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), underscoring these institutions' critical role in supporting the NHPI community. According to the U.S. Department of Education's Office of Postsecondary Education, the number of funded AANAPISI institutions has risen by 22 in the past two years.

AANAPISI is one of eight federally designated Minority Serving Institution (MSI) programs, established by Congress in 2007 through the College Cost Reduction and Access Act and further supported by the Higher Education Opportunity Act in 2008.

To qualify as an AANAPISI, institutions must meet the basic eligibility criteria outlined in Section 312(b) of the Higher Education Act's Title III and V programs. Additionally, institutions must have an undergraduate enrollment of at least 10% Asian American and Native American Pacific Islander (AANAPI) students. Specific criteria also require that at least 50% of degree-seeking students receive need-based financial aid under Title IV of the Higher Education Act.

Despite representing one of the largest groups within Minority-Serving Institutions (MSIs), AANAPISI-designated institutions remain underfunded. For instance, in fiscal year 2020, AANAPISI institutions received an average of \$57,181 per capita, compared to \$4,216,427 allocated to other institutions. Over a seven-year period, AANAPISIs saw an increase of only \$1.4 million in funding, while Hispanic-Serving Institutions received an increase of \$40 million over the same timeframe.

For fiscal year 2023, OPE allocated \$20.9 million in total for AANAPISI funding, split between discretionary (\$16.4 million) and mandatory awards (\$4.6 million). This funding supports both new and continuation grants across institutions that serve a high number of Asian American, Native Hawaiian, and Pacific Islander (AANHPI) students. The discretionary funding saw 16 new awards averaging around \$377,914 per institution, and 30 continuation awards averaging \$336,710. The funds aim to enhance capacity-building initiatives, workforce readiness programs, and other resources for these institutions.

Recent increases in funding reflect growing recognition of the unique challenges AANAPISI institutions face, particularly as they serve a high percentage of low-income, first-generation, and underrepresented students. However, while funding has increased in recent years, AANAPISIs still receive considerably less funding per capita compared to other Minority-Serving Institutions, highlighting a need for continued advocacy to address funding disparities.



## 2.2. Trends in Educational Institutions

Table 1 lists enrollment numbers of Pacific Islander students at various U.S. higher education institutions, reflecting the distribution of Pacific Islander student populations across these campuses. The highest Pacific Islander enrollments are found at institutions with strong ties to Pacific Island communities. The top three institutions by Pacific Islander enrollment are:

- *College of Micronesia* (1,992 students),
- *College of Marshall Islands* (1,376 students), and
- *American Samoa Community College* (927 students).

These institutions are strategically located in regions with high Pacific Islander populations, likely contributing to higher enrollment rates. The institutions with higher Pacific Islander enrollments are concentrated in or near the Pacific Islands and Hawai‘i, underscoring the importance of regional accessibility and relevance to Pacific Islander communities. Beyond Pacific-centric universities, some mainland U.S. universities also enroll Pacific Islander students, although typically in lower numbers (e.g., California State University campuses and the University of Nevada). This suggests that while Pacific Islanders may seek educational opportunities on the mainland, there is a stronger preference or need for educational access within the Pacific region.

The distribution and concentration of Pacific Islander students across these institutions highlight potential areas for targeted support programs, capacity building, and funding efforts to meet the unique needs of this student demographic, especially at institutions with higher enrollments.

Institutions with high Pacific Islander enrollments are a keystone to the Asian American and Native American Pacific Islander-Serving Institutions (AANAPISI) program. This data can guide decisions on funding allocations, as high-enrollment institutions may benefit from additional support to enhance educational outcomes for Pacific Islander students.

Table 1 provides valuable insights for stakeholders and policymakers focused on educational equity, highlighting where Pacific Islander students are concentrated and where targeted support can make the most impact.

**Table 1. 2021-2022 enrollment and degrees awarded to Pacific Islanders in order of highest to lowest (National Center for Education Statistics).**

| Location                 | Institute                               | Enrollment, fall | Degrees Awarded to Pacific Islander students, 2021-2022 |            |          |             |
|--------------------------|-----------------------------------------|------------------|---------------------------------------------------------|------------|----------|-------------|
|                          |                                         | Pacific Islander | Associate's                                             | Bachelor's | Master's | Doctor's\4\ |
| <b>Federated</b>         | College of Micronesia, FSM              | 1,992            | 231                                                     | 16         | 0        | 0           |
| <b>Marshall Islands</b>  | College of the Marshall Islands         | 1,376            | 133                                                     | 15         | 0        | 0           |
| <b>American Samoa</b>    | American Samoa Community College        | 927              | 161                                                     | 12         | 0        | 0           |
| <b>Guam</b>              | Guam Community College                  | 863              | 91                                                      | 0          | 0        | 0           |
| <b>Hawaii</b>            | University of Hawaii at Manoa           | 547              | 0                                                       | 87         | 51       | 8           |
| <b>Northern Marianas</b> | Northern Marianas College               | 473              | 70                                                      | 18         | 0        | 0           |
| <b>Palau</b>             | Palau Community College                 | 440              | 99                                                      | †          | †        | †           |
| <b>Hawaii</b>            | Chaminade University of Honolulu        | 377              | 1                                                       | 76         | 36       | 0           |
| <b>Hawaii</b>            | Leeward Community College               | 337              | 40                                                      | †          | †        | †           |
| <b>Hawaii</b>            | Hawaii Pacific University               | 332              | 1                                                       | 12         | 11       | 0           |
| <b>California</b>        | California State University, Sacramento | 309              | 0                                                       | 52         | 2        | 0           |
| <b>California</b>        | American River College                  | 272              | 29                                                      | †          | †        | †           |
| <b>Hawaii</b>            | Honolulu Community College              | 249              | 20                                                      | †          | †        | †           |
| <b>Hawaii</b>            | Kapiolani Community College             | 248              | 19                                                      | †          | †        | †           |
| <b>Alaska</b>            | University of Alaska Anchorage          | 247              | 17                                                      | 27         | 1        | 0           |
| <b>Hawaii</b>            | University of Hawaii at Hilo            | 229              | 0                                                       | 50         | 3        | 0           |
| <b>California</b>        | Sacramento City College                 | 227              | 17                                                      | †          | †        | †           |
| <b>Nevada</b>            | University of Nevada, Las Vegas         | 227              | 0                                                       | 28         | 1        | 1           |
| <b>Hawaii</b>            | Windward Community College              | 219              | 16                                                      | †          | †        | †           |
| <b>California</b>        | Cosumnes River College                  | 198              | 29                                                      | †          | †        | †           |
| <b>California</b>        | College of San Mateo                    | 187              | 23                                                      | †          | †        | †           |
| <b>Hawaii</b>            | Hawaii Community College                | 169              | 25                                                      | †          | †        | †           |
| <b>California</b>        | Chabot College                          | 154              | 27                                                      | †          | †        | †           |
| <b>Hawaii</b>            | University of Hawaii Maui College       | 153              | 15                                                      | 0          | 0        | 0           |
| <b>California</b>        | San Francisco State University          | 152              | 0                                                       | 31         | 2        | 1           |
| <b>California</b>        | San Jose State University               | 150              | 0                                                       | 41         | 7        | 0           |
| <b>Washington</b>        | Pierce College District                 | 144              | 19                                                      | 0          | 0        | 0           |
| <b>Washington</b>        | University of Washington, Seattle       | 140              | 0                                                       | 34         | 11       | 2           |
| <b>California</b>        | California State University, East Bay   | 138              | 0                                                       | 42         | 9        | 0           |
| <b>Guam</b>              | Pacific Islands University              | 132              | 6                                                       | 3          | 0        | 0           |
| <b>California</b>        | Foothill College                        | 131              | 6                                                       | 0          | 0        | 0           |
| <b>Virginia</b>          | Northern Virginia Community College     | 131              | 19                                                      | †          | †        | †           |
| <b>Hawaii</b>            | University of Hawaii, West Oahu         | 127              | 0                                                       | 33         | 0        | 0           |
| <b>California</b>        | Skyline College                         | 117              | 3                                                       | 0          | 0        | 0           |
| <b>California</b>        | San Diego State University              | 115              | 0                                                       | 27         | 12       | 0           |
| <b>California</b>        | San Joaquin Delta College               | 114              | 21                                                      | †          | †        | †           |
| <b>Oregon</b>            | Portland State University               | 109              | 0                                                       | 24         | 7        | 0           |
| <b>California</b>        | University of California, Davis         | 102              | 0                                                       | 31         | 2        | 0           |
| <b>California</b>        | City College of San Francisco           | 92               | 5                                                       | †          | †        | †           |
| <b>Washington</b>        | Saint Martin's University               | 90               | 0                                                       | 7          | 0        | 0           |
| <b>California</b>        | Canada College                          | 86               | 8                                                       | †          | †        | †           |
| <b>Illinois</b>          | William Rainey Harper College           | 86               | 0                                                       | †          | †        | †           |
| <b>California</b>        | California State University, Long Beach | 85               | 0                                                       | 26         | 6        | 0           |
| <b>California</b>        | Diablo Valley College                   | 84               | 4                                                       | †          | †        | †           |
| <b>California</b>        | San Diego Mesa College                  | 83               | 1                                                       | 0          | 0        | 0           |
| <b>California</b>        | El Camino Community College District    | 79               | 8                                                       | †          | †        | †           |

Table 3 provides an overview of the educational institutions most attended by Pacific Islanders that offer programs related to natural resource management, agriculture, and environmental sciences, highlighting their degrees, certificates, and recent enrollment data. Institutions across the Pacific offer a range of programs, from undergraduate certificates to master’s degrees. Programs highlighted in this table focus on fields such as agroforestry, agriculture, environmental science, and natural resource management, which are vital for the sustainable development and conservation needs of the region.

Several land grant institutions, such as the *College of Micronesia*, *University of Guam*, and *American Samoa Community College*, provide support for agricultural and natural resource programs. These institutions play an essential role in fostering local expertise and building capacity within their communities.

Some institutions, like the *College of the Marshall Islands*, have recently launched new programs, such as an Associate of Science in Agroforestry Education and Sustainable Livelihoods. This program, which started in 2023, has enrolled five students, with the first graduate expected by May 2025. This growth reflects responsiveness to regional needs in natural resource management education.

In 2022-2023, the University of Guam reported 52 associate-level degrees and 13 bachelor’s degrees in natural resource-related fields.

Graduate-level degrees in environmental science are limited, with *University of Guam* and *University of Hawai‘i at Mānoa* being among the few with students receiving advanced degrees. For example, the University of Guam provides a Master of Science in Environmental Science, which supports professional training and research capabilities within the Pacific region.

The availability of natural resource and environmental programs in these institutions underlines a commitment to developing local capacity to address environmental challenges. These programs support career paths in forestry, conservation, and resource management, helping to prepare a skilled workforce capable of supporting the environmental and agricultural sectors across the Pacific. However, the numbers of annual degrees in the field are still very low compared to other fields of study.

Since the 2012-2013 academic year, Northern Marianas College has awarded only 80 Associate degrees in Natural Resources Management (Table 2). The highest number of degrees conferred in a single year was 16 in 2017-2018, while the program has averaged around 8 graduates per year. This indicates modest enrollment and graduation rates, highlighting both the program’s consistent but limited reach and a potential area for growth in addressing workforce needs in natural resource management.

**Table 2. Northern Mariana college NRM degree trends over time.**

| NMC Degrees and Certificates Awarded | Year  |       |       |       |       |       |       |       |       |       | Total |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                      | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 |       |
| AS in Natural Resources Management   | 2     | 6     | 7     | 9     | 11    | 16    | 7     | 6     | 9     | 7     | 80    |

Based on recent data on degrees conferred by Pacific Islanders, the top fields of study are business and health professions, making up 40% of total degrees (Table 4). There is a low number of degrees awarded in specialized fields, indicating either a lack of interest, barriers to access, or a limited number of programs available. This may points to the need for enhanced support and resources in specific academic disciplines.

**Table 3. Top 10 schools with highest enrollment of Pacific Islanders, the NRM degrees offered, and the number of degrees awarded in 2022-2023 (National Center for Education Statistics).**

| Institute                         | Land Grant | Dept.                                                            | Degree                                                                                                                                          | Undergrad Certificate | Associate 2022-2023 | Bachelor 2022-2023 | Master 2022-2023 |
|-----------------------------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|--------------------|------------------|
| College of Marshall Islands       |            | Workforce, Adult and Vocational Educational Services             | A.S. Agroforestry Education and Sustainable Livelihoods (new program, 5 Marshallese students enrolled, first student will graduate in May 2025) |                       | New program in 2023 |                    |                  |
| Palau Community College (Koror)   |            | Associate of Applied Science Degree                              | Agricultural Science                                                                                                                            |                       | 4                   |                    |                  |
| College of Micronesia             | Yes        | Associate of Science                                             | Agriculture and Natural Resource Management                                                                                                     | 30                    | 9                   |                    |                  |
| Northern Mariana College (Saipan) | Yes        | Natural Resources Management                                     | A.S. in Natural Resource Management                                                                                                             |                       | 13                  |                    |                  |
|                                   |            |                                                                  | A.S. in Agriculture                                                                                                                             |                       |                     |                    |                  |
| American Samoa Community College  | Yes        | Agriculture, community, and natural resources                    | A.S. in Agribusiness                                                                                                                            |                       | 0                   |                    |                  |
|                                   |            |                                                                  | A.S. in General Agriculture                                                                                                                     |                       | 3                   |                    |                  |
|                                   |            |                                                                  | A.S. in Natural Resources                                                                                                                       |                       | 6                   |                    |                  |
|                                   |            |                                                                  | A.S. in Family and Consumer Science                                                                                                             |                       | 0                   |                    |                  |
| University of Guam                | Yes        | Agriculture & Life Sciences Tracks                               | Agriculture & Natural Resource Science                                                                                                          |                       |                     | 10                 | 2                |
|                                   |            |                                                                  | Tropical Agriculture Production                                                                                                                 |                       |                     |                    |                  |
|                                   |            |                                                                  | Minor in Tropical Horticulture Course                                                                                                           |                       |                     |                    |                  |
|                                   |            |                                                                  | Minor in Crop & Environmental Protection Science                                                                                                |                       |                     |                    |                  |
|                                   |            |                                                                  | Minor in Farm & Natural Resources Management Requirements                                                                                       |                       |                     |                    |                  |
|                                   |            |                                                                  | Master of Science in Environmental Science                                                                                                      |                       |                     |                    |                  |
| Guam Community College            |            | Certificate                                                      | Certificate in Environmental Technician                                                                                                         |                       |                     |                    |                  |
| University of Hawaii, Manoa       |            | The School of Life Sciences, College of Natural Sciences, Botany | Natural Resources & Environmental Management                                                                                                    |                       |                     | 52                 | 13               |
|                                   |            |                                                                  | Tropical Agriculture and the Environment                                                                                                        |                       |                     | 12                 |                  |
|                                   |            |                                                                  | Tropical Conservation Biology & Environmental Science                                                                                           |                       |                     |                    |                  |
|                                   |            |                                                                  | Tropical Forest Ecosystems & Agroforestry Management                                                                                            |                       |                     |                    |                  |
|                                   |            |                                                                  | B.A. in Botany                                                                                                                                  |                       |                     | 14                 | 4                |
| Chaminade University of Honolulu  |            | School of Natural Sciences and                                   | B.S. Environmental Science                                                                                                                      |                       |                     |                    |                  |
|                                   |            |                                                                  | B.S. Environmental Studies                                                                                                                      |                       |                     | 18                 |                  |
| Leeward Community College         |            | Science, Tech, Engineering and Math                              | Agroecology and Sustainable Agriculture                                                                                                         | 3                     | 4                   |                    |                  |
|                                   |            |                                                                  | Plant Sciences                                                                                                                                  | 1                     | 2                   |                    |                  |
| Hawaii Pacific University         |            | College of Natural and Computational Sciences                    | Environmental Science                                                                                                                           |                       |                     | 6                  |                  |
|                                   |            |                                                                  | Environmental Studies                                                                                                                           |                       |                     | 10                 |                  |
|                                   |            |                                                                  | Natural Resources Management and Policy, General                                                                                                |                       |                     | 0                  |                  |
|                                   |            |                                                                  | Water, Wetlands, and Marine Resources Management                                                                                                |                       |                     | 1                  |                  |

**Table 4. Bachelor's degrees conferred by postsecondary institutions for Pacific Islanders for Top 10 fields of study.**

