The Federated States of Micronesia

Kosrae Biodiversity Strategy and Action Plan

2018–2023

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Foreword

The living wealth of our island State is our biodiversity and natural resources. Sustaining the habitats and ecosystems that nurture these is vital for improving the quality of life of our people and yielding a sustainable future. The updating of this Kosrae Biodiversity Strategy and Action Plan (KBSAP) reflects our ongoing commitments to sustaining our biodiversity and natural resources. This update outlines Kosrae's objectives toward stemming island, regional and global loss of biodiversity over the next five years, in support of its overarching Vision and Goal. This update continues to recognize the significance of managing, protecting and conserving the biodiversity - our living wealth, for the benefit of the present and future generations.

This update reflects the goals and objectives of our National Biodiversity Strategic Action Plan (NBSAP) which also relates and aligns with our FSM Strategic Development Plan - Environment Sector and the Convention on Biological Diversity. We commit to this update, reflecting and maintaining the objectives of the 2004 Plan but with changes made primarily to the underlying and supporting activities to consider changing circumstances. The objectives will continue to implement and serve not only to improving our biodiversity but also to address drivers of its loss in a mutually-supportive manner with cooperating partners.

Ultimately, working cooperatively with others will bring better results. It is this determination that this updated Plan must be implemented in a collaborative and supporting manner to reach our anticipated Vision and Goal. This Plan shall also serve to inform the public of the significance of sustaining our biodiversity and support community, non governmental and government agencies and organizations in accessing and implementing supporting projects towards the Plan and other overarching strategies.

The development of this updated Plan has gathered collective support and input from government departments and agencies, non governmental organizations, municipal governments, and community groups, and the successful completion of this document would not have been possible, without the cooperation and support from these key sectors. Implementation of this Plan requires this continuing support of joint implementation by all these key sectors and other relevant and supporting donors and development partners.

The Micronesia Conservation Trust (MCT) is highly acknowledged and complemented for the completion of this update, with support from the FSM Department of Resources and Development. Stakeholders at the state level have committed tireless efforts to see to the completion of this update with the MCT, and it is with profound gratitude to extend my sincere appreciation.

We all must work together to ensure that our biodiversity is safeguarded, for both, the present and future generations. This updated KBSAP is an important milestone in this endeavour.

Kulo ma lulap.

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Table of Contents

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The development of this plan was made possible through the generous financial support of the United Nations Development Programme.

The Kosrae BSAP revision process was coordinated and facilitated by the Micronesia Conservation Trust, with many people from a great number of organizations, both governmental and non-governmental, and communities contributing to the consultation and validation workshops, and providing essential additional information. It is these people that have made the development of this Kosrae BSAP possible:

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Introduction

The State of Kosrae differs geographically from the other three states of the Federated States of Micronesia (FSM) in that it is comprised of a single high volcanic island. The interior of the island is characterized by high, steep, rugged mountains rising to 2064 ft. at Mt. Finkol, and covered with dense tropical rainforest. It is the least populous state with a population of 6,616, and has the lowest population density at 156 per square mile (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, n.d.). The island has a roughly triangular shape totalling approximately 43 sq. miles and has four municipalities, namely Lelu, Malem, Tafunsak and Utwa. The population lives mainly along the coastal areas as the basaltic mountain interior is very inaccessible.

Several light industries exist on the island, including construction company sites, gravel quarries, a power plant, a relatively small petroleum/oil/lubricants storage tank farm, an airport, a seaport and an aquaculture center. Several hotels service a small tourist industry, which peaked in 2000 with almost 3,700 visitors that year (FSM, 2004). As with the other FSM states, the majority of the workforce in Kosrae is in the public sector. The average annual income from wages in Kosrae is $8,474, somewhat lower than the national average of $11,386. Much of the population remains dependent on the land and sea for food, with approximately 81% of households engaging in at least one subsistence activity (agriculture and forestry, handicrafts and home production, livestock and aquaculture, or fishing, hunting and gathering), which is slightly higher than the national average of 77% (FSM Office of Statistics, Budget, Overseas Development Assistance and Compact Management, 2014).

The FSM is a constitutional democracy, operating at national, state, municipal and local levels, with most power delegated to the four states by the national constitution. The State Government of Kosrae is the smallest in the FSM and is structurally similar to the FSM National Government, with executive, legislative, and judicial branches. Key agencies, departments, and conservation organizations involved in natural resource management and sustainable use include the Department of Resources and Economic Affairs, the Kosrae Island Resource Management Authority, Attorney General's Office, the Kosrae Conservation and Safety Organization, and the College of Micronesia FSM Land Grant Research. At the Community level, each municipality has formed Resource Management Committees comprised of community volunteers with the motivation to assist in the conservation and sustainable use of the resources of the island. The state government holds 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. Kosraean traditional culture was highly influenced by missionaries in the mid 19th century. Today, religious activities influence much of the lives of Kosraeans, whilst western influence is continuing to impact traditional Kosraean culture.

