The Federated States of Micronesia

National Biodiversity Strategy and Action Plan

2018–2023

Foreword

In the Federated States of Micronesia we are blessed with beautiful and bountiful natural environments, and our enduring traditional cultures. We find ourselves the guardians of some of the richest biodiversity in the world and, coupled with our strong and diverse traditions, are in a position to conserve both our natural heritage and social heritage together. This combination of nature and society is very powerful, and is an underlying theme throughout this revised National Biodiversity Strategy and Action Plan.

Much has changed since the initial National Biodiversity Strategy and Action Plan for the Federated States of Micronesia was implemented in 2002, but what has not changed is our commitment and motivation to protecting our islands and working towards a sustainable future. Huge progress in conservation has been achieved in that time; all of our waters are designated a shark sanctuary, and we stand alongside our regional neighbors in our commitment to achieve the twin goals of the Micronesia Challenge to preserve 30% of our near-shore resources and 20% of our terrestrial resources by 2020. These and many other activities help bring us closer to meeting our commitments under the Convention on Biological Diversity and to the Sustainable Development Goals. Such progress has only been possible because of the people and communities of the Federated States of Micronesia, and the commitment they show to conserving their lands and waters. However, there remains much for us to do.

It is this determination to conserve and protect our biodiversity that has brought together government agencies, non-governmental organizations and communities from across our States to develop this revised National Biodiversity Strategy and Action Plan. The vision and actions within this Plan not only fulfill our obligations under the Convention on Biological Diversity, more importantly they provide us with a clear way forward for our efforts over the next five years.

Environmental activities, including biodiversity conservation, are primarily implemented by our four States, and so I anticipate working with each of the States in developing and implementing the actions and activities described in this National Biodiversity Strategy and Action Plan. I endorse full support of all the National Government agencies in assisting the States in the implementation of this National Biodiversity Strategy and Action Plan.

For the reasons above, I hereby fully endorse the National Biodiversity Strategy and Action Plan 2018–2023 for the Federated States of Micronesia.

The Honorable Marion Henry

Secretary, Department of Resources and Development, Federated States of Micronesia

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Executive Summary

The Federated States of Micronesia (FSM) is a country of incredible and unique biodiversity, and the importance of this biodiversity cannot be overstated. It is an intrinsic part of the country's many traditional cultures and practices, and a foundation for a secure, sustainable and economically independent future. With its multitude of low-lying islands and the fact that a large number of people live in coastal communities, the FSM is also at the forefront of climate change. Ensuring the FSMs biodiversity is healthy offers the best way forward for dealing with this, with robust ecosystems better able to withstand a changing climate and the resultant disturbances. It is therefore imperative that biodiversity in the FSM be conserved, protected and sustainably utilised. However, a number of threats to biodiversity in the FSM have been identified, including environmental conversion and degradation, over-exploitation of resources, waste management and pollution, invasive and alien species, climate change and infrastructure development.

This revised National Biodiversity Strategy and Action Plan (NBSAP) provides a road map for the protection of biodiversity in the FSM against these threats, with the following vision:

> *The FSM will have more extensive, diverse, and higher quality of marine, freshwater, and terrestrial ecosystems, which meet human needs and aspirations fairly, preserve and utilize traditional knowledge and practices, and fulfil the ecosystem functions necessary for all life on Earth.*

This revised NBSAP has been developed through a consultative process involving a great many people from across all four states and the national government. These included members of various governmental agencies at both state and municipal levels, UNDP, non-governmental organizations (NGOs), community-based organizations, scientists and educators. In so doing, this NBSAP is the product of a wealth of experience and expertise across these fields.

The development of this revised NBSAP follows the progress made under the initial NBSAP that was implemented in 2002. The themes that were identified in that first document remain as relevant today as they did then, and so this revised NBSAP utilizes the same themes to focus the actions needed to conserve the biodiversity of the FSM for the future:

- Theme 1. Ecosystem Management
  - Strategy Goal: A full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection
- Theme 2. Species Management
  - Strategy Goal: The FSM's native, endemic, and traditionally important species are protected and used sustainably, and its threatened species protected, for the benefit of the people of the FSM and the global community
- Theme 3. Genetic Resource Use
  - Strategy Goal: The FSM's genetic resources are accessible for utilization and all benefits derived are equitably shared amongst the stakeholders
- Theme 4. Agrobiodiversity
  - Strategy Goal: The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM
- Theme 5. Ecological Sustainable Industry Development
  - Strategy Goal: Economic development activities in the FSM meet the needs of the population while sustaining resources for the benefit of future generations
- Theme 6. Biosecurity
  - Strategy Goal: Border control, quarantine and eradication programs are effectively protecting the FSM's native biodiversity from the impacts of alien invasive species
- Theme 7. Waste Management
  - Strategy Goal: All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity
- Theme 8. Human Resources & Institutional Development
  - Strategy Goal: All citizens, residents and institutions of the nation are aware of the importance of biodiversity and have the technical knowledge, skills and capability to conserve, preserve and sustainably utilize, manage and develop all biodiversity within the nation
- Theme 9. Resource Owners
  - Strategy Goal: Traditional resource owners and communities are fully involved in the protection, conservation, preservation and sustainable use of the nation's biodiversity
- Theme 10. Mainstreaming Biodiversity
  - Strategy Goal: All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

- Theme 11. Financial Resources
    - Strategy Goal: Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

The landscape of biodiversity conservation in the FSM has changed dramatically over the 16 years since the implementation of the initial NBSAP. There are a number of developments in that time that are of particular note. In 2002, the Micronesia Conservation Trust (MCT) was established. The MCT supports biodiversity conservation, climate change adaptation and sustainable development throughout the FSM and wider Micronesia region. An ecoregional plan for the conservation of biodiversity in the FSM was developed in 2003, as communicated in *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia*. The FSM, along with a number of other countries, in 2006 committed to the Micronesia Challenge, with its twin aims of conserving 30% of near-shore resources and at least 20% of forest resources across Micronesia by 2020. In 2017, the FSM also enacted a law that expanded its no-commercial-fishing-zone to include 10% of the FSM Exclusive Economic Zone (EEZ). These initiatives are just four amongst a great many activities that have been developed and initiated across the FSM, further examples of which include the growth of a network of protected areas, both terrestrial and marine, the establishment of various conservation-focused NGOs, and significant levels of community engagement and commitment to the protection and sustainable management of natural resources. The national government, along with its four state governments, have increased both technical and financial support to the agencies and organizations spearheading biodiversity conservation efforts across the FSM.

This NBSAP highlights not only the progress that has been made over time, but also provides the necessary focus on the achievements that are needed in the future. It is vital, therefore, that this NBSAP remains visible and relevant over the coming 5 years. To help achieve this, an annual quick assessment process has been developed to allow progress on each of the actions within the plan to be evaluated, and new actions to be added as needed. After 5 years, the plan will undergo a full, consultative review, to ensure that it continues to accurately reflects the status and needs of biodiversity in the FSM over time.

1.0 Introduction

1.1. Introduction to the FSM

The Federated States of Micronesia (FSM) is an independent sovereign nation located in the North Pacific comprising four states from west to east; Yap, Chuuk, Pohnpei and Kosrae.

Formerly part of the United Nations Trust Territory of the Pacific Islands under US administration, which also included the Marshall Islands, the Northern Mariana Islands and Palau, the FSM ratified its own constitution in 1979. In 1986 the FSM signed a Compact of Free Association with the United States, and full independence was recognized in 1991 with the termination of the United Nations trusteeship. The Compact of Free Association with the United States makes provision for, amongst other things, economic support for the FSM. The terms of the Compact were renegotiated in 2003 and the revised Compact implemented in 2004, with financial assistance for the FSM agreed up to 2023.

1.1.1. Geography and geology

The FSM is located approximately 2,485 miles/4,000 km southwest of Hawaii and 1,864 miles/3,000 km north of eastern Australia, lying just above the equator. It comprises four of the five island groups that make up the Caroline Islands archipelago, the Western-most of these being Palau.

Extending across 1,680 miles/2,700 km east to west, and made up of 607 islands, the FSM has a total land area of approximately 271 sq. miles/702 km^2 with more than 3,730 miles/6,000 km of coastline (CIA, 2018). The FSM is a true ocean nation, with 3,950 km^2 of lagoon (Namakin, 2008) and an Exclusive Economic Zone that encompasses almost 1,158,300 sq. miles/3,000,000 km^2 of the Pacific Ocean (FSM PIO, 2011).

The islands themselves represent a range of geological types: low coral islands, raised coral islands, low lying atolls and volcanic 'high' islands (FSM, 2013). Volcanic outcrops are present on the high islands of Chuuk, Kosrae and Pohnpei, and island elevations range from sea level to a high point of 782 m at Nanlaud, Pohnpei (CIA, 2018). Each state is centered on one or more of these high islands, and all but Kosrae State contain numerous outlying atolls (FSM, 2013).

1.1.2 Population

The 2010 Census of Population and Housing recorded a total population for the FSM of 102,843 (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). Populations by state are: Yap, 11,377 people; Chuuk, 48,654 people; Pohnpei, 36,196 people and Kosrae, 6,616 people (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). There has been an overall fall in population since the 2000 census, reflected in a national population growth rate of -0.4. Growth rates vary by state, however, with Yap and Pohnpei registering positive growth, at 0.12 and 0.48, respectively, while Chuuk and Kosrae demonstrate negative growth with rates of -0.97 and -1.50, respectively. Yap, Chuuk and Pohnpei all demonstrated falling populations on their outer islands (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.).

In spite of this recent fall in overall population, the United Nations, Department of Economic and Social Affairs, Population Division projects that the population will return to positive growth for the next approximately 40 years, with a potential peak of around 130,000 people (UNDESA, 2017).

There has been a very slight shift towards urban living across the country, with 22,924 people, 22.3% of the population, dwelling in urban areas. This represents a slight increase from 21.8% in 2000 (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). The FSM remains, however, one of the least urbanized populations globally.

1.1.3 Economy

The FSM economy is largely based upon subsistence activities. Whilst this differs in major towns, where the economy is driven by government employment and commercial activities (U.S. Department of State, 2017b), nearly all households across the country engage in some form of subsistence activities (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). Based upon the 2013/14 Household Income and Expenditure survey, the average household income across the FSM is approximately $13,000 (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2014).

The national budget of the FSM has been in surplus since 2008 as consolidated government revenues have grown faster than expenditures. This is evidenced by the latest economic reporting, which shows that for the fiscal year 2016 total revenues were a little over $210 million, while expenditure amounted to approximately $208 million (FSM Office of Budget & Economic Management, 2017). Almost 80% of the National Government's domestic revenue in the fiscal year 2016 came from fishing license fees, which bring in approximately $60 million annually.

In terms of growth, while GDP growth was 3.8% for the fiscal year 2016, real GDP growth has averaged -0.2% per annum since the outset of the Amended Compact in 2004 (FSM Office of Budget & Economic Management, 2017). Fisheries contributed 4.3% GDP growth in the fiscal year 2016 (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2017). Conversely, agriculture contributed only 0.4% GDP growth, although it is identified as a priority sector for economic development (FSM Office of

Statistics, Budget, Overseas Development Assistance and Compact Management, 2017).

It must be recognized that presently the FSM economy remains heavily reliant on external financial inputs. In the fiscal year 2016, 33% of government expenditure was sourced from payments under the Compact of Free Association and supplemental educational grants from the US, 15% from other US grants, and 4% from aid from other countries, (GAO, 2018). Overseas development aid provides a significant source of revenue for the FSM, with $18.6 million dollars of aid received in 2016. Levels of aid directed to agriculture, fishing and the environment remains fairly constant year-to-year at around $0.2 million, $1 million and $0.4 million, respectively (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2017).

Naturally, the FSM is assiduously pursuing sustainable economic independence. Under the terms of the revised Compact, annual payments are made into a Compact Trust Fund with the purpose of supporting economic independence from 2024 onwards by providing an annual source of revenue to the National Government. At the end of fiscal year 2017 the net value of the fund was calculated to be almost $565 million (Trust Fund for the People of the Federated States of Micronesia, 2018).

1.2 Governance in the FSM

The FSM is a constitutional democracy with a National Government, based in Palikir, Pohnpei, comprised of executive, legislative and judicial branches. Governance of the FSM operates at national, state, municipal and traditional levels, with most power delegated to the four states by the national constitution. Each of the four states within the FSM has its own constitution, elected legislature and governor.

Under the FSM constitution, each state has the power to function as a semi-autonomous government, able to enact its own legislation to address issues relating to natural resources, and each state has its own set of environmental laws and regulations. State governments hold jurisdiction over coastal waters up to 12 nautical miles from land. Beyond this, the National government has jurisdiction over the remainder of the EEZ, i.e. from 12 nautical miles to 200 nautical miles from land.

Traditional culture and systems play an important part in governance of the FSM. The role of traditional chiefs varies not only between states but also within states, between high islands and the low-lying outer islands. These differences are reflected by the varying degrees to which traditional governance is included in the different state constitutions. Yap is the only state to constitutionally provide for a traditional leadership branch of the State Government, which comprises a council of chiefs from the Yap main islands and another from the outer islands, while Kosrae is the only state not to contain a tradition-specific article in its constitution.

There is currently no role for traditional chiefs at the national level. The FSM Constitution allows for the establishment of a Council of Chiefs, but to date this has not been implemented.

Traditional governance is extremely important in relation to environmental matters, largely owing to the nature of land rights and ownership that govern the usage of natural resources.

1.2.1 Traditional Culture and Land Ownership

The traditional cultures of the FSM are unique and play vital roles in all aspects of life across the country. Whilst English is the official language of government and secondary and tertiary levels of education (FSM, 2004), each state has its own languages, traditional cultures and systems.

Land ownership in the FSM is limited to citizens of the FSM only, with land lease terms varying by state (U.S. Department of State, 2017a). The majority of land and inshore marine areas are privately or collectively owned (The Nature Conservancy, 2003), with some variation between States. In Yap, the majority of land and near-shore marine areas are privately owned, and utilization of these areas is under traditional control. Similarly, in Chuuk most land and near-shore marine areas are in private hands, with ownership being predominantly inherited or gifted. Purchase of land in Chuuk has become a possibility more recently. In Pohnpei and Kosrae, the land is under a mix of private and State ownership, and the majority of near-shore marine areas are under State control and held as public trusts (FSM, 2010).

The unique systems of land tenure that exist across the FSM are accompanied by varying traditional management practices, and these unique cultural differences therefore require unique approaches to biodiversity conservation that are both place and context specific. Indeed, the central role of traditional cultures across the FSM places communities at the center of biodiversity conservation.

1.3 Living with Climate Change in the FSM

1.3.1 The FSM Climate

The FSM experiences a tropical climate, with consistently warm weather driven by the north-east trade winds. The average annual temperature in 2017 was around 82°F in Yap, Pohnpei and Kosrae, and 83.5°F in Chuuk (NOAA NCEI, 2018). There is little variation in temperature throughout the year, with no more than

a 3°F difference between the average warmest and coolest months (Australian Bureau of Meteorology and CSIRO, 2011).

The high islands of Chuuk, Pohnpei and Kosrae are generally hot and humid, with particularly high rainfall between May and November. Rainfall in the FSM is generally plentiful, with a wet season from May to October and a dry season from November until April. The West Pacific Monsoon (WPM) affects rainfall in the FSM, particularly in Yap State (Australian Bureau of Meteorology and CSIRO, 2011). In 2017 Kosrae received the highest annual rainfall of the four States, at around 230 inches. Pohnpei received around 190 inches, while Yap received almost 140 inches and Chuuk a little over 136 inches. (NOAA NCEI, 2018).

The FSM is strongly affected by the El Niño Southern Oscillation (ENSO), which has a particularly forceful influence on minimum air temperatures during the wet season (Australian Bureau of Meteorology and CSIRO, 2011). Based upon records taken in Yap and Pohnpei, El Niño is also associated with reduced rainfall during the dry season, with Pohnpei experiencing increased rainfall during the wet season in El Niño years (Australian Bureau of Meteorology and CSIRO, 2011). As freshwater availability is directly linked to rainfall, reductions in precipitation can lead to droughts in a very short space of time.

La Niña years are associated with extremely high tides in the FSM, which can lead to seawater inundation of crops and freshwater supplies (Fletcher & Richmond, 2010). The FSM is also vulnerable to extreme weather-related events, particularly typhoons, storm waves, flooding, landslides and drought.

1.3.2 A Changing Climate

Data from Pohnpei and Yap demonstrate increased average air temperatures in both locations, with the strongest trend, of +0.24°C per decade since 1950, seen in Pohnpei during the wet season (Australian Bureau of Meteorology and CSIRO, 2011). While sea surface temperature records demonstrate a degree of variability that makes it difficult to identify clear trends, waters around the FSM have been warming by approximately 0.11°C per decade in the eastern regions of the country and by 0.8°C per decade in the western regions since 1970 (Australian Bureau of Meteorology and CSIRO, 2011).

Based upon a growing body of data and evidence, projections of future climate variations can be made in the context of different levels of greenhouse gas emissions. Under a high emissions scenario, temperature increases greater than 2.5°C by 2090 in the FSM are projected with high confidence, with a similar temperature increase projected for the ocean surface (Australian Bureau of Meteorology and CSIRO, 2011). Annual rainfall is also projected to increase, somewhere in the range of >5% and >15% by 2090 depending upon the model used and the specific location within the FSM (Australian Bureau of Meteorology and CSIRO, 2011). In terms of extreme weather events, there is a projected decrease in droughts, with mild droughts occurring in the range of eight to nine times every 20 years by 2030, and severe drought occurring twice every 20 years by 2030. It is also projected that the number of typhoons will decline (Australian Bureau of Meteorology and CSIRO, 2011). It should be considered, however, that periods of drought followed by increasingly intense rainfall are increasing sedimentation run-off and coastal erosion, which in turn impacts essential marine ecosystems, such as seagrass meadows, and in turn marine productivity (Houk et al, 2013).

Of particular importance to the FSM, owing to reliance on near-shore coastal fisheries and the low-lying nature of many of its islands, are ocean acidification and sea level rise. In the case of ocean acidification, this is projected to rise throughout the 21st century resulting in reductions in the available form of calcium carbonate necessary for coral growth (Australian Bureau of Meteorology and CSIRO, 2011). As regards sea level, models suggest a rise of approximately 2–6 inches by 2030, and of approximately 8–24 inches by 2090 under a high emissions scenario (Australian Bureau of Meteorology and CSIRO, 2011). More than 80% of communities in the FSM are vulnerable to sea-level rise and flooding, given that most villages and settlements are situated in either coastal areas or in areas around rivers and streams (FSM, 2018). A 2010 study using the Coastal Module of the integrated Climate Framework for Uncertainty, Negotiation and Distribution assessment model suggested that a 1-meter sea-level rise by 2100 would incur damage costs in excess of 5% of GDP in the FSM (Anthoff et al, 2010).

A number of sectors within the FSM economy are recognized as being vulnerable to climate change, including fisheries, agriculture and tourism (FSM Department of Finance and Administration, 2018). These three sectors are also the focus of private sector investment, being considered as offering the greatest opportunities for short and long-term economic growth in the FSM (FSM, 2004), with all three dependent upon a healthy environment and thriving biodiversity, which are themselves also considered highly vulnerable to climate change (FSM Department of Finance and Administration, 2018).

2.0 Biodiversity in the FSM

Biodiversity in the FSM is rich and abundant with high levels of endemism, and is a recognized part of the globally important Polynesia-Micronesia biodiversity hotspot (CEPF, 2007). Biodiversity hotspots are not only biologically rich but also threatened, usually containing at least 1,500 endemic plant species and having lost at least 70% of their original surface area (CEPF, 2018). In the FSM, species richness declines from east to west across the FSM, with increasing distance from landmasses. As would be expected, endemism rises in the same direction (The Nature Conservancy, 2003).

There are two terrestrial and one marine ecoregion identified in the FSM. These represent exceptional examples of specific habitats that contain the most distinctive biodiversity for that habitat type. The terrestrial ecoregions comprise the Yap Islands State ecoregion and the Islands of Yap, Chuuk, Pohnpei and Kosrae ecoregion (WWF, 2018). Much of the Yap Islands State ecoregion is open savanna with secondary tropical dry forest. It contains three endemic bird species, which provide the basis for its ecoregion status, while also being home to a number of species with restricted ranges. The Islands of Yap, Chuuk, Pohnpei, and Kosrae ecoregion contain a unique mix of tropical moist broadleaf forests types. Pohnpei and Kosrae support the only remaining montane cloud forest in Micronesia, which are high in floral endemism. It has been further suggested that a biogeographic distinction can be made between Chuuk and Pohnpei, based upon the diversity and range of invertebrate species. It remains to be seen whether such a distinction is supported by other taxa (WWF, 2018). In terms of marine biodiversity, the FSM is a Tropical Coral ecoregion, containing some of the largest coral atoll complexes in the world (WWF, 2018).

An ecoregional approach to biodiversity conservation has been adopted in the FSM, with ecoregional planning initiated as part of the original NBSAP development process. Ecoregional planning is discussed in more detail below.

2.1 The Importance of Biodiversity to the FSM

The importance of biodiversity to the FSM cannot be overstated. It is an intrinsic part of the country's many traditional cultures and practices, and is the foundation for a secure, sustainable and economically independent future. A number of priority areas for economic development have been identified by the national government, including agriculture, fisheries, renewable energy and tourism. (FSM Office of Budget & Economic Management, 2017). Healthy biodiversity is essential to the success of each of these endeavors, ensuring long-term food and nutrition security and opportunities for securing revenue streams in the face of ongoing pressures such as climate change.

Biodiversity and traditional culture in the FSM cannot be considered in isolation from each other. Many native and endemic species are utilized in various aspects of daily living, including customary practices and traditional medicine, amongst many others. Historically, traditional knowledge, practices and modes of resource management have protected and conserved the FSM's biodiversity. This sustainable management has undergone a huge shift as the FSM's societies have changed over the past decades. The role of traditional knowledge is, however, increasingly recognized as playing an essential part in the conservation of biodiversity.

