PRIORITIZED ROAD INVESTMENT AND MANAGEMENT ENHANCEMENTS (PRIME) PROJECT

Federated States of Micronesia

ENVIRONMENT AND SOCIAL MANAGEMENT FRAMEWORK

FINAL

Prepared for

Department of TRANSPORTATION, COMMUNICATIONS & INFRASTRUCTURE
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ABBREVIATIONS

AOI	Area of Interest
CBO	Community Based Organization
CIU	DoFA Central Implementation Unit
CRRS	Climate Resilient Road Strategy
DoFA	Department of Finance and Administration
DoTC&I	Department of Transportation, Communications and Infrastructure
DRD	Department of Resources and Development
E&S	Environmental and Social
ESA	Environmental and Social Assessment
ESCP	Environmental and Social Commitment Plan
ESF	World Bank Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	World Bank Environmental and Social Standards
FSM	Federated States of Micronesia
GIS	Geographic Information Systems
GoFSM	Government of FSM
GM	Grievance Mechanism
IOL	Inventory of Loss
KIRMA	Kosrae Island Resource Management Authority
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
OHS	Occupational Health and Safety
PAP	Project Affected Person
PIU	PRIME Project Implementation Unit
PMU	DoTC&I Project Management Unit
PRIME	Prioritized Road Investment and Management Enhancement Project
RF	Resettlement Framework
SEP	Stakeholder Engagement Plan
SOGI	Sexual Orientation and Gender Identity
SIDS	Small Island Developing States
TOR	Terms of Reference
VA	Vulnerability Assessment

WWTP	Wastewater Treatment Plant
WB	World Bank
WHO	World Health Organization

GLOSSARY

Cut-off date	The eligibility cut-off date is the date of completion of the inventory of loss (IOL) for Project works under Component 2. Assets located within the Component 2 works footprint after this date will not be eligible for entitlements or associated assistance.
Disadvantaged / Vulnerable People	Those who may be more likely to be adversely affected by the project impacts and/or more limited than others in their ability to take advantage of a project's benefits. Such an individual/group is also more likely to be excluded from/unable to participate fully in the mainstream consultation process and as such may require specific measures and/or assistance to do so. This will take into account considerations relating to age, including the elderly and minors, and including circumstances where they may be separated from their family, the community or other individuals on which they depend. Specifically, vulnerable groups for PRIME, disadvantaged and vulnerable people consist of the following categories of persons: i) those without legal title to the land or other asset/s, ii) households headed by females (where appropriate[1]), iii) the elderly or disabled, iv) vulnerable road users due to road construction (refer definition to below), and v) other vulnerable groups, such as people living in extreme poverty or hardship.
Gender Mainstreaming	The process of ensuring that gender concerns and women's needs and perspectives are explicitly considered in projects and programs, and that women participate in the decision-making processes associated with development-based activities.
Indigenous Persons	WB ESS7: Referring exclusively to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (i) self- identification as members of a distinct indigenous social and cultural group and recognition of this identity by other; and (ii) collective attachment to geographically distinct habitats, ancestral territories or areas of seasonal use or occupation, as well as to the natural resources in these areas; and (iii) customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and (iv) a distinct language or dialect, often different from the official language or languages of the country or region in which they reside.
Meaningful Consultation	WB ESF / ESS10: a two-way process that (a) begins early in the a project planning process to gather initial views on the project proposal an inform project design; (b) encourages stakeholder feedback, particularly as a way of informing project design and engagement by stakeholders ion the identification and mitigation of environmental and social risks and impacts; (c) continues on an ongoing basis, as risks and impacts arise; (d) is based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information in a timeframe that enables meaningful

[1] Note: On some islands in FSM all houses are headed by a female as they own the land. In these cases, the female head of the household would not be considered a vulnerable person.

	consultations with stakeholders, in a culturally appropriate format, in relevant local language(s) and in understandable to stakeholders; € considers and responds to feedback; (f) supports active and inclusive engagement with project-affected parties; (g) is free of external manipulation, interference, coercion, discrimination, and intimidation; and (h) is documented and disclosed by the Borrower.
PRIME Roads	Roads that will be assessed as part of Technical Assistance (TA) aspects of the PRIME Project, including the Vulnerability Assessment (VA), Climate Resilient Road Strategy (CRRS) and Environmental and Social Assessment (ESA) studies, which include the majority of the existing 'primary roads' on the main islands of each FSM State, and some additional secondary roads that are considered to be of strategic and/or economic importance by DoTC&I. Only the primary roads identified will be funded under Component 2 of the PRIME Project. Any recommended improvements identified by the VA/CRRS on the secondary roads will not be considered for funding under Component 2 of PRIME, however they may form part of recommended future investment needs for FSM's road network.
Project Affected Persons	Includes any person, households, entity, organizations, firms or private institutions who, on account of changes that result from the Project will have their (i) standard of living adversely affected, (ii) right, title, or interest in any house, land (including residential, commercial, agricultural, forest, plantations, grazing, and/organizing land), water resources, communal fishing grounds, annual or perennial crops and trees, or any other moveable or fixed assets acquired, possessed, restricted, or otherwise adversely affected, in full or in part, permanently or temporarily; and/or (iii) business, occupation, place of work or residence, or habitat adversely affected, permanently or temporarily, with or without displacement.
Vulnerable Road Users	Road users who are more vulnerable to harm because they are not in a vehicle, including pedestrians, motorcyclists, cyclists, and those on animals or animal drawn carts.

1. Introduction

1.1 Environmental and Social Assessment Overview

The Government of Federated States of Micronesia (GoFSM) has applied for financing from the World Bank (WB) for the Prioritized Road Investment and Management Enhancements (PRIME) Project to improve the climate resilience of FSM's road network. Part of the PRIME Project includes the assessment of environmental and social risks including:

(i) Environmental and Social Assessment (ESA);

(ii) Preparation of environmental and social instruments in accordance with the WB ESF;

(iii) Support stakeholder consultation activities; and

(iv) Provision of technical environmental and social advice as required to the Government of FSM as part of project preparation.

The ESA Consultant has been engaged by the GoFSM through the Department of Transportation, Communications and Infrastructure (DoTC&I) to undertake the ESA and preparation of the instruments required for WB appraisal including development of an Environmental and Social Management Framework (ESMF) for the PRIME Project.

1.2 Environmental and Social Management Framework (ESMF)

1.2.1 Purpose and Scope of the ESMF

As outlined in the World Bank Environmental and Social Framework 2017 (ESF), the purpose of the Environmental and Social Management Framework (ESMF) is to examine the risks and impacts of a project when the project consists of a program and/or series of works, and the risks cannot be determined until the program or works details have been identified. This is the case for the PRIME Project as the specific works that will form the Project will only be determined after the completion of the Vulnerability Assessment (VA) and Climate Resilient Road Strategy (CRRS) studies.

Once the works are defined for the PRIME Project and the necessary information becomes available, the framework will be used to develop the projects specific Environmental and Social Management Plans (ESMP) proportionate to potential risks and impacts for specific works.

As set out in Environmental and Social Standard (EES) 1: Assessment and Management of Environmental and Social Risks and Impacts (ESS 1) of the ESF, the ESMF is to set out the principles, rules, guidelines and procedures to assess the environmental and social risks and impacts, as well as measures and plans to reduce, mitigate and/or offset adverse risks and impacts.

1.2.1.1 Covid-19 Pandemic

On March 11, 2020, the World Health Organization (WHO) declared a global pandemic in response to the global spread of the severely infectious 2019 Novel Coronavirus (SARS-CoV-2, or 'Covid-19').

FSM is particularly vulnerable to the risk of Covid-19 due to its economic reliance on international travel of residents, tourists, and trade. Although no cases have been reported in the FSM to date (as at 1 December 2020), both international and domestic (i.e. inter-State) travel restrictions have been in place in FSM since March 2020, with strict quarantine requirements for travelers.

As a result the core internationally-based ESA consultant team was not able to travel to FSM as part of the preparation of PRIME Project ESA. Instead locally based sub-consultants in each State were engaged to undertake baseline data collection, field survey and stakeholder consultation activities under the direction of the internationally based environmental and social experts.

In the absence of physically being present on-the-ground in FSM, the internationally-based ESA consultant team implemented innovative solutions to baseline data collection including the use of ESRI ArcGIS Collector, a device (e.g. smart phone) based application which was used by the FSM-based team to capture data. The data was automatically uploaded to the consultants' GIS database. This method of data collection ensured consistent and comprehensive data and information collection and communication and allowed the GIS team to review in 'real-time' the data and 'geo-tagged' photographs captured in the field.

Consultation meetings were facilitated by the State-based ESA consultant team members. While initial efforts were made to allow relevant members of the international ESA consultant team to call into larger meetings via online video conferencing, internet connection was not reliable enough for this approach to be successful in most cases.

The FSM-based team was provided with training and consultation material (including presentation, Project Summary, agenda, meeting minutes template and attendee lists) by the international ESA consultant team members prior to consultation meetings. This was undertaken to ensure consistency in the messages being communicated to stakeholders across all four States, to ensure valuable feedback was provided and to manage stakeholder expectations. An internal debrief meeting was then held after the meeting to discuss any issues raised by the stakeholders and learnings from the process.

1.2.2 Links with Other Documents

This ESMF is just one of several reports and environmental and social (E&S) instruments developed to support management of the E&S aspects of the PRIME Project. Other key E&S documents prepared by the consultants for project appraisal include:

- Resettlement Framework (RF).
- Stakeholder Engagement Plan (SEP).
- Environmental and Social Commitment Plan (ESCP).

Documents to be prepared during project implementation, prior to preparation of the Contractor Bid documents, include:

- Labor Management and Health & Safety Procedures (LMP).
- Generic Environmental and Social Management Plan (ESMP).

2. Project Background and Rationale

2.1 Overview of the 'PRIME' Project

The *Prioritized Road Investment and Management Enhancements (PRIME) Project* will provide funds for technical assistance and institutional strengthening to improve the management of the road network in relation to potential climate change impacts for the FSM. In addition, the Project will fund the feasibility, design and construction of physical works on priority road assets to improve resilience to climate-related hazards or events.

FSM faces significant challenges related to its small size, remoteness, geographical dispersion, environmental fragility and sensitivity to external shocks. Climate projections predict elevations in air temperature, frequency of days of extreme, increased rainfall and rising sea levels. Sea level rise combined with natural year-to-year changes will accentuate the impact of storm surges and coastal flooding.

FSM's transport network is of critical importance to the country's economy and economic development through supporting trade and promoting commercial activity by facilitating the movement of goods and services, and providing safe and efficient access to social services including schools and health facilities. Critical climate resilient road, bridge or drainage improvement works to be implemented urgently to maintain a basic level of land transport connectivity in each state will be identified as part of the PRIME Project. The extent of these works are described and shown in Section 2.4.

While some initial road works have been identified as requiring urgent works (refer Component 2, Section 2.3.2), the design of the required works has not yet been undertaken and the full extent of impacts are not yet known. The additional works that will form the PRIME Project will be identified as part of the VA and CRRS studies. As part of these studies a multi-criteria assessment will be undertaken to prioritize the urgency of works and works that will be funded by PRIME. Environmental and social risk screening will be part of the multi-criteria analysis.

2.2 Climate Adaptation and Resilience Objectives

Frequent natural disasters and climate change impacts impose high costs and may even threaten the physical viability of some areas of the main islands of FSM and more remote outer islands. Droughts, typhoons, storm waves, flooding and landslides all affect FSM.

FSM is particularly vulnerable to the impacts of climate change and is likely to suffer serious adverse environmental, social and economic losses as a result of climate change induced hazards. Many people live within the coastal zone and are therefore vulnerable to climate related changes in precipitation, sea level, storms and coastal erosion.

The negative impacts of climate change are already evident in FSM, for instance, saltwater intrusion from rising sea levels that damage crops and contaminate freshwater supplies and increasing extreme weather events such as typhoons. In addition, as drought and sea level rise are amplified by regional El Niño Southern Oscillation (ENSO) processes, formerly sustainable atoll communities now rely on imported food and water during times of stress. Exacerbated by sea level rise, extreme spring tides, known in FSM as 'King Tides', are causing site-specific intense marine inundation that damages taro beds, soil, agro-forestry resources, and critical infrastructure along the coast, especially on low atoll islets.

Similar to other Small Island Developing States (SIDS), FSM is vitally dependent on access to well-functioning and reliable transportation systems. FSM's road network is of critical importance to the country's economic development. It provides for the day-to-day well-being of its people by increasing their access to economic activities and social services. It is estimated that around 75% of the population lives within 1 km of the coast, and critical infrastructure - such as hospitals, schools, government offices, places of employment, tourist infrastructure, port facilities, airports, and roads–is located primarily in the coastal zone. The country's road network and users already suffer regular temporary – sometimes only for hours, but occasionally longer - breaks of serviceability as vulnerable links or locations can be frequently rendered impassable and journeys disrupted by flooding, debris deposit, culvert, bridge and/or pavement damage.

Expected climate change effects - the combination of rising sea level and more intense typhoons – will place these coastal assets and communities at a higher level of risk. The FSM road network faces a range of vulnerability issues, in particular:

(i) Coastal exposure to sea-level rise, storm surge, wave action during spring tides and typhoons;

(ii) Inland flooding and landslips during extreme rainfall events; and

(iii) Accelerated pavement deterioration due to extreme weather and rising water tables in some locations.

The GoFSM plans to prepare a detailed assessment of vulnerabilities in road transport and develop a strategy for enhancing the climate resilience of the overall network for the same time-frame, with WB's assistance through the PRIME Project.

As outlined in Section 2.1, a key component of the PRIME Project is the preparation of the Road Network VA and CRRS studies, the objective of which is to mainstream analysis of severe weather events and climate change into road network planning and will enable a prioritized list of proposed investments in the network.

2.3 'PRIME' Investments and Activities

The PRIME Project will be included within the WB's Pacific Climate Resilient Transport Program (PCRTP) series of projects and will make significant investments in a range of climate resilient infrastructure.

Project activities will primarily take place within existing primary road corridors, or immediately adjacent to the road to improve erosion protection, drainage or safety features. Some additional secondary roads that are considered to be of strategic and/or economic importance will also form part of the 'PRIME Roads' and be assessed under Component 1 below but recommended improvements on these secondary roads will not be considered for funding under Component 2. The extent of these roads, including a definition of 'PRIME roads' in each State, are presented in Section 2.4.

The three key components of the PRIME Project are outlined below.

2.3.1 PRIME Component 1: Spatial and Sector Planning Tools

This Component involves technical assistance (TA) that will improve the way that climate change is addressed in FSM's road sector to enable policymakers to make informed decisions based on the most accurate and up-to-date information available. The following activities are proposed under Component 1:

a) **Vulnerability Assessment (VA) and Climate Resilient Road Strategy (CRRS).** Preparation and implementation of a VA and CRRS to assess levels of vulnerability to climate change and severe weather events (e.g. sea-level rise, extreme rainfall, landslide, storm surge, etc.) across FSM's existing primary road corridors and GoFSM-selected existing strategic secondary road corridors. The VA and CRRS will also identify measures to enhance resilience and prioritize investments to balance vulnerability reduction against cost implication. Training will be provided to relevant national and state officials in the use of VA and CRRS tools.

b) **Climate-informed road asset management systems**. Provision of hardware, software and ancillary tools to establish climate-informed road asset management systems to be used by DoTC&I and State Road Authorities. Training will be provided to relevant National and State officials in the use of these systems.

2.3.2 PRIME Component 2: Climate Resilient Infrastructure Solutions

This Component involves feasibility studies, design and construction of identified priority road assets to improve their resilience to climate-related hazards. The integration of climate change considerations into infrastructure activities will help strengthen the resilience of assets and improve functionality of the road network. Component 2 is split into two parts:

a) **Urgent Priority Works** (including design and supervision). Critical climate resilient road, bridge, causeway or drainage improvement works that should be implemented urgently to maintain a basic level of road connectivity in each state. Urgent works proposed for financing under the PRIME Project include:

   (i) Improving the narrow, low-level Lelu causeway in Kosrae;

   (ii) Replacing the 12 m Awak bridge in Pohnpei;

   (iii) Improving the 2.5 km airport to Pou Bay bridge road in Chuuk; and

   (iv) Replacing two short-span (6 m long) steel and concrete composite bridges in Yap.

b) **Works informed by the VA and CRRS** (including design and supervision). In addition to the urgent priorities under Sub-component 2a, a selection of near, medium and long-term road works would be financed to enhance the resilience of the network in each state to climate change impacts and natural hazards, in accordance with the recommendations from the VA and CRRS undertaken as part of Component 1. Works will be restricted to road networks within the existing primary road corridors. It is expected that physical works will not commence until year 2 of the Project.

   Interventions are expected to include measures to strengthen network resilience, including but not necessarily limited to:

   (i) **Pavement and surface strengthening** – periodic maintenance, repairs, rehabilitation or reconstruction of existing road pavement layers and/or surfacing, including provision of sealed shoulders and raising road levels;
   (ii) **Drainage improvements** – provision, reinstatement and/or lining of longitudinal drainage, replacement and/or increasing capacity of cross drainage culverts, improving open or covered outfalls, provision of subsoil drainage and cut-off drains;

(iii) **Spot slope stabilization** – widening and/or reducing slope of cuttings and fill embankments to reduce landslip risk, soil bioengineering and biotechnical stabilization techniques, and anchoring of unstable rock slopes;
(iv) **Rock wall revetment strengthening** – for protection of coastal road sections;
(v) **Improvements to causeways and bridges** – repairs or reconstruction of existing crossings and/or provision of new crossings to provide safe, all weather access for vehicles and pedestrians; and
(vi) **Road safety improvements** – traffic calming measures, provision of guardrails, line marking and minor realignments to improve sight distance.

Design of civil works will conform to international design codes of practice such as *Austroads*[2] for road and bridge design. Specifications for all works and materials will also be in accordance with international standards, making use of innovative materials and approaches if they will enhance climate resilience.

Once the proposed Component 2 works have been identified as part of the VA/CRSS prioritization process, early environmental and social risk screening will identify significant impacts that require avoidance and mitigation and will contribute to project selection for funding under the PRIME Project prior to commencement of preliminary design for the works.

Further environmental and social risk screening will be undertaken once concept preliminary designs have been developed to determine whether:

(i) There are high risk (significant) environmental and/or social aspects of these works that could prevent the works from being included under the PRIME Project;

(ii) Works could be designed in a way to minimize environmental and social impacts; or

(iii) Specific environmental assessments (such as ESIAs) and ESMPs, and Land Access Reports/Plans are to be prepared. If works are subsequently redesigned, further screening may be appropriate.

2.3.3 PRIME Component 3: Strengthening the Enabling Environment

This Component will provide funding to support institutional and regulatory reforms for road sector asset management and maintenance, including measures to strengthen local capacity and to increase the sustainability of climate resilient road sector investments. In addition, this Component will help to strengthen coordination among relevant institutions, will look at ways in which road sector management can be improved, and will address any emerging priority issues that can help support GoFSM in addressing climate change risks. Proposed sub-components include:

a) **Institutional and Governance Review**. A review of institutional arrangements, key policies, regulations, legislation and roles and responsibilities of principle stakeholders involved in the road sector with recommendations to strengthen such arrangements.

[2] https://austroads.com.au/

b) **Project Management.** Establishment and maintenance of a Project Implementation Unit (PIU) to support the implementation of the PRIME Project. In addition, this includes operating costs for PRIME-related travel and communications costs.

c) **Road Safety Program**. Provision of technical assistance activities to improve road safety.

d) **Capacity Building Initiatives**. Assess current preventive maintenance techniques and industry capacity. Provide technical trainings to sector agencies and local consultants and contractors to better operate and regulate a more climate resilient road network.

e) **Gender-informed Driver Licensing Pilot**. A pilot program to study and implement activities that address gaps in the possession of a driver's license.

f) **Emerging Priority Issues**. Providing technical assistance to strengthen the Recipient's capacity to address emerging priority issues that could have an impact on the Recipient's ability to manage a climate resilient road network.

Environmental and social instruments outlined in Section 1.2.3 (e.g. RF, ESMF, LMP, SEP and ESCP), provide the methods to manage the environmental and social risks relating to the technical advisory services that will be funded under this component. These instruments are relevant for all activities under each Component. Environmental and social instruments specifically relevant to Component 3 include the ESCP, SEP and LMP.

2.4 Project Location

2.4.1 National Context

FSM is located near the equator about 4,000 km southwest of the Hawaiian Islands in the Western Pacific Ocean and within the Caroline Islands group. The largest nation in the Micronesian sub-region, FSM is made up of four semi-autonomous states (Kosrae, Pohnpei, Chuuk and Yap) located between Marshall Islands to the east and Palau and the Philippines to the west (refer Figure 2-1).

FSM is made up of 607 islands scattered over an area of about 2.6 million km^2, including its Exclusive Economic Zone (EEZ), in the western Pacific Ocean. The total land area of FSM is 704.6 km^2, with 7,192 km^2 of lagoon area. The islands vary from small islets, which are inundated at high tide, to atolls and large volcanic islands with land area of more than 80 km^2. Approximately 65 (approx. 10%) of the islands are inhabited.

In general, there is only one primary, circumferential route on each of the four main FSM Island states. In addition, most of the population in FSM lives close to the coast, and critical infrastructure including roads, schools, places of employment, port facilities, tourist facilities, power plants and airports, are located primarily in the coastal zone.

Figure 2-1: Location of FSM States: Kosrae, Pohnpei, Chuuk and Yap

2.4.2 Extent of 'PRIME Roads'

For the purpose of the PRIME Project, the PRIME Roads have been defined as the roads that will be assessed as part of Technical Assistance aspects of the PRIME Project, including the VA/CRRS and ESA studies, which include the majority of the existing 'primary roads' on the main islands of each FSM State, and some additional secondary roads that are considered to be of strategic and/or economic importance by DoTC&I. The extent of the PRIME Roads in each State are shown in the sections below.

Only works that have been prioritized for primary roads will be eligible for funding under Component 2 of the PRIME Project. Any recommended improvements identified by the VA/CRRS on the secondary roads will not be considered for funding under Component 2 of PRIME, however they may form part of recommended future investment needs for FSM's road network.

Component 2 works are only likely to include a small proportion (<10%) of the primary roads within the PRIME Road network. The exact location of works, and the proportion of the PRIME Road that will have climate resilient road works funded by PRIME will vary between States depending on the nature of the works proposed.

2.4.2.1 Kosrae State

The primary road network in Kosrae consists of the coastal road which circles two-thirds of the island, built largely on the coastal strand bordered by mangrove forest and coastal shoreline, from Utwe in the south through to the Airport at Okat in the northwest.

The PRIME Road extent on Kosrae includes much of the primary road network, plus an additional secondary road to the north east of the island (refer Figure 2-2) considered to be of strategic and economic importance to Kosrae at last partly due to commercial activity on that road (i.e. a water bottling plant).

Figure 2-2: Extent of PRIME Road on Kosrae.

2.4.2.2 Pohnpei State

The Primary Road Network in Pohnpei consists of the 77 km coastal circumferential road of which 54 km is paved and the remainder typically formed using a coral rock base course.

The PRIME Road extent on Pohnpei includes much of the primary road network plus additional secondary roads considered to be of strategic an economic importance to Pohnpei, including a road to Nan Madol (Figure 2-3), a significant archaeological site on the eastern shore of Pohnpei that has been declared a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site.

Figure 2-3: Extent of PRIME Road on Pohnpei.

2.4.2.3 Chuuk State

The Chuuk State capital is located on Weno Island has a circumferential road that is approximately 18.5 km in length. The Weno primary road network is currently in poor condition in places, and inadequate drainage leads to difficultly with ongoing maintenance.

The PRIME Road extent on Weno Island, includes much of the primary road network on the island plus additional secondary roads (West Pou Road, and other linking roads) considered to be of strategic an economic importance (refer Figure 2-4).

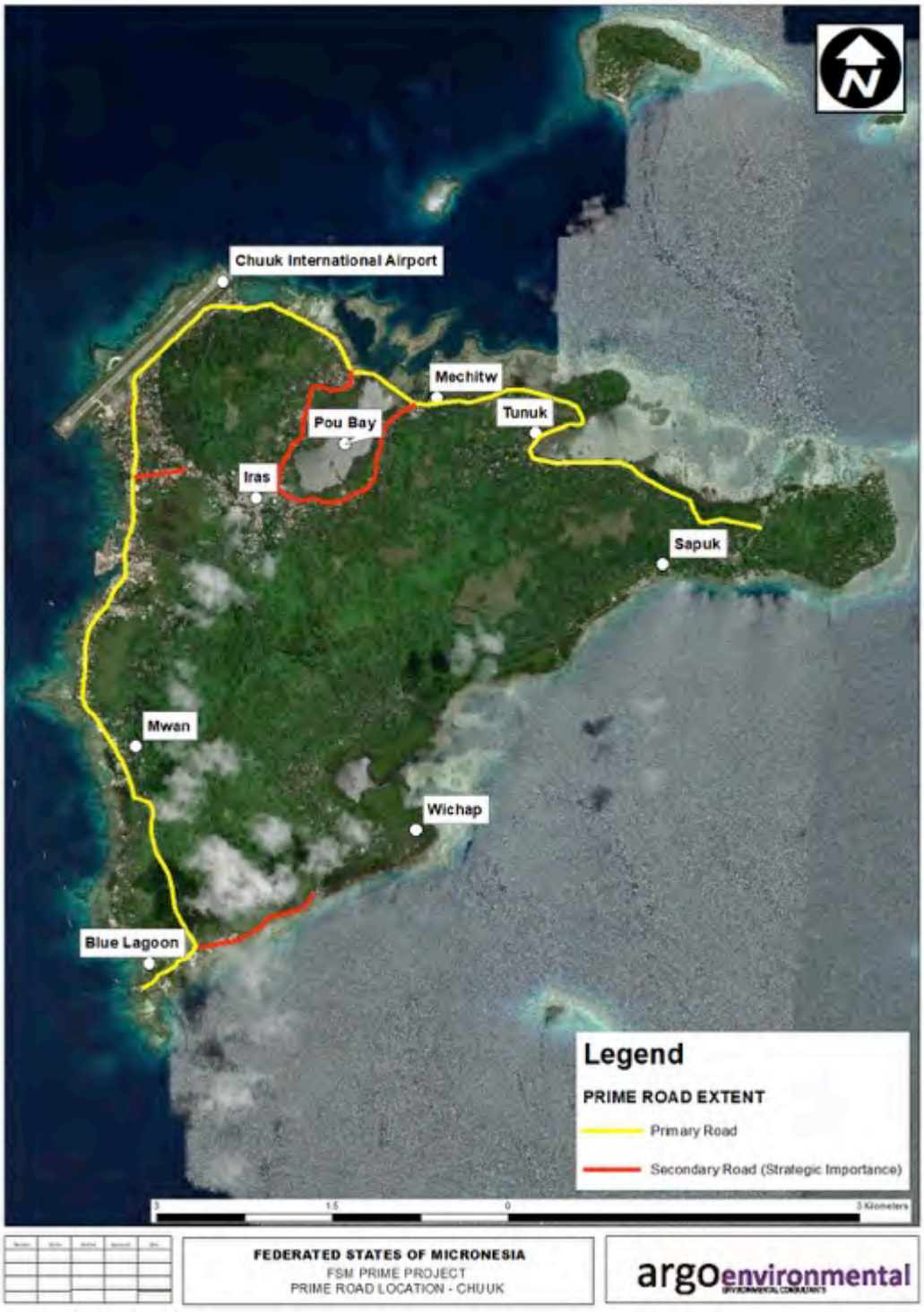

Figure 2-4: Extent of PRIME Road on Chuuk.

2.4.2.4 Yap State

The primary road network on Yap includes three primary roads: the main trunk road that runs from the southern end of Yap Island in Magachil to the northern end of Maap Island; the Yap Central Loop; and a road that branches off the main trunk road serving the districts of Gagil.

The PRIME Road extent on Yap consists of the primary road network, plus additional branches of the road to Ruu and Bugol as shown in refer Figure 2-5.

Figure 2-5: Extent of PRIME Road on Yap.

3. Legislative & Regulatory Framework

3.1 FSM National Government Legislation, Regulations and Policy Requirements

3.1.1 Overview

The GoFSM is modeled after the federal system similar to that of the United States with a national president and four state governors with respective legislatures and judiciaries. The states of Pohnpei, Chuuk and Yap have four levels of governance – National, State, municipal, and traditional. Kosrae does not have the fourth level of government, as it no longer has traditional leadership.

The four States of FSM (Kosrae, Pohnpei, Chuuk and Yap) have considerable degrees of autonomy. Each State also has its own set of environmental and social laws and regulations geared to protect the States from a wide range of environmental impacts including, the effects of climate change. Under the Compact II, Article VI and section 161 of Title II, FSM is committed to applying the National Environmental Policy Act 1969 (since repealed) and "*to develop and implement standards and procedures to protect its environment*".

The following articles of legislation are relevant to the PRIME Project.

3.1.2 FSM Constitution

The Constitution of the FSM (the 'Constitution') is the supreme law in FSM, and includes a bill of rights (Art IV).

The Constitution acknowledges and protects the role and functions of traditional leaders as recognized by custom and tradition, as well as the traditions of the Micronesian people (Art V).

The Constitution establishes National, State and Municipal levels governance (Art VII).

Each State is required to have its own democratic Constitution. The Constitution refers to traditional practice and custom as a guiding influence in all aspects of decision-making in FSM and seeks to preserve the role of tradition and custom in FSM life. To support this, a Council of Chiefs consisting of traditional leaders and elected representatives is provided for in the Constitution.

Article IX of the Constitution establishes FSM's legislature, which selects the President, and with members elected for districts in each state according to population. Each State elects their own legislature and governor. The National legislature has the power to make legislation on a wide range of topics. For example, they may make laws "t*o regulate the ownership, exploration, and exploitation of natural resources within the marine space of the Federated States of Micronesia beyond 12 miles from island baselines*" [Title 3].

Article X of the Constitution vests FSM's executive power in an elected President as the Head of State, who is elected by Congress for a four-year term and limited to no more than two consecutive terms. The President appoints judges, ambassadors and principal officers of government departments in the National Government.

Article XI of the Constitution establishes the judiciary of FSM as comprised of the Supreme Court, and subsidiary courts, established by statute. The *Judiciary Act of 1979* provides

further guidance about the judiciary of FSM. Court decisions are constitutionally required to be consistent with Micronesian customs and traditions.

The legislative power of the National Government is vested in Congress. The Congress includes one member elected from each of the four States, an additional member elected from congressional districts in each State apportioned by population. Chuuk, Pohnpei and Yap may decide that one of its seats be reserved for a traditional leader in place of one of the elected representatives.

Regulation development, as prescribed under the FSM *Administrative Procedures Act*, requires the widespread publication and dissemination of proposed regulations before adoption, including radio announcements in English and indigenous languages. Opportunities for public comment and public hearings are incorporated in the Act.

In most instances, national legislation is supplemented, or even duplicated, by State legislation.

The Constitution contains several references to the environment, land use and customs, including the following:

Preamble	States, in part, "*[t]o make one nation of many islands, we respect the diversity of our cultures. Our differences enrich us. The seas bring us together, they do not separate us. Our islands sustain us, our island nation enlarges us and makes us stronger.*"
Article XIII	Contains additional provisions, including some that relate to the environment.
Section 2	Provides that "*radioactive, toxic chemical, or other harmful substances may not be tested, stored, used, or disposed of within the jurisdiction of the Federated States of Micronesia without the express approval of the national government of the Federated States of Micronesia.*"
Section 4	In terms of land use, "*[a] noncitizen, or a corporation not wholly owned by citizens, may not acquire title to land or waters in Micronesia.*"
Section 5	Prohibits a lease agreement for the use of land for an indefinite term by a noncitizen, a corporation not wholly owned by citizens, or any government is prohibited.
Section 113 (General Provisions)	Empowers the High Commissioner to restrict or forbid non-citizens from acquiring interests in real property and in business enterprises.
Section 114 (General Provisions)	Requires due recognition to be given to local customs in the system of law.
Section 202 (General Provisions)	Provides that customs not in conflict with other laws in Micronesia are preserved.

3.1.3 FSM Environment Protection Act (2014)

The *Environment Protection Act (revised Code 2014)* provides for the protection of the environment, culture, historic and natural aspects of Micronesian heritage.

The *Act* is a national government declaration of on-going commitment in cooperation with State and municipal governments and other concerned public and private organizations. The *Act* declares to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare to create and maintain conditions under which the people of FSM man and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of FSM.

The *Act* declares that it is the continuing responsibility of the FSM to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate governmental plans, functions, programs, and resources to the end that the inhabitants of the FSM may:

a. Fulfill the responsibilities for each generation as trustee of the environment for succeeding generations;

b. Assure for all Micronesians safe, healthful, productive, and aesthetical and culturally pleasing surroundings;

c. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable or unintended consequences; and

d. Preserve important historic, cultural, and natural aspects of our Micronesian heritage, and maintain, wherever possible, an environment, which supports diversity and variety of individual choice.

The effort to protect and preserve the environment needs to be carried forward in close cooperation with the States in the formulation of policy, enforcement, and other activities.

The FSM recognizes that each person has a responsibility to contribute to the preservation and enhancement of the environment. Section 302 of the Environmental Impact Assessment Act states that - 1) any person, prior to taking any action that may significantly affect the quality of the environment within the Exclusive Economic Zone (EEZ) of the FSM, or within the boundaries of the National Capital Complex at Palikir, must submit an environmental impact statement to the Director, in accordance with regulations established by the Director. (2) The environmental impact statements required by subsection (1) of this section are public documents.

Building on the Trust Territory Environmental Quality Protection Act (Title 25 of the FSM Constitution), the FSM Environmental Protection Act 1984 (FSM EPA), and its subordinate instruments, seeks to provide the legislative basis for the protection of the environment, including cultural, historic and natural aspects of Micronesian heritage, throughout FSM. The Act acknowledges that close co-operation between the National and State Governments is required to support this objective.

The 1969 Act established the Environmental Protection Board within the Office of the President. The Board is composed of five members: “one member from each State and one member appointed by the President”. In 1987, an Act to Reorganize the Government of the FSM redefined the Board to mean the Secretary for Human Resources.

The Act requires the Secretary to enter into written cooperative arrangements with the States or State agencies for the purposes of providing funds to the States, collecting data on local needs and transferring authority to the States to act as agents of the National Government in implementing environmental programs at the State level. Such delegation of functions may be withdrawn on written advice from the Secretary if the delegation results in termination of any financial grant.

The Secretary, as a result, has broad authority to protect health, welfare and safety and to implement policy and strategies, through the promulgation of regulations, to remedy pollution and contamination of air, land and water.

3.1.4 FSM EPA Environmental Impact Assessment Regulations (1989)

The purpose of the EIA Regulations is to implement Section 13 of the FSM Environmental Protection Act by establishing standard procedures for preparation of an environmental impact assessment statement prior to taking or funding any major action that may significantly affect the quality of the human environment.

These Regulations require the National Government and its agencies to submit an Environmental Impact Statement (EIS) to the Secretary of Human Resources prior to taking any "major"[3] action significantly effecting the quality of the human environment. "Effect" is defined to include indirect, direct and cumulative effects in areas such as land use, population density, air, water and natural systems including ecosystems. "Effects" may be ecological, aesthetic, cultural, historical, economic, social or health-related. "Significant Impacts", determined as a result of a preliminary assessment, require a Comprehensive EIA. Draft EIA statements are to be made available for public comment and review, including provision for a public hearing.

Part I (l) defines Project Proponents as the FSM National Government or its agencies or the recipient of funding from the FSM National Government or its agencies, that propose to undertake any major action significantly affecting the quality of the human environment.

Part III sets out the EIA process. Part IV elaborates on this process which is a two-step assessment process with the first step being the submission of an Initial Assessment using a checklist template. If following evaluation there are potentially severe environmental impacts, then a Comprehensive EIA is required. The contents of the Comprehensive EIA are set out in Part V.

The EIA process is intended to help the general public and government officials make decisions with the understanding of the environmental consequences of their decisions, and take actions consistent with the goal of protecting, restoring, and enhancing the environment. These regulations provide the directions to achieve this purpose. In addition, these regulations are designed to:

a. Integrate the EIA process into early planning of projects to ensure timely consideration of environmental factors and to avoid delays; and

b. Identify at an early stage the significant environmental issues requiring further study thereby defining the scope of the EIA.

For the PRIME Project, DoTC&I in association with their state counterpart agencies (state Transport Divisions/Departments) and the CIU Safeguards Team would identify the range of permits required, prepare the assessments and the permit applications. As much as possible / relevant the assessments will be prepared for both the WB and FSM requirements

3.1.5 Labor Law

FSM has national legislation that outlines worker's rights. The Labor Code (Title 51) outlines hiring of non-resident workers, labor development, and other requirements. The Labor Code requires:

[3] No definition is provided for a 'Major' action in the Regulations. For the purposes of this assessment it is assumed that the urgent works PRIME Project constitutes a 'Major' action given the potential nature and scale of associated potential impacts.

a. Non-resident workers to obtain health certificates and have a minimum of two years of related work experience;

b. Any benefits provided to non-resident construction workers such as housing, transport, etc. will also be provided to any national contractor who is required to leave their principle place of residence for work;

c. Applications for foreign workers are needed, unless the foreign workers will be in the country less than 90 days; and

d. Minimum employment conditions outlined in the Code apply to all foreign workers.

Legislation related to occupational health and safety is limited. The Public Employment Code 2014 requires that workers exposed to hazardous working conditions are additionally compensated.

3.1.6 Other Relevant Legislation

Current environmental regulations relevant to the PRIME Project which draw heavily on legislation put in place during Trust Territory arrangements include those outlined below.

Legislation related to land tenure and land acquisition in FSM is outlined in the RF[4].

While there are laws regulating closed marine areas in FSM, there is no legislation dedicated solely to protected areas in FSM.

FSM does not have any disaster risk management legislation; however a Nationwide Climate Change Policy was created in 2009 (FSM, 2009). The focus of this Policy is to mitigate climate chance especially at the international level and adaptation at the national, state and community levels to reduce the FSMs vulnerability to climate change adverse impacts.

3.1.6.1 Marine and Freshwater Quality Standards Regulations (1986)

The *Marine and Freshwater Quality Standards Regulations (1986)* identify the uses for which waters of FSM shall be maintained and protected in order to specify water quality standards required to maintain the designated use and to prescribe requirements to maintain specified water quality. Any entity responsible for a point source discharge that threatens a breach of these standards, unless it has received a discharge permit under the National Pollutant Discharge Elimination System (NPDES) from the USEPA, is in breach of these Regulations.

These Regulations provide the basis for the state water quality Regulations, with EPA / KIRMA managing these requirements at the state level. Most of their effort is allocated to drinking water quality rather than river or marine waters and, as a result, baseline data is sparse. Rivers and streams and coastal areas potentially impacted by PRIME Project activities will require baseline data collection and ongoing monitoring as detailed in the ESMF.

3.1.6.2 Trust Territory Solid Waste Regulations (1979)

The *Trust Territory Solid Waste Regulations (1979)* establish minimum standards for the design, construction, installation, operation and maintenance of solid waste storage, collection and disposal systems. “Solid Waste” is defined as “garbage, refuse, and other

[4] DoTC&I, 2020, ‘Prioritized Road Investment and Management Enhancements (PRIME) Project, FSM: Resettlement Framework’, Report prepared for Department of Transportation, Communication and Infrastructure.

discarded solid waste materials" not including substances in water sources, but including liquid waste such as waste oil, pesticides, paints, solvents and hazardous waste. A "disposal system" includes the entire process of storage, collection, transportation, processing and disposal of solid waste by any person or authority.

All waste generated as a result of the PRIME Project will be recycled where possible with residual material being disposed of at a facility permitted by the state EPA/KIRMA.

Measures related to solid waste management, including minimization, recycling and reuse of material, will be developed in the Generic ESMP. A Waste Minimization and Management Plan (WMMP) is also to be prepared by the Contractor which sets out strategies and actions required to reduce potential health and environmental risks associated with waste generation and disposal, as well as opportunities for construction waste reuse.

3.1.6.3 FSM EPA Earthmoving Regulations (1988)

These Regulations provide that "*no person shall release funds, equipment or materials or building permit to those engaged in earthmoving activities until a permit is issued by the Secretary of Human resources*". Earthmoving is defined to include activities of a continuous nature such as dredging or quarrying which disturb or alter the surface of the land, including reefs and lagoons. Earthmoving also applies to the subdivision of land, and the moving, depositing or storing of soil, rock, coral or earth.

All aggregate material used for roading (and other works) construction activities will require to be sourced from a quarry facility that has the appropriate permit. DoTC&I will need to establish from State agencies whether a permit is required for the "d*epositing or storing of soil, rock, coral or earth*" in relation to the PRIME Project. If aggregate material is imported then State regulations will also need to be met.

Measures related to earthmoving, as well as use of aggregate material are outlined in the Generic ESMP, including the prohibition of the use of coral reef/rock for project activities. The disposal, and where appropriate reuse, of excavated material will be addressed in the Contractor's WMMP.

3.1.6.4 FSM Constitution, Title 26 Historical Sites, and Antiquities

The FSM Code Title 26 – Historical Sites and Antiquities states that it is FSM policy to protect and preserve the diverse cultural heritage of the peoples of Micronesia and to identify and maintain areas, sites and objects of historical significance. "Cultural attribute" is defined as all aspects of local culture, tradition, arts, crafts, all social institutions, forms of expression and modes of social interaction. "Historical property" is defined as sites, structures, building, objects, and areas of significance to local history, archaeology and culture. "Historical artefact" means an object 30 years or more in age.

Although the Act allows for the establishment of the Institute of Micronesian Culture and History, the Institute was never established and, in 1987, the relevant section of the Act was repealed. The administrative body charged with the preservation of cultural heritage is the Office of Administration Services, which established the Division of Historic Preservation in 1988. The Division is currently staffed by one Historic Preservation Officer. To promote liaison with the States, local staff are employed to assist with the work of the Division in the States.

The risk of PRIME Project impacting historical sites and antiquities is considered to be low given the proximity of these identified features to the PRIME Project. If a historic site or

artefact is identified that could be potentially impacted as a result of PRIME Project activities mitigation measures will be developed in the project-specific ESMP. A chance find procedure will be developed in the Generic ESMP to address accidental discoveries.

3.1.6.5 Trust Territory Air Pollution Control Standards and Regulations (1980)

This Regulation sets air quality standards by preventing or controlling the emissions of air contaminants at their source. The Regulations incorporates USEPA National Emission Standards for Hazardous Air Pollutants. If the PRIME Project requires the use of an Asphalt plant consideration to the standards for this activity will be required[5].

3.1.6.6 Toilet Facilities and Sewerage Disposal Regulations (1977)

These Regulations establish minimum standards for toilet facilities and sewerage disposal to reduce environmental pollution, health hazards, and public nuisance from such facilities. Standards are established for i) flush toilets connected to a sewerage system available to the public, ii) flush toilets connected to septic tanks and iii) a pit privy or outside banjo. All public and private buildings require toilet disposal facilities approved by the Secretary of Human Resources. The Regulations make it unlawful to dispose of treated or semi-treated sewerage into any body of water in FSM, unless it can be clearly demonstrated that such activity is necessary for the economic and social benefit or research and that the activity poses no public health hazard.

Any accommodation facilities and temporary toilet facilities provided as part of the PRIME Project will need to be in compliance with these and/or State Regulations.

3.1.6.7 FSM Constitution Title 23 Resource Conservation

Marine species preservation is promoted under the FSMC Title 23 – Resource Conservation, Chapter 1, Marine Species Preservation, which is based on Trust Territory Code. Chapter 1 provides for the control of destructive fishing practices and prohibits the use of explosives, poisons, chemicals or other substances which kills fish or marine life for catching or killing fish unless authorized by a permit. The Chapter places limitations on the harvesting of hawksbill turtles and sea turtles, cultivated sponges, black-lip mother-of-pearl oyster shell, trochus and marine mammals.

Title 23 – Resource Conservation (Chapter 2) of the Trust Territory Endangered Species Act 1975 provides for the protection of endangered fish, shellfish and game. The Act declares the indigenous plants and animals of the FSM to be of aesthetic, ecological, historical, recreational, scientific and economic value. The Act further states that the policy of FSM is to foster the well-being of these plants and animals including the prevention of the extinction of any species.

The Act is administered by the Director of the Department of Resources and Development (DRD) and provides the Director with the authority to set up conservation and research programs aimed at conserving endangered and threatened species. It also provides authority to acquire land or aquatic habitats for the conservation resident endangered or threatened species. It is uncertain if any acquisitions or associated conservation programs have been established by the Department.

Note that the National Government does not have jurisdiction inside the 12 nautical miles limit which is the responsibility of the individual States (See Section 3.2 for further detail).

[5] See https://www.epa.gov/stationary-sources-air-pollution/risk-and-technology-review-asphalt-processing-and-asphalt-roofing-0

3.1.6.8 FSM Land Use Act

Section 205 of the General Provisions of the *Land Use Act* for FSM provides that "[t]he law concerning ownership, use, inheritance, and transfer of land in effect in any part of the Trust Territory on December 1, 1941, shall remain in full force and effect to the extent that it has been or may hereafter be changed by express written enactment made under authority of the Trust Territory."

The *Government Property Acquisition [Title 56]* deals with eminent domain (Chapter 1), real property acquisition (Chapter 2), relocation assistance (Chapter 3) and alien property (Chapter 4).

This provisions of this Act are outlined in the RF.

3.2 State Government Legislation, Regulation and Policy Requirements

The four States of FSM each have their respective state level regulations and legal frameworks elaborating on the National Constitution and EIA Regulation and stipulating their specific requirements. The state level EIA Regulations are briefly discussed below. Note that it is the State regulations that are the most important for the PRIME Project, as the works will be monitored at a State level.

State legislation related to land tenure and land acquisition is outlined in the RF.

3.2.1 Kosrae

3.2.1.1 The Legal Framework

The following laws and policies that exist in Kosrae for managing and conserving the environment that may apply to the PRIME Project:

- Constitution of the State of Kosrae 1984 (Primary rule of law in the State of Kosrae).
- Kosrae State Code, Title 17, Chapter 4 (Establishes the Kosrae EPA).
- Kosrae State Code Title 9 (Establishes the Kosrae Protected Areas System).
- Kosrae Island Resource Management Act.
- Kosrae State Development Regulation 2014.
- Kosrae State Code, Section 11.103 (State Acquisition of Land).
- Kosrae Code, Section 11.1401 and 11.1402 (Protection of antiquities and traditional culture).
- Kosrae Code, Section 11.1601 (Endangered species).
- Kosrae Code Section 11.201 (Land use and subsidiary regulations).
- Kosrae Code, Section 13.1201 (Toilets and the disposal of domestic (human) waste).
- Kosrae Code, Section 13.506 (Littering).
- Kosrae Code, Section 13.514 (Water quality).

- Kosrae Code, Section 13.524 (Endangering a species).

The Development Review Commission (DRC) is a five-member body that reviews development proposals and is mandated to "protect the environment … balancing development with those of environmental quality … ensuring that economic and social development is environmentally sustainable". The DRC has the authority to enter, enforce, and issue injunctions, mandamus, or other remedies requiring compliance through the Attorney General. Further, the DRC has the authority to protect the environment and antiquities.

The State can acquire an interest in private land for public purpose. The Constitution and Article XI, Land and Environment, provide for fair compensation should there be a need for land acquisition for the purpose of resettlement. The process must be done in good faith with reasonable effort to avoid substantial hardship to the interested parties.

3.2.1.2 Kosrae Constitution (1984)

Article XI of the Kosrae Constitution addresses land and environment matters. It grants the people the right to "*a healthful, clean and stable environment*". The State government is required to "*by law protect the State's environment, ecology, and natural resources from impairment in the public interest.*" The Constitution prohibits nuclear, chemical, gas or biological weapons and hazardous radioactive material being in the State. The Constitution provides "*[t]he waters, land, and other natural resources within the marine space of the State are public property, the use of which the State Government shall regulate by law in the public interest…*" Rivers and streams may be designated by law as public property for use in the public interest. The State Government may acquire land for public purposes without the interested parties' consent, subject to the payment of fair compensation and good faith attempt at negotiation. Title to State land may only be acquired by Micronesian citizens who are Kosraean by descent.

Kosrae Article VIII of the Kosrae Constitution provides that the two levels of government for Kosrae are State and municipal. Municipalities are granted powers and functions in relation to local affairs, property and government so far as they are not limited by law. The Kosrae Constitution requires the State Government to "protect the State's traditions as may be required by the public interest" (Art II).