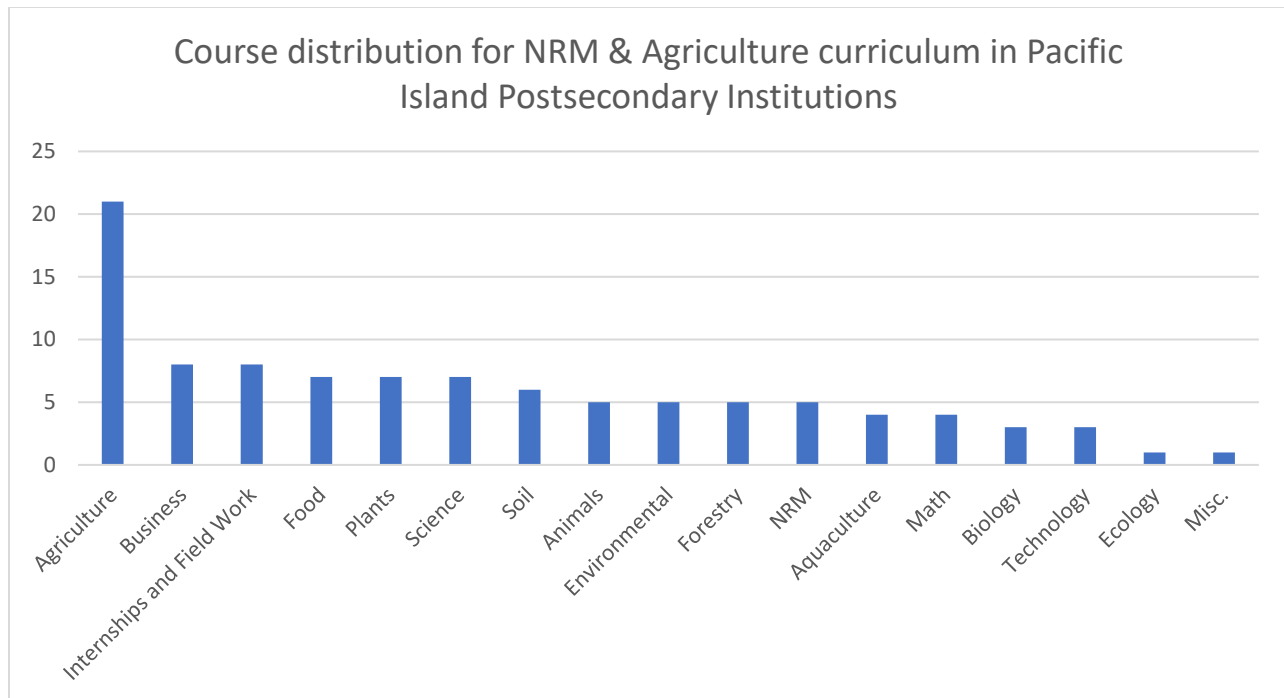
|    |                                                                              | 2021-2022        |                        |
|----|------------------------------------------------------------------------------|------------------|------------------------|
|    | Bachelor's degrees conferred by postsecondary institutions by field of study | Pacific Islander | Distribution of Fields |
| 1  | Business                                                                     | 958              | 22%                    |
| 2  | Health professions and related programs                                      | 784              | 18%                    |
| 3  | Social sciences and history                                                  | 336              | 8%                     |
| 4  | Social sciences                                                              | 308              | 7%                     |
| 5  | Psychology                                                                   | 275              | 6%                     |
| 6  | Biological and biomedical sciences                                           | 221              | 5%                     |
| 7  | Computer and information sciences and support services                       | 214              | 5%                     |
| 8  | Homeland security, law enforcement, and firefighting                         | 182              | 4%                     |
| 9  | Communication, journalism, and related programs                              | 175              | 4%                     |
| 10 | Engineering                                                                  | 133              | 3%                     |
|    | All Other Degrees                                                            | 737              | 17%                    |
|    | Total in 2021- 2023                                                          | 4,323            | 100%                   |

In the 2020–2021 academic year, postsecondary institutions awarded bachelor's degrees to 4,419 Pacific Islanders, but only 54 of these degrees (approximately 1.2%) were in agriculture and natural resources (Table 5). In 2021–2022, the total number of degrees awarded to Pacific Islanders was slightly lower at 4,323, with only 63 degrees (1.5%) in natural resources. This represents a very small proportion of degree attainment in this field among Pacific Islander students, underscoring the limited distribution of graduates in agriculture and natural resources relative to other areas of study. Increased outreach or targeted support may be required to increase representation in the natural resources field.

**Table 5. Bachelor's degrees conferred by postsecondary institutions for Pacific Islanders in agriculture and natural resources (National Center for Education Statistics).**

|                                                                                                                                                          | 2020-2021        | 2021-2022        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|
|                                                                                                                                                          | Pacific Islander | Pacific Islander |
| <b>Total Pacific Islanders</b>                                                                                                                           | <b>4,419</b>     | <b>4,323</b>     |
| Agriculture and natural resources- Includes Agricultural, animal, plant, veterinary science, and related fields; and Natural resources and conservation. | 54               | 63               |
| <b>Percent NR out of all Fields of Study</b>                                                                                                             | <b>1.2%</b>      | <b>1.5%</b>      |

### 2.3. Courses Offered in Pacific Island Institutions



**Figure 1. Courses compiled by theme for NRM & agriculture/ agroforestry degrees from Pacific Island Institutions.**

The course distribution for Natural Resource Management (NRM) and Agriculture programs in Pacific Island postsecondary institutions highlights a strong emphasis on agriculture, which accounts for the highest number of courses. This focus reflects the importance of farming practices to the region's communities and economies. Additionally, practical learning opportunities such as internships and fieldwork, along with business courses, are well-represented, underscoring the value of experiential education and entrepreneurial skills in these fields. Moderate to low representation is seen in themes like food, plants, soil, environmental sciences, and forestry, suggesting a minimal coverage of important areas within natural resources and agricultural studies.

Fewer courses are dedicated to technology and ecology, indicating potential gaps that could be addressed to meet emerging workforce needs. Foundational topics, such as general science and math, provide interdisciplinary support, preparing students for specialized studies. Overall, the curriculum aligns well with local needs but also highlights opportunities for enhancement in less-represented areas.

**Table 6. Courses by theme for NRM & agriculture/ agroforestry degrees in Pacific Island Institutions.**

| <b>Theme</b> | <b>Course Description</b>                            | <b>Institute</b>                  |
|--------------|------------------------------------------------------|-----------------------------------|
| Agriculture  | Introduction to Horticulture                         | American Samoa Community College  |
| Agriculture  | Agro- Industry Products                              | College of Marshall Islands       |
| Agriculture  | Introduction to Agriculture                          | College of Micronesia             |
| Agriculture  | Crop Production                                      | College of Micronesia             |
| Agriculture  | Agricultural Project Management                      | College of Micronesia             |
| Agriculture  | Agricultural Science                                 | Northern Mariana College (Saipan) |
| Agriculture  | Crop Production                                      | Northern Mariana College (Saipan) |
| Agriculture  | Farm Management                                      | Northern Mariana College (Saipan) |
| Agriculture  | Micropropagation and Nursery Practices               | Northern Mariana College (Saipan) |
| Agriculture  | Introduction to Tropical Agriculture                 | Palau Community College (Koror)   |
| Agriculture  | Horticultural Crop Production                        | Palau Community College (Koror)   |
| Agriculture  | Tropical Landscape Horticulture                      | Palau Community College (Koror)   |
| Agriculture  | Crop Protection                                      | Palau Community College (Koror)   |
| Agriculture  | Farm Management                                      | Palau Community College (Koror)   |
| Agriculture  | Horticultural Science                                | University of Guam                |
| Agriculture  | Pest Management                                      | University of Guam                |
| Agriculture  | Entomology                                           | University of Guam                |
| Agriculture  | Tropical Vegetable Production                        | University of Guam                |
| Agriculture  | Tropical Fruits Horticulture                         | University of Guam                |
| Agriculture  | Ornamental Crop Production In The Tropics            | University of Guam                |
| Agriculture  | Ornamental Crop Production in the Pacific Laboratory | University of Guam                |
| Animals      | Animal Science                                       | American Samoa Community College  |
| Animals      | Principles of Animal Science                         | College of Micronesia             |
| Animals      | General Animal Husbandry                             | Palau Community College (Koror)   |
| Animals      | Poultry and Swine Production                         | Palau Community College (Koror)   |
| Animals      | Animal Science                                       | University of Guam                |
| Aquaculture  | Introduction to Aquaculture                          | American Samoa Community College  |
| Aquaculture  | Aquaponics                                           | College of Marshall Islands       |
| Aquaculture  | Aquaculture                                          | College of Micronesia             |
| Aquaculture  | Aquaculture                                          | University of Guam                |
| Biology      | Environmental Biology                                | Guam Community College            |
| Biology      | Introduction to Microbiology                         | Guam Community College            |
| Biology      | Biology (1, 2)                                       | University of Guam                |
| Business     | Agriculture Economics                                | American Samoa Community College  |
| Business     | Family Finance                                       | American Samoa Community College  |
| Business     | Introduction to Business                             | College of Marshall Islands       |
| Business     | Agricultural Entrepreneurship                        | College of Marshall Islands       |

|                            |                                                           |                                   |
|----------------------------|-----------------------------------------------------------|-----------------------------------|
| Business                   | Intro to Business                                         | College of Micronesia             |
| Business                   | Microeconomics                                            | College of Micronesia             |
| Business                   | Macroeconomics                                            | Northern Mariana College (Saipan) |
| Business                   | Agricultural Business Management                          | University of Guam                |
| Ecology                    | Species and Ecosystem Management                          | Northern Mariana College (Saipan) |
| Environmental              | Environmental Studies                                     | American Samoa Community College  |
| Environmental              | Climate, Food Security, and Health                        | College of Marshall Islands       |
| Environmental              | Environmental Conservation                                | Northern Mariana College (Saipan) |
| Environmental              | Conservation Politics and Economics                       | Northern Mariana College (Saipan) |
| Environmental              | Environmental Conservation                                | Northern Mariana College (Saipan) |
| Food                       | Parenting: Models for Guiding & Nurturing Children        | American Samoa Community College  |
| Food                       | Nutrition                                                 | American Samoa Community College  |
| Food                       | Food Sovereignty: Traditional Crops for Healthy Lifestyle | College of Marshall Islands       |
| Food                       | Food Preservation and Safety                              | College of Marshall Islands       |
| Food                       | Food Processing                                           | College of Micronesia             |
| Food                       | Selected Topics in Land Resources and Food Systems        | College of Micronesia             |
| Food                       | Food Science                                              | Northern Mariana College (Saipan) |
| Forestry                   | Forests & Agroforestry                                    | American Samoa Community College  |
| Forestry                   | Agroforestry & Terrestrial Ecosystems                     | College of Marshall Islands       |
| Forestry                   | Nutrient Dynamics on Agroforestry                         | College of Marshall Islands       |
| Forestry                   | Silvicultural Systems in Agroforestry Management          | College of Marshall Islands       |
| Forestry                   | Social Forestry                                           | College of Marshall Islands       |
| Internships and Field Work | Practical Job Experience                                  | American Samoa Community College  |
| Internships and Field Work | Environmental Service Learning Exchange                   | American Samoa Community College  |
| Internships and Field Work | Agroforestry Internship                                   | College of Marshall Islands       |
| Internships and Field Work | Directed Field Experience                                 | College of Micronesia             |
| Internships and Field Work | NRM Seminar                                               | Northern Mariana College (Saipan) |
| Internships and Field Work | NRM Internship                                            | Northern Mariana College (Saipan) |
| Internships and Field Work | Agriculture Internship                                    | Northern Mariana College (Saipan) |
| Internships and Field Work | Internship                                                | Palau Community College (Koror)   |
| Marine                     | Intro to Marine Biology                                   | Guam Community College            |
| Math                       | Statistics                                                | College of Micronesia             |
| Math                       | Math                                                      | Guam Community College            |
| Math                       | Calculus                                                  | University of Guam                |

|            |                                                            |                                   |
|------------|------------------------------------------------------------|-----------------------------------|
| Math       | Physics                                                    | University of Guam                |
| Misc.      | Waste Site Worker Safety<br>HAZWOPER                       | Guam Community College            |
| NRM        | Survey of Community & Natural<br>Resources                 | American Samoa Community College  |
| NRM        | Polynesian Culture & Natural<br>Resources Learning Project | American Samoa Community College  |
| NRM        | Natural Resources                                          | American Samoa Community College  |
| NRM        | Introduction to NRM                                        | Northern Mariana College (Saipan) |
| NRM        | Special Topics in NRM                                      | Northern Mariana College (Saipan) |
| Plants     | Textiles & Plant-Based Cultural Arts                       | College of Marshall Islands       |
| Plants     | General Botany with lab                                    | College of Micronesia             |
| Plants     | Ethnobotany                                                | College of Micronesia             |
| Plants     | Plant Science                                              | Northern Mariana College (Saipan) |
| Plants     | Plant Science                                              | Palau Community College (Koror)   |
| Plants     | Plant Science                                              | University of Guam                |
| Plants     | Plant Pathology                                            | University of Guam                |
| Science    | Introduction to Chemistry                                  | College of Micronesia             |
| Science    | Chemistry                                                  | Guam Community College            |
| Science    | Scientific Methods and Data Analysis                       | Guam Community College            |
| Science    | Gen Chem                                                   | Northern Mariana College (Saipan) |
| Science    | Genetics                                                   | University of Guam                |
| Science    | Chemistry                                                  | University of Guam                |
| Science    | Inorganic Chemistry                                        | University of Guam                |
| Soil       | Geology                                                    | Guam Community College            |
| Soil       | Soil Science                                               | Northern Mariana College (Saipan) |
| Soil       | Soil Technology                                            | Palau Community College (Koror)   |
| Soil       | Soil Science                                               | University of Guam                |
| Soil       | Principles of Soil Science                                 | University of Guam                |
| Soil       | Environmental Soil Science                                 | University of Guam                |
| Technology | Multimedia Design                                          | College of Micronesia             |
| Technology | Geographic Information Systems                             | College of Micronesia             |
| Technology | Intro to GIS                                               | Guam Community College            |

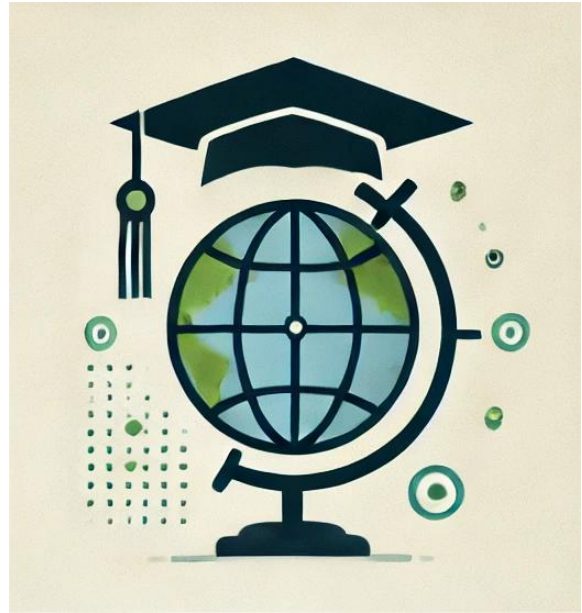
Across all the institutions, only one plant pathology course and one pest management course were identified (both found at UoG), which are a significant component of natural resource management in the Pacific Islands. Additionally, GIS courses are lacking with only two available, one at College of Micronesia and one at Guam Community College.

## 2.4. University of Guam Research Centers

The University of Guam (UOG) hosts several research centers that contribute to applied scientific research in the region. These research centers and affiliated institutions play a key role in building capacity across the Pacific Islands, particularly in the fields of environmental science, natural resource management, and sustainable development. These centers foster both regional and international collaboration, empowering local scientists, resource managers, and students to address pressing issues like climate change, conservation, and agriculture.

### **Western Pacific Tropical Research Center (WPTRC):**

As the research arm of UOG's College of Natural and Applied Sciences, WPTRC focuses on tropical agriculture, aquaculture, invasive species management, native plant protection, plant pathology, soil health, and forestry. WPTRC also runs research stations, such as the Ija and Inarajan Research & Education Centers, the Yigo Research Center, and the Triton Farm, which support local agriculture and ecological research. The center receives funding from federal agencies like the USDA, NSF, and local government agencies.



**Water and Environmental Research Institute of the Western Pacific (WERI):** This institute focuses on freshwater resource management, addressing challenges like water security and watershed management in Guam and other Pacific Island territories. WERI conducts research on sustainable water use, supports a Master of Science in Environmental Science program, and provides outreach through initiatives like the Northern Guam Lens Aquifer tours and participation in forest and water management summits.