Systems of land ownership and tenure differ across the four states of the FSM. Land ownership in the FSM is limited to citizens of the FSM only, with land lease terms varying by state (US Department of State, 2017).

The FSM experiences a tropical climate, with consistently warm weather driven by the north-east trade winds. The average annual temperature in Kosrae in 2017 was 82.4°F (NOAA NCEI, 2018). There is little variation throughout the year, with the high islands such as Kosrae being generally hot and humid. Rainfall across the FSM is generally plentiful, with Kosrae receiving approximately 230 inches in 2017. (NOAA NCEI, 2018).

The FSM as a whole, including Kosrae, 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). El Niño is also associated with reduced rainfall during the dry season. 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.

Air and sea surface temperatures across the FSM are increasing, with waters around the FSM 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). Under a high emissions scenario, temperature increases greater than 2.5°C by 2090 are projected with high confidence for the FSM, with a similar temperature increase projected for the ocean surface (Australian Bureau of Meteorology and CSIRO, 2011).

Annual rainfall is also projected to increase across the FSM, 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). Increasingly intense rainfall events, particularly when following drought conditions, 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 as a whole, and also to Kosrae, owing to reliance on near-shore coastal fisheries, 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). 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).

Kosrae State Vital Statistics based on 2005 Forest Inventory Analysis and 2010 Kosrae State Census

Geography	
Location	05° N, 163° E
Number of islands	1
Land area	43 sq. miles (27,520 acres)
Forest (including agroforest)	41.4 sq. miles (26,496 acres)
Non-forest vegetation	1 sq. miles (665 acres)
Cropland	0.006 sq. miles (4 acres)
Urban (including urban cultivated)	1.2 sq. miles (751 acres)
Other (including water)	0.4 sq. miles (247 acres)
Ocean area	560 sq. miles
Climate	
Annual average temperature (2017)	82.4° F
Rainfall (2017)	230 inches
Demographics	
Population	6,616
% of total FSM population	6.4%
Population density	156 per sq. mile
Economics	
Average annual income (wages)	$8,474
% households involved in subsistence activity	81%
% contribution to national total household income	7.1%

Biodiversity in Kosrae

Biodiversity across the FSM is incredibly rich, with FSM recognized as part of the globally important Polynesia-Micronesia biodiversity hotspot (CEPF, 2007).

The waters of the FSM are home to 1,221 species of fish. Of these, 1,070 are associated with the extensive reef system (Froese & Pauly,, 2018). In fact, the wider Micronesia region is estimated to contain 4% of the world's coral reefs, with reefs a defining feature of the FSM.

There are 4 main harbors nestled amongst the mostly mangrove-ringed island dotted with several strands of sandy beaches and surrounded with a fringing reef. The reef flats that surround Kosrae are considered to be among some of the most pristine remaining in the world. 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). Biological surveys of reefs across the FSM have assessed the percentage of reefs 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 Kosrae 20% of outer reefs met the threshold. The data from these surveys also demonstrated that fishing pressure was a primary determinant of reef condition.

The FSM also supports approximately 36.3 sq. miles of mangrove forest across the islands, approximately 5.4 sq. miles of which are in Kosrae (Donnegan et al, 2011). Indeed, much of the FSM is covered with forests, and Kosrae is no exception. With an estimated 41.4 sq. miles of forest, almost 95% of Kosrae is forested (Donnegan et al, 2011). Of this, upland forest covers 28.5 sq. miles, swamp forest covers 1.8 sq. miles and agroforest covers 5.8 sq. miles (Donnegan et al, 2011). Cropland accounts for only approximately 4 acres of land in Kosrae, and areas classified as 'urban cultivated' account for 438 acres (Donnegan et al, 2011).

Kosrae is home to a number of important endangered species, including fruit bat and the Micronesian pig. The only remaining stand of *Terminalia carolinensis* trees in the world, locally known as Ka, is found in Kosrae.

Of the many environmental threats facing many places on Earth today, including the State of Kosrae, perhaps none is more serious than the loss of biodiversity – the variety of species, ecosystems, and ecological processes that forms the basis for continued life on Earth. The problem of biodiversity loss is so significant and urgent simply because of its irreversibility. Once a species is extinct, it is lost forever. Moreover, because humankind is so dependent on ecosystem services provided by biodiversity, the degradation or loss of habitat and species poses a serious risk to humans. Thus, the significance of nurturing the biodiversity of Kosrae State through maintaining its habitats and ecosystems is vital to ongoing social, economic and cultural development, and to sustaining its rich traditions.