3.2.1.3 Kosrae State Development Regulation 2014

The purpose of the *Kosrae State Development Regulation 2014* is to implement Title 7, Chapter 4 of the Kosrae Code by establishing the EIA process which is intended to help the general public and government officials make decisions "*with the understanding of the environmental consequences of their decisions, and take actions consistent with the goal of protecting, restoring, and enhancing the environment. In addition, the regulations are intended to:*

- *Integrate the EIA process into the early planning of projects to insure timely consideration of environmental factors in order to avoid delays; and*
- *Identify at an early stage the significant environmental issues requiring further study and de-emphasize insignificant issues, thereby defining the scope of the Environmental Impact Statement ("EIS").*"

The Regulation defines a "development project" to mean the construction, alteration, movement, fill, removal, disposal or any other modification to the land or coastal areas. A development project can include, but is not limited to the installation, placing, or building

of surface structures, land reclamation, navigation channels, harbors, utility lines, piers, shopping centres, clearing land, causeways, golf courses, apartment complexes, hotels, schools, roads, parking areas, or any other similar activity. It also defines "Earthmoving" to mean any construction or other activity which disturbs or alters the surface of the land, a coral reef or bottom of a lagoon, including, but not limited to excavations, dredging, embankments, land reclamation in a lagoon, land development, subdivision development, mineral extraction, ocean disposal, and the moving, depositing or storing of soil, rock, coral or earth.

Part III sets out the Development Review Permit process which among other things, requires the developer to conduct initial consultation with the Kosrae Island Resource Management Authority (KIRMA) to explain the planned development and to determine if a Development Review Permit application is necessary. KIRMA operates as a semi-autonomous agency within the Kosrae State Government and consists of five units (historic, marine, terrestrial, education, and permitting) which monitors, promulgates safety and security, and informs policy in the protection of the island's resources.

If necessary, the proponent then submits an application for a Development Review Permit including an EIA Checklist. The review of the application will involve a determination if an EIS is necessary, depending on the Technical Advisory Committee's assessment of the nature and severity of the potential impacts. A Development Review Permit will be reviewed and granted by KIRMA.

The DRC also determines if (under Section 3.7) the proposal requires a public information meeting "*whenever it is reasonably foreseeable that a project will result in a significant impact to the environment, DRC will ensure that all affected persons will have the opportunity to provide input, written or oral, for the project.*"

The Development Review Permit process will be required for physical works funded by the PRIME Project with the decision being made on whether an EIA is required following a review by the Technical Advisory Committee.

3.2.2 Pohnpei

3.2.2.1 The Legal Framework

The following laws and policies that exist in Pohnpei for managing and conserving the environment that may apply to the PRIME Project:

- Constitution of the State of Pohnpei 1984 (Primary rule of law in the State of Pohnpei).
- Public Trust Lands Distribution Act 1980.
- Public Lands Act 1987.
- Deed of Trust Act 1987.
- Trust Territory Environmental Protection Act, preserved from the Trust Territory environmental law (The Act and subordinate regulations relate to:
    - Air pollution;
    - Pesticides;
    - Public water supply systems;

- Marine and freshwater quality;
- Solid waste;
- Toilet facilities and sewerage disposal; and
- Earthmoving.

- Transportation Zone Act 1987.
- Conservation and Resource Enforcement Act 1982.
- Forest Management Act 1979.
- Pohnpei Watershed Forest Reserve and Mangrove Protection Act 1987.
- Designation of State Bird Act.
- Marine Resources Conservation Act 1981.
- Pohnpei Environmental Protection Act 1992.
- Pohnpei Cultural Preservation Act.
- Trust Territory Environmental Quality Protection Act.

3.2.2.2 Pohnpei Constitution (1984)

Under the Pohnpei Constitution, the State Governor must establish and administer "*comprehensive plans for the conservation of natural resources and the protection of the environment*". Article 12 states that only Ponapean citizens, who are also pwilidak of Pohnpei, may acquire a permanent interest in real property. The Constitution also prohibits leases of more than 25 years and indefinite land-use agreements. The Government of Pohnpei may acquire land for public purposes following consultation with local government, owners and an offer for payment of a purchase price or compensation. Article 13 of the Pohnpei Constitution prohibits the introduction, storage, use, test and disposal of nuclear, chemical, gas and biological weapons, nuclear power plants and related waste materials from Pohnpei.

Article 5 of the Pohnpei Constitution states "*[t]his Constitution upholds, respects, and protects the customs and traditions of the traditional kingdoms of Pohnpei*" and that the Pohnpei Government shall respect and protect customs and traditions.

3.2.2.3 Pohnpei Environmental Protection Act (1992)

Pohnpei's *Environmental Protection Act (1992)* S.L. No. 3L-26-92 establishes a procedure for preparation of an environmental assessment statement (EAS) prior to any action that may significantly affect the quality of the human environment. The degree of environmental assessment detail for a project depends upon the significance of its potential environmental impacts.

Significance of the action is determined by the EPA on consideration of an Initial Assessment (with a prescribed checklist) submitted by a proponent.

The EPA receives the environmental assessment document and reviews it for compliance with the Act and the regulations in terms of format, adequacy of information and objectivity. The EPA authorizes commencement of a project, through a permitting process, only if it determines that the assessment is sufficient. Once the completed assessment is presented

to the EPA Board of Directors and upon the final deliberations of the EPA Board, a permit will be given to the project proponent with conditions for compliance of the project proponent as required by EPA regulations.

There is a range of potentially required permits and licenses for a major development in Pohnpei. These comprise:

a. EPA Earthmoving Permit;

b. Land Ownership Documentation;

c. Forestry Clearance;

d. Marine Resources Assessment Report;

e. Municipal Government Clearance (planning approval);

f. Department of Lands Approval; and

g. Historic Preservation Clearance.

The Act requires the active assistance of all government authorities to achieve its goals. The result, in practice, is that only the EPA Earthmoving Permit is required. This applies to projects with significant amounts of earthworks. Its focus is the management of soil and water conservation.

The Pohnpei EPA will require an initial assessment document which will determine whether an EAS is required depending on the nature and scale of impacts. The EAS would be reviewed by the EPA Board of Directors and a permit provided with conditions for compliance with EPA regulations.

3.2.3 Chuuk

3.2.3.1 The Legal Framework

The following laws and policies that exist in Chuuk for managing and conserving the environment that may apply to the PRIME Project:

- Constitution of the State of Chuuk 1989 (Primary rule of law in the State of Chuuk.
- Memorandum of Understanding (MoU) – Solid Waste Management (MoU between the State and National Governments delegating State power to administer, at State level, the Solid Waste Management Permit Program and the Solid Waste Management Permit Variance Program).
- MoU – Earthmoving (MoU between the State and National Governments delegating State power to administer, at State level, the National Earthmoving Regulations).
- Chuuk State Historic Preservations Act 1991 (Relating to wrecks in Chuuk lagoon).
- Chuuk State Environmental Protection Act 1994.

3.2.3.2 Chuuk Constitution (1989)

Article XI of the Chuuk Constitution requires the legislature to "*provide by law for the development and enforcement of standards of environmental quality, and for the establishment of an independent state agency vested with responsibility for environmental matters.*" Article XI of the Chuuk Constitution also gives the State Government the power

to take an interest in land for public interest purposes subject to negotiations and the payment of compensation.

Article IV of the Chuuk Constitution recognizes and protects customary law and the role of tradition leaders in Chuuk.

3.2.3.3 Chuuk State Environmental Protection Act (1994)

The *Chuuk State Environmental Protection Act (1994)* creates and empowers the Chuuk State EPA. Section 1005 defines the functions and powers of the Chuuk EPA, one of which (para f) is: "*Establish and provide for the continuing administration of a permit system whereby a permit shall be required before the discharge by any person of any pollutant in the air, lands and water or for the conduct by any person of any activity, including but not limited to, the operation, construction, expansion, alteration of any facilities*."

Section 1006 of the Act states that "*A person shall submit an environmental impact statement to the Agency, in accordance with regulations established by the Agency, prior to taking any major action which may substantially affect the quality of the environment.*"

In addition, further functions of the Chuuk EPA relevant to the PRIME Project include:

- Establishment of criteria for the classification of air, land and water; and
- Collection of information, record keeping, monitoring, and reporting.

There are penalties for any persons who violate the Act or any permits or orders issued under it. The Act is not clear regarding the process of applying for a permit, and the environmental assessment requirements to support such an application.

Notwithstanding this, given the nature and scale of the works proposed under the PRIME Project it is likely that an EIS would be required.

3.2.4 Yap

3.2.4.1 The Legal Framework

The following laws and policies that exist in Chuuk for managing and conserving the environment that may apply to the PRIME Project:

- Constitution of the State of Yap 1982 (Primary rule of law in the State of Yap).
- Environmental Quality Protection Act 1987.
- Draft Water Supply Systems Regulations (Based on the U.S. Trust Territory Public Water Supply Systems Regulations).
- Trust Territory Solid Waste Regulations 1979.
- Draft Toilet Facilities and Sewerage Disposal Regulations.
- Draft Earthmoving and Sedimentation Regulations.
- Yap State Code, Chapter 10, Section 1008 (Wildlife conservation).
- Yap State Code, Title 11, Section 805 (Oil spills).
- Yap State Code, Title 11, Section 815 (Reef and environmental damage).
- Yap State Code, Title 18, Chapter 4, Section 401 (Disposal of petroleum products).

- Yap State Code, Title 18, Sections 404, 402 and 403 (Relating to oil spills).
- Yap State Code, Title 18, Chapter 10, Section 1011 (Temporary protection of marine life).
- Yap State Code, Title 20, Chapter 3 (Building permits).

3.2.4.2 Yap Constitution (1982)

The Yap Constitution states that the "s*tate Government may provide for the protection, conservation and sustainable development of agricultural, marine, mineral, forest, water, land and other natural resources*." It also prohibits testing, storing, using or disposing of radioactive and nuclear substances within the State. Land ownership and uses are restricted under the Yap Constitution. The State recognizes traditional rights and ownership of natural resources and areas within the marine space of the State up to 12 miles from island baselines.

The Yap Constitution grants due recognition to the Dalip pi Nguchol and their traditional and customary roles, and to traditions and customs in providing a system of law (Art III). In Yap, Traditional leaders who serve in the Council of Pilung and the Council of Tamol carry out traditional and customary functions. Land in Yap may only be acquired in a manner consistent with traditions and customs (Art XIII).

3.2.4.3 Yap – Regulations for Environmental Impact Assessment, Title II, Chapter I. (1995)

Administered by the Yap State Environmental Protection Agency (YSEPA), the *Regulation for Environmental Impact Assessment 1995* implements the Yap State Environmental Quality Protection Act by establishing standard procedures for the preparation of an EIS to be prepared prior to any action proposed to be undertaken that may significantly affect the quality of the human or natural environment.

In addition, these regulations are designed to:

a. Integrate the EIA process into early planning of projects to ensure timely consideration of environmental factors and to avoid delays; and

b. Identify at an early stage the significant environmental issues that may require further study thereby the, scope of the EIA.

The Regulation requires that all projects require a Preliminary Environmental Impact Statement (PEIS) (Part II; 2.1, 2.2) prior to and preferably early in the planning stages of the development proposal.

There are exemptions from the preparation of a PEIS for activities that "*will probably have minimal or no significant effects on the environment*." Among those exempted activities are "*(1) Operations, repairs, or maintenance of existing structures, facilities, equipment, or topographical features, involving negligible or no expansion or change of use beyond that previously existing; (2) Interior alterations involving things such as partitions, plumbing, and electrical conveyances.*"

Where the environmental impacts in the PEIS is assessed by the EPA Board to be have severe potential impacts, the proponent is required to prepare a more detailed environmental assessment report (Draft EIS) which will be reviewed and commented on by the EPA Board and others including the public, and these comments are send to the Proponent for review and incorporation into the Final EIS.

A process of public consultation and review of the Draft EIS is also provided in the Regulation (Section 3.4) with all written comments to be received by EPA after a specified period. The EPA Board makes a determination whether or not to approve the proposal, with or without conditions, or to decline, within 30 days of submission of the finalized EIS.

The Yap State EPA will require a PEIS which will determine whether an EAS is required depending on the nature and scale of impacts. It is possible that the PRIME Project would be exempt from the requirement to prepare a PEIS if it was determined that the proposed activities consist of operations, repairs, or maintenance of existing structures, facilities, equipment, or topographical features, involving negligible or no expansion or change of use beyond that previously existing. This would need to be discussed with the Yap State EPA. A more detailed environmental assessment report would be required if it was determined that the Project has severe potential impacts.

3.3 International Standards and Guidelines

3.3.1 International Environmental Agreements

FSM is a signatory to a number of international conventions and treaties. Those potentially relevant to the Project are listed below:

- International Plant Protection Convention 1951.
- World Heritage Convention 1972.
- United Nations Convention on the Law of the Sea 1982.
- Agreement relating to the Conduct of a Joint Program of Marine Geoscientific Research and Mineral Resource Studies of the South Pacific Region, with Annexes, 1982; with Related Agreement, 1984.
- Vienna Convention for the Protection of the Ozone Layer 1985.
- Convention for the Protection of the Natural Resources of the South Pacific Region 1986; and companion protocols 1986.
- Convention on Biological Diversity (CBD) 1993.
- United Nations Framework Convention on Climate Change (UNFCC) Paris Agreement 2016.

3.3.2 World Bank Environmental and Social Framework

As a condition of WB financing the PRIME Project, DoTC&I has committed to implementing the Project in a manner consistent with the WB Environmental and Social Framework 2017 (ESF).

Matters to be addressed include environmental, health and safety, gender, labor, social, land and cultural heritage laws and policies as a minimum. The WB Environmental and Social Standards (ESS), as set out in the ESF, are considered to relevant for the PRIME Project requiring the GoFSM to prepare environmental and social risk management instruments:

- ESS1 – Assessment and Management of Environmental and Social Risks and Impacts.
- ESS2 – Labor and Working Conditions.

- ESS3 – Resource Efficiency and Pollution Prevention and Management
- ESS4 – Community Health and Safety.
- ESS5 – Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
- ESS6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- ESS7 – Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities.
- ESS8 – Cultural Heritage.
- ESS10 – Stakeholder Engagement.

Risk screening finds that potential impacts are less significant, site specific, mostly reversible and that a range of potential measures for mitigation can be readily designed in the majority of cases.

3.3.3 World Bank General Environmental, Health & Safety Guidelines

The World Bank Group's *General Environmental, Health, and Safety Guidelines 2007 (EHS Guidelines*) represent good international practice for managing environmental impacts and community and occupational health and safety (OHS) risks. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

3.3.3.1 Environmental - Air Emissions and Ambient Air Quality

This guideline applies to projects that generate emissions to air and provides an approach to the management of significant sources of emissions including specific guidance for assessment and monitoring of impacts. The key potential source of air emissions associated with the PRIME Project is in relation to potential cement or asphalt plant or dust pollutants emissions generated from construction activities and/or machinery usage.

Projects with significant sources of air emissions and potential for significant impacts to ambient air quality should prevent or minimize impacts by ensuring that:

- Emissions do not result in pollutant concentrations that exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines (see Table 3-1); and
- Emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards. As a general rule, this Guideline suggests 25 percent of the applicable air quality standards to allow additional, future sustainable development in the same airshed.

Table 3-1: WHO ambient air quality guidelines (WHO 2005)

Parameter	Averaging Period	Guideline Period in µg/m^3
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year	40 (guideline)

Parameter	Averaging Period	Guideline Period in µg/m^3
	1 hour	200 (guideline)
Particular Matter PM_{10}	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particular Matter $PM_{2.5}$	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Notes: PM 24-hour value is the 99th percentile. Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Point sources are characterized by the release of air pollutants typically associated with the combustion of fossil fuels such as nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter (PM) as well as other air pollutants including certain volatile organic compounds (VOCs). Emissions from point sources should be avoided and controlled according to good international industry practice (GIIP) through the combined application of process modifications and emissions controls, such as regular engine maintenance and repair, use of modern vehicle fleet with emissions control devices such as catalytic converters and driver education programs.

Fugitive source air emissions refer to emissions that are distributed spatially over a wide area and not confined to a specific discharge point. The most common pollutant involved in fugitive emissions is dust or particulate matter (PM). This is released during certain operations such as transport and open storage of solid materials and from exposed soil surfaces including unpaved roads. Recommended prevention and control of these emissions sources include:

- Use of dust control methods such as covers, water suppression, or increased moisture content for open materials storage piles; and
- Use of water suppression for control of loose materials on paved or unpaved road surfaces.

Consideration to both point source (from an asphalt or cement plants) and fugitive (e.g. dust from stockpiles, exposed soils) will need to be given for the PRIME Project.

3.3.3.2 Environmental - Hazardous Materials Management

This guideline applies to projects that use, store, or handle any quantity of hazardous materials defined as materials that represent a risk to human health, property or the environment due to their physical or chemical characteristics.

The guideline provides guidance in relation to both General Hazardous Materials Management: (where hazardous materials are handled or stored) and Management of Major Hazards (storage or handling hazardous materials at, or above, threshold quantities thus requiring special treatment to prevent accidents such as fire, explosions, leaks or spills and to prepare and respond to emergencies).

The overall objective of hazardous materials management is to avoid or, when avoidance is not feasible, minimize uncontrolled releases of hazardous materials or accidents during handling, storage and use. This objective can be achieved by:

- Establishing hazardous materials management priorities based on hazard analysis of risky operations identified through ESA;
- Where practicable, avoiding or minimizing the use of hazardous materials;
- Preventing uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that might result in fire or explosion; ·
- Using engineering controls (containment, automatic alarms and shut-off systems) commensurate with the nature of hazard; and
- Implementing management controls (procedures, inspections, communications, training, and drills) to address residual risks that have not been prevented or controlled through engineering measures.

A Waste Minimization and Management Plan (WMMP) and Spill Management Plan (SMP) are to be prepared by the Contractor which sets out strategies and actions required to reduce potential health and environmental risks associated with waste generation and disposal, including hazardous materials (discussed further in Section 6.2.3), management to avoid spills and other environmental releases, and identify opportunities for construction waste reuse.

3.3.3.3 Environmental - Waste Management

These guidelines apply to projects that generate, store, or handle any quantity of waste. Solid (non-hazardous) wastes generally include any garbage, refuse. Hazardous waste shares the properties of a hazardous material (e.g. ignitability, corrosivity, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed.

Waste management should be addressed through a Waste management system that addresses issues linked to waste minimization, generation, transport, disposal, and monitoring.

PRIME Project will generate a range of solid waste types including non-hazardous and potentially hazardous wastes including waste material generated from removal of existing road surfaces, bridges, causeways etc. Consideration to the management of hazardous materials will be required for the PRIME Project.

A WMMP is to be prepared by the Contractor which sets out strategies and actions required to reduce potential health and environmental risks associated with waste generation and disposal, as well as identify opportunities for material recycling or reuse (discussed further in Section 6.2.3).

3.3.3.4 Environmental - Noise

Noise prevention and mitigation measures should be applied where there is the potential for noise levels to exceed applicable guidelines at sensitive receptors.

The preferred method for controlling noise from stationary sources is to implement noise control measures at source. Methods for prevention and control of sources of noise emissions depend on the source and proximity of receptors. Noise reduction options that should be considered include: Selecting equipment with lower sound power levels; mandatory mufflers on engine exhausts and compressor components; limiting hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas; Re-locating noise sources to less sensitive areas to take advantage of distance and shielding; Taking advantage of the natural topography as a noise buffer during facility design; and developing a mechanism to record and respond to complaints through the Grievance Mechanism (GM) established for the PRIME Project (outlined in the RF and SEP).

Noise impacts should not exceed the levels presented in Table 3-2, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 3-2: WHO noise level guidelines (WHO 1999)

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime (07:00 – 22:00)	Daytime (22:00 – 07:00)
Residential; industrial; educational	55	45
Industrial; commercial	70	70

3.3.3.5 Worker Health and Safety

The fundamental premise for OHS under the EHS Guidelines is that "*Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers*" and that "*Companies should hire contractors that have the technical capability to manage the occupational health and safety issues of their employees…*".

The OHS philosophy in the EHS Guidelines is that preventive and protective measures should be introduced according to the following order of priority:

a. Eliminating the hazard by removing the activity from the work process.

b. Controlling the hazard at its source through use of engineering controls.

c. Minimizing the hazard through design of safe work systems and administrative or institutional control measures.

d. Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

All workers engaged in the PRIME Project will need to be covered under the terms of the EHS Guidelines. The Contractor will be required to provide a Worker H&S Plan that

addresses key project requirements in relation to worker health and safety. All other Project workers will work under the OHS controls to be prepared in the LMP.

3.3.3.6 Community Health and Safety

This guidance specifically addresses some aspects of project activities taking place outside of the traditional project boundaries but nonetheless related to the project operations. These issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project and includes issues such as:

- **Water Quality** - Groundwater and surface water represent essential sources of drinking water which may be impacted by project activities involving discharges.
- **Traffic Safety** - Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that protect project workers and road users. Road safety initiatives proportional to the scope and nature of project activities should include measures such as:
    - Adoption of best transport safety practices (e.g. emphasizing safety aspects among drivers, improving driving skills);
    - Use of speed control devices (governors) on trucks;
    - Regular maintenance of vehicles;
    - Employing safe traffic control measures, including road signs and flag persons to warn of dangerous conditions; and
    - Planning and timing of road use for Project activities (such as delivery of equipment or material).
- **Disease prevention** - Health hazards typically include those relating to poor sanitation and living conditions, sexual transmission and vector-borne infections associated with imported labor. Communicable diseases of most concern are sexually-transmitted diseases (STDs) such as HIV/AIDS. Recommended interventions include: Providing surveillance and active screening and treatment of workers; Undertaking health awareness and education initiatives.

Consideration to community health and safety will be required for the PRIME Project in relation to water quality, traffic safety, SEA/SH and disease prevention, will also be required, particularly if imported labor is used. The Generic ESMP and works specific ESMP will include controls to protect the community from road works incidents and nuisances, vehicle incidents and nuisances and harm from workers. A Community Health and Safety Plan is to be prepared by the Contractor which sets out strategies and actions required to prevent and/or minimize any negative health or safety impacts on the community arising from the physical works (discussed further in Section 6.2.3).

3.3.3.7 Toll Roads

The guidance document for toll roads includes information relevant to construction, operation and maintenance of large, sealed road projects including bridges and overpasses. Elements of this guideline document also apply to smaller scale and / or unsealed road projects and have been described here for completeness.

Issues specific to construction and operation of roads, as set out in the Toll Roads guidance document, include the following:

- **Environmental issues** – including habitat alteration and fragmentation, stormwater, waste, noise, air emissions and wastewater.
- **Community Health and Safety issues** - including pedestrian safety, traffic safety and emergency preparedness.

3.3.3.8 Construction Materials Extraction

The construction materials extraction guidance document includes information relevant to construction materials extraction activities such as aggregates, sand, gravel, etc. It addresses stand-alone projects and extraction activities supporting construction, civil works, and cement projects.

Potential issues during the operational, construction, and decommissioning phases of construction materials extraction primarily include the following:

- **Environmental issues** – including air emissions, noise and vibrations, water, waste and land conversion.
- **Occupational health and safety hazards** – including respiratory hazards, noise and physical hazards
- **Community health and safety issues** – including land instability, water, explosives safety and decommissioning.

3.3.4 World Bank Good Practice Notes

A number of World Bank Good Practice Notes which outline an Environmental and Social Framework for Investment Project Financing (IPF) Operations are relevant for the PRIME Project including:

- Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works, February 2020.
- Non-Discrimination and Disability, June 2018.
- ESS6: Biodiversity and Sustainable Management of Living Natural Resources, June 2018.
- Gender, October 2019.
- Road Safety, October 2019.
- Non-Discrimination: Sexual Orientation and Gender Identity (SOGI), October 2019.

These Good Practice Notes have been considered in preparation of the PRIME instruments and where appropriate incorporated into technical advisory, the development of relevant environmental and social assessments, Generic ESMP and any works specific ESMPs for the PRIME Project.

3.4 Comparison of WB ESF and FSM Legislative Requirements

Table 3-3 provides an analysis of gaps between WB safeguard requirements as set out in the ESMF and FSM Legislative requirements.

Table 3-3: Gaps between WB ESF and FSM legislative requirements, and gap filling measures

WB Environmental and Social Standards	FSM Legislative Requirements	Equivalence and Gap Filling
ESS1 – Assessment and Management of Environmental and Social Risks and Impacts		
To identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs.	The EIA Regulations at national and state levels require an EIA to be prepared prior to taking any "major" action significantly effecting the quality of the human environment. The EIA process is intended to assist understanding of environmental consequences and actions required to protect, restore, and enhance the environment. The regulations Identify at an early stage significant environmental issues thereby defining EIA scope.	Partial equivalence. ESS1 and FSM national and state requirements would need to be followed for ESA and preparation of instruments. Where possible, instruments will be prepared to satisfy both WB and FSM requirements. In some instances, separate instruments will be prepared (for example where the timing or scale of the assessment is significantly different).
To adopt a mitigation hierarchy approach to: (a) Anticipate and avoid risks and impacts; (b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) Once risks and impacts have been minimized or reduced, mitigate; and (d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.		
To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project.		
To utilize national environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate.		
To promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity.		
ESS2 – Labor and Working Conditions		
To promote safety and health at work.	FSM national legislation outlines worker's rights, and the Labor Code outlines the requirements regarding hiring of non-resident workers, labor development and other requirements.	Partial equivalence. ESS2 requirements will be followed where there are gaps in local legislation, including preparation of the PRIME Project LMP.
To promote the fair treatment, non-discrimination and equal opportunity of project workers		
To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.		
To prevent the use of all forms of forced labor and child labor		
To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.		
To provide project workers with accessible means to raise workplace concerns.		

WB Environmental and Social Standards	FSM Legislative Requirements	Equivalence and Gap Filling
ESS3 – Resource Efficiency and Pollution Prevention and Management		
To promote the sustainable use of resources, including energy, water and raw materials.	The EIA Regulations at national and state levels require an EIA and permitting process to assist with understanding of environmental consequences and actions required to protect, restore, and enhance the environment, as well as sourcing raw aggregate material required, and disposal of waste.	Partial equivalence. ESS3 requirements will be followed where there are gaps in local legislation.
To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.		
To avoid or minimize project-related emissions of short and long-lived climate pollutants.		
To avoid or minimize generation of hazardous and non-hazardous waste.		
To minimize and manage the risks and impacts associated with pesticide use.		
ESS4 – Community Health and Safety		
To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances.	No specific health and safety regulations or policies relating to community well-being.	ESS4 requirements will be followed where there are gaps in local legislation.
To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams.		
To avoid or minimize community exposure to project-related traffic and road safety risks, dis-eases and hazardous materials.		
To have in place effective measures to address emergency events.		
To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.		
ESS5 – Land Acquisition, Restrictions on Land Use and Involuntary Resettlement		
Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative designs.	FSM's legislation: • Encourages the avoidance of adverse environmental and social impacts and their effective mitigation where avoidance is not possible. • Requires negotiations with affected land owners, on values of land, and resettlement assistance.	Partial equivalence. ESS5 requirements will be followed where there are gaps in local legislation, including preparation of the PRIME Project RF.
Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the end of the project to share in the project benefits.		
Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.		

WB Environmental and Social Standards	FSM Legislative Requirements	Equivalence and Gap Filling
To address the impacts resulting from Bank-assisted investment projects, the borrower prepares a resettlement plan or resettlement policy framework.	• Avoiding hardship on displaced land owners is explicitly provided for but more for legal landowners, and legal occupiers, not for illegal occupiers and their assets / livelihoods • Requires negotiations with affected land owners, on values of land, and resettlement assistance. • Limits compensation imposed on how much compensation is paid for lost income from business or farm operation. • Provides for public consultation as part of the environmental assessment process and full disclosure of EIA reports to the public. • is explicit on dealing with displaced people • recognizes the heritage, traditional boundaries and cultural ties to the islands	
It is necessary to improve or at least restore livelihoods of Displaced Persons (DP) by a range of strategies targeted at Affected People (AP). Nobody is to be made worse off as a result of the development project.		
Requires that Displaced Persons are compensated for all losses, including non-land assets, at full replacement cost.		
Bank expects the borrower to take into account the views, roles, and rights of groups including NGOs and local communities affected by the Bank financed project in the planning, designing, implementing, monitoring and evaluating of such projects.		
Bank requires that Displaced People (DP) should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs. Bank also requires that displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.		
Bank requires: i) Screening to identify whether Indigenous Peoples are present, ii) Social assessment to assess potential adverse impacts, iii) Consultation and participation, iv) preparation of an Indigenous Peoples Plan (if required), and v) Public Disclosure.		
ESS6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources		
To protect and conserve biodiversity and habitats.	The Environment Protection Act provides for the protection of the environment, culture, historic and natural aspects of Micronesian heritage. The EIA Regulations at national and state level requires actions that protect, restore, and enhance the environment.	Partial equivalence. ESS6 requirements will be followed where there are gaps in local legislation.
To apply the mitigation hierarchy and the pre-cautionary approach in the design and implementation of projects that could have an impact on biodiversity.		
To promote the sustainable management of living natural resources.		
To support livelihoods of local communities including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.		
ESS7 – Indigenous Peoples		
To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities.	The Environment Protection Act provides for the protection of the environment, culture, historic and natural aspects of Micronesian heritage.	Partial equivalence.

WB Environmental and Social Standards	FSM Legislative Requirements	Equivalence and Gap Filling
To avoid adverse impacts of projects on Indigenous Peoples/ Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.	FSM law recognizes the heritage, traditional boundaries and cultural ties to the islands.	ESS7 requirements will be followed where there are gaps in local legislation. Provisions have been included in the PRIME Project SEP to comply with ESS7.
To promote sustainable development benefits and opportunities for Indigenous Peoples/Historically Underserved Traditional Local Communities in a manner that is accessible, culturally appropriate and inclusive.		
To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous Peoples/ Historically Underserved Traditional Local Communities affected by a project throughout the project's life cycle.		
To obtain the Free, Prior, and Informed Con-sent (FPIC)3 of affected Indigenous Peoples/ Historically Underserved Traditional Local Communities in the three circumstances described in this ESS.		
To recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples/Historically Under-served Traditional Local Communities, and to provide them with an opportunity to adapt to changing conditions in a manner and in a time-frame acceptable to them.		
ESS8 – Cultural Heritage		
To protect cultural heritage from the adverse impacts of project activities and support its preservation.	FSM National and State law including the Environment Protection Act recognizes the heritage, traditional boundaries and cultural ties to the islands	Partial equivalence. ESS8 requirements will be followed where there are gaps in local legislation. Provisions have been included in this ESMF to address potential risks and impacts and comply with ESS8.
To address cultural heritage as an integral aspect of sustainable development.		
To promote meaningful consultation with stake-holders regarding cultural heritage.		
To promote the equitable sharing of benefits from the use of cultural heritage.		
ESS10 – Stakeholder Engagement and Information Disclosure.		
To establish a systematic approach to stake-holder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.	The EIA Regulations at national and state level involves a process which is intended to help the general public and government officials make decisions with the	Partial equivalence. ESS10 requirements will be followed where there
To assess the level of stakeholder interest and support for the project and to enable stake-holders' views to be taken into account in project design and environmental and social performance.		

WB Environmental and Social Standards	FSM Legislative Requirements	Equivalence and Gap Filling
To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them.	understanding of the environmental consequences of their decisions	are gaps in local legislation. Provisions have been included in the PRIME Project SEP to comply with ESS10, and national legislation on public consultation, project information disclosure and grievance mechanisms.
To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.		
To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.		

4. Existing Environment

4.1 Introduction

This section provides a summary of the information provided in the Baseline Resource Report (Appendix A) on the physical, biological and socio-economic elements of the environment.

4.2 Project Area of Influence

The initial description of the Project's Area of Influence (AOI) is based on the definition provided in the Guidance Note to ESS1, to which the Project is to comply. Specifically, this Guidance note states that:

"*….Where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, the collection and analysis of environmental and social baseline information and data, at an appropriate level of detail for the project, are essential to define the project's area of influence and describe relevant physical, biological, ecological, socioeconomic, health, and labor conditions, including any changes anticipated to occur in the foreseeable future (including projected variability in climatic and environmental conditions due to potentially significant climate change or that would require adaptation measures that could occur over the life of the project), along with current and proposed development activities within the general project area but not directly connected to the project to be financed…..*"

The area considered for assessment of baseline conditions (the Project "Area of Influence" or "AOI") consists of the:

- Road corridor adjacent to the 'PRIME Roads' (and works where it is a bridge, causeway, etc.) and immediate adjacent environment either side of the road alignment (see Figure 2-2 to Figure 2-5);
- Road users and communities connected to and by the PRIME roads;
- Any temporary structures (such as bridges, causeway replacement structure, etc);
- Receiving environment downstream (and upstream when considering fish passage) if the works are a bridge (or causeway) or works are related to drainage, culverts etc.;
- Contractors yards, lay down or stockpile areas and any other works related facilities; and
- Quarry locations and immediate surrounds.

Table 4-1 outlines the guidelines that have been followed to determine the AOI for the PRIME Project which is based on a precautionary approach. All data was obtained by desktop study and field survey conducted between July and October 2020.

Table 4-1: Project Area of Influence (AOI) delineations and conditions

Environment	Project AOI
Local villages / communities businesses	Adjacent to PRIME Road alignments and works locations. Connected to and by the PRIME Road network.
Road users (motorists, cyclists, pedestrians and other modes of transport)	Users of the road that may have access or transportation restrictions from the works if they are not adequately managed. Users that will benefit from improved infrastructure.
Important species habitat	Sensitive ecological areas in close proximity to the PRIME Road alignments and works locations potentially receiving runoff during construction / operation.
Streams & inshore waters (adjacent to coastline)	Assuming a precautionary approach, an area directly adjacent to the PRIME Road alignments and works locations potentially receiving stormwater runoff during construction / operation.

The AOI extent considered in the ESMF is broader than the area in which possible physical works/interventions will occur as Component 2 works will only be undertaken along small discrete sections (<10%) of the 'primary roads' identified a part of the 'PRIME Roads'. However all road users that rely on the road networks for work, education, markets, community and social connectivity will potentially be affected by, and benefit from the Project.

The broader AOI has been applied for the E&S baseline, impact and risk assessment for the ESMF in order to ensure the process captures anticipated impacts.

Any site-specific environmental and social assessment to be prepared, if required, are to define the AOI specifically for those works, based on the works footprint including all ancillary components and potential impacts on environmental, economic and social resources.

4.3 General Baseline Description

This Section of the report summaries the key physical, environmental, and socio-economic resources present nationally and at a state level potentially within the AOI from primary (i.e., field assessment) and secondary (e.g., reference material, GIS data) sources. The E&S Baseline Resources Report which provides more detailed on the secondary source information is provided in Appendix A. This information has been used to screen the environmental and social risks associated with the PRIME Project (see Section 5.7).

4.3.1 National

4.3.1.1 Biological Resources

FSM consists of two ecoregions (Wortel *et. al.* 2003). The Yap tropical dry forest ecoregion is characterized by a monsoon-like climate with rainy seasons followed by periods of drought. The dominant vegetation types are mixed broadleaf forest, swamp, mangrove, savanna, and agroforests (Falanruw *et. al* 1987). The other States share the Carolines tropical moist forest ecoregion characterized by heavy rainfall. Mixed broadleaf forests comprise the dominant vegetation type on the high volcanic islands. FSM is characterized by 12 terrestrial biomes and 6 marine biomes. Biodiversity is characterized by a high rate of endemism and large numbers of species.

FSM coastline is about 3,300 nautical miles with an estimated 14,517 km^2 of reefs and wide range of different habitat types. Areas of mangrove and seagrass beds, consisting

of a number of species and considered important sensitive habitat, are found throughout FSM.

The EEZ has resident and transient or migratory populations of cetaceans (whales and dolphins) with a total of nine species being observed. Of these species, blue whale is considered 'Endangered' and sperm whale is considered 'Vulnerable'. The green turtle ('Endangered') and hawksbill turtle ('Critically Endangered') are the most commonly observed (IUCN 2020).

In terms of Conservation areas, areas, 130 Areas of Biodiversity Significance (ABS) have been identified in FSM (TNC 2003). The combined sites encompass 291,753 ha or 19% of the FSM's entire terrestrial and inshore area (including reefs and lagoon areas). In addition, each state has a number of protected managed areas.

4.3.1.2 Governance, Economy, Poverty and Gender

Most States have an effective traditional system of governance which complements the newer systems of government supported by non-government agencies (Raynor & Kostka 2003). Customary marine tenure gives resource owners jurisdiction and responsibility for marine resource use. Management of land, waters and all natural resources is through the traditional leadership system.

Ownership of land and aquatic areas varies between States. In Kosrae and Pohnpei, land is both privately and State owned, while aquatic areas are managed by the State as public trusts. In Chuuk, most land and aquatic areas are privately owned and acquired through inheritance, gift or, recently, by purchase. In Yap, almost all land and aquatic areas (shoreline to the outer reefs) are owned or managed by individual estates and usage is subject to traditional control (FSM 2010).

FSM cash economy primarily depends on the flow of funds from the United States of America (OEC 2017). FSM receives Compact of Free Association funds and supplementary grants from the United States which provides for US economic assistance, defense of the FSM and other benefits in exchange for US defense and certain other operating rights in the FSM. Economic activities consist primarily of subsistence farming and fishing. The economy has languished over the last decade and real GDP growth has averaged -0.4% resulting in declining living standards and contributed to net outward migration (FSM DoTC&I 2015). The economy is firmly tied to overseas aid which is significant relative to domestic revenue at the State level and is dominated by funding from the Compact agreement.

FSM is at an early stage of the process of urbanization with about 22% of its population living in the urban areas (2010 FSM Census). Agricultural and livestock raising activities and fishing activities are almost universal among FSM households.

Heads of households are primarily male with 53% of heads aged 40 to 59 years old (FSM 2014). The annual average income in FSM was estimated to be USD 16,950. However, 20% of the households earned less than US$ 2,600 and approximately 37% of household heads earned less than USD 5,000 with the majority of household heads earning between USD 5,000–29,000. The most common source of income for households is home production (mainly agriculture items) with 76% of the households involved in some form of subsistence activity.

A labor force comprised of 37,919 people represents a national labor force participation rate of 57.3% (2010 FSM census). Of this group, 31,789 people are employed while 6,130

are unemployed equating to an unemployment rate of 16.2%. For those that are employed over half are involved in education (24.6%), public administration and defense (18.6%), wholesale/retail trade and motor vehicle repair (9.7%) and health and social work (9.1%).

Approximately 22.4% of households or 29.9% of the population (SPC 2005) are living below the minimum cost of living or the Basic Needs Poverty Line (BNPL). Chuuk, Pohnpei and Yap have experienced an increase in the poverty incidence while Kosrae had a decline. Poverty also has a gender bias; while female-headed households constituted 20% of the household population in FSM, they constituted 39% of the total number of households in the lower three expenditure deciles (ADB 2004).

4.3.2 Kosrae

4.3.2.1 Physical Environment

Kosrae has a total area of approximately 112 km^2. The steep mountainous interior is covered with tropical rainforest. Around much of the island there are continuous mangrove swamp forests and seaward coastal strands. The island is surrounded by a broad shallow carbonate platform much of which is covered by freshwater swamps, mangrove forests and low coral land and beach strand (US Army Engineers 1989). In the nearshore coastal environment, seagrass beds sensitive to development are present in some locations and further offshore, coral reef habitat.

Soils are typically brownish red in color, mostly fine granular clay depending on the bedrock and can be deep in places (Takesy 2014). The most erodible soils are typically confined to the interior where steeper slopes predominate. The island has several significant Rivers and other smaller perennial and intermittent streams and springs. Groundwater is not considered to be an important water source.

A number of areas (including Lelu, Malem, Utwe and Tafunsak) have been identified where coastal change-related impacts are likely to be most significant either due to ongoing movement of the shoreline and/or the proximity of key infrastructure to the shoreline such as roads (Ramsay & Douglas 2000).

4.3.2.2 Ecological Environment

Terrestrial Ecology

There are over 322 plant species in Kosrae of which 250 species are native, many of which are endemic to one or more islands in the FSM (Falanruw 2002). Key vegetation types are shown in Figure 4-1.

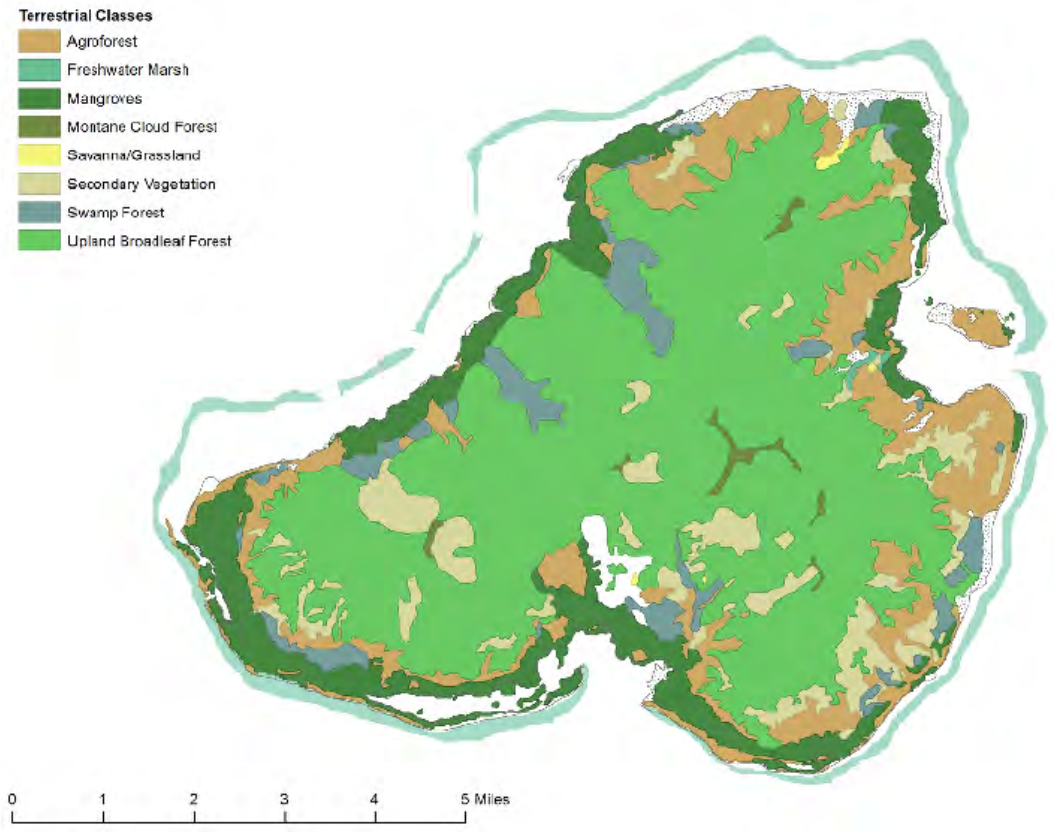

Figure 4-1: Location of key terrestrial habitat classes in Kosrae (from Weeks 2019)

Those located in close proximity to the coastal road include:

- Freshwater marsh and riverine systems with grasses, sedges and herbs growing in standing water most of the year and generally located in areas slightly above sea level and are often just inland of mangroves.
- Swamp forests occur where soils are inundated with fresh or slightly saline water. They are most commonly found just inland of mangroves, above tidal influence but lower in elevation than the surrounding terrain.
- Mangrove forests.
- Agroforest including palm trees, a component of forests, which occur in dense stands especially in areas where the primary forest has been disturbed.

Three species are identified as IUCN listed threatened (one 'Endangered' and two 'Vulnerable') and one 'near threatened' (NT) flora species. Kosrae has six endemic bird species two of which are now extinct. Two restricted-range bird species including the 'Critically Endangered' migratory species Beck's petrel *Pseudobulweria becki* and the Micronesian Imperial-pigeon *Ducula oceanica*, which is considered 'Near Threatened' are also present. Other rare, regionally significant or protected fauna species include two endemic species of bats, three threatened reptiles and two 'Endangered' freshwater fish species.

Coastal Marine Ecology

Kosrae is surrounded by a broad shallow carbonate platform much of which is covered by freshwater swamps, mangrove forest and low coral land and beach strand. The carbonate platform is of recent reef origin and extends between 1 – 5 km out from the islands volcanic

shoreline boundary. Three lagoons or embayment's bisect the reef platform, the largest of which is Lelu Harbor off the east coast.

Coastal marine habitat sensitive to development activities is present around Kosrae. Figure 4-2 presents a map showing the distribution of key coastal habitat classes in Kosrae (from Weeks 2019).

Mangrove and lowland swamp forest occupy relatively large areas between the basaltic uplands and seaward beach strand areas - 1,562 ha of mangrove forest represents 14% of the total land area (Cole *et al* 1999). Mangrove forest is most extensive along the south and north-west coasts (and in Tofol Harbor) while lowland swamp forest occurs in several discrete locations.

Sea grass beds are present on fringing reef flats primarily along the north and west coasts and consist primarily of four species (*Cymodea rotundata*, *Enhalus acoroides*, *Thalassia hamprichii* and *Holdule uninervis*).

Outer reef slopes and terraces beyond the spur and groove formations are characterized by coral reef habitat with high diversity and species abundance. Several species of giant clam that once proliferated across these reefs are now under threat due to the high levels of exploitation.

Kosrae has 8 Protected Managed Areas (PMA) and 12 Areas of Biological Significance (Figure 4-4) including two terrestrial, one marine, five coastal marine and two coastal freshwater ecosystems totaling 8,261 ha.

The primary roads considered under the Project do not pass through any of the 'existing' protected areas, although four 'proposed' protected areas do intersect these roads Figure 4-3).