**Center for Island Sustainability (CIS):** serves as a hub for fostering sustainable development and environmental stewardship in the Micronesian region. Founded in 2009, CIS emphasizes research, education, and outreach to address critical environmental challenges facing island communities. Its initiatives integrate traditional ecological knowledge with contemporary scientific approaches to create innovative solutions for issues such as climate change, renewable energy, sustainable food systems, and community resilience.

**UOG Sea Grant:** The program, recently recognized as an institutional program under NOAA's National Sea Grant College Program, plays a key role in addressing Guam's marine and coastal challenges. This recognition reflects UOG Sea Grant's excellence in research, education, and outreach efforts focused on sustainable development and conservation of Guam's marine resources. Its work supports initiatives in watershed management, sustainable fisheries, aquaculture, climate resilience, and environmental education. Since its inception in 2012, UOG Sea Grant has grown significantly, providing funding for research, graduate fellowships, and community-based education initiatives. It fosters partnerships across Micronesia and the Pacific to strengthen natural resource management, food security, and workforce development in the region. This program also emphasizes collaborative relationships with local organizations, which bolster its capacity to execute programs relevant to Guam's needs and broader

regional priorities

**NASA Guam EPSCoR:** The NASA Guam EPSCoR (Established Program to Stimulate Competitive Research) program is focused on increasing Guam's research capacity and competitiveness, specifically in areas related to NASA missions and the region's needs. Its mission includes enhancing Guam's research infrastructure and fostering collaboration between local researchers and NASA. The program supports educational efforts, particularly in geographic information systems (GIS) and remote sensing, and provides seed grants to UOG faculty for capacity-building projects. Additionally, it aims to promote workforce development in scientific areas, helping to establish a stronger, more sustainable research environment in Guam and the broader Marianas region. Through its partnerships, the program also facilitates networking opportunities between researchers and experts from NASA.

**Cooperative Extension & Outreach:** The University of Guam's Cooperative Extension and Outreach (CEO) program plays a key role in building capacity for agroforestry and natural resource management in the region. Through its Agriculture & Natural Resources division, the program provides practical support for farmers, ranchers, and natural resource managers, focusing on sustainable practices such as soil conservation, pest management, and improved irrigation techniques. For example, the Extension office offers resources on effective plant care, such as sheet mulching for weed suppression and soil health, and guides on nutrient management and pest control tailored to the unique needs of the island's tropical environment.

Additionally, the program hosts workshops and educational series, helping to address the knowledge gap in modern agricultural practices, and supports the development of farming networks through technical assistance. It also emphasizes research and field trials to understand the best crops for the local soil and climate, making it an essential resource for fostering sustainable agroforestry practices. These efforts are directly aligned with the needs of natural resource management, empowering local communities to manage resources in a sustainable, economically viable way, while addressing environmental challenges like invasive species and climate variability.

**University of Guam Herbarium:** The University of Guam (UOG) Herbarium is an essential resource for understanding the plant life of the region, supporting both academic research and conservation efforts. It houses a collection of plant specimens, which are vital for the study of Guam's unique flora and the broader Pacific Island ecosystems. The Herbarium supports research by offering a space for researchers and students to study plant species, their distributions, and ecological roles, contributing to natural resource management and biodiversity conservation. The Herbarium is a key component of UOG's research infrastructure, helping facilitate studies on invasive species, climate change impacts on local ecosystems, and sustainable land management practices.

Together, these centers are integral to the development of a skilled local workforce capable of tackling environmental and sustainability challenges in the Pacific Islands. Through their collaborative efforts, they ensure that the region's future leaders are well-equipped to implement research-based solutions to the complex issues affecting the islands.

### **3. Infrastructure Assessment and Current Capacities**

#### **3.1. Micronesia Challenge**

The Micronesia Challenge, launched in 2006, set an ambitious goal to conserve at least 30% of nearshore marine resources and 20% of terrestrial resources across 2.5 million square miles, encompassing the Federated States of Micronesia (FSM), Palau, the Republic of the Marshall Islands (RMI), Guam, and the Commonwealth of the Northern Mariana Islands (CNMI). After successfully achieving this initial target, the challenge raised its conservation goals to 50% for marine resources and 30% for terrestrial resources. The updated objectives also incorporate strategies to address climate change, control invasive species, enhance sustainable livelihoods, and implement effective fisheries management approaches.

##### **3.1.1. Micronesia Challenge Young Champions Internship (MCYC)**

The Micronesia Challenge Young Champions (MCYC) Internship aims to cultivate the next generation of conservation leaders in Micronesia and to raise awareness of the goals of the Micronesia Challenge (MC) and Protected Areas Networks (PAN) across the region. This eight-month program provides college students and recent graduates from Micronesian islands with mentorship from respected grassroots conservation leaders. From 2009 to 2019, 43 internships have been awarded, with an annual cohort of five interns, each representing a jurisdiction within the Micronesia Challenge: the Republic of Palau, the Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, and Guam.

According to the Micronesia Conservation Trust's 2019 annual report, one of MCYC's key partnerships is with the Pacific Islands Marine Protected Areas Community (PIMPAC). MCYC interns have contributed to various impactful projects, including: (1) assisting the Pohnpei and Kosrae State Supreme Courts in developing a roadmap for establishing an environmental court; (2) supporting Palau's Ministry of Justice and PAN Office in enhancing enforcement and prosecution processes; and (3) working with Guam's Office of the Attorney General to revise environmental legislation.

##### **Program Statistics (as of 2019-2020):**

- **Total Participants:** 43
- **Skills Developed:** Professional-level experience in natural resources, conservation, and marine management.

##### **3.1.2. Micronesia Conservation Trust Fellowship**

The Micronesia Conservation Trust (MCT) Professional Fellowship supports the return of Pacific Island postgraduate students as leaders within natural resource management organizations and agencies. By addressing gaps in existing capacity-building programs, this fellowship strengthens conservation and natural resource management efforts across the region. Established in August 2020 with funding from the Department of the Interior's Technical Assistance Program, the fellowship also enables professional fellows to mentor emerging leaders in the Micronesia Challenge Young Champions (MCYC) program, enhancing their development throughout the course of the program.

##### **3.1.3. Bill Raynor Micronesia Challenge (BRMC) Scholarship Program**

Established in 2016 in honor of Bill Raynor, a dedicated advocate for conservation in Micronesia, this scholarship supports the development of effective conservation practices and sustainable livelihoods

throughout the region. The scholarship provides funding for Micronesian students pursuing a master's or doctorate degree in resource management or conservation fields at universities within the Pacific Region, including institutions in Guam, Hawai'i, Fiji, New Zealand, Australia, Japan, and the U.S. mainland. Two scholarships are awarded per round. As of 2020, thirteen students had received funding, with six additional students working toward master's degrees in environmental fields and two pursuing doctoral studies in biology.

The scholarship is funded through a sub-account within the Micronesia Challenge Endowment. Eligibility criteria require applicants to be employed by a natural resource agency, NGO, or to demonstrate high potential for employment in conservation.

#### **Program Statistics:**

**Number of Participants to Date:** 19 students

**Skills Developed:** Leadership and technical skills; majors that prepare recipients for work in conservation, climate adaptation, and sustainable development in Micronesia

**Degree Levels Supported:** Master's or doctorate in natural resources fields

#### **3.1.4. Japan Association for the Promotion of International Cooperation-Sophia University (APIC-Sophia) Scholarship Program**

This collaborative scholarship, offered by the Micronesia Conservation Trust (MCT) Fellowship in partnership with Sophia University and the Association for the Promotion of International Cooperation (APIC) in Tokyo, Japan, supports the Micronesia Challenge 2030 (MC 2030) initiative. The program is designed for Micronesian students pursuing a graduate degree in Global Environmental Studies. Through BMRC funding, the scholarship also provides support for internships, enhancing practical experience. Up to two Micronesian students are selected each year, and since 2017, over 10 students have earned master's degrees through this program, subsequently returning to contribute to conservation efforts in their communities.

#### **Program Statistics:**

**Number of Participants to Date:** Approximately 12 students (2 per year since 2017)

**Training Provided:** Master's degree in Global Environmental Studies



### **3.2. Internships, fellowships, and training programs**

#### **3.2.1. Pacific Internship Programs for Exploring Science (PIPES)**

PIPES, a youth program at the University of Hawai'i Hilo, seeks to cultivate future generations of aloha 'āina leaders in Hawai'i and the Pacific through transformative place-based internships, mentorship, innovative programming, and strategic partnerships. The program is grounded in a framework of four core values—*na'au*, *'āina*, *kaiāulu*,

and *ka'ao*—which emphasize connection to self, place, community, and centuries of observational knowledge.

Originally developed to connect students from Hawai'i and the U.S.-affiliated Pacific Islands with hands-

on conservation internships, PIPES has steadily grown over nearly three decades. The program provides approximately 30 to 40 internship placements each summer, with a primary focus on engaging Native Hawaiian and local students in natural resource management and conservation.

Since 1994, PIPES has expanded its reach, aiming to increase local representation in environmental fields. Through various partnerships and dedicated mentoring, the program has collectively served hundreds of students, contributing to a growing network of alumni committed to conservation efforts throughout the Pacific region. This has not only transformed participants' career trajectories but also strengthened local conservation practices and indigenous representation in environmental fields.

Additional programs in the PIPES network include the Kekaulike Internship Program, 'Aina Pathway Program (Ecological Pathway Program), Hoapili Grant-Specific Internships, Kapa'akea Grant-Specific Internships

**Skills:** Ecological knowledge and stewardship, technical skills, research and presentation, cultural and linguistic proficiency, professional development and networking, interdisciplinary problem-solving skills. These skills collectively prepare PIPES interns for impactful roles in ecological conservation, natural resource management, and community engagement, aligning with the program's mission to foster future aloha 'āina leaders across Hawai'i and the Pacific.

**Training and Experience:** Through experiential learning, interns acquire professional skills in *aloha 'āina* (love and care for the land) work, including multidisciplinary approaches to addressing workforce challenges, such as the shortage of teachers in Hawai'i. The program also includes liaison training to strengthen partnerships between the University of Hawai'i and its partner institutions.

**Certifications and Achievements:** Some interns achieve milestones, including publishing their research and receiving support from PIPES to present their work at public conferences, enhancing both their academic and professional profiles.

### 3.2.2. Kupu Pathways- Environmental Education Department

Established in 2007, Kupu is a nonprofit organization dedicated to environmental conservation and community empowerment through cultural and ecological stewardship across Hawai'i and the Pacific. The organization draws inspiration from the resilient kupukupu fern, symbolizing renewal and growth, and works to address the evolving challenges faced by natural resource professionals in Hawai'i. Recognizing the need for future-ready workforce development, Kupu has initiated pivotal programs such as the Conservation Leadership Development Program (CLDP) and the Natural Resource Sector Partnership (NRSP).

**Kupu Pathways Program Impact:** The Kupu Pathways program, which includes both the CLDP and NRSP, has contributed to building Hawai'i and the Pacific Islands natural resource sector. It offers paid entry-level positions, providing participants with hands-on training, field skills, and certifications for careers in conservation and resource management. Through these opportunities, young professionals gain expertise in areas such as invasive species removal, ecosystem restoration, and cultural land management practices. The partnerships and career pipelines that Kupu establishes also address the projected workforce needs for Hawai'i, fostering the next generation of leaders in conservation.

Kupu Pathways is designed to build a workforce that is both knowledgeable in scientific methods and rooted in the cultural understanding essential for sustainable stewardship in Hawai'i. The program's collaborations with educational institutions and resource agencies, as well as its alignment with broader conservation and sustainability goals, have strengthened the sector's capacity to meet both present and future demands.

By investing in community members, particularly Native Hawaiian youth, and emphasizing traditional ecological knowledge, Kupu's programs contribute to Hawai'i's broader environmental, economic, and

cultural resilience. This initiative not only prepares young professionals for careers in conservation but also promotes cultural revitalization and environmental sustainability across the Pacific.

The **Natural Resource Sector Partnership (NRSP)**, organized under Kupu, was developed through collaboration between educators and industry professionals to foster positive changes in educational systems and to strengthen Hawai‘i’s natural resource fields. The partnership’s primary aim is to better prepare and inspire Hawai‘i’s students to meet the current and future needs of these sectors. Key goals of NRSP include: (1) Building Career Awareness, (2) Connecting Students to ‘Āina and Community, and (3) Investing in College and Career Preparation, Access, and Transitions. Through these focus areas, NRSP seeks to enhance workforce readiness in natural resource management while deepening students’ connections to local communities and environments.

The **Conservation Leadership Development Program (CLDP)** provides early career professionals, aged 17 and older, with entry-level, paid experience in conservation. Through CLDP, young professionals are matched with host sites that align with their specific conservation interests, which range widely, including fields such as ornithology, botany, natural resource management, aquatic resources, marine biology, Hawaiian cultural studies, and agricultural science.

Participants gain valuable field experience through either a seasonal (6-month) or yearlong (11-month) term with partners located across the Hawaiian Islands and U.S. Pacific Islands, including Hawai‘i Island, Kaua‘i, Maui, Moloka‘i, O‘ahu, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (Rota and Saipan).

CLDP participants develop skills in invasive species removal, native habitat restoration, outreach, education, and natural resource management. Upon completing the program, participants receive the Segal AmeriCorps Education Award, which can be applied to further educational expenses or loan repayment.

The **Hawai‘i Youth Conservation Corps (HYCC)** offers a seven-week summer program under Kupu that immerses Hawai‘i youth in hands-on natural resource projects. Participants gain exposure to conservation, sustainability, and natural resource management, fostering interest in related career paths. The program also emphasizes teamwork and resilience as participants work collaboratively on dynamic projects. HYCC operates across multiple islands, including Hawai‘i Island, Kaua‘i, Maui, Moloka‘i, and O‘ahu.

### **3.2.3. Professional Internships in Pacific Terrestrial Island Ecosystems Management Program (PIPTIEM)**

The Professional Internships in Pacific Terrestrial Island Ecosystems Management (PIPTIEM) program, funded by the USDA Forest Service, offers specialized technical training to young professionals in terrestrial natural resource management. With funding allocated for the 2021–2024 period, the program focuses on developing the expertise of emerging professionals from the Northern Mariana Islands (CNMI), Guam, the Federated States of Micronesia (FSM), Palau, and the Republic of the Marshall Islands (RMI).

PIPTIEM provides participants with hands-on training, education, and valuable cross-cultural learning experiences in collaboration with forestry management organizations and conservation agencies. The program's core objective is to empower young professionals and local organizations to design and implement effective conservation strategies. These strategies address regional environmental challenges by fostering sustainable solutions rooted in practical application, enhancing the capacity for local ecosystem management and conservation in the Pacific Islands.



### 3.2.4. Coral Reef Initiative Summer Internship

The DCRM Summer Internship, operated by the Commonwealth of the Northern Mariana Islands (CNMI), offers participants a 10-month hands-on experience working with natural resource management and conservation professionals. This program, part of the NOAA Coral Reef Conservation Program, enhances community understanding of coral reef ecosystems, coastal zone issues, environmental threats, and conservation initiatives.

**Impact and Reach:** Since its inception in 2002, the program has hosted over 100 interns, with an average of 15 participants per year. Approximately 25% of DCRM's current staff began their careers through this internship program.

**Skills and Career Development:** Participants gain practical experience in environmental conservation, developing skills that support future careers in the field. Through direct involvement in conservation efforts, interns build a solid foundation in natural resource management and public awareness.

### 3.2.5. The Islands of Opportunity Alliance (IOA) – Louis Stokes Alliances for Minority Participation Program (LSAMP)

In 1991, Congress established the National Science Foundation (NSF) Louis Stokes Alliances for Minority Participation (LSAMP) to support the success of historically underrepresented students in obtaining baccalaureate and graduate degrees in science, technology, engineering, and mathematics (STEM). The Island of Opportunity Alliance (IOA), an LSAMP program serving the U.S.-affiliated Pacific Region, aims to increase the number of underrepresented minority graduates in both two- and four-year STEM degrees, including programs focused on natural resources and conservation. The University of Hawai‘i at Hilo leads the IOA, an alliance that includes ten Pacific region institutions: American Samoa Community College, College of the Marshall Islands, College of Micronesia-FSM, Chaminade University of Honolulu, Guam Community College, Hawai‘i Pacific University, Northern Marianas College, Palau Community College, University of Guam, and University of Hawai‘i at Mānoa.

IOA-LSAMP provides Pacific region students with hands-on internship opportunities in natural resource and conservation fields through partnerships with the Pacific Internship Programs for Exploring Science (PIPES) and the Yale Conservation Scholars-Early Leadership Initiative. Acceptance into the Yale program is highly competitive, with placements focused on conservation projects across the northeastern United States.