As demand for a consumptive lifestyle increases, there are growing pressures on the island's resources that must be managed sustainably for future generations. A coordinated approach to biodiversity conservation through an agreed upon plan can contribute to the overall environmental health of the island. The people of Kosrae therefore outline below the Kosrae Biodiversity Strategy and Action Plan (BSAP) that should be used in conjunction with the National Biodiversity Strategy and Action Plan (NBSAP), the land use plan and other resource management strategies to address priorities for the conservation and sustainable use of its biological resources.

It is recognized that a number of threats to the biodiversity of Kosrae, and the entire FSM, exist. These threats, which have been identified at a national level and are relevant to Kosrae State, comprise:

- Environmental conversion and degradation
- Over-exploitation of resources
- Waste management and pollution
- Invasive and alien species
- Climate change
- Infrastructure development.

In light of these threats, since the introduction of the initial Kosrae BSAP in 2004, significant developments toward comprehensive biodiversity conservation in Kosrae and throughout the FSM have been undertaken.

Over time a network of strong partnerships between the national and state governments, local governments and communities, partners such as the University of Guam who provide technical expertise, and various conservation organizations, such as The Nature Conservancy and the Micronesia Conservation Trust, amongst many others. Programs supported by the MCT focus on biodiversity conservation, climate change adaptation and sustainable development throughout the FSM and wider Micronesia region, with the MCT playing a vital role in conservation in Kosrae.

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 (UNESCO, 2011).

Perhaps the most significant conservation initiative to come about since the initial Kosrae BSAP 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 essential ecosystems natural resources. 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 Micronesia, 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. 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.

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 (The Nature Conservancy, 2003). One hundred and thirty areas of biodiversity significance (ABS) were identified across the FSM, twelve of which are in Kosrae. These comprise two terrestrial sites totaling 18.66 sq. miles, one marine site of 0.21 sq. miles, five coastal marine sites totaling 5.66 sq. miles and four coastal freshwater sites totaling 7.35 sq. miles (The Nature Conservancy, 2003).

Various figures exist for the number of areas under protection in Kosrae, however, a 2009 nationwide gap analysis of protected areas suggested that at that time 7.2 sq. miles of terrestrial and marine environments were under protection in the state (MCT, 2009). An additional 7.9 sq. miles are considered to be outside of protected areas but within ABS Action Sites, while a further 9.7 sq. miles are outside of both protected areas and ABS Action Sites but are within ABS Standard Sites, thus representing good conservation features (MCT, 2009).

Notably, the first conservation easement in the region was established in Kosrae in 2014. The easement, a system whereby landowners surrender certain development rights in return for annual payments from an easement fund, was implemented 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 and medicinal resources, to continue while preventing future development of the land. The easement also allows for some eco-tourism activities.

Background to the Revised Kosrae Biodiversity Strategy and Action Plan

Development Process for the Revised Kosrae BSAP

The first Kosrae BSAP was produced in 2004, following a series of community consultations and expert meetings.

Oversight of the revision process was provided by the Micronesia Conservation Trust, and a process of research, consultation and validation was followed. The objectives and actions as defined in the initial Kosrae BSAP were taken out to consultation, and a multi-stakeholder group was engaged in a two-day workshop to review the BSAP 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. The group comprised government officials, regional, state and community NGO representatives, technical experts, scientists, researchers and educators involved in environmental education. The Micronesia Conservation Trust was accompanied by The Nature Conservancy during these consultations.

In addition to these consultations, a specific women's focus group was held to ensure that the different interactions with and observations of biodiversity experienced by women in Kosrae were understood and incorporated into the revised Kosrae BSAP.

Following this process, a revised document was developed, which was then circulated to a select group from the original consultations, who then convened for a further two-day validation workshop.

This process was part of a wider set of consultations undertaken as part of the revision of the NBSAP. The revision of the NBSAP took account of each of the states' revised BSAPs, as well as being consulted upon separately. By following this process, it is intended that the NBSAP and individual state BSAPs are mutually supportive and reflect each other.

The Kosrae Biodiversity Strategy and Action Plan

Vision

To achieve a sustainable, diverse, and healthy environment respected and safeguarded by Kosraeans for present and future generations.

Goal

The Kosrae BSAP goal is striving for successful action to conserve Kosrae State biodiversity, and must address the full range of causes of its current loss through conservation programs, protection of biodiversity, sustainable use of natural resources, restoration of endangered species, and build-up of individual human capacity for conserving biodiversity through awareness programs.