2.2 The Value of Biodiversity in the FSM

Naturally, the biodiversity of the FSM has huge intrinsic value, locally, regionally and globally. Placing an economic value on it has not, however, been possible to date. The need for improved environmental accounting in the FSM is clearly recognized, with a strategic way forward to developing better environmental statistics alongside a system of environment-economic accounting outlined by the Department of Resources & Development (FSM Department of Resources & Development, 2017). This includes the development of a national central repository for all environment-related data and the review of various existing datasets to identify their utility for statistical purposes. That being said, an examination of the value of fishing and agricultural activities both at a national and a household level can provide some, albeit limited, insight into the value of FSM's biodiversity.

First and foremost, subsistence activities reliant on biodiversity are vital to the economy as a whole and to individual household incomes. The vast majority of household are engaged in some form of subsistence activity. The 2010 Census of Population and Housing demonstrates that 94.6% of households are engaged in agricultural activity for household or family purposes, with 81.8% engaged in livestock raising activities and 71% of households engaged in fishing activities. Approximately 10% of households engage in these activities for commercial purposes (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). While an average of 47% of household income across the four states is from wages and salaries, receipts from subsistence activities provide an average of 8% of household income in Pohnpei, 9% in Kosrae, 26% in Chuuk and 29% in Yap (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2007).

Analyses based upon the Household Income and Expenditure Survey 2013/2014 data suggest that coastal subsistence fisheries make up 67% of all coastal fisheries production, at 3,555 metric tons. This translates to an estimated dollar value of US$8.8 million (Gillet, 2016).

Fishing license fees, primarily for tuna fishing, are a significant contributor to the FSM's domestic income stream, valued at approximately $60 million annually in terms of government revenue (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2017). The value of the offshore catch (predominantly tuna) from within the FSM's EEZ in 2014 has been estimated at approximately $85 million for locally-based vessels and approximately $228 million for vessels based overseas(Gillet, 2016).

When coastal commercial and subsistence fishing, offshore commercial fishing and aquaculture are considered together, the total value of the fisheries operations in the FSM are estimated at over $327 million, for a catch in excess of 170,000 metric tons and over 37,000 pieces (Gillet, 2016).

Considering agrobiodiversity, this is recognized as essential for future food and nutrition security, and plants once considered as subsistence crops are re-emerging as marketable produce (Ames et al, 2009). The Annual Household Income and Expenditure Survey 2013/14 estimates the value of subsistence agriculture across the FSM as being approximately $6.5 million (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2014). Beyond this, indicators of overall agricultural production are not yet in place (FSM Office of Budget & Economic Management, 2017), and there are no data to demonstrate the economic value of the nation's agrobiodiversity.

Whilst these figures offer only a glimpse of the benefits derived from the FSM's rich biodiversity, they are suggestive of the immense economic value that it holds.

2.3 The Value of Ecosystem Services in the FSM

2.3.1 Essential Ecosystems in the FSM

Although a small country by landmass, the FSM contains a diverse array of marine and terrestrial ecosystems. There are six distinct marine biomes, which comprise mangrove forest, estuaries, sea grass beds, lagoons, coral reefs, and open ocean, and twelve terrestrial biomes, which comprise atoll forest, littoral beach strand, mangrove forest, swamp forest, freshwater marsh, riparian forest, freshwater rivers and streams, grassland, secondary (agro)forest, primary forest, rain forest, and crest (dwarf or montane cloud) forest (FSM, 2018). The biodiversity within these biomes is characterized by a high rate of endemism and a profusion of species, and they deliver an array of essential ecosystem services.

The most prominent marine ecosystem in the FSM is its system of coral reefs. Covering an area of approximately 1,660 sq. miles/4,300 km^2 (Spalding et al, 2001), all types of reef, fringe, barrier, patch and atoll, are represented extensively across the four states. The coral reefs provide a number of essential ecosystem services. Not only are they a source of huge biodiversity for the waters of the FSM, providing spawning and nursery grounds for many economically important species, the reefs provide an essential source of food and income across the islands. The reefs protect the islands' shorelines and are a focus for tourism, which is itself a priority area for future economic development (FSM, 2004).

Many of the reef systems are found within lagoons, of which there are 1,525 sq. miles/3,950 km^2 in Yap, Chuuk and Pohnpei combined, with the largest single lagoon at 823 sq. miles/2,132 km^2 in Chuuk (Namakin, 2008). As well as myriad reefs, these lagoons also host essential seagrass beds, which provide a number of ecosystem services. Alongside mangrove forests and reef habitats, seagrass beds help to stabilize the wider environment, providing support for other biological communities. They stabilize sediments and act as a nursery habitat for many marine fish and invertebrates, some of economic importance, and so support the health of local fisheries (Green & Short, 2003).

A rapid ecological assessment of seagrass beds in the waters around Pohnpei and Ahnd atoll mapped approximately 17 sq. miles/44 km^2 of seagrass meadows and identified three species of seagrass associated with Pohnpei and two associated with Ahnd (CSP, 2006). Historical losses to seagrass beds in the FSM have, for example, resulted from the construction of a runway in Kosrae in the late 1960s, as well as dredging of seagrass beds for coastal road construction in Kosrae and Pohnpei. This highlights the potential damage coastal development, alongside boat traffic, effluent and land run-off, can cause (Green & Short, 2003).

On the border of the marine and terrestrial environments are the FSM's mangrove forests, of which there are approximately 94 km^2 across the islands. Pohnpei contains the greatest area of mangrove with approximately 22 sq. miles/57 km^2, followed by Kosrae with approximately 5.4 s miles/14km^2, Chuuk with approximately 4.6 sq. miles/12 km^2 and Yap with almost 4.2 sq. miles/11 km^2 (Donnegan, 2006). The mangrove forests of the FSM provide a number of vital ecosystem services. They absorb wave energy, thus protecting shorelines from erosion, and trap sediment that may otherwise smother seagrass and reef habitats. In addition, the mangroves support the FSM's fisheries through their role as nursery environments for many species of reef fish.

In Kosrae, an estimated 10% of mangroves were harvested in the 10-year period to 2006 (Hauff, 2006), and it is estimated that approximately 9% of mangroves have been lost in Yap in the years between 2006 and 2014. Potential causes for this loss are considered to be typhoon action or impact from an oil spill (Cannon et al, 2014). More generally, the mangroves forests are

thought to be impacted by a range of effects, including excess sea water depth at low tide, typhoons, fungi, harvesting, girdling to open channels and high-tide wave action (Cannon et al, 2014). Channel opening is often driven by dredging for coral aggregate, which can fetch approximately US$26 per cubic yard (Crooks et al, 2016). Potential future threats also include aquaculture pond construction and coastal development for housing, commercial, tourism or infrastructure purposes (Crooks et al, 2016).

The terrestrial landscape of the FSM is dominated by forests, which comprise various types, including upland forest, palm forest, swamp forest and agroforest. All forest types are represented in all four states, with the exception of palm forests, which are absent from Kosrae and Yap, and swamp forest, which is absent from Chuuk. Tropical montane cloud forests are found on Pohnpei and Kosrae, with those on Kosrae being some of the lowest in the world, beginning at an elevation of only approximately 300 m (Pouteau, 2018). Agroforest occupies significant areas of land in all four states, with 22.8 sq. miles/59 km^2 in Pohnpei, 16.6 sq. miles/43 km^2 in Chuuk, 10.4 sq. miles/27 km^2 in Yap and 5.8 sq. miles/15 km^2 in Kosrae (Donnegan et al, 2011).

All of the states contain non-forested land, including savanna and grassland, cropland and wetlands. Yap contains more non-forest vegetation than any of the other states, with approximately 6.4 sq. miles/16.5 km^2 of savanna or other scrub or grassland (Donnegan et al, 2011). Cropland accounts for only approximately 0.8 sq, miles/2 km^2 of land in Chuuk, 0.05 sq. miles/0.12 km^2 in Pohnpei, 0.02 sq. miles/0.06 in km^2 Yap and 0.01 sq. miles/0.02 km^2 in Kosrae. Areas classified as 'urban cultivated' account for larger, though still small, areas ranging from 0.5 sq. miles/1.2 km^2 in Yap to 0.8 sq. miles/2.1 km^2 in Chuuk (Donnegan et al, 2011).

Freshwater forested wetlands are most commonly found on Kosrae, though present on many of the high islands. Usually located between uplands and mangroves, along the lower reaches of streams and rivers, it is considered that these wetlands are likely to play a role in sediment trapping, along with floodwater retention, as well as being a habitat for wildlife (Allen, 2005).

Together, these ecosystems protect the islands and the population of the FSM against a number of natural phenomena and disasters such as storm surges, king tides, typhoons, and other natural disasters, they contribute to erosion mitigation, buffer wind and waves during storms, store and process essential nutrients, provide natural waste management, help to control pollution control and support the array of biodiversity resident in the FSM. The FSM's ecosystems have also been a key component to the country's cultures for more than 2,000 years, shaping island lifestyles, and creating the strong cultural identities and attachments to the environment that persist today.

2.3.2 Recognizing the Value of Ecosystem Services in the FSM

Whilst the instrumental value of the provision of myriad services from the FSM's varied ecosystems is recognized, attaching a dollar value to them represents a significant challenge. Estimating an economic value for ecosystems and ecosystem services can enable prioritization of conservation targets and assist in communicating their relative importance. However, whilst it is apparent that the economy of the FSM rests on the nation's biodiversity, attempts to place an economic value on the ecosystems of the islands have been extremely limited.

As has previously been discussed, fisheries provide a significant income at a national and household level. Some sense of ecosystem service value can be gleaned through a survey conducted in 2016 on the dependence of FSM communities on ecosystem services. This demonstrated that at three sites (Malem in Kosrae, Pakin in Pohnpei and Oneisomw in Chuuk), 75% of the household benefits come directly from marine (i.e. coral reefs, seagrasses) and terrestrial (i.e. mangroves, upland forest) ecosystems (Brander et al, n.d.). This same survey found that marine ecosystem provisioning services, including the catching of reef fish, pelagic fish and crustaceans, contributed 58.7% of household incomes; 11.2% as direct income 47.5% subsistence. This equates to a value of approximately $500 a month per household (Brander et al, n.d.). Across the wider Micronesian region, provisioning services account for 53% of the value of household income and benefits in watershed areas, and 49% on low-lying islands and atolls (Brander et al, 2018).

Mapping Ocean Wealth, a tool developed by The Nature Conservancy for communicating the value of marine and coastal ecosystems, estimates that the FSM's coral reefs provide an annual value of over $16 million through tourism and recreation services (The Nature Conservancy, n.d.).

Further assessment of ecosystem service values, economic as well as social and health-related, will be of immense benefit to ongoing conservation efforts and should be a focus for the future.

2.4 The Status of Biodiversity in the FSM

Since the initial National Biodiversity Strategy and Action Plan was developed, significant efforts have gone into researching the condition of and changes to the FSM's biodiversity. New data is, however, somewhat scattered and there remains a need for comprehensive documentation of the nation's biodiversity.

2.4.1 Marine and Coastal Biodiversity

Coral reefs, the most biodiverse ocean habitats, are a defining feature of the FSM, with the wider Micronesia region estimated to contain 4% of the world's coral reefs (The Nature Conservancy, 2016). These reefs support an abundance of biodiversity, upon which the population of the FSM relies. The

basis of the reefs, the corals themselves, are incredibly diverse in the waters of the FSM, with both soft and hard/stony corals extensively represented. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species lists 427 species of coral in the FSM's waters, 100 of which are considered to be vulnerable and three endangered (IUCN, 2018).

1,221 species of fish have been recorded in the waters of the FSM. Of these, 1,070 are associated with the extensive reef system (Froese & Pauly, 2018). Only six species, including the chronixis surgeonfish and the Caroline anchovy, are considered to be endemic to the FSM, and twenty-eight species are considered threatened.

Recent biological surveys of reefs across the FSM were undertaken by Houk et al (2015) to assess the percentage of reefs across the FSM that can be considered to be above the 'effectively conserved' threshold in the context of the Micronesia Challenge, based upon a number of criteria contributing to an overall ecosystem condition score. In Yap, 50% of outer reefs, 20% of channel reefs and 75% of inner reefs meet the threshold. In Chuuk 17% of outer reefs, 17% of patch reefs and 43% of inner reefs meet the threshold. In Pohnpei, 14% of inner and 30% of outer reefs can be considered 'effectively conserved, while in Kosrae 20% of outer reefs meet the threshold to be considered as such. The data from these surveys also demonstrated that fishing pressure was a primary determinant of reef condition.

Research on mesophotic coral reefs, which occur at depths of between approximately 30 and 150 m, in the waters around Pohnpei has been undertaken in recent years. This further supports the incredible biodiversity of the reefs in FSM, with 11 species of fish new to science being identified (Rowley et al, in press). The same research has also demonstrated the devastating impact that bleaching events can have on reef systems, with bleaching in 2016 and 2017 seen to extend beyond 30 m depth in some cases (Rowley et al, in press).

There are four turtle species native to the FSM: the Leatherback and Olive Ridley, which are considered vulnerable; the Green Turtle, which is considered endangered, and the Hawksbill Turtle, which is critically endangered (IUCN, 2018). In addition, seventeen cetacean species are listed by the IUCN as being found in the waters of the FSM including the sperm whale, which is considered to be vulnerable (IUCN, 2018).

The IUCN lists 139 marine invertebrate species for the waters around the FSM, including three species of sea cucumber that are considered endangered and four that are considered vulnerable, one vulnerable species of cockle and three conservation-dependent clam species (IUCN, 2018). More than 70 species of sea cucumbers have been recorded across the wider Micronesia region, performing an essential nutrient cycling function (Bossarelle, 2017). At least 42 species are present in the waters of Chuuk (Kerr et al, 2014), with 28 species recorded in Pohnpei (Bossarelle, 2017). A 2017 survey of sea cucumbers in Pohnpei Island and Ahnd Atoll suggest that stocks are low, below regional reference densities, and dominated by a small number of species (Bossarelle, 2017). This is considered to be due to prior over-harvesting.

2.4.2 Terrestrial Biodiversity

The majority of the terrestrial FSM is forested. Land cover estimates based upon satellite imagery of approximately 253 sq. miles/655 km^2 of the four states taken in 2005 and 2006 suggest that forests cover nearly 90% of the FSM (Donnegan et al, 2011). The largest expanse of forest, around 127 sq. miles/330km^2, is found within Pohnpei, while Yap contains the smallest amount of forest of all four states with almost 27 sq. miles/70km^2.

Considering the high degree of forest cover in the FSM, it is not surprising that plant diversity is extremely rich. More than 1,239 species of fern and flowering plant have been described in the FSM. Of these, 782 species are considered native, with more than 457 species introduced. Estimates of the number of plant species in the FSM remain based upon geographical checklists created in the 1970s and 1980s (Fosberg et al, 1979, 1982, & 1987), although the need for more recent data has been partly addressed through the 2010 checklist of vascular plants in Pohnpei State. This identified 935 native and non-native species and infraspecies, comprising 345 indigenous species, 52 endemic species, 360 cultivated species and 178 naturalized species. Seventeen of the 178 naturalized species are considered to be extremely aggressive and invasive (Herrera et al, 2010).

Estimations of plant endemism across the entire Micronesia region have been made, and these suggest that the FSM contains 110 endemic plant species (Costion & Lorence, 2012). While slightly lower than previous estimates, this value is still indicative of a highly rich biodiversity with a percentage endemism of 15.7 (species per km^2), higher than any other island biodiversity hotspot (Costion & Lorence, 2012). Table 1 provides estimates of plant endemism by State.

Table 1. Plant endemism by state in the FSM (Costion & Lorence, 2012)

Yap:	
9 endemic species Including *Psychotria arbuscular,* a shrub from the coffee family	8% endemism
Chuuk:	
16 endemic species Including *Garcinia carolinensis* (Ltb.) Kosterm and the herby vine *Hoya trukensis*	13% endemism
Pohnpei:	
47 endemic species Including *Peperomia breviramula* and the tree-shrub *Croton ripensis,* which are both considered to be rare with ranges that are not well understood	14% endemism
Kosrae:	
18 endemic species Including the uncommon *Pandanus kusaicolu* and *Medinella diversifolia,* which has a restricted range	16% endemism

Based upon collections made on Pohnpei and Kosrae by the New York Botanical Garden, it is estimated that 138 fungal species belonging to 67 genera exist in Pohnpei, and approximately 105 species belonging to 41 genera exist in Kosrae. The number of new or endemic species remains, as yet, unknown. The described species include eight bioluminescent species, and six edible species with significant local medicinal uses (Balick, 2011).

The FSM is home to 128 native species of bird, including 22 endemic species and 12 globally threatened species. One of these, the Pohnpei Starling, is considered to be critically endangered with a declining population estimated at being between only 1 and 49 individuals (BirdLife International, 2018). Three species in the IUCN list, the Kosrae crake, the Mangareva reed-warbler and the Kosrae starling are considered to be extinct (BirdLife International, 2018).

There are three endemic bird species resident in Yap; the Yap monarch (*Monarcha godeffroyi*) and two species of white-eye. Similarly, Chuuk is resident to three endemic bird species; the Truk white-eye (*Rukia ruki)*, the Truk monarch (*Metabolus rugensis*) and the oceanic fly catcher (*Myiagra oceanica*). Both the Truk white-eye and the Truk monarch are considered to be endangered (IUCN, 2018). Research by Floyd et al (2016) suggests that Kosrae, which was previously considered to be home to no extant endemic bird species, is home to two such species (and four endemic sub-species): the Kosrae fruit dove (*Ptilinopus hernsheimi*) and the Kosrae white-eye (*Zosterops cinereus*). Both were previously considered to be sub-species; the Kosrae fruit dove a component of the crimson-crowned fruit dove complex, and the Kosrae white-eye a sub-species of the dusky white-eye complex. Pohnpei is resident to seven endemic species; the Pohnpei Kingfisher (*Todiramphus reichenbachii*), which is considered to be vulnerable), the Pohnpei Lorikeet (*Trichoglossus rubiginosus*, which is near threatened), the Pohnpei Fantail (*Rhipidura kubaryi)*, the Pohnpei Flycatcher (*Myiagra pluto*), the long-billed white-eye (*Rukia longirostra*, which is near threatened), the Pohnpei white-eye (*Zosterops* ponapensis) and the aforementioned Pohnpei starling (*Aplonis pelzelni*) (IUCN, 2018).

There are fifteen Important Bird Areas (IBAs) across the FSM, totaling 57,336 sq. miles/148,500 km^2 of land and ocean, and two endemic bird areas (BirdLife International, 2018). There are no data around the status of the IBAs in terms of their state or the pressures upon them.

The IUCN identifies six species of terrestrial mammal in the FSM (IUCN, 2018). Three species of flying fox and one species of sheath-tailed bat are known to be endemic to the FSM, all four of which are considered to be threatened (IUCN, 2018). Previously it was considered that there were five endemic species of flying fox in the FSM, however, it seems likely that both the Micronesian flying fox and the Mortlock flying fox comprise two sub-species each with the FSM (Wiles, 2005). Included in the list of mammals are the Polynesian rat and the Philippine Deer, both of which are introduced species, and the latter of which has a declining population (IUCN, 2018).

Until relatively recently, biological surveys for reptiles in the FSM have been rare. Current data suggest that there 35 species of reptile either resident in the FSM or that are visitors, comprising one crocodile species, four sea turtle species, ten gecko, thirteen skink, one anole, one monitor lizard, two sea snake and three blind snake species (Buden & Taboroši, 2016). Of these, endemic species include the Ant Atoll Blind Snake, the Ulithi Atoll Blind

Snake, the Pohnpei Skink, the Mortlock Islands Scaly-tailed Gecko, and possibly the Giant Micronesian Gecko (Buden & Taboroši, 2016). There are also a small number of species considered to be unestablished exotics.

Information regarding terrestrial invertebrate fauna is scattered and incomplete. The IUCN lists 69 species of terrestrial invertebrates, including two species of snail considered to be critically endangered; the Pohnpei tree snail (*Partula emersoni*) and the Pohnpei ground Partula snail (*Partula gaumensis*) (IUCN, 2018). New locality records for ten species of butterfly were made between 2007 and 2013 (Buden & Tennent, 2017). Whilst the species recorded are widespread across Oceania, they demonstrate that there is much still to learn about the invertebrate fauna of the FSM.

2.4.3 Inland waters

There are records of 64 species of freshwater dwelling fish in the FSM, including four endemic species and two introductions (Froese & Pauly, 2018). The freshwater goby *Lentipes caroline* was identified as a new species in only 2013, based upon specimens collected in high gradient streams on Pohnpei (Lynch, 2013).

2.4.4 Eco-regional planning

An ecoregional planning approach to biodiversity conservation has been adopted in the FSM. This approach, which prioritizes areas of conservation need to build a portfolio of conservation targets, allows for the development of a conservation plan for a nation containing myriad species of national and global importance for which the development and implementation of individual conservation and management plans would be impossible.

Utilizing The Nature Conservancy's planning framework, and recognizing the lack of comprehensive data on nearly all aspects of biodiversity in the FSM, a number of project teams came together during meetings and workshops to develop the ecoregional plan. Through this process an initial fifty-three key conservation targets representing terrestrial, marine and coastal, and freshwater ecological systems, terrestrial natural communities, special ecological features, and terrestrial, marine and freshwater aquatic species were identified.

Through a further process of identifying conservation goals for these targets, a portfolio of 130 Areas of Biodiversity Significance was developed. A key outcome of ecoregional planning, these Areas of Biodiversity Significance were identified based upon the number of conservation targets within an area, the feasibility of conservation in that area, the positive conservation leverage conservation activity in that area may have on adjacent areas, the urgency of the threats being faced by the species, communities and ecosystems in that area, and the cultural and historic value of the area. The identified Areas of Biodiversity Significance account for approximately 87 sq. miles/226 km^2 of the terrestrial landscape, 319 sq. miles/827 km^2 of marine-only waters, 1,783 km^2 of coastal marine waters and 32 sq. miles/82 km^2 of coastal freshwater.