### 3.2.6. G3 Conservation Corps

The Guam Green Growth (G3) Conservation Corps is a workforce development initiative focused on equipping participants with skills essential for Guam's emerging green economy. Established in partnership between the Guam Green Growth Initiative and the University of Guam, this five-month full-time training program immerses participants in a wide range of sustainability topics. Key skills specific to natural resources include invasive species management and reforestation practices. Since its launch in 2021, the G3 Conservation Corps has graduated approximately 12 participants annually, with the fourth cohort set to begin in May 2024.

**Number of Participants to Date:** Around 36 (approximately 12 per year since 2021)

**Skills Developed:** Sustainability practices, invasive species removal, reforestation, and green economy strategies

### 3.2.7. Micronesia Environmental Law Fellowship Program

The Micronesia Environmental Law Fellowship aims to strengthen environmental protection and law enforcement within the Freely Associated States (FAS) of Micronesia—specifically, the Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI), and the Republic of Palau. The fellowship places a specialized environmental law fellow within the Attorney General's office or other relevant agencies in each jurisdiction to address environmental issues and enhance legal capacity.

The fellowship program is structured to provide legal expertise and resources to support the FAS governments' environmental protection efforts. By embedding a legal fellow directly within the government structure, the program enables a hands-on approach to environmental law, where fellows work on drafting new regulations, prosecuting violations, and advising on policy improvements for effective natural resource management. The fellows engage across government branches to improve inter-agency collaboration on environmental law enforcement and policy execution.

**Participant Data:** Since its inception in 2020, the program has awarded approximately one fellowship per year, resulting in a total of four fellows as of 2024. Each fellow's term allows for in-depth engagement with local environmental issues, establishing legal frameworks, and setting precedents for future enforcement.

**Skills Developed:** Fellows gain expertise in environmental law through real-world practice, developing and enforcing regulations while working closely with local governments. Key skills include:

- Crafting and enforcing environmental policies and laws, including those related to protected areas, resource management, and pollution control
- Prosecution of violations, aiming to deter harmful practices and encourage sustainable behaviors within local communities
- Research and development of best management practices (BMPs) that are shared regionally to support environmental conservation across Micronesia
- Exposure to environmental courts or specialized regulatory frameworks, learning to recommend penalties that convert violators into conservation advocates

**Training and Credentials:** The fellowship provides comprehensive, on-the-job training in environmental law, allowing fellows to work directly with high-ranking officials such as the Attorney General, gaining exposure to environmental regulatory processes and enforcement strategies unique to the Pacific region. This fellowship provides no additional formal certification, but the extensive experience and skills developed contribute to the fellows' professional qualifications and advocacy capabilities.

By building capacity in environmental law and supporting the FAS governments' objectives, the Micronesia Environmental Law Fellowship is crucial in safeguarding Micronesia's unique ecosystems and promoting sustainable development across the region.

### **3.2.8. NSF Navigating Home fellowship program**

The NSF Navigating Home Fellowship, hosted by the University of Guam, is a yearlong program designed to support graduates from Guam and other U.S. territories who have backgrounds in marine, environmental, and geosciences. Its primary goal is to address the region's "brain drain" by encouraging participants to return to or remain on their home islands, thereby strengthening the local workforce. Fellows engage in interdisciplinary research projects that address island-specific challenges, such as coral reef restoration and watershed management, while collaborating closely with university faculty and community organizations. The program also emphasizes professional development through tailored mentorship, hands-on training, and public engagement opportunities. By fostering partnerships between academic institutions and local stakeholders, the fellowship aims to train and retain a culturally diverse workforce equipped to address ecological and geoscience challenges in the Pacific. Ultimately, it seeks to transform geoscience culture through innovative strategies that integrate traditional knowledge and community-driven approaches, creating a sustainable model for workforce development across island communities.

The NSF Navigating Home Fellowship aims to bring back, train, and retain graduates from Guam, Puerto Rico, and the U.S. Virgin Islands in marine and environmental sciences to strengthen the local workforce and foster geoscience innovation.

**Number of Participants:** Over its five-year program, it will support 68 fellows and 68 professionals through training and mentoring partnerships between universities and community organizations.

**Skills developed:** transdisciplinary research, public engagement, and science communication, with a focus on culturally relevant methods.

### **3.2.9. Enhancing Kosrae, Chuuk, and Yap's Ecosystems and Food Security through the Prevention, Eradication, Control, and Management of Invasive Alien Species**

The project, "Enhancing Kosrae, Chuuk, and Yap's Ecosystems and Food Security through the Prevention, Eradication, Control, and Management of Invasive Alien Species," is a targeted conservation initiative designed to address the invasive species threat in the Federated States of Micronesia. Invasive alien species (IAS) pose risks to native ecosystems, agricultural stability, and food security in these regions. This project focuses on building local capacity, coordinating regional strategies, and prioritizing actionable measures to curb the spread and impact of invasive species.

The main goal of this project is to strengthen invasive species management frameworks across Kosrae, Chuuk, and Yap by focusing on three key objectives:

1. **Targeted Eradication Efforts:** Eradicating at least one high-priority invasive species per state with the help of specialized eradication teams, utilizing both local knowledge and expert input. This effort includes setting up eradication protocols and necessary training for local agencies to ensure safe, effective operations.
2. **Community Education and Awareness:** Educating local communities on the impacts of IAS on their ecosystems and food security. This includes outreach programs that focus on identification, early reporting, and responsible land management to minimize IAS spread. The education

component also aims to promote community engagement in ongoing efforts and increase awareness about how IAS impact agriculture, biodiversity, and water resources.

3. **Development of a Master List and Invasive Species Scorecard:** Creating a comprehensive terrestrial master list of known invasive species in each state and developing a regional IAS scorecard. This master list will help stakeholders keep track of IAS, measure the extent of their spread, and prioritize management actions. The scorecard will serve as an assessment tool to periodically evaluate the impact of IAS on native ecosystems and track the success of eradication and control measures.

**Expected Outcomes:** By combining eradication, education, and tracking, this project intends to reduce IAS populations in Kosrae, Chuuk, and Yap and promote long-term ecological balance. Some anticipated outcomes include:

- Enhanced biodiversity protection through effective IAS management, contributing to healthier ecosystems and resilient food systems
- Improved agricultural productivity and food security by reducing IAS threats that directly affect crops and soil health
- Increased awareness and engagement among local communities, fostering a proactive approach to IAS prevention and control.

**Skills and Capacity Building:** The project focuses on enhancing the skills of local stakeholders by providing training in invasive species identification, control techniques, and eradication strategies. By equipping local professionals with practical skills and engaging communities, this initiative builds a network of informed individuals dedicated to invasive species control and environmental stewardship.

**Regional Significance and Sustainability:** This project is part of a broader initiative to build a sustainable and resilient natural resource framework across the Pacific Islands, aligning with larger conservation goals in the region. By establishing a baseline with the IAS master list and tracking progress with the scorecard, the project contributes valuable data to future IAS management programs, supporting sustainability across the Federated States of Micronesia.

In summary, this project leverages targeted IAS management, capacity-building, and community engagement to mitigate the environmental and food security challenges posed by invasive species, ultimately fostering sustainable ecosystems in Kosrae, Chuuk, and Yap.

### 3.2.10. Aloha + Challenge

To advance natural resource management in Hawai‘i, the Aloha + Challenge highlights the importance of creating a sustainable workforce but currently lacks retention-focused initiatives and long-term funding comparable to the Micronesia Challenge Capacity-Building Program. The *Green Workforce and Education* target seeks to build a local green job sector to fulfill Aloha + Challenge’s sustainability goals. By 2030, it aims to transform institutions and develop a workforce that champions community welfare, environmental stewardship, and economic resilience in both professional and volunteer positions. Although the unemployment rate serves as a progress indicator, it doesn’t fully capture the multifaceted landscape of Hawai‘i’s green industry, indicating potential benefits from establishing a dedicated trust fund for the Aloha + Challenge. Such a fund could support education, training, and skill-building to ensure the development and retention of professionals within natural resources.

As part of this initiative, the University of Hawai‘i at Mānoa offers an interdisciplinary curriculum that fosters a comprehensive understanding of the relationship between human and natural systems. This

program equips students with evidence-based analytical skills necessary to address sustainability challenges in Hawai‘i and beyond.

**Skills Developed:** Broad interdisciplinary knowledge connecting natural systems with social systems.

**Education Programs:** Programs include Bachelor of Science degrees in fields like Natural Resource and Conservation, equipping graduates with skills to contribute meaningfully to Hawai‘i’s green workforce.

### **3.2.11. Forest Service Arboriculture Training Program**

The Forest Service Arboriculture Training Program provides hands-on training in tree care and management for professionals interested in forestry and arboriculture careers. Focused on technical skills, these programs address a range of core competencies, including safe tree-climbing, pruning techniques, tree health diagnostics, and urban forest management. Participants gain experience in both fieldwork and classroom instruction, learning sustainable practices essential for urban and rural ecosystem maintenance. Training sessions are conducted nationwide, often in collaboration with state forestry agencies and educational institutions, creating a pipeline for skilled arborists to serve in public lands management and urban forestry roles.

**Skills Developed:** Tree risk assessment, safe tree climbing and rigging, pruning techniques, pest management, tree biology, and urban forestry planning.

**Certifications:** Participants often receive certifications through programs such as the Certified Arborist credential from the International Society of Arboriculture (ISA) or related state certifications, helping trainees meet industry standards for arboricultural expertise.

**Training Duration:** Programs are typically structured in multi-day workshops, with extended courses lasting several weeks for comprehensive skills-building.

The program supports the Forest Service's goal of sustaining healthy forests and enhances public safety in recreational and residential areas by building a workforce trained to manage tree-related hazards and promote ecosystem health.

## **3.3. Partnerships and organizations**

### **3.3.1. Micronesia Conservation Trust**

The Micronesia Conservation Trust (MCT) was incorporated in 2002 as a charitable and irrevocable corporation under the laws of the Federated States of Micronesia, later achieving 501(c)(3) status from the U.S. IRS in 2016. MCT serves as a vital funding mechanism and capacity-building organization for biodiversity conservation and sustainable development across five Micronesian jurisdictions: the Federated States of Micronesia, the Republic of Palau, the Republic of the Marshall Islands, the U.S. Territory of Guam, and the Commonwealth of the Northern Mariana Islands. Through partnerships with a broad network of governments and NGOs in both Micronesia and Hawai‘i, MCT supports initiatives

addressing conservation, climate resilience, terrestrial and marine resource management, sustainable livelihoods, and community development through sub-grants and specialized training.

MCT's Capacity Building Program supports various organizational and technical training activities, including financial and project management, environmental and technical training, and opportunities for professional development through scholarships and internships. With a focus on empowering local leaders and institutions, MCT has become an internationally recognized leader in the field of conservation funding, fostering sustainable solutions across Micronesia.

### **3.3.2. Micronesians in Island Conservation (MIC)**

The Micronesia Challenge (MIC), the first peer learning network in the Asia-Pacific Region, was established in the Federated States of Micronesia and Palau. Founded by respected conservation leaders from government agencies and NGOs, MIC aims to accelerate capacity-building efforts in conservation. Through a coordinated approach, MIC identified key institutional and training gaps across the region, focusing on areas that would benefit most from enhanced skills and knowledge-sharing. This initiative continues to play a pivotal role in addressing conservation challenges by fostering collaboration and building resilience in local ecosystems and communities.

**Table 7. MIC partners in 2011 report, almost all still active in conservation and natural resource management. Description section details sourced from program websites, online articles, and any available records of the agency/ organization and project work.**

| <b>MIC Partner Organizations</b>                                    | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beautify CNMI (CNMI, NGO)                                           | Beautify CNMI is a community-driven organization focused on environmental stewardship in the Northern Mariana Islands, promoting cleanups, conservation, and public awareness campaigns to protect natural resources. It collaborates with local groups, government agencies, and volunteers to organize large-scale cleanup events and sustainability initiatives, fostering environmental responsibility among residents. By emphasizing education, community engagement, and partnerships, Beautify CNMI helps create a cleaner, greener region while empowering communities to safeguard their environment.                                               |
| Chuuk Conservation Society (NGO)                                    | <p>The Chuuk Conservation Society goals are to protect and conserve the marine and terrestrial ecosystems of Chuuk State, Federated States of Micronesia, promote sustainable practices, and educate residents on the importance of environmental stewardship with a focus on creating a network of marine managed areas that consider both biodiversity conservation and community needs. Key areas include marine conservation, community engagement, capacity building, monitoring and research, policy advocacy and climate change adaptations.</p> <p>The capacity building goal is supported by the Micronesia APIC-Conservation Trust Scholarship.</p> |
| Chuuk Environmental Protection Agency (GOV)                         | The Chuuk Environmental Protection Agency (EPA) works to protect and enhance Chuuk State's environment through initiatives targeting pollution control, waste management, and biodiversity preservation. The agency implements policies such as the Chuuk State Clean Environment Act of 2018, which addresses issues like banning single-use plastics, managing solid waste, and ensuring cleaner urban spaces. Additionally, the EPA leads community outreach, educational programs, and collaborations to raise environmental awareness.                                                                                                                   |
| Chuuk Marine Resources (GOV)                                        | The Chuuk Department of Marine Resources (DMR) is a government agency tasked with managing and protecting the state's marine ecosystems and resources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Conservation & Environment Protection Program (CEPP) (FSM, GOV/NGO) | The CEPP in FSM supports the sustainable management of marine, terrestrial, and freshwater ecosystems by integrating traditional knowledge with modern conservation techniques. Its efforts focus on protecting Areas of Biodiversity Significance, which are critical to preserving FSM's natural heritage, while empowering local communities to lead conservation initiatives. By addressing challenges like climate change, invasive species, and resource management, the program builds resilience and ensures the sustainable use of natural resources for future generations.                                                                         |
| Conservation Society of Pohnpei (NGO)                               | Founded in 1998 by concerned citizens and now the premier conservation organization in the Federated States of Micronesia. The society works to increase community involvement in conservation and management of Pohnpei's natural resources, building local capacity through public and private partnerships and promote law and policies supporting these objectives.                                                                                                                                                                                                                                                                                       |