Strategy and Action Plan

The initial Kosrae BSAP focused on six objectives:

- To develop, review, and enforce policies and regulations for sustainable harvesting of natural resources
- To create and implement educational and awareness programs in the community that address biodiversity conservation
- To improve, manage and preserve vital ecosystems
- To minimize waste contributing to the pollution of our environment
- To implement programs and practices for the security of our genetic resources and local knowledge
- To develop programs for restoring biodiversity and species habitat

These key objectives remain relevant and so this revised Kosrae BSAP utilizes them as the areas of focus under which revised and updated actions are described.

Objective 1

To develop, review, and enforce policies and regulations for sustainable harvesting of natural resources

The actions included in the initial Kosrae BSAP were as follows:

- Form committee to initiate and implement educational and awareness programs on cutting of trees
- Ban use of poisonous chemicals such as bleach, cyanide, local plant roots (*Derris trifolia*), leaves (*Canti cands*), and other destructive fishing methods as in the use of dynamite and electrocution devices
- Enforce seasonal harvesting of threatened species protected by Kosrae State laws and regulations
- Ban the use of modern fishing equipment and devices such as scuba gear and FADS
- Regulate exportation of significant species such as mud crabs, lobster, and other species considered threatened
- Ban use of gill nets with a mesh size approximately less than one inch

Progress to date

Some progress has been made under this objective. Mangrove harvesting regulations have been put in place that determine areas in which mangrove harvesting is acceptable. Three such areas have been established to date.

With regard to fishing methods, there is a ban on the use of poisonous chemicals in place as part of the consolidated environmental act that was enacted in 2010 (Title 19.328 "Prohibited Methods of Fishing"). There is also a ban on the use of scuba gear for spear fishing. However, fish aggregating devices (FADS) have not been banned, rather they are currently being used offshore to help ease pressure on nearshore reefs. There are currently no regulations in place regarding the mesh size of any fishing nets.

Four enforcement officers completed the Guam Community College conservation enforcement training course, subsequently sharing their knowledge with Officers of the Pohnpei Division of Fish and Wildlife.

The enforcement of harvesting seasons needs to be further enhanced and supported, though twenty five personnel across government agencies have been deputized under the Kosrae Conservation Enforcement Taskforce to enforce regulations. With regard to turtles, seasonal harvesting is monitored, and no-take seasons are enforced.

The export of fish species is allowed, but for subsistence use only. However, there is no program in place to monitor this.

Updated actions:

1. Conduct one (1) annual training to enforcement officers and one (1) forum among policymakers on policies and regulations regarding sustainable use and management of natural resources
2. Set up a hotline that will support enforcement of the ban of threatened and banned species
3. Develop a deputization program for conservation enforcement officers (inclusive of all resource managers)
4. Undertake a process of legislative review in relation to the harvesting of biodiversity and natural resources with a view to ensuring their conservation and protection through the strengthening of laws and regulations
5. Develop a fee structure for the exportation of significant species such as mud crabs, lobster, and other species considered threatened
6. Develop an Environmental Court Case Day/designate a specific day within the week to solely address environmental cases

Indicators

Indictors under this objective will include:

Action 1:

- One annual training conducted to enforcement officers
- One annual forum conducted among policymakers

Action 2:

- Hotline established, staffed, and financed

Action 3:

- Number of conservation enforcement officers completing deputization program

Action 4:

- One legal counsel hired to conduct review

Action 5:

- Exportation fee structure developed and implemented

Action 6:

- Environmental Court Case Day established and utilized

Constraints

Constraints will largely be related to funding, human capacity and support from both the leadership and communities in relation to specific conservation-focused policies and legislation.

Objective 2

To create and implement educational and awareness programs in the community that address biodiversity conservation and climate change

The actions included in the initial Kosrae BSAP were as follows:

- Integrate local biodiversity conservation and management into elementary school curriculum
- Create committee to implement educational and awareness programs on local biodiversity conservation with the utilization of available media services and technology
- Initiate and conduct school visits to address biodiversity lessons

Progress to date

Progress directly against the original actions under this objective has been limited, although work has been undertaken that is linked to the intentions of the actions. For example, there is currently no integration of biodiversity conservation and management into the elementary school curriculum. However, Pacific Resources for Education and Learning is working with NGOs and other partners to develop climate change awareness programs, though these will not be implemented in all schools. Some stand-alone units on conservation and climate change have been developed, but these subjects have not yet been incorporated into the state curriculum.

A committee to implement educational and awareness programs has not been created. A number of awareness programs have, however, been implemented through a variety of environmental organizations. Examples of these programs include the annual summer youth-to-youth program co-organized by the Kosrae Conservation and Safety Organization and Kosrae Island Resource Management Authority alongside the Department of Health Services and Department of Education, question-and-answer programs broadcast on the radio on specified 'environmental' days, and community awareness programs. Other youth programs include the newly developed Heroes of Tomorrow Training Program, which was developed to build activists in key areas of Kosrae inclusive of environment. Other environmental initiatives include the Coconut Shell Project by the Micronesian Red Cross Kosrae Chapter, and manufacturing of banana fiber products by Green Banana Paper Company.