From these sites, twenty-four Priority Action Areas were identified, to enable the initiation of effective conservation measures in the context of limited resources, both financial and human. The Priority Action Areas represent 48% of the total terrestrial portfolio of Areas of Biodiversity Significance and 49% of the coastal/marine portfolio.

Discussed in detail in *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia* (The Nature Conservancy, 2003), the network of sites included in the ecoregional plan ensures the conservation of a full representation of the FSM's ecosystems. As such, it addresses the first thematic strategic goal in the NBSAP, i.e. that a full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection.

Implementation of the ecoregional plan requires comprehensive planning, significant funding, and engagement at all levels of society, with a focus on a network of community established and managed conservation areas. Specifically, the Micronesians in Island Conservation Network has been established to engage government and non-government agencies in a peer-learning network that aims to increase the effectiveness of conservation in the identified Priority Action Areas, helping to make sure that conservation activities are scientifically and culturally viable.

During the ecoregional planning process, critical threats to the Areas of Biodiversity Significance were also identified, with overfishing/overhunting recognized as the single most critical threat to biodiversity in the FSM. In addition, the process highlighted a number of key data gaps relating to a number of the key conservation targets, many of which remain unfilled.

2.4.5 The Micronesia Challenge

The most significant conservation initiative to come about since the initial NBSAP was drafted is the establishment of the Micronesia Challenge in 2006. At that time, the FSM, along with the Republic of the Marshall Islands, the Republic of Palau, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI), developed and committed to the Micronesia Challenge, which has the dual aims of conserving 30% of near-shore resources and at least 20% of forest resources across Micronesia by 2020 (Micronesia Challenge, n.d.).

The Micronesia Challenge has been a catalyst for creating a regional web of mutually reinforcing projects, programs, and peer-learning networks to improve the condition and management of the essential ecosystems and natural resources that the people of Micronesia rely on. Reflecting the region's diverse resource tenure systems and traditional management practices, national and sub-national government agencies with policy, regulatory, and enforcement mandates are partnered with

non-governmental organizations (NGOs) with conservation and community outreach and mobilization skills to work with communities and traditional leaders to manage resources, conserve biodiversity, and increase ecosystem and community resilience to climate change. International universities, institutes, and conservation organizations provide scientific knowledge and support, while regional peer-learning networks connect resource managers and NGOs from across the Micronesia Challenge, functioning as capacity building and knowledge sharing platforms.

In working to achieve the Micronesia Challenge marine and terrestrial targets, government and non-government partners across the FSM have championed the creation of new terrestrial and marine protected areas. Effective protected areas result in more resilient ecosystems, better able to withstand the impacts of climate change and marine protected areas have proven to be one of the best ways to protect diverse and healthy marine ecosystems and coral reef communities.

The FSM National and State governments and their numerous partners are also working towards sustainable financing for protected areas. This includes the FSM's Micronesia Challenge Endowment Fund sub-account that was established as a result of the FSM's commitment to the Micronesia Challenge, and which is administered by the MCT to support protected area management through contributions and investments. As of October 2017, this Endowment was valued at just over $5.7M.

As part of the Micronesia Challenge, the FSM, the MCT, government, NGO and community partners have all worked closely together through participatory processes and consultations to establish more than fifty state, municipal, and community-legislated and/or traditionally-declared protected areas. These areas cover a wide range of marine, terrestrial, and atoll ecosystems. In September 2018, the national government of the FSM endorsed the National Protected Areas Network Policy Framework (NPANPF), developed in 2015 in cooperation with a number of local partners. The NPANPF outlines a transparent, fair, and efficient system governing the designation and operation of a nationwide protected areas network, inclusive of state-level protected area networks in Yap, Chuuk, Pohnpei, and Kosrae. This nationwide network is designed to facilitate the national government's delivery of assistance to its states in the protection of significant areas of biodiversity, key habitats, and other valuable resources. The NPANPF establishes procedures for the management entities of protected area sites to apply to join the protected area management network, and outlines the benefits of membership in the nation-wide network, including access to long-term and sustained technical and financial assistance.

The FSM's NPANPF is designed to augment efforts at the state, municipal, and community levels throughout the country to achieve conservation and climate change adaptation goals, which broadly reflect the country's participation in the Micronesia Challenge, the United Nations Convention on Biological Diversity, and the United Nations Framework Convention on Climate Change. Funding for the operation of the NPANPF will come from a combination of national government allocations, state financial and in-kind support, and investment earnings from the FSM's Micronesia Challenge Endowment Fund.

Also in 2015, the MCT and the FSM Department of Resources and Development prepared a companion document to the NPANPF: the associated Country Program Strategy (CPS), with guidelines and procedures for the disbursement of investment earnings from the FSM's Micronesia Challenge Endowment Fund. The strategies and procedures for dispersing these earnings described in the document are intended to support the operation of the FSM's protected areas network.

2.4.6 Threatened species

There are a number of species in the FSM that are considered to be threatened to varying degrees. The IUCN identifies 325 species as being threatened to varying degrees or, in some cases, extinct. Table 2 includes details of those species identified by the IUCN as critically endangered or endangered.

The majority of the IUCN assessments for the FSM were made subsequent to the initial NBSAP, so it is not possible to identify any change in status over time based on the IUCN Red List data.

2.4.7 Summary status changes

As has previously been states, losses to various ecosystems have been experienced across the FSM, and a significant number of native and endemic species are considered endangered.

Major changes in biodiversity are most clearly seen in the marine environment, where the main threats come from overfishing, coral bleaching due to rising sea temperatures, and the impact of crown of thorns starfish (Houk, 2018). Indeed, it has been suggested that up to 25% of hard coral species in Kosrae could be considered vulnerable to regional extinction, owing to low levels of occupancy (Richards, 2014).

An analysis of the Pohnpei near-shore fishery comparing data from 2006 and 2015 demonstrated a changing in catch composition, a reduction in catch-per-unit-effort and a reduction in overall volume caught (Rhodes et al, 2018). During the same time period, the use of unsustainable fishing methods increased. These data suggest a reduction in the abundance of fish and in general and of specific species, which will likely have repercussions across reef ecosystems. Data from Kosrae comparing fish and coral assemblages between 1986 and 2015 demonstrate a shift in composition, with larger-bodied, predatory fish and sharks being replaced with smaller-bodied fish at lower trophic levels (McLean et al, 2016). These data also demonstrate that both fish and coral populations have become more highly differentiated with reduced species overlap, perhaps as a result of localized disturbance patterns.

It is clear that the pressures on biodiversity in the FSM are many and varied. From overfishing of the reefs to forest loss for the

growth of cash crops, and from development activities such as dredging to the presence of invasive species, the pressures on the native flora and fauna of the FSM are apparent and increasing.

Table 2. Critically endangered and endangered species of the FSM as identified by the IUCN (IUCN, 2018)

Species	Common name/s	Red List status	Population trend
Anacropora spinosa		Endangered	Decreasing
Aplonis pelzelni	Pohnpei Starling	Critically endangered	Decreasing
Eretmochelys imbricata	Hawksbill Turtle	Critically endangered	Decreasing
Partula emersoni	Pohnpei tree snail	Critically endangered	Unknown
Partula guamensis	Pohnpei ground Partula snail	Critically endangered	Unknown
Calidris tenuirostris	Great Knot	Endangered	Decreasing
Cheilinus undulatus	Giant Wrasse, Humphead, Humphead Wrasse, Maori Wrasse, Napoleon Wrasse, Truck Wrasse, Undulate Wrasse	Endangered	Decreasing
Chelonia mydas	Green Turtle	Endangered	Decreasing
Cycas micronesica		Endangered	Decreasing
Dendroceros japonicus		Endangered	Decreasing
Edolisoma insperatum	Pohnpei Cicadabird	Endangered	Decreasing
Edolisoma nesiotis	Yap Cicadabird	Endangered	Stable
Emballonura semicaudata	Pacific Sheath-tailed Bat, Polynesian Sheath-tailed Bat	Endangered	Decreasing
Emoia boettgeri	Micronesia Forest Skink, Boettger's Emo Skink	Endangered	Decreasing
Emoia ponapea	Ponape Skink	Endangered	Decreasing
Holothuria nobilis	Black Teatfish	Endangered	
Holothuria scabra	Golden Sandfish, Sandfish	Endangered	Decreasing
Holothuria whitmaei	Black Teatfish	Endangered	
Metabolus rugensis	Chuuk Monarch, Truk Monarch	Endangered	Decreasing
Millepora tuberosa		Endangered	Decreasing
Numenius madagascariensis	Far Eastern Curlew, Eastern Curlew	Endangered	Decreasing
Porites eridani		Endangered	Unknown
Pteropus mariannus	Marianas Flying Fox, Marianas Fruit Bat, Marianna Flying Fox, Micronesian Flying-fox, Micronesian Flying Fox, Pagan Island Fruit Bat, Ulithi Fruit Bat	Endangered	Decreasing
Rhincodon typus	Whale Shark	Endangered	Decreasing
Rukia ruki	Teardrop White-eye, Faichuk White-eye, Great Truk White-eye, Large Truk White-eye, Truk White-eye	Endangered	Decreasing
Sicyopterus eudentatus		Endangered	Decreasing
Sphyrna mokarran	Great Hammerhead, Hammerhead Shark, Squat-headed Hammerhead Shark	Endangered	Decreasing

2.5 Gender and Biodiversity in the FSM

The differing roles of women and men in society in the FSM in terms of livelihoods and the division of labor means that experiences of biodiversity, and awareness of changes in biodiversity over time, may be gendered. Men and women may cultivate different crops, with women often producing crops predominantly for consumption rather than sale. In addition, women may take the predominate role in food preparation within a household. These differing experiences provide unique insights into biodiversity, agrobiodiversity and perceptions of changes in biodiversity. To this end, consultations with women's groups in each of the four states were undertaken during the development of the revised NBSAP to support better understanding of this unique perspective.

Women across the FSM have different degrees of involvement in caring for forest gardens, crops, livestock and fisheries. In Kosrae these were noted as being predominantly male activities, while in Chuuk female involvement was significant. Women do, however, undertake the majority of food preparation across all four states, and so have a clear view on food availability, size and quality.

In terms of growing food, many women tend agroforest gardens, and it is widely recognized that changes in the seasons of specific food plants have taken place in recent years. Of particular note is breadfruit, which is being harvested later in Pohnpei, and which is seen as being smaller and of poorer quality in Chuuk and Pohnpei. In Kosrae, a general reduction in crop size for many plants has been noted. Climate change is considered to be a major role in this, with some areas reporting increased rain, and others a drying out of land such as taro patches. In Yap, saltwater intrusion into taro patches has been experienced in those patches near the coast. Crops such as banana and taro have had to be relocated in areas of Kosrae owing to saltwater intrusion into traditional growing areas. In Kosrae, a number of previously common plants such as Kosraean lime, tangerine and apple amongst others, have become uncommon and seasonal, when they used to be abundant year-round. These are cash crops for women in Kosrae, and so the reduction in availability is likely to contribute to economic insecurity.

In terms of marine resources, reductions in number, size and quality have been noted in relation to marine resources, with overfishing and pressures from export markets considered to be key roles in this. In Pohnpei, a reduction in sea cucumbers close to shore was noted amongst other changes, whilst in Yap a decrease in the size of mud clams has been observed.

In Pohnpei and Kosrae it has been noted that some medicinal plants are harder to find today than they were in the past.

Growing numbers of invasive plant and animal species have been witnessed across all states. A sharp increase in non-native plants occurred in Chuuk in 2015, following typhoon Maysak. Perceptions are mixed as to whether these new species are problematic or not, although removal of such plants is widely considered important. Increasing numbers of pests have been noted too, with termites recognized to damage coconut trees in Kosrae and white fly affecting vegetables also in Kosrae. Little fire ants have recently been introduced to Yap and are being monitored.

In terms of awareness around the importance of biodiversity, this appears to be good across the states, at least amongst those women involved in the consultations. Participation in awareness campaigns was also apparent.

Whilst clearly anecdotal, what these experiences and perceptions demonstrate is that biodiversity, both terrestrial and marine, is changing. The availability and quality of species utilised for food and medicine seems to be, in the main, declining. Climate change is perceived to be having an impact on agrobiodiversity, with sea water inundation of taro patches supporting this. Recording these experiences and perceptions is important as they show how the everyday experiences of biodiversity in the FSM reflects the scientific data. They demonstrate that biodiversity conservation isn't an issue only for scientists and policy-makers, but is essential to the everyday wellbeing of people across the FSM.

2.6 Sustainable Utilization of Biodiversity in the FSM

Through a number of unique initiatives an array of environmentally friendly and economically empowering projects that model sustainable use of local biodiversity, are being implemented across the FSM.

In 2015, the establishment of the Green Banana Paper (GBP) company in Kosrae marked a significant step in the FSM as a model for the economically sustainable use of local biodiversity. The company mission is to create local jobs and sustainable livelihoods by transforming agricultural waste into plant-based products. GBP recycles harvested banana stems, which would otherwise be considered a waste by-product of the fruit harvest, into exportable, artisanal paper products. As banana plants fruit only once and must then be chopped down to make room for self-replicating offshoots, banana stems are a rapidly-renewable local resource that through GBP can provide additional income to local subsistence farmers. GBP therefore operates a "waste-to-wealth" cycle that supports sustainable economic development in the FSM.

In 2016, the Awak Youth Organization, the Awak Farmer's Association and the Conservation Society of Pohnpei (CSP) were alarmed that the Awak Village river was declared one of the most severely contaminated in Pohnpei, with the primary source of pollution being the 26 pigpens built nearby. Over the course of the year, the organizations collaborated to implement a project encouraging farmers in the area to convert their pigpens to a dry-litter system designed to prevent waste entering the river system. The dry-litter system also results in the production of compost, which can then be sold. The project involves a revolving fund

whereby community members receive loans to convert their piggeries to the dry-litter system, selling the resulting compost and paying down the loans.

In 2017 in Pohnpei, a local organization Menin Katengensed (MK) opened a sustainable seafood market, PMK Market. The first of its kind in Pohnpei, PMK Market aims to provide an alternative livelihood and fair-trade strategy for local fishermen based upon the use of sustainable harvesting techniques. The market provides a self-financing mechanism for the organization and opens a direct avenue for awareness-raising to fishers and consumers. The PMK Market also seeks to provide fishers with an option-to-buy opportunity, which helps them to purchase materials to extend the quality of their catch and improve sustainability within the fishery.

In 2018, the FSM Petroleum Corporation, Vital, began implementation of the Coconut-for-Life (C4L) program. C4L is a development program aimed at rehabilitating the coconut agroforestry and processing industry across the FSM. The purpose of the program is to provide sustainable agricultural trade opportunities, and to improve the living standards of communities through local socio-political structures and institutions by utilizing a modified Participatory Guarantee System (PGS). The project will purchase coconuts from local farmers to provide income and support livelihoods.

In 2018, the Pohnpei-based Awak Farmer's Association began producing plates out of betel nut palms as a substitute product for polystyrene and plastic plates for use in the FSM. Betel nut palm is an abundant natural resource and the plates are hypo-allergenic, food and human safe, and biodegradable after use. The development of this project not only contributes to the environmentally friendly and sustainable use of local biodiversity but is also providing an alternate income source for the villagers.

Established in 1997, the Marine and Environmental Research Institute of Pohnpei (MERIP) is an organization that supports environmentally and economically viable natural resource-based businesses through technical services, partnerships and research. MERIP focuses on developing sustainable livelihoods through small scale mariculture ventures with communities adjacent to protected areas. As of mid-2018, MERIP has worked with 62 small farmers around Pohnpei helping them develop farms for bath sponges, corals, and giant clams for the marine ornamental trade. MERIP develops products, provides training and materials to community members, and also establishes overseas markets for these products. MERIP also bolsters private sector development by working with sustainable mariculture wholesalers in the Micronesia region.

Many other initiatives have been implemented in all four states, demonstrating numerous ways in which biodiversity can be used to support sustainable livelihoods.

2.7 Climate Change and Biodiversity in the FSM

Even though various projections have been made about future changes to climatic and environmental conditions in the FSM, the impacts of climate change are already being felt. The FSM has experienced some of the highest rates of sea-level rise around the world during the period of available satellite and tide gauge monitoring. Naturally such changes, and variations in atmospheric and ocean temperature and precipitation patterns, will impact biodiversity. As species that are able to migrate do so, and others that are unable to migrate disappear, entire ecosystems will change, and with those changes will come repercussions for those that depend upon the services they provide.

Considering the marine environment, it is likely that coastal fisheries will be negatively affected in a number of ways by climate change. Rising temperatures and increasing precipitation are predicted to increase stratification of the ocean water column and so reduce the supply of nutrient-rich water to the surface mix layer across the western and central Pacific Ocean (Barrange et al, 2018). Rising sea levels will exacerbate the effects of storm surges on coastal fish habitats (Barrange et al, 2018). Sea level rise will also likely lead to the loss of mangrove forests owing to intolerance to extended immersion in sea water (Barrange et al, 2018). The survival of such forests will depend upon the ability of the forests to migrate, which will be affected by terrain and the speed of sea level rise.

A 'business as usual' model of CO_2 emissions projects ocean acidification in the western and central Pacific Ocean to a degree that reduces the available form of calcium carbonate used by corals to levels at which complex coral systems do not occur. Therefore, it can be assumed that serious degradation of coral reefs will occur by 2050 (Barrange et al, 2018). Ocean circulations are also likely to change under a high-emissions scenarios, impacting nutrient flows (Barrange et al, 2018). Applying a climate–fish–fisheries approach to modeling the impact of climate change on fisheries, Lehodey et al (2017) suggest a reduction in yellowfin tuna stocks of up to 40% by 2100, based upon a high-emissions scenario. Similarly, the FSM's waters are likely to become less favorable for skipjack tuna spawning (Lehodey, 2013).

In terms of the terrestrial environment, there have been anecdotal reports from across the country of changing weather patterns resulting in different harvesting patterns than previously recognised (FSM, 2018), highlighting the risk to essential agricultural activities from a changing climate. Climate projections also suggest that the FSM as a whole will see an increase in rainfall. This brings with it an increased risk of natural disasters such as floods and landslides, which can in turn lead to ocean sedimentation. Conserving biodiverse watershed forests will help build resilience against such events and so in turn help to avoid

the coastal sedimentation that this can bring, as well as helping to safeguard the human population against physical harm.

In addition to the risks to biodiversity of climate change, biodiversity itself plays an essential role in building resilience to climate change in the FSM. Ensuring the FSMs biodiversity is healthy offers the best way forward for dealing with climate change, with robust ecosystems better able to withstand a changing climate and the resultant disturbances.

2.8 Major Threats to Biodiversity in the FSM

In addition to the ongoing pressures brought about by climate change, biodiversity in the FSM faces a number of other threats. An assessment of the proportions of selected amphibians, birds, mammals and plants affected by different threats by Kingsford et al (2009) suggested that 90% of assessed species in the FSM are affected by habitat loss, 38% by invasive species, 48% by over-exploitation and 10% by pollution. Whilst the numbers of species assessed in this analysis were fairly low, this does illustrate the pressure that biodiversity in the FSM is under.

Overfishing/overhunting is recognized as the biggest threat to the Areas of Biodiversity Significance identified in the ecoregional approach to conservation adopted in the FSM (The Nature Conservancy, 2003). In the period 2006–2015, catch per unit effort for coastal fishing in Pohnpei decreased, while marketed reef fish volume declined approximately 20%, demonstrating the impact of unsustainable fishing practices (Rhodes, 2018).

Environmental degradation and conversion represents a significant threat to biodiversity, with any development activity having the potential to impact important ecosystems. The FSM *Infrastructure Development Plan FY2016–FY2025*, which outlines the infrastructure priorities for the national and state governments, identifies that all projects under the plan will comply with the outcome measure for Strategic Goal 1 of the Strategic Development Plan, i.e. that an environmental impact assessment will be carried out on all government and non-government development activities (FSM, n.d.).

Waste management is a continuing challenge, with solid waste disposal a municipal-level responsibility. However, not all municipalities have a refuse collection service (ADB ,2014), and disposal of waste causes local pollution problems. Disposal of scrap metal is a continuing problem, with abandoned vehicles a source of pollution from chemical leakage.

Small islands are particularly vulnerable to the effects of alien and invasive species, which are most commonly introduced via air transport and shipping. The Global Register of Introduced and Invasive Species, initiated by the IUCN and developed by the Invasive Species Specialist Group to address Aichi Target 9, contains 592 entries for the FSM. Verified records suggest that 526 invasives are plant species, 62 are animal and one is fungal, with a small number of bacteria and virus species (GRIIS, 2018). The Threatened Island Biodiversity Database lists 39 islands across the FSM that are known to contain IUCN-recognized threatened species whose populations are threatened by invasive species (Threatened Island Biodiversity Database Partners, 2016). These islands contain nine threatened species across 53 populations facing pressures from 21 invasive species across 105 populations. The invasive species range from cane toads (*Bufo marinus*) and brown tree snakes (*Boiga irregularis*) to feral populations of domestic livestock such as chickens and water buffalo.

Priority invasives include rat species, cats and pigs, with rats implicated in the extinction of two bird species endemic to Kosrae; the Kosrae crake (*Porzana* monasa) and the Kosrae starling (*Aplonis corvina*) (Pagad, 20015). Rat species, along with an introduced flatworm species, are also known to be the primary threat to a number of mollusk species endemic to Pohnpei. On Ahnd Atoll, Pohnpei, a number of species including the Caroline Islands ground dove are threatened by invasives such as cats and rats, while native species on Ulithi Atoll, Yap face threats from pigs, oriental house rats (*Rattus tanezumi)* and mangrove monitor lizards (*Varanus* indicus) (Griffiths, 2018). Successful programmes eradicated the Polynesian rat (*Rattus* exulans) from the small island of Dekehtik, and the black rat (*Rattus rattus*) from the islands of Nahnkapw and Pein Mal, all located off Pohnpei, by 2007. However, these programs are currently the exception, rather than the rule.