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|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | Interns of CSP are awarded internships through the Micronesia Challenge.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Department of Environmental Quality (DEQ) (CNMI, GOV)                   | Now part of the Bureau of Environmental and Coastal Quality (BECQ), DEQ focuses on managing and preserving natural resources in CNMI. It oversees programs addressing water quality, solid waste management, hazardous materials, and air pollution while promoting sustainable practices like recycling and conservation. Through collaborative efforts with local, regional, and federal partners, DEQ works to protect public health and the environment.                                                                 |
| Division of Aquatic and Wildlife Resources (Guam, GOV)                  | The Division of Aquatic and Wildlife Resources (DAWR), part of the Guam Department of Agriculture, focuses on conserving and managing Guam's aquatic and terrestrial wildlife. Its mission includes the preservation of endangered species, sustainable management of natural resources, and promoting public education about Guam's unique ecosystems.                                                                                                                                                                      |
| FSM Protected Area Network (PAN) (GOV)                                  | FSM PAN provides a framework for communities to access technical and financial resources while promoting sustainable conservation practices, with key activities including ecological monitoring, community engagement, and capacity-building efforts to enhance protected area management across FSM.                                                                                                                                                                                                                       |
| Hatohobei State Government (Palau, GOV)                                 | Hatohobei, the most isolated state in Palau, has a state government working on local issues like environmental protection and resource management, especially around sustainable fishing practices due to the rich marine life.                                                                                                                                                                                                                                                                                              |
| Helen Reef Project (Palau, NGO)                                         | A conservation initiative focused on the protection of Helen Reef, a remote and biologically rich area at the southern limit of Palau. The project, largely led by rangers who monitor and safeguard the area, aims to preserve the diverse marine life, including species like the Napoleon wrasse, hawksbill sea turtles, and various fish species. The project has faced challenges such as isolation, resource limitations, and the threat of poaching but remains necessary in conserving the reef's fragile ecosystem. |
| Koror State Department of Conservation and Law Enforcement (Palau, GOV) | Dedicated to protecting the natural resources and assets of Koror State in Palau through law enforcement, conservation efforts, and collaboration with national agencies.                                                                                                                                                                                                                                                                                                                                                    |
| Kosrae Conservation & Safety Organization (NGO)                         | An active non-profit focused on the protection and sustainable use of Kosrae's natural resources. Founded in 1998, the organization works on various environmental initiatives, including invasive species management and watershed protection, with a focus on preserving the island's ecosystems for future generations.                                                                                                                                                                                                   |
| Kosrae Island Resource Management Authority (KIRMA) (GOV)               | Its mission is to oversee the sustainable use and protection of Kosrae's natural resources, balancing environmental preservation with economic and social development. KIRMA manages various environmental and conservation projects, such as the Mahkontowe Conservation Area, and works closely with other organizations to address issues like coastal hazards and climate change impacts.                                                                                                                                |
| Mariana Islands Nature Alliance (MINA)                                  | Empowering environmental stewardship through science and island wisdom MINA is a community-based, non-profit conservation organization promoting and advocating for the protection and restoration of natural resources in the                                                                                                                                                                                                                                                                                               |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (NGO)                                                                       | Northern Mariana Islands.<br>MINA participates with the Micronesia Challenge Young Champions Internship program.                                                                                                                                                                                                                                                                                                                                                         |
| Mariana Trench Marine National Monument (MTMNM)<br>(GOV/NGO)                | Managed by NOAA and the U.S. Fish and Wildlife Service in coordination with local stakeholders, MTMNM was established in 2009 to protect a vast area of 95,000 square miles in the Marianas Archipelago, covering three distinct units: the Islands Unit, the Volcanic Unit, and the Trench Unit.                                                                                                                                                                        |
| Marshall Islands Conservation Society (NGO)                                 | Incorporated in 2004 and organized around the vision of People and Nature in Harmony wherein the Marshallese people come to a new equilibrium with nature. MICS is dedicated to building awareness, support and capacity for sustainable use of resources, conservation and biodiversity protection using traditional resource management practices, scientific assessments and targeted protection of locations, features and species.                                  |
| Republic Marshall Islands Environmental Protection Agency (RMIEPA)<br>(GOV) | Established in 1984, RMIEPA works alongside the Ministry of Natural Resources and Commerce and other governmental bodies to promote sustainable environmental practices, enforce environmental laws, and ensure the health of both terrestrial and marine ecosystems. The agency also supports initiatives to monitor natural resource usage, address pollution, and maintain biodiversity, while promoting environmental education and fostering community involvement. |
| Marshall Islands Marine Resource Authority (MIMRA)<br>(GOV)                 | MIMRA enforces national fisheries laws, oversees resource protection, and collaborates on regional and international levels to ensure sustainable management practices. MIMRA also drives the Reimaanlok Conservation Framework, which focuses on community-led conservation and the sustainable management of the nation's marine ecosystems.                                                                                                                           |
| Micronesia Challenge (Regional, IGO)                                        | See Section 3.1                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Micronesia Conservation Trust (Regional, NGO)                               | See Section 3.1.2                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Palau Conservation Society (PCS)<br>(NGO)                                   | PCS works to empower Palau's communities to steward the environment driven by the vision of Healthy Ecosystems for Healthy Palau and a mission to work with the community to preserve the nations unique natural environment and perpetuate the Palauan conservation ethic to existing generations and beyond.                                                                                                                                                           |
| Palau Int'l Coral Reef Center (PICRC)<br>(GOV/NGO)                          | PICRC is dedicated to promoting ocean stewardship through research, education, and community engagement. It plays a key role in advancing the conservation of Palau's marine ecosystems, particularly by focusing on areas like the Palau National Marine Sanctuary, fisheries, and marine protected areas.                                                                                                                                                              |
| Palau Protected Area Network (GOV)                                          | Created in 2008, PANF is a non-profit organization created by law to be a separate entity from the National Government serving as the financial mechanism for the Protected Areas Network (PAN). PAN is a national network of                                                                                                                                                                                                                                            |

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | conservation of Palau's biodiversity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Pohnpei State Division on Forestry and Marine Enforcement (GOV) | The Pohnpei State Division on Forestry and Marine Enforcement is tasked with overseeing and enforcing regulations related to the state's natural resources. This includes the management of marine protected areas, mangrove reserves, biosphere areas, and shoreline habitats. The division plays a key role in the conservation of coastal zones, wildlife, and marine sanctuaries, and it enforces laws related to endangered species and regulated fishing practices within the state.                                                                                                                                                                                                                                                                                                                                                                                     |
| RARE (Guam, NGO)                                                | RARE is a global conservation organization that works to inspire change in local communities by empowering people to protect and restore the environment. Their programs, such as Fish Forever, Lands for Life, and Climate Culture, focus on building community-driven solutions to challenges like biodiversity loss and climate change. They partner with local leaders to co-manage and conserve ecosystems, aiming for lasting, sustainable outcomes that benefit both people and nature.                                                                                                                                                                                                                                                                                                                                                                                 |
| The Nature Conservancy (Regional, NGO)                          | <p>The Nature Conservancy (TNC) has an active presence in the Pacific Islands, where it works on a range of initiatives focused on ocean health, biodiversity, and community resilience. TNC supports both local and regional efforts to protect the Pacific's marine and terrestrial ecosystems. Key projects include advancing sustainable fisheries management, improving coral reef resilience, and supporting marine protected areas (MPAs). TNC also works on initiatives like the Micronesia Challenge (see Section 3.1).</p> <p>Their strategies involve both high-tech solutions, such as electronic monitoring of tuna fisheries, and community-based approaches to ensure sustainable practices. TNC's work combines scientific research with traditional knowledge, aiming for long-term sustainability and increased community participation in conservation.</p> |
| Yap Community Action Program (GOV/NGO)                          | Established in 1995 to create a means to encourage and implement infrastructure and development projects at the community level that remain consistent with the State's overall development goals and policies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Yap Environmental Protection Agency (GOV)                       | Yap EPA enforces regulations related to coastal and marine protection, waste management, and pollution control. It is involved in projects such as improving the public dump site into a sanitary landfill.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Yap Institute of Natural Science (YINS) (NGO)                   | YINS is focused on researching sustainable development, natural history and adaptive technology in Yap. Much of the research that YINS has done focuses on fruit bat surveys, fishery studies and mariculture feasibility reports. YINS is also responsible for providing information on the sustainable use of natural resources on Yap.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### 3.3.3. Pacific Islands Management and Protected Area Community (PIMPAC)

The Pacific Islands Management and Protected Area Community (PIMPAC) is a regional network committed to advancing site-based and ecosystem-based management across the Pacific Islands by fostering continuous opportunities for knowledge-sharing, skill-building, and capacity enhancement among natural resource professionals. Established as a response to identified training gaps, PIMPAC emphasizes four core approaches: peer learning exchanges, technical training, partnership development, and resource sharing among conservation practitioners.

In 2005, PIMPAC began as a collaborative initiative to address challenges in natural resource and marine management across the Pacific, particularly in Marine Protected Areas (MPAs). The network also led to the development of the Micronesia Challenge Young Champions (MCYC) Internship to address specific workforce gaps in marine management by creating specialized training programs. This initiative supports the development of future professionals by providing MPA managers with structured curricula that combine ecosystem-based management training with practical internship opportunities modeled on the University of the South Pacific (USP) Internship framework.

The NOAA Fiscal Year 2023 report highlights a new three-year project supporting PIMPAC's ongoing mission. The project's objectives include strengthening site managers' capacity for effective management, leveraging regional successes to enhance protected area networks, and expanding training opportunities for both youth and current staff. Through this work, PIMPAC aims to establish enduring management systems that support sustainable conservation efforts across the Northern Mariana Islands and beyond.

**Key Skills:** Peer-to-peer learning, partnership building, knowledge sharing

**Training Focus Areas:** Management planning, socio-economic and biological monitoring, enforcement strategies, climate change adaptation

### 3.3.4. Global Island Partnership (GLISPA)

The Global Island Partnership (GLISPA) is an international organization dedicated to promoting resilience and sustainability in island communities worldwide. Through its mission to inspire leadership, catalyze commitments, and facilitate collaboration, GLISPA seeks to empower islands to address unique environmental, economic, and social challenges. Notable regional initiatives supported by GLISPA include the Micronesia Challenge and the Aloha+ Challenge, both recognized as transformative models in conservation and sustainable development.

GLISPA mobilizes high-level political engagement to advance island-focused goals, elevating island priorities on the global stage and fostering networks that support conservation, climate adaptation, and sustainable resource management. By strengthening partnerships across government, non-profit, and private sectors, GLISPA helps build a framework for collaboration that empowers island leaders and communities to innovate and drive impactful, long-term solutions.

### 3.3.5. Secretariat of the Pacific Regional Environmental Programs (SPREP)

The Secretariat of the Pacific Regional Environment Programme (SPREP) plays a pivotal role in advancing environmental sustainability and resilience across the Pacific. By focusing on the collection,

dissemination, and communication of key environmental information, SPREP ensures that stakeholders at all levels have access to the data needed to drive impactful environmental policies and positive change. Through multi-disciplinary frameworks and cross-sector collaboration, SPREP supports the development of national and regional environmental policies and strategies that align with sustainable goals.

SPREP's core priorities include climate change resilience, environmental governance, island and ocean ecosystem conservation, waste management and pollution control, as well as governance and operational efficiency. To support capacity building, SPREP offers a suite of resources such as climate change portals, a comprehensive research database, and a range of e-learning opportunities. The e-learning hub includes webinars, open learning courses (free short courses on foundational topics), a "Children's Corner" with open-source educational content for younger students, and executive courses tailored for select Pacific officials. These resources are designed to build regional expertise, strengthen environmental stewardship, and facilitate sustainable growth aligned with the shared vision for Pacific resilience.

### **3.3.6. Hawaii Conservation Alliance and Foundation**

The Hawai'i Conservation Alliance (HCA) is a collaborative network of conservation leaders dedicated to protecting the diverse ecosystems and biocultural heritage of Hawai'i's lands, streams, and oceans. Through coordinated efforts, HCA members focus on tracking conservation progress, sharing tools and technological advancements, identifying conservation needs, addressing emerging threats, and developing priority conservation projects.

Supporting this mission, the Hawai'i Conservation Alliance Foundation (HCAF), established in 2006 as a 501(c)(3) non-profit, provides essential support for fundraising, advocacy, outreach, and capacity building for native ecosystem and biocultural conservation across Hawai'i.

A cornerstone of HCA's outreach is the annual Hawai'i Conservation Conference, which brings together conservation professionals, researchers, and students to exchange insights, share research findings, and foster collaboration. The conference also offers professional development workshops aimed at emerging professionals to help build technical and leadership skills and strengthen networking opportunities. These workshops empower participants to lead within their current roles and actively contribute to conservation work across the Hawaiian Islands.

### **3.3.7. Pacific Islands Climate Adaptation Science Center**

The Pacific Islands Climate Adaptation Science Center (PI-CASC) is an extensive network dedicated to building capacity to address climate change and other large-scale environmental stressors affecting natural and cultural resources across the Pacific region. Collaborating with a wide range of partners, including government agencies, regional entities, and local organizations in Guam, Hawai'i, and the U.S.-affiliated Pacific Islands, PI-CASC supports climate resilience through diverse, region-specific programs.

Key PI-CASC programs include the Summer Undergraduate Research Fellowship (SURF), Climate Adaptation for Resource Management (CARM) fellowship, graduate scholar placements, and the Manager Climate Corps (MCC). These initiatives provide training and research opportunities focused on climate adaptation, resource management, and scientific research in Pacific ecosystems.

In 2021, PI-CASC launched the Climate Education Hub, a valuable resource for climate science education tailored to the Pacific Islands. This Hub offers curriculum integration materials, place-based educational resources, and tools for climate-focused classroom lessons. The Hub also includes access to resources for both in-person and online programs, covering a wide range of climate-related topics and providing insights into events and tools essential for climate education in the region.

This suite of programs helps to equip current and future leaders in the Pacific with the skills and knowledge necessary to address pressing environmental challenges.

### **3.3.8. Pacific Invasives Learning Network**

The Pacific Invasives Learning Network (PILN) is a peer-to-peer learning network established in 2006 to strengthen invasive species management efforts across Oceania. It brings together 24 multi-disciplinary teams representing various island governments, conservation organizations, and community groups throughout the Pacific. With six founding member agencies from different island governments, PILN was designed to foster regional cooperation, facilitate knowledge-sharing, and support best practices in invasive species control.

PILN operates by connecting teams on issues ranging from invasive species prevention and eradication to long-term ecosystem restoration and resilience. Through this network, members have access to expertise, resources, and technical support, enabling them to implement effective invasive species management strategies locally while benefiting from shared regional experiences. The collaborative approach empowers members to not only address the ecological threats posed by invasive species but also to promote biodiversity, protect agriculture, and support sustainable community development across the Pacific islands.

The network also provides training, workshops, and resources tailored to the challenges of managing invasives in island ecosystems, with a focus on practical, field-tested solutions. This approach has made PILN a resource for improving the environmental health and resilience of Pacific islands through locally-driven, collaboratively enhanced invasive species management practices.

### **3.3.9. Institute of Pacific Islands Forestry**

The Institute of Pacific Islands Forestry (IPIF), part of the USDA Forest Service's Pacific Southwest Research Station, is dedicated to supporting ecological health and resource management throughout the Pacific Islands. Based in Hilo, Hawaii, IPIF serves as the headquarters for the Hawai'i Experimental Tropical Forest (HETF) and provides essential research facilities, including laboratories and greenhouse space. The Institute collaborates with local, federal, and international partners to address environmental challenges such as ecosystem conservation, sustainable forestry, and biodiversity preservation.

Research and programs at IPIF are diverse, addressing challenges from invasive species management to climate adaptation. For example, in collaboration with the Smithsonian Institution, IPIF participates in conservation efforts for native orchids in Palau, aiming to document orchid species and their mycorrhizal partners. Additionally, through projects like the "Melai Mai" initiative, IPIF has supported food security by introducing resilient breadfruit varieties in Pacific Island communities affected by climate events.

By fostering partnerships with local entities and other federal agencies, IPIF plays a crucial role in promoting sustainable practices and enhancing resilience in Pacific Island ecosystems.

## **4. Occupational Analysis**

### **4.1. General Occupation Trends**

Occupational trends in the Pacific Islands are influenced by shared challenges across the region, including geographical isolation, small-scale economies, high transportation and utility costs, population growth, and increased vulnerability to natural hazards and climate change. These factors shape employment opportunities and economic strategies, which vary among islands but reveal common patterns.

Employment in the Pacific Islands largely consists of a combination of agriculture, subsistence activities, and small-scale business or barter-based economies. Rural communities rely heavily on subsistence farming and fishing, though urban migration is increasing as people seek alternative employment opportunities. This shift is partly driven by population growth, which pressures subsistence systems, resulting in declining agricultural productivity and crop yields in some regions.

Gender disparities are pronounced in the labor market. Men tend to dominate paid employment sectors, particularly outside of agriculture, while women often have access to fewer employment opportunities and are underrepresented in higher-paying roles. Addressing these imbalances is essential to ensure inclusive growth.

To address these occupational challenges, strategies are needed to boost living standards, enhance social cohesion, and build resilience in the workforce. Developing skills in climate adaptation, sustainable resource management, and digital connectivity will be crucial to the islands' long-term economic stability and workforce sustainability.

### **4.2. Natural Resource Management Sector**

Employment in the Pacific Islands' natural resource management (NRM) sector is critical given the region's dependency on natural resources for local livelihoods, food security, and resilience to natural disasters. Forests play a key role in mitigating landslides and flooding risks, while coastal ecosystems provide vital food sources and economic opportunities, particularly in fisheries. These resources, however, face threats from deforestation, overfishing, and the exacerbating impacts of climate change.

To effectively manage these resources, the region requires strengthened institutional capacities in environmental planning, management enforcement, and broad stakeholder engagement. Developing sustainable employment in NRM is therefore essential for both ecosystem preservation and economic development. Historically, NRM employment in the Pacific Islands has centered around fisheries, forestry, minerals, and tourism, but specialized and higher-paying roles within these fields are often filled by expatriates due to skill shortages locally. Additionally, resource processing has typically been outsourced, limiting local investment and job creation.

Enhancing the sustainability of NRM employment involves investing in education, skills development, and local capacity-building in key areas such as conservation, resource management, and sustainable tourism. By increasing local expertise and retention within the sector, Pacific Island countries can foster sustainable economic growth, enhance environmental stewardship, and promote greater socio-economic resilience.

As the Pacific Islands prepare for and respond to climate change impacts, jobs in natural resource management and other “green” sectors are becoming important components of climate adaptation strategies. In 2019, the agriculture, forestry, and fishing sector accounted for 28.4% of total employment across the region, underscoring the significance of agricultural reliance. However, job creation opportunities are expanding within sustainable practices, including organic farming, climate-resilient agriculture, and renewable energy production. There is also growth potential for green jobs in resource management, environmental protection, and within public administration, where new roles focus on sustainable resource utilization. Additionally, climate-adaptive infrastructure projects, such as seawall construction, are anticipated to generate further employment.