Quarterly school visits are undertaken in relation to specific environmental issues and include presentations, activities and surveys both prior to and following the visits. Essay, song and drawing contests are developed linked to specific environmental themes, and awareness-generating materials such as brochures and t-shirts are distributed. Pacific Resources for Education and Learning are also developing a three-dimensional map of Kosrae for educational purposes.

The Association for Promotion of International Cooperation, Bill Raynor, Micronesia Challenge Scholarship is regionally focused but made available to FSM, including Kosrae. Under the Micronesia Challenge Young Champions (MCYC) Internship Program, interns have been recruited across the FSM (and the region) and mentored by resource management agencies across the region. Leadership skills development relevant to environmental management for potential conservation leaders facilitated through the MCYC Internship Program influences the choice of field of study and future career paths of the interns. The US Forest Service Professional Internships in Pacific [Terrestrial] Island Ecosystem Management (PIPTIEM) program is also available, with natural resources managers able to either attend school or targeted technical trainings while working in their states.

Updated actions:

1. Call for the endorsement of Environmental Science framework by FSM Department of Education.
2. Conduct quarterly meetings between environmental agencies to enable ongoing education and awareness programs about local biodiversity conservation and climate adaptation to youth, elders, women, etc
3. Develop and maintain websites for key resource management agencies and departments and ensure all existing websites are appropriately maintained and utilize social media effectively
4. Develop a summer internship program for pre-juniors and pre-senior students in high school to gain experience working in the environmental sector
5. Collect, document, and utilize traditional knowledge regarding biodiversity conservation and climate adaptation. programs

Indicators

Indictors under this objective will include:

Action 1:

- State Leadership Resolution passed to call for endorsement of Environmental science

Action 2:

- Participation in annual Youth to Youth program increased and sustained
- Reports or briefings natural biodiversity circulated or published on a quarterly basis
- Collaborated school visits conducted on a quarterly basis

Action 3:

- Resource management agencies' (e.g. KIRMA) websites developed and maintained

Action 4:

- Summer internship program developed

Action 5:

- Kosrae traditional knowledge survey conducted and shared
- Awareness programs on traditional knowledge on biodiversity conducted on a quarterly basis

Key indicators under this objective will include the integration of biodiversity conservation into the school curriculum, the number of participants in awareness activities and the general level of knowledge regarding biodiversity conservation across Kosraean society.

Constraints

Funding and limited resources, such as personnel, transport etc. may act as constraints on the undertaking of the actions under this objective. Building and coordinating necessary partnerships may also be constraints to action.

Objective 3

To improve, manage and preserve areas of biological significance

The actions included in the initial Kosrae BSAP were as follows:

- Prevent destructive development of terrestrial, freshwater, and marine/aquatic areas
    - Enforce sustainable development of vital areas
    - Enforce development of regulations for vital areas
    - Restrict development of highly erodible areas
- Strengthen and enforce existing permitting laws and regulations
- Require environmental impact statements for all major development projects.
    - Strengthen capacity of personnel to review project EIS
- Designate more conservation areas

Progress to date

Progress under this objective has been good. The creation, establishment and development of a variety of programs, task forces, committees and associations has helped prevent destructive developments taking place. Some examples of the actions undertaken include the establishment of marine protected areas, community-based education programs related to fisheries management as well as the initiation of community-based organizations such as resource management committees and fisher and farmer associations. An invasive species program has been established, and the Kosrae Conservation Enforcement Taskforce has been put in place. The Kosrae State Strategic Development Plan and the updated land use plan also address the issue of development on the island, as does the new Kosrae Shoreline Management plan.

Extensive collaboration efforts between government agencies, conservation organizations and landowners have also been undertaken, resulting in some notable outcomes, such as the Yela Conservation Easement, and the Olum Watershed.

A permitting and Environmental Impact Assessment process is in place to regulate development activities that can have detrimental impacts on the environment and its natural habitats. Kosrae developed its EIA guidelines in 2014.

In relation to protected areas, the Kosrae Protected Areas System was put in place in 2010. Various protected areas are already in place, such as the Utwe Biosphere Reserve, the Yela Ka Forest Conservation Easement and the Mahkontowe Conservation Area, Trochus Sanctuary, and Tafunsak Protected Area with marine protected areas and watershed areas proposed for designation in Awane, Malem, Walung, Olum and Tofol.