Recognizing the threats to biodiversity is not limited to environment-specific policy and action. The FSM's Strategic Development Plan 2004–2023 identifies a range of causes for the steady degradation of the nation's environment. These include: population growth and migration; over-harvest of fish and wildlife resources brought on by increasing economic expectations amongst the population; human activities such as land clearing, logging, dredging, mining, agriculture, uncontrolled disposal of wastes, burning, reclamation, and coastal/near-shore degradation; natural hazards such as those associated with extreme weather events, climate change, high tides and sea-level rise; and competition with or predation by introduced alien species (FSM, 2004). The Strategic Development Plan goes on to identify a number of goals to address these threats, all of which align and support the strategic themes of the NBSAP, demonstrating a clear alignment of policy approaches.

The threats identified in the Strategic Development Plan are in broad agreement with the threats to biodiversity identified in the initial NBSAP. These threats were further supported throughout the consultation process for this revised NBSAP, and so have been retained, as follows:

- Environmental conversion and degradation
- Over-exploitation of resources
- Waste management and pollution

- Invasive and alien species
- Climate change
- Infrastructure development

2.9 Constraints to Biodiversity Conservation

A number of constraints to biodiversity conservation were identified during the development of the initial NBSAP. These were:

- Rapidly Increasing Populations and more Consumptive Lifestyles
- Inadequate Scientific Base Line Biological Information on the Status of Biodiversity
- Insufficient Aquatic and Terrestrial Conservation Areas and Management Plans
- Insufficient Biodiversity Legislation and Lack of Enforcement
- Insufficient Skilled/Trained Human Resources
- Insufficient Coastal Planning and Zoning
- Inadequate Awareness of Links between Conservation and Sustainable Economic Development
- Insufficient Funding for Conservation Activities

The consultation process for this revised NBSAP identified something of a shift in constraints. Considering those from the initial NBSAP, it is clear that increasingly consumptive lifestyles persist, though the population of the FSM can no longer be said to be rapidly increasing. Though data may be lacking, an inadequate scientific base can no longer be said to be the case as increasing efforts go into mapping and recording the biodiversity of the FSM. In fact, significant changes have occurred related to each of the initial constraints, from a growing body of legislation (though perhaps, not yet enough) to increasing access to sources of funding for conservation activities. As such, the constraints to biodiversity conservation in the FSM today are seen as being:

- Ongoing increases in consumptive lifestyles
- Limitations to funding, in terms of priorities for available funds and awareness of routes to alternative funding streams
- Insufficient institutional and technical capacity
- Inadequate enforcement of legislation and regulations
- Inadequate coordination between funding bodies leading to redundancies in conservation activities
- Conflicting, and changing, political priorities undermining conservation efforts
- Inadequate awareness across all levels of society of links between conservation and sustainable economic development
- Insufficient community engagement

2.10 Conservation Initiatives and Priorities

In Pohnpei, the Pohnpei Watershed Forest Reserve was established under the Watershed Forest and Mangrove Protection Act of 1987, to help protect the integrity of the island's watershed on public trust lands and conserve the biodiversity both in the watershed forest and mangrove forests, the latter being recognised as essential to healthy and productive fisheries. This represents one of the earliest conservation initiatives in the FSM. Since the development of the initial NBSAP in 2002, significant developments toward comprehensive biodiversity conservation throughout the FSM have been undertaken. These programs and initiatives demonstrate the strong commitment across the FSM for the protection of its precious natural resources and the achievement of a sustainable future.

The Micronesia Conservation Trust

In 2002, the Micronesia Conservation Trust (MCT) began operating as the first conservation trust fund in the region. The MCT supports biodiversity conservation, climate change adaptation and sustainable development throughout the FSM and wider Micronesia region. This support is achieved by providing sustained funding to support context- and site-specific programs with an emphasis on community-led solutions and building the capacity of Micronesian organizations to implement conservation programs. It is able to support the establishment of community protected areas, livelihoods projects and projects to support communities to adapt to climate change stressors through well-established relationships with many partner organizations locally, regionally and internationally. The MCT is accredited to both the Adaptation Fund (AF) and the Green Climate Fund (GCF). Under the GCF, MCT is accredited to support individual projects to a value of $10 million.

The MCT vision: Enduring partnerships that conserve our land and sea to improve quality of life for communities across Micronesia.

The MCT mission: We build partnerships, raise and manage funds, make grants, influence policy, and provide conservation and financing expertise.

Since 2002, the MCT has become an intrinsic part of the conservation landscape across Micronesia, an is a vital asset in the achievement of biodiversity conservation in the FSM.

A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia

Following the development of the initial NBSAP, *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia* was published in 2003. This document details the ecoregional plan developed by The Nature Conservancy in concert with a variety of experts and government and conservation agencies. Described in detail in the section above, this contributes to the implementation of the NBSAP strategic goal to protect and conserve a full representation of the FSM's marine, freshwater and terrestrial ecosystems by putting forwards a list of twenty-four priority areas for immediate conservation (The Nature Conservancy, 2003).

The Micronesia Challenge

Of significant importance to conservation in the FSM was the establishment of the Micronesia Challenge in 2006. Previously described in detail, the Micronesia Challenge is a shared commitment by the FSM, the Republic of the Marshall Islands, the Republic of Palau, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI), to conserve 30% of near-shore resources and at least 20% of forest resources across Micronesia by 2020 (Micronesia Challenge, n.d.). The Micronesia Challenge has led to the development of an extensive range of conservation projects through the wider region, and more than fifty state, municipal, and community-legislated and/or traditionally-declared protected areas established in the FSM alone. This work is supported by the FSM's Micronesia Challenge Endowment Fund.

Other significant initiatives

The regional Pacific Islands Managed & Protected Areas Community (PIMPAC) was established in 2005 to address the unique challenges faced by marine protected area managers across Micronesia. It aims to provide opportunities for information expertise, practice, and experience exchange in order to enable and support site-based and ecosystem-based management capacity. It has a number of state and national-level partners across the FSM and provides training for all-important capacity building in the sphere of marine conservation (PIMPAC, n.d.).

Also in 2005, Utwe, Kosrae was declared a biosphere reserve under the United Nations Educational, Scientific and Cultural Organization (UNESCO) biosphere reserves program, which is designed to identify sites that support both biodiversity conservation and sustainable use. This was followed by the declaration of Ahnd Atoll, Pohnpei as a biosphere reserve in 2007 (UNESCO, 2011).

The Nationwide Climate Change Policy was enacted in 2009, with two biodiversity-specific goals; the need to use ecosystem-based approaches to climate change adaptation where applicable, and the encouragement and strengthening of traditional knowledge application to conservation practices, also for the purposes of adaptation (FSM, 2009).

National legislation was implemented in 2015 creating a shark sanctuary across the full extent of the FSM's EEZ. This is part of the wider Micronesia regional shark sanctuary, the first of its kind in the world, which covers 2.5 million sq. miles/6.5 million km^2 and comprises the waters of the FSM, Palau, CNMI, Marshall Islands and Guam

In 2016, the FSM submitted its first Nationally Determined Contribution under the United Nations Framework Convention on Climate Change. This commits the FSM to reducing greenhouse gas emissions to 28% below the 2000 level by 2025, with additional reductions up to 35% below the 2000 level considered achievable with international financial, technical and capacity-building support (FSM, 2016). These are ambitious targets, particularly in light of the country's minimal contribution to global greenhouse gas emissions, but reflects the seriousness of the threat of climate change to the FSM and other small island developing nations.

In 2017 a congressional bill was signed in to law setting aside approximately 10% of the FSM's EEZ for conservation. Supported by the Micronesia Conservation Trust and other partners through the "FSM for 10%" campaign, the law prohibits commercial fishing and exploitation of marine resources in an area extending to 12 nautical miles seaward of the territorial sea, i.e. between 12 nautical miles and 24 nautical miles from the shore (Micronesia Challenge, 2017)

The FSM contains a number of protected areas, both terrestrial and marine, that fall under the FSM Protected Area Network. Various figures exist for the number of these areas, based upon the different criteria used to classify them. However, a 2009 gap analysis of protected areas suggested that at that time 637 sq. miles/1,650 km^2 of terrestrial and marine environments were under protection across the FSM, with approximately 246 sq. miles/638 km^2 in Yap, 130 sq. miles/337 km^2 in Chuuk, 254 sq. miles/657 km^2 in Pohnpei and 7 sq. miles/19 km^2 in Kosrae (MCT, 2009). An additional 147 sq. miles/382 km^2 were recorded as being outside of protected areas but within Area of Biodiversity Significance Action Sites as identified through the ecoregional planning process, with a further 542 sq. miles/1,405 km^2 in Area of Biodiversity Significance Standard Sites (MCT, 2009).

Biological surveys of MPAs have been undertaken in Chuuk Lagoon, Pohnpei Lagoon and Nimpal Channel, Yap. In Chuuk Lagoon, two of the three MPAs demonstrated significantly higher coral richness than their reference sites, and one site exhibited significantly greater species richness, fish density and biomass than its reference site, though this was not replicated at all MPAs (Andrew et al, 2011). In Pohnpei Lagoon, fish biomass was significantly higher in two of the MPAs compared with their reference sites, though coral cover did not differ particularly by protection status (Koshiba et al, 2011). In Nimpal Channel, Yap, fish biomass was significantly higher in the protected area

compared with the reference site, while coral condition was not related to protection status (Olsudong et al, 2012). These surveys, though only snapshots of relatively small areas, demonstrate various benefits to these MPAs, whilst also highlighting the unique conditions and status of each site.

The first conservation easement in the region, a system whereby landowners surrender certain development rights in return for annual payments from an easement fund, was implemented in Kosrae state in 2014 to protect the Yela Ka Forest, the largest stand of *Terminalia carolinensis* trees in the world. This enables traditional ownership of the forest, and sustainable traditional harvest of forest resources, to continue while preventing future development of the land.

Another initiative in the region is the Micronesian Center for Sustainable Transport (MCST), based at the University of the South Pacific (USP) campus in the Marshall Islands and established in 2013 (MCST, 2017). The MCST is a unique program addressing the need for Pacific states to transition to low carbon transport pathways. The MCST provides a space for willing partners to collaborate on research, analysis and implementation of practical projects within a common program. In many instances, the MCST formalizes and consolidates already existing research and project networks that have been active for some time across the Micronesia region. With its physical home in the Marshall Islands, the MCST knowledge portal is a virtual Center of Excellence providing connectivity between a number of related international programs and this work on low carbon transport transition.

3.0 Background to the Revised National Biodiversity Strategy and Action Plan

The FSM became a signatory to the Convention on Biological Diversity during the 1992 United Nations Conference on Environment and Development, with ratification in 1994 (Government of the FSM, n.d.). Under Article 6 of the Convention, each signatory country is required to develop and implement a National Biodiversity Strategy and Action Plan (NBSAP). This document is the first revised NBSAP to be developed following the initial NBSAP in 2002.

The 2002 NBSAP has been supplemented by the development of two National Reports, one in 2010 and one in 2014. These detailed progress on the implementation of the NBSAP. In addition, *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia* (The Nature Conservancy, 2003) supports the implementation of the NBSAP through the development of an ecoregional conservation plan for the FSM.

In 2010 the Convention on Biological Diversity adopted a new Strategic Plan for Biodiversity for the decade from 2011 to 2020, which included the Aichi Biodiversity Targets. The Aichi Targets are designed to enable the achievement of the Vision, Mission and Strategic Goals of the Strategic Plan. Implementation of the Strategic Plan requires that all signatories to the Convention review and update their NBSAPs, using the Strategic Plan and its Aichi Targets as a flexible framework, and integrate the Aichi Targets into national targets. The national targets should themselves contribute to the reaching of the Aichi Targets, with signatories adopting their updated NBSAPs as policy instruments and using them for the integration of biodiversity into national development, accounting and planning processes. In addition, signatories should monitor and review implementation of their NBSAPs and national targets using relevant indicators (CBD, n.d.).

It is relevant to note that achievement of the Micronesia Challenge targets of conserving 30% of near-shore resources and at least 20% of forest resources by 2020, to which the FSM committed in 2006 (Micronesia Challenge, n.d.), would mean that Aichi Targets 11 and 12, the conservation of at least 10% of coastal and marine areas, and the conservation of at least 17% of terrestrial and inland water areas by 2020, respectively, would be significantly surpassed (UNEP, 2010).

Following the development of the Aichi Targets, multiple biodiversity indicators have been developed to help evaluate progress towards their achievement (Biodiversity Indicators Partnership, 2018). These indicators range from estimates of global human impacts on marine ecosystems to protected area coverage. At present, there are not sufficient FSM-specific data for the majority of these indicators to be populated.

The FSM's commitment to matters of national and global environment go beyond the CBD. There are in excess of 200 pieces of national and state legislation that relate to the environment of the FSM, including the FSM Environmental Protection Act, which became Public Law in June 2012. Of particular note are the various state-level protected area network laws that has been put in place, and the national Protected Area Framework that is in development to ensure a full range of the FSMs ecosystems and biodiversity is protected and conserved. Furthermore, each of the four state-level Joint Strategic Action Plans for Disaster Risk Management and Climate Change recognize the role and importance of the NBSAP and their respective state biodiversity strategy and action plans.

More widely, the FSM is signatory to a number of international treaties and conventions that relate to the nation's, and the world's, environment and biodiversity (Government of the FSM, n.d.). Details of these can be seen in Table 3.

3.1 Development Process for the Revised NBSAP

Oversight of the revision process was provided by the Micronesia Conservation Trust, and a process of research, consultation and validation was followed. Initial, extensive research was undertaken to provide latest-possible data and information regarding the status of biodiversity within the FSM and the pressures it is under.

The themes and objectives as defined in the initial NBSAP were then taken out to consultation in each of the four states. During a two-day workshop in each state, multi-stakeholder groups were engaged to review the NBSAP for ongoing relevance, identifying what progress had been made, where additional efforts were needed under current objectives and actions, and where new actions were required. These groups comprised officials from national, state and municipal governments, regional, state and community NGO representatives, technical experts, scientists, researchers and educators involved in environmental education. The Micronesia Conservation Trust was accompanied by Ricky Carl The Nature Conservancy during these consultations.

In addition to these consultations, specific women's focus groups were held in each state. These were conducted to ensure that the different interactions with and observations of biodiversity experienced by women in the FSM were understood and incorporated into the revised NBSAP.

Following this process, feedback from all four states was collated and combined into a revised document. This document was circulated to a select group from the original consultations, who then convened for a further two-day validation workshop.

Table 3. International treaties and conventions to which the FSM is signatory (Government of the FSM, n.d.)

Treaty/convention	
Convention on Biological Diversity	Ratification: 20 June 1994
United Nations Framework Convention on Climate Change	Ratification: 18 November 1993
Kyoto Protocol to the United Nations Framework Convention on Climate Change	Ratification: 21 June 1999
United Nations Convention on the Law of the Sea	Accession: 29 April 1991
Convention for the prohibition of fishing with long driftnets in the South Pacific	Ratification: 20 December 1990
Treaty on fisheries between the Governments of certain Pacific Island States and the Government of the United States of America	Ratification: 10 November 1987
United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	Ratification: 25 March 1996
Montreal Protocol on Substances that Deplete the Ozone Layer	Ratification: 6 September 1995
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Accession: 6 September 1995
Convention to ban the importation into Forum island countries of hazardous and radioactive wastes and to control the transboundary movement and management of hazardous wastes within the South Pacific Region (Waigani Convention)	Ratification - 23 May 1997
International Plant Protection Convention	6 July 2007 (Contracting party only)
World Heritage Convention	Acceptance: 22 July 2002
Stockholm Convention on Persistent Organic Pollutants	Ratification: 22 May 2001
Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity	Signature: 11 January 2012
The Convention for the Protection of Natural Resources and Environment of the South Pacific Region (the Noumea Convention)	29 November 1988

3.2 State Biodiversity Strategy and Action Plans

States in the FSM take responsibility for the management of land and near-shore natural resources, with the national government primarily responsible for those resources within the Exclusive Economic Zone. It is therefore appropriate that each state develops its own biodiversity strategy and action plan (BSAP). Following the initial NBSAP development process, therefore, each state developed an individual BSAP.

Under the process for revising the NBSAP, each of the state plans was also considered during the two-day state consultations and subsequent two-day validation workshop. For each state BSAP, objectives and actions were considered in terms of progress, relevance and the need for new actions. This information also fed into the NBSAP process. Similarly, following revision of the state BSAPs, they were subject to the same validation workshop as the NBSAP.

By following this process, it is intended that the NBSAP and individual state BSAPs are mutually supportive and reflective of each other.

3.3 Lessons Learned from the Prior NBSAP

Implementation of the initial NBSAP has utilized a number of programs and approaches, most notably *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia* and the Micronesia Challenge. These, along with the establishment of the Micronesia Conservation Trust, have enabled significant progress to be made across all of the NBSAP themes. In this way, the initial NBSAP

served to bring a much-needed focus on conservation to the FSM. The revised NBSAP will serve to build on the successes of the initial NBSAP and drive forward biodiversity conservation in the FSM.

It is recognized that this revised NBSAP is overdue. It is the intention that this be addressed through a revised process of ongoing evaluation and periodic revision, as described in the section Monitoring, Reporting and Reviewing. In this way, it will be possible to maintain a focus on the NBSAP, ensuring it is used by relevant agencies as a tool to shape ongoing and future conservation policies and activities.

4.0 The National Biodiversity Strategy and Action Plan

4.1 Vision

The FSM will have more extensive, diverse, and higher quality of marine, freshwater, and terrestrial ecosystems, which meet human needs and aspirations fairly, preserve and utilize traditional knowledge and practices, and fulfil the ecosystem functions necessary for all life on Earth.

This vision for the FSM's National Biodiversity Strategy and Action Plan remains as relevant today as when the initial NBSAP was drafted, reflecting its broad intrinsic and instrumental values.

4.2 Guiding Principles

As with the initial NBSAP, a number of guiding principles underpin this revised strategy and plan:

- **Sovereign Rights -** The people of the FSM hold the sovereign rights over their biological diversity.
- **Community-based Approach -** The community is the basic management unit for biodiversity in the FSM – they have the right and responsibility to manage and sustainably develop their biodiversity resources for their benefit and that of future generations.
- **Traditional Heritage -** We will build upon and utilize the rich traditional knowledge and experience of our ancestors to devise and implement strategies for the sustainable stewardship of our rich natural resources.
- **Ecological Integrity –** We will strive to maintain and improve the diversity and quality of our ecosystems, conserving our biodiversity in-situ while enhancing our ecosystems' capacity to adapt to change.

In addition to these principles, climate change and gender are recognized as specific underlying themes to the entire NBSAP. The focus on climate change reflects a shift in priorities since the initial NBSAP was drafted, while the need to consider gender is recognized as vital to fully understanding the importance and experience of biodiversity across society in the FSM.

4.3 Strategy and Action Plan

This document supports not only the national FSM strategic goals, but also the strategic goals and their related Aichi targets under the CBD Strategic Plan for Biodiversity 2011–2020.

As a whole, this document supports Aichi Target 17 under Strategic Goal E:

- Strategic Goal E: *Enhance implementation through participatory planning, knowledge management and capacity building*
- Target 17: *By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.*

National and State governments have not yet developed a specific set of indicators to measure progress towards the objectives within the various BSAPs.

The Themes from the initial NBSAP were deemed to still be relevant and so have been retained as the main structure of this revised NBSAP. Similarly, the majority of objectives remain relevant and, along with the actions, have been modified or added to as appropriate based upon the consultation feedback.

Theme 1. Ecosystem Management

Strategy Goal:

A full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection

Progress to date

Substantial progress has been made towards this theme, with numerous protected areas designated across the terrestrial and marine environments of all states. In Kosrae, for example, the Mahkontowe Conservation Area, a terrestrial upland/watershed protected area, has been established with an accompanying management plan. Many protected areas have been designated in line with the Areas of Biodiversity Significance identified in *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia*. In addition, numerous protected areas have been community driven, based on the desire to ensure sustainable resource management.

Significantly, one of the main targets of the Micronesia Challenge is to develop a nation-wide protected area network to ensure the conservation of areas of significant biodiversity, unique or key habitats and areas containing other valuable resources. By implementing a Protected Area Network, the national government will be able to support each state's protected areas by making technical expertise and finances more accessible. All four states have either developed or are developing the relevant legislation or regulations to enable their protected areas to be integrated into the Protected Area Network, and a national-level Protected Area Network Policy Framework was adopted in October 2018 to help facilitate the necessary national support. This network represents one of the largest steps towards fulfilling the strategic goal under this theme.

The Ridge to Reef program was launched across the Pacific in 2016 under the Global Environment Facility. This program, adopted by the FSM, seeks to ensure biodiversity protection and conservation is undertaken in a way that is integrated with sustainable land use and management. The 'ridge to reef' concept reflects the intrinsic links between the health of terrestrial and marine ecosystems, and the need to maintain essential ecosystem services to sustain livelihoods. The program supports the growing number of designated protected areas across the FSM.

Naturally, ongoing monitoring of protected areas is required. Annual assessments of marine protected areas are in place across the states, and the Micronesia Protected Area Management Effectiveness (MPAME) tool is being utilised across many protected areas, both marine and terrestrial, to help guide ongoing management and assist capacity building efforts.

Both within and outside of terrestrial protected areas, forest inventories are being carried out across the FSM. In 2016, in collaboration with the United States Forest Service (USFS) regular Forest Inventory Analysis (FIA) program, an additional 93 intensified FIA plots within protected area network sites and other priority landscape areas were established. Ultimately, this program will improve the effectiveness of the Micronesia Challenge and enable the development of comprehensive data sets that will be essential to ongoing monitoring and adaptive management strategies.