Realizing the potential of these green job sectors requires reforms in education and training systems, with a specific focus on skill-based training, curriculum alignment with green industry demands, and increased access to technical and vocational education (TVET). An example can be seen in the Philippines’ National Green Jobs Human Resource Development Plan, which promotes skill-building in green industries through basic and higher education initiatives and a technical/vocational training framework. This program also includes a job database that identifies green job opportunities and provides information on the skills required, a model that could be adapted in the Pacific Islands.

A primary challenge to expanding green jobs in the Pacific lies in the mismatch between existing TVET systems and industry requirements, often due to insufficient technical training quality and outdated curricula. This skills gap may be further widened by high emigration rates among skilled workers. A 2017 ILO study found that emigration rates for highly skilled workers in the Pacific Islands were among the highest globally, with Palau exhibiting an 80% emigration rate for skilled professionals. Addressing these challenges through targeted skill development and retention strategies is essential to building a resilient and sustainable green workforce across the Pacific.

To align skills development with labor market needs, increasing green industry participation in curriculum development and quality assurance is essential. According to a survey by the International Labor Organization (ILO), of 27 countries assessed, nearly two-thirds had established platforms or specific agencies to anticipate skills requirements for the green transition, demonstrating a trend toward active engagement with green industries in workforce planning.

Skills training should address current labor market needs and anticipate future demands, particularly in the context of the Pacific Islands' economic and environmental challenges. The ILO identified six key skill development challenges impacting the Pacific Islands:

1. Limited quality and relevance of Technical and Vocational Education and Training (TVET);
2. Insufficient links between labor market demand and educational training;
3. Low proficiency in communication and information technology among the workforce;
4. A lack of entrepreneurial skills;
5. Gaps in generic workplace skills; and
6. Absence of tracer studies to assess the relevance of institutional training.

In terms of labor participation, Pacific Islanders heavily rely on agriculture and forestry. The Pacific Data Hub reported that between 2013-2014, agriculture and forestry constituted 19% of household incomes in the Federated States of Micronesia (FSM), though this likely underestimates actual reliance due to the omission of informal work. In Palau, 9.8% of the total labor force (and 16% of the male labor force) engaged in agriculture and forestry as their primary economic activity in 2015, reflecting the region's continued dependence on natural resources for economic and food security.

Addressing these skill gaps through targeted training aligned with industry needs can better prepare the workforce to support sustainable development and resilience in the face of economic and environmental shifts.

Limited data is available on regional trends in labor force, especially for agriculture and forestry jobs. Data from the Pacific Data Hub is very outdated for most islands. In the Marshall Islands, the number of skilled agricultural, forestry, and fishery workers declined from 1,482 in 2011 to 993 in 2019. In FSM, there were 1,783 skilled workers in this field in 2013 and no data reported since then. Palau showed an increase from 155 skilled workers in 2013 to 461 in 2015, which is nearly a 200% increase in 2 years.

**Table 8. Data on skilled agricultural, forestry, and fishery works in the Marshall Islands, FSM, and Palau. Pacific Data Hub.**

| Skilled agricultural, forestry, and fishery workers | All education levels |
|-----------------------------------------------------|----------------------|
| <b>Marshall Islands</b>                             |                      |
| 2011                                                | 1,482                |
| 2019                                                | 993                  |
| <b>Micronesia (Federated States of)</b>             |                      |
| 2013                                                | 1,783                |
| <b>Palau</b>                                        |                      |
| 2013                                                | 155                  |
| 2015                                                | 461                  |

According to the Pacific Data Hub, the labor force in the Agriculture, Forestry, and Fishing sector is typically composed of skilled agricultural, forestry, and fishery workers (Table 9). Other occupations within this sector include roles in the armed forces, craft and related trades, elementary occupations, management, professionals, technicians, and services and sales. However, the data does not distinguish between the specific contributions of forestry and agriculture. As a result, the inclusion of fisheries may skew any trends in workforce distribution and labor force participation, making it difficult to isolate forestry-specific patterns.

**Table 9. Pacific Islands labor data for the Agriculture, Forestry, and Fishing Economic Sector according to the Pacific Data Hub.**

| <b>Pacific Island Countries and territories</b> | <b>Year</b> | <b>Occupation in Agriculture, Forestry, and Fishing Economic Sector</b> | <b>All education levels</b> |
|-------------------------------------------------|-------------|-------------------------------------------------------------------------|-----------------------------|
| Marshall Islands                                | 2011        | Armed Forces Occupations                                                | 18                          |
|                                                 |             | Craft and Related Trades Workers                                        | 21                          |
|                                                 |             | Elementary Occupations                                                  | 9                           |
|                                                 |             | Managers                                                                | 6                           |
|                                                 |             | Skilled Agricultural, Forestry and Fishery Workers                      | 68                          |
|                                                 | 2019        | Elementary Occupations                                                  | 261                         |
|                                                 |             | Managers                                                                | 47                          |
|                                                 |             | Skilled Agricultural, Forestry and Fishery Workers                      | 423                         |
| Micronesia (Federated)                          | 2013        | Elementary Occupations                                                  | 149                         |
|                                                 |             | Skilled Agricultural, Forestry and Fishery Workers                      | 600                         |
| Palau                                           | 2013        | Services and Sales Workers                                              | 53                          |
|                                                 |             | Skilled Agricultural, Forestry and Fishery Workers                      | 58                          |
|                                                 | 2015        | Elementary Occupations                                                  | 278                         |
|                                                 |             | Managers                                                                | 18                          |
|                                                 |             | Professionals                                                           | 12                          |
|                                                 |             | Services and Sales Workers                                              | 7                           |
|                                                 |             | Skilled Agricultural, Forestry and Fishery Workers                      | 171                         |
|                                                 |             | Technicians and Associate Professionals                                 | 20                          |

## 5. Needs Assessment Background Analysis

### 5.1. Review of Forest Action Plans

This synthesis compiles information from the Forest Action Plans of Palau, RMI, CNMI, FSM, and Guam. It is organized into the following sections:

1. Educational Needs
2. Data Gaps
3. Professional Training
4. Human Resource Needs
5. Projects and community support

The findings from these plans have been categorized by theme, except for Human Resource Needs, which is presented by region. The section on Projects and Community Support includes both ongoing initiatives and opportunities for future growth and development.

#### 5.1.1. Educational Needs

##### 1. Scholarships, Internships, and Recruitment

- Scholarship, internships in the field of sustainable forestry educational programs needed
- Support and improve PIPTIEM, COM interns, COM ag certification, MCYC, Bill Raynor (Yap)
- Recruitment of agriculture students
- Youth interest in agriculture and agroforestry certification program
- Natural resource internships, trainings, courses
- *PIMPAC recruiting more ag students, and Urban & Community forestry program internships*
- *Micronesia Challenge ongoing internship for undergraduate conservation programs*
- *MC Bill Raynor scholarship program for graduate students*

##### 2. Curriculum Development and Integration

- Develop educational materials
- Collaborate with NGOs, PCC, and MOE to develop and disseminate educational materials and forest curriculum modules integrated into school programs
- Integrated biodiversity curriculum for elementary schools, pre- and post-effectiveness survey (Chuuk)
- MCT developing Island Ecology Course with the University of Guam with support from USFS

##### 3. Public Awareness and Resource Management Education

- Resource management awareness and education engagement with communities, including celebrations like Earth Day, Environment Day, Biodiversity Day, International Day of Forests, Kosrae Invasive Species Day (Kosrae)
- Natural resource and conservation, biodiversity, agroforestry, and biosecurity students returning to the workforce
- Community involvement in environmental education programs

##### 4. Agriculture and Agroforestry Education

- CMI Agriculture Course
- Natural resource and agroforestry certification programs for youth
- Youth interest in agriculture and agroforestry certification program

##### 5. Collaboration with External Institutions

- Collaboration with NGOs, PCC, and MOE to develop and disseminate educational materials and

- forest curriculum modules integrated into school programs
- MCT developing Island Ecology Course with University of Guam with support from USFS

## 5.1.2. Data Gaps

### 1. Geospatial and Mapping Data Needs

- **GIS Mapping and Analysis:**
  - GIS mapping of fire-prone areas to help prioritize projects
  - High-resolution imagery to determine changes in native forest status from 2002 to present (LiDAR data and vegetation map update)
  - GIS, aerial imagery analysis, remote sensing
  - Vegetation type mapping at the Republic and project level
  - Native/primary forest mapping: fragmentation, age class, health conditions, tree densities, and risks
  - GIS forest health database at forest canopy-layer scale tracking outbreak and spread of diseases and pests
  - Coastal contour lines at 0.5-meters
  - GIS data such as vegetation and resource maps and analysis
  - Atoll community-based mapping and priority designation
- **Specific GIS Needs:**
  - GIS training for old and new aerial photos, remote sensing, spatial imagery, and geo-database development
  - Species inventory data (non-existent or lacking)
  - Coastal forest removal trend data
  - GIS and other relevant technologies forecast modeling for mitigation

### 2. Ecological and Environmental Data Needs

- **Forest and Habitat Data:**
  - Forest habitat with endangered species size
  - Tree plantations size
  - Agroforestry and food security awareness data
  - Data for Pohnpei's Outer Island sub-specific and varietal levels of species composition for atoll beach strands and atoll forest/agroforests
  - Invasive species assemblages, distributions
  - Sediment modeling that includes mass wasting, gully erosion, streambank erosion to existing N-SPECT and a comprehensive model to identify sediment sources
- **Biodiversity and Ecosystem Services:**
  - Sea-level rise quantitative data missing for terrestrial biodiversity
  - Biodiversity plans and needed data
  - Freshwater quality and quantity data
  - Erosion acceleration processes data
- **Agroforestry Data:**
  - Agroforest trend data needed
  - Population changes and distribution impacts on agroforestry and natural resource management

### 3. Monitoring, Data Management, and Storage

- **Data Collection and Monitoring Protocols:**
  - Terrestrial baseline data, data collection, and monitoring protocol by atoll training
  - Monitoring data lacking

- Species inventory data non-existent to lacking
- Plan implementation progress/success (reporting data)
- Guidelines and processes on regular data storage, backup, and organization
- **Collaboration and Data Sharing:**
  - Data sharing/collaboration tool that is utilized by all partners (e.g., Republic of the Marshall Islands Data Portal)
  - Terrestrial information management system needs developed and utilized

#### **4. Infrastructure and Development Data**

- **Development and Infrastructure Data:**
  - Infrastructure of new development
  - Coastal forest protection and reinforcement data

#### **5. Policy, Regulations, and Biosecurity Data**

- **Policy and Regulatory Data:**
  - Biosecurity policy & regulation technical information
  - Enforcement and awareness programs
  - Biosecurity protocols and response capacity for non-established priority species
  - Invasive species identification and management data
  - Biocontrol education and management data

### **5.1.3. Professional Training**

#### **1. Invasive Species Management and Biosecurity**

- Invasive species rapid action and management
- Invasive species eradication and management techniques
- Invasive species identification training within Guam Forestry staff
- Invasive species early detection public education and outreach trained staff
- Biocontrol education for professional staff
- Biosecurity and University of Guam invasive species identification and management cross-training of current Department of Agriculture staff
- Nursery trade biosecurity education and partnership with Customs, GISAC, and RISC
- Invasive species management training
- Invasive plant management strategy and Integrated Pest Management practices education and training
- Biosecurity protocols and response capacity for non-established priority species
- Invasive species monitoring technique improvement
- Biosecurity Task Force partner and institutional capacity building focused on forest health

#### **2. Wildfire Prevention and Management**

- Wildfire prevention and management
- Fire risk management and prevention training
- GIS training specific to post-wildfire damage assessment and rehabilitation and revegetation requirements
- Wildfire initial attack organization and equipment training
- Fire Watch suppression training
- DAF, DPS wildfire management and fire break training to include Yap-California cross-training program
- State wildfire plan and Community Wildfire Protection Plans (CWPPs)
- Wildfire protection plans and wildfire programs
- Fire Watch suppression training

#### **3. Forest Resource Management (FRM) and GIS Training**

- Forest Resource Management (FRM) training modules for data management, analysis, reporting, species identification, monitoring, geospatial and data analysis, report writing, field demonstrations, BMPs, erosion and sediment control, BMPs for littoral and mangrove forests
- GIS, aerial imagery analysis, remote sensing, geo-database training
- GIS skills for mapping and monitoring watershed areas
- GIS and spatial analysis technical support
- GIS/Safety Training Program and existence of GIS/Safety Certified personnel
- GIS training for wildfire damage assessment
- GIS/Safety Certified personnel for project work

#### **4. Community Engagement and Capacity Building**

- Community engagement technique training
- Cross-site learning of BMPs and lessons learned exchanges
- Engagement and train government leaders to be Environmental Resource Champions
- Learning exchange opportunities, successes and lessons learned
- Place-based training programs and manuals specific to island ecosystems
- Community, youth, and school Conservation Education (CE) and awareness programs
- Local Early Action Planning (LEAP) toolkit, Managed and Protected Area Management Effectiveness (MPAME) tool, and standard capacity assessment tool

#### **5. Professional Development and Staff Training**

- Building professional development and skills, particularly through training opportunities outside of the CNMI (e.g., California, Florida)
- Active and ongoing professional development
- Staff development (capacity) plans
- Orientation programs for new staff managers
- Staff trained in tracking landowners assisted, number of species propagated, planted, survival rates, and forest resources areas on public/private lands
- Trained staff in the use and management of the USFS SMART system
- Trained staff in the development and implementation of Forest Stewardship Plans (FSP) and Urban & Community Forestry (UCF) Plans
- Arborist Training & Certification
- Arboriculture training program and existence of certified arborists
- ISA arborist certification
- Staff/resource manager with pesticide application certification
- Performance-based budget training & initiatives
- Grant writing and project management training
- Funding opportunity training

#### **6. Policy and Enforcement Training**

- Enforcement training for policy and conservation officers
- Enforcement and awareness programs
- Enforcement and permitting process education
- Enforcement and permitting process education
- Biosecurity protocols for border and enforcement staff

#### **7. Agroforestry and Sustainable Practices**

- Agroforestry training and education
- Exchange programs with Pohnpei for mangrove management and sustainable harvesting
- Agroforestry and food security awareness programs
- UAS imagery to inventory, develop software, mapping, and measuring methodology of coconut, breadfruit, and pandanus
- Agro-biodiversity promoting comprehensive agroforestry programs
- Agroforestry awareness, education, and training for local communities

#### **8. Biodiversity and Ecosystem Management**

- Terrestrial biodiversity protection training and other capacity-building opportunities for resource managers and forestry staff
- Ecosystem resource awareness and training
- Biosecurity education for terrestrial resource management
- Pest detection and management
- Exchange programs for biodiversity conservation (Mangrove management, etc.)

#### **9. Collaboration and Technical Support**

- Outside technical consultants, advisors, and researchers capacity building opportunities for project engagement between NGOs, government, and resource managers
- Collaboration and data sharing with Chuuk managers and outside partners
- PRMC and working group coordination and collaboration of technical committees

#### **10. Urban and Community Forestry**

- Urban & Community Forestry program (FSM Ridge to Reef)
- Urban tree removal ordinances and guidelines
- Urban and community forestry services capacity building including nursery stock, planting, outreach, education, and arborist services
- Public and tourist awareness campaigns for Urban and Community Forestry for wildfire awareness, pest eradication, urban planting, etc.