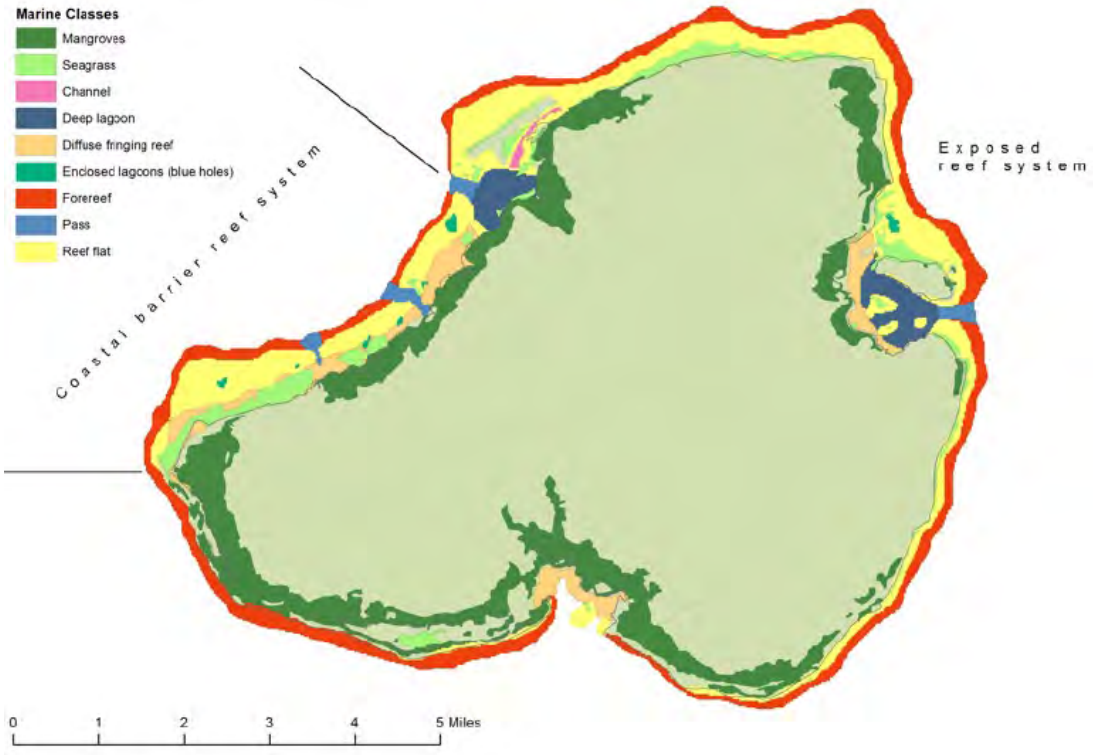

Figure 4-2: Location of key terrestrial habitat classes in Kosrae (from Weeks 2019)

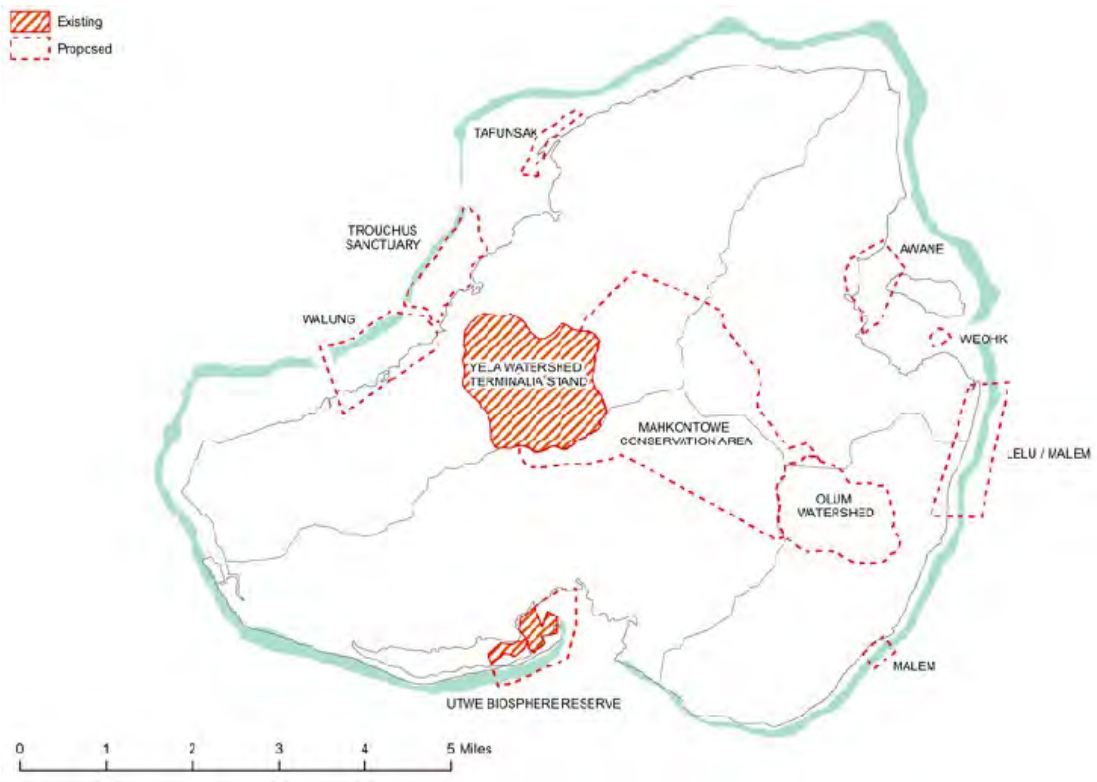

Figure 4-3: Existing and proposed protected areas (from TNC 2019)

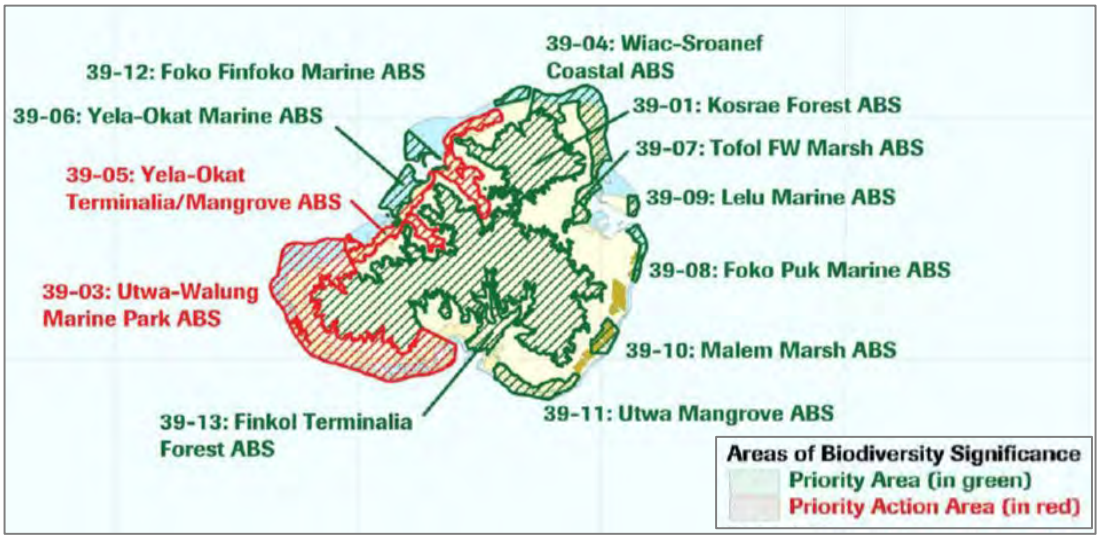

Figure 4-4: Areas of Biological Significance in Kosrae (from TNC 2019)

4.3.2.3 Social-Economic Environment

Kosrae's economy depends significantly on financial support from the United States, provided by the Compact Agreement with FSM. Consequentially, public sector dominates the economy; the primary employer is the State through its ten departments.

Kosrae's GDP was estimated at USD$14.6m in 2015 (FSM DoTC&I 2015). Major economic sectors in the State of Kosrae are marine resources, tourism, agriculture and small scale businesses. The private sector provides employment through retail outlets, restaurants, resorts, farming and some service businesses. Employee earnings in 2015 was US$1.822m (private sector) and US$17.051m (State Government). The subsistence economy is based on small-scale horticulture and fishing.

Kosrae has a total population of 6,616 (FSM 2010 census) with an average annual growth rate of -0.40%, the greatest rate of change of all FSM States, reflecting a declining economy and an interstate (to Pohnpei) or international population movement.

In terms of public infrastructure, piped water systems from rivers for potable water serve 7 areas in Kosrae (SPREP 2019). The Lelu sewerage system provides small bore sewers which receive effluent from household septic tanks. The Tofol sewerage system collects sewage from Government buildings and provides oxidation ponds treatment.

The solid waste facilities in Kosrae consist of five dumpsites and an aluminum can compaction and storage facility. Kosrae has 20 permitted privately-owned quarry sites. Only the Quarry at Tenwak (locally-known as Puk Quarry) has a rock crushing machine and sorter. No data is available on the quality or quantity of material potentially available for roading projects.

Figure 4-5 shows the location of key sensitive social receptors (such as key villages, churches, schools, hospitals) along the PRIME Road extent on Kosrae, as well as assets identified during a road corridor survey (including private dwellings, commercial buildings, grave sites). Examples of these assets are shown in Figure 4-6.

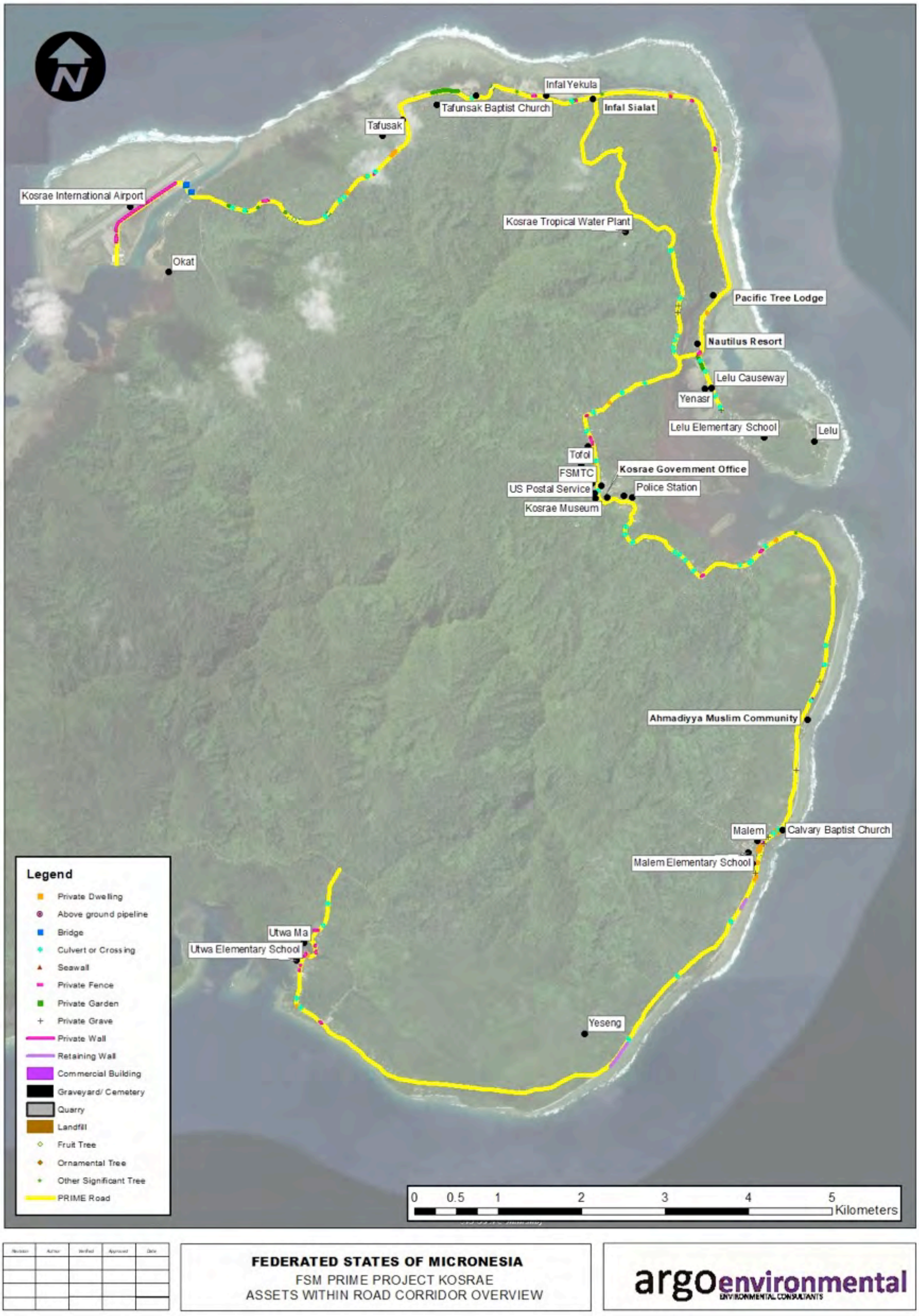

Figure 4-5: Key assets identified during the road corridor inspection – Kosrae

Figure 4-6: Images showing key assets located in close proximity to the road on Kosrae including walls (top left & right) private residences, garden and power poles (middle left & right), and one lane bridge on Lelu causeway and coastal protection works (bottom left & right).

4.3.3 Pohnpei

4.3.3.1 Physical Environment

Pohnpei is a high volcanic island with a mountainous interior, is about 21 km in diameter and 112 km in circumference. Including lagoon islands, the total land area of Pohnpei is approximately 340 km^2.

In terms of Flooding and Erosion hazard areas the majority of the low-lying coastal margin is considered at risk of flooding and the majority of 'very high' to 'high' potential erosion hazard areas are located in the stepper areas poorer quality soils of the interior occasional extending towards the coastal margin.

4.3.3.2 Ecological Environment

Key terrestrial habitat sensitive to development disturbance as a proportion of total area ranges includes Mangrove (15.6%), Swamp forest (0.6%), Upland forest (35.4%) and Marsh (0.4%). A total of 729 species plants have been described with approximately 438 species being native. A total of 291 introduced plant species are present. A range of avian, mammalian, reptilian species are present including 73 bird species. A number of mammals (including bats), reptiles (skinks, geckos, snakes), amphibians and freshwater fish are also likely to be present.

The key reef type in close proximity to the coast is described as "reticulated fringing reef defined as a network of linear or polygonal reef framework with intervening depressions". Approximately 4,403.6 ha of predominately intertidal and shallow (<3 m) subtidal seagrass meadow are present the waters around Pohnpei Island (and Atoll) of varying levels of coverage (continuous, aggregated, and isolated).

A total of existing (12 areas) and proposed (12 areas) protected areas in Pohnpei and 35 Areas of Biodiversity Significance (ABS) have been identified for Pohnpei including terrestrial (9), marine (5), coastal marine (18) and coastal freshwater sites (3).

4.3.3.3 Social-Economic Environment

Economic activity consists largely of subsistence farming and fishing and government activity which employs two-thirds of the adult working population and receives funding largely - 58% in 2013 – from US Compact of Free Association assistance. Pohnpei had been the fastest growing with GDP growth averaging 2% per annum in the FY1987-FY2003 period (FSM Strategic Development Plan 2003). In the early period FY1987-FY1995 of the Compact, a strong rate of growth 5.4% was experienced. Private and public sector expanded attaining 9.0% and 2.3% growth respectively.

The mainstay of the economy is subsistence farming and fishing. There is limited tourism due to a lack of access and facilities although it has increased in recent years with small hotels opening.

Land is both privately and State owned while aquatic areas are managed by the State as public trusts. The Constitution requires the Government of Pohnpei to protect customs and traditions and allows statutes to be enacted to uphold custom.

A total of 29 bridges and causeways have been identified around Pohnpei associated with the Project main road network. Piped water systems from Nanpil River and wells serve a total population of 2,500 in Kolonia and Palikir. The Kolonia Central Sewerage System, which consists of about 12 miles of sewers has about 1,200 connections.

Pohnpei has 45 coral sand dredge sites (33 inactive and 12 active) and two rock quarries. They all have permits from EPA and are mainly for road maintenance and construction. One of the hard rock quarries is located at Ipwal Sokes and is owned and operated by a company called APSCO.

Figure 4-7 shows the location of key sensitive social receptors (such as key villages, churches, schools, hospitals) along the PRIME Road extent on Pohnpei, as well as assets identified during a road corridor survey (including private dwellings, commercial buildings, a seawall and a pipeline). Examples of these assets are shown in Figure 4-8.

Figure 4-7: Key assets identified during a road corridor inspection – Pohnpei

Figure 4-8: Images showing examples of assets located in close proximity to the road on Pohnpei including private residences and churches (top left & right), telecoms tower and water pipeline (bottom left & right).

4.3.4 Chuuk

4.3.4.1 Physical Environment

Weno Island is of volcanic origin consisting of olivine-basalt with minor andesite, with steep rugged uplands surrounded by coastal lowlands. Weno is drained by a number of streams most of them short with small catchment areas. The compacted volcanic material results in a shallow (unconfined) groundwater lens. Key areas considered to be of high coastal instability are primarily located along the northern (including Pou Bay) and south-eastern coastlines.

4.3.4.2 Ecological Environment

Key terrestrial habitat sensitive to development disturbance as a proportion of total area includes mangrove (7%), upland forest (16.2%) and marsh (5.6%). A total of 470 species have been described of which approximately 298 species are native. A total of 172 species of plants have been introduced. A range of avian, mammalian, reptilian species are present including 73 species of bird and number of mammals (including bats), reptiles (skinks, geckos, snakes), amphibians and freshwater fish are likely present.

Weno Island has several designated protected / managed areas. In addition, 50 Areas of Biodiversity Significance (ABS) have been identified including terrestrial (9), marine (10), coastal marine (20) and coastal freshwater sites (11) throughout Chuuk. The key ABS sites on Weno in close proximity to the primary road network are Pou Bay and the North Weno Marine ABS (refer E&S Baseline Resources Report, Appendix A).

4.3.4.3 Social-Economic Environment

In 2010, Chuuk experienced 3% GDP growth with an increase in spending from both public and private sectors (Arnold 2016). Chuuk's economy grew at 1% experiencing public sector expansion of 4.4% and the numbers of hours worked by civil servants increased. In subsequent years, Chuuk has experienced very little growth. Analysts have forecast the decrease in compact funding ($1.7 million) will hinder government spending with little private sector growth. In 2011, the unemployment rate in Chuuk was 28%

The Chuuk Public Utility Corporation operates the public water supply serving 378 residential customers (around 19% of total households) and 101 commercial and government customers. The Weno sewerage network, the only centralized sewer system, is located on the north and north-western side of Weno Island. The sewerage network has 384 residential households and 106 commercial and government customers. Sewage is treated at the Weno Wastewater Treatment Plant (WWTP) which is located next to the Weno airport.

Solid waste facilities on Weno consist of the Fanipat dumpsite and the Weno Recycling Facility (Johnston 2011). There are three basalt quarries located on Weno two of which have not been in operation since the 1990s. One of the sites has equipment and is still in operation but output is extremely limited (see Figure 4-9). There is also a basalt Quarry on Tonoas Island in Chuuk Lagoon.

Figure 4-9 shows the location of key sensitive social receptors (such as key villages, churches, schools, hospitals) along the PRIME Road extent on Chuuk, as well as assets identified during a road corridor survey (including private dwellings, commercial buildings, and fruit trees). Examples of these assets are shown in Figure 4-10.

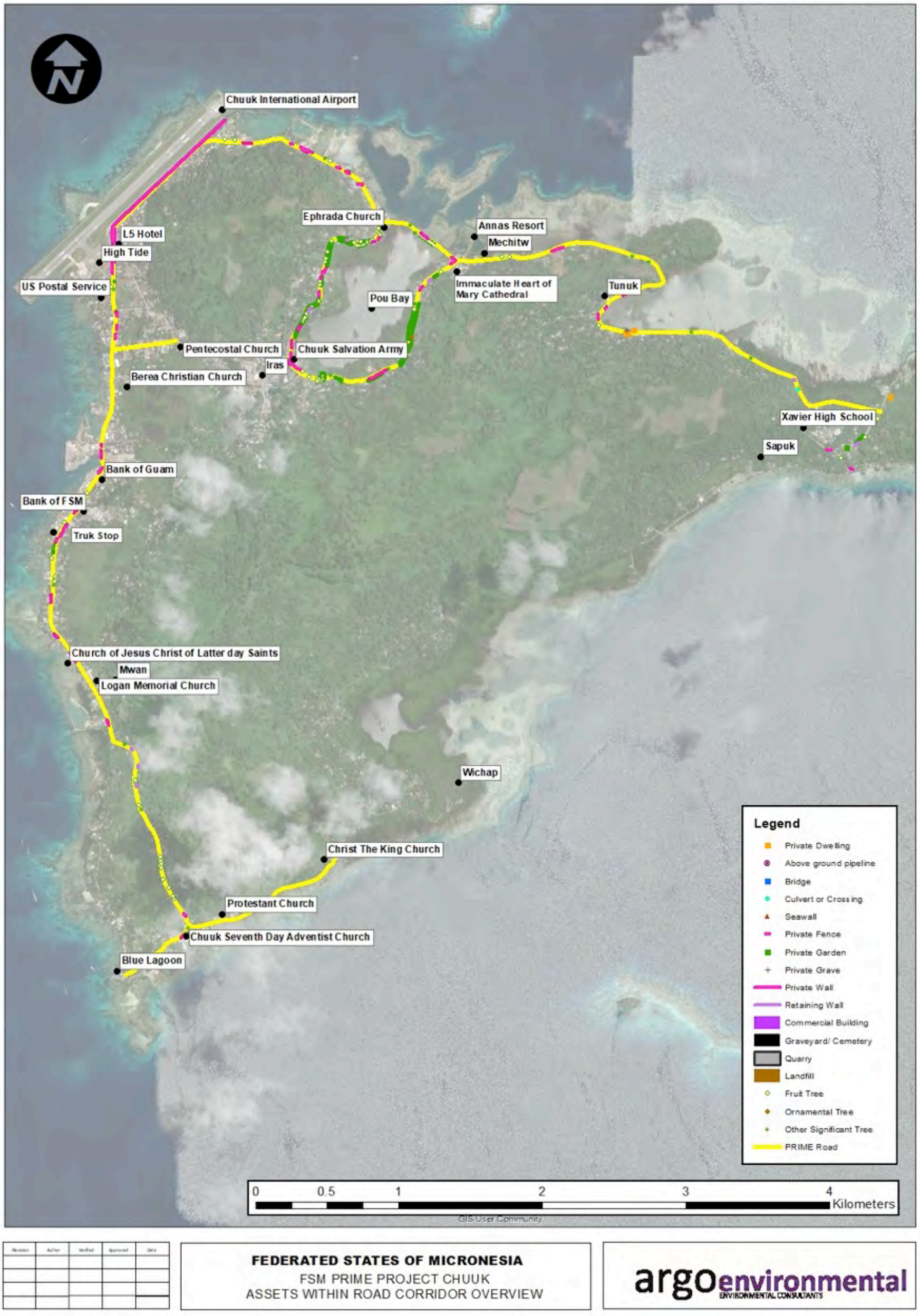

Figure 4-9: Key assets identified during a road corridor inspection - Chuuk

Figure 4-10: Images of Chuuk showing examples of assets identified during the road corridor on Chuuk inspection including walls and private fences (top and middle left and right), pig pen (bottom left) and power poles (bottom right).

4.3.5 Yap

4.3.5.1 Physical Environment

Yap Islands comprise an island arc system composed of continental crust and consist of two distinct sequences: ancient weathered volcanic rock and weathered metamorphic schists, accompanied by coral sand and mangrove mud. The islands are surrounded by a broad fringing barrier reef and has a low undulating topography. There are four main soil types on the Yap Islands have been derived from the basement rocks.

The primary freshwater source on Yap proper is surface water. There are no perennial streams on Yap where most streams will be dry during part of the dry season. A proportion of the surface water percolates into the soils recharging groundwater, which eventually escapes as small springs or seeps directly into the ocean. However, given the bedrock on Yap is metamorphic and volcanic, it yields little groundwater for use.

4.3.5.2 Ecological Environment

The major land class/habitat types are: non-forest (28%), agroforest (26%) and secondary vegetation (6%). The vegetation of Yap has been greatly modified; other than mangroves, little native forest remains. There are four threated (one 'Endangered' and three 'Vulnerable') and one "Near Threatened' (NT) floral species in Yap. All of the threatened species are trees. Yap contains four endemic bird species: the Yap cicadabird is considered to be 'Endangered' and the other three are 'Near Threatened'.

There are 8 protected marine areas and currently no legally protected terrestrial areas. A total of 32 Areas of Biodiversity Significance (ABS) are located in Yap State including five terrestrial, six marine and 21 coastal marine ecosystems, at least seven of which are in close proximity to the primary road network (refer E&S Baseline Resources Report, Appendix A).

4.3.5.3 Social-Economic Environment

The Yap State economy is firmly dependent on funding from the US which provides about 75% of revenue. The Yap state economy achieved the highest rate of economic growth of the FSM states during the original Compact period. Growth of the private sector was the most impressive achieving an annual average of 5.8% across 17 years. Economic performance during the last 4 years of the Compact were disappointing reflecting the inability of the private sector to sustain growth, prudential fiscal policies and poor results of the state owned commercial purse seine fishing company (FSM 2003).

Almost all land and aquatic areas are owned or managed by individual estates and usage is subject to traditional control (FSM 2010). The distribution of Yap's population varies considerably between rural (10,537 people) and urban (840) areas, with the population in

Piped water systems from Gitam Reservoir and wells serve the population of 3,150 in Colonia. The sewerage system has about 700 connections. A disused quarry site is located on the northern side of the western end of the existing Airport runway in Kanif. The only solid waste management facility is the Fitkabeetinaem landfill.

Figure 4-11 shows the location of key sensitive social receptors (such as key villages, churches, schools, hospitals) along the PRIME Road extent on Chuuk, as well as assets identified during a road corridor survey (including private dwellings, commercial buildings, and fruit trees). Examples of these assets are shown in Figure 4-12).

Figure 4-11: Key assets identified during a road corridor inspection - Yap

Figure 4-12: Images showing examples of assets located in close proximity to the road on Yap including private residences and commercial properties walls (top left & right) fences and walls (middle left & right, bottom left), and public utilities (bottom right)

4.4 Indigeneity in FSM

Micronesians represent the overwhelming majority in FSM, with recent estimates putting them at 91% of the population. With the vast geographical expanse of the country, there is huge cultural and linguistic diversity amongst the islands comprising the four states. While English is the official language of FSM, there are eight major indigenous languages of the Malayo-Polynesian linguistic family spoken in the FSM: Yapese, Ulithian, Woleaians, Chuukese, Pohnpeians, Kosraeans, Nukuoro, Kapingamarangi. Each State includes the indigenous languages as official languages. English has become the common language of the government, and for secondary and tertiary education. Outside of the main capital towns of the four FSM states, the local languages are primarily spoken.

There are distinct cultural identities between the four states with unique cultural characteristics. However, cultural similarities are indicated by the importance of traditional extended family and clan systems found on each island as well as a common national identity. Traditional leadership continues to play an important role in Micronesian society on most islands (with the exception of Kosrae). Over the recent two decades, Pohnpei has rapidly developed as the most westernized state in the nation. This results in large part because the national government is located here. Yap continues as the most traditional society in the FSM with a strong caste system.

The individual States have separate and distinct land tenure arrangements, with some broad commonalities that persist throughout State land tenure systems. The FSM Constitution forbids land ownership to foreigners as well as to domestic corporations that have non-FSM citizens among their shareholders. Group and communal ownership of land is prevalent throughout the FSM. There are differences, however, concerning rights of land transfer within the FSM. In Chuuk, Kosrae and Yap, land can be transferred by law to all FSM citizens. In Pohnpei, however, it can only be transferred to persons from that island.

Traditional and cultural institutions have a strong presence in Micronesian life. The keystone of Micronesian society is the extended family, which is collectively responsible for maintaining the welfare of the family including in relation to customary family land.

The system of land tenure is a complex mix of the old and the new. Older customary land tenure conditions are strong or weak depending on the people involved, the location and history of the land, the historical title and rank of the land, and the cash opportunity associated with ownership, lease or use rights. Traditionally, land ownership in FSM was limited to inheritance within a family or clan. As a result, many land parcels in FSM are subject to the communal use and alienation rights of extended families, clans and communities. Private landholders influenced to varying degrees by customary land tenure systems nevertheless occupy most lands.

Patterns of public and private ownership over land and aquatic areas vary among the states. In Pohnpei and Kosrae, land is both privately and state owned, while aquatic areas are managed by the state as public trusts. In Chuuk, most land and aquatic areas are privately owned and acquired through inheritance, gift or by purchase. In Yap, almost all land and aquatic areas are owned or managed by individual estates and usage is subject to traditional control.

Land tenure patterns generally involve communal ownership of a single plot, single ownership of several and separate plots or usage right to land owned by traditional leaders. In the traditional economy, land is not a commodity to be sold or traded. However, the attitude in some areas towards land is changing with sales and trades taking place as well as leases especially near centers of development. Cadastral and registration programs have been undertaken in each of the states with varying effects. In the main island of Yap, less than 10% of land has been registered and titled since a cadastral program commenced some 30 years ago. Chuuk and Kosrae have made more progress in the initial determination of land parcels although there is a substantial backlog in the land parcels to be surveyed and mapped and numerous outstanding disputes. Pohnpei appears to have made the greatest progress in the cadastral survey of private lands.

5. Anticipated Environmental & Social Impacts of Component 2 Physical Works

5.1 Introduction

The PRIME Project has the potential to create a range of impacts as a result of Project feasibility, design and construction of physical works on priority road assets. The impacts of this Project on the physical, ecological and social environment have been assessed using the methodology described below.

Specific environmental and social sensitivities identified through the impact and risk assessment are outlined in Section 5.9.

Detailed assessment and measures to be adopted to mitigate any potential impacts will be provided in the Generic ESMP or works specific ESIA/ESMP.

5.2 Potential Impacts of Components 1 and 3

While the majority of potential impacts are expected under Component 2 physical works, a number of risks exist for Components 1 (Technical Assistance related to the VA/CRRS, and road asset management systems), and Component 3 (institutional and regulatory reforms and capacity buildings.

The risks to be considered under Components 1 and 3 include the following:

- **Lack of or insufficient stakeholder engagement** – where key stakeholders and community have not been meaningfully engaged during the Technical Assistance stage, impacting outcomes of VA / CRRS and resulting in distrust / discontent from stakeholders.
- **Poor quality environmental and social data** – existing data and information inadequate to inform the assessment, with high level of inaccuracy or gap filing required, leading to either additional investigative studies required or inaccurate conclusions/recommendations from the VA/CRRS.
- **Avoiding sensitive receptors (cultural heritage, natural or critical habitats)** – sensitive receptors not being adequately screened during Component 1, leading to these sensitivities not being fully understood or identified.
- **Inadequate training of national and state officials –** training and capacity building undertaken during Component 1 and 3 is not adequate to provide national and state officials to either support the Project, meaningful input the decision-making process, or carry the Project forward through operation, after the external consultants are no longer involved.
- **Institutional and regulatory reforms not sufficient** – inadequate strengthening of institutional structures and regulation leading to lack of communication between institutions and States and an inability to effectively regulate climate change risks on the roading network.

5.3 Potential Feasibility, Design and Pre-Construction Impacts under Component 2

Without knowing the exact Component 2 physical works to be implemented under the PRIME Project, the impact assessment process for this ESMF involved identification of the Project's 'likely' activities and potential environmental and social impacts resulting from each activity during Project phases. A works activity could include design/technical assistance, site preparation, construction, reinstatement, operation and maintenance.

Potential impacts have been screened and evaluated as to whether they are adverse, positive, or have a negligible or neutral impact. These issues are discussed in the following sections in relation to the 'likely' Component 2 works activities under the PRIME Project.

The feasibility, prioritization, design and procurement of works can play a major role to avoid or reduce significant impacts to people and the environment. Project design should reflect current international standards for design and construction of roads and bridges, which may include site preparation, slope stability, drainage, access road geometry, pavement, bridges, causeway and other road infrastructure assets.

The following key impacts need consideration at the design / pre-construction / technical assistance phases:

- **Climate Change Impacts** – roads and bridges typically have design lives of 20 to 40 year timeframes over which climate change could have direct and indirect impacts. Direct impacts are due to effects of the environment namely increased frequency and intensity of rainfall and sea level rise. The indirect impacts of climate change on roads are due to the potential relocation of population and human activity altering the demand for roads. An understanding of the likely impacts of future climate change by road planners, designers and asset managers can result in considerable cost savings in the long term.
- **Easement Agreements** – there may be issues defining or securing the road easement documents for some works areas. This could include:
    (i) Formal easement documents do not exist;
    (ii) Documents are believed to exist, but cannot be sourced/found;
    (iii) Easement documents exist and can be sourced but are not well defined (i.e., either no map accompanying the easement agreement or the map is not detailed enough to define the exact extent of the easement); or
    (iv) There are existing (i.e. historic) disputes over the area of land or easement.

  Not having formal, well defined, easement agreements in place for a section of road to be upgraded as part of the PRIME Project could potentially lead to Project risks such as land owner disputes and grievances, which if unmitigated or unresolved could hinder the implementation of works under the PRIME project program of works.
- **Asset Damage –** through stormwater runoff eroding road or damaging adjacent assets through poorly designed and installed side-drains and culverts.
- **Direct Land and/or Asset Loss** – as a result of the need to relocate structures such as houses, commercial properties, etc. and the resultant impact on livelihoods to accommodate the PRIME Project.

- **Disruption to Access** – such as during road works activities or the replacement of bridge or causeway which could pose significant inconvenience to road users.
- **Restricted Coastal Margin Access** – where works restrict local communities access to the coastal margin either temporarily or permanently.
- **Safety in Design / Road Safety Assessments** – design not robust enough for local conditions or not international best practice, does not take into account locally available material, or not appropriate for local safety issues (i.e. types of pedestrian or vehicular road use).
- **Avoiding sensitive receptors (cultural heritage, natural or critical habitats)** – sensitive receptors not being adequately screened, leading to these sensitivities not been fully understood or identified during design phase, resulting in inappropriate design, or unnecessary impacts.
- **Identifying opportunities for environmental improvements** – opportunities exist for environmental and social environment through sound and thoughtful design, particularly as part of the 'participatory design approach'.
- **Lack or insufficient public consultation and project information disclosure** – leading to community not aware of nature, scope, impacts or timing of works, and not being able to adequately engage in the 'participatory design approach' process.

5.4 Potential Construction Impacts under Component 2

Potential impacts arising from road works activities will depend on a number of factors including the existing site conditions, the location of nearby assets and sensitive environmental and social receptors and the scale and nature of the works proposed. On this basis potential impacts are summarized in Sections below. In many instances potential impacts can be mitigated through the implementation of Good International Industry Practice measures outlined in the generic ESMP or works specific ESIA/ESMP.

5.4.1 Physical and Ecological Environment

5.4.1.1 Water Quality and Sediment

There is potential for the discharge of sediment and contaminants as a result of Project construction activities. An increase in suspended sediments in receiving water bodies (streams and coastal marine area) can be caused by earthworks and vegetation clearance activities as well as uncontrolled discharges of fine material from exposed soil and stockpiles through stormwater runoff and overland flow. This can lead to changes in the water quality of adjacent watercourses and coastal environments. There is also the potential for hydrocarbons from machinery operations and refueling activities impacting water quality.

In the case of the PRIME Project potential water quality impacts could arise due to the generation of fine material in stormwater runoff and the vicinity of ecologically sensitive water bodies. Impacts are manageable through the use of practical standard road environmental mitigation practices, such as stormwater control, stockpile management, controlling hazardous substances suitable slope stabilization, minimizing instream works etc.

5.4.1.2 Terrestrial Biodiversity and Habitat

The potential impacts of construction activity relate primarily to the direct loss of habitat in road, bridge or causeway footprints (such as riparian margins) as a result of earthworks associated with construction activity. Noise and vibration are likely to be the main impacts on terrestrial faunal species (e.g. birds, lizards, bats, etc.) during construction (refer section 5.4.1.5).

The environmental screening process (refer Section 6) includes a biodiversity and natural habitat screening and assessment process for works, and specific mitigation measures are to be developed in a site-specific ESMP if necessary.

5.4.1.3 Freshwater and Coastal Marine Biodiversity and Habitat

The potential impacts of construction activity relate primarily to:

- The direct loss of freshwater and coastal marine habitat in road / bridge / causeway footprint;
- Water quality impacts associated with uncontrolled runoff of sediments from exposed earth or stockpiles in stormwater from construction areas, or from spills or leaks from hazardous substances; and
- Impacts on freshwater and marine fauna and flora as a result of changes in water quality.

The environmental screening process (refer Section 6) includes a biodiversity and natural habitat screening and assessment process for works, and specific mitigation measures (in addition to those related to water quality management) are to be developed in the Generic ESMP, or site-specific ESMP if necessary, such as maintaining fish migration and suitable crossing design.

5.4.1.4 Air Quality

Fugitive emissions of particulate material can occur from earthworks, concrete construction activities and from disturbance of unsealed roads. Mobile source emissions occur from machinery used for excavation, construction and transport operations.

Emissions during construction are likely to consist of the following:

- Exhaust emissions from machinery (e.g. excavators, trucks, etc) which will depend on age and condition of machinery;
- Dust associated with the earthworks, road use, material storage/ stockpile, concrete batching or asphalt plant operation, quarrying or crushing materials; and
- Emissions of smoke from bitumen production, etc.

Adverse effects of these emissions depend primarily upon the sensitivity of the local environment and proximity to local populations. Those located closer to the construction activities are most likely to be most affected whilst those located further away are likely be least affected. These effects can be classified generally as nuisance effects as a result of deposition of particulates onto places where people live or frequent, or onto crops.

Impacts of particulate matter depend on the size of the particles generated. Human health effects of airborne particulate matter are mainly associated with fine particles that are less than 10 microns in size (PM_{10}) and which are small enough to enter the upper respiratory

tract. Coarser particulate matter, greater than about 10 to 20 microns, generally cause nuisance effects due to soiling of surfaces, visibility or irritation to eyes and nose. The large fraction (greater than 20 μm) is usually referred to as deposited particulate matter.

Proposed construction activities are expected to result in minor impacts relating to dust generation from earthworks activities, formation of soil and gravel stockpiles and from the movement of heavy construction vehicles. These impacts can be managed but can cause a nuisance for neighboring property owners and can create a hazard to road users.

Monitoring and implementation of measures to manage dust generation (such as the use of dust carts, etc.) will be in the generic ESMP. All machinery and vehicles used in the Project will be expected to meet State EPA emissions standards and EHS Guidelines.

5.4.1.5 Noise and Vibration

Construction activities can result in increases in ambient and peak noise levels. Increases in noise associated with construction are typically short term and are not considered to be significant given the adoption standard mitigation measures (i.e., mufflers on vehicles, etc.).

Intense vibration can damage buildings, retaining walls and other structures as well as cause nuisance and potential health effects on people.

The main potential sources of noise and vibration for this Project are likely to be:

- Removal of any road surface / soil / overburden / vegetation by bulldozer;
- Delivery and placement of fill material in reclamation areas;
- Equipment and material deliveries to site by heavy vehicles;
- Aggregate crushing, concrete batching or asphalt plant operation;
- Removal of existing structures (such as bridges and causeways); and
- Installation works for new bridges and causeways (e.g. pile driving).

Any residential dwellings or commercial buildings in close proximity to works will be particularly sensitive to elevated noise and vibration.

Construction related traffic or activities could affect noise levels and potentially result in noise effects on nearby sensitive receptors such as local residents.

Managing the timing of works and site activities is the most appropriate management option for all the noise-producing activities.

No blasting is expected to be required reducing the potential impacts from vibration. However, drilling may be required for installation of new bridge piles which could have low to moderate vibration effects. Monitoring and compliance with accepted EHS Guidelines will be required.

Overall, given the short-term nature of construction activity and adherence to Good International Industry Practice and EHS Guidelines, including monitoring, the potential noise and vibration impacts during construction are not expected to be significant.

5.4.1.6 Hazardous Substances

The use and storage of hazardous substances (such as hydrocarbons, bitumen, cement, etc) can impact on soil and water resources if they accidentally spill or leak into the environment or if they are not properly disposed of, or in the event of a fire in the case of flammable substances. Storage of hazardous substances will need to be managed (i.e., EHS Guidelines and adopted for fuel stored in bunded areas, refueling activities remote from watercourses on hard stand areas, fire-related precautions adopted, etc.).

With Good International Industry Practice mitigation measures in place, such as suitable storage, inspection, handling and contingency practices, the risk of hazardous substances being discharged to the environment is considered to be low.

5.4.1.7 Waste Management

Solid waste will be generated as a result of the construction process particularly as a result of removing existing structures such as bridges and causeways or the existing road surface. While existing road material could be re-used on site some may require removal and disposal.

Any solid waste generated will be managed according to the following hierarchy of treatment:

(i) Recycled / reused where possible.

(ii) Remaining waste taken off-site and disposed at a facility licenced by a State EPA/KIRMA.

Any hazardous waste generated as a result of the PRIME Project will be managed based on EHS Guidelines.

Construction workers will also require access to sanitation facilities. Liquid wastes will require treatment to a standard that is consistent with treatment of similar waste within each State.

The Contractor will be required to prepare a Waste Minimization and Management Plan (WMMP) and Spill Management Plan (SMP) which sets out strategies and actions required to reduce potential health and environmental risks associated with waste generation and disposal, including hazardous materials, management to avoid spills and other environmental releases, and identify opportunities for material recycling or reuse.

5.4.1.8 Invasive Pest Species

Roads and vehicles associated with construction activities can be vectors for weeds and animal pests. There is the potential to introduce invasive species through vehicles and transport of soil, aggregate and construction materials particularly if this material is imported from overseas or inter-State. Implementation of Good International Industry Practice mitigation measures (vehicle washing, sourcing weed free aggregates, etc) will minimize the risk of invasive pest introductions.

5.4.1.9 Aggregate and Asphalt Suppliers

Construction works will require aggregate to be used and a supply of asphalt or cement. Asphalt and concrete batching plants have the potential to be a source of pollution to soils, ground and surface waters.

Suppliers of road construction material for the Project will be required to hold a quarry license from the EPA/KIRMA and meet ESS, as well as be in general accordance with EHS Guidelines. No coastal or marine coral rock or sand will be permitted to be used on the PRIME Project due to risks to climate resilience and ecological impacts.

Each of the States have existing and disused quarry sites which have been for road maintenance and construction activities in the past. These sites (described in the Baseline Resource Assessment, Appendix A) will require further investigation to determine whether they can supply suitable material (both quality and quantity) to meet the needs of Project works (once known).

If these quarry sites are not able to meet Project needs, aggregate material will need to be sourced from offshore.

Aggregate material imported from offshore will need to meet any State and ESS requirements, which includes impacts managed through the implementation of Codes of Practice for quarry and dredging operations and ensuring materials such as aggregate and equipment meet strict biosecurity precautions and clearance for imported materials, as well as adherence to the World Bank Group EHS Guidelines for construction material extraction.

With Good International Industry Practice mitigation measures in place any potential impacts of locally or international sourced material can be managed.

5.4.1.10 Greenhouse Gas Emissions

Greenhouse gas emissions (GGE) during construction will be generated by construction machinery. This impact will be temporary and is not expected to be a significant contributor to overall emissions, so long as vehicles are adequately maintained. Vessels bringing equipment and resources from overseas will generate emissions but are considered to be minor in terms of overall contribution to GGE.

Since any change or increase in greenhouse gas emissions are likely to be minimal, no assessment has been completed and no mitigation is proposed.

5.4.2 Social-Economic and Cultural

5.4.2.1 Resettlement, Land and Asset Loss

Direct temporary or permanent land and/or asset loss as a result of the need to relocate structures (such as house fences, boundary walls, access driveways) and the resultant impact on livelihoods could arise as a result of the PRIME Project. No physical displacement of people is expected to occur. Measures outlined in the Resettlement Framework (RF) will mitigate this potential impact.

5.4.2.2 Pedestrian and Vehicular Traffic

During construction it is likely that there will be an increase in the number of truck movements to and from the work sites bringing in fill, construction material and earthworks equipment. This increased traffic could result in increased traffic congestion and an increased risk of traffic incidents and general road safety issues (such as road crossing by pedestrians).

However, it is considered that any increased construction traffic experienced will result in only minor impact on road users and minor and short term increases in congestion, and

noise and air quality effects on nearby sensitive receptors such as local resident's following implementation of Good International Industry Practice mitigation measures.

Traffic related impacts on air quality, noise and vibration are discussed in Section 5.4.1.4 and Section 5.4.1.5 above.

Disruption of a key transportation networks (i.e. replacement of bridge or causeway) could pose significant delays in journey times and overall inconvenience to road users. Alternative routes and/or temporary crossings (in the case of bridges works) are to be considered as part of the design, and a 'participatory design approach' will be used to determine the best approach to maintaining access for all road users during construction for applicable works. Mitigation must include measures such as signage and fencing, speed restrictions, etc.

In addition, roads will be required to remain passable during construction activities to minimize potential impacts on all road users including pedestrians and cyclists.

A Traffic and Road Safety Assessment (TRSA) will be undertaken under PRIME Component 1 for identified roads and mitigation will be included in ESMPs. The Contractor will also be required to prepare a Traffic Management Plan (TMP) for the works.

Overall, the impacts from increased construction traffic to and from works sites, and construction related traffic impacts are considered to be minor for most works due to the finite duration of works with any impacts mitigated through implementation of Good International Industry Practice mitigation measures.

In some instances however there is a risk of more substantial pedestrian and vehicular traffic related impacts from proposed works (such as proposed improvements to causeway and bridge replacements). However these potential impacts can be managed through the implementation of effective mitigation measures (i.e. installation of temporary parallel crossing structure).

Given the significant benefit that the community will gain from the works being completed these impacts are considered minor provided mitigation measures outlined in the Generic ESMP and/or work specific ESMP are implemented.

5.4.2.3 Disruption to Existing Essential Services

It is possible that disturbance or relocation of existing utility services (such as power, water, telecommunications etc) may be required for some works as it is common for this infrastructure to be located within or adjacent to the road easement in all States.

Once the Component 2 works have been determined, utility infrastructure within the proposed works footprint is to be surveyed as part of the Inventory of Loss (IOL). Consultations with the relevant State owners of the utility infrastructure identified within the footprint will be necessary to negotiate the most practical solution for avoidance or relocation of that infrastructure to ensure that works construction activities do not impact provision of this service to the community.

5.4.2.4 Construction Yard, Site Offices, Laydown Areas, Stockpiles etc.

Construction yards, laydown areas and associated works facilities can cause an adverse impact through the increased disturbance, vegetation clearance, noise and waste generated by yards and work sites especially if the sites are located close to houses and villages. In addition, use of construction camps to accommodate imported workers can

create a range of issues such as: unsolicited interaction with local communities; drug / alcohol use; and increases in communicable diseases such are sexually-transmitted diseases (STDs), HIV/AIDS. etc.

Given the works are likely to be in close proximity to towns, villages and communities and in many cases State capitals, it is anticipated that the Project will not require accommodation camps. Workers would likely be housed in existing facilities such as guest houses or rental properties. However, should construction camps be required the potential impacts can be mitigated by Good International Industry Practice such as providing suitable sanitation, water, catering, recreation and controlling worker behavior.

Imported labor may be required for the Project, if adequate resources and skills are not be available locally. Importing labor can result in a range of impacts including on the environment (e.g. increased pressure on existing natural resources), local economy and livelihoods (e.g. inflation pressures, exacerbate vulnerability of marginal groups), increased pressure on local infrastructure and health services (e.g. potential increases in violence, alcohol / drug consumption, diseases, etc), and social and community wellbeing.

Contractors shall also adhere to the Project Labor Management Plan (LMP)[6], as well as prepared a Social Interaction Plan (SIP), as part of the CESMP, which is to include a code of conduct for site workers induction, rules regarding alcohol use, interaction with the local community, establish requirement for stakeholder committee/community liaison officer, etc

A construction yard, site office, laydown areas and or stockpile areas may be required during construction depending on the location and scope of the works.

Should this infrastructure be required, this will be negotiated between the Contractor and landowners (as outline in Section 5.4.2.1). Mitigation measures will be included in the Generic ESMP and the works specific ESMP to ensure no residual impacts are anticipated

5.4.2.5 Archaeology and Cultural Heritage Resources

Ground disturbance activities such as those likely for bridge and road works are to be undertaken which can potentially damage cultural or historic sites, particularly where earthworks are required.

However the likelihood of any physical cultural resources being present within works is considered low given the works are predominantly located within the road easement and on existing road network with no new alignments proposed. The exception is graves, in close proximity to PRIME Project works.

Sites of archaeological or cultural significance (such as grave sites) that may be adversely affected in any way by the works will have been identified in the design phase as part of the environmental and social assessment or through the Inventory of Losses survey, and through consultation with the land owners and community (and any other relevant stakeholders). Contractors will implement the agreed mitigation measures throughout the construction phase.

To avoid any potential impacts to unknown sites of archaeological or cultural significance, a chance find protocol will be provided in the ESMP which will identify actions to be undertaken in the event of uncovering cultural heritage during the construction phase.

[6] To be completed prior to the engagement of project workers.

5.4.2.6 Worker Health and Safety

Bridge and road construction activities can present significant health and safety risks to workers. These include potential risk to workers from vehicles (working on an active road network), heavy machinery, working near water, exposure to heat/sun, trenching, unstable slopes, overhead hazards (such as cranes), etc.

To avoid these impacts Contractors will be required to work in accordance with relevant the WBG EHS Guidelines and adhere to National and State Health and Safety legislation, and be addressed by way of a Project specific Occupational Health and Safety Plan (OHSP) to be prepared by the Contractor which outlines labor and working conditions.

Contractors shall also adhere to the Project Labor Management Plan (LMP)[7] and the National/State Labor Laws to prevent the exploitation of workers. In addition to workplace occupational safety regulations, this includes requirements to not use child labor; not discriminate workers in respect of gender, employment and occupation; to not use forced labor; and to allow freedom of association.

Unexploded Ordinance (UXO) are known to exist in FSM as a result of military actions throughout the Pacific during World War II from 1942-1945. While many of the UXO's have been cleared there is a chance some may still remained undiscovered.

Given the works to be implemented under the PRIME Project are largely within existing road corridors that had been constructed and maintained since that time (typically 1970s onwards), the chance of workers encountering UXO's as part of this Project is low.

However, mechanisms for identifying and reporting UXO's should be included as part of the Contractors Health and Safety Plan and included in a screening and Chance Find Procedure to be included in the Generic ESMP. In the event that a temporary road, bridge or causeway alignment is required an assessment for UXO risk should be undertaken, and a UXO clearance team may be required.

5.4.2.7 Community Health and Safety

Community health and safety can be impacted directly and indirectly during works construction activities through accidents, injury and spread of communicable disease. Public access must be restricted from entry to the work sites to ensure their safety. Safe, well sign-posted, alternative routes for pedestrians and vehicles must be provided at all times. Conversely, the Contractor must not restrict the rights of local communities to access their properties. Restricting the movements to traffic and temporarily changing road layouts can increase the potential for accidents.

Construction traffic will utilize existing roads as haulage routes. The increase in vehicle movements has the potential to place people using the area at risk particularly children. This risk can be minimized by restricting construction vehicle speeds and timing the works to avoid the periods when pedestrians and vehicles people are most frequently using the road. Other protective measures include signage and barriers, speed restrictions, etc.

There is also the risk of spread of communicable diseases from workers to the local community particularly if workers are working or residing in an area for extended periods. Any associated risks will be managed through the works specific ESMPs.

[7] To be completed prior to the engagement of project workers.

Gender-based violence (GBV) rates are high in FSM and women are vulnerable to trafficking, illegal sex work, unwanted pregnancies, harassment and violence. Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) is prevalent with approximately one in three women (32.8%) having experienced physical and/or sexual violence by an intimate partner in their lifetime.

Imported and transient workforces such as those required for the construction industry are known to contribute to these issues. For women in FSM there are multiple barriers to having equal opportunities as well as a life free from violence and coercion. Priority areas of the GoFSM national gender planning include addressing female unemployment and a gender-stratified labor market, teenage pregnancy, violence against women and girls and limited access to justice and protection for women.

The PRIME Project aims at achieve gender mainstreaming in its design, management and implementation, to ensure barriers to participation of women are taken into account. The Contractor shall also prepare a GBV Action Plan, a part of the CESMP, to address GBV risk. Additionally, a specific SEA and SH Grievance Mechanism is currently being developed by the DoFA Centralized Implementation Unit (CIU) which will be implemented for the PRIME Project.