Related CBD Strategic Goals and Aichi Targets:	
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 5:	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced
Target 6:	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits
Target 7:	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Goal C:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 11:	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes

Target 14:	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable

Related Sustainable Development Goals:

Goal 2:	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 6:	Ensure the availability and sustainable management of water and sanitation for all
Goal 8:	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 12:	Ensure sustainable consumption and production patterns
Goal 14:	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss

Micronesia Challenge:

Effectively conserve at least 30% of the near-shore marine resources and 20% of the terrestrial resources across Micronesia by 2020

Objective 1: Research and monitoring

To undertake research and resource assessment/evaluation for the identification, documentation and monitoring of the FSM's ecosystems for the implementation of appropriate resource management programs, including conservation and protected areas

Actions:

- Undertake regular comprehensive biological resource surveys of the nation's terrestrial, marine and freshwater biodiversity
- Periodically obtain aerial imagery to update vegetation maps, document and evaluate land use practices and conditions of the aquatic environment
- Develop and implement long-term monitoring programs at the state level for all ecosystems within each State to provide scientific information on the status of the nation's biodiversity through time
- Natural resource management agencies and relevant institutions to work together to develop priority research topics to be addressed and standardized monitoring techniques to be taught and utilized by all States, ensuring appropriate emphasis is given to the full array of aquatic and terrestrial ecosystems
- Publish all research and monitoring documents on an ongoing basis and develop a database of these that is available to the public
- Develop and implement a program for monitoring the impact on biodiversity from climate change
- Examine the feasibility of creating a National Research Unit to strengthen the permit process and maintain oversight of all research activities, including but not limited to biodiversity and climate change research, and ensure results from all research programs are made available to the FSM

Objective 2: Conservation Areas

To enhance the management of existing conservation areas and establish new areas to achieve a full representation of the FSM's ecosystems and support climate change resilience building

Actions:

- Undertake regular gap analyses of protected areas to support the expansion of the Protected Area Network
- Further develop and implement management plans for the existing marine and terrestrial conservation areas within the nation
- Integrate traditional conservation methods techniques into management plans where appropriate

- Continue to identify, develop, design and implement management plans for new aquatic and terrestrial conservation areas within the nation, especially in areas that are currently poorly represented, contain unique habitats, or have high levels of threats
- Integrate all management plans and protected area programs with community/resource(s) owner participation activities including enforcement
- Incorporate large conservation areas to include more than one ecosystem (e.g. mangroves, sea grass beds, lagoon systems and barrier reefs), and consider integrating a ridge-to-reef approach that combines terrestrial and marine ecosystems
- Further develop and maintain an appropriate information system (e.g.: Geographical Information System) to store and share information on ecosystems and conservation areas
- Continue to develop and refine the Ecoregional Conservation Planning process for the nation and implement recommendations
- Identify and conserve critical watershed areas
- Further develop and implement programs for the restoration of degraded aquatic and terrestrial ecosystems, prioritizing those of endemic, endangered and threatened species
- Further develop and implement conservation of biodiversity in important natural and cultural heritage sites throughout the nation (e.g. Nan Madol, Pohnpei State)
- Update the document *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia*

Objective 3: Sustainable Use of Ecosystems

To develop and implement effective management programs that ensure income-generating activities that use biodiversity resources sustainably

Actions:

- Finalize, implement and enforce ecosystem management plans through legislation. Enforcement actions are required to eliminate destructive practices (e.g. dynamite fishing)
- Develop guidelines and protocols for the sustainable use of the nation's biodiversity (e.g. eco-tourism, non-timber forest products and mariculture)
- Ensure all foreign investment activities that utilise the nation's biodiversity are sustainable
- Undertake economic valuations of ecosystem services for terrestrial, aquatic area use
- Increase the number, improve and maintain mooring buoys located within designated marine areas in each state for large vessels, especially the tuna fishing fleet

Indicators

Selected key indicators under this theme include, but are not limited to:

- Number of terrestrial and marine protected being designated
- The degree of research data being generated and published about the ecosystems of the FSM
- Establishment of state-level Protected Area Network legislation or regulations that support the national Protected Area Network Policy Framework

Constraints

Achievement of the various actions within this theme will rely on a substantial degree of political will, the lack of which will greatly hinder progress. Financial and human capacity also have the potential to be limiting factors, particularly technical capacity to undertake research and monitoring and, moreover, to analyse collected data. Community engagement will be vital to ensuring success across the activities within this theme.

Theme 2. Species Management

Strategy Goal:

The FSM's native, endemic, and traditionally important species are protected and used sustainably, and its threatened species protected, for the benefit of the people of the FSM and the global community

Progress to date

Concern over the use of natural resources has increased over time throughout the FSM, and with progress in the protection of species and ensuring any utilization is sustainable being seen in all states.

Various species-specific conservation measures have been put in place, including a ban on dynamite fishing in Chuuk, a ban on the taking of bumphead parrotfish for sale in Pohnpei, and no-take seasons in place for this and other fish species in each of the states. Minimum size requirements exist for various species in different states, such as minimum size of 6 inches for pearl oysters taken in Kosrae and Pohnpei. In addition, traditional closure laws are in place in Chuuk, limiting access to specific areas and implemented by communities and resource owners. In Kosrae a trochus sanctuary has been established, and regulations around harvesting trochus are in place in both Yap and Chuuk. Species-specific activities are not limited to the marine environment. In Yap, for example, the establishment of a fruit bat sanctuary has been proposed and is the beginning phases of development.

Monitoring and inventorying of species occurs across the states as part of ongoing ecological assessments of marine and terrestrial environments, for example, the monitoring of marine protected areas and the forestry inventory assessments. This monitoring forms part of a science-to-management loop that forms the basis of management of protected areas across the FSM.

Various sustainable industries have been developed in the FSM, with notable examples including the Green Banana Paper Company, and Wawa's banana chips, both in Kosrae and both sustainably utilizing locally grown bananas.

There is still much progress to be made under this theme, for example in some instances, efforts to put in place legislation to protect and manage species have not been successful. However, the importance of this theme is recognised across the FSM, and it is reflected in the strategic plans of the individual states.

Related CBD Strategic Goals and Aichi Targets:	
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 6:	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits
Target 7:	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Target 9:	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment
Goal C:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 11:	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes
Target 12:	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

Related Sustainable Development Goals:	
Goal 1:	End poverty in all its forms everywhere
Goal 2:	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 6:	Ensure the availability and sustainable management of water and sanitation for all
Goal 8:	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 12:	Ensure sustainable consumption and production patterns
Goal 14:	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss

Micronesia Challenge:

Effectively conserve at least 30% of the near-shore marine resources and 20% of the terrestrial resources across Micronesia by 2020

Objective 1: Conservation of Species

To identify, preserve and conserve all native, endemic, threatened, and traditionally important species in the FSM through effective conservation programs

Actions:

- Develop guidelines and procedures for registering protected species in a national protected species registry
- Establish, maintain and update a threatened species list
- Regularly review existing lists of threatened species in peril and develop and implement appropriate conservation programs. Determine which species are suitable for recovery/reintroduction programs (including propagation) and investigate the potential and feasibility of developing captive breeding programs to prevent species extinctions
- Develop State botanical gardens to house collections of native flora
- Work with other countries to further develop and implement regional and international programs to protect migratory species (e.g. turtles)
- Further develop and strengthen endangered species laws and regulations
- Develop and implement programs for the conservation and protection of native species and varieties from the destructive impact of alien and invasive species

Objective 2: Research and Monitoring

To undertake research for the identification, documentation and monitoring of species contributing to the implementation of appropriate conservation and management programs

Actions:

- Undertake ongoing research programs to complete the identification and current status of the nation's flora and fauna
- Make funding available to enable forest inventory assessments to take place every 5 years
- Make funding available to enable comprehensive marine assessments to take place every 5 years
- Establish and implement resource-monitoring programs for species that are threatened, rare, endemic, commercially harvested and culturally significant, with an emphasis on developing protocols that can be adopted by communities
- Develop a central location within each State that will house all research findings and distribute them to interested parties
- Develop monitoring programs to evaluate, document, and implement appropriate actions on threats to the biodiversity of the nation
- Support and develop program to monitor ocean temperature and acidification, and to evaluate the impact of coral bleaching, crown of thorns starfish, land-based pollution, and other threats to coral reefs

- Develop research and monitoring programs to identify the presence and evaluate effects of invasive species and develop control and/or eradications programs where appropriate

Objective 3: Sustainable Use and Management of Species

To ensure the sustainable use and management of species for social and economic development

Actions:

- Re-evaluate and/or develop appropriate sustainable management plans, including sustainable harvesting levels and enforcement programs for all commercial and subsistence harvested marine (inshore and offshore), freshwater and terrestrial flora and fauna
- Through legislation and enforcement eliminate all destructive harvesting practices (e.g. dynamite and fish poisoning fishing)
- Develop and implement native forest regeneration and rehabilitation programs
- Develop and encourage environmentally sustainable and economically viable aquaculture and forest product programs
- Identify and implement suitable sustainable use management programs for species that are important for the eco-tourism industry (e.g. game fishing, manta ray observations, mangrove forest tours)
- Establish environmental certification "green products" for natural resource export by the private sector at sustainable levels (e.g. marine aquarium council certification and forest stewardship certification)

Indicators

Key indicators under this theme will relate directly to the outcomes of specific actions, such as the enacting of legislation in all states to prevent destructive harvesting practices. More general indicators include, but are not limited to:

- Up-to-date population numbers for endemic, threatened and important species
- Regularly updated monitoring and assessment data
- The number of species-specific conservation programs that are put in place

Constraints

Many of the constraints related to the actions under this theme relate to funding and capacity, with ongoing monitoring and assessment for species conservation requiring sources of funding for people and equipment. Capacity is a related issue, ensuring adequate technical expertise is available to undertake monitoring and subsequent data analysis. Both funding and capacity are naturally also potential constraints for regulatory enforcement, such as no-take seasons for specific marine species.

Political will is an ever-present constraint in relation to furthering legislative and regulatory controls for the protection and sustainable utilization of specific species.

Theme 3. Genetic Resource Use

Strategy Goal:

The FSM's genetic resources are accessible for utilization and all benefits derived are equitably shared amongst the stakeholders

Progress to date

The importance of intellectual property and the equitable sharing of benefits derived from biodiversity is well recognized in the FSM. The FSM signed the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity in January 2012, and ratified it a year later. Subsequently, the FSM developed a national Access and Benefit Sharing Framework. Furthermore, individual states have implemented their own legislation to try to ensure equitable sharing of benefits derived from their biodiversity. In Yap, a Royalty Law is in place that requires that 10% of all income from the final work product sold should return to Yap in the form of royalty fees. Similarly, in Kosrae a Royalty Act is in place, and Chuuk State a benefit sharing law drafted.

It is evident that further work is needed to address the majority of the actions under this theme.

Related CBD Strategic Goals and Aichi Targets:	
Goal D:	Enhance the benefits to all from biodiversity and ecosystem services
Target 16:	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation

Objective 1: Equitable Sharing of Benefits of Genetic Resources

To develop and implement appropriate national and state legislation measures to effectively access genetic resources and carry out fair and equitable sharing of benefits from the use of these resources

Actions:

- Develop National and State bioprospecting legislation
- Develop National and State bioprospecting enforcement programs and penalties
- Develop and implement appropriate benefit sharing mechanism and legislation for all holders of traditional knowledge and owners of resources utilized in bioprospecting
- Develop National and State legislation asserting royalty rights over final products involving FSM natural resources
- Clearly define through appropriate legislation intellectual property rights
- Establish a bioprospecting-coordinating national expert panel
- Develop, implement and enforce a scientific code of conduct for all biodiversity and bioprospecting research in the FSM
- Develop and implement a research permit process that includes provision for hiring local associates in order to assure that local capacity is developed and supported in conjunction with research on genetic resources
- Develop and implement a system for tracking biodiversity research in the nation
- Establish a process for permitting the collection of biological specimens needed for scientific studies in order to comply with international regulations on the transport of biological specimens as well as to control biopiracy

Indicators

Establishment of appropriate legislations is the key indicator for actions under this theme. In addition, demonstration of biodiversity-related research permitting and appropriate cataloguing of related data are important measure of success.

Constraints

Whilst any legislation-related actions have the potential to be constrained by a lack of political will, there remains an issue of capacity under this theme. This is particularly relevant in relation to establishing and executing appropriate systems for permitting and monitoring research and bioprospecting across the FSM.

Theme 4. Agrobiodiversity

Strategy Goal:

The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM

Progress to date

The importance of conserving agrobiodiversity is recognized in relation to food and nutritional security, human health and food sovereignty. It is, therefore, not surprising that numerous initiatives have been developed to promote the sustainable use and conservation of agrobiodiversity across the FSM.

In Kosrae, hydroponics is being utilized by the Kosrae Women in Farming Group as a way to improve crop production, while in Chuuk, nurseries for food crops and endemic agricultural species have been established. In 2004, the Island Food Community of Pohnpei was established to promote the use of local food. This not only helps to ensure a healthy, nutritious diet but also promotes the conservation of native varieties and cultivars.

In Yap, regulations to allow farming groups to be achieve official co-operative status is being addressed. This would enable such groups to apply for funding to support ongoing agrobiodiversity-focused activities, such as the establishment of nurseries for local crop varieties. Similar action is also being undertaken in Chuuk.

Environmentally sound agricultural practices are also being adopted in various parts of the FSM. In both Kosrae and Pohnpei, for example, a dry-litter piggery system is being adopted that prevents pollution of local water supplies and generates additional income for farmers through the production of fertilizer.

Climate change further emphasizes the need for conservation of agrobiodiversity to ensure maximum resilience and to afford the greatest opportunity to maintain a productive, diverse and sustainable agriculture sector.

Related CBD Strategic Goals and Aichi Targets:	
Goal A:	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 1:	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 7:	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Goal C:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 13:	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity
Goal E:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 19:	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Related Sustainable Development Goals:	
Goal 1:	End poverty in all its forms everywhere
Goal 2:	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3:	Ensure healthy lives and promote well-being for all at all ages
Goal 12:	Ensure sustainable consumption and production patterns
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss

Objective 1: Conservation and Sustainable Use of Agrobiodiversity

To develop and ensure the effective implementation of appropriate conservation measures for the sustainable use of agrobiodiversity

Actions:

- Promote methodologies for sustainable use of agrobiodiversity
- Eliminate unsustainable agrobiodiversity use
- Establish incentives that encourage conservation and sustainable use of agrobiodiversity
- Promote environmentally sound agricultural practices (e.g. organic farming, agroforestry and polyculture)
- Promote, develop and share environmentally sustainable agricultural practices.
- Identify, develop and establish botanical gardens featuring local endemic, endangered and threatened species
- Create and maintain state seed banks of all native, endemic, endangered and threatened species
- Identify, promote and enhance existing programs for the inventory, propagation and preservation of traditional species, varieties, cultivars and breeds

Objective 2: Promotion and Development

To compile existing research findings and develop programs and projects critical to the development of agrobiodiversity

Actions:

- Document existing traditional agrobiodiversity resources and practices, including the usage of aerial photography
- Develop and expand on existing markets for local species and varieties that can be produced on a sustainable basis
- Identify 'value added' opportunities for local produce
- Develop a national marketing strategy for the regional export of local niche products
- Promote existing research findings with farmers through training programs and public education
- Undertake awareness activities around invasive species that impact agroforestry

Objective 3: New Research and Development

To conduct relevant research critical to the development of agrobiodiversity

Actions:

- Evaluate the usefulness and impacts of new biotechnologies
- Develop and expand on new markets for local species and varieties
- Develop and implement research and development training programs for all relevant agencies and institutions involved in agrobiodiversity
- Document and publish all research information and findings and maintain collections of information in each state
- Conduct research on the ecology of traditional agricultural methods
- Monitor all new introduced agricultural species
- Undertake research around invasive species that impact agroforestry
- Establish state clearing house mechanisms to be linked to the national clearing house mechanism

Objective 4: Food and Health Security

To enhance and strengthen food and health security through the use of sustainable agrobiodiversity practices

Actions:

- Develop and implement new and existing programs that promote the production of local nutritional food
- Develop and implement programs that increase local food production and enhance agrobiodiversity
- Encourage sustainable breeding programs for livestock (e.g. pigs and chickens)

- Assess imported animal feeds and the potential implications of their use for human health

Indicators

Indicators such as the proportion of piggeries that have switched to a dry litter system will be useful under this theme. With regard to new and ongoing agrobiodiversity research, publication of data and the presence of state-level data collections will be useful indicators. In terms of food and nutritional security, indicators related to human health and non-communicable disease will be a useful reflection of the production and utilization of local foodstuffs.

Constraints

Awareness of the importance of agrobiodiversity for climate change resilience and food and nutritional security is a key constraint under this theme. In addition, funding is an important issue for activities related to the promotion of environmentally sound agricultural practices. Changing behaviour and food choices are potentially significant constraints in relation to developing sustainable markets for local foods, while capacity may be an issue in the exploration and development of new regional markets.

Theme 5: Ecological Sustainable Industry Development

Strategy Goal:

Economic development activities in the FSM meet the needs of the population while sustaining resources for the benefit of future generations

Progress to date

Sustainable industry and economic incentives are essential elements supporting sustainable use of biodiversity and its conservation. The Micronesia Conservation Trust has played an essential role in developing partnerships with individual donors and donor agencies since its establishment in 2002, enabling a great many initiatives to take place. The Yela Ka Forest conservation easement in Kosrae demonstrates how the prevention of development can be economically viable; through the easement, the forest owners receive regular payments for maintaining the integrity and limiting resource usage to traditional, sustainable practices only.

Various resources and goods have been identified as having the potential to form the basis of sustainable income generating activities. For example, in Pohnpei alone, pepper, coffee, betel nut, coconut products and grass skirts all offer the potential for sustainable income generation. It is recognized that feasibility studies are required around all of these activities, and while an awareness of potential routes for sustainable income generation exist, action now needs to be taken to progress these.

In terms of marine resources, mariculture activities hold significant promise. The Marine and Environmental Research Institute of Pohnpei has been carrying out work on sponge and pearl farming that could be expanded across the states.

In terms of energy resources, more work is needed. That being said, solar panels fitted to the airport and high school in Weno, Chuuk are feeding electricity back to the grid. The Barefoot College Solar Mamas project has been working in villages in Kosrae, Pohnpei and Chuuk to train older women in the installation and maintenance of solar panels, to bring sustainable electricity to remote communities. There is also interest across the states in the use of biogas generators linked to piggeries

Related CBD Strategic Goals and Aichi Targets:	
Goal A:	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 3:	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
Target 4:	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 7:	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Target 8:	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity
Goal E:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 19:	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Related Sustainable Development Goals:	
Goal 1:	End poverty in all its forms everywhere
Goal 7:	Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8:	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9:	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 12:	Ensure sustainable consumption and production patterns
Goal 14:	Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Objective 1: Ecologically Sustainable Industries

To develop, utilizing the precautionary principle, long-term smart and ecologically sustainable industries that provide attractive incomes while minimizing the exploitation of and impact on natural resources

Actions:

- Promote the development of ecologically sustainable and economically profitable enterprises utilizing and conserving the nation's biodiversity and utilizing economic incentives (e.g. tax breaks) to promote expansion of these activities while removing all incentives for non-compliant industries
- Promote and support research and pilot programs that develop partnerships between the government and private sector to develop ecologically sustainable industries
- Further develop and support those industries currently meeting ecological sustainability goals (e.g. Eco-tourism)
- Develop and implement mechanisms for the establishment of National and State "green" accounting programs, including incentives
- Establish incentive-based programs for "environmentally friendly" community development, including economic incentives and financial access for these activities
- Develop and implement environmental economic valuation procedures for assessing the full economic value of biodiversity to the nation
- Integrate biodiversity valuation as an integral component of all land use and coastal use planning
- Explore and develop a program that introduces a user fee program for conservation areas to provide additional funding assistance for the management of these areas
- Explore the potential for initiating and developing ecologically benign industries that can drive economic development

Objective 2: Income Generating Activities

To develop and promote long-term ecologically sustainable income generating activities for resource owners and the community

Actions:

- Identify and implement appropriate programs to promote and support sustainable income generating activities at the community level and provide financial incentives and capacity building to assist in the development of these programs
- Establish and strengthen networks and partnerships between public and private sectors including donor agencies to support sustainable income generating activities
- Undertake evaluations of feasibility and ecological sustainability of all proposed income generating activities
- Develop mechanisms to derive income and develop capacity from eco-education and eco-research industries

Objective 3: Energy Resources

To secure long-term efficient and sustainable energy sources that promote the use of technology contributing to energy conservation and the protection of biodiversity

Actions:

- Promote and support environmentally sound development of natural energy sources at all levels of the nation and
- Develop National and State strategies for energy safety and efficiency
- Promote renewable energy resources and provide incentives for their use

- Promote and provide technical information to develop alternative energy sources using solar, wind, water and hydrogen cells for power generation
- Promote technology that contributes to energy conservation
- Carry out awareness programs explaining the processes involved in the development of any new energy sources
- Develop management plans to ensure any use of the nation's forests, especially mangrove forests, for energy sources is sustainable
- Reduce reliance on wood as fuel
- Reduce greenhouse gas emissions

Indicators

In relation to the development of sustainable income generating activities, growth in this sector will be demonstrated through economic indicators. The proportion of electricity derived from renewable energy sources will clearly indicate progress in the development of an environmentally sound energy sector.

Constraints

Constraints under this theme will include, but not be limited to, the ability to develop partnerships with donor bodies, and the degree of funding that can be secured in this way. In addition, technical expertise and ongoing technical capacity will be needed to develop and maintain alternative energy resources.

Theme 6. Biosecurity

Strategy Goal:

Border control, quarantine and eradication programs are effectively protecting the FSM's native biodiversity from the impacts of alien invasive species

Progress to date

Biosecurity is a vital part of biodiversity conservation in the FSM, with the impact of invasive species such as the coconut rhinoceros beetle and the little fire ant already becoming apparent.

A national biosecurity law has been enacted, and a National Biosecurity Act has been developed, but not yet passed. Each state has an invasives task force and strategic action plans in place. These groups are responsible for control and/or eradication of invasive species. Rapid response plans are in place for some species. In Yap, a rapid response plan for the coconut rhinoceros beetle has been developed and is awaiting enactment. In Kosrae, both the Department of Resources and Economic Affairs and the Kosrae Island Resource Management Authority have an Invasive Control Program focusing on both invasive plant and animal species.