Updated actions:

1. Update list of areas of biological significance (ABS)
2. Priority ABS to be identified and included in the Protected Areas System
3. Enforce environmental impact statement requirements for all development projects in areas of biological significance

Indicators

Indictors under this objective will include:

Action 1:

- Areas of biological significance identified and documented

Action 2:

- At least two areas of biological significance included in Protected Areas System

Action 3:

- 100% of development projects go through EIS

Indicators under this objective will include the number of protected areas designated, the number of development projects undertaken and re-enactment of the Consolidation Bill that covers environmental legislation. Specific indicators include the number of citations for illegal fishing practices and the removal of illegal dumping sites.

Constraints

The main constraints under this objective include financial and human capacity, the ability to enforce regulations, support from leadership and the level of awareness and preparedness to change behaviours amongst the public.

Objective 4

To minimize waste contributing to the pollution of our environment

The actions included in the initial Kosrae BSAP were as follows:

- Enforce littering law
- Strengthen and enforce existing pollution regulations
    - Prevent development of pigpen and poultry farm on or along coastal areas
- Upgrade and comply with sewage discharge systems to meet United States EPA standards
- Prevent unsafe discharge of hazardous chemicals on land and in aquatic areas
- Prevent dumpsites in mangrove and swampy areas
    - Implement Kosrae State Solid Waste Management Plan
- Implement educational and awareness programs to increase awareness of littering law and pollution regulations
- Explore alternatives to plastics, Styrofoam, and other non-biodegradable materials

Progress to date

A good degree of progress has occurred under this objective. With regard to littering, a successful program providing trash bins to the community of Malem has been conducted by the Kosrae Conservation and Safety Organization, with the Kosrae Island Resource Management Authority working to replicate this success in other communities, and establishing an inter-municipal collection system.

A ban on plastic bags has been introduced, and while biodegradable bags are currently allowed, draft regulations are in development to ban all plastic bags. The Kosrae Conservation Enforcement Task Force was established in 2014, comprising staff from a number of government agencies and municipalities. An Environmental Citation Form was also introduced in 2016.

Organic dry litter piggery projects have been initiated to prevent water pollution, and a water quality survey conducted on rivers and recreational sites, both in 2017. Loans for housing in Kosrae, and the Kosraean housing program, require that homes utilize a US-standard septic tank system, also as a way to address and prevent pollution.

In terms of hazardous chemicals, a revised state persistent organic pollutant regulation was enacted in 2013, with an amendment to add two more substances introduced in 2014. A recycling program exists to deal with aluminum cans, plastic and glass bottles, and to export used batteries. The government is also working with the Kosrae Utility Authority on plans for the incineration of used oil.

A Japan International Cooperation Agency-funded 'Fukuoka method' central landfill site was established in 2008, and the Kosrae State Solid Waste Management Plan was adopted in early 2018. Municipal dumpsites have been closed to encourage use of the central site. Annual bulky waste collection operations are in place, and trash collection has been integrated into environmental events with community-based groups, women's organizations and church groups. An annual community coastal clean-up is organized through the collaborative efforts of a number of government agencies, and community and school awareness programs are also conducted by various several government agencies.

Updated actions:

1. Enforce the littering law
2. Implement the Kosrae State Solid Waste Management Plan
3. Restrict development of pig pens and poultry farms on or along aquatic areas
    a. Move pigpen and poultry mandate from Department of Health to KIRMA
    b. Develop enabling law for pigpen and poultry management
4. Upgrade and comply with sewage discharge systems to meet United States EPA standards in all new and existing developments
5. Prevent unsafe discharge of hazardous chemicals on land and in aquatic areas
6. Establish a representative group focusing on awareness of the littering law and pollution regulation
7. Explore and promote policies for alternatives to plastics, Styrofoam, and other non-biodegradable materials
8. Develop and implement legislation to ensure those undertaking projects or developments are responsible for the cost of disposing of the associated trash and waste generated

Indicators

Indictors under this objective will include:

Action 1:

- Atleast 5 cases prosecuted on Littering Law per year
- Community members trained and utilized to enforce littering law

Action 2:

- Inter municipality waste collection system developed and utilized

Action 3:

- Pigpen and poultry regulations transferred from DOH mandates to KIRMA mandates
- 100% of pig pens and poultry farms relocated away from aquatic areas

Action 4

- 100% of household in compliance with sewage system standards

Action 5:

- Storage unit for hazardous chemicals provided

Action 6:

- Semi-annual awareness programs on littering law and pollution regulations

Action 7:

- Policy for usage of alternative supplies developed and implemented

Action 8:

- Disposal of waste materials included in project contracts

Constraints

Funding and human capacity will likely be constraints under this objective, along with inadequate current policies and legislation. Specific constraints include the inability to replicate the Fukuoka method of trash disposal across communities and a lack of facilities for storing used crude oil.