5.4.2.8 Vulnerable Groups

ESS1 also states that "*special consideration should be given to stakeholders that may be disadvantaged or vulnerable*".

While some vulnerable groups may live near or use sections of road that will be potentially impacted by works construction activities, they are not specifically targeted or likely to be impacted over and above other landowners or groups and will not be excluded from any socio-economic benefit from the Project.

Particular attention will be paid to the needs of vulnerable Project Affected Person (PAPs) including socially and economically vulnerable groups during any stakeholder consultation activities and socio-economic surveys to be undertaken for works (if required). This may include those without legal title to the land or other assets, households headed by females (where appropriate[8]) the elderly or disabled and other vulnerable groups such as people living in extreme poverty or hardship[9]. The Stakeholder Engagement Plan (SEP) provides further detail on engagement with PAPs.

Pedestrians and cyclists are also considered to be vulnerable to road works. Relevant aspects of the WBG EHS Guidelines and the WB Road Safety Guidance Note are to be adhered to in regard to traffic safety.

5.4.2.9 Visual Amenity

Key potential impacts on visual amenity from the works could include minor vegetation clearance, increased heavy vehicle traffic, land disturbance, lighting, the presence of works infrastructure and increase workers.

Visual impacts are most significant when they affect the view of sensitive receptors such as residential areas, urban areas, major and secondary roads, recreational and tourist

[8] Note: On some islands in FSM all houses are headed by a female as they own the land. In these cases the female head of the household would not be considered a vulnerable group.

[9] As determined and identified by the relevant community leader.

areas, heritage sites and other landmarks. The development of works could disrupt the local landscape and scenic views through:

- Clearing of existing vegetation;
- Stripping, excavation and earthworks on the site;
- Soil, waste and aggregate stockpiling; and
- Transportation of equipment to and from the site.

If these activities are appropriately managed (through measures such as visual screening from replanting vegetation), the visual amenity impacts of construction activities for the works are expected to be minor, and mostly temporary.

5.4.2.10 Stakeholder Engagement and Consultation Risks

Lack of meaningful, or insufficient consultation and project information disclosure consultation can result in distrust or discontent from Project stakeholders.

It is important for the stakeholder engagement process to be inclusive, participatory and transparent to ensure multiple opportunities for learning about the Project for all affected or interested stakeholder groups. Ensuring informed participation and consultations creating an atmosphere for open dialogue, ensuring the vulnerable are empowered and facilitated to participate and transparency are the principles in the approach to stakeholder engagement.

Key stakeholder considerations, principles and engagement approaches for the Project are outlined in the Project SEP.

5.5 Potential Operational Impacts under Component 2

The potential operational phase impacts, including both positive and negative, are summarized below.

5.5.1 Potential Benefits

Once operational, roads, culverts and causeway upgraded or repaired under the PRIME Project will likely result in the following benefits:

- Road and assets that are more resilient to climatic events by providing a more robust road surface, effective drainage, protection from coastal and river/streambank erosion, realignment away from erosion risk areas, etc.
- Environmental benefits resulting from improved water flow / aquatic habitat from bridge, culvert and causeway improvements.
- Improved connectivity and more reliable access resulting in socio-economic improvements through the ongoing transportation and movement of people and goods.
- Reduction in lost time due to road damage from inclement weather events that affect bridges and culverts through flooding or washout.
- Enhance the safety of road users including pedestrians and cyclists.
- Improve the travel times and comfort of road users.
- Reduced vehicle wear and tear requiring less frequent maintenance.

The Project will therefore benefit both communities and vulnerable groups by way of providing a safer environment for all road users and allow improved and safer access to employment opportunities, markets, and social services. This includes men and women, the young and the old, indigenous and non-indigenous persons within FSM.

Other potential positive impacts following completion of the Project could include improved road side drainage system (e.g., channels and catch pits) conveying stormwater to the adjacent receiving environment and assist with more efficient capture of potential contaminants (such as sediment, litter etc.).

5.5.2 Environmental Impacts

Potential environment impacts include:

- **Water Quality** – There is the potential for the discharge of sediment and contaminants (such as heavy metals, oils and hydrocarbon) from vehicle movements on the completed works infrastructure (e.g. road, bridge, causeway etc). These uncontrolled discharges have the potential to enter surface water drainage channels from runoff over newly created impervious surfaces and migrate towards the adjacent receiving environment. This potential impact can be mitigated in design and is considered minor and to be similar to that which occurs currently.
- **Aquatic Biodiversity and Habitat** – The potential impact of the PRIME Project on aquatic biodiversity once completed primarily include the discharge of contaminants in stormwater runoff from the road surface. This potential impact can be mitigated in design and is considered minor and to be similar to that which occurs currently.
- **Terrestrial Biodiversity and Habitat** – Minor clearance of overhanging vegetation may be required for maintenance purposes for some works and a possibility of roadkill cannot be discounted. However impacts on the integrity of natural habitats are considered very minor and consistent with the current way the existing road network is maintained throughout FSM.
- **Air Quality** – Air quality source emissions during operation will occur from vehicular movements along the road network and are likely to consist of exhaust emissions and dust associated with the road use, etc. The likelihood of nuisance effects are no different to that which occur currently because the works are not anticipated to increase the volume of traffic or the duration of journey time. Dust may be reduced in areas where the road surface is improved.
- **Noise and Vibration** – Vehicle movements across the operational bridges, causeways and roads are likely to result in very little or no increase in noise and vibration from current conditions for adjacent residential properties as no increases in traffic movements are anticipated. Speeds may increase due to safer infrastructure and heavier truck weights may be possible due to the upgraded infrastructure resulting in an associated increase in engine noise. However, the smoother running surface is likely to reduce tire noise. While FSM has no noise standards, any change from current conditions is expected to be minor.

5.5.3 Social Impacts

Potential social impacts include:

- **Pedestrian and Vehicular Traffic** – traffic flow and road safety is expected to be improved during operation. It is expected that similar volumes of traffic will continue

to use the road network (i.e. there is expected to be no appreciable change in traffic volume).

- **Community Health and Safety** – Community safety can be impacted directly and indirectly once the works have been completed, through vehicular and pedestrian accidents resulting in injury (which can be potentially serious).

The potential increase in speed and wider road has the potential to place people, particularly children, using the area at risk. This risk can be minimized through the design and implementation of traffic management systems (speed bumps, pedestrian crossings, signage, central pedestrian islands, etc.) which will assist with restricting speeds restricting vehicle speeds particularly near residential properties. As no increase in vehicle movements are anticipated, the increased potential to place people using the area at risk is no more than minor.

5.6 Cumulative Impacts

Neither construction nor operation of the works likely to be implemented under the PRIME Project are considered to result in trans-boundary or global scale impacts. The works will result in local impacts that will not directly impact other countries outside of the FSM.

Cumulative impacts from the Project will potentially be created by vegetation clearance, contaminants discharges (such as sediment) and social impacts such as changes to ambient air quality and the existing noise environment primarily throughout the construction period.

The Project will not significantly change environmental conditions and result in an overall positive social outcome for local communities provided Good International Industry Practice mitigation measures are implemented.

5.7 Risk Assessment & Impact Identification Methodology

Risk Assessment is routinely undertaken as part of the ESMF process. In assessing a project's environmental risk, impacts are rated to determine the appropriate response or management actions that should be implemented to minimize potential impacts. The risk assessment methodology for the PRIME Project is described in this Section.

The commonly adopted Australasian Standard for Risk Management[10] has been used to determine the level of risk posed by activities associated with the Project based on the likelihood or probability of an event, and the consequences of the impacts of that event occurring (see Table 5-1).

Table 5-1: Qualitative risk analysis matrix

	Consequence				
	1	2	3	4	5
Likelihood	Severe	Major	Moderate	Minor	Negligible
A - Almost Certain	E	E	H	M	M
B – Likely	E	H	H	M	L
C- Possible	H	H	M	M	L
D – Unlikely	H	M	M	L	L
E - Rare	M	M	L	L	L

Risk Map Color Code
E = Extreme
H = High
M = Moderate
L = Low

This conventional risk management framework is considered applicable in the context of this assessment which has a focus on high level identification of biodiversity and ecosystem services and socio-economic risks. The ESMF assessment of risk (as described below) provides detail on these risk areas as appropriate.

Note: this ESMF risk assessment focuses on the specific works level impacts and suitable mitigation measures to reduce these impacts. The WB risk rating process undertaken by WB as part of high level E&S risk screening[11] classifies and screens the Project-level risks in terms of activities to be funded by the PRIME Project.

There are four main levels of risk after combining the 'likelihood' and 'consequences' factors (see Table 5-2 and Table 5-3). Each level has a response or management control action.

The four 'Risk Levels' are:

- Extreme (E) Risk - those impacts that require immediate action at the highest level of management.
- High (H) Risk - those impacts requiring action at senior management level.
- Moderate (M) Risk - those that require policies in place to address impacts and monitoring programs.

[10] AS/NZS ISO 31000:2009. Risk Management – Principles and guidelines.

[11] WB, 2020, 'Federated States of Micronesia Prioritized Road Investment and Management Enhancements Project: Appraisal Environmental and Social Review Summary (ESRS Appraisal Stage)', December 2020.

- Low (L) Risk - those impacts that do not require any specific management actions but may be part of routine management and monitoring plans.

In cases of "E", "H" and "M" Risks, mitigation measures are identified to reduce the level of residual Project risk.

Table 5-2: Qualitative measures of likelihood

Level	Descriptor	Example	Frequency
A	Almost certain	Is expected to occur in most circumstances	> Once per year
B	Likely	Will probably occur in most circumstances	Once per year
C	Possible	Could occur	Once every 5 years
D	Unlikely	Could occur but not expected	May happen within Project life
E	Rare	Occurs in only exceptional circumstances	Not likely to happen within Project life

Source: Modified from Standards Australia/New Zealand 2006

Table 5-3: Qualitative measures of consequence

Level	Descriptor	Environmental / Social Impacts	Public/Media Attention	Financial (USD)
1	Catastrophic	Significant extensive detrimental long term impacts on the environment, community or public health. Catastrophic and/or extensive chronic discharge or persistent hazardous pollutant. Damage to an extensive portion of aquatic ecosystem. Long term impact on water resource	Probable public or media outcry with national/international coverage. Significant green NGO campaign	>$700,000
2	Major	Off-sire release contained with outside assistance. Short to medium term detrimental environmental and social impact off-site or long term environmental damage on-site.	May attract attention of local and state media and local community groups	$350,000 – $700,000
3	Moderate	Onsite release contained with outside assistance. Significant discharge of pollutant possible source of community annoyance. Non-persistent but possible widespread damage to land. Damage that can be remediated without long term loss or very localized persistent damage.	May attract attention of local media heightened by local community	$35,000 – $350,000
4	Minor	On site release immediately contained without outside assistance. Ongoing or repeat exceedances of odor, dust or noise/vibration limits.	Local community attention or repeated complaints	$3,500 – $35,000
5	Insignificant	Negligible environmental impact. Minor transient release of pollutant including odor, dust and noise/vibration. Minor social impact.	Local landowner verbal discussion / complaint	<$3,500

Notes: Financial consequence value converted from AUD to USD (1:1.4)

5.7.1 Outcome of Risk Assessment & Impact Identification

Table 5-4 to Table 5-7 present the results of the assessment of risks associated with the proposed PRIME Project. A summary of key measures to mitigate risk are identified. Key points in relation to any residual 'Extreme' and 'High' Risk Project activities following mitigation are addressed in Section 5.8.

Table 5-4: Outcome of Assessment of Component 1 (Spatial and Sector Planning) and Component 3 (Strengthening the Enabling Environment) Risks.

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
1. Preparation of VA / CRRS							
Lack of or insufficient stakeholder engagement	Local community.	Lack of or insufficient stakeholder engagement where key stakeholders and community have not been meaningfully engaged during the Technical Assistance stage, impacting outcomes of VA / CRRS and resulting in distrust / discontent from stakeholders.	2	A	E	Ensure Stakeholder Engagement Plan (SEP) is implemented to ensure appropriate engagement and input and buy-in from stakeholders.	M
Poor quality environmental and social data	Local community / environment	Poor quality environmental and social data inadequate to inform the assessment, with high level of inaccuracy or gap filling required, leading to either additional investigative studies required or inaccurate conclusions/recommendations from the VA/CRRS.	2	A	E	Environmental and social objectives to be included in Terms of References (ToRs). Design team to be mindful of data sources, limitations and assumptions, and ensure accuracy and adequacy of the data collection process.	M
Initial E&S Screening of sensitive receptors	Local community / environment	Sensitive receptors (cultural heritage, natural or critical habitats) not being adequately screened during Component 1, leading to these sensitivities not being fully understood or identified.	2	A	E	Mitigation of potential impacts on sensitive receptors through screening and design-related avoidance. E&S screening will be undertaken for each works site, to determine assessment pathway, and feed into multicriteria assessment for works prioritization.	M
2. Institutional and regulatory strengthening and capacity building							
Inadequate training of national and state officials	Institutional structures	Training and capacity building undertaken during Component 1 and 3 is not adequate to provide national and state officials to either support the Project, meaningful input the decision-making process, or carry the Project forward through operation, after the external consultants are no longer involved.	3	A	H	Training and capacity building objectives to be included in Terms of References (ToRs), including assessment of current capacities, and upskilling and resourcing requirements and monitoring.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Institutional and regulatory reforms not sufficient	Institutional structures	Inadequate strengthening of institutional structures and regulation leading to lack of communication between institutions and States and an inability to effectively regulate climate change risks on the roading network.	3	A	H	Existing challenges and experiences to be communicated with consultant undertaking Institutional Governance Review, objectives to be included in Terms of References (ToRs). Suitable and realistic timeframes to be incorporated to allow meaningful engagement with all key institutional stakeholders, including workshops.	L

Table 5-5: Outcome of Assessment of Key Feasibility, Design and Pre-Construction Phase Environmental, Social, Health and Safety Risks for Component 2

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
1. Easement agreement (s)							
Easement agreement documentation for existing road easements not available for entire sections of proposed works areas.	Land owners and land users adjacent to works areas.	Risk of land owner/user objection to proposed works	4	B	H	Improvement works for existing roads will be designed through participatory design approach. Affected land owners and community will be consulted from preliminary design stage and provide agreement to works design. Property losses adjacent to roads will be minimized and where unavoidable will be restored through mitigation measures outlined in the Resettlement Framework (RF).	L
2. Ecological biodiversity/habitats							
Road / Bridge / Causeway design	Stream and coastal area biodiversity and habitats	Loss or modification of stream and coastal area biodiversity and habitats	3	A	H	Mitigation of potential impacts on ecological habitat as a result of improvement works to existing roads and structures through screening and design-related avoidance. Biodiversity and natural ecological habitat impacts will be screened and assessed for each works site, if required, site-specific ESMP will be prepared to provide the avoidance and mitigation measures. Design team to have EHS clauses in bid documents and require Contractors Environmental and Social Management Plan (CESMP).	L
3. Cultural heritage							
Road / Bridge / Causeway design	Cultural heritage features and artifacts	Loss or modification of cultural heritage features and artifacts, graves	3	A	H	Mitigation of potential impacts on cultural, archaeological or historically significant sites through screening and design-related avoidance. Cultural heritage and archaeological impacts to be screened and assessed for each works site, and if required a site-specific ESMP is to be prepared to outline specific avoidance and mitigation measures. Design team to have EHS clauses in bid documents and require CESMP from Contractors.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
4. Permanent or temporary asset loss (e.g., land, buildings, fences, crops, etc.)							
Loss of land and non-land assets	Asset owners.	Permanent loss of land or restricted land use due to land access requirements for project works. (Impacts identified through works design and due diligence process in advance of works.)	3	A	H	Avoidance of severe impacts on livelihood or those requiring physical displacement through screening process. Due diligence to assess losses, consultation with affected persons, preparation of resettlement instrument (resettlement plan or voluntary land donation plan).	L
Temporary use of land for laydown area	Asset owners.	Temporary loss of land due to use of land for laydown area.	3	A	H	Identification and use of Government land for laydown areas/ land previously used for similar activities, etc. If required voluntary land donation (VLD) process to be initiated. If no VLD, then rental allowance to be provided. At end of rental period land to be returned in original condition.	M
5. Construction materials (e.g., aggregates) and waste materials generated							
Use of aggregate materials in construction activities.	Environmental risk.	Use of material from non-sustainable sources (i.e., coastal sand and coral reef materials).	1	B	E	Only material from licensed local or international land-based sources (i.e., quarries) to be used (i.e. no coastal sand and coral reef / rock to be used). Where licensed local quarry sites do not meet compliance requirements, they should develop and implement site specific ESMP in line with relevant WBG EHS guidelines for construction material extraction. Design team to have EHS clauses in bid documents and require CESMP from Contractors.	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Waste materials generated during road construction activities.	Disposal of waste materials.	Pollution arising from disposal of waste materials at unlicensed facilities.	2	A	E	Material reused in roading process where possible or disposed of at permitted landfills. Design team to include in bid documents: a. Relevant EHS clauses related to disposal of waste material. B. Requirement for Contractor to prepare CESMP, 'Waste Minimization and Management Plan (WMMP)' and 'Spill Management Plan (SMP)'.	M
6. Coastal margin access							
Loss of access to coastal area.	Land owners, wider community.	Permanent or temporary loss of access to coastal margin due to adjacent works.	3	A	H	Design engineer to identify where coastal margin access restrictions and issues may arise during preliminary design. Avoidance or minimization of access restrictions through participatory design approach, to ensure coastal margin access is maintained during and following construction. Access restriction impacts to be screened and assessed for each works site, and if required a site-specific ESMP is to be prepared to outline specific avoidance and mitigation measures, including consultation with landowners, reinstatement of access etc. Design team to have EHS clauses in bid documents to avoid unnecessary access restrictions or disturbance, and require Contractor to prepare CESMP.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
7. Disruption to usual access							
Replacement of bridges / causeways	Asset users / local community	Permanent or temporary loss of access for users / local community	2	A	E	Design engineer to identify where issue will arise. Site-specific ESMP to be prepared including consultation with landowners, reinstatement of access, etc. Design and construction team to ensure alternative route(s) / crossing (s) are available. Where this is not possible then temporary crossing to be provided. Road access restrictions and disruptions to be screened and assessed for each works site, and if required a site-specific ESMP is to be prepared to outline specific avoidance and mitigation measures, including consultation with landowners, reinstatement of access. Design team to have EHS clauses in bid documents and require Traffic Management Plan (TMP) and CESMP from Contractors.	M
	Adjoining land owners	Temporary restriction on use of adjoining privately owned land adjacent to bridge / causeway alignment	2	A	E	Design engineer to identify where issue will arise. Site-specific ESMP to be prepared including consultation with landowners, reinstatement of access, etc. Use of private/customary land for temporary use to be negotiated between with land owners. At end of rental period land to be returned in original condition. Access restrictions and disruptions to be screened and assessed for each works site, and if required a site-specific ESMP is to be prepared to outline specific avoidance and mitigation measures, including consultation with landowners, reinstatement of access et Design team to have EHS clauses in bid documents and require TMP and CESMP from Contractors.	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
8. Erosion potential of stormwater / diverted surface waters							
Change in waterflow as a result of culvert / bridge installation.	Watercourses and coastal areas.	Changes in erosion potential as a result in changes in water flow.	3	A	H	Design of structures to minimize erosion potential such as concrete side drains / culverts, energy dissipation structures installed. Design team to have EHS clauses related to sediment and erosion procedures in bid documents and require Erosion and Sediment Control Plan (ESCP) from Contractors. Water flow / hydrology impacts to be screening screened and assessed for each works site, and if required a site-specific ESIA and ESMP is to be prepared to outline specific avoidance and mitigation measures, including any appropriate technical studies.	L
9. Surface water quality							
Discharges from operational surfaces.	Surface waters.	New pathways for contaminants, including refuse (e.g. trash, plastic bottles/bags, etc) to enter waterbodies.	3	A	H	Design of features to minimize ingress of stormwater contaminants (e.g., catchpits), and specifications for regular maintenance required. Design team to have EHS clauses related to stormwater contaminants and discharges in bid documents and require ESCP, WMMP and SMP from Contractors.	L
10. Use and Accommodation of Imported Labor (if required)							
Use and accommodation of imported labor.	Local community.	Environmental (increased pressure on existing natural resources) economic and livelihoods (inflationary pressures, exacerbate vulnerability of marginal groups, etc), infrastructure and services pressure, health (potential increases in violence, alcohol/drug consumption, sexually transmitted diseases, etc), and social and community wellbeing.	3	A	H	Identify whether imported labor required. If imported labor required then a Social Interaction Plan (SIP) is to be prepared to include site workers induction, rules regarding alcohol use, interaction with the local community, establish requirement for stakeholder committee/community liaison officer, etc	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
11. Design							
Safety in Design / Road Safety Assessments	Local community	Design not robust enough for local conditions or not international best practice, and does not take into account locally available material.	2	A	E	Design specifications included in design consultant ToRs (stating that design must adhere to appropriate international best practices guidelines for the works). Type and quality of locally available material communicated include in ToRs to inform sound design, or requirement for sourcing suitable material from offshore.	M
Design suitable for climate change adaptation and resilience objectives	Local Community / environment	Design based on inaccurate climate change projects and assumptions, including sea level rise, extreme weather frequency and severity etc, leading to insufficient road drainage resulting in flooding and inundation issues.	2	A	E	Design specifications and objectives included in design consultant ToRs (stating that design must adhere to appropriate international best practices guidelines for the works, and latest internationally accepted climate change projections).	M
Avoiding sensitive receptors (cultural heritage, natural or critical habitats) through design	Local community / environment	Sensitive receptors not being adequately screened, leading to these sensitivities not been fully understood or identified during design phase, resulting in inappropriate design, or unnecessary impacts.	2	A	E	Mitigation of potential impacts on sensitive receptors through screening and design-related avoidance (e.g. participatory design approach'). Sensitive receptors will be screened and assessed for each works site, if required, site-specific ESMP will be prepared to provide the avoidance and mitigation measures.	M
Design for transport noise during operation, including integration of suitable mitigation measures, if needed.	Local community	Design does not adequately account for transport noise impacts on sensitive receptors during operation, such as noise from increased speeds.	3	A	H	Design specifications to include traffic calming devices in villages and barriers on corners, speed signs etc, particularly in the vicinity of sensitive receptors.	L

Table 5-6: Outcome of Assessment of Key Construction Phase Environmental, Social, Health and Safety Risks for Component 2 Physical Works

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
1. Air Quality / Dust							
Generation of dust as a result of construction activities in PRIME Project works locations including laydown areas	Soil disturbance, road surface removal, spillage from trucks transporting material	Dust creating nuisance (and potential health issues) where road works occur in close proximity to adjacent residential / commercial properties.	4	B	M	Construction vehicles shall be regularly serviced and maintained to prevent the emission of visible particulates. The number and size of stockpiles shall be minimized, and have appropriate containment to prevent dust discharges. Dust suppression (i.e. a water cart, or similar) shall be used to dampen active work areas and stockpiles in dry conditions. Washing vehicle tyres and sweeping the road on a daily basis to prevent the spread of soil and dust outside of the works area. Banning fires on site.	L
2. Noise & vibration							
Construction activity creating noise and / or vibration disturbance in PRIME Project works locations including laydown areas	Local community	Noise and / or vibration disturbance to adjacent households where road works occur in close proximity	3	A	H	The Contractor shall ensure noise attenuation is in accordance with the WHO and WB EHS guidelines. Consultation and engagement so people are fully informed and can make alternative arrangements for work or accommodation during works, in accordance with SEP. Strict adherence to State working hour requirements. Regularly maintenance of machinery, equipment and vehicles to ensure noise reduction e.g. mufflers, use of air brakes, etc. Reduced speed limits. Monitor and investigate complaints through GM, and consider noise barriers where appropriate. Contractor to identify structures within zone of vibration impact, and assess condition of structure. Noise monitoring at site and sensitive receptors.	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
	Contractors	Noise/ vibration impacts on health of workers	3	A	H	Contractor to ensure adherence to OHSP. Workers provided with PPE including ear protection. Regularly maintenance of machinery, equipment and vehicles.	L
3. Surface Water Quality							
Construction activities in PRIME Project works locations e.g., road / culverts / bridges / causeways.	Changes in water quality in adjacent receiving environment, including surface water and ground water aquifers.	Ground disturbance leading to runoff of contaminants (e.g., sediment, hydrocarbons, cement, etc) in stormwater and changes in water quality of adjacent receiving environment.	3	A	H	Contractor to prepare and implement ESCP detailing procedures to ensure ground disturbance in minimized, and measures to control offsite movement of disturbed sediments hazardous substance and other discharges, effective stormwater control, slop excavation, in-stream works and monitoring requirements.	L
		Ingress of contaminants (such as hydrocarbons) due to spillage in laydown areas, refueling activities entering groundwater.	3	A	H	Contractor to prepare and implement a SMP, detailing procedures to minimize release of contaminants such as fuels stored in bunded areas, refueling activities on hardstand areas etc. Additional controls for hazardous substances including oils and hydrocarbons are provided below.	L
		Loss and/or discharge of hazardous material into the aquatic and/or terrestrial receiving environment, or groundwater aquifer.	3	A	H	Storage of all hazardous substances and chemicals (including fuel) and refueling is to occur at least 50 m away from watercourses. Conduct daily inspections of machinery with particular attention to repair of hydraulic and fuel systems to prevent leakage. Careful handling of unhydrated cement material and wet cement and fuel to avoid spills. The Contractor shall have spill kits available and staff be trained in their use. Immediate notification of PIU in case of any fuel or chemical spill, to report the incident and should be reported to the EPA/KIRMA within 24 hours.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
4. Aquatic Ecological Resources							
Construction activities in PRIME Project works locations adjacent to culverts/bridges/causeway	Aquatic (i.e., freshwater fish, habitat) & coastal marine resources (fish, coral reef habitat, seagrass beds, etc)	Ground disturbance leading to runoff of contaminants (e.g., soils, hydrocarbons, cement, etc) in stormwater and deposition on downstream sensitive ecological environment. Direct loss of habitat and/or resources in footprint of bridges / causeway. Loss of endemic and/or protected species.	3	A	H	In addition to the mitigation proposed for water quality, mitigation measures are to include identifying and plugging all discharge points, ensure upstream and owns fish migration is not impeded, and design crossings (including bridges, culverts and causeways) to avoid disturbance of sensitive habitat (e.g. mangroves, sea grass etc) where possible. Where it is not possible a planting regime is to be implemented to restore the lost habitat.	L
5. Terrestrial / Riparian Ecological Resources							
Construction activities in PRIME Project works locations including laydown areas.	Sensitive terrestrial fauna / fauna particularly in sensitive ecological areas.	Direct loss of habitat in construction footprint or disturbance of terrestrial fauna and fauna	3	A	H	Contractor to implement site-specific ESMP detailing procedures to minimize footprint and disturbance of terrestrial fauna and fauna particularly in sensitive ecological areas.	L
Invasive species.	Terrestrial fauna / fauna.	Introduction of invasive aquatic and / or terrestrial pest / weed species as a result of construction activities.	4	B	M	Imported aggregates to be sourced from weed free locations. Washing of vehicles Exposed soil to be reseeded and revegetated.	L
6. Waste Management and Construction Material							
Disposal of solid or liquid waste.	Environment.	Uncontrolled disposal of solid or liquid waste material into the aquatic and / or terrestrial receiving environment.	3	A	H	The Contractor to prepare a Waste Minimization and Management Plan (WMMP), to cover all aspects of general waste generation, storage, disposal and reuse. Workers to have access to rubbish receptacles, which allow for the collection and segregation of wastes. Solid wastes to be collected and disposed of at an appropriately licensed disposal facility. Paper, bottles and cans shall be transported to local recycling facilities, if available.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Use of aggregate materials in construction activities.	Environmental risk	Use of material from non-sustainable sources (i.e., coastal sand and coral reef materials).	1	B	E	Only material from licensed local or international land-based sources (i.e., quarries) to be used (i.e. no coastal sand and coral reef / rock to be used). Where licensed local quarry sites do not meet compliance requirements, they should develop and implement site specific ESMP in line with relevant WBG EHS guidelines for construction material extraction. The Contractor shall provide a record of the quarry license approval from aggregate suppliers (i.e. issued by EPA/KIRMA) prior to start of construction.	M
Waste materials generated during road construction activities.	Disposal of waste materials	Pollution arising from disposal of waste materials at unlicensed facilities.	2	A	E	The Contractor shall prepare a WMMP, to cover all aspects of construction waste generation, storage, disposal and reuse. Road material that cannot be reused shall be transported and/or stockpiled off-site for use on unsealed roads, or disposed of at an appropriately licensed disposal facility.	M
7. Land and Access Restrictions							
Permanent loss of land and non-land assets.	Land and asset owners and users	Permanent loss of land or assets, or restricted land use due to land access requirements for project works.	3	A	H	Implementation of any construction related measures set out in the land access procedures (e.g. Land Access Due Diligence report, Voluntary Land Donation report or Resettlement Plan), including consultation requirements set out in the RF and SEP. Contractor is to consult with the owners of the assets that require relocation in order to determine the most appropriate re-siting the affected infrastructures, and undertake relocation where appropriate. Should unexpected impacts occur to land or assets as a result of construction activities, community grievances are to be addressed through the Grievance Mechanism.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Temporary loss of land and/or permanent loss of non-land assets such as crops, fences, ornamental gardens, etc in road alignment, laydown areas or temporary diversion roads.	Asset owners	Impacts due to construction affecting private property or restricting access. (Impacts that fall under construction method for which the contractor is responsible for determining)	3	A	H	Land required for construction facilities is to be secured by the Contractor as required, via VLD if suitable. If no VLD then lease agreement is to be negotiated and agreed between the civil works Contractor and the land owner prior to mobilization, and rental allowance to be provided if appropriate (in accordance with RF). At end of rental period, any temporarily acquired land is to be rehabilitated to a pre-works condition or in a condition acceptable to the land owner. Should unexpected impacts occur to land or assets as a result of construction activities, community grievances are to be addressed through the GM.	L
Disruption of road access for users due to crossing works (e.g. replacement of bridges / culverts / causeways.	Road users	Permanent or temporary loss or restriction of access for road users / local community.	3	A	H	Contractor to maintain road access throughout construction (i.e. alternative route(s) / crossing(s) are made available). The local community is to be informed of the upcoming works (including maps, dates and times of operation) through letter drops to all adjacent properties, and the installation of signage (as per SEP). TMP to be implemented and adhered to throughout construction. Any road user complaints to be to be addressed through the GM and complaints register.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Disruption of access to adjoining properties due to works.	Residential and commercial properties, and other land owners	Temporary restriction on access to, or use of, adjoining privately owned land adjacent to works.	3	A	H	Contractor to maintain access to adjoining properties throughout construction. Vehicular and pedestrian access to adjacent properties and adjoining roads shall be maintained throughout construction except for essential works where temporary closure shall be minimized. Any road closures are to be undertaken and managed in accordance with the DoTC&I standard practices. TMP to be implemented and complaints addressed through the GM.	M
Disruption to Existing Services	Utility Providers / local community	Disturbance of underground or overhead utility infrastructure resulting in a disruption of services.	3	A	H	Contractor to engage with service providers prior to works commencing to confirm the likely presence and locations of services and develop a plan for minimizing disruption of any services. The Contractor shall be liable for any services disrupted as a result of the construction works.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
8. Traffic Safety							
Movement of construction vehicles	Local Community / Contractors / Pedestrian & Vehicular Traffic	Potential human hazards due to movement of vehicles and machinery on all roads and potential for increase accident risk around work areas. These risks could include increased traffic congestion, risk of traffic incidents, and general road safety issues (such as road crossing by pedestrians), Disruption of key transportation networks (i.e. replacement of bridge or causeway) could pose significant delays in journey times and overall inconvenience to road users.	1	B	E	Contractor to implement TMP in consultation with DoTC&I and State representative agencies, which will include as a minimum: • Controlled crossing points for local community; • Construction activities to be restricted to relevant State working hour requirements; • Regular consultation with roadside residents as per the SEP; • Implementation of strict speed limits in settlement areas; • Project vehicles to be equipped with warning lights to ensure high visibility to other road users; • Traffic control supervisor to be used; • Alternative routes and/or temporary crossings to be identified; • Strong enforcement of Project regulations regarding drug and alcohol use and levels of fatigue; and • Implementation of GM during the Project to ensure community concerns or issues are addressed. Contractor to communicate TMP to local community as described in the Stakeholder Engagement Plan (SEP) and works specific ESMP's.	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
9. Use and Accommodation of Imported Labor (if required)							
Use and accommodation of imported labor	Local community	Environmental (increased pressure on existing natural resources) economic and livelihoods (inflationary pressures, exacerbate vulnerability of marginal groups, etc.), infrastructure and services pressure, health (potential increases in violence, alcohol/drug consumption, sexually transmitted diseases, etc.), and social and community wellbeing	3	A	H	Establish/form stakeholder committee(s), where future work plans, site requirements, labor and material requirements and problems are discussed, in order to prioritize employment of locals, where appropriate. Implement Social Interaction Plan (SIP), including undertaking weekly toolbox meetings with all site workers on culture, tradition, custom and expectations of local communities. Transparency and open communication with the communities on issues that affect them. Any imported labor related issues to be addressed through the GM and complaints register.	M
10. Labor Management							
Use of underage people	Contracted workers	Use of people under the age of 18 in hazardous Project activities.	3	A	H	Contractor agrees to contract provisions that require no people under the age of 18 are to be employed in hazardous activities. Implementation of the Project Labor Management Procedures (LMP).	L
Forced labor	Contracted workers	Use of forced labor on the Project.	3	A	H	Contractors confirm that they are not using forced labor. Where employment occurs directly with Government, employees are not considered forced by virtue of the fact as they have signed a contract. Implementation of the Project Labor Management Procedures (LMP).	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
11. Cultural Heritage / Archaeology							
Sites, features or artifacts of cultural, archaeological or historical significance.	Cultural heritage	Physical disturbance of cultural, archaeological or historically significant sites (e.g. grave sites, historical artifacts etc) due to proposed construction activities.	3	A	H	Sites in close proximity to the works are to be mapped and communicated to the Contractor workers to minimize risk of disturbance. Should sites of cultural, archaeological or historical significance be deemed at risk of indirect disturbance as a result of Project activities, the CIU is to develop strategies to protect these sites in consultation with the local community and the relevant State Government department. A chance find procedure is to be implemented should physical cultural resources be uncovered during construction.	L
12. Health and Safety							
Worker Health & Safety	Construction workforce	Potential injury to workers as a result of construction activities.	3	A	H	Contractor to comply with the FSM Labor Code, an inform all employees of their rights. Contractor to prepare and implement an OHSP which is to be approved in writing by the PIU prior to commencing works, and train workers in its content. Contractor to conduct training for all workers on the OHSP and health and safety matters as required by good engineering practice. Workers to be provided with appropriate PPE suitable for civil work such as safety boots, helmets, gloves, protective clothes, goggles and ear muffs for protection (as appropriate) at no cost to the workers. Contractor to provide potable water supplies, first aid facilities, a toilet and hand washing facilities at works sites. All workers required to sign a Code of Conduct (CoC) which outlines acceptable behavior for the workers and their role, including reference to GBV, SEA/SH.	M

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation Summary	Post-Mitigation Residual Impact
			C	L	Rating		
Community Health & Safety	Local community	Potential issues arising to local community as a result of construction activities in the vicinity of the works sites, including risks associated with imported labor.	3	A	H	Contractor to consult with adjacent landowners prior to commencement of work on site, as directed by the SEP. Temporary signage and boundary fences are to be used to deter pedestrian access into construction areas, and inform the community of works activities, timing and the GM process. Contractor OHSP to include the requirement to educate all site staff on the prevention and treatment of communicable diseases including filariasis, dengue, zika, hepatitis, HIV/AIDS and Covid-19. The Contractor and all workers (including imported labor) associated with the Project are to comply to FSM national and State Covid-19 health and safety management plans, and international WHO standards, and include Covid-19 provision in the OHSP. All contractor site staff required to sign a Code of Conduct (CoC), as well as prepare a GBV Action Plan which outlines acceptable behavior for the workers and their role, including reference to GBV, SEA/SH.	M

Table 5-7: Outcome of Assessment of Key Operational Phase Risks Component 2 Physical Works

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation	Post-Mitigation Residual Impact
			C	L	Rating		
1. Surface and Groundwater Quality							
Discharges from operational surfaces	Surface waters and groundwater aquifers	Introduction of road activity contaminants from operational surfaces New pathways for contaminants, including refuse (e.g. trash, plastic bottles/bags, etc) to enter waterbodies.	3	A	H	Regularly maintain and clear drainage channels, culverts and stormwater control features installed as part of construction phase (e.g. catchpits), to prolong life of infrastructure.	L
2. Flooding							
Road flooding	Road users and property owners	Overflow of drainage systems due to poor maintenance affecting road users and property owners.	3	A	H	Regularly maintain and clear drainage channels, culverts and stormwater control features installed as part of construction phase (e.g. catchpits), to reduce the potential for site inundation (i.e. flooding) during extreme weather events, and prolong life of infrastructure.	L
3. Road Integrity							
Road Integrity	Erosion	Compromised road integrity due to water movement creating erosion issues as a result of upgrades / sealing of roads.	3	A	H	Regularly maintain and clear drainage channels, culverts and stormwater control features installed as part of construction phase (e.g. catchpits), to reduce the potential for site inundation (i.e. flooding) during extreme weather events, and minimize erosion risk.	L
4. Health and Safety							
Road Safety	Road users and local community	Increase in accidents relating to increased speeds on roads.	3	A	H	Evaluate potential for installation of traffic calming devices in villages and barriers on corners, speed signs, etc Consult with Police to enforce speed limits.	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation	Post-Mitigation Residual Impact
			C	L	Rating		
Transport noise during operation.	Local community	Increase of traffic noise from increased speeds on roads.	3	A	H	Evaluate potential for installation of traffic calming devices in villages and barriers on corners, speed signs, etc Consult with Police to enforce speed limits.	L

5.8 Residual "High Risk" Matters

5.8.1 Introduction

All of the "Extreme", "High" and "Medium" Risk matters identified in Section 5.7 of this ESMF can be resolved to a "Low" or "Medium" Risk category by application of Good International Industry Practice mitigation measures.

5.9 Environmental and Social Sensitivities Maps

To assist with identifying potential areas where impacts on environmental and social values may arise from the PRIME Project, data from primary (field investigations) and secondary sources (primarily GIS data) for a range of parameters including hazards (erosion and flooding), sensitive receptors and identified road corridor assets (described in Section 4.3) have been mapped (see Figure 5-1 to Figure 5-4). The information used in these maps is provided in Appendix B.

Identifying areas of environmental and social risk assists with the early screening of areas of potential concern from an environmental and social perspective. Based on key attributes outlined in Table 5-7, an assessment of level of sensitivity for each state has been undertaken (Table 5-8 to Table 5-11).

Figure 5-1 to Figure 5-4 identify areas considered to be of 'Medium' or 'High' environmental and social sensitivity depending on the nature of the works proposed. Note these locations are considered indicative only and require further investigation.

Where areas are identified as 'High' sensitivity, engineering design may be required (where appropriate) to avoid or minimize potential impacts. Potential impacts in relation to 'Medium' sensitivity areas can be managed through implementation of mitigation measures.

Table 5-8: Key environmental and social attributes enabling assessment of level of sensitivity

Sensitivities	High	Medium
a. Higher density of important assets (e.g. residential houses, businesses, fences walls, fruit trees, etc) located in road easement; b. Watercourse / culvert upstream of biologically significant CMA area; c. Erosion / flood risk hazard zone; d. Populated area	2 or 3 of the 4 attributes required	1 of the 4 attributes required
Notes:	*Further investigation required to confirm potential impacts. Risks to be aware of rather than necessary limit works from proceeding.*	*Impacts can be managed through suitable engineering design.*

Table 5-9: 'High' sensitivity areas - Kosrae

Box No.	E&S Sensitivity
1, 9, 10	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets
2, 3	Watercourse / culvert / bridge upstream or in biologically significant area; Important assets
3	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone;
4	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Populated area
5, 6, 7, 8	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets; Populated area
11	Erosion / flood risk hazard zone; Important assets; Populated area

Table 5-10: 'High' sensitivity areas - Pohnpei

Box No.	E&S Sensitivity
1, 11, 16	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets
2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 19	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone
11,	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets
13	Erosion / flood risk hazard zone; Important assets
16	Watercourse / culvert / bridge upstream or in biologically significant area; Important assets

Table 5-11: 'High' sensitivity areas - Chuuk

Box No.	E&S Sensitivity
1, 2, 3, 4, 5	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets
5, 6	Erosion / flood risk hazard zone; Important assets

Table 5-12: 'High' sensitivity areas - Yap

Box No.	E&S Sensitivity
1 - 8	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone
9	Watercourse / culvert / bridge upstream or in biologically significant area; Erosion / flood risk hazard zone; Important assets

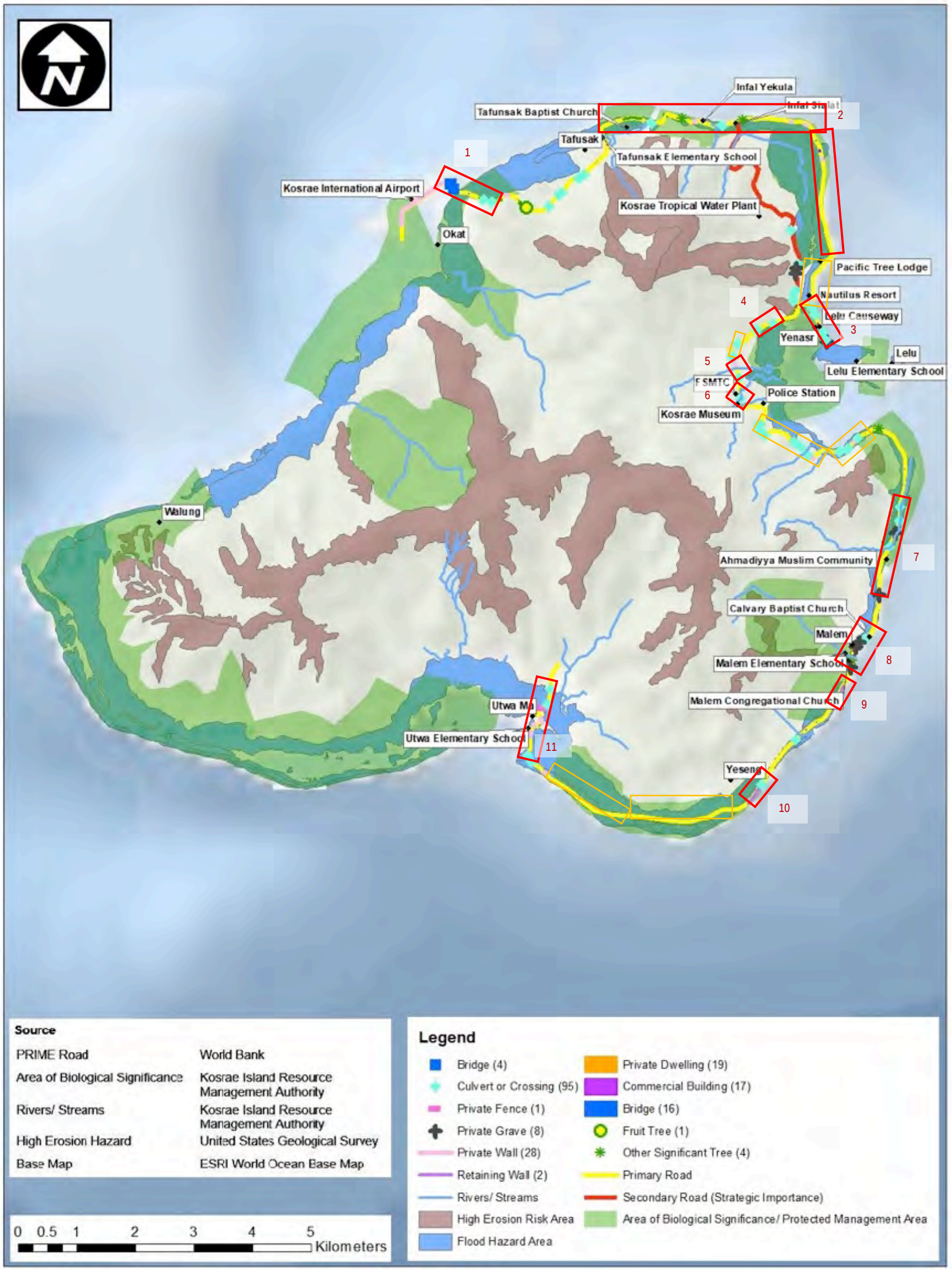

Figure 5-1: Key E&S sensitivities on Primary Road network – Kosrae (showing 'high' (red box) and 'medium' (orange box) sensitivities)

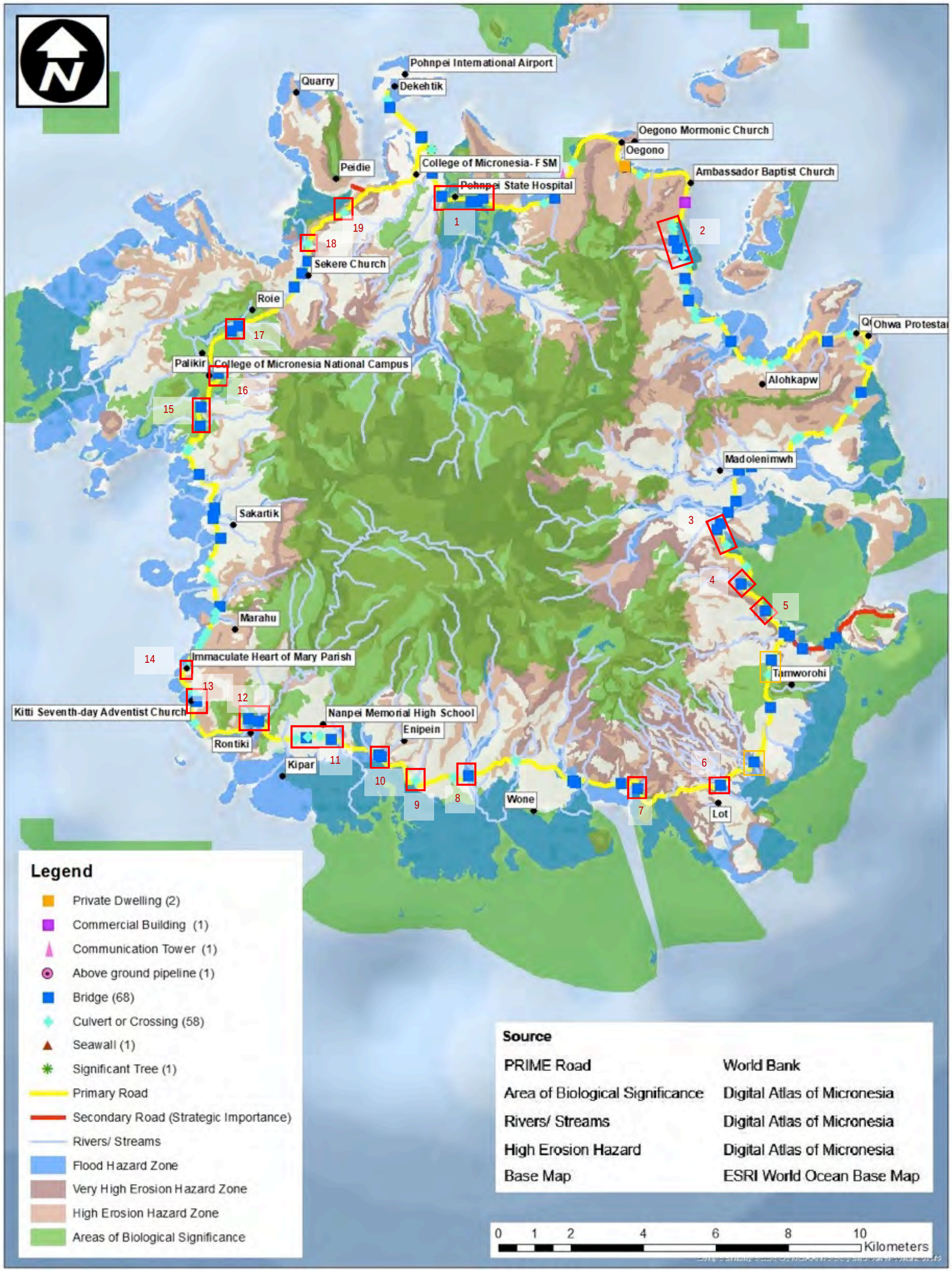

Figure 5-2: Key E&S sensitivities on Primary Road network – Pohnpei (showing 'high' (red box) and 'medium' (orange box) sensitivities).

Figure 5-3: Key E&S sensitivities on Primary Road network – Chuuk (showing 'high' (red box) and 'medium' (orange box) sensitivities).