#### **11. Environmental and Impact Assessment (EIA)**

- EIA Training Program for development projects
- Biosecurity Task Force partner and institutional capacity building

### **5.1.4. Human Resource Needs**

#### **CNMI:**

- GIS specialists (inferred)
- Community outreach, education and awareness program specialists for forest health, invasive species(inferred)
- Certified arborists & tree planters
- Entomologist and/or pathologist agency position

#### **Palau:**

- Governor appointed MAFE team leader
- Technical Committee and PAN coordinator

#### **FSM:**

- Develop GIS office (Pohnpei)
- Biosecurity officers (Pohnpei)
- Adequate number of DAF forestry staff (Yap)

#### **Guam:**

- Education and outreach staff
- Wildfire staff for prevention, mitigation, suppression and post fire activities
- Education and outreach staff
- Professional Guam Foresters with community outreach skills
- GIS staff
- Forest Legacy Assessment trained staff, contractors and partners

- Forest Legacy and Community Forests and Open Spaces program land acquisition, easement, land trade trained staff and partners
- Wildfire management trained and certified staff, public, partners and volunteers
- Wildfire safety, prevention, preparedness, cause investigation, suppression, and post-fire activity staff training
- Wildfire education and outreach activities (prevention) trained staff to continue development of Community Wildfire Protection Plans (CWPP)
- Fire Management Officer
- Fire Watch Staff
- Wildfire management crews
- Professional forestry positions
- Forester I, II, and III professional positions
- Forestry aids
- Professional Cooperative Fire Protection staff are also needed
- Professional Forester (wildfire management emphasis)
- Forestry Aides (wildfire management emphasis)

**RMI:**

- Invasive Species Coordinator through SPREP Office
- Traditional Leader coordination to designate traditional conservation areas or mo sites
- Increase National Resource Management partners
- NRC Forestry Division dedicated forester positions
- Engineers and technical professionals needed to support coastal community resilience building
- Department of Agriculture dedicated grant writer and manager, and GIS technical expert are needed/recommended
- Current staff and potential resource managers need access to on-island (Chuuk) skills training capacity building
- GIS/Safety Training Program and existence of GIS/Safety Certified personnel
- Arboriculture training program and existence of certified arborists
- Staff/resource manager with pesticide application certification

### **5.1.5. Projects and community support**

#### **1. Public Awareness, Education, and Outreach**

- Local and community-level educational and informational programs
- Invasive species public awareness campaigns
- WUI (Wildland Urban Interface) public awareness campaigns
- Public fire safety awareness
- Public forest health meetings, trainings, and printed guides
- Public awareness campaigns of natural resource issues and BMPs
- Educational materials on forest management and watershed forests
- Development and dissemination of educational materials on freshwater sources and ecosystem services of forests
- Public education on bio quarantines, pest prevention, and early detection
- Conservation Education & Outreach
- Community, youth, and school conservation education and awareness programs emphasizing tree values

- Invasive Alien Species (IAS) risk reduction and early detection awareness
- Awareness and conservation education on invasive species, climate change, and wildfire prevention
- Urban and community forestry awareness, training, and collaboration
- Community outreach on food security, traditional knowledge, and cultural practices
- Public and tourist awareness campaigns on urban forestry and wildfire

## **2. Training and Capacity Building**

- Wildland fire personnel training
- Invasive species management capacity building
- Carbon stocks, carbon trading, and ecosystem services (e.g., i-Tree) training development and implementation
- BMP training & guide for communities, developers, and landowners
- Wildfire prevention volunteer opportunities and training
- Private landowner technical assistance and planting materials for agroforestry
- Landowner conservation incentive programs
- Staff capacity development plans
- Landowner & developer forest health training
- Training landowners on aerial photography, IKONOS, LIDAR & SAR, and ground truthing
- Training on sustainable food production BMPs
- Invasive species education, monitoring, and detection
- Disaster preparedness, response, and recovery education
- Agroforestry and forest biodiversity training for local communities
- Wildfire risk training and community wildfire protection plans (CWPP)
- State wildfire plan and training for wildfire prevention
- Private landowner and community stewardship training
- Community training in invasive species management

## **3. Collaborations, Partnerships, and Networking**

- Collaborate with NGOs on student and community volunteer programs
- Share strategy experiences through documents, staff exchanges, and engagements
- Wildfire Network and CWPP community development
- International cooperation (e.g., JICA for biodiversity conservation opportunities)
- Collaboration on mangrove management and biodiversity conservation
- Private landowner and community resource stewardship and protection area plans
- Collaboration for invasive species management, early detection, and eradication

## **4. Agroforestry, Food Security, and Sustainable Livelihoods**

- Agroforestry and food security awareness programs for local communities
- Agroforestry awareness, education, and training, including food export,



- replanting, and nurseries
  - Traditional agroforestry and coastal management practices education
  - Landowner effective management and marketing of economically valuable trees for timber, food, and medicine
  - Guidelines on BMP for sustainable food production
  - Watershed management job creation and training linked with alternative livelihoods
  - Agroforestry promoting comprehensive, intensive agroforestry programs
  - Seedling production and distribution for agroforestry and conservation efforts
  - Traditional food recipe book and local crop preservation
- 5. Invasive Species Management**
- Invasive species community outreach program
  - Invasive species rapid response mechanism
  - Invasive species, fire prevention, climate change, mangrove forest valuation educational material development
  - Community outreach on invasive species control and early detection
  - Unified invasive species BMPs for contractors, laborers, and companies (e.g., port-of-entry, eradication)
  - Invasive species monitoring techniques and control data-sharing programs
  - Control of aggressive vines and invasive species awareness campaigns
- 6. Disaster Risk Management and Climate Change**
- Disaster awareness, education, and training for local communities
  - Disaster Risk Management and Climate Change adaptation programs
  - Wildfire protection plans and programs
  - Disaster preparedness and response education for local communities
- 7. Biodiversity Conservation and Ecosystem Services**
- Enforcement of biodiversity rules and regulations
  - Biodiversity conservation awareness programs for communities and policymakers
  - Coastal forest protection and reinforcement awareness through community shoreline replanting projects
  - Traditional coastal stabilization methods awareness
  - Traditional knowledge documentation and sharing for biodiversity and food security
  - Promoting cultural practices related to forest and biodiversity conservation
  - Forest management and agroforestry systems to promote biodiversity and resilience
- 8. Land Stewardship and Sustainable Forest Management**
- Local private landowner and community land stewardship participation
  - Timber lot guidelines for communities
  - Private landowner technical assistance for forest management and agroforestry practices
  - U&CF/Forest Stewardship Board training and workshops
  - Guidelines for forest management, including pest identification and sustainable practices
  - Community-based forest management with environmental literacy and stewardship
- 9. Technology and Resource Modernization**
- Modernization of WUI resources and technology
  - Development and use of online training opportunities
  - Forest and agroforestry BMPs for local communities using modern technology
  - Urban planning and land tenure integration with sustainable forest management
- 10. Cultural Awareness and Traditional Knowledge**
- Cultural awareness around indigenous salt-tolerant vegetation and coastal protection
  - Preservation and integration of traditional knowledge with modern forest management practices
  - Cultural practices conflict awareness and education
  - Traditional food preparation, preservation, and nutrition education for school programs

## 6. Capacity Needs Meetings and interviews

Interviews with forestry and agroforestry professionals across the Pacific Islands reveal several critical capacity gaps in workforce development, technical training, education, and recruitment. These challenges impact project implementation, workforce retention, and the ability to meet long-term conservation and sustainability goals. Despite growing initiatives to expand training and educational pathways, persistent barriers such as funding constraints, inadequate job training, and a disconnect between workforce needs and formal job requirements hinder progress.

### 1. Workforce Capacity and Recruitment Challenges

- Difficult understaffing continues to be a major issue across forestry and natural resource agencies, with some teams consisting of only two to four people managing entire regions.
- Recruitment efforts are hindered by **overly ambitious job requirements** that do not align with the actual skills needed for forestry roles. Agencies need to **revise job descriptions** to better reflect fieldwork, data analysis, and management responsibilities.
- Retention is mixed—some long-term professionals stay for decades, while others leave due to a lack of career advancement opportunities.
- **Developing a local workforce is challenging** due to limited forestry-focused education in the Pacific. Many professionals transition from agriculture or marine science backgrounds.
- **Internship and apprenticeship programs** such as the TVET program (World Bank-funded) offer promising models for building a skilled workforce through **peer learning and hands-on experience**.
- **Remote learning options** (e.g., online master's programs) can improve accessibility, but hands-on, field-based learning remains critical for skill development.

### 2. Skills and Training Gaps

- Forestry professionals require expanded training in **arborist work, pest and disease management, invasive species control, forest mensuration, and GIS**.
- **Data analysis and numeracy skills are lacking**, including training in **sampling design, forest monitoring, and GIS mapping**. Partnerships with the **University of Guam (UoG)** could help integrate these topics into curricula.
- **Technical training in GIS, GPS use, and data collection** is essential for workforce readiness. Expanding a **GIS boot camp or certification program** would be beneficial.
- **Written and verbal communication skills remain a barrier**. Many professionals struggle with report writing, grant applications, and delivering oral presentations in English.

- **Training must also include administrative skills**, as many forestry professionals are responsible for budgets, project management, and grant administration in addition to fieldwork.
- **Fieldwork should be central to training**. Practical learning in agroforestry, nursery management, and ecological monitoring is necessary for workforce preparedness.

### 3. Educational Pathways and Access to Locally Relevant Training

- Forestry and agroforestry education is **limited across the Pacific**, with most students pursuing agriculture, business, or marine sciences instead.
- **Student enrollment in agroforestry programs remains low**. At the College of the Marshall Islands (CMI), only five students are currently enrolled, with one expected to graduate in 2025.
- **Dual enrollment programs** at CMI, which allow high school students to earn college credits in agroforestry, are a promising model for accelerating workforce entry.
- **Traditional ecological knowledge (TEK) is not fully integrated** into training programs. There is a strong push for **island-focused curricula** that blend modern forestry techniques with **local ecological and cultural practices**.
- The **Fiji National University model** offers a **diversified agroforestry curriculum**, incorporating **nutrition, medicinal plants, and non-communicable disease (NCD) prevention**, which could be adapted for other Pacific Island programs.
- **Training and certification programs need expansion**. Examples include developing a **GIS certification** at a community college or extending existing **USFS RNGR nursery training workshops** beyond short-term learning models.

### 4. Resource and Infrastructure Needs

- **Lack of infrastructure, including greenhouses and research labs**, limits hands-on training opportunities. At CMI, greenhouse construction is still in progress, and training is conducted through the Land Grant program.
- **Grant management expertise is insufficient**, making it difficult for agencies to secure sustainable funding for training programs and workforce development.
- **More investment in documentation and knowledge sharing** is needed to build institutional capacity over time. Written guides and recorded best practices would help standardize training efforts.
- **Community engagement remains weak** due to a lack of training in media and communication. Forestry professionals require **better engagement strategies to work with municipalities and local organizations**.

### 5. Strategic Directions for Capacity Development

- **Expand GIS and technical certification programs** at community colleges or regional institutions.

- **Develop longer, hands-on training opportunities** to replace short, intensive models that do not allow sufficient skill-building.
- **Enhance scholarship and apprenticeship programs** to encourage students and professionals to pursue careers in forestry.
- **Strengthen community engagement training** to improve partnerships with local stakeholders.
- **Invest in infrastructure** such as greenhouses, research labs, and nursery facilities to support technical training.
- **Increase documentation and knowledge sharing within agencies** to build long-term institutional capacity.
- **Advocate for better alignment between training programs and workforce needs** to create a more effective educational pipeline.
- **Revise job descriptions and hiring criteria** to reflect the actual skills needed for forestry and agroforestry positions.

Capacity challenges in forestry and agroforestry programs across the Pacific Islands stem from a combination of workforce shortages, training limitations, and inadequate educational pathways. Addressing these needs requires a multi-faceted approach, including the development of long-term training programs, expansion of technical education, and better integration of traditional knowledge into modern forestry practices. Strategic investment in education, infrastructure, and workforce development will help create a resilient, skilled workforce capable of managing the region's natural resources while addressing food security, climate adaptation, and sustainable land management.

## 7. PIFC 2023 Capacity Building

### 7.1. PIFC Executive Committee Discussion Notes

The following section highlights several key takeaways from the exploratory discussion on capacity-building needs that occurred with the PIFC Executive Committee in December 2023.

#### 1. Outdated Job Descriptions and Hiring Processes

- In regions like Palau and Guam, many government position descriptions are outdated—some over 30 years old. Updating these descriptions can be as challenging as creating entirely new positions. As a result, many job roles do not accurately reflect current duties, potentially discouraging candidates.
- Position description updates are bureaucratically complex, requiring extensive approval processes, and may need to be budgeted in advance (e.g., in Iva’s case, involving cabinet approval).

#### 2. Challenges with Recruitment and Public Perception of Job Roles

- Traditional advertising (e.g., government websites, radio) may not effectively reach target demographics, prompting consideration of social media and word-of-mouth for recruitment.
- Job descriptions can sometimes use technical language that intimidates potential applicants, suggesting a need for workshops or simplified descriptions to help prospective employees feel confident applying.

#### 3. Barriers for Local Talent Development and Retention

- Brain drain is a concern, as many skilled individuals leave the Pacific for more secure and well-compensated opportunities abroad. Addressing this requires strategies to make local roles more appealing.
- Programs that encourage students to work elsewhere and then return to their home islands (e.g., in American Samoa) could foster skill development and reintegration.
- Offering scholarships and internships, such as those provided by Palau’s government for students to return home, are helpful for bridging educational opportunities with local job prospects.

#### 4. Education and Practical Training Gaps

- Many students lack practical field skills, such as basic math, local flora identification, and knowledge of traditional uses of trees. Universities could address these gaps by embedding hands-on curricula relevant to forestry and natural resource management.
- **Important job skills like grant writing, business management, public speaking, and website management are often missing from academic programs, leaving employees to learn these on the job.**

#### 5. Certifications vs. Degrees and Career Progression

- For many positions, certification alone is not viewed as sufficient for career advancement; formal degrees are often required. However, some agencies (e.g., Jack’s example) do recognize training certifications in salary increases, indicating a need for more consistent standards.

- Aligning agency requirements to recognize a combination of certifications and practical experience could make roles more accessible.

#### 6. University and Agency Partnerships

- Building stronger partnerships with universities could help align educational programs with real-world job needs, provide field exposure opportunities, and foster student interest in forestry and conservation careers.
- Enhancing relationships with educational institutions and increasing guest lectures, internships, and in-field learning experiences were discussed as beneficial ways to recruit future talent and prepare students for forestry careers in the Pacific.

#### 7. Contextual Understanding of Local Environments

- Participants emphasized the importance of context-specific understanding, particularly around topics like invasive species, which may differ in impact depending on the local ecosystem. Integrating this into educational programs would create a more nuanced approach to environmental management.

#### 8. Promoting the Appeal of Forestry and Conservation Careers

- Introducing excitement into career recruitment (e.g., “jumping out of helicopters to fight fires”) could attract interest, although expectations need to be managed for local contexts.
- Practical outreach to schools and communities to raise awareness of local forests and conservation challenges could build interest from a young age and help students recognize local forestry career paths.

Overall, the discussion highlighted a need for improved education, targeted recruitment strategies, flexible position requirements, and stronger ties between academic institutions and agencies to build a skilled and motivated workforce for forestry and natural resource management in the Pacific Islands.

### 7.2. Results of Conference Breakout Session on Capacity Building

The following list of questions was discussed in the break out session on capacity-building:

1. What would I see you doing at your job?
  - a. What are the duties / jobs (usually 6 – 12)? General, not specific, statements of work performed (*i.e. Maintain nursery equipment*)
2. What are the tasks that you do to complete the duties?
  - a. Should have a single action verb, are something you can complete. (*i.e. Test irrigation nozzles*)
3. What general knowledge and skills are required?
  - a. What behaviors do you need to demonstrate while performing the tasks we discussed?
4. What tools, equipment, supplies, and materials are necessary to perform the identified tasks?
5. What duties or tasks are you required to do that you are not comfortable doing?
  - a. Do you have any duties that feel like a whole job on its own? Is there a duty that takes time away from your main duties/ jobs?
6. What experience helped prepare you the most for this position?
  - a. University, previous work, special training program, etc...
7. When you first started this position, did you receive the training required to complete your duties?
  - a. Did you have the experience needed to step into the roles you were asked to do?
  - b. What skills and knowledge did you learn on the job?

8. What kind of training opportunities would help you complete your duties/ job? What additional training do you need?
9. What is the status of employee retention?
  - a. Are turnover rates high in the position? If so, why?
10. What is the organizational structure for your organization? If you could change the organizational structure, how would you?

### 7.2.1. Forest Resource Specialists

Forest managers have diverse duties and responsibilities, which include:

1. **Planning and Coordination:** Develop and implement forest management plans, coordinate with partners, and plan planting projects and maintenance activities.
2. **Propagation and Nursery Management:** Oversee plant propagation, nursery maintenance, and management, ensuring healthy nursery stock for future planting.
3. **Pest and Weed Control:** Manage pest control, conduct weed control activities, and monitor plant health to maintain ecosystem balance.
4. **Education and Outreach:** Engage in public outreach, educate communities, and provide forestry extension services to promote sustainable practices.
5. **Grant and Contract Administration:** Administer grants, manage contracts, and ensure adherence to budgetary and project guidelines.
6. **Volunteer and Personnel Management:** Recruit, train, and oversee staff and volunteers, providing guidance and support to fulfill forest management objectives.
7. **Seed Collection and Inventory:** Collect and store seeds for propagation and maintain accurate inventory records of nursery stock and other resources.
8. **Financial and Progress Reporting:** Manage finances, track expenses, and prepare progress and project reports for stakeholders.
9. **On-the-Ground Forest Maintenance:** Conduct tree planting, fertilizing, and site preparation, and maintain forest areas in alignment with project goals.
10. **Administrative and Office Duties:** Perform office tasks related to project planning, record-keeping, and reporting to ensure smooth operation and compliance.