Objective 5

To implement programs and practices for the security of our genetic, historic and traditional resources and knowledge

The actions included in the initial Kosrae BSAP were as follows:

- Develop regulations for the research and use of genetic resources
- Develop mechanisms and access and benefit sharing regimes to manage and protect traditional knowledge

Progress to date

Some progress has been made under this objective, including the establishment of the Royalty Act, access benefit sharing (ABS) for research purposes outside of Kosrae.

In terms of traditional knowledge, the Historic Preservation Office archive section has been established, and information access and sharing are facilitated through the Office's website and Facebook page. Moreover, a youth ethnozoology program was developed in 2018 by the Historic Preservation Office, utilizing Heroes of Tomorrow participants.

The Kosrae Conservation and Safety Organization conducted an ethnobotany "Plants and People" book in partnership with the New York Botanical Garden, while the Historic Preservation Office established a library.

Updated actions:

1. Implement regulations for research and use of genetic resources
2. Develop mechanisms and access and benefit sharing regimes to manage and protect traditional knowledge
3. Establish a center to promote and foster traditional knowledge sharing
4. Develop awareness programs to ensure the continued survival of traditional knowledge and traditional methods of resource use

Indicators

Indicators under this objective will include:

Action 1:

- ABS regulations implemented

Action 2:

- ABS regulation implemented

Action 3:

- Center for traditional knowledge provided and utilized

Action 4:

- Cultural week conducted on an annual basis

Constraints

The current lack of a national-level access and benefits sharing law is a major constraint. There is also a lack of a biodiversity-focussed database to store marine and terrestrial genetic data and information. The cultural reluctance to share traditional knowledge that is apparent in all states of the FSM will also be a constraining factor under this objective.

Objective 6

To develop programs for restoring biodiversity and species habitat

The actions included in the initial Kosrae BSAP were as follows:

- Establish mangrove tree planting programs in each municipality
- Rehabilitate and enhance stewardship for species habitat
- Initiate quarterly underwater and on-land community clean-ups
- Establish terrestrial and marine reserves
- Promote establishment of on-island research facilities

Progress to date

Good progress has been made under this objective. Coastal plant and watershed replanting programs have been ongoing over the previous 3 years, though these are funding dependent. In addition, seedling production for coastal, mangrove and medicinal plants has been undertaken by the Kosrae Island Resource Management Authority, with plants provided free of charge. Farmers associations have been running similar seedling program, while women in farming groups have been producing seedlings of fruit plants and staple crops for use in agroforestry gardens.

The establishment of the Yela Ka Forest Conservation Easement is a notable example of habitat stewardship, while various forest sites have been identified for community use alongside areas designated for stewardship, and there are plans to enhance fisheries stewardship.

Malem-centered waste management project to support the clean-up of illegal dumpsites has been a success. Community clean-ups are also periodically carried out. Annual clean-ups are carried out on Environment Day also. Coastal clean-up activities are ongoing, but these are funding-dependent.

A number of terrestrial and marine reserves are in place, including the Yela Ka Forest Conservation Easement, the Utwe Biosphere Reserve and the Tafunsak Marine Reserve. The Walung Marine Protected Area is in the process of being designated, while the Trochus Sanctuary established in 1986 has been consistently maintained and managed.

In terms of on-island research facilities, these are limited. That being said, the College of Micronesia FSM has an ongoing tissue culture program in place related to crop production.

Updated actions:

1. Recruit a Protected Area Network Coordinator
2. Continue to expand rehabilitation programs for land and aquatic species including mangroves, trees, trochus etc. across all municipalities
3. Develop stewardship plans for all protected habitats
4. Implement regular underwater and on-land community clean-ups
5. Support on-island research facilities

Indicators

Indicators under this action will include:

Action 1:

- PAN coordinator recruited

Action 2:

- At least two rehabilitation projects per year over the next five years

Action 3:

- Stewardship plan developed for each protected habitats

Action 4:

- Underwater cleanups conducted annually
- Quarterly community clean ups conducted

Action 5:

- Partnership strengthened between key agencies through at least one memorandum of understanding

Constraints

A lack of community awareness and the ability to change people's behaviour may be constraining factors. In addition, funding, leadership priorities and land ownership issues may also present challenges under this objective.

Implementation, Monitoring and Reporting

Implementation

Implementation of this Kosrae BSAP will require a broad network of government agencies, funding bodies, civil-society groups and communities. This will require co-ordination through the government to ensure necessary funds can be accessed and the appropriate groups collaborate as needed.