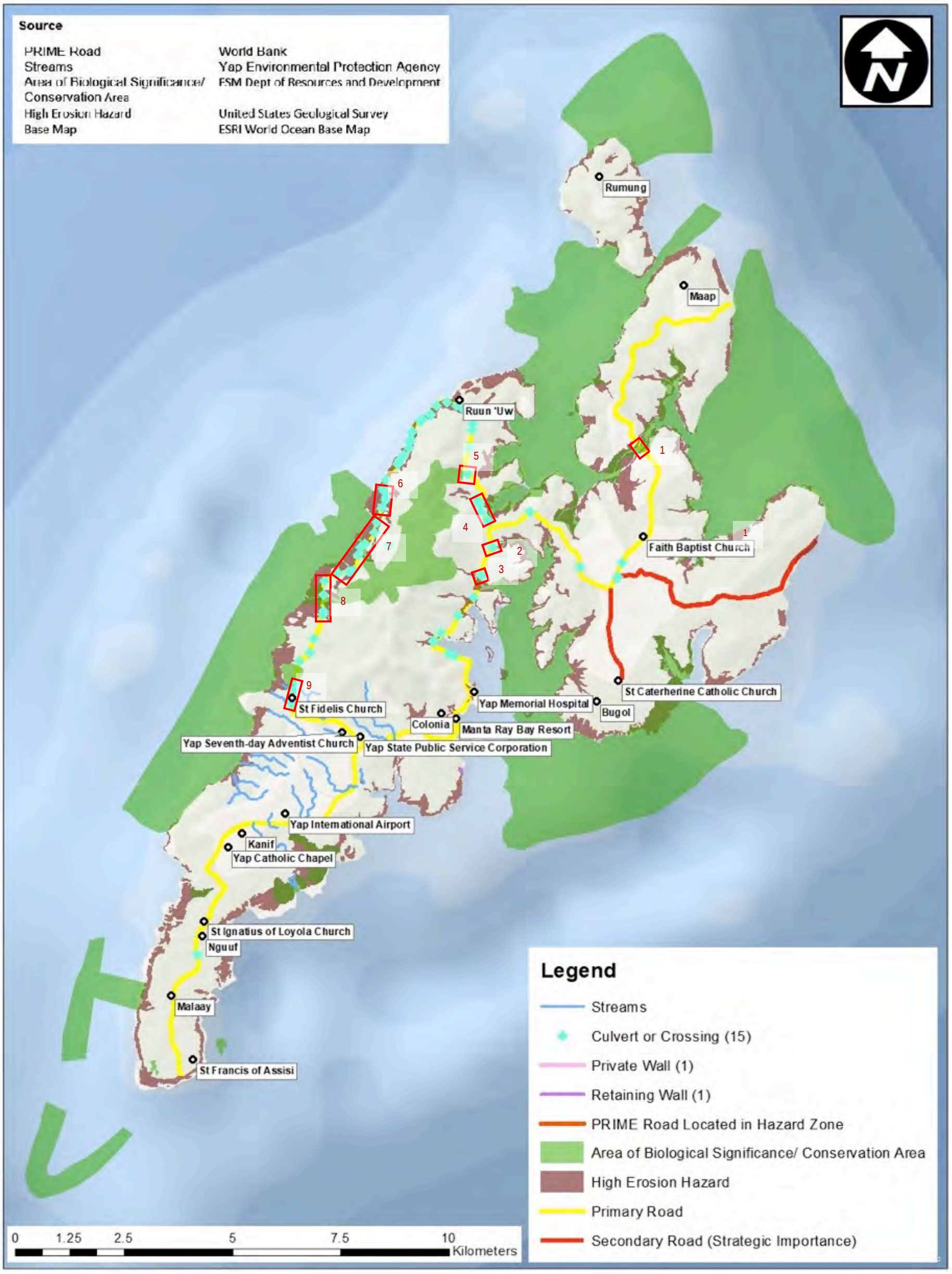

Figure 5-4: Key E&S sensitivities on Primary Road network – Yap (showing 'high' (red box) and 'medium' (orange box) sensitivities).

6. Risk Management Procedures for Component 2 Works

6.1 Environmental and Social Risk Screening

Once the climate resilient road works have been identified and prioritized for FSM as part of the VA and CRRS studies, two rounds of environmental and social screening are to be undertaken by the CIU Safeguard Team (supported by environmental and social consultants engaged by the PIU, as required) as part of the feasibility and design process for Component 2 works. This screening process is to outlined below:

1) **Initial E&S Risk Screening (activity selection / prioritization under PRIME)** - an '*Initial E&S Screening Form'* (Appendix C, Form 1) is to be completed which identifies potential high-level environmental and social risks and impacts of the proposed works and any critical risks that could prevent the identified works from being implemented under the PRIME Project.

2) **Detailed E&S Screening (during preliminary design)** – preparation of an '*E&S Screening Report*' after the works are further defined as part of the preliminary design process to feed into the design and impact mitigation process. This report is to include:

    a. An outline of the Project environmental and social risk screening process;

    b. Completed '*Environmental and Social Screening Forms*' (Appendix C, Forms 2 to 4);

    c. A summary of the works E&S Screening (as directed by the Appendix C, Form 2);

    d. A summary of the findings of the screening process, (as directed by the Appendix C, Form 3 – E&S Assessment and Management Plan Requirements; and Form 4 – Agreed E&S Documents); and

    e. Recommendations for the environmental and social assessment and preparation of environmental and social risk management instruments.

On the basis of the environmental and social screening, the Project will adopt one of the following approaches:

3) **Further redesign of the works** to avoid/minimize environmental and social impacts including potential land and/or asset loss where practical (in which case the *E&S Screening Report* will need to be prepared again, after completion of the redesign). The design team, PIU, environmental and social consultants and CIU Safeguards Team are to work together to identify risks and mitigation measures in design in compliance with the WB ESS, ESMF, EHS Guidelines and Good International Industry Practice.

4) **Implementation of the Generic Environmental and Social Management Plan (Generic ESMP)** in the event of low risk environmental and social impacts with works largely contained within the existing road easement.

5) **Preparation of a works specific Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP)**

if moderate, high or extreme environmental and social impacts are expected from Component 2 works including impacts that may extend a significantly beyond the road easement and / or where works impacts are not suitably captured as part of the Generic ESMP. This is to be undertaken in parallel with detailed design.

The E&S screening process in relation to the ESMF is illustrated in the flow chart in Figure 6-1). The scope of these documents is outlined in Section 6.2 below.

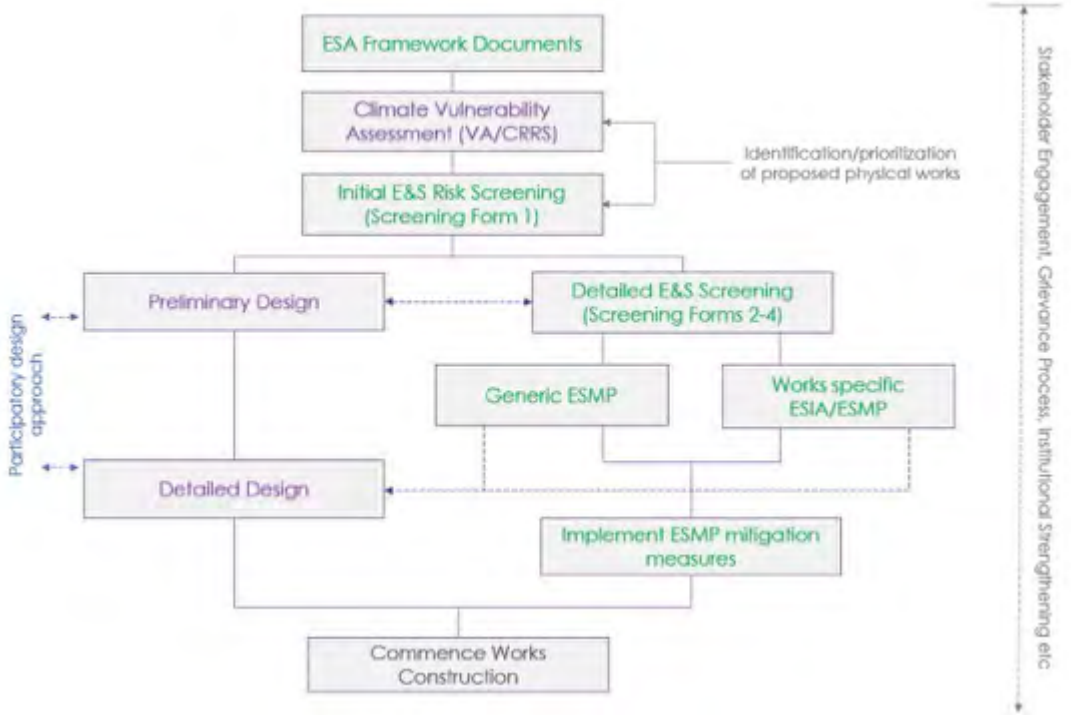

Figure 6-1: E&S screening process in relation to the ESMF.

The PRIME Project will also emphasis a 'participatory design approach' whereby the design of road improvements will prioritize works within the corridors of existing primary roads and minimize avoidable environmental and social impacts such as loss of private property, where technically feasible. This approach will provide potentially affected persons and communities and stakeholders an opportunity to participate in the decisions related to the design of road improvements that affect them (discussed further in the RF).

The *E&S Screening Report* will be prepared by the CIU Safeguards Team (supported by environmental and social consultants engaged by the PIU, as required) and submitted together with the feasibility study report to the WB for review and clearance.

6.2 Preparation of ESIA/ESMPs

6.2.1 Generic ESMP

A Generic ESMP will be prepared in advance of the Component 1 Technical Assistance, including VA/CRRS studies. Once the VA/CRRS studies have been completed and the proposed works have been confirmed this Generic ESMP may require revision to ensure any physical climate resilience road works not initially envisioned under Component 2 are taken into account.

The Generic ESMP is to be used in the event of low risk environmental and social impacts with works largely contained within the existing road easement (such as road resurfacing, drainage improvements, installation of culverts, slope protection etc), and in locations without high E&S sensitivities identified in Section 5.9.

Given the majority of PRIME Component 2 works are expected to result in low risk and easily managed environmental and social impacts and be within the existing road easement, the Generic ESMP is expected to be suitable for the many of Component 2 works.

If moderate, high or extreme potential impacts are identified during E&S screening then a works specific ESIA/ESMP will be required. The triggers for requiring a works specific ESIA/ESMP are set out in the *Environmental and Social Screening Forms* (provided in Appendix C).

6.2.2 Works Specific ESIA and ESMP

In the event that potential works impacts are extensive and/or extend beyond the road easement, and/or have longer lasting impacts if not adequately managed, a works specific ESIA and ESMP is to be prepared. These are categorized as moderate, high or extreme using the risk tables in Section 5.8.

Depending on the nature and scale of Component 2 works proposed, it may be necessary for an ESIA to be prepared, to adequately develop appropriate mitigation measures for the potential works impacts, including the potential preparation of additional technical studies in order to inform the impact assessment. The exact scope of the ESIA will depend on the nature and extent of potential impacts.

An example of this could be improvements to Lelu Causeway in Kosrae which has been identified as one of the 'urgent works' under Component 2a. Due to the causeway being the only practical access to Lelu township and potential for more moderate impacts on the coastal and marine environment if works are not undertaken in an appropriate manner, initial E&S screening indicates that these works are likely to require a specific ESIA and ESMP in order to fully understand the baseline environment, potential risks and impacts, and mitigate these impacts (depending on the proposed nature of causeway improvement works to be undertaken).

Should the E&S screening determine that an ESIA is required for the Component 2 works then it should adhere to the indicative outline included in ESS1 – Annex 1.D as well as in compliance with FSM National and State Environmental Legislation and Regulations. As a minimum the ESIA should include the following key elements:

(i) Executive Summary;

(ii) Description of the road works;

(iii) Baseline Data;

(iv) Environmental and Social Risks and Impacts;

(v) ESMP including Mitigation and Monitoring Measures; and

(vi) Analysis of Alternatives.

Additionally, the works specific ESMP is to be broadly consistent with the structure of the Generic ESMP, where relevant, and include as a minimum:

(i) Mitigation Measures;

(ii) Monitoring Requirements;

(iii) Capacity Building and Training;

(iv) Implementation Schedule and Cost Estimates; and

(v) Integration of the ESMP with other Project documents and Plans

Should a works specific ESIA/ESMP be required, the PIU may need to engage an external E&S consultant to prepare these documents on its behalf and overseen by the CIU Safeguards Team.

The works specific ESIA/ESMP should also be prepared alongside, and integrated with, the design process, participatory design approaches, stakeholder engagement, and any Land Access Procedures Plan/s required (such as the Land Access Due Diligence Report, Voluntary Land Donation Report or Resettlement Plan), as set out in the RF, as required on a works specific basis.

In order to achieve the best outcome, the ESMP will need to be prepared in an integrated way with the design consultant and with land access agreements. This would need to be an iterative process where the ESMP informs design occurring concurrently with the design process.

6.3 Civil Works Contractor Requirements

6.3.1 Environmental, Social, Health and Safety Clauses in Bid Documentation

Environmental and social, health and safety clauses are to be incorporated in DoTC&I bid documents for contracted works. Works-specific mitigation to be inserted in the bid documents will be outlined in the Generic ESMP.

The CIU Safeguards Team will be responsible for the oversight of the environmental, social, health and safety activities of the Contractor will review draft bid documents and will conduct periodic on-site visits to monitor and supervise progress.

6.3.2 Contractor Environmental and Social Management Plans

In addition to the ESMPs (discussed in Section 6.2) the following management plans will be required by the Contractor in a Contractor Environmental and Social Management Plan (CESMP) prior to the commencement of construction. They should be prepared based on the nature and scale of risks identified in the scope of works.

These plans are to be approved by the PIU and CIU, and appended to the Contractors ESMP (CESMP). A recommended list of these management plans is provided in Table 6-1. Should a site specific ESMP be required for the works additional management plans may be identified for the Contractor to prepare and implement.

An outline of these plans will be included in the Generic ESMP to guide the Contractor in the development of these plans.

Table 6-1: Examples of sub-plans to the Contractor Environmental and Social Management Plan

Management Plan	Responsibility	Approving Organisation
Contractors ESMP (CESMP)	Contractor	PIU and CIU Safeguards Team
Erosion and Sediment Control Plan (ESCP)	Contractor	PIU & CIU Safeguards Team
Surface Water and Groundwater Management Plan (SWGMP)	Contractor	PIU & CIU Safeguards Team
Pollution Prevention and Control Plan (PPCP)	Contractor	PIU & CIU Safeguards Team
Waste Minimization and Management Plan (WMMP)	Contractor	PIU & CIU Safeguards Team
Spill Management Plan (SMP)	Contractor	PIU & CIU Safeguards Team
Traffic Management Plan (TMP)	Contractor	DoTC&I, PIU & CIU Safeguards Team
Road Safety Management Plan (RSMP)	Contractor	DoTC&I, PIU & CIU Safeguards Team
Social Interaction Plan (SIP)	Contractor	PIU & CIU Safeguards Team
Quarry EHS Management Plan #	Contractor	PIU & CIU Safeguards Team
Community Health and Safety Plan (CHSP)	Contractor	PIU & CIU Safeguards Team
Occupational Health and Safety Plan (OHSP)	Contractor	PIU & CIU Safeguards Team
Gender Based Violence Action Plan (GBVAP)	Contractor	PIU & CIU Safeguards Team
Emergency Management and Response Plan (EMRP)	Contractor	PIU & CIU Safeguards Team
Subcontractor Management Plan	Contractor	PIU & CIU Safeguards Team
Environmental Monitoring Plan	Contractor	PIU & CIU Safeguards Team

in the event that Contractor needs to develop a quarry due to local licensed quarry sites not meeting Project, or local compliance requirements.

6.4 Implementation of ESMP and CESMP

The design engineers, DoTC&I and other implementing agencies are to implement the relevant sections of the ESMP during feasibility, design, project prioritization, land owner negotiations and other activities. Supervision of the implementation of the ESMP and CESMP by the Contractor will be carried out by the PIU with training, oversight and auditing by CIU Safeguards Team.

6.5 Risk Management for Technical Advisory Activities

The process for screening and assessing environmental and social risks is as follows:

1. CIU Safeguards Team reviews all TOR and provides the required clauses or scope of work for the TA to comply with the WB ESS, the PRIME ESMF, RF, SEP, LMP and all other instruments.

2. CIU Safeguards Team assists in the evaluation of consultants or contractors for TA that includes E&S risk assessment or mitigation, to ensure that the team/individual has the correct skills and experience.

3. CIU Safeguards Team reviews draft and final technical outputs against the ESS, the PRIME ESMF, RF, SEP, LMP and all other instruments and make any recommendations to the PIU for improvements or changes.

7. Stakeholder Engagement, Consultation and Participation

Stakeholder engagement will be undertaken throughout the PRIME Project including planning and design, construction and post construction phases (i.e. operation) for all specific Component 2 works to be implemented under the PRIME Project and for all technical advisory activities under Component's 1 and 3 where relevant.

The stakeholder engagement process for the broader PRIME Project is described in detail in the SEP[12] including stakeholder engagement undertaken to date a part of Project preparation and those required throughout the PRIME Project.

Set out below is a summary of key considerations regarding stakeholder engagement relevant to the ESMF.

A wide range of stakeholders have been identified for consideration throughout the Project (outlined in the SEP).

Each Component 2 works will have a discrete list of stakeholders identified and engaged with:

- Land Owners and Occupiers – called Project Affects Persons (PAPs) under ESS5.
- Local Communities (including nearby or indirectly affected villages, community interest groups, road users etc).
- Relevant Municipal and State Government departments and agencies.
- Traditional / community leaders.
- Others (including NGOs, CBOs, businesses, utility providers etc).

A variety of mechanisms will be utilized to consult with the identified stakeholders during implementation of the ESMF including:

(i) Village meetings involving women, men and youth from communities;

(ii) Separate meetings with specific interest groups and their representatives as required (including women, youth, senior, religious, vulnerable households, conservation groups, NGO/CBOs);

(iii) Key informant interviews with relevant government staff (e.g. EPA/KIRMA) and community/traditional leaders;

(iv) Environmental NGOs and community groups interested in environmental and matters; and

(v) Informal conversations with passers-by, transport users and other interested parties near the works site.

To ensure broader participation consultations are to be undertaken at venues, times and in language that do not disadvantage any particular groups (e.g. women, or vulnerable households).

[12] DoTC&I, 2020, 'Prioritized Road Investment and Management Enhancements (PRIME) Project, FSM: Stakeholder Engagement Plan', Report prepared for Department of Transportation, Communication and Infrastructure.

Vulnerable groups are to be targeted through representative organizations including women, disability and youth associations. Remote communities which are often low income will be included through their traditional (e.g. chiefs) and formal representatives (e.g. senators).

Other considerations to be taken into account through the stakeholder engagement process for the Project are outlined in detail in the SEP.

Should grievances arise from technical advisory, design, institutional strengthening, construction or operation impacts from activities associated with the PRIME Project, a Grievance Mechanism (GM) has been developed through which affected parties can resolve such issues in an efficient, unbiased, transparent, confidential timely and cost-effective manner. This GM is outlined in the PRIME Project RF and SEP.

Consultations with stakeholders were undertaken during the preparation of the Project and relevant E&S instruments, including the ESMF. A total of 108 separate stakeholder groups across the four States were engaged during Project preparation, including:

- National – 4 Government;
- Kosrae – 17 Government; 15 Communities groups; 7 'Other' stakeholders;
- Pohnpei – 10 Government; 2 Communities groups; 2 'Other' stakeholders;
- Chuuk – 22 Government; 3 Communities groups; 6 'Other' stakeholders; and
- Yap – 4 Government; 12 Communities groups; 4 'Other' stakeholders.

A total of 42 consultation meetings were conducted from 30-Jul-2020 to 12-Nov-2020 across all four States. Information presented, and feedback provided by the stakeholders along with how the issues are addressed by the project are set out in the SEP. A summary of stakeholder engagement activities undertaken in outlined in SEP Appendix C, while consultation meeting minutes are provided in SEP Appendix D.

The final draft of the ESMF, along with the other E&S Instruments, was made available by DoTC&I to key stakeholders in each State to review and provide comment prior to the documents being finalized. The 'final' ESMF as well as respective ESIA and ESMPs will be publicly disclosed on the WB website (www.worldbank.org) as well as relevant FSM government websites (www.dofa.gov.fsm).

In addition, Stakeholders are to be regularly informed and updated on the PRIME Project throughout by way of consultation meetings and public notices (e.g. radio, newspaper etc, as appropriate), and signs and/or notice boards are to also be erected at the works site. Details of disclosure activities and requirements are set out in the SEP.

8. Institutional Arrangements, Responsibilities and Implementation

8.1 Institutional Responsibilities and Structures

The realization of a successful ESMF will require the full participation of Project relevant implementing agencies in collaboration with National, State and Municipal Government Officials. The responsibility to implement all commitments in the ESMF along with the Generic ESMP or any works specific ESIAs/ESMPs prepared will be distributed between these stakeholders.

The relevant institutional structures to be either utilized (for existing institutions) or established for the PRIME Project including roles and responsibilities are shown in Figure 8-1 and described below.

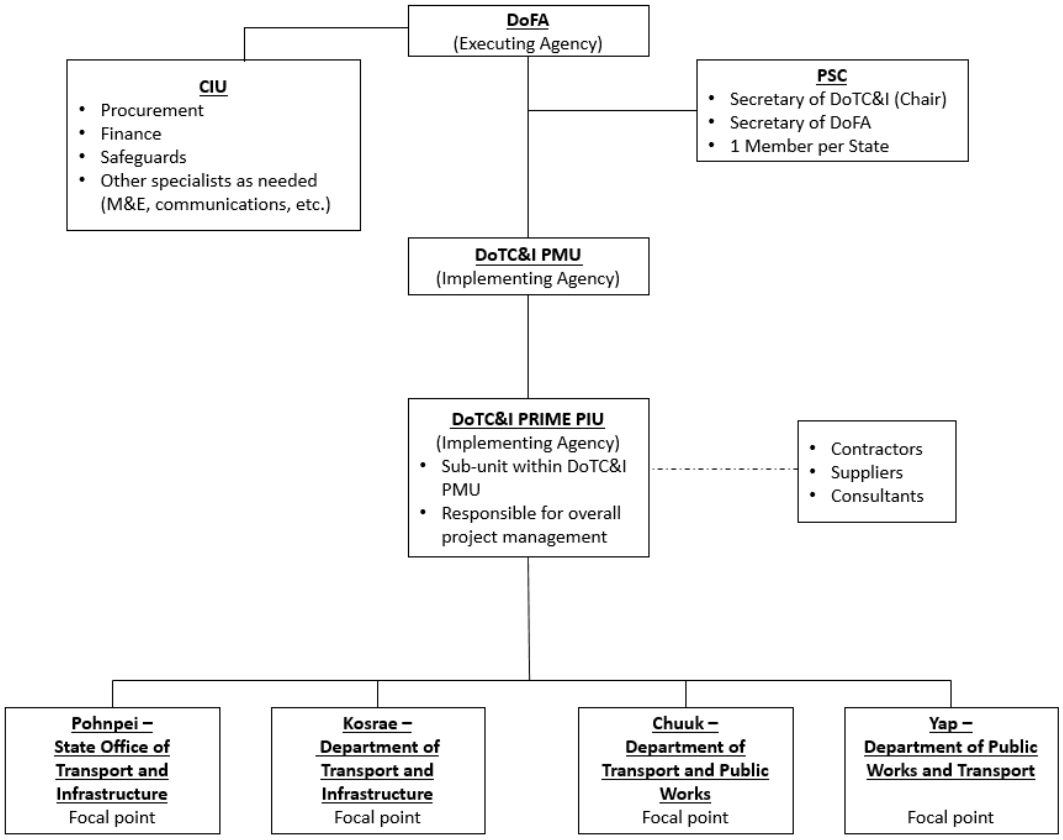

Figure 8-1: Implementation arrangements for the PRIME Project .

8.1.1 Coordination among the National and State Governments and Departments

The PRIME Project is designed to work with the National GoFSM and with each of the four State Governments and will be implemented over a five-year period following project effectiveness. DoFA will be the Executing Agency (EA) while National DoTC&I will be the Implementing Agency (IA) working closely with each of the four States.

As the PRIME Roads fall under the jurisdiction of the relevant State Governments, Project Implementation Agreements (PIAs) with each of the States will also be required to help govern the PRIME activities in each State, with one PIA for each of the following groups:

(a) National DoTC&I, Kosrae State Government and Kosrae Department of Transport and Infrastructure;

(b) National DoTC&I, Pohnpei State Government and Pohnpei State Office of Transport and Infrastructure;

(c) National DoTC&I, Chuuk State Government, and Chuuk State Department of Transport and Public Works; and

(d) National DoTC&I, Yap State Government, and Yap State Department of Public Works and Transportation.

PIAs will be executed prior to the commencement of Project activities under Component 2 to ensure clarity and agreement between all relevant parties on implementation roles and responsibilities.

As each road authority is under its respective State's control and to ensure good technical coordination, focal points will be appointed in each State to work on and manage day-to-day PRIME activities associated with its land transport sector and to liaise with the National DoTC&I.

Within the National GoFSM, DoTC&I has a project management unit (PMU) that has responsibility for the delivery of Overseas Development Assistance funded infrastructure projects (including the World Bank, Asian Development Bank, United States Federal Aviation Administration, People's Republic of China and the United Nations) with the exception of energy (managed by the Department of Resources and Development) and telecommunications (managed by the DoTC&I Communications Division). The primary focus of the PMU is on program management with day-to-day project management tasks deferred to project implementation units.

A PRIME PIU will be established within DoTC&I. All contracts with consultants, contractors and suppliers will be signed by the DoTC&I Secretary with the administration and contract management tasks of the contract being implemented by the PIU as their day to day responsibility. The DoTC&I Secretary will sign off on all consultant and contractor invoices and authorize CIU to make payments.

During project implementation, the DoFA Centralized Implementation Unit (CIU) Safeguards Team will assist DoTC&I with the environmental and social aspects.

Both the CIU and DoTC&I are existing units, and are familiar with WB ESF and project-specific environmental and social risk management instruments from their experiences with other WB-funded projects.

8.1.2 PIU Implementation Support

The PIU will coordinate the implementation of the PRIME Project with DoTC&I management, DoTC&I PMU, DoFA CIU, PIU State Focal Points, and the State transport agencies in a manner that is to be set forth in the PIAs that outlines the roles of each organization. The PIU will also be responsible for preparing and implementing the Project in accordance with annual work plans and budgets which will detail the Project's activities and eligible expenditures. The PIAs will clarify, among other things, the necessary state and intra-government cooperation and support necessary for the Project.

The PIU will have overall supervision of ESMF implementation. Environmental and social risk management will also be the responsibility of the PIU, supported by the CIU

Safeguards Team. The PIU will ensure the availability of an appropriate budget for ESMF implementation.

Training and capacity building of the PIU will take place under PRIME Component 1 and 3. Technical capacity building will be undertaken by the external consultants engaged to undertake the TA, while E&S related capacity building is to be undertaken by the CIU Safeguards Team.

8.1.3 CIU Implementation Support

The already established CIU within the DoFA, the PRIME Project Executing Agency (EA), is a functional unit that supports the implementation of the WB portfolio and includes an environmental and social Safeguards Team.

In order to provide strong and efficient support throughout FSM, the CIU provides support to core implementation functions needed for all WB portfolio projects in FSM including, but not limited to, procurement, financial management, social and environmental risk management, monitoring and evaluation, as well as outreach and communications. The CIU team members responsible for these functions report to the CIU Program Manager and provide services and hands on support to the PRIME Project Implementing Agency (i.e., DoTC&I) for preparation, implementation and capacity building activities. The CIU will be supported during project implementation by environmental and social consultants for due diligence, community engagement and instrument preparation as needed. Project implementation responsibilities however remains with the IA (DoTC&I).

8.1.4 Role and Composition of the PSC

To ensure the four States are adequately represented in decision making process, a Project Steering Committee (PSC) will be established and chaired by DoTC&I. Recent experience from the existing FSM Maritime Investment Project (FSMIP) suggests that ensuring the appropriate representation of all parties in the Project Steering Committee (PSC) will be critical for success. The FSMIP project PSC structure could be considered.

The Secretary of DoFA will be a member, along with a member appointed by the Governor of each of the four States. The PSC will provide general oversight and policy direction to PRIME Project stakeholders during Project implementation, convene key stakeholders in the event of disagreement and periodically review Project progress. The PSC will have a role in determining priorities for allocating Project funds after the completion of the VA and CRRS studies.

8.2 Implementation Roles and Responsibilities

The management, coordination and implementation of the ESMF and its integral tasks will be the responsibility of the PRIME PIU with support from the CIU Safeguards Team.

It will be important for the PIU and other implementing agencies to ensure that the institutional capacity is in place before implementation of the ESMF commences. Some of the main shortcomings of E&S frameworks include:

(i) Lack of funds for planning, development and follow-up monitoring; and

(ii) Lack of experience in framework implementation due to the absence of qualified and experienced staff.

The proposed organizational structure and management functions for implementing the ESMF is described below. While the DoTC&I and DoFA may decide to adapt this structure

according its needs and funding, it is emphasized that the various components listed and described below should be represented in the organizational structure in order to successfully implement the ESMF.

8.2.1 PIU Project Manager and Project Officer

The PIU will be initially staffed with a PIU Project Manager, and a Project Officer, based in Pohnpei (National Government DoTC&I) with additional PIU support to be recruited (such as State level or administrative support) as required.

The PIU Project Manager will be responsible for working collaboratively with all national level stakeholders and overseeing all State level stakeholder consultation activities with support from PIU State Focal Points.

The PIU Project Manager will also be responsible for the following tasks in relation to implementation of the RF with support from the CIU Safeguards Team as required:

- Approve the content of any future revisions to the ESMF, based on technical review and recommendations by CIU Safeguards Team;
- Initiate the commencement of, and review the content of, the E&S screening forms and report to be undertaken by the CIU Safeguards Team (or a E&S consultant);
- Approve content of any ESIA/ESMPs prepared for specific works or the Generic ESMP;
- Implement and monitor all stakeholder engagement strategies/plans for the Project;
- Coordinate, facilitate, and where appropriate participate, in face-to-face stakeholder meetings with on-the-ground support from the PIU Focal Points, and CIU Safeguards Team;
- Oversee implementation of any recommended environmental and social mitigation measures set out in the ESMPs for the specific works; and
- Prepare monthly and quarterly monitoring reports.

In addition, the PIU Project Manager will be responsible for the tasks set out in the RF.

Efforts are to be made to keep stakeholders informed on Project progress including establishing a direct line of communication between to the PIU Project Manager as the key stakeholder contact points. The PIU Project Manager can then direct stakeholder contact to any other appropriate Project implementation groups (e.g. PIU State Focal Points, CIU Safeguards Team, design consultants, E&S consultant and contractor) as appropriate. This direct line of contact to the PIU Project Manager will allow for on-going updates and discussions outside of formal consultation activities and allow for stakeholder concerns and suggestions to be taken into account as they arise.

The Project Officer is to provide assistance and support to the Project Manager on the above.

8.2.2 PIU State Focal Points

A focal point in each State will be appointed by the PIU to work on and manage day-to-day activities for the PRIME Project such as coordinating implementation of specific Component 2 works. The PIU State Focal Point is likely to be appointed from within the

State Department of Transport and Infrastructure (or Department of Transport and Public Works' in Chuuk and Yap).

The PIU State Focal Point will report directly to the PIU Project Manager, and act as the key contact person for stakeholder enquires in each State with oversight from the PIU Project Manager and CIU Safeguards Team, as appropriate.

Any PIU State Focal Points appointed should be suitably qualified with good communication skills to undertake a range of stakeholder engagement activities and be appropriately trained in the needs of the Project.

The PIU State Focal Point will also be responsible for the following tasks:

- Oversee all State level stakeholder engagement related activities for the Project;
- Manage the grievance mechanism (outlined in the RF and SEP) at the State level, including receiving, screening, resolving for forwarding grievances (e.g. to PIU Project Manager, CIU Safeguards Team or others), as appropriate;
- Interact with related and complementary support activities that require *ad hoc* or intensive stakeholder engagement;
- Act as mediator between the Contractor and stakeholders;
- Support CIU Safeguards Team (or E& S consultant/s) to undertake E&S screening for Component 2 works; and
- Proactively identify stakeholders, Project risks and opportunities (with support from the CIU Safeguards Team) and inform the PIU Project Manager to ensure that the necessary planning can be done to either mitigate risk or exploit opportunities.

In addition, the PIU Project Manager and Project Officer will be responsible for the tasks set out in the RF.

8.2.3 PIU Project Assistant

The PIU will require a Project Assistant to be recruited to provide support to the Project by ensuring all administrative requirements are managed effectively. Main responsibilities are to include:

- Document management, including capture and filing (physical and electronic) of stakeholder and PAP documents and records.
- Database management, including:
    - Continuously update stakeholder information (contact details, organizational details, designation, engagement activities); and
    - Continuously update grievance information (grievance records, grievance database, agreements, meeting registers).
- Logistics management;
- Support with arranging accommodation and traveling where required; and
- Assist with printing of materials to be used during stakeholder meetings (posters, pamphlets, Project Summary Documents, letters, attendance registers, maps, newsletters etc).

8.2.4 CIU Safeguards Team

The existing DoFA Centralized Implementation Unit (CIU) provides support for all WB portfolio projects in FSM including, but not limited to, procurement, financial management, environmental and social risk management, monitoring and evaluation, as well as outreach and communications.

The CIU Safeguards Team currently undertakes a range of stakeholder engagement activities as part of it's portfolio of WB funded Projects and has existing relationships with a many of stakeholders in each State which will be important to utilize for the PRIME Project. The CIU will be supported by environmental and social consultants throughout project implementation as needed.

In relation to implementation of the RF, the PIU will require support from the CIU Safeguards Team in particular for capacity building and E&S technical support throughout the Project and to ensure the RF is implemented appropriately and is consistent with the requirements of ESS5.

In relation to implementation of the ESMF, the CIU Safeguards Team will be responsible for:

- Ensuring the E&S risk screening is undertaken for each Component 2 works (with local support from PIU State Focal Points);
- Applying the ESMF and other instruments to all Components, including review of Technical Advisory TOR and draft and final outputs;
- Prepare, or oversee the preparation of, works specific ESIA/ESMPs for the works (if required), for the works, including the preparation of TOR, selection of consultants, and review of draft and final outputs;
- Support external consultants to prepare any works specific ESIA/ESMPs required, and review and provide recommendation to PIU Project Manager for approval prior to the completion of detailed designs;
- Ensure environmental and social clauses and relevant E&S instruments are included in Contractor bid document, including environmental and social protection and mitigation measures are included;
- Supervise physical works, carry out audits etc., to ensure environmental and social protection and mitigation measures are implemented by Contractors;
- Oversee the implementation of specific mitigation measures outlined in the ESMPs and CESMP;
- Manage grievances and EHS incidents as required, providing technical support to resolving issues and incidents;
- Storing data (including grievance records), collating and interpreting stakeholder feedback and providing details to the PIU, DoTC&I, design team and others as necessary;
- Provide E&S reporting on a quarterly basis as part of WB reporting;
- Assist to obtain all relevant permits from EPA, KIRMA and federal agencies; and

- Providing technical and capacity building support to the PIU and other project implementing agencies on the implementation of instruments, as the PIU does not contain E&S expertise.

The CIU Safeguards Team may need additional social and environmental risk management support to implement the growing WB portfolio in FSM including the PRIME Project. Specialist consultants may be required on an *ad hoc* basis by the CIU to prepare environmental and social assessments, E&S instruments and/or to conduct specialist supervision or monitoring services.

8.2.5 Civil Works Contractors

The Contractor engaged to undertake road works construction will be responsible for undertaking stakeholder engagement related to construction of the specific physical works, as well as implementing any environmental and social protection and mitigation measures as outlined in their Terms of Reference and accompanied instruments (e.g. CESMP). Specifically the Contractor is required to:

- Support the PIU State Focal Points in engaging with stakeholders relating to communicating the scope and timing of works (either by attendance at meetings, installation of notice boards, door knocks/letter drops, etc.);
- Negotiation with landowners/users in relation to temporary use of land required for construction relation activities (e.g. laydown and storage/stockpile areas, worker camps, amenities, etc.) and assessment of temporarily used land after reinstatement/restoration to a condition acceptable to the land owner;
- Negotiation with landowners regarding relating/reinstalling physical assets (such as fences, walls etc) located directly within the Project footprint;
- Receiving complaints and grievances by stakeholders and forwarding to the PIU State Focal Point during works construction, and resolution of grievances if they are related to the Contractor (in coordination with the PIU);
- Implement specific mitigation measures outlined in the ESMP; and
- Prepare and implement additional E&S management plans relevant for the scope of the works under their CESMP (e.g. TMP, H&SP, SMP, WMMP, ESCP, SIP etc.).

8.3 Implementation Process

All activities for implementing the ESMF, including the Generic ESMP or any works specific ESIA/ESMP required will be completed prior to the commencement of any construction activities for the works. PIU will submit evidence of recommended environment and social mitigation implemented in advance of works construction activities commencing, where appropriate, in order to satisfy the WB that the that PIU has satisfactorily completed the implementation of the ESMF, and issue its “No Objection” for the award of civil works contract.

Table 8-1: ESMF Implementation Responsibilities

Activities	Agency Responsible
Disclosure and public consultation for PRIME Project preparation.	PIU, with support from CIU Safeguards Team
Coordinate and/or undertake Stakeholder engagement and consultation throughout PRIME Project.	PIU, with support from CIU Safeguards Team
Implement and monitor all stakeholder engagement strategies/plans and activities required for the Project.	PIU, with support from CIU Safeguards Team
E&S risk screening for works, including initial screening after VA/CRRS, and detailed screening during preliminary design.	CIU Safeguards Team (or E&S consultant)
Technical advisory into design process based on E&S screening.	CIU Safeguards Team
Preparation of works specific ESIA/ESMP.	PIU (engagement of E&S consultant with oversight from CIU Safeguard Team)
Obtain all relevant permits from EPA, KIRMA and federal agencies.	PIU, with support from CIU Safeguards Team
ESMF monitoring and reporting including monthly and quarterly reports, including internal audits.	PIU, with support from CIU Safeguards Team
Preparation of tender bid documents and TORs, including requirement for Contractor ESMP.	PIU, with support from CIU Safeguards Team
Tendering and award of civil works.	PIU, with support from CIU Safeguards Team
Confirm 'No Objection' for the award of civil works.	WB
Preparation of Contractor CESMP (including ESCP, WMMP, SMP, TMP, SIP, CHSP, OHSP etc.) as required.	Contractor (to be reviewed and approved by PIU and CIU Safeguards Team)
Clearance of Contractor CESMP prior to works starting.	PIU, with support from CIU Safeguards Team
Supervision, including monitoring / auditing of Contractors implementation of the CESMP.	PIU, with support from CIU Safeguards Team
Establishment of Project level grievance mechanism, including receiving, screening, resolving and/or forwarding grievances, as appropriate.	PIU, with support from CIU Safeguards Team, Contractor, Council of Chiefs
Technical advisory throughout Project, including *ad hoc* capacity building of PIU, Contractor etc., as required.	CIU Safeguards Team

9. Budget and Financial Arrangements

PIU and DoFA shall ensure that the total cost of ESMF implementation (including time inputs, material and reimbursements) are budgeted for within the PRIME Project Budget, and shall cover the following:

(i) Engagement of external E&S consultants to support the CIU with E&S Screening and/or preparation of works specific ESIAs/ESMPs;

(ii) Technical analysis or assessment required as part of works specific ESIA;

(iii) Implementation of any environment or social mitigation measures recommended in the ESMPs, including any environmental monitoring requirements;

(iv) Supervising the Contractor's CESMP implementation and follow up of incidents, non-compliances and other matters;

(v) Consultation and stakeholder engagement; and

(vi) Internal monitoring and implementation of the ESMF and other instruments (ESCP, LMP etc.).

While the types of activities and investments to be carried out under the PRIME Project are known (refer Section 2.3), the extent of the works that can be completed will depend on the results of the VA and CRRS to be carried out under Component 1.

Budget allocation for environmental and social risk management is to be assessed separately for each works based on the scope of climate resilience road works under Component 2, and refined in the works ESMP.

An indicative budget of US$395,000 has been estimated for the GoFSM to implement the E&S risk management requirements of the ESMF over five years as outlined in Table 9-1.

Table 9-1: Indicative budget for implementing the ESMF

Item	Description	Amount (US$)
Preparation of ESIA and ESMPs	Preparation of works specific ESIA and ESMP under Component 2.	$310,000
Purchase of environmental monitoring equipment	Assumed handheld water quality meters and noise meters purchased for each of the four States. Includes purchasing, annual servicing and calibration fluids for five years.	$20,000
Monitoring of works activities	Includes works monitoring across all four States throughout Project. Includes travel for key PIU and CIU staff from Pohnpei to other States, and travel for the PIU Focal Point within each State (including flights, car hire, fuel etc.)[13]	$50,000
Obtaining permits from EPA/KIRMA and other regulatory authorities	Includes EIA/KIRMA permit fees for works etc	$15,000
Stakeholder engagement, implementation of resettlement framework and implementation of GM	As per the RF	NA (outlined in the RF)
	PROVISIONAL SUM	$395,000

[13] Assumed travel for international CIU Safeguards Team member/s to be covered under DoFA CIU budget.

Budget for Project stakeholder engagement, resolution of grievances through the GM, preparation of land access procedure plans and securing land for the works is outlined in the RF, and has not been duplicated here.

Any environmental and social mitigation measures required for works construction (such as sediment controls measures, replanting of riparian vegetation, costs for disposal of waste material) is to be included in the Contractors budget.

10. Monitoring and Evaluation

10.1 Internal Monitoring and Reporting

Monitoring and evaluation is essential to ensure successful implementation of the ESMF. The PIU, with support from the CIU Safeguards Team, will be responsible for establishing a monitoring program that will monitor, measure and assess the implementation and overall success of the ESMF and mitigation measures recommended as part of either the Generic ESMP or works specific ESMP (if required), including identifying issues and facilitate timely responses.

The PIU will be required to ensure the Contractor's bid documents include:

(i) The works specific ESMP or Generic ESMP;

(ii) Standard Environmental and Social Contract Clauses;

(iii) Roles and responsibilities are clearly explained; and

(iv) Suitable budgets are allocated.

Internal monitoring is to be reported quarterly by PIU (with support from CIU Safeguards Team) for the overarching PRIME Project, and monthly for the separate Component 2 works.

10.1.1 Construction Monitoring and Reporting

10.1.1.1 Monthly Monitoring

During the site preparation and construction phases for works, the following key progress indicators are to be measured internally by the PIU on a monthly basis:

(i) Compliance with ESMP and CESMPs (and other Contractor Plans required);

(ii) The status of implementation of any recommended environmental and social mitigation measures; and

(iii) The findings of monitoring programs.

Monitoring of environmental effects will be undertaken daily by the Contractor during construction, in accordance with an Environment Monitoring Plan to be prepared by the Contractor and approved by the PIU and CIU Safeguards Team prior to commencement of construction works.

The PIU State Focal Point is to undertake weekly monitoring for the works site throughout the construction period (or at an alternative frequency agreed to by the PIU and Contractor if required depending upon the progress of works). Monitoring by the PIU will be based on frequent visual observations of works construction activities, preparation of necessary plans and reports, engagement and consultation with stakeholders (as directed by the SEP), and reviewing and reporting on any Project-related complaints and/or grievances.

Visual monitoring of a works site for adherence to environmental controls should include:

- Correct storage of diesel and other potential contaminants;
- Site tidiness;
- Waste disposal; and

- The effectiveness of sediment controls (where appropriate).

A visual assessment of watercourses in the vicinity of the works is to be undertaken by the State Focal Point during the weekly monitoring visit, for any observable changes in suspended solids or oil/grease downstream of works. If changes are observed (i.e. discoloration in water column) or works are being undertaken in the watercourse or stream banks at the time, water quality monitoring is to be undertaken within watercourses using a hand-held water quality meter. Details regarding this water quality monitoring are to be further described in the Generic ESMP, including parameters to be measured.

Noise monitoring may be required as part of the weekly monitoring by the PIU State Focal Point for works sites in close proximity to sensitive receptors. If excessive noise from machinery is suspected by the State Focal Point, noise monitoring is to be undertaken using a handheld noise meter at i) the works site, and ii) any sensitive receptors identified in close proximity to the works site (such as residential houses, schools, businesses, churches etc), during the operation of machinery and construction activities.

Prior to the commencement of works the PIU State Focal Point is to undertake baseline monitoring of the works site for both water quality and noise monitoring is to be undertaken as described above, with the results to be used as a baseline to which construction monitoring is to be compared.

The CIU Safeguard Team, and EPA/KIRMA may also visit the site at any time to ensure adherence to the ESMP.

Periodic post-construction monitoring will be carried out by DoTC&I during the Defects Notification Period which extends for 365 days after the completion of construction.

A brief monthly internal monitoring report will be prepared by the PIU on this basis, including the results of any other environmental monitoring specified in the Generic ESMP, works specific ESMPs and CESMP. The monitoring requirements set out in the RF should also be detailed in this monitoring report.

The results and findings from the monthly reports should be consolidated and summarized annually until Project construction works are complete.

10.1.1.2 Incident Reporting

Should an environmental incident, such as a spill of hazardous substances, occur during the course of site works, the Contractor Site Manager is to immediately notify the PIU State Focal Point, who is then to forward the incident to the PIU Project Manager, CIU and EPA/KIRMA. The Site Manager is to take prompt and immediate action to minimize any impact and where necessary, liaise with all relevant authorities. The Site Manager is to, in liaison with the PIU and CIU, direct an appropriate course of action and shall record the date, time and nature of the incident, full details of the causes and effects, further investigations to be undertaken, person responsible for such investigations, outcomes of the investigation, actions and resolution of the incident (including preventative measures implemented to prevent recurrence). Preventative measures are to be subject to monitoring and review. Incidents will be included in any audit reports during site works.

10.1.1.3 Works Completion Report

At the completion of works activities a completion audit is to be undertaken to establish whether the commitments set out in the ESMP and CESMP have been fully complied with during implementation. This report should detail any issues and resolution encountered

during works implementation and any residual issues or management measures required. The report should also include photographs of site reinstatement

The completion report will be carried out by the PIU, with support from the CIU Safeguards Team, and summarize whether the objectives set out in the ESMP and CESMP have been achieved. The monitoring requirements set out in the RF should also be detailed in this works completion report.

10.1.1.4 Schedule of Construction Reporting

Reporting requirements during works construction are outlined in Table 10-1 below.

Table 10-1: Schedule of construction reporting

Report Type	Frequency of Submission	Responsibility	Submit to:
CESMP	Prior to commencement of works	Contractor	PIU Project Manager and CIU Safeguards Team
CESMP updates	As required	Contractor	PIU Project Manager and CIU Safeguards Team
Other Contractor Management Plans (refer Section 6.3.2)	Prior to commencement of works	Contractor	PIU Project Manager and CIU Safeguards Team
Updates to any Contractor Management Plans	As required	Contractor	PIU Project Manager and CIU Safeguards Team
Monthly Construction Report	First week of month (for month prior)	PIU (State Focal Point)	PIU Project Manager and CIU Safeguards Team
Incident reporting	Within 24 hrs of incident	Contractor (Site Manager)	PIU Project Manager and CIU Safeguards Team, then to EPA/KIRMA
Complaints and Grievances Reporting	Within 24 hrs of grievance	Contractor (Site Manager)	PIU Project Manager and CIU Safeguards Team
Works Completion Report	After completion of works and reinstatement of site	PIU (State Focal Point)	PIU Project Manager and CIU Safeguards Team

10.1.2 Quarterly PRIME Project Monitoring and Reporting

Quarterly monitoring reports are to be prepared for the PRIME Project by the PIU including the following information:

(i) Status of each activity and the related environmental and social risks, including a summary of the findings from monthly reports on physical works;

(ii) Achievement of targeted indicators, including objectives attained and not attained during the period;

(iii) Issues or problems encountered, complaints/grievances received and progress with resolving the grievances;

(iv) EHS incidents, and progress with resolution and close out;

(v) Schedule for the next period.

10.2 Submission and Distribution of Monitoring Reports

The Quarterly Monitoring Reports and Works Completion Report are to be circulated to Project Stakeholders including DoTC&I, DoFA etc, and the WB for review and feedback, so they are made aware of:

(i) The ESMF implementation progress; and

(ii) Any issues that may arise so as to take timely and appropriate action.

WB will provide implementation support for the PRIME Project on an on-going basis and visit FSM to monitor and evaluate progress. In country mission support or virtual support will be provided every three to six months to be timed for after submission of a quarterly monitoring report.

The PRIME Project will undergo a mid-term review by the WB no later than three years after the effective date of the Finance Agreement.