A key area for further progress is ensuring strong prevention measures are in place at the national level, with more effective quarantine measures. National quarantine plans are in place, however, improved collaboration between national and state-level bodies is necessary, as control and eradication is a state-level responsibility.

Funding for projects under this Theme will be made available under the sixth replenishment of the Global Environment Facility, which has a focus on the prevention, control and management of invasive alien species.

Related CBD Strategic Goals and Aichi Targets:	
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 9:	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment
Goal E:	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 19:	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Related Sustainable Development Goals:	
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss
Goal 17:	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Objective 1: Policy and Legislation
To improve and strengthen appropriate national, state and municipal policies and legislation to ensure the effective management of biosecurity
Actions:
• Develop national and state policies and actions for the management of all biosafety issues • Develop national and state policies, legislation and actions for the management of genetically modified organisms • Further develop and implement national and state laws and screening processes for alien species introductions and genetically modified organisms to manage or minimize their impacts on the nation's biodiversity

- Further develop the national government's power to enforce (including issues of transportation and staffing) all laws and legislation relating to alien introductions

Objective 2: Control and Eradication

To identify and develop appropriate programs to ensure effective control and eradication of species threatening biodiversity

Actions:

- Strengthen facilities and provide informed and trained personnel for border control and quarantine services
- Ensure budget exists for relevant personnel to attend appropriate training and educational conferences
- Develop programs for the control and eradication (where feasible) of invasive species
- Develop programs for the control of all endemic species being exported from the nation
- Further develop and implement screening protocols for all international and domestic watercraft entering the nation's ports and traveling within the nation
- Further develop and implement screening of all international and domestic watercraft operating between ports within the nation
- Implement regional and international programs to protect native marine biodiversity on the high seas and all coastal ports (e.g. PACPOL and IMO programs)
- Implement existing invasive species task force and develop rapid response plans in each State and Regionally

Objective 3: Research and Monitoring

To undertake a systematic and scientific research and monitoring program to allow management of biosecurity threats

Actions:

- Review, evaluate, update and prioritize the lists of terrestrial and aquatic invasive species in the FSM
- Strengthen the national and state government agencies to be able to undertake appropriate scientific research and assessment of introduced species
- Increase collaboration with regional and international agencies to assist in the identification, control and eradication of invasive species

Indicators

The main indicators under this theme will be the prevention of increasing numbers of invasive species in the FSM and the adequate control and/or eradication of those invasive species already known to be present in the FSM.

Constraints

Key constraints will be capacity to deal with those invasive species already known to be present in the FSM, as well as the funding to maintain high levels of training within the invasive species task forces across all four states. Further constraints may include the effective collaboration between national and state-level bodies, and the political will to introduce tighter quarantine relating to all international and domestic transport between islands.

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Progress to date

Steps are being taken across the FSM to improve management of waste. In terms of garbage, designated dump sites have been initiated to combat illegal dumping. In Kosrae, the centralized landfill utilizes the Fukuoka Method to manage garbage, and this method is also being implemented in a waste management project in Chuuk. In Yap, a private company has been contracted to collect waste form government offices and some households. A ban on the import and use of plastic bags has been put in place in Yap. However, across the FSM, the import and use of Styrofoam remains a significant issue.

Recycling programs are in place in both Kosrae and Yap, to deal with aluminum, plastic bottles and glass. In Chuuk, a system of citations is in place against the dumping of waste in the lagoon from tourist 'live-aboard' vessels, although greater enforcement of fine collecting is needed. A National Waste Management Strategy has been developed under the South Pacific Regional Environment Programme (SPREP), though this now requires updating.

Petrochemicals and other hazardous chemicals also present threats to the environment of the FSM. Persistent organic pollutant legislation exists, and regulations on the importation of some hazardous chemicals exist. For example, Yap state regulates pesticide imports, and each state has an NGO dedicated to monitoring Freon.

While air and noise pollution are recognized as being relevant, they are not currently a high priority in the overall context of waste management in the FSM.

The FSM Government has access to Green Climate Fund and Adaptation Fund moneys to support waste management initiatives, so will be able to bring in the financial and technical assistance required to further the actions under this theme in the future.

Related CBD Strategic Goals and Aichi Targets:	
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 8:	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

Related Sustainable Development Goals:	
Goal 3:	Ensure healthy lives and promote well-being for all at all ages
Goal 6:	Ensure the availability and sustainable management of water and sanitation for all
Goal 9:	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 11:	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 14:	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss

Objective 1: Solid Wastes and Sewage
Provide an environmentally safe mechanism for the collection, storage and disposal of solid wastes and sewage within the nation to prevent further degradation of the environment and loss of biodiversity within the nation

Actions:

- An assessment will be carried out in the states to identify priority waste management and sewage needs
- A technical assistance program will be developed and implemented to fund necessary infrastructure (e.g. water systems, refuse dumps, recycling facilities, sewer systems and treatments plants) to assure the health and welfare of all FSM inhabitants
- Develop and implement waste collection, storage and disposal programs for residential and commercial premises Develop and implement programs for reuse and recycling of wastes, both within and outside the country
- Develop and implement waste management programs that prevent contamination of freshwater (including ground water lens and coastal marine environment)
- Develop, implement, and improve sewage treatment programs and, relocate and extend marine sewage discharge locations, to limit negative impacts on the marine environment

Objective 2: Petrochemicals

Provide an environmentally safe mechanism for the collection, storage and disposal of petrochemical wastes to prevent degradation of the environment and loss of biodiversity within the nation

Actions:

- Develop and implement petrochemical waste collection, storage and disposal programs for residential and commercial premises throughout the nation
- Develop and implement programs for reuse and disposal of petrochemical wastes
- Develop and implement monitoring legislation and enforcement of petrochemical pollution, including ship waste dumping in open waters
- Develop and implement programs for the safe collection and disposal of petrochemical wastes resulting from shipwrecks

Objective 3: Hazardous Chemicals

Provide an environmentally safe mechanism to control and manage the use of hazardous chemicals and to develop and implement correct storage and disposal programs to prevent the degradation of the environment and loss of biodiversity within the nation

Actions:

- Develop and implement hazardous chemical waste collection, storage and disposal programs for residential and commercial premises throughout the nation
- Develop and implement programs for the importation, handling, use and safe disposal of hazardous wastes (including lead batteries, pesticides, fertilizers, and chlorine) both within and outside the country
- Develop and implement monitoring legislation and enforcement programs to prevent unauthorized use and misuse of hazardous chemicals including incorrect storage and disposal
- Revise and further develop legislation and regulations on hazardous chemicals, including importation requirements

Objective 4: Pollution Emergencies

Enhance the nation's capability to effectively respond to pollution emergencies to reduce negative impacts on the environment

Actions:

- Increase preparedness and skills of the relevant government and private sector agencies and acquire equipment required to rapidly respond to petrochemical spills and other hazardous chemical emergencies on land and water
- Enhance and strengthen the links between National, State and Municipal governments with regard to coordination and response to petrochemical spills and other hazardous chemical emergencies
- Develop and implement legislation to require all polluters (governmental and private) to clean up and/or pay for damages occurred by polluting the environment

- Establish a revolving 'green fund' generated from petrochemical and hazardous waste violations to support responses to and the clean-up of pollution emergencies
- Ensure relevant international agreements and protocols are endorsed by the FSM national government to better support state responses

Objective 5: Air and Noise Pollution

Provide an environmentally safe mechanism for the reduction of all activities that degrade the atmosphere and associated biodiversity

Actions:

- Develop and implement air and noise quality monitoring programs for residential and commercial premises throughout the nation
- Revise and further develop legislation and regulations to effectively reduce air and noise pollution within the nation
- Develop and implement monitoring and enforcement of air and noise, light and thermal pollution legislation

Indicators

Indicators will include, but not be limited to:

- Reduction in illegal dumping of garbage, for example in mangroves
- Timely and effective clean-up of any pollution emergencies, such as chemical wastes from shipwrecks
- Effective implementation of the Fukuoka Method in designated landfill sites across all four states

Constraints

Behaviour change in terms of littering and taking waste to legal dump sites presents a significant challenge for waste management. In terms of hazardous chemicals, identifying and partnering with countries willing to take such chemicals is problematic and can be slow under the regulations of the Stockholm Convention.

Theme 8. Human Resources & Institutional Development

Strategy Goal:

All citizens, residents and institutions of the nation are aware of the importance of biodiversity and have the technical knowledge, skills and capability to conserve, preserve and sustainably utilize, manage and develop all biodiversity within the nation

Progress to date

Human capacity building is naturally an essential element of biodiversity conservation in a small island country such as the FSM. Numerous training programs have been implemented across the FSM, with training of local personnel an integral part of the Micronesia Challenge program. The Micronesia Challenge also includes a Young Champions program to engage local youth in the initiative. In Kosrae, management planning training, grant writing training and solid waste management training have been made available through various agencies. The Japan International Cooperation Agency has also established a capacity building program in Chuuk, related to climate change adaptation. This involves sending government personnel on adaptation capacity building training.

Capacity building extends to education, with the establishment of the Association for Promotion of International Cooperation, Bill Raynor and Sophia University scholarship program, enabling a small number of students from the FSM to attend Sophia University in Tokyo as undergraduate and graduate students. The intention of this program is that the scholarship students will return to the FSM to work in an appropriate environmental capacity.

It is recognized that funding for additional staff is problematic, particularly with changes to how funding under the Compact of Free Association sector grants is directed. This leads to an increasing burden of responsibility and associated training for existing staff.

Awareness activities are in place for various biodiversity-related issues and activities, including pollution, waste management and gardening. In Chuuk, a student summer camp is held, and in Kosrae a summer youth program is in place along with the Youth-2-Youth Environmental Summit. Further awareness building is needed, particularly related to the connection between health, climate change and biodiversity conservation.

Related CBD Strategic Goals and Aichi Targets:	
Goal A:	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 1:	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably
Target 4:	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits
Goal E:	Enhance implementation through participatory planning, knowledge management and capacity building
Target 18:	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

Related Sustainable Development Goals:	
Goal 2:	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 4:	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 8:	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9:	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 12:	Ensure sustainable consumption and production patterns
Goal 14:	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15:	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss
Goal 17:	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Objective 1: Human Capacity Building

To develop and strengthen the capacity of resource owners, traditional leaders, communities, technical staff and policy makers in the coordination and implementation of conserving, preserving and sustainably utilizing and developing the biodiversity of the FSM

Actions:

- Develop and implement local capacity training programs for national, state and municipal personnel involved in the formation and implementation of conservation related programs, including education and enforcement sectors
- Develop and implement capacity building training for local communities, resource owners and traditional leaders on the principals and benefits of Environmental Impact Assessment (EIA), so EIA activities can be applied to development projects at community levels
- Update EIA process in the states to include community participation
- Secure and seek financial assistance to develop and implement capacity development programs for all sectors
- Require all visiting researchers and research agencies to hire local individuals to assist in all program activities
- Require grant-funding agencies to include local individuals to assist in the preparation of program documents
- Develop and implement local capacity building and strengthening programs on biological surveys, monitoring techniques and ecosystem management
- Establish multi-sectoral groups of local experts to co-ordinate and undertake biological surveys and monitoring programs, seek outside assistance when necessary
- Provide and implement local training programs on community based conservation management approaches, methodologies and the development of sustainable income generating activities
- Provide training and capacity building for communities on their legal rights and appropriate procedures for reporting environmental offences
- Undertake capacity building training for national and state personnel on genetically modified organisms and their possible effects on the nation's biodiversity
- Undertake capacity building training for quarantine personnel (national and state) on border control, quarantine services and the effective screening of new species introductions and necessary eradication of potentially invasive species
- Develop and implement training programs to enhance and strengthen public and community knowledge of the understanding, awareness and commitment to sustainable agricultural and fisheries practices
- Provide training on proposal development and strengthen human capacity to seek and acquire outside funding assistance
- Develop and implement local capacity building and strengthening programs on correct waste management usage and disposal, including removal of hazardous waste products (e.g. machinery and toxic products) and recycling
- Develop and implement local capacity building and strengthening programs on alternative ecologically friendly industries, and energy conservation and management
- FSM national government to endorse and support implementation of the national environmental science curriculum in all schools (public and private, elementary and high school level)
- Develop a scholarship program to support graduate students in conservation, resource management and environmental science areas

Objective 2: Institutional Strengthening

To develop and strengthen the capacity of national, state and municipal government agencies, NGOs and academic institutions in the coordination, education and implementation of activities for conserving, preserving and sustainably utilizing the biodiversity of the FSM

Actions:

- Develop and implement institutional strengthening training programs for national, state and municipal government agencies, educational institutions and NGOs involved in the formation and implementation of conservation related programs
- Develop and implement institutional strengthening programs for all national, state and municipal government agencies on the principles, benefits and enforcement of Environmental Impact Assessment (EIA)
- Secure and seek financial assistance to develop and implement institutional strengthening programs for all sectors*
- Strengthen the ability of the national and state agencies, education institutions and NGOs to provide and implement local educational training programs to all citizens on community-based conservation management approaches, methodologies and the development of sustainable income generating activities
- Strengthen the capacity of national, state and municipal government agencies, education institutions and NGOs to develop a mechanism to integrate traditional and modern conservation management practices to further improve the agrobiodiversity of the nation

* For clarity, it should be noted that "all sectors" includes not only governmental agencies, but also non-governmental organizations, civil society organizations and community-based organizations

Objective 3: Public Awareness and Education

To promote, encourage and strengthen the awareness and understanding of all stakeholders (local resource owners, traditional leaders, communities, government agencies, academic institutions, NGOs and policy makers) of the importance of protecting, preserving and ensuring sustainability of the biodiversity of the FSM

Actions:

- Develop, promote and conduct public awareness campaigns and programs through media, workshops/seminars and information material for National and State government agencies, municipal councils and relevant targets groups including resource owners on the functions and benefits of conserving and sustainable utilization of the nation's biodiversity
- Integrate information on traditional knowledge and promote traditional practices that are important for the conservation and sustainable use of biodiversity into the education curriculum
- Increase coordination and networking between relevant National and State agencies to better utilize information on the FSM's biodiversity for use and integration into school and college curricula, youth and development programs
- Develop learning exchanges between islands, municipalities and conservation sites to exchange knowledge and ideas related to biodiversity conservation practices
- Develop and distribute public awareness material on all legislation relating to biodiversity use to all stakeholders in the nation's official language (English) and translated into each state language
- Develop and implement public awareness and educational programs on the importance and management of all ecosystems, native and other important species and agrobiodiversity
- Develop public awareness programs to increase the knowledge and appreciation of the functions and benefits of biodiversity
- Develop and implement national and state public awareness programs for invasive species to prevent illegal introductions and encourage control
- Increase public awareness, education and acceptance of proper sanitation practices, waste disposal mechanisms and pollution programs
- Increase public awareness, education and acceptance of ecologically sustainable industry development and energy usage, including alternative energy options (e.g. solar and wind)
- Existing clearinghouse mechanisms for disseminating and sharing information on biodiversity activities to be utilized at national and state levels

Indicators

Indicators under this theme will include such things as numbers of personnel in appropriate government and non-governmental agencies, and level of training personnel have received. In addition, numbers and visibility of environmental campaigns, and recognition of these by the public, will be useful indicators of awareness.

Constraints

A major constraint is funding to assist in capacity building, in terms of the funding that is available and how it is directed and prioritised. Capacity of existing staff to shoulder increasing responsibilities is also a challenge. In terms of awareness building, funding and capacity are the key constraints.

Theme 9. Resource Owners

Strategy Goal:

Traditional resource owners and communities are fully involved in the protection, conservation, preservation and sustainable use of the nation's biodiversity

Progress to date

There is significant traditional knowledge in the FSM that directly relates to biodiversity, its conservation and sustainable use. Traditional knowledge is difficult to record directly, owing to cultural norms that tend to preserve such knowledge strictly within families, but is utilized in the identification and delineation of protection areas. That being said, the Kosrae Historic Preservation Office documents tangible and intangible cultural material, which includes traditional knowledge.

The unique systems of land ownership across the FSM make working with communities and resource owners an essential element of biodiversity conservation and sustainable management. Programs under the Micronesia Challenge exemplify this approach, ensuring resource owners and communities are central to the development and enforcement of protected areas, and their ongoing management.

Related to this are the issues of access and benefits sharing, as detailed under Theme 3. As previously discussed, royalty laws exist in Yap and Kosrae, a Royalty Act is in place, and Chuuk State has drafted a benefit sharing law.

Related CBD Strategic Goals and Aichi Targets:	
Goal A:	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 3:	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
Target 4:	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits
Goal B:	Reduce the direct pressures on biodiversity and promote sustainable use
Target 6:	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits
Target 7:	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Goal E:	Enhance implementation through participatory planning, knowledge management and capacity building
Target 18:	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

Related Sustainable Development Goals:	
Goal 2:	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 12:	Ensure sustainable consumption and production patterns

Objective 1: Traditional Knowledge, Practices and Innovations
Preserve traditional knowledge and practices of the cultures of the FSM that are important for the protection, conservation, preservation and sustainable use of biodiversity
Actions:
• Develop and maintain a register to document, preserve, sustain, and enhance all traditional knowledge, practices and innovations including intangible cultural heritage (ICH) important for the conservation of biodiversity • Develop suitable national and state legislation to protect traditional knowledge, practices and innovation and provide a mechanism for benefit sharing to appropriate knowledge holders • Develop and implement programs that integrate traditional knowledge, practice and innovation with modern scientific technology and methodologies to promote conservation and sustainable use of biodiversity

Objective 2: Empowering Resource Owners
Empowering resource owners and communities to conserve and sustainably manage biodiversity under suitable customary and modern resource management practices
Actions:
• Develop and implement programs for resource owners, traditional leaders, communities and municipalities to be responsible for the conservation and sustainable use of biodiversity • Integrate activities and programs that promote the conservation and sustainable use of biodiversity into relevant government agency extension services • Further develop and encourage the full participation of all resource owners and community groups in the formulation, coordination and implementation of programs for the conservation and sustainable use of biodiversity • Establish and implement an incentive scheme including examples of public-private partnerships to encourage environmentally friendly communities/municipalities that promote conservation and sustainable use of biodiversity ensuring that intellectual property rights are protected • Develop appropriate legislation at the state and municipal levels that encourages the empowerment of resource owners and communities to monitor and enforce environmental regulations

Indicators

The main indicators under this theme will include, but not be limited to, the passing of appropriate legislation and the halting of the loss of traditional knowledge. Increasing levels of engagement of communities and resource owners in conservation programs will also serve to demonstrate progress under this theme.

Constraints

There are two major constraints regarding the preservation of traditional knowledge and practices. The first relates to the loss and decreased sharing and use of traditional knowledge at the family level, with younger generations being less interested in learning about traditional knowledge and competing priorities. The second issue relates to a cultural reticence to share knowledge outside of the family structure, which makes recording of traditional knowledge a sensitive issue to address.

Theme 10. Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Progress to date

Each of the states has its own Strategic Development Plan, incorporating the importance of the sustainable use and conservation of biodiversity. In Pohnpei, the Micronesia Conservation Trust (MCT), The Nature Conservancy (TNC) and state government initiated a holistic municipal plan that required all sectors to mainstream biodiversity into municipal plans.

In terms of legislation, Chuuk sustainable land management legislation is currently being considered along with legislation to ensure sharing of data from research institutes operating within the state.

Municipal resource management committees have been established in Kosrae, while in Chuuk, the Chuuk Technical Advisory Committee (TAC) was established with representatives from different sectors and included members actively involved in on-the-ground work.

More data is needed to fully understand the impact of population on the natural resources of the FSM. This should include information regarding the export of resources to those Micronesians living overseas. That being said, it is generally considered that more emphasis is needed on the interaction of the population with natural resources, rather than the size of the population itself.

Related CBD Strategic Goals and Aichi Targets:	
Goal A:	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 1:	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably
Target 2:	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems
Target 3:	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
Target 4:	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits

Related Sustainable Development Goals:	
Goal 1:	End poverty in all its forms everywhere
Goal 4:	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 8:	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 12:	Ensure sustainable consumption and production patterns
Goal 17:	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Objective 1: Population
To enhance understanding of links between population and our islands' carrying capacities
Actions:
• Develop a program to link data on population, natural resources and biodiversity to sustainable development • Develop and monitor indicators of sustainable development • Develop and implement a public awareness program on the links between population density, natural resources, biodiversity and prospects for sustainable development • Implement public health programs that support responsible parenthood

Objective 2: Policy
To integrate concepts of conservation and sustainable use of biodiversity into all relevant sectoral policies, programs and plans
Actions:
• Incorporate concepts of biodiversity conservation into all future national, state and municipal social and economic policies and development strategies • Incorporate a population policy providing information pertaining to environmental and resource carrying capacities, sustainable financing, and economic hardships • Provide advice and technical information pertaining to the development of policies that fall within the NBSAP framework • Develop a national-level NBSAP awareness campaign to spotlight the importance of the NBSAP across relevant sectors

Objective 3: Multi-Sectoral Collaboration
To strengthen and develop multi-sectoral collaboration in promoting conservation, preservation, and sustainable use of biodiversity in the FSM
Actions:
• Enhance and strengthen the linkages between national, state and municipal government agencies, NGOs, CBOs, and private sector, including strengthening the links between foreign investment boards and the State chambers of commerce, to provide information on the conservation and management of the FSM biodiversity (e.g. Pohnpei Resource Management Committee, Yap Environmental Stewardship Consortium and the Kosrae Resource Management Committee) • Enhance the collaboration and assistance from regional and international agencies to assist the nation's stakeholders • Strengthen national and state linkages with regional and international environmental conventions that the FSM is a party to on behalf of and for the benefit of the States • Develop and implement programs to further strengthen the partnerships between the private sector, NGOs, CBOs, and local community in implementing biodiversity related programs • Establish a multi-sector team of experts (domestic, regional and international) to conduct biological research, resource evaluations and monitoring programs on the FSM biodiversity • Ensure that all multi-sector teams and groups include representation from all sectors, e.g. health and transportation, and are not limited only to those groups perceived to have direct involvement in biodiversity conservation and management • Undertake an assessment of available funding and resources for the development of assessments and reports versus on-the-ground work, to ensure appropriate allocation

Objective 4: Legislation
To ensure that appropriate national, state and municipal legislation is developed and effectively enforced to sustainably manage the FSM's biodiversity
Actions:
• Review and strengthen existing national, state and municipal government environmental legislation and acts to incorporate relevant actions from the NBSAP and ensure integration of all themes across all relevant sectors within the nation

- Review bi-annually, the FSM participation in international treaties relating to biodiversity to which the nation is a party on behalf of and for the benefit of the States
- Support and further develop national, state and municipal capabilities for the enforcement of all biodiversity legislation
- Strengthen and support EIA legislation at the state and municipal government level to minimize the adverse impacts of the nation's development on the environment
- Develop mechanisms and legal framework regulating access to traditional knowledge, intellectual property issues, genetic resources and bioprospecting
- Assess the islands' biological carrying capacities and develop ecological planning based on these

Objective 5: Environmental Impact Assessments

To ensure that EIAs are conducted for all development projects to minimize any adverse impacts on the FSM's biodiversity

Actions:

- Further develop and regularly review relevant state and municipal EIA legislation and policies as they relate to biodiversity
- Implement National, State and Municipal legislation that requires all developers (including all levels of government, non-government organizations and the private sector) to undertake EIAs and to involve resource owners and stakeholders in all EIA procedures
- Include the undertaking of biological surveys/assessments and economic evaluations as integral parts of all EIA procedures
- Expand the scope of EIAs to include gender and societal impacts

Indicators

Indicators under this theme will include, but not be limited to:

- Public awareness and understanding of the link between population and natural resources
- The number of multi-sectoral groups established at national and state-levels
- Development of appropriate new legislation
- Awareness of the NBSAP amongst appropriate governmental and non-governmental agencies

Constraints

Political will is likely to be a major constraint under this theme. Technical capacity is likely to be a specific constraint limiting the local ability to undertake environmental impact assessments and effectively evaluate environmental impact statements.