These duties collectively ensure the successful implementation of forest management initiatives, from planning and planting to education and ecosystem maintenance.

A forest manager's core tasks include:

1. **Nursery Operations:** Oversee nursery work, focusing on plant propagation and ensuring healthy stock for planting projects.
2. **Financial Planning:** Create and manage financial planning spreadsheets to monitor budgets and resource allocation.
3. **Seed Collection and Tree Maintenance:** Collect seeds for future plantings, fertilize trees, and maintain plant health to support sustainable forest growth.
4. **Coordination and Communication:** Attend meetings to coordinate with team members and partners, aligning on project goals and strategies.

At the workshop, participants did not mention any duties or tasks that they were required to do that they did not feel comfortable doing.

A forest manager needs a combination of interpersonal, physical, and technical skills:

1. **Professional Conduct and Self-Trust:** Demonstrate reliability, maintain a positive attitude, and trust in one's own judgment to make effective decisions.
2. **Adaptability and Open-Mindedness:** Stay open to new methods, ideas, and feedback to continually improve forest management practices.
3. **Physical Fitness:** Maintain good physical condition to perform hands-on tasks and fieldwork in outdoor environments.
4. **Technical Knowledge of Forestry:** Possess skills in tree identification, soil assessment, planting techniques, and effective fertilizer use to support healthy forest growth.

These skills ensure a forest manager can manage resources, work efficiently in the field, and adapt to evolving forestry practices.

Individuals who have prepared to be natural resource managers often draw from a variety of hands-on experiences. These include past work with planting, seed propagation, and urban planting, which provided practical knowledge of plant growth and management. Additionally, involvement in family plantation work, as well as farm and ranch operations, helped to deepen their understanding of land management and agricultural practices. These experiences collectively equipped them with valuable skills and insights necessary for effective natural resource management and land stewardship.

All participants only received on the job training, as opposed to formal training through their employer. The skills and knowledge gained from the job were primarily rooted in life experiences and on-the-job training. Respondents noted that the experience allowed them to develop essential skills such as public speaking and stepping out of their comfort zone, which helped build both personal and professional growth. These hands-on experiences were key in enhancing their ability to navigate challenges and adapt to various situations in their roles.

#### **Training Opportunities for Forest Managers:**

- General training on core skills
- Learning from colleagues (mentorship, job-shadowing)
- In-house training to build internal knowledge
- Team-building exercises
- GIS (Geographic Information Systems) training
- Grant writing training

The essential tools, equipment, and supplies needed for forestry tasks include:

1. **Hand and Power Tools:** Hand tools, electric tools, and chainsaws for tree maintenance, planting, and clearing operations.
2. **Heavy Equipment:** Chipper and trailer to manage and transport debris and materials.
3. **Field Vehicles:** Utility Terrain Vehicle (UTV) for efficient travel across varied terrain in the field.
4. **Mapping and Survey Technology:** Maps and drones for site assessment, monitoring, and planning.

These resources are often required for fieldwork, from transportation and site preparation to monitoring and equipment maintenance.

Employee retention challenges in the forestry sector are primarily driven by low pay, which has made it difficult to attract and retain qualified personnel. Hiring issues are compounded by the limited financial incentives offered, as salaries are often insufficient to meet the needs of employees. Many workers feel that salary increases are necessary to improve retention and ensure long-term commitment from staff, especially in a competitive job market where employees seek better compensation and career advancement opportunities.

### 7.2.2. Forestry Administrators

Administrative duties for a forest management office include a range of tasks that support financial, project, and personnel management:

1. **Grant and Financial Management:** Oversee grant management, including federal grants, ensure compliance, monitor budgets, and manage finances to support program goals.
2. **Budgeting and Procurement:** Handle budget monitoring, track expenditures, prepare requisitions, and manage procurement, including collecting pro-formas (financial statements) and requests for quotations from vendors.
3. **Contract and Compliance Oversight:** Ensure contract obligations are met, connect with the grants office as needed, and manage reporting requirements for various funding sources.
4. **Data Collection and Reporting:** Gather and analyze data, prepare reports, create spreadsheets, and develop graphs to visually communicate project progress and financial performance.
5. **Personnel and Recruitment Management:** Coordinate recruitment efforts, track payroll, and support division managers with personnel-related administrative tasks.
6. **Document and Correspondence Management:** Maintain records of all correspondence, input outgoing documents, and log communications to ensure organized and accessible documentation.
7. **Supply Management and Ordering:** Manage ordering and requisitions for supplies, ensuring timely procurement to meet project and office needs.

These duties ensure efficient administrative operations and compliance with financial and grant requirements, while supporting strategic planning and resource allocation.

An administrator in a forestry office handles a range of tasks essential for organized and compliant office operations:

1. **Grant Oversight and Compliance:** Assign and review grant management duties, track expenditures, ensure grant compliance, and apply administrative cost principles.
2. **Procurement and Vendor Management:** Manage order processing, vendor payments, reimbursements, and procurement, including obtaining quotes and coordinating supplies.
3. **Financial Tracking and Reporting:** Compile expenses, track financial data, and prepare reports to monitor budget adherence and project costs.
4. **Organization and Scheduling:** Organize tasks, maintain the office calendar, and manage time efficiently to ensure all administrative responsibilities are met.
5. **Data Management and Outreach:** Handle data entry, manage outreach materials, and ensure familiarity with Forest Service systems for efficient operations.

These responsibilities support the structured, compliant, and resource-efficient functioning of the forestry office.

The administrators highlighted a range of experiences that prepared them for their roles, including on-the-job training, formal training programs, and education. Many cited attending college and completing Forestry Programs, along with internships and special training programs, as foundational experiences.

They also emphasized the value of learning from co-workers, receiving mentorship, and engaging in self-development activities. Participation in specialized training sessions, such as finance training and APIPA, as well as virtual training on financial systems, helped enhance their skills. Additional preparation came from attending workshops and training with other agencies, including the Ministry of Finance. Volunteering in Hawaii, involvement in mentoring programs like KUPU and Blue Waters, and participating in resource assistant programs further contributed to their readiness for the administrative tasks in forestry management.

Most participants received some formal training, while others received only on the job training to prepare them for the position. The responses highlighted a variety of skills and knowledge gained on the job. Key elements included training from the first grant accountant, mentoring, and on-the-job training (OJT). One mentioned their education as CMI graduates and emphasized the importance of being open to learning new things. However, some noted that certain training was inaccurate or poor. The team also benefited from special grant management training, while acquiring practical skills in areas such as plumbing. Additionally, they developed expertise in the management of federal lands, grant reporting, and expenses, which contributed significantly to their roles.

For administrators, the duties or tasks they feel uncomfortable doing include:

1. **Unclear or Unassigned Tasks:** Being asked to perform duties outside of their assigned responsibilities or role, such as tasks unrelated to administrative duties or certifying requests when the responsible person is absent.
2. **Non-compliance Issues:** Tasks that may not comply with established regulations, such as not adhering to FMR (Financial Management Regulations) or being instructed to act in a way that conflicts with their role.
3. **Management and Direction of Others:** Directing colleagues on projects or managing team dynamics can be uncomfortable, especially when it involves guiding others on tasks outside their usual responsibilities.
4. **Time Management and Communication:** Struggling with time management and ensuring effective communication within the team can create challenges in meeting deadlines or coordinating efforts.
5. **Public Speaking and Follow-up:** Public speaking or presenting to larger groups can be uncomfortable, as well as following up on documents sent to finance or ensuring communication is maintained.

These discomforts highlight the challenges administrators face in balancing their duties and managing their team effectively while adhering to organizational standards and expectations.

An administrator in a forestry office needs a blend of technical, communication, and organizational skills:

1. **Training and Knowledge of Office Duties:** Be well-trained in assigned duties and knowledgeable in administrative processes, financial management regulations, and office protocols.
2. **Financial Tracking and Software Proficiency:** Proficiently use Excel, Microsoft Office, and accounting software to track expenditures, prepare budgets, and ensure compliance with financial management regulations.
3. **Communication and Interpersonal Skills:** Demonstrate strong communication skills, foster a positive and friendly office environment, and build effective working relationships.
4. **Technical and Equipment Skills:** Competently use office technology, including computers, printers, cell phones, and internet-based systems, to manage administrative tasks efficiently.

These skills support effective office management, financial oversight, and smooth communication within the forestry office.

For administrators, the training opportunities they feel would help them complete their job include:

1. **Grant and Financial Management:** Training on grant budgets, management, and reporting; Admin cost principles and financial systems; Special grant management training, including procedures for managing federal grants.
2. **Record and Documentation Management:** Training on record management and e-filing systems; Knowledge of reporting requirements and administrative cost principles.
3. **Professional Development and Networking:** Attending workshops and conferences, particularly with the Ministry of Finance; Networking with other departments and agencies to broaden skills and knowledge.
4. **Operational and Procedural Knowledge:** Virtual or in-person training on basic grant procedures; Exposure to various forestry and grant management departments to understand their roles better.
5. **Technical and Specialized Training:** Arborist and technical training to support forest management work.

The essential tools and supplies needed for administrative tasks include:

1. **Office Equipment and Supplies:** General office supplies like stationery, pens, and pencils, as well as office equipment such as smartphones, laptops, and computers.
2. **Technology and Systems:** E-filing system for document management, internet connection for communication and research, and technology like hard drives and CPUs for data storage and processing.
3. **Transportation:** Vehicles for office-related travel and field visits, as needed.
4. **Manpower:** Adequate staff and support to manage tasks and maintain office operations efficiently.

These tools and supplies ensure smooth, organized, and efficient administration in the forestry office.

Administrators identified several factors affecting employee retention, including dissatisfaction with management, such as upper management's failure to address wrongdoings or a lack of fair leadership. Concerns about salary were prevalent, with issues like unequal pay distribution and workers handling multiple roles for a single salary, leading to frustration. There were also concerns regarding the need for non-U.S. nationals to have access to a bachelor's degree, as well as dissatisfaction with low pay and a lack of turnover opportunities. Despite these challenges, a good work environment was seen as a key factor in retaining employees, as it fosters job satisfaction and reduces turnover. However, there is an overall concern that current work requirements are difficult to meet given the resource constraints.

Administrators offered several suggestions for improving the organizational structure. Some would prefer to replace the existing structure with an elected one, while others proposed reorganizing job duties to improve efficiency, such as shifting productivity to different sections or working more closely with accountants. There were suggestions to eliminate the deputy secretary position and create a permanent office administrator role. A few felt that replacing the director or adopting a bottom-up approach would foster better communication and leadership. Additionally, administrators recommended adding division supervisors for more oversight and trimming the organization down to a simpler structure with a main boss and workers, streamlining the hierarchy for better effectiveness.

### 7.2.3. Forest Health Managers

In the PIFC Forest Health breakout session, participants highlighted several key experiences that helped

them the most in their work. These included:

1. **Mentorship Programs** – Participants emphasized the value of mentor relationships, which provided guidance and support in their careers.
2. **University of Guam** – The University of Guam was recognized for its role in providing educational opportunities and support for those working in forest health.
3. **Pathways Intern Program** – Internships through the Pathways program were noted for offering hands-on experience in the field.
4. **AmeriCorps On-the-Job Training** – AmeriCorps offered on-the-job training, helping individuals build practical skills.
5. **Quarantine and Invasive Species Management** – Training related to quarantine protocols and invasive species management was considered invaluable.
6. **NOAA Coral Reef Program Fellowship** – The NOAA Coral Reef Program Fellowship provided experience in conservation and resource management.
7. **Limited Programs Specific to Entomology in Micronesia** – Participants noted that in Micronesia, few programs are specifically focused on entomology, which poses a gap in specialized training.

These experiences were seen as helpful in advancing skills related to forest health management and invasive species control.

When asked where they received their training, the responses reflected a combination of on-the-job learning and external resources:

1. **Impact of COVID on Training Opportunities** – COVID significantly reduced formal training opportunities, limiting access to professional development.
2. **Lack of Fiscal/Grant Training** – Many employees did not receive formal training in fiscal management or grants, requiring them to learn by doing.
3. **Cultural Interaction through On-the-Job Training** – Training in cultural interactions often occurred through hands-on experience rather than structured learning.
4. **Forest Inventory in 2020** – Training for forest inventory was lacking, forcing employees to figure it out on the job.
5. **Staff Shortages and Cross-Training** – Due to limited staff, employees learned to perform a variety of tasks across different areas, including marine work for terrestrial managers, offering both challenges and benefits.
6. **External Training and Mentorship** – Some employees attended outside training sessions, such as with Rich McKenzie, or learned through volunteer work with land grant programs, gaining community connections and hands-on experience.
7. **Active Learning in the Community** – Engaging directly with the community provided real-world training, helping employees learn in practical settings.
8. **Self-Directed Learning** – Employees who switched positions had to independently learn new skills, such as reviewing Forest Action Plans and forest health manuals, but lacked formal training in areas like budgeting, requiring a self-starter attitude.

In summary, the majority of training was self-directed or learned through hands-on experience, with some external training and mentorship opportunities, but gaps in formal, structured training, particularly in fiscal management and specific technical areas.

When asked what training opportunities would help them complete their job, the responses highlighted the need for both technical and interpersonal skills development, as well as tailored opportunities for specific needs:

1. **Soft Skills Development** – Training in soft skills such as professional communication (e.g., email etiquette) and governance to improve workplace interactions.
2. **Human Resource Management** – Learning how to manage people effectively, with a focus on leadership and building team dynamics.
3. **Mentorship and Contextual Learning** – Training that includes mentorship to better understand the specific context and needs of a place.
4. **Grant Writing Skills** – A need for grant writing training, particularly for younger employees, to improve their ability to secure funding.
5. **Leadership and Sensitivity Training** – Request for leadership development, sensitivity training, and conflict management or mediation skills to handle interpersonal challenges.
6. **Public Speaking and Community Engagement** – A desire for training in public speaking (e.g., speech classes) and techniques to better engage and motivate people, bringing out the strengths of all team members.
7. **Citizen and Community Science** – Interest in learning about citizen science and community science opportunities, with an emphasis on best practices that ensure equity and inclusivity.
8. **Project Management** – Desire for project management skills to better plan, execute, and track projects.
9. **Specialized Lab Support** – A need for additional training in lab support and analysis.
10. **Training for Smaller Islands** – Acknowledgment that smaller islands, such as those in Micronesia, need more training resources than larger ones like Guam due to limited local capacity.

In summary, these responses reflect a broad range of training needs, from technical skills like grant writing and project management to softer skills like leadership, conflict resolution, and community engagement. There's also a call for more localized and equitable training opportunities, particularly for smaller island communities.

When asked about employee retention, the responses revealed several key challenges:

1. **Funding Instability** – Many employees face job insecurity due to reliance on "soft funding" (e.g., grants), making it difficult to retain staff who might otherwise stay. There's a need for government buy-in to secure more stable, state-funded positions.
2. **Salary and Compensation** – Low wages were frequently cited as a major weakness in retention, with some employees leaving for better-paying opportunities. Stipends for extra workdays, such as Saturdays, were suggested as a possible incentive.
3. **Job Scope Creep** – Employees noted that job descriptions often expand beyond their original scope, with the same individuals handling tasks across multiple programs, adding to stress and burnout.
4. **Heavy Travel Demands** – In some regions, extensive travel needs add to the workload, making these positions less attractive, especially if other jobs offer more stable conditions.
5. **Perception of Work** – Forestry jobs are sometimes seen as unappealing or "unsexy," which

affects recruitment and motivation, especially for younger workers.

6. **Educational and Career Pathways** – The need for degrees and career guarantees was highlighted to encourage local youth to pursue forestry positions rather than leave for opportunities elsewhere, particularly in other fields like marine studies.
7. **Leadership and Community Engagement** – Greater leader buy-in and community outreach, such as youth programs and local planting events, were recommended to generate interest in forestry work.
8. **Grant Management Burden** – The constant pressure to secure funding through grant writing is an ongoing challenge, as it requires upkeep and detracts from other responsibilities.

In summary, these insights underscore the need for stable funding, better compensation, clearer job roles, and community and educational engagement to strengthen employee retention in forestry agencies across the Pacific Islands.

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