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Appendix A Baseline Resource Report

PRIORITIZED ROAD INVESTMENT AND MANAGEMENT ENHANCEMENTS (PRIME) PROJECT

Federated States of Micronesia

BASELINE RESOURCE REPORT

Prepared for

Department of
TRANSPORTATION, COMMUNICATIONS & INFRASTRUCTURE
Government of the Federated States of Micronesia

With Funding from

THE WORLD BANK
IBRD • IDA

December 2020

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ABBREVIATIONS

DoTC&I	Department of Transportation, Communications and Infrastructure
E&S	Environmental and Social
ESA	Environmental and Social Assessment
ESF	World Bank Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESS	World Bank Environmental and Social Standards
FSM	Federated States of Micronesia
GIS	Geographic Information Systems
GoFSM	Government of FSM
PRIME	Prioritized Road Investment and Management Enhancement Project
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
WB	World Bank

1. Introduction

1.1 Environmental and Social Assessment Overview

The Government of Federated States of Micronesia (GoFSM) has applied for financing from the World Bank (WB) for the Prioritised Road Investment and Management Enhancement (PRIME) Project to improve the climate resilience of FSM's road network. Part of the PRIME Project includes the assessment of environmental and social risks including:

(i) Environmental and Social Assessment (ESA);

(ii) Preparation of environmental and social instruments in accordance with the WB ESF;

(iii) Support stakeholder consultation activities; and

(iv) Provision of technical environmental and social advice as required to the Government of FSM as part of project preparation.

Argo Environmental Ltd (ARGO) has been engaged by the Department of Transportation, Communications and Infrastructure (DoTC&I) for FSM to undertake the environmental and social assessment (ESA) and preparation of the instruments required for WB appraisal, including development of an Environmental and Social Management Framework (ESMF), for the PRIME Project.

The ESA Consultant was engaged by the GoFSM through the Department of Transportation, Communications and Infrastructure (DoTC&I) to undertake the environmental and social assessment (ESA) and prepare instruments required for WB appraisal including development of an Environmental and Social Management Framework (ESMF) for the PRIME Project. This Baseline Resource Report was prepared to inform the development of the ESMF.

1.2 Project Background and Rationale

The *Prioritized Road Investment and Management Enhancements (PRIME) Project* will provide funds for technical assistance and institutional strengthening to improve the management of the road network in relation to potential climate change impacts for the FSM. In addition, the Project will fund the feasibility, design and construction of physical works on priority road assets to improve resilience to climate-related hazards or events.

FSM faces significant challenges related to its small size, remoteness, geographical dispersion, environmental fragility and sensitivity to external shocks. Climate projections predict elevations in air temperature, frequency of days of extreme, increased rainfall and rising sea levels. Sea level rise combined with natural year-to-year changes will accentuate the impact of storm surges and coastal flooding.

FSM's transport network is of critical importance to the country's economy and economic development through supporting trade and promoting commercial activity by facilitating the movement of goods and services, and providing safe and efficient access to social services including schools and health facilities. Critical climate resilient road, bridge or drainage improvement works to be implemented urgently to maintain a basic level of land transport

connectivity in each state will be identified as part of the PRIME Project . The extent of these works are described and shown in thew ESMF[1].

The PRIME Project focuses on primary road networks, as well as other (e.g. secondary) roads identified as being of strategic and/or economic importance to FSM within the existing legal road easements in each State (e.g. road improvements, overlay, drainage improvements, spot slope stabilization, rock wall revetment strengthening, improvements to causeways and bridges).

In general, there is only one primary, circumferential route on each of the four main FSM Island states. In addition, most of the population in FSM lives close to the coast, and critical infrastructure including roads, schools, places of employment, port facilities, tourist facilities, power plants and airports, are located primarily in the coastal zone.

1.3 This Report

1.3.1 Background

This Baseline Resource Report presents a compilation of the ecological resource (terrestrial, freshwater and marine habitat) and socio-economic information and data available for the FSM States acquired from primary and secondary sources. Locally based sub-consultants in each State have been used to collect primary source information though field survey under the direction of the international environmental and social expert team.

Initially, an analysis of available information was undertaken[2] where gaps in information were identified to focus the baseline data collection phase of the Project. Appendix A identifies where gaps in this baseline data still remain.

This baseline resources information will be used to assist with screening proposed activities to be funded under the PRIME Project in terms of Environmental and Social (E & S) risk. All maps and GIS data used to generate the maps contained in this Report will be shared separately in electronic format to be used in E & S risk management.

1.3.2 Project Area of Influence

The initial description of the Project's Area of Influence (AOI) is based on the definition provided in the Guidance Note to ESS1, to which the Project is to comply. Specifically, this Guidance note states that:

"*….Where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, the collection and analysis of environmental and social baseline information and data, at an appropriate level of detail for the project, are essential to define the project's area of influence and describe relevant physical, biological, ecological, socioeconomic, health, and labor conditions, including any changes anticipated to occur in the foreseeable future (including projected variability in climatic and environmental conditions due to potentially significant climate change or that would require adaptation measures that could occur over the life of the project), along with current and proposed development activities within the general project area but not directly connected to the project to be financed…..*"

[1] DoTC&I, 2020, 'Prioritized Road Investment and Management Enhancements (PRIME) Project, FSM: Environmental and Social Management Framework', Report prepared for Department of Transportation, Communication and Infrastructure.

[2] Gap Analysis Report. Prioritized Road Investment and Management Enhancements (PRIME) Project (P172225). Federated States of Micronesia. August 2020.

The area considered for assessment of baseline conditions (the Project "Area of Influence" or "AOI") consists of the:

- Road corridor adjacent to the 'PRIME Roads'[3] (and works where it is a bridge, causeway, etc) and immediate adjacent environment either side of the road alignment;
- Any temporary structures (such as bridges, causeway replacement structure, etc);
- Receiving environment downstream (and upstream when considering fish passage) if the works are a bridge (or causeway) or works are related to drainage, culverts etc;
- Contractors yards, lay down or stockpile areas and any other works related facilities; and
- Quarry locations and immediate surrounds.

Table 1-1 outlines the guidelines that have been followed to determine the AOI for the PRIME Project which is based on a precautionary approach.

Table 1-1: Project Area of Influence (AOI) delineations and conditions

Environment	Project AOI
Local villages / communities	Adjacent to PRIME Road alignments and works locations.
Road users	Users of the road that may have access or transportation restrictions from the works if they are not adequately managed.
Important species habitat	Sensitive ecological areas in close proximity to the PRIME Road alignments and works locations potentially receiving runoff during construction / operation.
Streams & inshore waters (adjacent to coastline)	Assuming a precautionary approach, an area directly adjacent to the PRIME Road alignments and works locations potentially receiving stormwater runoff during construction / operation.

The AOI extent considered is broader than the area in which possible physical works/interventions will occur as Component 2 works will only be undertaken along a small section (<10%) of the 'primary roads' identified a part of the 'PRIME Roads'.

The broader AOI has been applied for the E&S baseline, impact and risk assessment in order to ensure the process captures anticipated impacts.

Any site-specific environmental and social assessment to be prepared, if required, are to define the AOI specifically for those works, based on the works footprint including all ancillary components and potential impacts on environmental, economic and social resources.

1.3.3 Methodology & Limitations

The following methodology was adopted to compile of baseline information provided in this Report:

[3] 'PRIME Roads' are defined as roads that will be assessed as part of Technical Assistance aspects (including the VA/CRRS and ESA studies) of the PRIME Project which include the majority of the existing 'primary roads' and some additional secondary roads that are considered to be of strategic and/or economic importance by DoTC&I. Only the primary roads identified will be funded under Component 2 of the PRIME Project.

- Primary data collection including In country consultations with relevant Government Departments / Agencies and NGOs
- Secondary data collection including internet searches of information repositories and data requisition form relevant Government Departments / Agencies

All data was obtained by desktop study and field survey conducted between July and October 2020. Every endeavour has been made to identify and refer to the most recent data available. However, some of the data is old and may be out of date.

2. Federated States of Micronesia

2.1 Physical Environment

2.1.1 Location & Geography

FSM is located near the equator about 4,000 km southwest of the Hawaiian Islands in the Western Pacific Ocean and within the Caroline Islands group. The largest nation in the Micronesian sub-region, FSM is made up of four semi-autonomous states (Kosrae, Pohnpei, Chuuk and Yap) (see Figure 2-1) located between Marshall Islands to the east and Palau and the Philippines to the west.

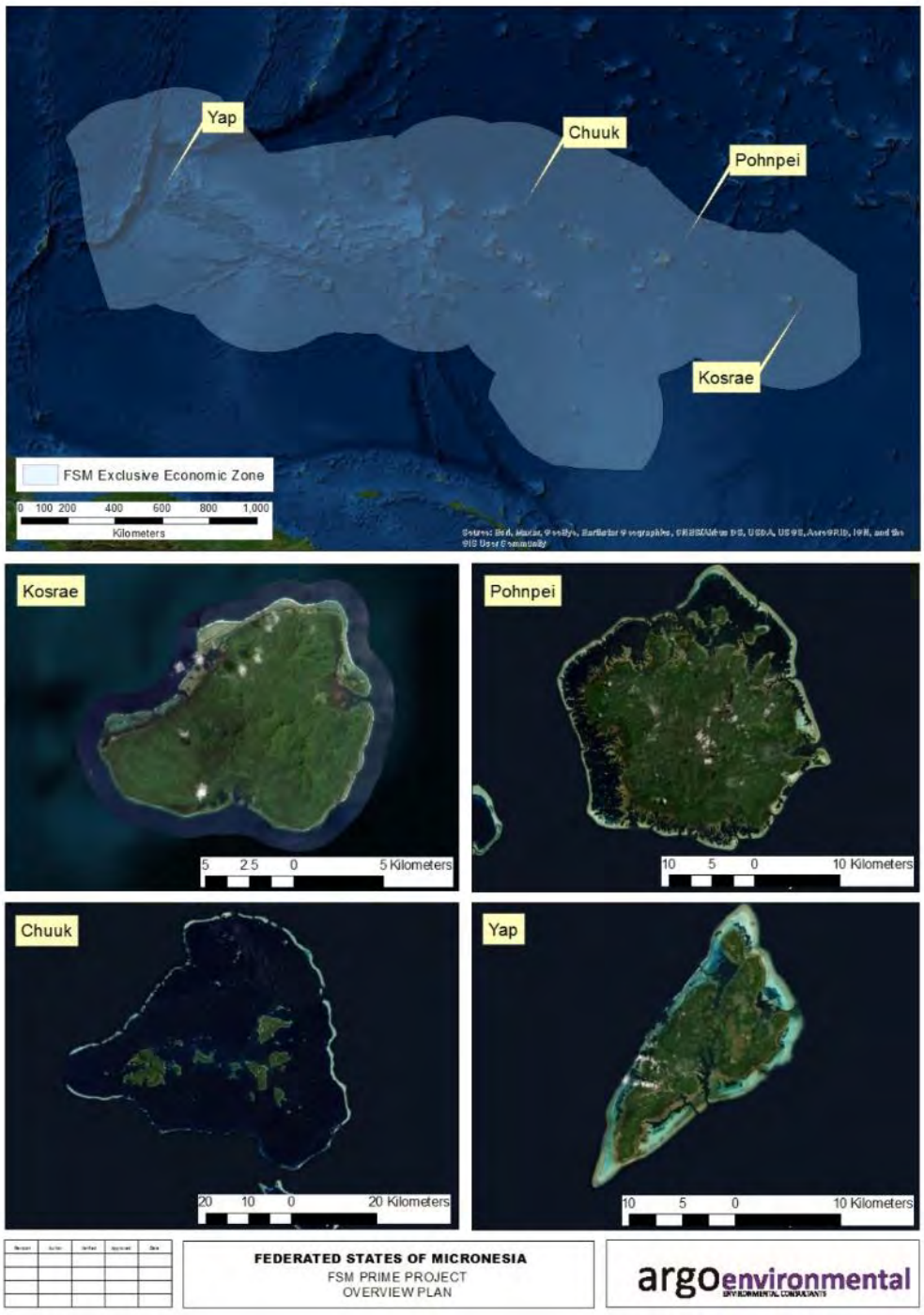


Figure 2-1: Location of FSM States: Kosrae, Pohnpei, Chuuk and Yap

FSM is made up of 607 islands scattered over an area of about 2.6 million km^2, including its Exclusive Economic Zone (EEZ), in the western Pacific Ocean. The total land area of FSM is 704.6 km^2, with 7,192 km^2 of lagoon area. The islands vary from small islets, which are inundated at high tide, to atolls and large volcanic islands with land area of more than 80 km^2. Approximately 65 (approx. 10%) of the islands are inhabited.

2.1.2 Climate

General

FSM has a tropical climate that varies with seasonality of rainfall influenced by the two distinct ecoregions (see Section 2.2 for more detail). The climate is tropical marine with daily temperatures ranging from about 24 to 29°C with little average variation throughout the year (Wortel *et al.* 2003). Annual rainfall ranges from 304 cm for drier islands like Yap to over 1,016 cm per year in the high mountains of Pohnpei and Kosrae. Humidity averages over 80 per cent. Northeast trade winds prevail from about November to May when conditions may be drier on western islands of the FSM.

The region is affected by storms and typhoons, which are generally more severe in the western islands and by periods of drought and excessive rainfall associated with the “El Nino” (ENSO) phenomena. In recent times, the droughts of 1982-1983 and 1997-1998 were especially severe.

The West Pacific Monsoon affects the western states of Chuuk and especially Yap more than the eastern states of Pohnpei and Kosrae. It tends to be farther east during El Niño, bringing higher rainfall, and in a more western position during La Niña, resulting in less rainfall.

Climate Change

Long- term average rainfall in FSM is projected by almost all models to increase with a greater increase projected in May to October than in November to April rainfall (ABM & CSIRO 2013). However, annual variability is still the same or larger than the projected change even in the highest emission scenario in 2090. Between 1979 and 2006 mean rainfall has increased in the western states of FSM but models do not project this will continue at this rate into the future. This indicates that the recent increase may be caused partly by natural variability and not due to global warming.

Extreme temperatures for the western FSM states are projected to increase by 0.8˚C by 2030 under the very high emissions scenario, and the frequency and intensity of extreme rainfall events are projected to increase by about 14 mm by 2030 in the very high emissions scenario (Figure 2-2) (ABM & CSIRO 2014).

Satellite data indicates that sea level has risen in FSM by over 10 mm annually since 1993, which is above the global average of 2.8- 3.6 mm per year. This higher rate of sea level rise may be related to natural fluctuations that take place on a yearly or decadal basis caused by phenomena such as the El Niño –Southern Oscillation. By 2030, under a very high carbon dioxide emissions scenario, this rise in sea level is projected to be in the range of 41 – 90 cm (Table 2-1). Values represent the 90% of the range of model results and are relative to the period 1986-2005. The sea level rise combined with natural yearly changes will accentuate the impact of storm surges and coastal flooding.

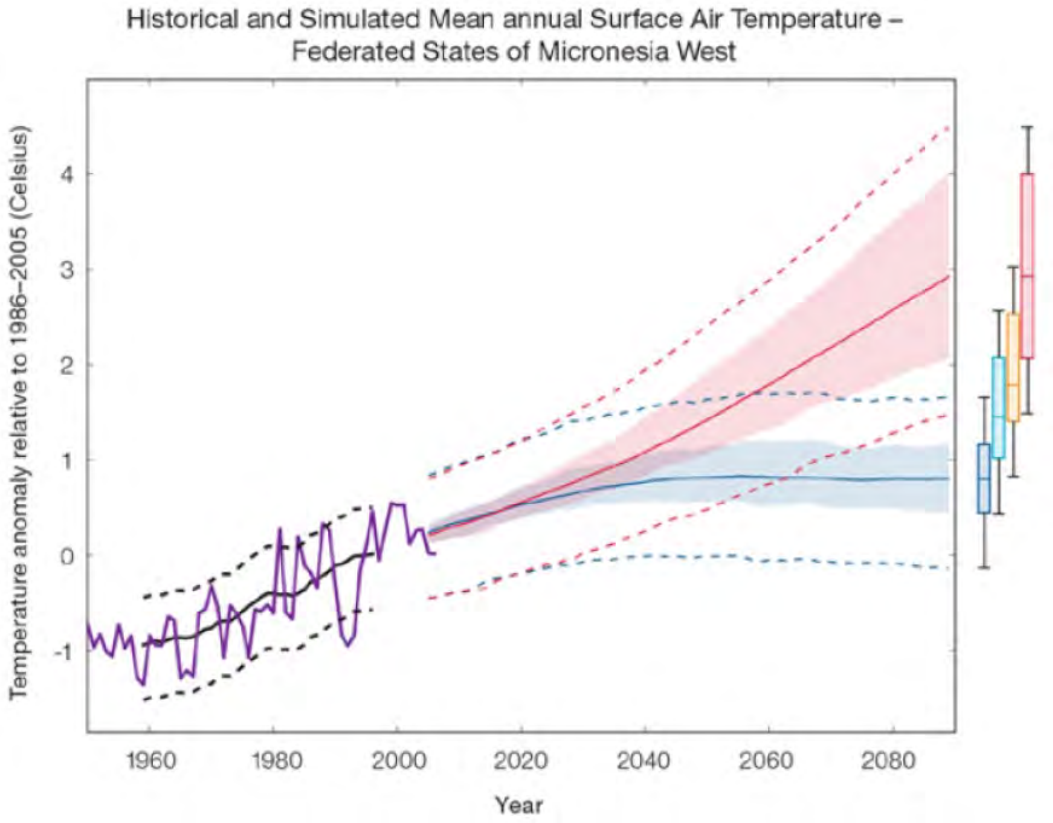


Figure 2-2: Historical & simulated mean annual surface air temperature – FSM West (from ABM & CSIRO 2014)

Table 2-1: Projected changes in annual mean sea level rise for FSM (from ABM & CSIRO 2014)

	2030		2050		2070		2090	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Very low emissions scenario	3.1–7.1	8–18	5.5–11.8	14–30	7.9–17.7	20–45	9.4–23.6	24–60
Low emissions scenario	3.1–6.7	8–17	5.5–12.2	14–31	8.7–19.3	22–49	11.8–26.8	30–68
Medium emissions scenario	2.8–6.7	7–17	5.5–11.8	14–30	8.7–18.9	22–48	12.2–27.2	31–69
Very high emissions scenario	3.1–7.1	8–18	6.7–13.8	17–35	11.0–23.2	28–59	16.1–35.4	41–90

2.1.3 Topography

The Islands of Kosrae, Yap, Chuuk and Pohnpei are known as ‘high’ islands, which are of volcanic origin. Geologically, Kosrae in the east is the youngest island, and the islands gradually become older as they move toward the western end of the Caroline island chain (USDA SCS 1982).

These islands range from islets barely above sea level – the majority of the islands - to the high islands – of which Pohnpei, which reaches 791 m above mean sea level (Nahnalaud), and then Kosrae (Mt. Finkol at 635 m) and Chuuk (Mt. Uinipot on Tol Island at 443 m) follow, in order (TNC 2002).

The unique forests of the high islands are known to protect watersheds and prevent erosion.

2.1.4 Hydrogeology

Approximately 60% of water resources in FSM exist as surface water in the form of small, intermittent streams that drain catchment areas of limited aerial extent (Johnston 2011).

The remaining 40% exist as groundwater in small, dispersed zones of sedimentary deposits, weathered volcanics and schists.

Kosrae and Pohnpei have perennial stream flow and serve as invaluable, nearly infinite resource as most of the water that does not run-off is absorbed through the soils and rock and sits as underground fresh water lenses in basalt caves created by earlier lava flows and geologic formations.

2.1.5 Seismology & Earthquakes

Most of the islands in FSM are situated in a relatively quiet seismic area (for example, Pohnpei is located in a seismic Zone 1 as classified by the Trust Territories of the Pacific Islands Design Criteria 1970). The exception is Yap, which is situated close to the Pacific "ring of fire" (Figure 2-3). These tectonic plate boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances.

While significantly damaging earthquakes have not been observed in recent times, FSM is subject to large tsunamis, as evident by the large tsunami run-ups of 1837, 1849 and 1899, which caused death and destruction in the Caroline Islands. Pohnpei island has not been affected the serious damage by earthquake since 1971.

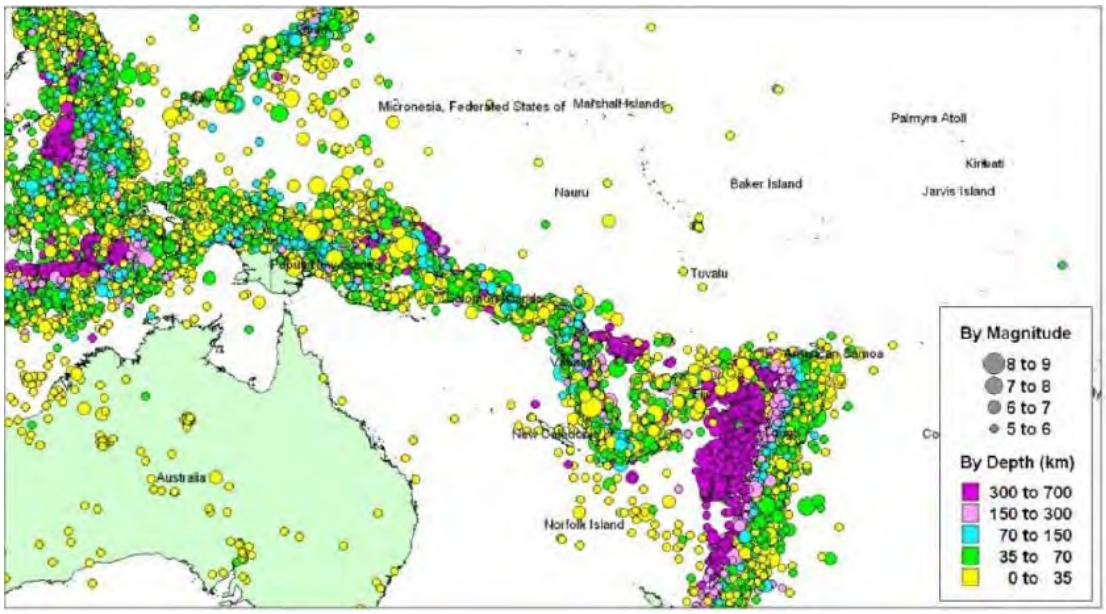


Figure 2-3: Epicentres of earthquakes in the west Pacific Islands region (Rong *et. al.* 2012)

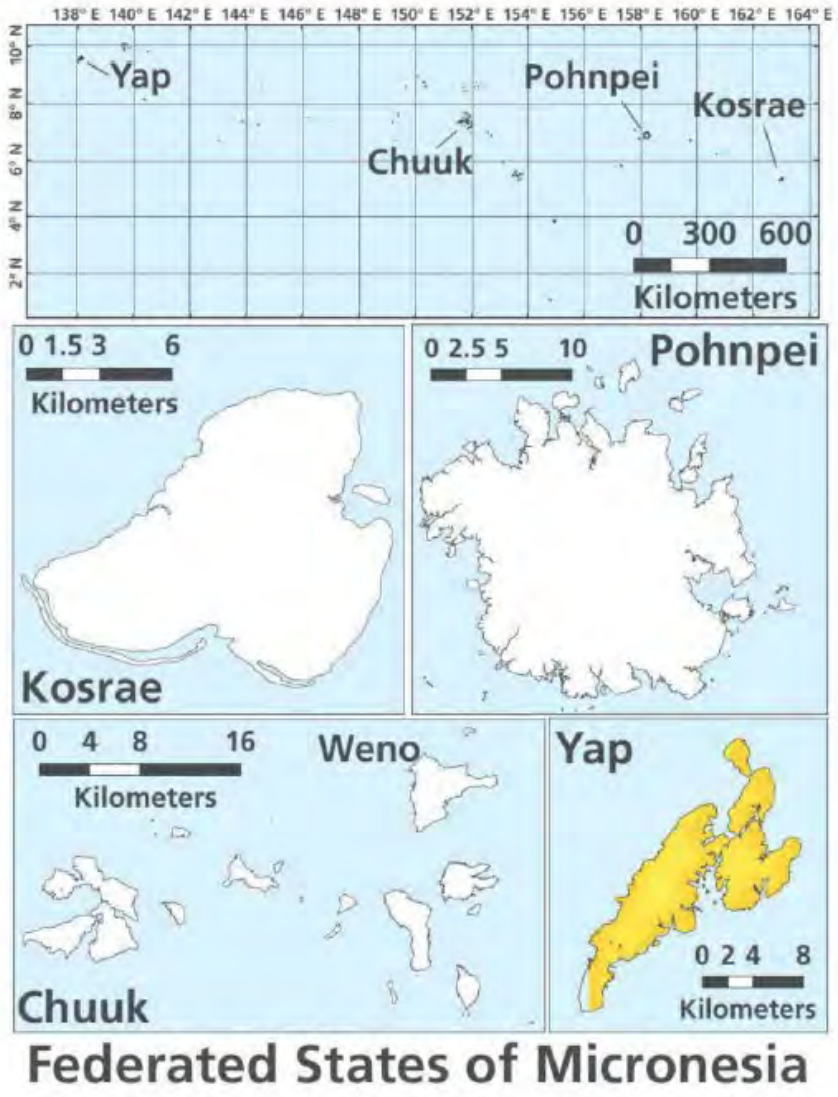
Yap has a 40% chance in the next 50 years of experiencing, at least once, light to moderate levels of ground movement (see Figure 2-4).

Moderate levels of ground movement are expected to cause minor damage to well-engineered buildings. Much lower levels of shaking are expected in the other main islands of FSM. In terms of expected annual economic-social wealth (EWS) loss risk due to earthquakes, FSM sits in the second lowest zone.

2.1.6 Oceanographic characteristics

Tides are semi-diurnal (2 tides a day) with a strong diurnal inequality and a maximum tidal variation of just over 1.5 m (meso-tidal) (Wolanski & Furukawa 2007). Small seasonal and daily tidal fluctuations have been recorded related to sea conditions associated with prevailing weather patterns.

Storm systems impact tidal height and can cause increased coastal erosion when coinciding with high water levels.



Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Potential Damage	none	none	none	Very light	light	Moderate	Moderate/ Heavy	Heavy	Very Heavy
Peak ACC. (%g)	<0.17	0.17-1.4	1.4-4.0	4.0-9	9-17	17-32	32-61	61-114	>114
Peak Vel. (cm/s)	<0.12	0.12-1.1	1.1-3.4	3.4-8	8-16	16-31	31-59	59-115	>115
Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+

Figure 2-4: Peak horizontal ground acceleration calculated for FSM (Note: 1g is equal to the acceleration of gravity) (Rong *et. al.* 2012).

2.1.7 Unexploded Ordinance

FSM has a significant World War II history. Although the risk is considered low, due diligence and careful consideration will be needed during Project works to ensure that the presence of unexploded WW II munitions that may be present in the Area of Interest (AOI) if present is removed.

2.2 Biological Resources

2.2.1 Biodiversity

The FSM consists of two ecoregions (see Figure 2-5) (Wortel *et. al.* 2003). The Yap tropical dry forest ecoregion is characterized by a monsoon-like climate with rainy seasons followed by periods of drought. The dominant vegetation types are mixed broadleaf forest, swamp, mangrove, savanna, and agroforests. Vegetation maps from 1976 aerial photos indicate that wild forests cover about 40% of the land area of Yap (including mixed broadleaf forest, swamp, and mangrove) (Falanruw *et. al* 1987). Agroforests (tree gardens) cover another 26% of the land area, and about 22% of the vegetation is savanna.

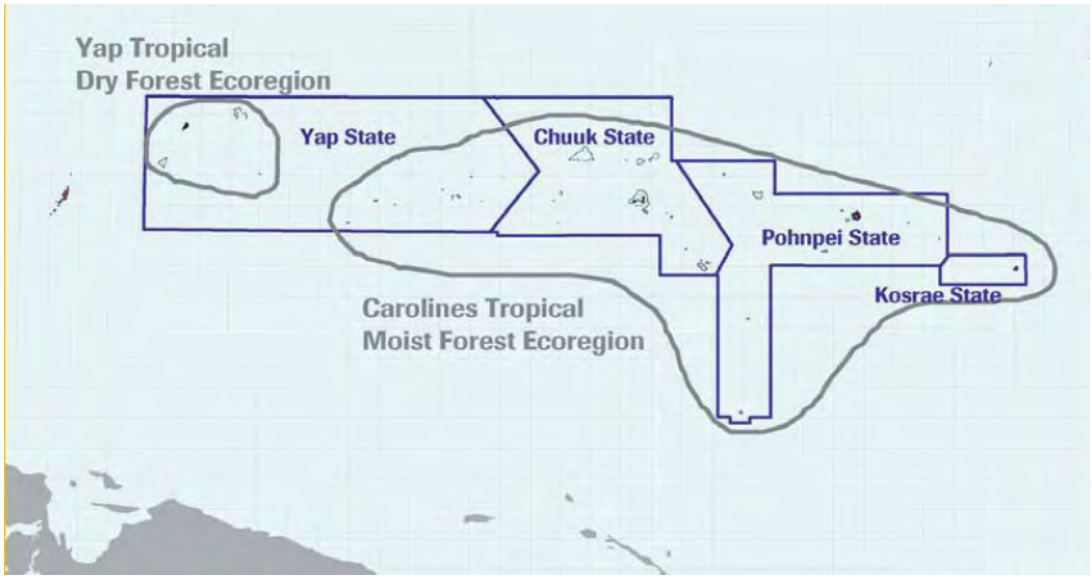


Figure 2-5: Map of FSM Ecoregions (TNC 2003)

The other three States share the Carolines tropical moist forest ecoregion characterized by heavy rainfall. Mixed broadleaf forests comprise the dominant vegetation type on the high volcanic islands. Historically, broadleaf forests almost completely covered these high islands, but people have since cleared or disturbed much of the lowland vegetation.

The islands of FSM are characterised by 12 terrestrial biomes including: 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. The country's marine biomes include: mangrove forest, estuaries, sea grass beds, lagoons, coral reefs and open ocean.

The biodiversity contained within these biomes is characterized by a high rate of endemism and large numbers of species.

2.2.2 Terrestrial Flora

Vegetation Types

Table 2-2 presents a summary of general vegetation types found across the high islands of FSM. Habitat sensitive to development disturbance as a proportion of total area ranges from:

- Mangrove - 7% (Chuuk) to 15.6% (Pohnpei)
- Swamp forest – 0% (Chuuk) to 0.8% (Kosrae)

- Upland forest – 16.2% (Chuuk) to 35.4% (Pohnpei)
- Marsh – 0% (Kosrae) to 5.6% (Chuuk)

Table 2-2: General vegetation types of FSM high islands (in Ha) (from FSM 2001)

	Kosrae	Pohnpei	Chuuk*	Yap
	1983	1983	1976	1976
Mangrove	1,562	5,525	306	1,171
Swamp Forest	345	214		155
Upland Forest	5090	12,548	677	2,556
Palm Forest		1,383		
Agroforest ***	2,585	11,865	2,378	2,538
Secondary vegetation	1,272	1,843	252	553
Grasslands		1,476	174	2,175
Marsh		149	234	165
Other nonforest **	263	490	149	403
Total Area	11,186	35,493	4,170	9,716

Plant Species

Over 1,239 species of ferns and flowering plants have been described in the FSM. Approximately 782 species are native, including about 145 species of ferns, 267 species of monocots and 370 species of dicots (Falanruw 2002). Table 2-3 presents approximate numbers of native and introduced plant species by State.

Table 2-3: Approximate numbers of native and introduced species of plants in States of the FSM (from Fosberg *et al* 1979, 1982, 1987).

Island	Ferns		Monocots		Dicots		Totals	
	Native	Introd.	Native	Introd.	Native	Introd.	Native	Introd.
Yap	45	2	144	64	187	176	376	242
Chuuk	45	3	95	61	158	108	298	172
Pohnpei	106	4	138	90	194	197	438	291
Kosrae	74	0	121	51	121	51	250	72

Over 457 species of plants, including many food plants have been introduced to the FSM with the percentage of introduced plants varying between states (Zirkus 2001). Some of these introduced species have become invasive pests that have spread out of control. The spread of invasive species is a continual threat due to increased movement of people and machinery between the islands. Table 2-4 presents a list of the key invasive weed species in FSM (FSM 2002).

A total of 364 vascular plant species that are considered endemic to Micronesia; most of them are restricted to the Caroline Islands (FSM and Palau) (Costion & Lorence, 2012).

2.2.3 Terrestrial Fauna

FSM terrestrial ecosystems support unique avian, mammalian, reptilian and other species, including:

- 119 species of birds (including 31 resident seabirds, 33 migratory shorebirds, 19 migratory land or wetland birds and five vagrant species). Several species of lizards have been introduced but thus far there has been no confirmed introductions of the brown tree snake (*Boiga irregularis*) which has decimated bird populations in Guam. Table 2-5 presents numbers of by category for each State (Engbring *et al* 1990).
- 25 mammals (including six endemic species or subspecies of bats);
- Over 27 species of reptiles (skinks, geckos, snakes) and amphibians (most of them native with at least four endemic) (Falanruw 2002); and
- 40 species of freshwater fish have been recorded in FSM (Pippard H 2012).

Introduced mammals include three species of rats, a mouse, deer, pigs, dogs, cats, and from time to time goats, rabbits and cattle, all of which can have damaging impacts on native biodiversity. There is one introduced amphibian cane toad *Bufo marinus* (FSM 2002).

Table 2-4: Top invasive weed species within the FSM

Common Name	Scientific Name	Pohnpei	Chuuk	Kosrae	Yap
	Coccina grandis	NWS			
Siam weed	*Chromolaena odorata*	WS	WS	WS	WS
Pagoda flower	*Clerodendrum paniculatum*	WS	NWS		
	Clerodendrum quadriloculare	WS	WS	WS	WS
Honolulu rose	*Clerodendrum chinense*	NWS	NWS		
Crepe ginger	*Costus speciosus*	WS			
	Merremia peltata	NWS	WS	WS	WS
Giant Sensitive plant	*Mimosa diplotricha*	WS			WS
False kava	*Piper auritum*	NWS			
African tulip-tree	*Spathodea campanulata*	WS	NWS	?	NWS
Wedelia	*Wedelia trilobata*	WS	WS	WS	WS

Notes: WS – widespread, NWS – not widespread

Several species of lizards have been introduced but thus far, there have been no confirmed introductions of the brown tree snake *Boiga irregularis* which has decimated bird and reptile populations on nearby Guam.

2.2.4 Freshwater Flora & Fauna

There is a paucity of data available on the abundance and distribution of freshwater flora and fauna in FSM. The FSM ecoregion is noted for its four endemic gobies - *Sicyopterus eudentatus*, *Sicyopterus lividus*, and *Stiphodon caeruleus* located on Pohnpei and Kosrae, and *Sicyopus nigriradiatus*is only found on Pohnpei[4]. Of these, *Stiphodon caeruleus* is the most abundant. *Sicyopterus eudentatus* is listed as 'Endangered' according the IUCN Red List (IUCN 2020).

endemism for freshwater fish is high but the number of species is generally low, especially above the first major waterfall where most euryhaline species are unable to inhabit (Parenti & Maciolek, 1993). This is thought to be largely due to the limited food base consisting of few algae and aquatic insect species hence the diversity of food types plays a significant role in the construction of an aquatic community. In Pohnpei, *Sicydiine gobies*, freshwater eels, and shrimps are typically the dominant life forms above the first waterfall in stream systems investigated[5]. Anguillid eels, Gobiid fishes and shrimps are native to Kosrean streams (unpublished interviews) but there are no published reports regarding the riverine biota.

Table 2-5: Categories of birds recorded from the four states of the FSM (after Engbring *et al.* 1990)

State	Native land and wetland residents	Resident seabirds	Non-resident seabirds	Shorebirds, migrants and vagrants	Introduced birds	Totals
Kosrae	10	5	9	16	2	42
Pohnpei	20	11	8	20	3	62
Chuuk	17	11	10	33	2	73
Yap	13	6	12	50	3	84

2.2.5 Marine Flora & Fauna

FSM coastline is about 3,300 nautical miles (Nimea 2006). The reefs, estimated at 14,517 km2, are home to more than 1,000 species of fish, more than 350 species of hard coral and 1,200 species of mollusc (FSM 2002).

Cetaceans

The EEZ of FSM has resident and transient or migratory populations of cetaceans (whales and dolphins). A total of 9 species have been observed in FSM (see Table 2-6) (Miller 2009). Of these species, blue whale *Balaenoptera musculus* is considered 'Endangered' (i.e., likely to become extinct) and sperm whale *Physeter macrocephalus* is considered 'Vulnerable' (i.e., is likely to become endangered unless the circumstances threatening its survival and reproduction improve) based on the IUCN Red List.

For the remaining cetaceans, they are either of 'least concern' or there is insufficient information to make an assessment on status.

[4] https://www.feow.org/ecoregions/details/829

[5] http://www.comfsm.fm/~brianl/research.html

Table 2-6: Cetacean Species likely passing through the FSM waters (from Miller 2009).

Species	Common Name	Category	IUCN Category
Physeter macrocephalus	Sperm whale	C2	Vu
Lagenodlphis hosei	Fraser's dolphin	C1	Lc
Tursiops sp	Bottlenose dolphin	C2	Lc
Ziphius cavirostris	Cuviers beaked whale	U	Lc
Stenella attenuate	Pantropical spotted dolphin	U	Lc
Peponcephala electra	Melon-headed whale	C1	Dd
Stenella coeruleoalba	Striped dolphin	C1	Dd
Stenella longirostris	Spinner dolphin	C1	Dd
Globicephala electra	Short-finned pilot whale	C1	Dd
Mesoplodon gingkodens	Gingko-toothed beaked whale	C1	Dd
Orcinus orca	Orca	U	Dd
Balaenoptera edeni	Bryde's-like whale	C1	Dd

Notes: C = confirmed. U = Unconfirmed. 1 refers to a relatively recent field (or specimen record) confirmation of the given species within the EEZ of a nation. 2 refers to a potential Class 1 record that is either dated, or may be marginally outside of a given EEZ. En = Endangered. Vu = Vulnerable. Lc = of least concern. Dd = Data deficient.

Marine turtles

The green turtle *Chelonia mydas* and hawksbill turtle *Eretmochelys imbricate* are the most commonly observed in the wider FSM waters, with the olive ridley turtle *Lepidochelys olivacea* and the leatherback turtle *Dermochelys coriacea* being less common (Edwards 2002).

An assessment of the conservation status of these species based on the IUCN Red List (version 3.1) indicates:

- Hawksbill turtle is 'Critically Endangered' (i.e., facing a very high risk of extinction).
- Green turtle is considered 'Endangered'; and,
- Olive ridley, leatherback and loggerhead turtles are considered 'Vulnerable'.

Seagrass

Tsuda *et al.* (1977) reported seven sea grass species in Yap, later confirmed by Tsuda & Kamura (1990), including *Cymodocea serrulata*, *C. rotundata*, *Enhalus acoroides*, *Thallasia emprichii*, *Halophila minor*, *H. ovalis* and *Syringodium isoetifolium*. In Pohnpei, Tsuda *et al.* (1977) reported two species of seagrass and McDermid & Edward (1999) reported a third species of sea grass *Cymodosia rotundata* at Nah Pali, Pohnpei. The abundance and distribution of seagrass in Pohnpei was last updated in 2005 (www.seagrasswatch.org). In Kosrae and Chuuk a total of 3 and 4 species respectively were identified in investigations undertaken in 2004 (www.seagrasswatch.org).

Mangroves

The three most common mangrove species *Bruguiera gymnorrhiza*, *Sonneratia alba* and *Rhizophora apiculata* are present on *Yap*, *Kosrae*, *Pohnpei* (Allen *et al* 2001) and *Chuuk*

(Stemmermann & Proby 1978). A total of seven (Kosrae and Pohnpei) and eleven (Yap) other mangrove species are present but are generally much less common (Allen *et al* 2001). Table 2-7 presents the distribution of the most common species by FSM State.

Table 2-7: Key mangrove species in FSM (from Stemmermann & Proby 1978).

Species	Pohnpei	Kosrae	Yap	Chuuk
Bruguiera gymnorrhiza	✓	✓	✓	✓
Lumnitzera littorea	✓	✓	✓	✓
Sonneratia alba	✓	✓	✓	✓
Rhizophora mucronata	✓	✓	✓	✓
Rhizophora apiculata	✓		✓	✓
Avicennia alba	✓	✓	✓	✓
Ceriops tagal			✓	

2.2.6 Conservation Areas

Each State has a network of currently and proposed terrestrial and marine protected areas. In addition, 130 Areas of Biodiversity Significance (ABS) have also been identified in FSM (Table 2-8) (TNC 2019). The location of these areas in each State is described in detail in the following sections.

In summary, the combined sites encompass 291,753 ha or 19% of the FSM's entire terrestrial and inshore area (including reefs and lagoon areas). Because the land area of FSM is very small, 50% of the ABS (64 sites) and a majority of the total area (61% or 178,191 Ha) are coastal marine sites connecting terrestrial and coastal targets.

Marine-only sites, largely lagoons and coral reefs, comprise the second largest area at 28% (82,620 Ha) of the total ABS area. Terrestrial sites, mainly upland native forests, make up just 8% (22,636 Ha) of total ABS area but total 23 sites. This reflects the relatively limited extent of natural terrestrial systems on small Pacific islands compared with the much larger marine systems surrounding them. Coastal freshwater areas, primarily coastal freshwater marshes, total just 3% (38,133 Ha) of the total ABS area.

2.3 Socio-Economic Environment

2.3.1 Economy

Overview FSM GDP

The National Government, for the fourth consecutive year, showed a significant fiscal surplus of $35.8 million FSM's gross domestic product (GDP) was US$1.13b, or US$3,500 per capita, in 2015. In that year there as a trade balance deficit of US$314 million, with exports at US$20.6 million (-17.8% annualized) and imports at $162 million (+15.8% since 2010) (OEC 2017). National government revenue was at its highest level ever at $166.1 million in FY2017 when both domestic revenue and external grants reached record levels. Public Law 18-107 in FY2015 amended the tax collection allocation to the States from 50 percent to 70 percent of net taxes collected for import taxes, income tax, and gross revenue tax.

The impact of this tax policy change sees a $4.8 million decline in tax revenue for the National Government from FY2016 onwards. This revenue has not been passed directly

to the States but by law is invested in the FSM Trust Fund on their behalf. It is estimated that $40 million will be invested in the Trust Fund on behalf of the States by 2023.

Table 2-8: Number and size of areas of biodiversity significance (ABS) by type and State (adapted from TNC 2019)

Species	# of ABS sites	Area (Ha)
TERRESTRIAL SITES		
Yap	3	651.9
Chuuk	9	1,328.1
Pohnpei	9	12,833.3
Kosrae	2	4,835.0
Total Terrestrial	23	22,648.3
MARINE ONLY SITES		
Yap	6	49,471.1
Chuuk	10	20,683.3
Pohnpei	5	12,480.5
Kosrae	1	54.5
Total Marine	22	82,689.4
COASTAL MARINE SITES		
Yap	21	24,007.4
Chuuk	20	77,089.9
Pohnpei	18	75,695.3
Kosrae	5	1,466.1
Total Coastal Marine	64	17,8358
COASTAL FRESHWATER SITES		
Yap	2	31.8
Chuuk	11	936.7
Pohnpei	3	5,283.1
Kosrae	4	1,904.9
Total Coastal Freshwater	20	8,156.4
OVERALL TOTAL	130	29,1752.8

FSM Strategic Development Plan- 2004-2023

The FSM's Strategic Development Plan (SDP) 2004 – 2023 provide a road map for social and economic development in FSM for the period 2004 – 2023. The SDP four main objectives include maintaining economic assistance at levels that support macroeconomic stability, improved enabling environment for economic growth - to be achieved through the FSM commitment to economic reform and the provision of an enabling environment to support open, outward - oriented and private sector led development and the use of the

annual Compact grant to support the provision of basic services in education and health (FSM 2003).

Compact of Free Association and Challenges from 2023

In 1986 FSM entered into a Compact of Free Association (Compact) with the US, which provides for US economic assistance (including eligibility for certain US federal programs) and other benefits in exchange for US defense and certain other operating rights in the FSM. The US and FSM negotiated a second (amended) Compact agreement in 2002–2003 that runs for a 20-year period to 2023, during which the US is providing roughly $2.1 billion to FSM (FSM Statistics Div 2018). The amended Compact's financial terms were renegotiated with the aim of encouraging sustainable development. Under this agreement the United States will provide almost $100 million in direct assistance every year until 2023, which includes the systematic reallocation of a portion of the direct aid to a jointly managed Trust Fund (GSO 2017). The Compact Trust Fund's total net position value increased 21.0 percent to $565.0 million in FY2017 from $466.9 million in FY2016. The increase was primarily due to interest, dividend, and realized and unrealized gains from investment of $69.3 million (OEC 2018) and contribution from the United States government of $29.5 million (FSM 2018).

About 60% of the Compact Funds supports the Government's administrative costs with the rest infrastructure projects and economic development. The public sector drives the cash economy and supports the service oriented private sector. FSM's gross domestic product (GDP) was US$1.13 billion, or US$3,500 per capita, in 2015 (OEC 2017). FSM faces a range of economic challenges as it approaches 2023, when financial assistance under the amended compact expires. The immediate challenge is to facilitate and sustain strong private sector growth through the use of its own land and marine resources. It also needs to create an enabling environment conducive to private sector development that can complement Compact Trust Fund resources and sustain FSM financially beyond 2023.

Earnings from Export

There has been increased revenue from exports with the last five reported years indicating the exports of Micronesia have changed by $88m from $41m in 2013 to $129m in 2018. The main exports of Micronesia are non-filleted frozen fish, fish fillets, aluminium plating and plating and the main destinations are Thailand, China, Japan, Philippines and Mexico. The fishing industry is highly important with foreign commercial fishing fleets paying over $16.985m annually for the right to operate in FSM territorial waters. These licensing fees account for 28% of the national government revenue and in addition, export of marine products, mainly to Japan, account for nearly 85% of export revenues.

Fishing license fees broke the $70 million level for the first time with a payment in the September quarter of $7 million for outstanding fees for 2015 and 2016 (FSM 2018) and the medium-term outlook for fishing fees is a steady $65 million per year (GSN 2018). The services sector, also a main contributor to GDP, stood at 65%. Manufacturing, as a value adding activity, was responsible for only 0.45% of the country's economy (Global Edge 2017). Yet, while the value of tuna harvested within the country's Exclusive Economic Zone (EEZ) every year is about US$200 million, the vast majority is fished by foreign vessels and the FSM earns only US$20 million annually from the sale of licensing fees.

Tourism potential

The tourism industry is another area of potential for FSM, particularly scuba diving, surfing and eco-tourism. Visitors numbered 24,125 in 2016, which represented a decrease of 20% on the previous year (Knoema. 2015). Tourism development is, however, constrained by

limited airline links and a lack of infrastructure. Some pre-historical cultural attractions of Nan Madol and Lelu ruins are special attractions for tourism in Pohnpei and Kosrae respectively. There is a need to preserve these sites for income generation through tourism (PITA 2019).

Tourism will not develop without the involvement of local villages and community members who are the major landowners in the FSM The tourism industry is another area of potential for FSM, particularly scuba diving, surfing and eco-tourism. Some 21,000 tourists visit the islands each year. Tourism development is, however, constrained by limited airline links and a lack of infrastructure. Some pre-historical cultural attractions of Nan Madol and Lelu ruins are special attractions for tourism in Pohnpei and Kosrae respectively. There is a need to preserve these sites for income generation through tourism (PITA 2019). Thee complex landownership system makes access to land difficult and risky. Both formal and informal institutions fall short in coping with the modern land market. These compounding issues have led to underutilized and unproductive lands, hampering the growth of the tourism industry (ADB 2015).

On-going support to the States of FSM

The National Government, through Congress, continues to support the States through revenue sharing initiatives, increasing from $9.4m in FY2012 to $47.7m in FY2017. FY2017 includes infrastructure allocations to the States of $15.4m and public projects of $11.0m which are a mix of infrastructure, economic and social projects (Ibid 2018). Economic activity for the four states consists largely of subsistence farming and fishing, and government which employ two-thirds of the adult working. The potential for tourism is limited by isolation, lack of adequate facilities and limited internal air and water transportation.

Governance Structure

The Pohnpei, Kosrae, Chuuk and Yap governments have exclusive power to deal with lands and leases and over the regulation of foreign investment, distribution of federal tax revenue and access to the United States (US) Compact of Free Association (Compact) grants. The FSM government is complex with three branches of government and four constitutional states with specific authority and differing legislations. The states have greater autonomy in managing their political and economic affairs. Natural resources, budgetary policies, and economic development are also managed by each state. However, national policies give recognition to individual states policies and priorities.

Each state government holds equal power in national affairs through electoral representation in the FSM National Congress. Most national political power was delegated to the four states by the FSM constitution including regulation of foreign investment and restrictions on leases. This meant that investors had to navigate between five different sets of regulations and licenses. U.S. citizens were able to live and work in the FSM indefinitely without visas under the Compact but cannot own property on most FSM State islands (Ibid, 2018).