Theme 11: Financial Resources

Strategy Goal:

Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

Progress to date

Attaining the financial resources needed to support the activities detailed within the NBSAP (and state BSAPs) is an ongoing challenge, however, significant steps have been made to enable the long-term, consistent funding of much of the important work being undertaken within the FSM.

Not least of these has been the establishment of the Micronesia Conservation Trust, which has developed strong partnerships with many donor organizations and individuals both regionally and internationally. This funding supports many biodiversity conservation, climate change adaptation and sustainable development-related activities, including community-led protected areas, projects to support sustainable livelihoods and projects to build climate change resilience.

The Micronesia Challenge endowment fund is a further source of financial for those activities within the NBSAP that directly relate to the goals of the Micronesia Challenge.

Over time, a substantial number of community organizations have been established, including farmers associations and women's associations across municipalities and states, as well as higher-profile programs such as the Yela Ka conservation easement. It is recognized that achieving long-term funding is an issue, as is changing priorities for government funding. Opportunities have, however, been identified for the development of further endowment funds to continue supporting essential biodiversity and climate change-related programs.

Related CBD Strategic Goals and Aichi Targets:	
Goal E:	Enhance implementation through participatory planning, knowledge management and capacity building
Target 20:	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties

Related Sustainable Development Goals:	
Goal 17:	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Objective 1: State Commitment

To define support needed to implement and monitor progress on the NBSAP and state BSAPs at the national and state levels

Actions:

- Determine staffing, financial and other resources needed to carry out NBSAP activities in the states
- Define and establish incentives to implement NBSAP activities
- Strengthen support for community-based NGOs and other community-based organizations

Objective 2: National Commitment

To provide, in accordance with national capabilities, long-term national financial support and incentives for undertaking conservation programs

Actions:

- Develop short-term and long-term sustainable financial plans and mechanisms, to include cost recovery programs where appropriate, within each state for undertaking conservation programs at all levels of the government

- Develop sustainable conservation funding mechanisms within the nation (e.g. allocation of tax revenue, user fees, eco-labelling, investment into Micronesia Challenge Endowment)
- Strengthen and improve national and state government budget allocations for staff and project activities for conservation and management of the nation's biodiversity
- Strengthen and improve support for conservation/biodiversity programs for NGOs and CBOs
- Provide technical, financial and marketing support and assistance for all sustainable development to incorporate environmental safeguards and mitigation programs

Objective 3: International Cooperation

To effectively acquire and allocate resources available under cooperation schemes with members of the international community

Actions:

- Develop short-term and long-term financial plans for undertaking sustainable biodiversity management and conservation programs for the nation
- Strengthen linkages to regional and international donor organizations, including private foundations and NGOs to provide financial assistance for sustainable biodiversity management and conservation
- Strengthen linkages with other developed country partners party to the Convention on Biological Diversity (CBD) as a means to effectively implement and provide financial assistance for sustainable biodiversity management and conservation
- Maintain a database of all potential donor assistance programs and distribute to all relevant agencies within the nation

Objective 4: Conservation Trust Fund

The continued establishment and development of the Micronesia Conservation Trust (MCT) Fund for implementation of the NBSAP and relevant biodiversity work

Actions:

- Formally establish and implement the Micronesia Challenge Endowment Fund
- Identify short-term and long-term funding sources for the establishment of the Micronesia Challenge Endowment Fund for the implementation of the NBSAP and relevant biodiversity related activities within the nation
- Utilize the Micronesia Challenge Endowment Fund to strengthen and empower resource owners and communities to manage their own resources sustainably
- Formalize revenue streams and cost recovery mechanisms through taxes and other sources of income generation for the use of the nation's biodiversity resources
- Support and invest in community-based conservation funding mechanisms including trust funds, revolving funds, etc. at state and/or municipal levels

Indicators

The main indicator under this theme will be whether all needed biodiversity-related programs are funded in the long-term.

Constraints

The main constraints under this theme are political will and the changing priorities and distribution of national funding. The time-limited nature of much international and donor-organization funding also acts to constrain what can be achieved.

5.0 Implementation, Monitoring and Reporting

5.1 Implementation

Many of the necessary tools for implementation have been developed in the 16 years following the initial NBSAP, significantly the ecoregional plan as described in *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia* and the Micronesia Challenge. Establishment of the Micronesia Conservation Trust has also enabled a constant focus to be maintained on biodiversity conservation programs and activities. Together these will continue to be central to the implementation of this revised NBSAP.

Implementation of the NBSAP is also intrinsically linked to implementation of the individual state BSAPs. With responsibility for natural resources lying with the states, each state will be best able to prioritise the Themes, Objectives and Actions in the NBSAP alongside those of their state-level BSAP.

The NBSAP will also be a natural guide for donor-funded programs, with those agencies involved able to ensure programs address the objectives and actions within the NBSAP.

5.1.1 National Biodiversity Database and Clearing House

Following development of the initial NBSAP, the FSM Biodiversity Clearing-House Mechanism was established by the Government of the Federated States of Micronesia and the College of Micronesia-FSM in collaboration with each of the States, and with funding from the Global Environment Facility through the United Nations Development Programme (FSM, n.d.).

Sharing the vision of the overall NBSAP as its goal, the Clearing-House Mechanism provides a platform for the exchange of National and State-level information required for the implementation of the FSM's obligations under the Convention on Biological Diversity, i.e. the National Biodiversity Strategy and Action Plan and each of the State Biodiversity Strategy and Action Plans. It also enables the sharing of information on, and experience with, the natural environment and biological diversity of the FSM (FSM, n.d.).

The Mission of the Clearing House Mechanism is stated as being to *promote and facilitate cooperation to effectively implement the NBSAP and Biodiversity Strategy and Action Plans for Chuuk, Kosrae, Pohnpei, and Yap; promote and facilitate technical and scientific cooperation between FSM and other countries, organizations and institutions; develop a national mechanism for exchanging and integrating information on biological diversity, and develop the necessary human and technological network.*

Available data through the Clearing-House Mechanism is currently limited, with a need for further expansion and development of this system.

The Nature Conservancy is planning to host a Pacific Regional Environment Programme (SPREP)-supported database of information related to the State of the Environment report that is in development. This database will go a significant way towards filling the current gap in data availability

5.2 Monitoring, Reporting and Reviewing

Monitoring the implementation of the NBSAP will be undertaken in two ways. Each state will be requested to complete an annual quick assessment, using the assessment form provided in the Appendix. This process will involve each state identifying which actions have been completed or achieved, which actions some progress has been made on, and which require initiating. States will also be able to identify necessary additional actions under each Theme and Objective. This fast assessment process will be overseen and managed by the Micronesia Conservation Trust.

A full review and revision of the NBSAP will be undertaken after five years, in 2023. This will follow a similar process of consultations and validation that have been utilised in the current revision. This review will provide an opportunity for major progress, changes or developments to be recorded and considered for inclusion in the next revision of the NBSAP, and will ensure that all Themes, Objectives and Actions remain relevant and reflect the challenges and unmet needs of the FSM's biodiversity at that time. This will also provide an opportunity to ensure that the NBSAP remains in line with any new strategies of initiatives under the Convention for Biological Diversity.

Reporting and disseminating information regarding the NBSAP and its constituent programs is the responsibility of the national government. This reporting should utilise the FSM Biodiversity Clearing-House Mechanism, as described above.

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Appendix 1: NBSAP Annual Quick Assessment Template

The following templates will be completed on an annual basis as an overview assessment of progress on the NBSAP.

Theme 1: Ecosystem Management

Strategy Goal:

A full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection

Objective 1: Research and Monitoring	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To undertake research and resource assessment/evaluation for the identification, documentation and monitoring of the FSM's ecosystems for the implementation of appropriate resource management programs, including conservation and protected areas				
Actions:				
• Undertake regular comprehensive biological resource surveys of the nation's terrestrial, marine and freshwater biodiversity				
• Periodically obtain aerial imagery to update vegetation maps, document and evaluate land use practices and conditions of the aquatic environment				
• Develop and implement long-term monitoring programs at the state level for all ecosystems within each State to provide scientific information on the status of the nation's biodiversity through time				
• Natural resource management agencies and relevant institutions to work together to develop priority research topics to be addressed and standardized monitoring techniques to be taught and utilized by all States, ensuring appropriate emphasis is given to the full array of aquatic and terrestrial ecosystems				
• Publish all research and monitoring documents on an ongoing basis and develop a database of these that is available to the public				
• Develop and implement a program for monitoring the impact on biodiversity from climate change				
• Examine the feasibility of creating a National Research Unit to strengthen the permit process and maintain oversight of all research activities, including but not limited to biodiversity and climate change research, and ensure results from all research programs are made available to the FSM				
Additional actions and/or comments:				

Theme 1: Ecosystem Management

Strategy Goal:

A full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection

Objective 2: Conservation Areas	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To enhance the management of existing conservation areas and establish new areas to achieve a full representation of the FSM's ecosystems and support climate change resilience building				
Actions:				
• Undertake regular gap analyses of protected areas to support the expansion of the Protected Area Network				
• Further develop and implement management plans for the existing marine and terrestrial conservation areas within the nation				
• Integrate traditional conservation methods techniques into management plans where appropriate				
• Continue to identify, develop, design and implement management plans for new aquatic and terrestrial conservation areas within the nation, especially in areas that are currently poorly represented, contain unique habitats, or have high levels of threats				
• Integrate all management plans and protected area programs with community/resource(s) owner participation activities including enforcement				
• Incorporate large conservation areas to include more than one ecosystem (e.g. mangroves, sea grass beds, lagoon systems and barrier reefs), and consider integrating a ridge-to-reef approach that combines terrestrial and marine ecosystems				
• Further develop and maintain an appropriate information system (e.g.: Geographical Information System) to store and share information on ecosystems and conservation areas				
• Continue to develop and refine the Ecoregional Conservation Planning process for the nation and implement recommendations				
• Identify and conserve critical watershed areas				
• Further develop and implement programs for the restoration of degraded aquatic and terrestrial ecosystems, prioritizing those of endemic, endangered and threatened species				
• Further develop and implement conservation of biodiversity in important natural and cultural heritage sites throughout the nation (e.g. Nan Madol, Pohnpei State)				
• Update the document *A Blueprint for Conserving the Biodiversity of the Federated States of Micronesia*				
Additional actions and/or comments:				

Theme 1: Ecosystem Management

Strategy Goal:

A full representation of the FSM's marine, freshwater and terrestrial ecosystems are protected, conserved and sustainably managed, including selected areas designated for total protection

Objective 3: Sustainable Use of Ecosystems	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and implement effective management programs that ensure income-generating activities that use biodiversity resources do so sustainably				
Actions:				
• Finalize, implement and enforce ecosystem management plans through legislation. Enforcement actions are required to eliminate destructive practices (e.g. dynamite fishing)				
• Develop guidelines and protocols for the sustainable use of the nation's biodiversity (e.g. eco-tourism, non-timber forest products and mariculture)				
• Ensure all foreign investment activities that utilise the nation's biodiversity are sustainable				
• Undertake economic valuations of ecosystem services for terrestrial, aquatic area use				
• Increase the number, improve and maintain mooring buoys located within designated marine areas in each state for large vessels, especially the tuna fishing fleet				
Additional actions and/or comments:				

Theme 2: Species Management

Strategy Goal:

The FSM's native, endemic, and traditionally important species are protected and used sustainably, and its threatened species protected, for the benefit of the people of the FSM and the global community

Objective 1: Conservation of Species	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To identify, preserve and conserve all native, endemic, threatened, and traditionally important species in the FSM through effective conservation programs				
Actions:				
• Develop guidelines and procedures for registering protected species in a national protected species registry				
• Establish, maintain and update a threatened species list				
• Regularly review existing lists of threatened species in peril and develop and implement appropriate conservation programs. Determine which species are suitable for recovery/reintroduction programs (including propagation) and investigate the potential and feasibility of developing captive breeding programs to prevent species extinctions				
• Develop State botanical gardens to house collections of native flora				
• Work with other countries to further develop and implement regional and international programs to protect migratory species (e.g. turtles)				
• Further develop and strengthen endangered species laws and regulations				
• Develop and implement programs for the conservation and protection of native species and varieties from the destructive impact of alien and invasive species				
Additional actions and/or comments:				

Theme 2: Species Management

Strategy Goal:

The FSM's native, endemic, and traditionally important species are protected and used sustainably, and its threatened species protected, for the benefit of the people of the FSM and the global community

Objective 2: Research and Monitoring	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To undertake research for the identification, documentation and monitoring of species contributing to the implementation of appropriate conservation and management programs				
Actions:				
• Undertake ongoing research programs to complete the identification and current status of the nation's flora and fauna				
• Make funding available to enable forest inventory assessments to take place every 5 years				
• Make funding available to enable comprehensive marine assessments to take place every 5 years				
• Establish and implement resource-monitoring programs for species that are threatened, rare, endemic, commercially harvested and culturally significant, with an emphasis on developing protocols that can be adopted by communities				
• Develop a central location within each State that will house all research findings and distribute them to interested parties				
• Develop monitoring programs to evaluate, document, and implement appropriate actions on threats to the biodiversity of the nation				
• Support and develop program to monitor ocean temperature and acidification, and to evaluate the impact of coral bleaching, crown of thorns starfish, land-based pollution, and other threats to coral reefs				
• Develop research and monitoring programs to identify the presence and evaluate effects of invasive species and develop control and/or eradications programs where appropriate				
Additional actions and/or comments:				

Theme 2: Species Management

Strategy Goal:

The FSM's native, endemic, and traditionally important species are protected and used sustainably, and its threatened species protected, for the benefit of the people of the FSM and the global community

Objective 3: Sustainable Use and Management of Species	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To ensure the sustainable use and management of species for social and economic development				
Actions:				
• Re-evaluate and/or develop appropriate sustainable management plans, including sustainable harvesting levels and enforcement programs for all commercial and subsistence harvested marine (inshore and offshore), freshwater and terrestrial flora and fauna				
• Through legislation and enforcement eliminate all destructive harvesting practices (e.g. dynamite and fish poisoning fishing)				
• Develop and implement native forest regeneration and rehabilitation programs				
• Develop and encourage environmentally sustainable and economically viable aquaculture and forest product programs				
• Identify and implement suitable sustainable use management programs for species that are important for the eco-tourism industry (e.g. game fishing, manta ray observations, mangrove forest tours)				
• Establish environmental certification "green products" for natural resource export by the private sector at sustainable levels (e.g. marine aquarium council certification and forest stewardship certification)				
Additional actions and/or comments:				

Theme 3: Genetic Resource Use

Strategy Goal:

The FSM's genetic resources are accessible for utilization and all benefits derived are equitably shared amongst the stakeholders

Objective 1: Equitable Sharing of Benefits of Genetic Resources	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and implement appropriate national and state legislation measures to effectively access genetic resources and carry out fair and equitable sharing of benefits from the use of these resources				
Actions:				
• Develop National and State bioprospecting legislation				
• Develop National and State bioprospecting enforcement programs and penalties				
• Develop and implement appropriate benefit sharing mechanism and legislation for all holders of traditional knowledge and owners of resources utilized in bioprospecting				
• Develop National and State legislation asserting royalty rights over final products involving FSM natural resources				
• Clearly define through appropriate legislation intellectual property rights				
• Establish a bioprospecting-coordinating national expert panel				
• Develop, implement and enforce a scientific code of conduct for all biodiversity and bioprospecting research in the FSM				
• Develop and implement a research permit process that includes provision for hiring local associates in order to assure that local capacity is developed and supported in conjunction with research on genetic resources				
• Develop and implement a system for tracking biodiversity research in the nation				
• Establish a process for permitting the collection of biological specimens needed for scientific studies in order to comply with international regulations on the transport of biological specimens as well as to control biopiracy				
Additional actions and/or comments:				

Theme 4: Agrobiodiversity

Strategy Goal:

The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM

Objective 1: Conservation and Sustainable Use of Agrobiodiversity	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and ensure the effective implementation of appropriate conservation measures for the sustainable use of agrobiodiversity				
Actions:				
• Promote methodologies for sustainable use of agrobiodiversity				
• Eliminate unsustainable agrobiodiversity use				
• Establish incentives that encourage conservation and sustainable use of agrobiodiversity				
• Promote environmentally sound agricultural practices (e.g. organic farming, agroforestry and polyculture)				
• Promote, develop and share environmentally sustainable agricultural practices.				
• Identify, develop and establish botanical gardens featuring local endemic, endangered and threatened species				
• Create and maintain state seed banks of all native, endemic, endangered and threatened species				
• Identify, promote and enhance existing programs for the inventory, propagation and preservation of traditional species, varieties, cultivars and breeds				
Additional actions and/or comments:				

Theme 4: Agrobiodiversity

Strategy Goal:

The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM

Objective 2: Promotion and Development	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To compile existing research findings and develop programs and projects critical to the development of agrobiodiversity				
Actions:				
• Document existing traditional agrobiodiversity resources and practices, including the usage of aerial photography				
• Develop and expand on existing markets for local species and varieties that can be produced on a sustainable basis				
• Identify 'value added' opportunities for local produce				
• Develop a national marketing strategy for the regional export of local niche products				
• Promote existing research findings with farmers through training programs and public education				
• Undertake awareness activities around invasive species that impact agroforestry				
Additional actions and/or comments:				

Theme 4: Agrobiodiversity

Strategy Goal:

The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM

Objective 3: New Research and Development	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To conduct relevant research critical to the development of agrobiodiversity				
Actions:				
• Evaluate the usefulness and impacts of new biotechnologies				
• Develop and expand on new markets for local species and varieties				
• Develop and implement research and development training programs for all relevant agencies and institutions involved in agrobiodiversity				
• Document and publish all research information and findings and maintain collections of information in each state				
• Conduct research on the ecology of traditional agricultural methods				
• Monitor all new introduced agricultural species				
• Undertake research around invasive species that impact agroforestry				
• Establish state clearing house mechanisms to be linked to the national clearing house mechanism				
Additional actions and/or comments:				

Theme 4: Agrobiodiversity

Strategy Goal:

The conservation and sustainable use of agrobiodiversity contributes to the nation's development and the future food security of the FSM

Objective 4: Food and Health Security	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To enhance and strengthen food and health security through the use of sustainable agrobiodiversity practices				
Actions:				
• Develop and implement new and existing programs that promote the production of local nutritional food				
• Develop and implement programs that increase local food production and enhance agrobiodiversity				
• Encourage sustainable breeding programs for livestock (e.g. pigs and chickens)				
• Assess imported animal feeds and the potential implications of their use for human health				
Additional actions and/or comments:				

Theme 5: Ecological Sustainable Industry Development

Strategy Goal:

Economic development activities in the FSM meet the needs of the population while sustaining resources for the benefit of future generations

Objective 1: Ecologically Sustainable Industries	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop, utilizing the precautionary principle, long-term smart and ecologically sustainable industries that provide attractive incomes while minimizing the exploitation of and impact on natural resources				
Actions:				
• Promote the development of ecologically sustainable and economically profitable enterprises utilizing and conserving the nation's biodiversity and utilizing economic incentives (e.g. tax breaks) to promote expansion of these activities while removing all incentives for non-compliant industries				
• Promote and support research and pilot programs that develop partnerships between the government and private sector to develop ecologically sustainable industries				
• Further develop and support those industries currently meeting ecological sustainability goals (e.g. Eco-tourism)				
• Develop and implement mechanisms for the establishment of National and State "green" accounting programs, including incentives				
• Establish incentive-based programs for "environmentally friendly" community development, including economic incentives and financial access for these activities				
• Develop and implement environmental economic valuation procedures for assessing the full economic value of biodiversity to the nation				
• Integrate biodiversity valuation as an integral component of all land use and coastal use planning				
• Explore and develop a program that introduces a user fee program for conservation areas to provide additional funding assistance for the management of these areas				
• Explore the potential for initiating and developing ecologically benign industries that can drive economic development				
Additional actions and/or comments:				

Theme 5: Ecological Sustainable Industry Development

Strategy Goal:

Economic development activities in the FSM meet the needs of the population while sustaining resources for the benefit of future generations