Monitoring, Reporting and Reviewing

Monitoring the implementation of the Kosrae BSAP will be undertaken in two ways. The lead agencies and parties will be requested to complete an annual quick assessment, using the assessment form provided in Appendix 1. This process will involve identifying which actions have been completed or achieved, which actions some progress has been made on, and which require initiating. This process will also enable the identification of necessary additional actions under each Objective. This quick assessment process will be led and managed by national and state government together, and facilitated by the Micronesia Conservation Trust.

A full review and revision of the Kosrae BSAP 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 Kosrae BSAP, and will ensure that all Objectives and Actions remain relevant and reflect the challenges and unmet needs of Kosrae's biodiversity at that time. This will also provide an opportunity to ensure that the Kosrae BSAP supports the planned revision of the NBSAP and that both remain in line with any new strategies of initiatives under the Convention for Biological Diversity.

Reporting and disseminating information regarding the Kosrae BSAP and its constituent programs is the responsibility of the state government.

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Appendix 1: Annual Quick Assessment Template

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

Objective 1:

Objective:	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
To develop, review, and enforce policies and regulations for sustainable harvesting of natural resources				
Actions:				
1. Conduct one (1) annual training to enforcement officers and one (1) forum among policymakers on policies and regulations regarding sustainable use and management of natural resources				
2. Set up a hotline that will support enforcement of the ban of threatened and banned species				
3. Develop a deputization program for conservation enforcement officers (inclusive of all resource managers)				
4. Undertake a process of legislative review in relation to the harvesting of biodiversity and natural resources with a view to ensuring their conservation and protection through the strengthening of laws and regulations				
5. Develop a fee structure for the exportation of significant species such as mud crabs, lobster, and other species considered threatened				
6. Develop an Environmental Court Case Day/designate a specific day within the week to solely address environmental cases				
Additional actions and/or comments:				

Objective 2:

Objective:	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To create and implement educational and awareness programs in the community that address biodiversity conservation and climate change				
Actions:				
1. Call for the endorsement of Environmental Science framework by FSM Department of Education.				
2. Conduct quarterly meetings between environmental agencies to enable ongoing education and awareness programs about local biodiversity conservation and climate adaptation to youth, elders, women, etc				
3. Develop and maintain websites for key resource management agencies and departments and ensure all existing websites are appropriately maintained and utilize social media effectively				
4. Develop a summer internship program for pre-juniors and pre-senior students in high school to gain experience working in the environmental sector				
5. Collect, document, and utilize traditional knowledge regarding biodiversity conservation and climate adaptation. programs				
Additional actions and/or comments:				

Objective 3:

Objective:	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To improve, manage and preserve areas of biological significance				
Actions:				
1. Update list of areas of biological significance (ABS)				
2. Priority ABS to be identified and included in the Protected Areas System				
3. Enforce environmental impact statement requirements for all development projects in areas of biological significance				
Additional actions and/or comments:				

Objective 4:

Objective:	Degree of achievement			
	No progress	Some progress	Completed	Still relevant?
To minimize waste contributing to the pollution of our environment				
Actions:				
1. Enforce the littering law				
2. Implement the Kosrae State Solid Waste Management Plan				
3. Restrict development of pig pens and poultry farms on or along aquatic areas				
a. Move pigpen and poultry mandate from Department of Health to KIRMA				
b. Develop enabling law for pigpen and poultry management				
4. Upgrade and comply with sewage discharge systems to meet United States EPA standards in all new and existing developments				
5. Prevent unsafe discharge of hazardous chemicals on land and in aquatic areas				
6. Establish a representative group focusing on awareness of the littering law and pollution regulation				
7. Explore and promote policies for alternatives to plastics, Styrofoam, and other non-biodegradable materials				
8. Develop and implement legislation to ensure those undertaking projects or developments are responsible for the cost of disposing of the associated trash and waste generated				
Additional actions and/or comments:				

Objective 5:

Objective:	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
To implement programs and practices for the security of our genetic, historic and traditional resources and knowledge				
Actions:				
1. Implement regulations for research and use of genetic resources				
2. Develop mechanisms and access and benefit sharing regimes to manage and protect traditional knowledge				
3. Establish a center to promote and foster traditional knowledge sharing				
4. Develop awareness programs to ensure the continued survival of traditional knowledge and traditional methods of resource use				
Additional actions and/or comments:				

Objective 6:

Objective:	Degree of achievement			Still relevant?
	No progress	Some progress	Completed	
To develop programs for restoring biodiversity and species habitat				
Actions:				
1. Recruit a Protected Area Network Coordinator				
2. Continue to expand rehabilitation programs for land and aquatic species including mangroves, trees, trochus etc. across all municipalities				
3. Develop stewardship plans for all protected habitats				
4. Implement regular underwater and on-land community clean-ups				
5. Support on-island research facilities				
Additional actions and/or comments:				