Most States have an existing effective traditional system of governance which complements the newer systems of government and are also supported by non-government agencies (Raynor and Kostika, 2003). In most FSM states, traditional management of land, waters and

all natural resources, is through the traditional leadership system[6]. Although patterns and rules of land ownership are changing within the FSM, complex traditional systems of land tenure still predominate. For instance, in the state of Yap land ownership has traditionally involved multiple rights of use and one piece of land might belong to one person but be subject to the consent of another, be lived on by a third, and harvested by a fourth party. This complex system of land control has resulted in considerable diversity in management while preventing widespread changes to large pieces of land (Falanruw 1985).

Customary Law and Tradition

Customary law and tradition have a lot of influence on access to and use of land, as declared in the FSM National Code, in matters where recognized customary law is deemed relevant by the courts, the customary law "*shall the full force and effect of law so far as [it does not conflict with the TT laws of the or the laws of the U.S. in effect in the Trust Territory*]." Indeed, even where parties before a court have not asserted that any principle of custom or tradition applies, courts have an affirmative obligation of their own to consider custom and tradition. The Constitution of the FSM includes a "*Judicial Guidance Clause,"* requiring that decisions of the Court be "*consistent*" with the customs and traditions of the indigenous people of the FSM. FSM citizens treat land as their most significant asset. The government states that "leasing of private lands in particular can be time consuming, due to fractional ownership and uncertain boundaries and titles. Many parcels of land are held by families or clans that may have different factions, all of whom assert interest in the land (ADB 2015).

Land Tenure Arrangements

Land is part of family trusts that pass down land use rights, surface and subsurface, from generation to generation within the extended matrilineal family system. Clans hold many parcels, leading to fractional ownership and uncertain boundaries and titles. By Constitution, only citizens can own land. Domestic corporations that have non-citizen shareholders may not own land (FSM 2015).

While individual states have separate and distinct land tenure arrangements, there are some broad commonalities that persist throughout state land tenure systems. The FSM Constitution forbids land ownership to foreigners, as well as to domestic corporations that have non-FSM citizens among their shareholders (Edward 2002).

Group and communal ownership of land is prevalent throughout the FSM. There are differences, however, concerning rights of land transfer within the FSM. In Chuuk, Kosrae and Yap, land can be transferred by law to all FSM citizens. In Pohnpei, however, it can only be transferred to persons from that island (Pohnpei State 1997). Traditional and cultural institutions have a strong presence in Micronesian life. The keystone of Micronesian society is the extended family, which is collectively responsible for maintaining the family welfare—particularly as it relates to customary family land. Traditionally, land ownership in the FSM was limited to inheritance within a family or clan. As a result, many land parcels in the FSM are subject to the communal use and alienation rights of extended families, clans and communities (EMAPT 1996). Private landholders—influenced to varying degrees by customary land tenure systems, occupy most lands. The government describes landownership in the FSM as "one of smallholdings. Most property is held as family trusts, and land use rights are passed down from generation to generation within the extended family

[6]Traditional leadership and impact on land ownership at State level will be explained in detail under discussions on land under each state.

system. Subsurface property rights are synonymous with surface rights. There are no state owned subsurface mineral or water rights in any of the states (ADB 2015). Landownership is limited by the Constitution to citizens.

The government describes landownership in the FSM as one of smallholdings (ADB 2015 & FSM DOTC&I 2015). Most property is held as family trusts and land use rights are passed down from generation to generation within the extended family system. With the exception of Yap and a few atolls in Pohnpei state where patrilineal affiliations govern inheritance of land rights, matri-lineages traditionally controlled estates in Micronesia (Ryan & Les 2018). Clans tend to hold many parcels, leading to fractional ownership and uncertain boundaries and titles. In FSM subsurface property rights are synonymous with surface rights such that there are no state-owned subsurface mineral or water rights in any of the states. FSM citizens treat land as their most significant asset and leasing of private lands can be time-consuming due to fractional ownership and uncertain boundaries and titles.

Landownership is limited by the Constitution to citizens. Even domestic corporations that have noncitizen shareholders may not own land. However, noncitizen individuals and corporations may lease either public or private lands. Although it is illegal to sell lands in Pohnpei there are many recorded cases of 'gifts' of land with widely known but unrecorded concurrent payments.

In FSM the majority of land is privately owned (68%) with only 32% considered to be public land (Table 2-9). The amount of public land varies considerably between states, with only 2% of Yap state public land and the rest privately owned.

Table 2-9: FSM land ownership (Doran 2004)

	FSM		Chuuk		Kosrae		Pohnpei		Yap	
Dry land area (sq miles)	165		16.7		42.3		67.4		38.6	
Public land	52.7	32%	0.2	1%	27.2	64%	24.4	36%	0.9	2%
Private land	111.9	68%	16.4	98%	15	35%	42.8	64%	37.7	98%
Commercial land	0.5	0%	0.1	1%	0.1	0%	0.2	0%	0.1	0%

Livelihoods and income

The majority of the population live in the coastal areas of the high islands; the mountainous interior is largely uninhabited; less than half of the population live in urban areas. Most people live a rural lifestyle largely dependent on their gardens and fishing for daily food requirements, although imported food is an increasing part of the diet. People are attracted to urban centers for incomes directly or indirectly derived from offshore transfers in the form of grants from the United States (US) and other donors.

FSM is at an early stage of the process of urbanization with about 22% of its population living in the urban areas (urban areas include Colonia in Yap, Weno in Chuuk, Kolonia in Pohnpei and Lelu in Kosrae), a slight increase from the level estimated in 2000 (FSM DOS 2010). According to the 2010 FSM Census, 22,924 out of the total population of 102,843 live in the various defined urban areas across the four states compared to 79,919 in rural areas or 77% of the total population (Knoema. 2015). Visitors numbered 24,125 in 2016, which represented a decrease of 20% on the previous year.

Like many households in the Pacific, agricultural and livestock raising activities are almost universal among FSM households (95% and 82% respectively; 95% and 86% in Yap). In addition, fishing activities accounted for 71% of all households (88% in Yap). These activities were carried out for own household or family use and consumption purposes.

About 10 percent of households reported to be engaged in these activities for sale or marketing for cash. These activities were common throughout all four states, particularly the outer island households reported heavy involvement in these activities for family use and consumption.

In FSM, according to a household income and expenditure surveys in 2013/14, heads of households are primarily male (80%), with 53% of heads aged 40 – 59 years old (Table 2-10). The annual average income in FSM was estimated to be USD 16,950. However, 20% of the households earned less than US$ 2,600 and approximately 37% of household heads earned less than USD 5,000; with the majority of household heads earning between USD 5,000 –29,000. Households headed by males earn on average 9% more than female headed households (total net income excluding imputed rents) and 11% more based on cash income.

Table 2-10: Distribution of households by household head characteristics (FSM 2014)

Sex	No. HHs	Age	No. HHs	% HH	Annual total income group (USD)	% Male	% Female
Male	13,365	< 30	712	4%	<5,000	37.4%	36.7%
Female	3,312	30 – 39	2,972	18%	5,000 – 9,999	23.2%	28.2%
		40 – 49	3,993	24%			
		50 – 59	4,756	29%	10,000 – 29,000	29.2%	28.4%
		60 – 69	2,682	16%			
		70+	1,562	9%	>30,000	10.2%	6.7%
Total	*16,677*	*Total*	16,677	100%	*Total*	*100%*	*100%*

Headed households who are involved in paid work earn on average 36% more than the retired and obviously much higher than the one who work for free (might be home production for consumption or volunteers). Households in FSM are dependent on cash income as over 63% of their total income is cash with additional income (or its equivalent) gains from a range of other sources (i.e. home production, gifts, imputed rents and in-kind) (Table 2-11). The less cash dependent households are the one whose heads work for free (not for cash) as they are involved in subsistence activities for own consumption.

Table 2-11: Household income by state 2013/14 (FSM 2014)

	Total annual household income (USD 000)	Average annual income (excluding imputed rent) (USD)			Income source				
		Total	Male	Female	Cash	Home production	Gifts	Imputed rents	Income in-kind
FSM	282,683	16,950	13,311	12,208	63.1	10.3	3.4	22.8	0.4
Yap State	41,807	17,768	16,103	15,085	67.1	16.7	5.3	10.8	0.1
Chuuk State	77,726	11,398	8,858	6,197	58.6	13.2	1.8	26.2	0.2
Pohnpei State	143,042	22,293	17,033	15,517	62.6	7.9	3.8	25.1	0.6
Kosrae State	20,109	18,461	15,190	14,896	75.6	3.0	3.0	18.0	0.4

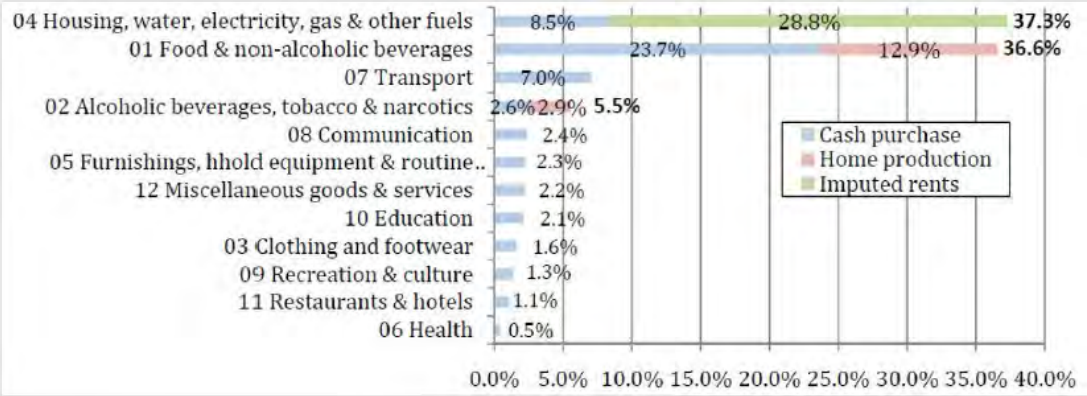
Notes: Cash: wage and salary income, business income, and sales of home production (agriculture, handicraft, livestock and/or fisheries). Home production: value of home production that the household produces themselves and then consumes. Gifts: all goods given receive are treated as income. Imputed rents: represent the value of a house for owner if they were to receive rent. Income in-kind: any income received by the household which was not in the form of cash

While approximate 55% of households report cash income from a current wage and salary job (55.5%) the most common source of income for households in FSM was the home production (mainly agriculture items) with 76% of the households involved in some form of subsistence activity. A large proportion of households also receive remittances i.e. cash from outside of FSM (41.6%).

Most household expenditure/disbursements are associated with consumption expenditure (94.1%) which represents items that the household consume itself. This analysis includes cash/in-kind purchases as well as home production consumed and gifts given away outside the household. Non-consumption expenditure accounts for only 4.9%, followed by only a small amount on investment/savings (1.0%).

The majority of consumption expenditure is associated with "housing" (37.3%) especially imputed rents (Figure 2-6, Table 2-12). Food and non-alcoholic beverages is the next most significant group (36.6%). Transport and Alcohol and tobacco (including sakau and betel nuts) account for 7.0% and 5.5% of the total household consumption expenditure respectively, with eight other divisions registering contributions lower than 3%. Only a small amount is spent on education and health due to government assistance in this area.

Figure 2-6: Household expenditure 2013/14



Notes: Cash purchases represent any purchases made by the household for goods or services for which a payment was made by the household. The payment can be made in the form of a cash payment or payment in-kind. Home production: covers the value of items which were home produced by the household and then consumed by that household. Imputed rents: represent the value of the house for owner and people who live in their main house for free (rent free)

Table 2-12: Household expenditure by State 2013/14

	Total annual expenditure (USD)		Average annual expenditure per capita (USD)	Average annual expenditure per household (USD)
FSM	237,132	100.0%	2,293	14,218
Yap State	32,471	13.7%	2,707	13,801
Chuuk State	70,637	29.8%	1,450	10,358
Pohnpei State	116,517	49.1%	3,154	18,159
Kosrae State	17,507	7.4%	3,046	16,072

Employment

The working age population at the 2919 census, defined as people aged 15 years and older, of 66,146 people represents an increase of 2,310 people (3.6%) since the 2000 census (FSM 2010 Census). The actual labor force comprised 37,919 people (22,076 males, 15,843 females) representing a national labor force participation rate of 57.3% (66%

for males, 48% females). Of this group, 31,789 people consider themselves employed while 6,130 are unemployed equating to an unemployment rate of 16.2% for FSM (15% males, 17% females).

Only 40% of households were employed in paid work, resulting in an average annual income between USD 18 – 20,000. For household where the head had no paid work, was retired, had home duties or other (60%) the average income was less than USD 13,624 (Table 2-13).

Table 2-13: Occupational status of households 2013/14

Occupation status	Average income (USD)	% cash income	No. HHs
Work for pay employee	18,365	88.2%	5,755
Work for pay – other	20,078	89.8%	871
Work – no pay	8,496	62.8%	4,705
Retired	13,624	86.6%	2,121
Home duties	7,613	72.6%	2,646
No work – other	10,623	76.7%	581
Total	*13,092*	*81.7%*	*16,677*

For those that are employed and working for salaries and wages, over half are involved in education (24.6%), public administration and defence (18.6%), wholesale/retail trade and motor vehicle repair (9.7%) and health and social work (9.1%) (Table 2-14). Very few earn a wage or salary in the fishing (1.8%) or agriculture (0.6%) sectors, as income from these sectors is generated from subsistence activities.

Transport

Priority infrastructure development projects in the ten sectors at National and State level plus project management costs, institutional projects and infrastructure maintenance represent a total investment of $1,082 million over the 10-year Plan period. For the first time a project specifically targeted at cross-sector climate change adaptation is included. This project in Yap will be followed in the future by similar projects identified through the Joint National/State Action Plan processes that are now coming on-line across the FSM (FSM 2018).

FSM has 388 km of roads, 184 km sealed and 204 km unsealed (FSM DOTC&I 2015). The majority of these roads are on the four main state islands. Few of the outer islands have any roads and islanders rely on small walking tracks to get between villages. None of the states have widely available public transportation options except for taxis, and a school bus service between Yap's capital of Colonia and smaller villages is the only significant public bus network in FSM. Road and pedestrian facilities are largely the responsibility of state departments for infrastructure/public works.

The islands of Yap, Pohnpei, and Chuuk all contain major international ports which welcome cruise and trading ships from around the world. Port development and management is the responsibility of independent authorities in Kosrae, Pohnpei and Yap that retain revenue generated from operations and have responsibility for operating costs and making investments. In Chuuk the port is the responsibility of the Department of Transportation and Public Works.

Table 2-14: Total wage and salary income by industry 2013/14

Industry	USD 000	Percent
Education	25,965	24.6%
Public administration & defence	19,571	18.6%
Wholesale & retail trade, repair of motor vehicles	10,193	9.7%
Human health & social work	9,590	9.1%
Construction	4,896	4.6%
Transportation & storage	4,597	4.4%
Accommodation and food service activities	3,779	3.6%
Financial & insurance activities	3,704	3.5%
Electricity, gas, steam & air conditioning supply	3,165	3.0%
Professional, scientific & technical activities	3,020	2.9%
Activities of extraterritorial organizations	2,949	2.8%
Information & communication	2,386	2.3%
Activities of households as employer	2,352	2.2%
Manufacturing	2,072	2.0%
Fishing	1,921	1.8%
Other services activities	1,863	1.8%
Administrative & support service activities	1,801	1.7%
Agriculture	612	0.6%
Water supply, sewerage, waste management	312	0.3%
Quarrying	255	0.2%
Arts, entertainment & recreation	231	0.2%
Forestry	87	0.1%
Real estate activities	76	0.1%
Total	105,394	

There are five major airports in FSM, with an international airport located in each state. In addition there are nine smaller airports located on outer islands, two in Yap state, three in Chuuk state and four in Pohnpei state. Airport development and management is the responsibility of independent authorities in Kosrae and Pohnpei that retain revenue generated from operations and have responsibility for operating costs and making investments. In Chuuk and Yap the airport is the responsibility of the Department of Transportation and Public Works.

According to the 2010 census, approximately 44% of Yapese household have a car, 6% a bus or truck and 2% a motorbike. In Yap, 13% of households own a boat with a motor, while 16% have a canoe or boat without a motor. Very few households in the Outer Islands (5) own a car, reflecting the lack of roads on the islands, however, they own the majority of canoes or boats without motors in Yap (76%).

2.3.2 Demographics

The last Census for FSM was in 2010 and is currently being undertaken this year, 2020. FSM's 2010 census record (DOS 2012) had a total population of 102,843 comprising 52,193 males and 50,650 females (Table 2-16). Current estimated population for FSM in 2020 is 105,503. World Bank estimate for 2019 population was 104,936 (World Bank 2016). The National Projected population based on 2010 Census and HIES survey is provided in Table 2-15.

Table 2-15: National Projected population based on 2010 Census and HIES survey (for 2010/2021)

	2020 Year			2021 Year		
National & States	Males	Females	Total	Males	Females	Total
National FSM	53,110	51,540	104,650	53,202	53630	104,832
Pohnpei	18164	18,138	36,832	18726	18170	36896
Chuuk	25,271	24,237	49,509	25315	24280	49,585
Kosrae	3411	3321	6732	3417	3327	6744
Yap	5734	5843	11577	5744	5853	11597

Long-range population projections suggest a continuation of little or no population growth for the foreseeable future. Projections to 2030 suggest no population growth from 2010 and less than 10% total growth to 2050. The level of urbanization in FSM remains relatively low at 22.9% of the total population (2020) (FSM 2018).

The average household size in FSM declined from 6.7 persons in 2000 to 6.1 persons in 2010 (Table 2-16). Similarly, average family size declined from 7.0 in 2000 to 4.4 in 2010 indicating a preference for smaller families by couples. This also reflects the decline in fertility as well, as young people delaying first marriage.

Table 2-16: Demographic information for FSM (source 2010 census).

Feature	FSM	Yap State	Kosrae State	Pohnpei State	Chuuk State
Land area (sq Km)	702	102	110		127.2
Land area (sq m)	271	45.6	42		49.2
Population	102,843	11,377	6,616	36,196	48,654
Male	52,193	5,635	3,352	18,371	24,835
Female	50,650	5,742	3,264	17,825	23,819
Average annual growth Rate	-0.40%	0.12%	-1.50%	0.48%	-0.97%
Population Density (person/sq mile)	379	247	156	274	993
Population -Percent urban	22.3	7.4	32.6	16.8	28.5
Population -Percent rural	77.7	92.6	67.4	83.2	71.5
Place of birth - FSM	96.9	94.4	93.9	95.3	99.0
Place of birth - Yap	10.5	92.7	0.1	0.6	0.0
Place of birth - Chuuk	47.6	0.9	0.4	2.2	98.8
Place of birth – Pohnpei	32.7	0.8	2.4	91.8	0.2
Place of birth - Kosrae	6.1	0.1	90.9	0.6	0.0
Median age (years)	21.5	25.1	21.6	21.8	20.7
Median age - male (years)	21.5	23.8	21.4	21.4	20.5
Median age – female (years)	21.9	26.4	21.9	22.2	20.9
Average family size	4.4	3.7	4.2	4.2	4.8
Average household size	6.1	4.9	5.7	5.6	6.9
No. of Households	16,767	2,311	1.143	6.289	7,024

2.3.3 Education

FSM runs an American style education system with free public education from age 6 through age 15 or completion of the 8th grade. High School attendance is not assured. All States administer high school entrance tests to 8th graders. Instruction is strictly a responsibility of the States with the National Government providing support and assistance. Funding for education is primarily provided through State Compact funds with some local revenue. The FSM is eligible for selected US Federal Education Programs that contribute a significant amount to the overall education budget. The FSM's only Institute of Higher Education (IHE) is the College of Micronesia-FSM (COM-FSM) located in Pohnpei (FSM 2015).

The national education agency is the FSM Department of Education. Each state has its own education agency operating public schools. The curriculum in this eight-year program includes subjects such as science, mathematics, language arts, social studies and physical education. Public elementary and secondary schools are free for all Micronesian students. There are five secondary schools (one per island) as well as several private secondary schools. In FSM, the College of Micronesia provides accredited post-secondary education from six campuses spread across all States.

Vocational education and training (VET) schools offer pathways to provide for the qualified workforce needed across all sectors of the FSM economy. Equal access to affordable, high quality VET schools is a target of FSM's Sustainable Development Goals (SDGs), with an emphasis on substantially increasing the number of youths and adults with the relevant skills for employment, decent jobs and entrepreneurship by 2030 (FSM, 2020). FSM has allocated $205.8M over a decade (2016-2025) toward the construction of new schools and school facilities throughout the islands, the single largest investment in the nation behind roads and pedestrian facilities (FSM 2020). This will be a collaborative effort between the respective Departments of Public Works and the Departments of Education[7]. In terms of bilateral aid to FSM the education sector receives the most assistance, with more than 35% of all Overseas Development Assistance (ODA) going to educational opportunities, activities and infrastructure (FSM 2020).

2.3.4 Public health

Health is a key SDG priority for FSM, highlighted by the fact that this sector has one of the highest government expenditures (21%) as a percentage of national GDP (FSM 2020). The World Health Organization (WHO) working with partners supports the Government in pursuing its national strategic priorities which include universal health coverage antimicrobial resistance by building resilient and sustainable health systems, build core capacities for proactive preparedness in health emergencies and natural disasters and, build capacity for NCD prevention and control (WHO 2018).

The Department of Health Services in each state provides medical and public health services through a hospital, community health centers and dispensaries (WHO 2018). Compared to other countries in the Western Pacific Region, the Federated States of Micronesia has relatively high coverage of health essential services (WHO 2018). Each state system is autonomous. Health services are highly subsidized by the state governments, except in private clinics.

[7] There are Boards of Education in each State and the College of Micronesia (COM) has a Board to manage its affairs. Sector coordination is undertaken through the FSM Association of Chief State School Officers comprised of the Secretary of Education, State Directors of Education and the COM President.

The National Department of Health and Social Affairs oversees health programs, including health planning, donor coordination, and technical and training assistance. It is also responsible for public health programs funded by the United States Department of Health and Human Services.

In total, there are six private health clinics in the country and one private hospital. Access to hospital services remains an issue, particularly for outer-islands residents due to transportation difficulties between islands. Furthermore, non-communicable diseases (NCDs) such as diabetes, cardiovascular diseases and cancers are major health problems.

Non-Communicable Diseases (NCDs) remain a vast and pervasive issue for the FSM, accounting for more than 70% of deaths (FSM 2020).

The overconsumption of imported packaged food, lack of physical activity and use of tobacco products are contributing to the high prevalence of NCDs and obesity in the country. Intentional (violence) injury and suicide are other issues, whose contributing factors are likely to be the burden of cultural and economic dislocation, particularly among young adult males. Alcohol use often leads to violent incidents. Tuberculosis (TB) also has a high prevalence, as does leprosy, the latter being among the highest in the Pacific.

COVID 19 Response

The implications of COVID-19 will impact the 4 states many ways, particularly noting public health, education, violence against women and children, mental health, psychosocial distress self-sufficiency and the economy. In FSM, response to the COVID-19 pandemic, people's safety and security was the priority. The President declared a public health emergency and the government established a COVID-19 taskforce and a response framework with a budget of $2.1M, and an economic stimulus package of approximately $15M to provide subsidies to businesses and to support workers in the tourism, retail and fisheries sectors. The health pandemic only added to the range of challenges faced by FSM including climate change, social and economic inequalities.

The COVID-19 pandemic has highlighted the need to shore up social protection systems and wider policies and initiatives to deliver public goods and services, particularly to the poorest and most vulnerable in the Federation (FSM Government, 2020).

2.3.5 Gender & Poverty

Ensuring that women are part of decision making at all levels, and protecting young girls, has been a sustained focus over the past decade in FSM. The development, endorsement and implementation of the National Gender Policy in 2018 has led to significant progress in government and civil society to address family protection issues.

The FSM National Gender Policy (FSM 2017) aims to ensure that all women, men, girls and boys in FSM states are respected and can reach their potential. The policy focuses on six goals: elimination of gender-based violence; better women's representation in decision-making; improved education outcomes; addressing barriers faced by women in the workforce; better healthcare and choices over fertility; and mainstreaming gender across government targets lifting the status of women to enable them to equally participate in the political, economic and social affairs of the country.

The National Gender Policy has five main goals and these include the better representation of women in decision making, elimination of violence against women, equitable education outcomes, addressing barriers women face in the workforce and access to better health care. The FSM National Youth Policy (2017-2023) also addresses young people's issues

and this also specifically includes young women. The Policy seeks to ensure opportunities to all youth to be active, responsible and self-reliant members of the community through the development of their full potential.

Poverty

Poverty and hardship exist in FSM and low-income households mostly spend their resources on food especially in Yap and Chuuk. As welfare levels rise, food share falls in all States. With more than 90% of families having access to land for farming, combined with strong cultural norms of sharing, hunger is rare in the nation. Malnutrition is likely the greater issue.

The last FSM national basic needs poverty assessment was based on the Household Income and Expenditure Survey (HIES), the most recent of which was completed in 2013/14. Although considerable progress has been made, the incidence of hardship in the FSM is still high.

The 2013/14 HIES indicates 31.4 % of the FSM population live below the national basic needs poverty line with a slight increase from 2005 to 2013 (UNICEF, 2017). Poverty levels are not uniform in the states. Children are also more likely to be vulnerable to poverty: nine per cent of children aged 0–14 years were living less than 10 per cent above the basic needs poverty line compared with 4.8 per cent of the total population (Ibid 2017).

Poverty levels are not uniform in the states. The poverty incidence is higher or more severe in Pohnpei and Chuuk than in Yap and Kosrae. This remains a challenge for FSM with a clear need to initiate projects and programs to both lift the capacity of government agencies, civil society organizations and the business community to implement projects successfully (FM 2020).

Data suggest that poverty particularly affects children and female-headed households and that poverty rates are significantly lower in Yap than in the other three states (UNDP 2014). While female-headed households constituted 20% of the household population in FSM, they constituted 39% of the total number of households in the lower three expenditure deciles (ADB 2017).

Gender Considerations

Although there are no specific discriminatory provisions in FSM law, there is no proactive approach ensuring that women are able to exercise their *de facto* legal rights. A comprehensive review carried out shortly after FSM ratified CEDAW found that with respect to 113 internationally recognized indicators of legal compliance, FSM was fully compliant on 27% partially compliant on 16 % and out of compliance on 57% of these indicators.

The concluding observation of the UN on the CEDAW discussions with FSM in 2017 identified many gaps in laws relating to gender based violence in all the 4 States (FSM 2017). In 2018, the FSM National Gender Policy had been endorsed and this will help progress gender work both at the national and state levels. The Gender Policy builds on the National Strategic Development Plan 2017-2023 which had identified the importance of inclusion of women as partners in development in FSM.

Gender relations in FSM are shaped by cultural norms and practices that vary greatly across the four states. Women rarely become traditional leaders and tend to defer to men in community affairs. In 2017 there was only one woman each in the Pohnpei and Chuuk legislature and the FSM Congress has introduced a bill (CB 20-116) that would purportedly guarantee representation of women in the FSM Congress.

Micronesian societies, with the exception of Yap and a few atolls in Pohnpei, emphasize matrilineal descent where identities, titles, rights and acquisition to property are traced through female hereditary lines. Women's rights to land ownership and their access to resources have, however, changed under the various colonial authorities that have governed FSM, with most decision making related to land ownership and land use being retained by male members of the family (SPC, 2012).

FSM has one of the highest rates of maternal mortality in the Pacific region, with all four states reporting high teenage pregnancy rates. In the FSM, maternal deaths are declining but are widely under-reported, and skilled birth attendants are in short supply in both states. Authorities recognize maternal mortality is still a problem in FSM (FSM 2017).

In the FSM gender parity in education this had been achieved at all levels, however, there is the issue of low economic participation of women. Better access to education does not translated into increased participation by women in the formal sector. This is likely due to deeply entrenched beliefs in the traditional role of women, where their role is at home (Ibid 2018).

In 2017 (Gender Policy baseline year), no women had been elected to the National government and there were only two female senators - one each in Pohnpei and Chuuk legislatures. Presence of women in higher positions in management and government is also rare. Gender norms that curtail women's opportunities to speak out and participate in decision-making are still strong (WBG 2017).

Culture and Traditions

Culture and traditions are revered in FSM and are constitutionally protected in the national and state constitutions. Article V, Section 2 provides: the traditions of the people of the Federated States of Micronesia may be protected by statute. If challenged as violative of Article IV, protection of Micronesian tradition shall be considered a compelling social purpose warranting such governmental action. This provision is mirrored in Article II, Section 2 of the Kosrae Constitution; Article V, Section 2 of the Pohnpei Constitution; Article IV, Section 1 of the Chuuk Constitution, and Article III, Section 2 of the Yap Constitution.

Each FSM state exhibits its own distinct culture and tradition, but there are also common cultural and economic bonds that are centuries old. For example, cultural similarities are evidenced in the importance of the traditional extended family and clan systems found on each island. Although united as a country, the people are actually a heterogeneous mixture, with different customs and traditions bound together by recent history and common aspirations (SPREP 2018). Cultural diversity is typified by the existence of eight major indigenous languages, and the people continue to maintain strong traditions, folklore and legends (FSM 2019).

Traditional gender norms, the patriarchal society and marriage practices such as early and forced marriage perpetuate GBV. Customary practices such as mediation and reconciliation disadvantage survivors of GBV prioritising community harmony over the harm caused to them and their needs and rights (FSM 2020).

Gender- Based Violence

The legal rights of women are protected under the FSM National Constitution and the constitutions of the four states, all of which prohibit discrimination on the grounds of sex. There is no national legislation criminalising sexual assault, however, each state has

identical legislation criminalising both sexual assault with penetration and sexual intercourse with girls under the age of 13.

State women's councils have been active in a range of women's rights areas including the elimination of violence against women and children. State women's councils have rotationally hosted National Women's Conferences, which result in an outcomes document of resolutions to government on a range of actions to progress the situation for women.

Gender based violence is relatively low in FSM. In 2016 it was estimated that 33% of women have experienced physical and/or sexual violence from their intimate partner (ADB 2016) and stakeholders reported that Domestic Violence Law of 2017 is not being implemented. Victim protection facilities are non-existent (in some states there are reported designated safe houses however they are not equipped for habitation) and protection processes are unclear. Also commonly reported during consultations was age consent issues as age of consent regulations are not enforced. The consent age has been recently lifted to 16; however, Human Trafficking law defines a child as any person below the age of eighteen (ESIA 2019).

In many parts of FSM, GBV towards women is normalised and socially and culturally accepted. While there is no data specific on Sexual Exploitation and Abuse (SEA) and workplace Sexual Harassment (SH) 65.2% of women agreed with at least one circumstance when a man has the right to leave his wife (FSM 2020).

As part of efforts to strengthen national prevalence data across the Pacific region, Family Health and Safety Surveys have recently been conducted in most Pacific Island Countries and Territories (PICTs) including FSM. These national surveys provide insight and confirm the experience of women in FSM who have been working to address GBV, highlighting that rates of intimate partner violence and non-intimate partner violence against women are high. The national survey also confirms attitudes held by men and women that support and excuse GBV towards women. There remains a gap in national prevalence data on other forms of GBV including workplace SH, SH towards women in public places, SEA, forced prostitution and human trafficking for the purpose of SEA (FSM 2020).

Surveys indicate one in five women in Pohnpei and one in four women in Yap have experienced violence at the hands of a loved one and these are below the National average. The prevalence rate of 'ever partnered'[8] women in Chuuk is above the national average at one in two and in Kosrae is higher again at close to three women in five (FSM 2018). The FSM government increased its capacity to generate sex-disaggregated data and to use gender statistics to guide national policy and decision-making, evaluation and learning and human rights reporting. This resulted from support from SPC's Progressing Gender Equality in the Pacific (PGEP) project (PWO 2020).

The FSM Maritime Project (ESIA 2019), consisting of maintenance and upgrades to existing infrastructure at primary ports across the four States, concluded that it is unlikely that there will be significant environmental and social impacts. However, influx of foreign workforce during the implementation phase and the increase in visiting fishing fleets during post-implementation, have a potential to cause harm or harassment to host communities including incidents of human trafficking.

There has been very little data collected on the levels of violence against women across FSM, since 2014 (UNFPA 2014) and increasing reports of domestic violence cases and

[8] Women who have ever been married, ever lived with a man or are currently with a regular male sexual partner.

gender-based violence is widely considered to be one of the primary human rights issues facing the FSM. Incest and child abuse both exist in FSM but are believed to be under-reported due to cultural sensitivities. The government has acknowledged the need for reliable data on the nature and incidence of domestic violence against women.

Human Trafficking

The FSM is a source country for women subjected to trafficking with women from FSM trafficked to Guam and mainland USA.

FSM has a national policy on human trafficking supported by anti-trafficking legislation at the national level and in all states. Two states have approved state-level action plans to implement the FSM National Action Plan and the government created an anti-trafficking coordinator position to oversee government anti-trafficking work (PWO 2020).

However, the FSM Government does not fully meet US Government minimum standards for the elimination of trafficking but is making significant efforts to do so demonstrating overall increasing efforts resulting in Tier 2 status (USSD 2029). As reported human traffickers are known to exploit domestic and foreign victims in FSM and from FSM abroad. Although the government established an anti-human trafficking division within the Department of Justice minimum standards in several key areas have not been met such as comprehensive standard operating procedures (SOPs) for proactive victim identification and referral to protection services.

Women's groups in all four states have lobbied extensively over the years for legislation that protects women from domestic violence and marital rape. In their concluding observations to the FSM government, the CEDAW Committee raised concerns about the discriminatory provisions particularly in relation to sexual offenses against women in the penal codes and conditions of employment in the labour laws in FSM.

2.3.6 Sites of Archaeological & Historical Value

A total of 26 of the buildings, sites, districts, and objects in FSM have been listed on the US National Register of Historic Places.

2.3.7 Infrastructure

Potable water

Piped water systems in FSM consist of two basic types. Systems, which use streams consist of a small intake across the stream, a raw water main to the treatment plant (for those systems which incorporate treatment) and a transmission and distribution network (SPREP 2019). Water treatment is by rapid filtration followed by chlorination. Only 5 systems out of about 70 identified have treatment facilities, and most systems supply untreated water. Table 2-17: Major water systems in FSM (from SPREP 2019). identifies key water systems in FSM.

Groundwater systems usually consist of a production borehole fitted with a submersible pump and a transmission and distribution network. A chlorine injection procedure is sometime incorporated into the system at the wellhead. A total of about 90 boreholes are present in the main islands. Table 2-18 identifies the key wells and production capacities. Underground formations are not conducive to the development of high yielding wells. However, the hydrogeology is considered suitable for multiple, low to medium yielding wells and the quality of ground water is mostly excellent.

Table 2-17: Major water systems in FSM (from SPREP 2019).

Water System Name	Location	Population on Served	Source of Water	Type of treatment
Kolonia	Pohnpei	1,900	Nanpil River and Wells	Sedimentation, Filtration and Chlorination
Palikir	Pohnpei	1,600	Wells	None
Weno	Chuuk	10,000	Pou River and 32 wells	None
Colonia	Yap	3,150	Gitam Reservoir and wells	Coagulation, Sedimentation, Filtration and Chlorination
Gagil – Tomil	Yap	1,700	Wells	Chlorination
Southern	Yap	900	Wells	Chlorination
Tofo/Lelu	Kosrae	2,927	Tofol and Innem River	None
Malem	Kosrae	1,257	Malem River	None
Utwe	Kosrae	1,152	Pulusrik River	None
Tafuyat	Kosrae	407	Tafuyat River	None
Yekula	Kosrae	430	Yekula River	None
Mutunte	Kosrae	1,360	Mutunte River	None
Walung	Kosrae	100	Walung River	None

Table 2-18: Production Capability of Operational Wells.

Location	No. of wells in Operation	Production Capability (gpd)
Kosrae	4	331,000
Chuuk	32	1,600,000
Pohnpei	11	700,000
Yap	13	900,000

Sewerage Systems

There are five sewerage systems in FSM, which serve Kolonia town in Pohnpei, Weno Island in Chuuk, Colonia town in Yap, Lelu town in Kosrae and the Tofol administrative area in Kosrae. Table 2-19 presents an overview of waste management infrastructure.

Table 2-19: Overview of waste management infrastructure in FSM

States	Public sewer system					Residential sewer system (population served)	
	Treatment process	Design capacity (MGD)	LPS/ GPS/ ES	Length of sewer/ size (Miles)	Population on served	Septic tank / cesspool	Pit latrine and others
Pohnpei State						8,500 (20%)	20,500 (57%)
PUC wastewater system	Extended aeration activated sludge	*0.8 – av.* 1.6 - max	5 – lps 2 - es	11.6	7,000		
PFC	Extended	.0066	1	0.5	12 tonnes		
	Aeration				Tuna, 1 hotel & staff		
Palikir	Septic tank w/ leaching field				700 employee		
Chuuk State							
Weno Island	Primary treatment	*0.75 – av.* 1.5 – max.	21 (old) 15 (new)	11.3 6.0 (new)	5,000 (8.6%)	8,300 (14.4%)	45,000 (77%)
Yap State						1,000 (9%)	6,400 (56%)
Yap Central	Imhoff	0.35	11		4,000 (36%)		
Kosrae State						4,500 (57.7%)	1,500 (19.3%)
Tofol	Oxidation on pond	0.015			1,800 (23%)		
Lelu	Small bore sewer and marine outfall						

Solid Waste Management

There are limited solid waste collection facilities in each of the principal islands of each state and dumpsites are located in the main centres of Pohnpei, Yap and Chuuk and in each municipality of Kosrae (Johnston 2011). According to Johnston (2011), none of these facilities approaches what could be considered an acceptable landfill. In each state the government has plans to develop a new landfill site but has been constrained by land availability and funding availability. The situation is most critical in Chuuk where the current dumpsite is neither secure nor environmentally acceptable (DOTC&I, 2004).

2.3.8 Noise & Vibration

There is limited noise and vibration monitoring data available for the FSM states. Noise data was collected for the Pohnpei Port Development Project and is outlined in Table 2-20: Noise data for the Pohnpei Port Development Project (from ADB 2013).

Table 2-20: Noise data for the Pohnpei Port Development Project (from ADB 2013)

Sampling Location	Noise Level (dBA)	
	Day	Night
Kolonia Town area (urban)	48.2	34.7
Min. Temperature	54.7	45.8

Figure 2-7 presents typical noise levels and sources. Both locations are typical of 'quiet' to 'moderately loud' noise environments.

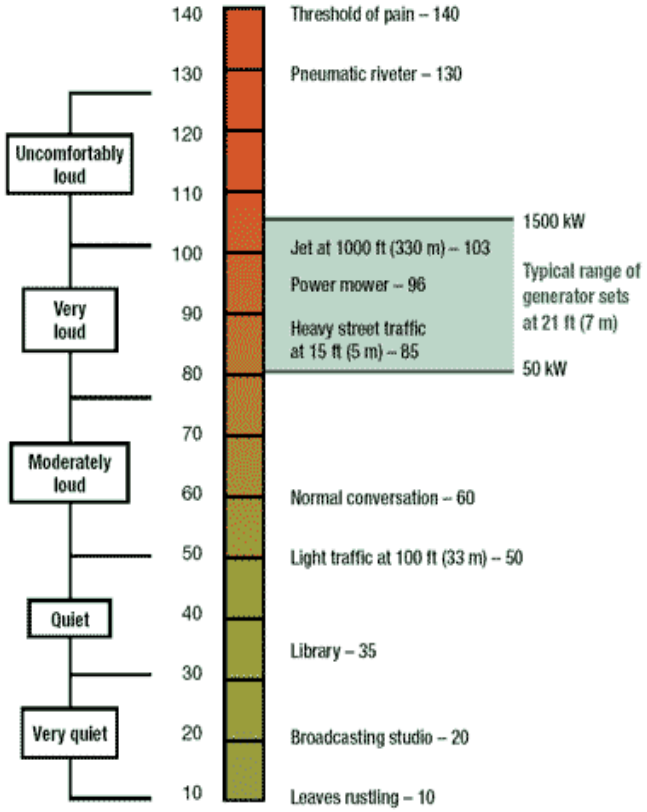


Figure 2-7: Typical noise levels and sources (Source: http://800nonoise.com/tutorials/generator-set-noise-solutions/)

The British Standard BS 5228-2:2009 outlines human response guidelines for vibration effects (Table 2-21). Any vibration generated from Project activities would need to be compliant with these (or similar) guidelines.

Table 2-21: Human response guidelines for vibration effects (from British Standard BS 5228-2:2009)

Vibration level (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

2.3.9 Air Quality

There is a paucity of air quality monitoring data for FSM states. Table 2-22 presents World Health Organisation air quality guideline (WHO AQG) concentrations for a range of key parameters which will be required to be met in relation to the current Project.

Table 2-22: Relevant WHO air quality guideline concentrations for key parameters

Parameter	Averaging period	Air quality criterion
PM_{10}	24 hour	50 µg/m^3
	Annual	20 µg/m^3
$PM_{2.5}$	24 hour	25 µg/m^3
	Annual	10 µg/m^3
SO_2	10 min	500 µg/m^3
	24-hour	20 µg/m^3
NO_2	1-hour	200 µg/m^3
	24-hour	400 µg/m^3
	Annual	40 µg/m^3

3. Kosrae

3.1 Physical Environment

3.1.1 Climate

Table 3-1 presents key climate data for Kosrae (from https://en.climate-data.org/). The key point to note is the abundant rainfall Kosrae receives annually (542 cm).

Table 3-1: Key climate statistics for Kosrae including temperature (°C) and rainfall (mm)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Temperature	27.5	27.5	27.4	27.2	27.4	27.4	27.2	27.5	27.4	27.5	27.5	27.5
Min. Temperature	24.8	24.8	24.7	24.5	24.6	24.5	24.2	24.3	24.2	24.3	24.4	24.7
Max. Temperature	30.2	30.2	30.1	30	30.2	30.3	30.3	30.7	30.7	30.8	30.6	30.3
Rainfall (mm)	399	485	500	583	491	453	446	415	383	344	414	510

3.1.2 Topography, Geology, Soils & Hydrology

Kosrae has a total area of approximately 112 km^2. The steep mountainous interior, which has four peaks ranging in height from 465-620 m above MSL, is covered with lush tropical rainforest. Around much of the island there are continuous mangrove swamp forests and seaward coastal strands. The island is surrounded by a broad shallow carbonate platform much of which is covered by freshwater swamps, mangrove forests and low coral land and beach strand (US Army Engineers 1989).

Kosrae is a volcanic high island with relatively flat and narrow coastal plains extending from the foothills to the shore. Soils are typically brownish red in color, mostly fine granular clay depending on the bedrock and can be deep in places. The parent rock is mostly Olivine or Benhaline basalt, and in places is porous and slaggy. Carbonates compose the majority of reef environments which include fringing reefs, lagoon floor, barrier reef, and deep passes. Figure 3-1 presents the distribution of highly erodible soils based on soil type and slope. The yellow and olive brown areas are considered to be the most highly erodible (Takesy 2014).

Figure 3-2 presents the location of key watersheds and rivers in Kosrae. The most significant rivers on Kosrae are the Finkol, Innem, and Okat. A number of other smaller perennial and intermittent streams and springs also occur around the base of the volcanic part of the island.

3.1.3 Groundwater

Groundwater is currently not an important water source on Kosrae as relatively little water seeps through the soil and into cracks and pores in the volcanic rocks . In some parts of the coastal fringe, wells tap a shallow layer or lens of freshwater underlain by saltwater. However, these wells only rarely provide drinking water because their water quality is poor.

There are a number natural springs that are highly respected as sources of water of excellent quality and has substantial groundwater resources (FSM/UN 1995, Jenson & Heitz 2004).

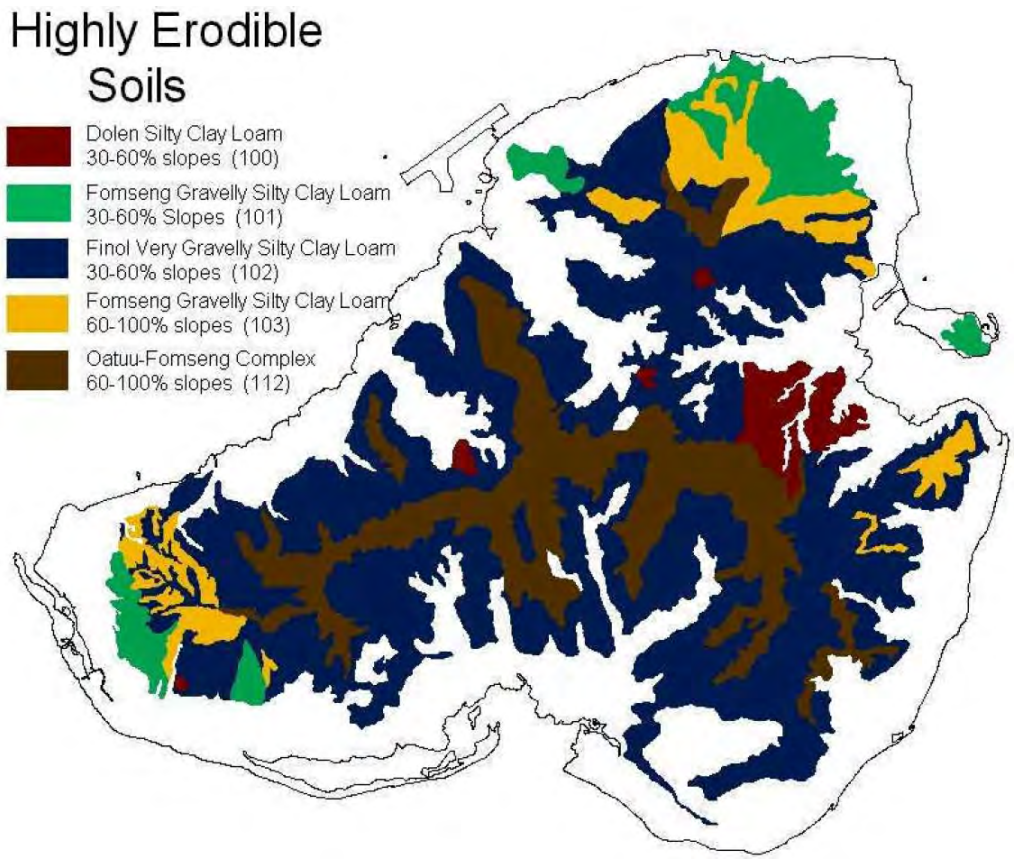


Figure 3-1: Distribution of highly erodible soils (from Takesy 2014)

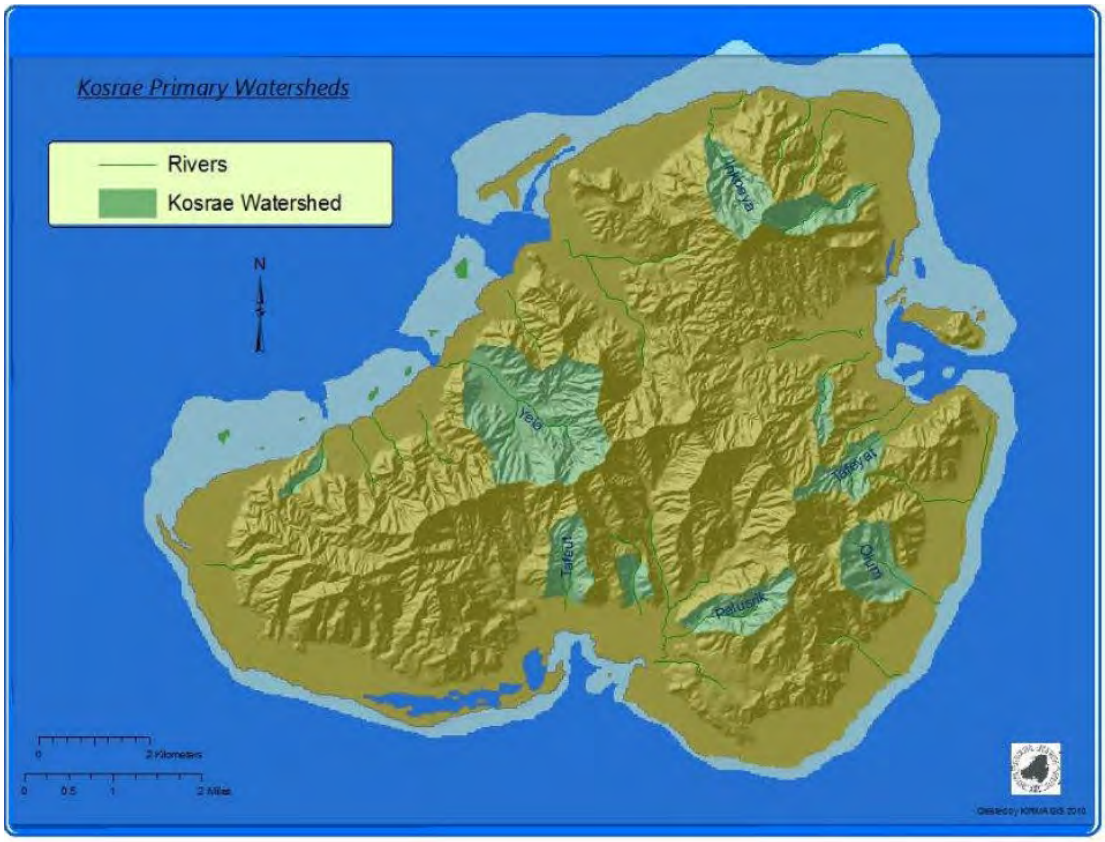


Figure 3-2: Digital Elevation Model with Important Watersheds of Kosrae (from FSM 2010)

3.1.4 Coastal Hazards

An investigation of the impacts of coastal change and inundation in Kosrae has been undertaken previously (Ramsay & Douglas 2000). A number of areas were identified where coastal change-related impacts are likely to be most significant either due to ongoing movement of the shoreline and/or the proximity of key infrastructure to the shoreline (see Figure 3-3) including:

- **Lelu -** Large changes have occurred in the shoreline position at Finfokoa over the last half century and continued changes in shoreline position are expected. Continued retreat of the coastline along the central section at Pukushruk will likely increase the exposure of the road to damage over time. Similarly the proximity of the road to the shoreline at Putukte suggests it will be susceptible to damage during periods of large waves and high tides.
- **Malem –** The length of road exposed at Pal and Mosral will continue to increase (to the south) with damage from erosion and wave overwashing. At Mosral if the concrete outlet continues to deteriorate reducing its effectiveness as a "groyne" the coastline to the north of the Mosral River could retreat more rapidly. A pattern of ongoing slow shoreline retreat is likely along much of the Malem coast particularly at Yeseng, Kuplu and from Yewak to Tenwak. At Yewak/Pilyuul, where the Pilyuul River would have originally discharged before being deflected north, there is a risk that ongoing retreat will increasingly expose the road to damage.
- **Utwe -** The Impuspusa coastline is relatively stable but experiences episodic storm damage which, over time, may increase the potential for damage to the road where it is located close to the shore.
- **Tafunsak –** The position of the shoreline at Finfoko and Wiya is relatively stable but the proximity of the road to the shore means it is susceptible to storm-related damage. At the western end of the seawall at Tafunsak downdrift erosion is undermining the road.