Objective 2: Income Generating Activities	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and promote long-term ecologically sustainable income generating activities for resource owners and the community				
Actions:				
• Identify and implement appropriate programs to promote and support sustainable income generating activities at the community level and provide financial incentives and capacity building to assist in the development of these programs				
• Establish and strengthen networks and partnerships between public and private sectors including donor agencies to support sustainable income generating activities				
• Undertake evaluations of feasibility and ecological sustainability of all proposed income generating activities				
• Develop mechanisms to derive income and develop capacity from eco-education and eco-research industries				
Additional actions and/or comments:				

Theme 5: Ecological Sustainable Industry Development

Strategy Goal:

Economic development activities in the FSM meet the needs of the population while sustaining resources for the benefit of future generations

Objective 3: Energy Resources	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
To secure long-term efficient and sustainable energy sources that promote the use of technology contributing to energy conservation and the protection of biodiversity				
Actions:				
• Promote and support environmentally sound development of natural energy sources at all levels of the nation and				
• Develop National and State strategies for energy safety and efficiency				
• Promote renewable energy resources and provide incentives for their use				
• Promote and provide technical information to develop alternative energy sources using solar, wind, water and hydrogen cells for power generation				
• Promote technology that contributes to energy conservation				
• Carry out awareness programs explaining the processes involved in the development of any new energy sources				
• Develop management plans to ensure any use of the nation's forests, especially mangrove forests, for energy sources is sustainable				
• Reduce reliance on wood as fuel				
• Reduce greenhouse gas emissions				
Additional actions and/or comments:				

Theme 6: Biosecurity

Strategy Goal:

Border control, quarantine and eradication programs are effectively protecting the FSM's native biodiversity from the impacts of alien invasive species

Objective 1: Policy and Legislation	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To improve and strengthen appropriate national, state and municipal policies and legislation to ensure the effective management of biosecurity				
Actions:				
• Develop national and state policies and actions for the management of all biosafety issues				
• Develop national and state policies, legislation and actions for the management of genetically modified organisms				
• Further develop and implement national and state laws and screening processes for alien species introductions and genetically modified organisms to manage or minimize their impacts on the nation's biodiversity				
• Further develop the national government's power to enforce (including issues of transportation and staffing) all laws and legislation relating to alien introductions				
Additional actions and/or comments:				

Theme 6: Biosecurity

Strategy Goal:

Border control, quarantine and eradication programs are effectively protecting the FSM's native biodiversity from the impacts of alien invasive species

Objective 2: Control and Eradication	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To identify and develop appropriate programs to ensure effective control and eradication of species threatening biodiversity				
Actions:				
• Strengthen facilities and provide informed and trained personnel for border control and quarantine services				
• Ensure budget exists for relevant personnel to attend appropriate training and educational conferences				
• Develop programs for the control and eradication (where feasible) of invasive species				
• Develop programs for the control of all endemic species being exported from the nation				
• Further develop and implement screening protocols for all international and domestic watercraft entering the nation's ports and traveling within the nation				
• Further develop and implement screening of all international and domestic watercraft operating between ports within the nation				
• Implement regional and international programs to protect native marine biodiversity on the high seas and all coastal ports (e.g. PACPOL and IMO programs)				
• Implement existing invasive species task force and develop rapid response plans in each State and Regionally				
Additional actions and/or comments:				

Theme 6: Biosecurity

Strategy Goal:

Border control, quarantine and eradication programs are effectively protecting the FSM's native biodiversity from the impacts of alien invasive species

Objective 3: Research and Monitoring	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To undertake a systematic and scientific research and monitoring program to allow management of biosecurity threats				
Actions:				
• Review, evaluate, update and prioritize the lists of terrestrial and aquatic invasive species in the FSM				
• Strengthen the national and state government agencies to be able to undertake appropriate scientific research and assessment of introduced species				
• Increase collaboration with regional and international agencies to assist in the identification, control and eradication of invasive species				
Additional actions and/or comments:				

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Objective 1: Solid Wastes and Sewage	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
Provide an environmentally safe mechanism for the collection, storage and disposal of solid wastes and sewage within the nation to prevent further degradation of the environment and loss of biodiversity within the nation				
Actions:				
• An assessment will be carried out in the states to identify priority waste management and sewage needs				
• A technical assistance program will be developed and implemented to fund necessary infrastructure (e.g. water systems, refuse dumps, recycling facilities, sewer systems and treatments plants) to assure the health and welfare of all FSM inhabitants				
• Develop and implement waste collection, storage and disposal programs for residential and commercial premises Develop and implement programs for reuse and recycling of wastes, both within and outside the country				
• Develop and implement waste management programs that prevent contamination of freshwater (including ground water lens and coastal marine environment)				
• Develop, implement, and improve sewage treatment programs and, relocate and extend marine sewage discharge locations, to limit negative impacts on the marine environment				
Additional actions and/or comments:				

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Objective 2: Petrochemicals	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Provide an environmentally safe mechanism for the collection, storage and disposal of petrochemical wastes to prevent degradation of the environment and loss of biodiversity within the nation				
Actions:				
• Develop and implement petrochemical waste collection, storage and disposal programs for residential and commercial premises throughout the nation				
• Develop and implement programs for reuse and disposal of petrochemical wastes				
• Develop and implement monitoring legislation and enforcement of petrochemical pollution, including ship waste dumping in open waters				
• Develop and implement programs for the safe collection and disposal of petrochemical wastes resulting from shipwrecks				
Additional actions and/or comments:				

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Objective 3: Hazardous Chemicals	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Provide an environmentally safe mechanism to prevent or eliminate the use and abuse of hazardous chemicals and to develop and implement correct storage and disposal programs to prevent the degradation of the environment and loss of biodiversity within the nation				
Actions:				
• Develop and implement hazardous chemical waste collection, storage and disposal programs for residential and commercial premises throughout the nation				
• Develop and implement programs for the importation, handling, use and safe disposal of hazardous wastes (including lead batteries, pesticides, fertilizers, and chlorine) both within and outside the country				
• Develop and implement monitoring legislation and enforcement programs to prevent unauthorized use and misuse of hazardous chemicals including incorrect storage and disposal				
• Revise and further develop legislation and regulations on hazardous chemicals, including importation requirements				
Additional actions and/or comments:				

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Objective 4: Pollution Emergencies	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Enhance the nation's capability to effectively respond to pollution emergencies to reduce negative impacts on the environment				
Actions:				
• Increase preparedness and skills of the relevant government and private sector agencies and acquire equipment required to rapidly respond to petrochemical spills and other hazardous chemical emergencies on land and water				
• Enhance and strengthen the links between National, State and Municipal governments with regard to coordination and response to petrochemical spills and other hazardous chemical emergencies				
• Develop and implement legislation to require all polluters (governmental and private) to clean up and/or pay for damages occurred by polluting the environment				
• Establish a revolving 'green fund' generated from petrochemical and hazardous waste violations to support responses to and the clean-up of pollution emergencies				
• Ensure relevant international agreements and protocols are endorsed by the FSM national government to better support state responses				
Additional actions and/or comments:				

Theme 7: Waste Management

Strategy Goal:

All human-generated wastes are effectively managed to prevent or minimize environmental degradation, pollution and loss of the nation's biodiversity

Objective 5: Air and Noise Pollution	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Provide an environmentally safe mechanism for the reduction of all activities that degrade the atmosphere and associated biodiversity				
Actions:				
• Develop and implement air and noise quality monitoring programs for residential and commercial premises throughout the nation				
• Revise and further develop legislation and regulations to effectively reduce air and noise pollution within the nation				
• Develop and implement monitoring and enforcement of air and noise, light and thermal pollution legislation				
Additional actions and/or comments:				

Theme 8: Human Resources & Institutional Development

Strategy Goal:

All citizens, residents and institutions of the nation are aware of the importance of biodiversity and have the technical knowledge, skills and capability to conserve, preserve and sustainably utilize, manage and develop all biodiversity within the nation

Objective 1: Human Capacity Building	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and strengthen the capacity of resource owners, traditional leaders, communities, technical staff and policy makers in the coordination and implementation of conserving, preserving and sustainably utilizing and developing the biodiversity of the FSM				
Actions:				
• Develop and implement local capacity training programs for national, state and municipal personnel involved in the formation and implementation of conservation related programs, including education and enforcement sectors				
• Develop and implement capacity building training for local communities, resource owners and traditional leaders on the principals and benefits of Environmental Impact Assessment (EIA), so EIA activities can be applied to development projects at community levels				
• Update EIA process in the states to include community participation				
• Secure and seek financial assistance to develop and implement capacity development programs for all sectors				
• Require all visiting researchers and research agencies to hire local individuals to assist in all program activities				
• Require grant-funding agencies to include local individuals to assist in the preparation of program documents				
• Develop and implement local capacity building and strengthening programs on biological surveys, monitoring techniques and ecosystem management				
• Establish multi-sectoral groups of local experts to co-ordinate and undertake biological surveys and monitoring programs, seek outside assistance when necessary				
• Provide and implement local training programs on community based conservation management approaches, methodologies and the development of sustainable income generating activities				
• Provide training and capacity building for communities on their legal rights and appropriate procedures for reporting environmental offences				
• Undertake capacity building training for national and state personnel on genetically modified organisms and their possible effects on the nation's biodiversity				
• Undertake capacity building training for quarantine personnel (national and state) on border control, quarantine services and the effective screening of new species introductions and necessary eradication of potentially invasive species				
• Develop and implement training programs to enhance and strengthen public and community knowledge of the understanding, awareness and commitment to sustainable agricultural and fisheries practices				
• Provide training on proposal development and strengthen human capacity to seek and acquire outside funding assistance				
• Develop and implement local capacity building and strengthening programs on correct waste management usage and disposal, including removal of hazardous waste products (e.g. machinery and toxic products) and recycling				
• Develop and implement local capacity building and strengthening programs on alternative ecologically friendly industries, and energy conservation and management				
• FSM national government to endorse and support implementation of the national environmental science curriculum in all schools (public and private, elementary and high school level)				
• Develop a scholarship program to support graduate students in conservation, resource management and environmental science areas				

Additional actions and/or comments:

Theme 8: Human Resources & Institutional Development

Strategy Goal:

All citizens, residents and institutions of the nation are aware of the importance of biodiversity and have the technical knowledge, skills and capability to conserve, preserve and sustainably utilize, manage and develop all biodiversity within the nation

Objective 2: Institutional Strengthening	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To develop and strengthen the capacity of national, state and municipal government agencies, NGOs and academic institutions in the coordination, education and implementation of activities for conserving, preserving and sustainably utilizing the biodiversity of the FSM				
Actions:				
• Develop and implement institutional strengthening training programs for national, state and municipal government agencies, educational institutions and NGOs involved in the formation and implementation of conservation related programs				
• Develop and implement institutional strengthening programs for all national, state and municipal government agencies on the principles, benefits and enforcement of Environmental Impact Assessment (EIA)				
• Secure and seek financial assistance to develop and implement institutional strengthening programs for all sectors*				
• Strengthen the ability of the national and state agencies, education institutions and NGOs to provide and implement local educational training programs to all citizens on community-based conservation management approaches, methodologies and the development of sustainable income generating activities				
• Strengthen the capacity of national, state and municipal government agencies, education institutions and NGOs to develop a mechanism to integrate traditional and modern conservation management practices to further improve the agrobiodiversity of the nation				
Additional actions and/or comments:				

Theme 8: Human Resources & Institutional Development

Strategy Goal:

All citizens, residents and institutions of the nation are aware of the importance of biodiversity and have the technical knowledge, skills and capability to conserve, preserve and sustainably utilize, manage and develop all biodiversity within the nation

Objective 3: Public Awareness and Education	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To promote, encourage and strengthen the awareness and understanding of all stakeholders (local resource owners, traditional leaders, communities, government agencies, academic institutions, NGOs and policy makers) of the importance of protecting, preserving and ensuring sustainability of the biodiversity of the FSM				
Actions:				
• Develop, promote and conduct public awareness campaigns and programs through media, workshops/seminars and information material for National and State government agencies, municipal councils and relevant targets groups including resource owners on the functions and benefits of conserving and sustainable utilization of the nation's biodiversity				
• Integrate information on traditional knowledge and promote traditional practices that are important for the conservation and sustainable use of biodiversity into the education curriculum				
• Increase coordination and networking between relevant National and State agencies to better utilize information on the FSM's biodiversity for use and integration into school and college curricula, youth and development programs				
• Develop learning exchanges between islands, municipalities and conservation sites to exchange knowledge and ideas related to biodiversity conservation practices				
• Develop and distribute public awareness material on all legislation relating to biodiversity use to all stakeholders in the nation's official language (English) and translated into each state language				
• Develop and implement public awareness and educational programs on the importance and management of all ecosystems, native and other important species and agrobiodiversity				
• Develop public awareness programs to increase the knowledge and appreciation of the functions and benefits of biodiversity				
• Develop and implement national and state public awareness programs for invasive species to prevent illegal introductions and encourage control				
• Increase public awareness, education and acceptance of proper sanitation practices, waste disposal mechanisms and pollution programs				
• Increase public awareness, education and acceptance of ecologically sustainable industry development and energy usage, including alternative energy options (e.g. solar and wind)				
• Existing clearinghouse mechanisms for disseminating and sharing information on biodiversity activities to be utilized at national and state levels				
Additional actions and/or comments:				

Theme 9: Resource Owners

Strategy Goal:

Traditional resource owners and communities are fully involved in the protection, conservation, preservation and sustainable use of the nation's biodiversity

Objective 1: Traditional Knowledge, Practices and Innovations	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Preserve traditional knowledge and practices of the cultures of the FSM that are important for the protection, conservation, preservation and sustainable use of biodiversity				
Actions:				
• Develop and maintain a register to document, preserve, sustain, and enhance all traditional knowledge, practices and innovations including intangible cultural heritage (ICH) important for the conservation of biodiversity				
• Develop suitable national and state legislation to protect traditional knowledge, practices and innovation and provide a mechanism for benefit sharing to appropriate knowledge holders				
• Develop and implement programs that integrate traditional knowledge, practice and innovation with modern scientific technology and methodologies to promote conservation and sustainable use of biodiversity				
Additional actions and/or comments:				

Theme 9: Resource Owners

Strategy Goal:

Traditional resource owners and communities are fully involved in the protection, conservation, preservation and sustainable use of the nation's biodiversity

Objective 2: Empowering Resource Owners	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
Empowering resource owners and communities to conserve and sustainably manage biodiversity under suitable customary and modern resource management practices				
Actions:				
• Develop and implement programs for resource owners, traditional leaders, communities and municipalities to be responsible for the conservation and sustainable use of biodiversity				
• Integrate activities and programs that promote the conservation and sustainable use of biodiversity into relevant government agency extension services				
• Further develop and encourage the full participation of all resource owners and community groups in the formulation, coordination and implementation of programs for the conservation and sustainable use of biodiversity				
• Establish and implement an incentive scheme including examples of public-private partnerships to encourage environmentally friendly communities/municipalities that promote conservation and sustainable use of biodiversity ensuring that intellectual property rights are protected				
• Develop appropriate legislation at the state and municipal levels that encourages the empowerment of resource owners and communities to monitor and enforce environmental regulations				
Additional actions and/or comments:				

Theme 10: Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Objective 1: Population	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To enhance understanding of links between population and our islands' carrying capacities				
Actions:				
• Develop a program to link data on population, natural resources and biodiversity to sustainable development				
• Develop and monitor indicators of sustainable development				
• Develop and implement a public awareness program on the links between population density, natural resources, biodiversity and prospects for sustainable development				
• Implement public health programs that support responsible parenthood				
Additional actions and/or comments:				

Theme 10: Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Objective 2: Policy	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
To integrate concepts of conservation and sustainable use of biodiversity into all relevant sectoral policies, programs and plans				
Actions:				
• Incorporate concepts of biodiversity conservation into all future national, state and municipal social and economic policies and development strategies				
• Incorporate a population policy providing information pertaining to environmental and resource carrying capacities, sustainable financing, and economic hardships				
• Provide advice and technical information pertaining to the development of policies that fall within the NBSAP framework				
• Develop a national-level NBSAP awareness campaign to spotlight the importance of the NBSAP across relevant sectors				
Additional actions and/or comments:				

Theme 10: Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Objective 3: Multi-Sectoral Collaboration	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To strengthen and develop multi-sectoral collaboration in promoting conservation, preservation, and sustainable use of biodiversity in the FSM				
Actions:				
• Enhance and strengthen the linkages between national, state and municipal government agencies, NGOs, CBOs, and private sector, including strengthening the links between foreign investment boards and the State chambers of commerce, to provide information on the conservation and management of the FSM biodiversity (e.g. Pohnpei Resource Management Committee, Yap Environmental Stewardship Consortium and the Kosrae Resource Management Committee)				
• Enhance the collaboration and assistance from regional and international agencies to assist the nation's stakeholders				
• Strengthen national and state linkages with regional and international environmental conventions that the FSM is a party to on behalf of and for the benefit of the States				
• Develop and implement programs to further strengthen the partnerships between the private sector, NGOs, CBOs, and local community in implementing biodiversity related programs				
• Establish a multi-sector team of experts (domestic, regional and international) to conduct biological research, resource evaluations and monitoring programs on the FSM biodiversity				
• Ensure that all multi-sector teams and groups include representation from all sectors, e.g. health and transportation, and are not limited only to those groups perceived to have direct involvement in biodiversity conservation and management				
• Undertake an assessment of available funding and resources for the development of assessments and reports versus on-the-ground work, to ensure appropriate allocation				
Additional actions and/or comments:				

Theme 10: Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Objective 4: Legislation	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To ensure that appropriate national, state and municipal legislation is developed and effectively enforced to sustainably manage the FSM's biodiversity				
Actions:				
• Review and strengthen existing national, state and municipal government environmental legislation and acts to incorporate relevant actions from the NBSAP and ensure integration of all themes across all relevant sectors within the nation				
• Review bi-annually, the FSM participation in international treaties relating to biodiversity to which the nation is a party on behalf of and for the benefit of the States				
• Support and further develop national, state and municipal capabilities for the enforcement of all biodiversity legislation				
• Strengthen and support EIA legislation at the state and municipal government level to minimize the adverse impacts of the nation's development on the environment				
• Develop mechanisms and legal framework regulating access to traditional knowledge, intellectual property issues, genetic resources and bioprospecting				
• Assess the islands' biological carrying capacities and develop ecological planning based on these				
Additional actions and/or comments:				

Theme 10: Mainstreaming Biodiversity

Strategy Goal:

All economic and social activities of the FSM take full account of impacts on and fully consider sustainability of biodiversity

Objective 5: Environmental Impact Assessments	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To ensure that EIAs are conducted for all development projects to minimize any adverse impacts on the FSM's biodiversity				
Actions:				
• Further develop and regularly review relevant state and municipal EIA legislation and policies as they relate to biodiversity				
• Implement National, State and Municipal legislation that requires all developers (including all levels of government, non-government organizations and the private sector) to undertake EIAs and to involve resource owners and stakeholders in all EIA procedures				
• Include the undertaking of biological surveys/assessments and economic evaluations as integral parts of all EIA procedures				
• Expand the scope of EIAs to include gender and societal impacts				
Additional actions and/or comments:				

Theme 11: Financial Resources

Strategy Goal:

Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

Objective 1: State Commitment	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To define support needed to implement and monitor progress on the NBSAP and state BSAPs at the national and state levels				
Actions:				
• Determine staffing, financial and other resources needed to carry out NBSAP activities in the states				
• Define and establish incentives to implement NBSAP activities				
• Strengthen support for community-based NGOs and other community-based organizations				
Additional actions and/or comments:				

Theme 11: Financial Resources

Strategy Goal:

Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

Objective 2: National Commitment	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To provide, in accordance with national capabilities, long-term national financial support and incentives for undertaking conservation programs				
Actions:				
• Develop short-term and long-term sustainable financial plans and mechanisms, to include cost recovery programs where appropriate, within each state for undertaking conservation programs at all levels of the government				
• Develop sustainable conservation funding mechanisms within the nation (e.g. allocation of tax revenue, user fees, eco-labelling, investment into Micronesia Challenge Endowment)				
• Strengthen and improve national and state government budget allocations for staff and project activities for conservation and management of the nation's biodiversity				
• Strengthen and improve support for conservation/biodiversity programs for NGOs and CBOs				
• Provide technical, financial and marketing support and assistance for all sustainable development to incorporate environmental safeguards and mitigation programs				
Additional actions and/or comments:				

Theme 11: Financial Resources

Strategy Goal:

Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

Objective 3: International Cooperation	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To effectively acquire and allocate resources available under cooperation schemes with members of the international community				
Actions:				
• Develop short-term and long-term financial plans for undertaking sustainable biodiversity management and conservation programs for the nation				
• Strengthen linkages to regional and international donor organizations, including private foundations and NGOs to provide financial assistance for sustainable biodiversity management and conservation				
• Strengthen linkages with other developed country partners party to the Convention on Biological Diversity (CBD) as a means to effectively implement and provide financial assistance for sustainable biodiversity management and conservation				
• Maintain a database of all potential donor assistance programs and distribute to all relevant agencies within the nation				
Additional actions and/or comments:				

Theme 11: Financial Resources

Strategy Goal:

Local, regional and international financial sources provide for the long-term financial sustainability of all conservation and biodiversity-related activities

Objective 4: Conservation Trust Fund	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
The continued establishment and development of the Micronesia Conservation Trust (MCT) Fund for implementation of the NBSAP and relevant biodiversity work				
Actions:				
• Formally establish and implement the Micronesia Challenge Endowment Fund				
• Identify short-term and long-term funding sources for the establishment of the Micronesia Challenge Endowment Fund for the implementation of the NBSAP and relevant biodiversity related activities within the nation				
• Utilize the Micronesia Challenge Endowment Fund to strengthen and empower resource owners and communities to manage their own resources sustainably				
• Formalize revenue streams and cost recovery mechanisms through taxes and other sources of income generation for the use of the nation's biodiversity resources				
• Support and invest in community-based conservation funding mechanisms including trust funds, revolving funds, etc. at state and/or municipal levels				
Additional actions and/or comments:				