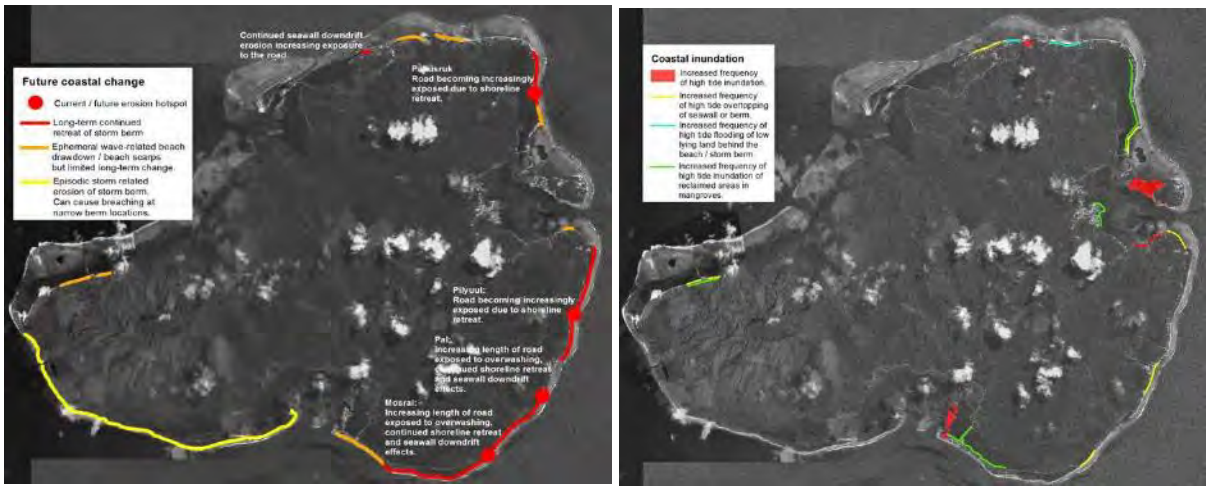


Figure 3-3: Key locations and types of coastal change likely to be experienced (left) and where coastal inundation issues are expected to increase (right) on Kosrae

3.2 Biological Environment

3.2.1 Terrestrial Ecology - Flora

The vegetation of Kosrae (Falanruw 2002) is dominated by the following (see Table 3-2: Types of plant communities in Kosrae):

- Cloud forest, which is considered unique given the number of endemic species present.
- Native upland forest characterised by *Campnosperma* species.
- Palm trees, a component of forests which occur in dense stands especially in areas where the primary forest has been disturbed.
- Freshwater marsh and riverine systems with grasses, sedges and herbs growing in standing water most of the year and generally located in areas slightly above sea level and are often just inland of mangroves.
- Swamp forests occur where soils are inundated with fresh or slightly saline water. They are most commonly found just inland of mangroves, above tidal influence but lower in elevation than the surrounding terrain.
- Mangrove forests.

There are over 322 plant species in Kosrae of which 250 species are native, many of which are endemic to one or more islands in the FSM.

Table 3-2: Types of plant communities in Kosrae

Community Type	Area (ha)
Mangrove Forest	1,562
Swamp Forest	345
Upland Forest	5,090
Agroforest *	2,538
Secondary vegetation	1,272
Other non-forest	263
Total Area	11,186

Notes: * includes coconut plantations.

Figure 3-4 presents a map showing the distribution of key terrestrial habitat classes (from Weeks 2019).

Three IUCN listed threatened (one 'Endangered' and two 'Vulnerable') and one near threatened (NT) flora species are present in Kosrae (Table 3-3). Of these species, one species (NT) is not endemic to Kosrae, but instead a cultivar from the islands of Pohnpei and Chuuk (Ivory nut palm *Metroxylon amicarum*). Two of the threatened species are lowland forest tree species (thorrot *Intsia bijuga* and lach *Pterocarpus indicus*) with *Pericopsis mooniana* from coastal forest and *Cycas micronesica* from closed forest. The other threatened species is the hornwort *Dendroceros japonicas*. The endemic tree species *Terminalia carolinensis* (ka), also found in Pohnpei, is protected in Kosrae.

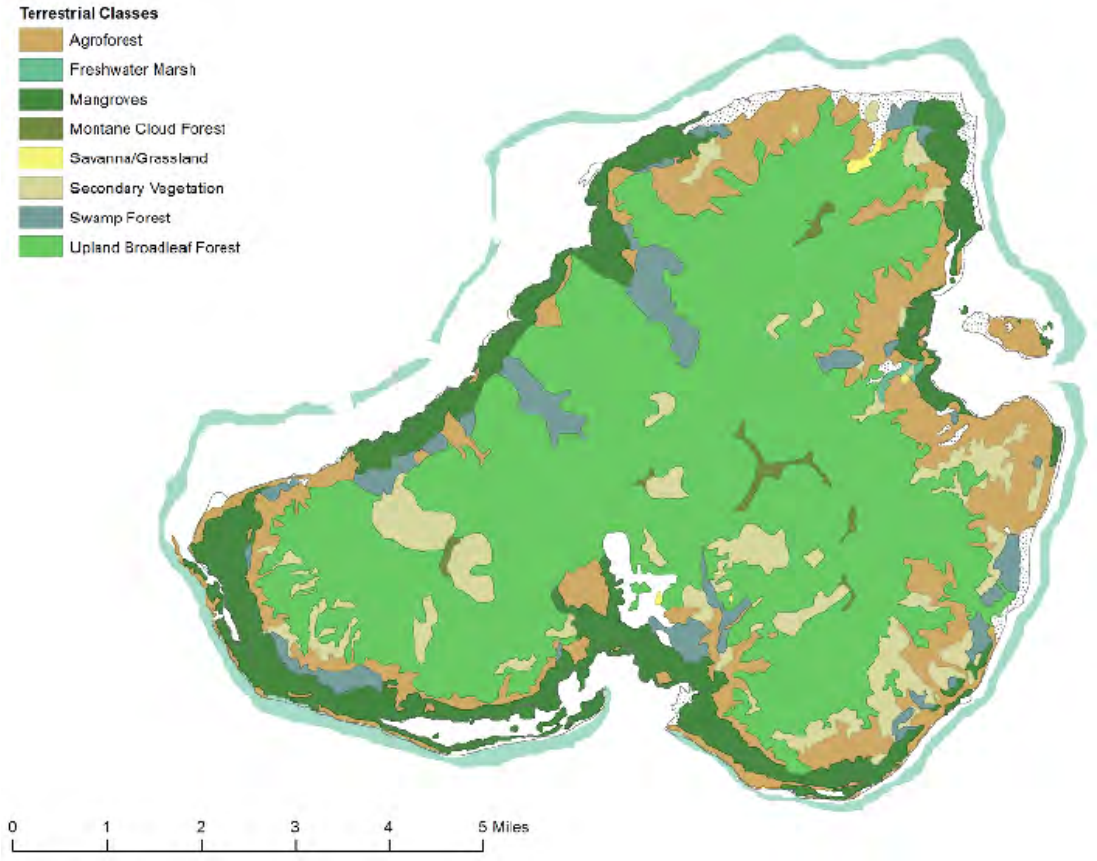


Figure 3-4: Location of key terrestrial habitat classes in Kosrae

Rare, regionally significant or protected flora species

In addition to IUCN listed species, Kosrae supports 18 endemic plant species (Costion & Lorence 2012) (see Table 3-4) with a further 20 found only in the Eastern Carolines (Kosrae, Pohnpei and Chuuk) and one species only found in Kosrae, Pohnpei and Palau. In addition, 19 endemic species are found across the Caroline Islands (FSM and Palau) including Kosrae.

3.2.2 Terrestrial Ecology - Fauna

Rare, regionally significant or protected species

Kosrae has six endemic bird species (Table 3-5):

- Two species are now extinct as they were last recorded in the 1800s: Kosrae Starling *Aplonis corvine* and Kosrae Crake, *Zapornia monasa*; and
- The other four endemic species are considered to be relatively common in their restricted range and are considered of 'Least Concern': Caroline Reed-warbler *Acrocephalus syrinx*, Caroline Swiftlet *Aerodramus inquietus*, Kosrae Fruit-dove *Ptilinopus hernsheimi* and Kosrae White-eye *Zosterops* cinereus.

Table 3-3: Threatened or near threated flora species of Kosrae (Falanruw 2002 & IUCN 2018)

Common name	Scientific name	IUCN Category	Comments	Habitat
	Dendroceros japonicus	Endangered	Recorded from Taiwan, central Japan (Honshu, Kyushu, Shikoku, Tokunoshima Island, Yakushima Island, Nansei-shoto (Ryukyu islands) and Ogasawara (Bonin) Islands and Kosrae (FSM)	Grows on tree-trunks or (more seldom) on rocks in temperate and subtropical evergreen forest
"thorrot"	*Intsia bijuga*	Vulnerable	Produces one of the most valuable timbers of South East Asia	Lowland rainforest tree
"lach"	*Pterocarpus indicus*	Vulnerable	Widespread tree	Found in lowland primary and some secondary forest, mainly along tidal creeks and rocky shores.
Ivory nut palm	*Metroxylon amicarum*	Near Threatened	This tree species is endemic to the islands of Pohnpei and Chuuk but is cultivated more widely. Also occurs on Guam, but the lack of local name indicates that it is probably not a native species.	A few trees have been planted in moist areas in Kosrae. Occurs from sea level up to 550 m asl.

Table 3-4: Endemic plant species specific to Kosrae (Costion & Lorence 2012).

Species	Distribution	Form	Notes
Endemics limited to Kosrae			
Selaginella kusaiensis	Kosrae	Herb	often occurring along rocky stream banks or moist rocky outcroppings
Elaphoglossum kusaiense	Kosrae	Herb	
Peperomia kusaiensis	Kosrae	Epiphyte	epiphytic in the cloud forests of Kosrae
Agrostophyllum kusaiense	Kosrae	Epiphyte	Orchid
Bulbophyllum fukuyamae	Kosrae	Epiphyte	Orchid
Bulbophyllum kusaiense	Kosrae	Epiphyte	Orchid
Phreatia kusaiensis	Kosrae	Epiphyte	Orchid
Rhynchophreatia pacifica	Kosrae	Epiphyte	Orchid
Robiquetia kusaiensis	Kosrae	Epiphyte	Orchid
Pandanus amissus	Kosrae	Tree	
Pandanus kusaicolus	Kosrae	Tree	
Polyscias subcapitata	Kosrae	Tree	
Cyrtandra kusaimontana	Kosrae	-	
Medinella diversifolia	Kosrae	WL	
Psychotria hosokawae	Kosrae	Tree/shrub	
Psychotria rhombocarpa	Kosrae	Tree/shrub	
Planchonella micronesica	Kosrae	-	
Elatostema fenkolense	Kosrae	Herb	

In addition, there are two additional restricted-range bird species including the 'Critically Endangered' migratory species Beck's petrel *Pseudobulweria becki* and the Micronesian Imperial-pigeon *Ducula oceanica* which is considered 'Near Threatened'. Kosrae may also be visited by 19 IUCN listed migratory bird species including two species considered 'Endangered', six 'Vulnerable' and 11 'Near Threatened' species.

Other rare, regionally significant or protected fauna species include:

- Two endemic species of bats of the genus Pteropus occur in Kosrae state; the Kosrae flying fox *Pteropus ualanus* – 'Vulnerable') and Kosrae fruit bat (*Pteropus mariannus ualans* –'Endangered') both of which are endemic (Table 3-6).
- Three threatened reptiles are known to occur in Kosrae: two migratory marine turtle species that nest on beaches and the Micronesia saw tailed gecko (*Perochirus*

ateles) which is endemic to the Marianas Islands and FSM and listed as 'Vulnerable' (Table 3-7).

- Two 'Endangered' freshwater fish species that may occur in Kosrae including the Japanese eel Anguilla japonica previously recorded as a vagrant in FSM and *Sicyopterus eudentatus* a large, herbivorous riverine goby which is endemic to Kosrae and Pohnpei (Table 3-8).

Table 3-5: Restricted-range and threatened birds of Kosrae (Birdlife International 2018, IUCN 2018)

Common name	Scientific name	IUCN Category	Comments	Habitat
Non-migratory species				
Kosrae Starling	*Aplonis corvina*	Extinct	*Aplonis corvina* was **endemic** to Kosrae. It is only known from two specimens collected in 1828 and was extinct by 1880.	Its inhabited mountain forests.
Kosrae Crake	*Zapornia monasa*	Extinct	Zapornia monasa was **endemic** to Kosrae. Two specimens were collected in 1827-1828, and the species was regarded as uncommon then. It declined to extinction over the next half-century.	It inhabited coastal swamps and marshes, taro patches and "continually wet, shadowy places in the forest.
Beck's Petrel	*Pseudobulweria becki*	Critically Endangered	Only known from Papua New Guinea and Solomon Islands. Has been seen in the Vanuatu archipelago. May occur in FSM as the extent of its breeding range and at-sea distribution is still unknown	Marine species that is likely to nest in burrows on the slopes of high mountains on larger islands, but may also breed on small islets
Micronesian Imperial-pigeon	*Ducula oceanica*	Near Threatened	This species occurs in the Micronesian islands of Palau, Yap, Chuuk, Pohnpei and Kosrae, including many small offshore islands. It is probably extinct on Kiribati and many or all of the Marshall Islands. There were estimated to be 572 birds on Yap, 51 on Chuuk, 822 on Pohnpei, 7,474 on Kosrae in 1983-1984. Numbers on Pohnpei are known to have declined by about 70% between 1983 and 1994. The population on Kosrae is inferred to have declined less severely due to the lower rate of forest loss and smaller human population on that island.	Forest species, found predominantly in the mountains of Pohnpei and Kosrae, but widespread where not hunted, including secondary forest, beach forest and mangroves.
Caroline Reed-warbler	*Acrocephalus syrinx*	Least Concern	**Endemic** to FSM	Found in subtropical/tropical dry grasslands but has also been recorded in subtropical/tropical moist montane forest and rural gardens
Caroline Swiftlet	*Aerodramus inquietus*	Least Concern	**Endemic** to FSM and is described as common to abundant. The population on Kosrae has not been	Found in caves and subterraean habitats (non-aquatic) but can also occur in subtropical and tropical moist lowland forest
			quantified but the species's population in the rest of its range is estimated to be 83,500 individuals.	
Kosrae Fruit-dove	*Ptilinopus hernsheimi*	Least Concern	**Endemic** to Kosrae and RMI	Prefers subtropical/tropical mangrove vegetation above high tide level but also found in subtropical/tropical moist lowland forest, subtropical/tropical moist forest and rural gardens
Kosrae White-eye	*Zosterops cinereus*	Least Concern	**Endemic** to Kosrae	Found across a range of habitats including subtropical/tropical moist lowland and degraded former forests, subtropical/tropical seasonally wet/flooded grasslands, dry savanna, subtropical/tropical moist shrubland, plantations and arable land

Table 3-6: Threatened mammals of Kosrae (IUCN 2018)

Common name	Scientific name	Category	Comments	Habitat
Kosrae fruit bat	*Pteropus mariannus ualans*	Endangered	Endemic to Kosrae Island	Found in areas of native tropical forest, coastal strand, and mangroves. roosting within healthy forest – both atoll and upland forests
Kosrae flying Fox	*Pteropus ualanus*	Vulnerable	Endemic to Kosrae Island	Natural history of this species is not well known. Suggested that it is similar to *Pteropus mariannus* in that it forms congregations in native forest and mangrove habitats.

Table 3-7: Restricted-range and threatened reptiles of Kosrae (IUCN 2018)

Common name	Scientific name	Category	Comments	Habitat
Hawksbill turtle	*Eretmochelys imbricata*	Critically Endangered	Migratory species. Has a circumglobal distribution throughout tropical and, to a lesser extent, subtropical waters of the Atlantic Ocean, Indian Ocean, and Pacific Ocean	Marine species that nests on insular and mainland sandy beaches in more than 70 countries worldwide
Green turtle	*Chelonia mydas*	Endangered	Migratory species. Has a circumglobal distribution, occurring throughout tropical and, to a lesser extent, subtropical waters Listed as Endangered on US Endangered Species Act 1973	Marine species that nests on beaches in more than 80 countries worldwide
Micronesia saw-tailed gecko	*Perochirus ateles*	Vulnerable	Species is distributed throughout the Marianas Islands (including Guam, where it is now presumed to be extinct); FSM where it is present on about a third of the islands (including Yap, Truk, Chuuk, Pohnpei, Kosrae, Kapingamarangi Atoll); and the Marshall Islands.	This species has been collected from palm leaf axils, in shrubs and bushes, and under loose flaking bark on standing trees. It is apparently highly arboreal and appears to be somewhat adaptable, occurring on islands where the only vegetation consists of coconut and breadfruit trees, as well as in natural forest.

Table 3-8: Threatened fishes of Kosrae (IUCN 2018)

Common name	Scientific name	Category	Comments	Habitat
Japanese eel	*Anguilla japonica*	Endangered	Migratory species. Occurs as a native species in Japan, China, Taiwan and Korea. The range of this species extends from the southern Pacific coast of Japan and further south to Hainan Island covering large areas of mainland China, Taiwan and the Republic of Korea. It has been recorded as a vagrant in FSM.	The species is catadromous, spending its lifetime in freshwater, estuaries and coastal environments, including rivers, streams and wetlands, but migrates thousands of kilometres to spawn
	Sicyopterus eudentatus	Endangered	Endemic to the FSM where it is known from Pohnpei and Kosrae Islands. This species is amongst the least common, if not the rarest, of the gobies in Pohnpei and Kosrae rivers. It used to be found in the Nanpil-Kiepw river. However, in 2001, no specimens were found in the Nanpil-Kiepw river and only one specimen was found in the Senipehn River at 92 m.	This is a large, herbivorous riverine goby. The species is found in rivers on rocky substrates and feeds on algae.

3.2.3 Coastal Marine Ecology

Kosrae is surrounded by a broad shallow carbonate platform much of which is covered by freshwater swamps, mangrove forest and low coral land and beach strand. The carbonate platform is of recent reef origin and extends between 1 – 5 km out from the islands volcanic shoreline boundary. Three lagoons or embayments bisect the reef platform, the largest of which is Lelu Harbor off the east coast. The floor of the harbour is deep, mostly in excess of 20-30m and is blanketed by fine silts and muds. Figure 3-5 presents a map showing the distribution of key marine habitat classes in Kosrae (from Weeks 2019).

Mangrove Forests

Mangroves are a significant coastal habitat and play an important role in coastal biological diversity, erosion control and are a natural barrier of protection for the islands such as Kosrae (Falanruw 2002). They also play an important role in trapping sediment moderating the effects of excessive storm runoff on the surrounding reef system.

Mangrove and lowland swamp forest occupy relatively large areas between the basaltic uplands and seaward beach strands. There is 1,562 ha of mangrove forest in Kosrae which represents 14% of the total land area (Cole *et al* 1999). Eleven mangrove tree species, including one hybrid, are present on the island of which *Sonneratia alba*, *Bruguiera gymnorrhiza* and *Rhizophora apiculata* are the most common (Allen *et al* 2001.)

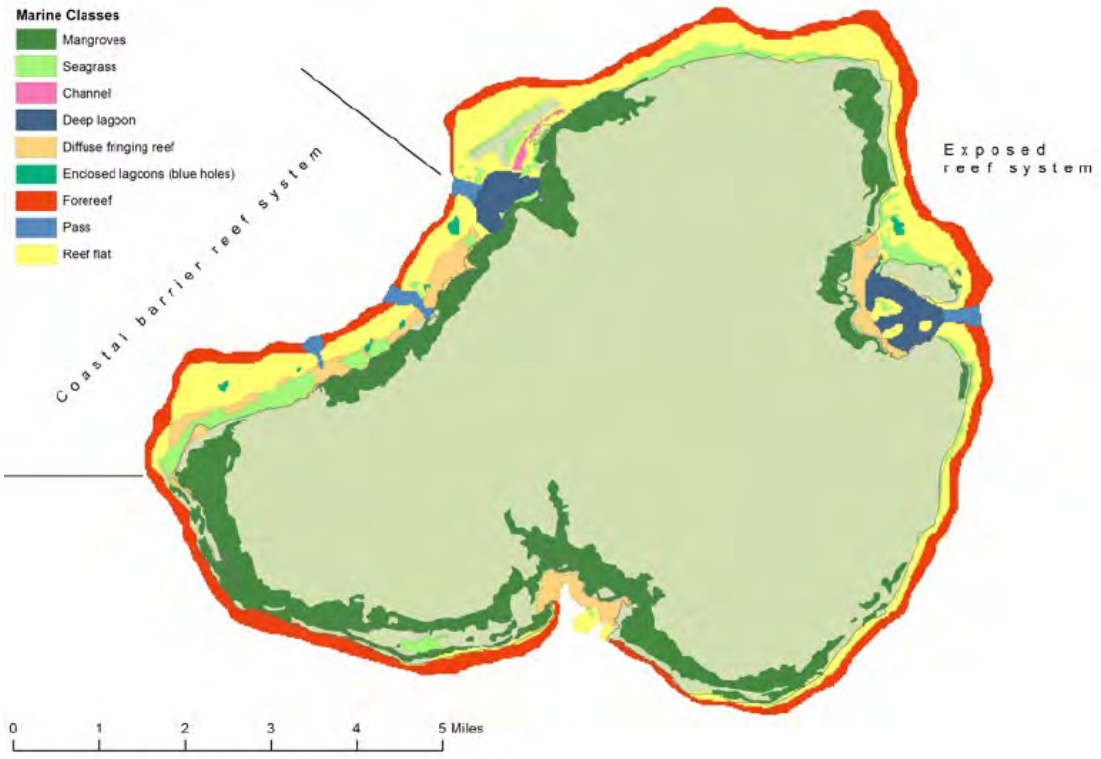


Figure 3-5: Location of key terrestrial habitat classes in Kosrae (from Weeks 2019)

Mangrove forest is most extensive along the south and north west coasts, and in Lelu Harbour, while lowland swamp forest occurs mainly along the southeast coast. Much of the forest occurs behind a protective coastal strand. The most widespread anthropogenic disturbance is harvesting of trees for fuelwood and poles which is done selectively and generally creates small, dispersed gaps. Other forms of anthropogenic disturbance, such as modifications of coastal landforms, alterations of freshwater inflows, road construction and conversion to residential or agricultural uses are still relatively minor but have led to some irreversible losses (Allen *et al* 2001).

The swamp forests have been modified in some areas over time by development for agroforestry, cutting of timber and clearance for house construction.

Seagrass

Sea grass beds are present on fringing reef flats primarily along the north and west coasts. Like mangroves, seagrass acts as a trap for terrigenous sediments and provide important habitat for a range of invertebrate and fish species. Four species have been identified; *Cymodea rotundata*, *Enhalus acoroides*, *Thalassia hamprichii* and *Holdule uninervis (see* www.seagrasswatch.org).

In the late 1960's and early 1970's, causeway construction on the reef flat between Kosrae and Lelu islands is considered to have adversely affected Lelu Harbour. The causeway blocked water circulation and fish runs into inner Lelu Harbour leading to a decline in seagrass and fish catches. The environmental effects of construction activity are possibly still impacting nearshore areas with shore erosion, reduced water flow and restoration still occurring at Lelu Harbour.

Reef Systems

The inner reef systems which extend beyond the mangrove fringe and terrigenous sediments are dominated by calcareous sand and rubble deposits which support seagrass

beds (Edwards 2002). The middle to seaward portion is frequently covered by coral rubble, shingle tracts etc. On windward reefs (north and east facing), the outer edge of the reef platform is covered by a solid reef pavement grading to sloping spur-and-groove formation in the surf zone where robust corals and coralline algae are abundant. Steep reef slopes and terraces with abundant coral growth and high diversity extend beyond the spur and groove formation. On leeward facing reefs this formation is less developed or absent altogether and a coral-rich reef slope descends abruptly beyond the outer edge of the reef flat.

Soft Bottom Benthic Communities

Rudimentary embayments bisect the reef platform at several places including Lelu Harbour which measures 3km long by 2 km wide. The floor is in excess of 20-30m deep and covered in fine muds and silts. These softer sediments are likely to be dominated by a range of infaunal and epifaunal invertebrates.

The deeper reef slopes of the Harbour are dominated by talus slopes of coral rubble with live coral more conspicuous on the steep mid-level and upper portions of the walls.

Threatened & Protected Species

Several species of giant clam are under threat in FSM due to the high levels of exploitation. One species, *Tridacna gigas* has been extirpated in FSM. Other species, such as *Hypoppus hypoppus* are also being depleted and like the *T. gigas*, they are being cultured for restocking of reef flats.

As described in Section 3.3, the green turtle *Chelonia mydas* and the hawksbill turtle *Eretmochelys imbricata*, are 'threatened' and 'critically endangered' respectively. However, these species are known to be harvested throughout FSM.

3.2.4 Conservation Areas

Kosrae has 8 Protected Managed Areas (PMA) and 12 Areas of Biological Significance (Figure 3-7) including two terrestrial, one marine, five coastal marine and two coastal freshwater ecosystems, totalling 8,261 ha (Table 2-8). Three officially protected terrestrial areas include:

- Yela Ka Forest is a conservation area of ka trees (*Terminalia carolinensis*) in the Yela Valley. A conservation easement, the first achieved outside the Americas, protects 78 acres of the 1,400 acre valley (Figure 13).
- Olum Watershed Protected Area is an ABS site (310.3 ha) with native upland forest that includes cultural and historical sites. The area is managed by KIRMA in partnership with landowners.
- Mahkontowe Conservation Area was enacted into Kosrae State Law 11-156 on June 7, 2018. This area refers to a 15 km^2 area which hosts a variety of significant cultural, archaeological, and natural aspects (Figure 11).

Table 3-9 identifies informally and formally protected areas.

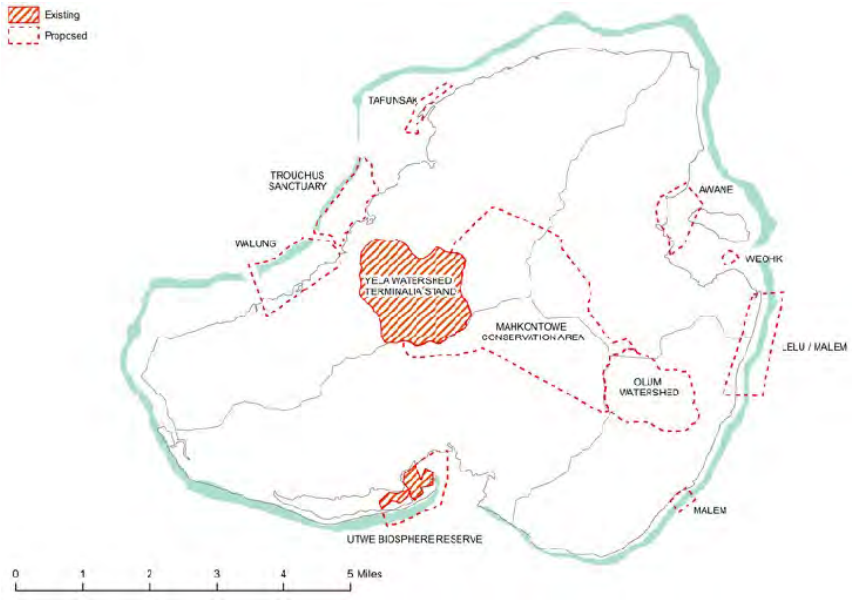


Figure 3-6: Existing and proposed protected areas (from TNC 2019)

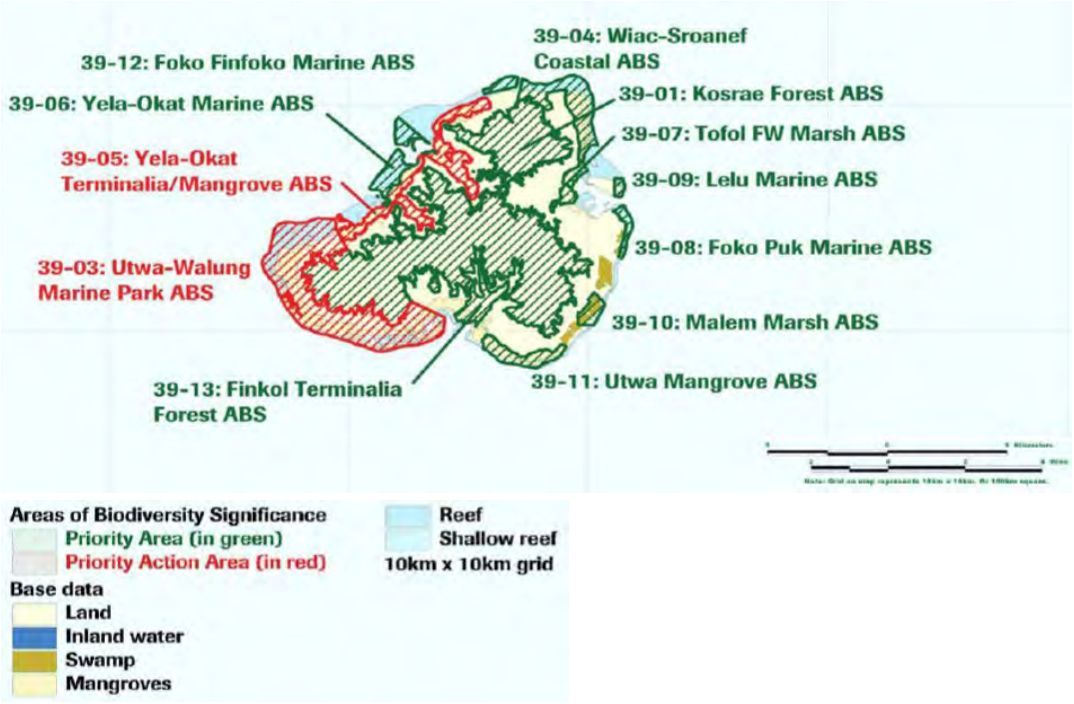


Figure 3-7: Areas of Biological Significance in Kosrae (from TNC 2019)

Table 3-9: Protected areas of Kosrae

0	Protected area name	Terrestrial or Marine	Area (ha)	Gazetted
1	Tafunsak	Marine	58.8	yes
2	Utwe Biosphere Reserve (includes the Utwe- Walung Marine PA)	Marine	130.88	yes
3	Awane	Marine	131.2	yes
4	Tukasungai (Trochus niloticus) Sanctuary	Marine	277.8	yes
5	Olum Watershed PA	Terrestrial	310.3	yes
6	Pikensukar MPA	Marine	20	no
7	Kuuplu Mangrove Forest Reserve	Terrestrial	44.8	no
8	Tofol Watershed Area	Terrestrial	305.9	no
9	Tukunsruh MPA (Mangrove Forest)	Marine	150A	no
10	Yela Ka Forest	Terrestrial	520.3	yes
11	Mahkontowe Conservation Area	Terrestrial	1,500	yes

3.2.5 Rivers & Watersheds

Figure 3-2 presents the distribution of key watersheds and rivers in Kosrae (FSM 2010).

3.2.6 Invasive Species

Figure 3-8 presents the known locations of Kosrae's priority action invasive species which include the starburst bush *Clerodendrum quadriloculare*, bitter vine *Mikania micrantha* and castor bean plant (Tangan tangan) *Ricinus communis* (FSM 2010). Other, more dispersive species have not been mapped.

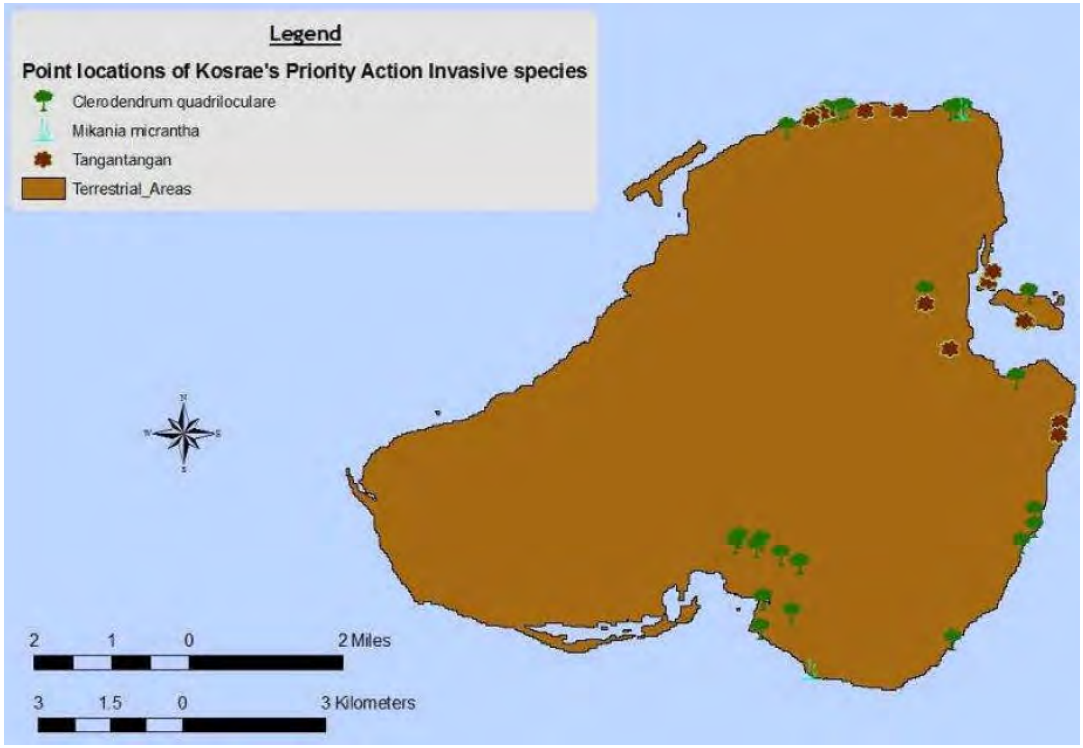


Figure 3-8: Incidence of targeted invasive species in Kosrae (U.S. FS and the FSM (2010)

3.3 Socio-Economic Environment

3.3.1 Economy

The major economic sectors of Kosrae are marine resources, tourism, and agriculture. Subsistence farming and fishing remains very important to most families. The public sector greatly depends upon the economic assistance of the United States through the Compact of Free Association.

The public sector plays a central role in the economy, the national and state-level governments employ over half of the country's workers and government services and public enterprises account for 38% of GDP. In 2013 the Kosrae Strategic Development Plan: 2014 – 2023 (KSDP) was finalized, recognizing the needs and aspirations of the Kosrae community and stakeholders in Kosrae. The KSDP takes a 10 year view of Kosrae and its place in Federated States of Micronesia. Kosrae's GDP growth has declined by 0.7% per annum since the beginning of the Amended Compact. A major issue is the size of the public sector in the economy, accounting for 40 percent of GDP activity. These factors suggest the Kosrae economy is in a highly volatile state as it approaches 2023 and has no significant financial reserves to fall back on.

Kosrae's GDP in 2015 was estimated at USD$14.6 million (or USD$1,963 per person). Major economic sectors in the State of Kosrae are marine resources, tourism, agriculture and small scale businesses. The combined output from these sectors contributed to an estimated USD$1.6 million, or 10% of the state products. The State Government owns and operates all infrastructure facilities, health facilities, and most education services, small enterprises, and an extensive commercial activity in the fishery.

The subsistence economy is based on small-scale horticulture and fishing. These two activities are not mutually exclusive as most farmers are also fishermen. Some have livestock for food production. This traditional subsistence economy is still vital for the Kosraean's. Remittances from family overseas also supplement the household income especially those with subsistence production and or no employment.

3.3.2 Land Tenure and Access

In Kosrae, land rights may be legally sold to FSM citizen. The FSM Constitution forbids the ownership of land by foreigners but they are permitted to lease land. Multiple ownership of land still exists throughout the FSM, requiring the consensus of families, clans and traditional leaders for leases and development. This can present a constraint to development depending on the ability to achieve consensus.

The Kosrae Constitution took effect on January 11, 1984. The Kosrae Constitution contains a provision where stated rights may be superseded where "*when a tradition protected by statute provides the contrary.*" The Constitution also stipulates that court decisions "*shall be consistent with this Constitution, State traditions and customs, and the social and geographical configuration of the State."* The emphasis on protection of natural land resources is a unique feature of the Constitution. This emphasis has made it possible for Kosrae to enact an island-wide land use program supported by law.

Article XI, § 5 deals with the issue of eminent domain and compensation for land appropriated by the government and authorizes the State Government to "*acquire interests in private land for public purpose without the consent of the interested parties.*" Such an acquisition may occur upon "*upon payment of fair compensation and the State Government's showing that the land and the interest are highly suited to their intended use, that it has made a good faith effort to gain the consent of the interested parties, and that it has made every reasonable effort to avoid substantial hardship to the interested parties in consideration of their personal circumstances.*

Article XI, § 6 designates rivers and streams as public property, and authorizes the State Government to regulate their use in the public interest.

Article XI, § 7 limits ownership of land to a specified class of individuals and states that only a person who is a citizen of the Federated States of Micronesia and Kosraean by descent including by adoption or a corporation which is wholly owned by such persons, may acquire title to land in the State. Acquisition of title by persons whose status as Kosraean by descent is based solely on adoption shall be within limits set by law. Acquisition or utilization of interests in real property may be restricted or regulated by law.

Article XI, § 8 states that "*[n]o certificate of title shall be issued to the State Government for land consisting of the road and adjacent areas except where the State has actual titl*e." A certificate of title previously issued to the State for such land is voidable upon application by the landowner holding title provided that any prior use agreement between the State Government and the private landowner shall be reinstated according to its terms until modified."

3.3.3 Demographics

Kosrae has a total population of 6,616 consisting of 3,352 is males (50.6%) and 3,264 (49.4%) female (FSM 2010 census) (Table 3-10). With an average annual growth rate of -0.40%, the greatest rate of change of all the FSM states, this is a reflection declining economy resulting in population movement interstate (Pohnpei) or to other countries.

Table 3-10: Demographic information for FSM (source 2010 census)

Feature	FSM	Yap State	Kosrae State	Pohnpei State	Chuuk State
Land area (sq Km)	702	102	110		127.2
Land area (sq m)	271	45.6	42		49.2
Population	102,843	11,377	6,616	36,196	48,654
Male	52,193	5,635	3,352	18,371	24,835
Female	50,650	5,742	3,264	17,825	23,819
Average annual growth Rate	-0.40%	0.12%	-1.50%	0.48%	-0.97%
Population Density (person/sq mile)	379	247	156	274	993
Population -Percent urban	22.3	7.4	32.6	16.8	28.5
Population -Percent rural	77.7	92.6	67.4	83.2	71.5
Place of birth - FSM	96.9	94.4	93.9	95.3	99.0
Place of birth - Yap	10.5	92.7	0.1	0.6	0.0
Place of birth - Chuuk	47.6	0.9	0.4	2.2	98.8
Place of birth – Pohnpei	32.7	0.8	2.4	91.8	0.2
Place of birth - Kosrae	6.1	0.1	90.9	0.6	0.0
Median age (years)	21.5	25.1	21.6	21.8	20.7
Median age - male (years)	21.5	23.8	21.4	21.4	20.5
Median age – female (years)	21.9	26.4	21.9	22.2	20.9
Average family size	4.4	3.7	4.2	4.2	4.8
Average household size	6.1	4.9	5.7	5.6	6.9
No. of Households	16,767	2,311	1.143	6.289	7,024

In addition, a number of other key points regarding the demographics of Kosrae:

- With a population of 6,616, Kosrae is the smallest state by population in FSM and has the lowest population density of all the FSM states (156 persons/sq mile).
- The distribution of Kosrae's population varies considerably between rural (4,456 people) and urban (2,160) areas with the population in both rural and urban areas declining growing at an average annual rate of -1.34% and -1.82% respectively.
- The greatest population in Kosrae is located in Lelu municipality (22.7%) followed by Tafunsak (32.0%), Malem (20.4%) and Utwe (13.9%)52. Figure 3-9 shows the location of urban areas on Kosrae and municipal boundaries.
- the average household size (5.7) is slightly smaller than the national average, as is the average family size (4.2).
- the official language is Kosraean with English used in government discourse with 90.1% of the population speaking English and 90.7% speaks Kosraean.
- The median age in Kosrae was 21.5 years.

- There are 1,143 households in Kosrae. Of these: 1,1079 households (94%) source power from a public utility; 990 (87%) have access to drinking water via public or community water supply or household tank; 1119 (98%) are connected to a sewer or have a septic tank; 872 (76%) have access to a car, bus/truck or motorbike; 490 (43%) have access to a mobile phone; and 246 (22%) have access to a computer, with 156 (14%) having access to the internet.

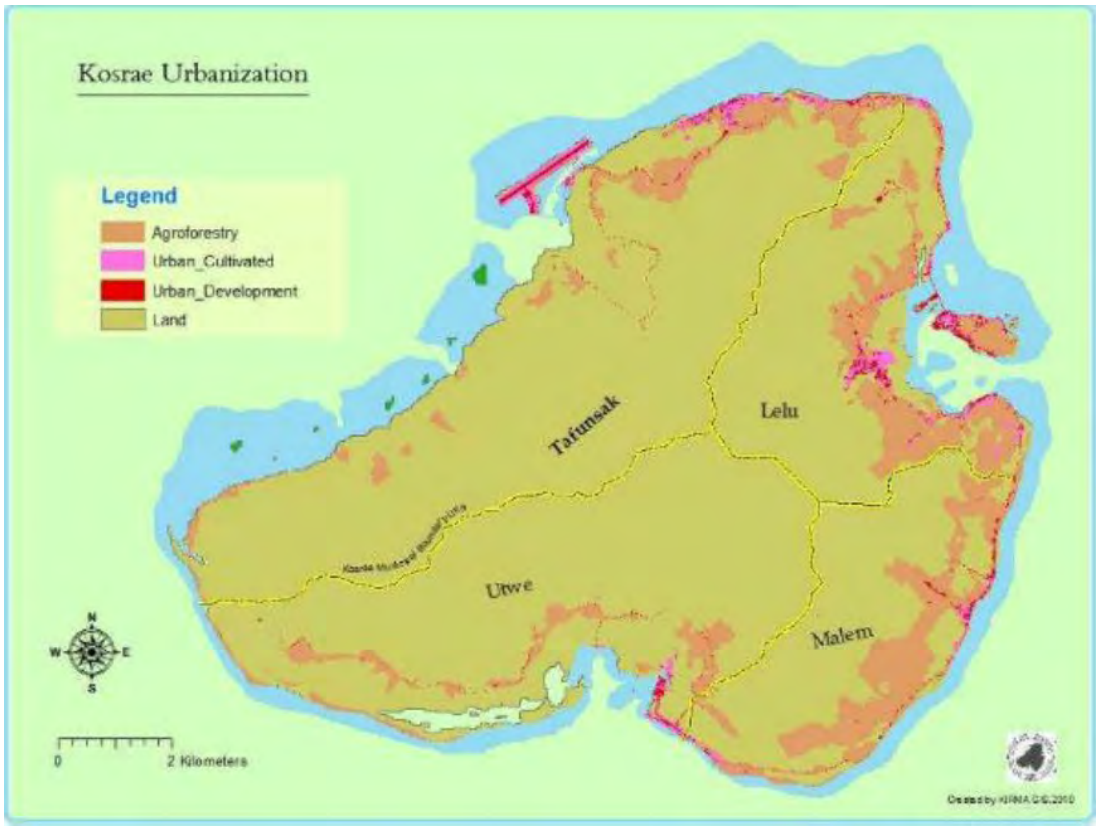


Figure 3-9: Urban areas in Kosrae

3.3.4 Education

Education in the FSM is compulsory for children aged 6 to 13 (elementary school). The national education agency is the FSM Department of Education. Each state has its own education agency operating public schools. The curriculum in this eight-year program includes subjects such as science, mathematics, language arts, social studies and physical education. Public elementary and secondary schools are free for all Micronesian students. There are five secondary schools (one per island) as well as several private secondary schools. In FSM, the College of Micronesia provides accredited post-secondary education from six campuses spread across all States.

According to the 2010 census, in Kosrae, 101% of 6-13-year olds go to elementary school (indicating students repeating years), 93% of 14-17 year olds attended high school and 25% of 18-24 year olds attend college. The 2010 FSM census also showed that 85% percent of Kosraean's aged 25 years and over had completed elementary education; 55% had completed high school, and 39% had attended college or other higher-level education institute with approximately 16% graduating. A further 2% were recorded as never having attended school.

3.3.5 Fisheries – Related Industries

Commercial & Artisanal Fisheries

There are no large-scale inshore commercial fishing operations in Kosrae. Small scale commercial game fishing charters catering for tourists is allowed. Much of the local small-scale fishers capture fish principally for household consumption and secondarily as an additional income stream.

Dive Industry

In 1997 a series of mooring buoys were installed around the Kosrae coast in anticipation of increased diving and fishing pressure on the surrounding reefs (see Figure 3-10). These sites are used by local dive operators as part of a small dive tourism industry, with a subset used for regular monitoring of the health of coral reef by Kosrae Island Resource Management Authority (KIRMA).

Figure 3-10: Locations of moorings in Kosrae indicating key dive sites

3.3.6 Sites of Archaeological & Historical Value

Figure 3-10 presents the locations of historical sites in Kosrae. Several heritage sites have been identified in Kosrae that are identified in the US National Register of Historic Places (Table 3-11).

Figure 3-11: Locations of historic sites in Kosrae

Table 3-11: Heritage sites listed on the US National Register of Historic Places

Name on the Register	Date listed	Location	Municipality	Description
Leluh Ruins	August 16, 1986	Address Restricted	Lelu	Leluh is a major prehistoric and historic archaeological site, encompassing the remains of a city on Lelu Island, a satellite of the larger island of Kosrae. The remains are those of a civilization that peaked around the 14th and 15th centuries, with elements still visible at the time of European contact in the early 19th century. The rulers of Leluh gradually conquered and thus unified the island of Kosrae. From the capital at Leluh, they ruled the island with a monarchy that archaeologists believe was similar to the kingdoms of Tonga or Hawaii.
Safonfok	February 17, 2002	Address Restricted	Walung	Safonfok is a prehistoric archaeological site near Walung. At the time of its discovery in 1999, it was one of the largest prehistoric industrial complexes found in the islands of the Pacific. The site, whose full extent has not been fully determined, was excavated in 1999-2000, revealing a major complex where an estimated hundreds of workers manufactured coral fishhooks and other tools.
Likinlulem	April 14, 2004	Walung 5°17'32"N162°54'40"E 5.292361°N 162.911111°E	Walung	Likinlulem is a major archaeological site in Kosrae. The site encompasses more than 2.8 ha on either side of Likinlulem Stream on the island's southwestern coast, in an area that is now overgrown mangrove swamp. It includes at least nine large enclosures with extensive internal features, a channelized stream, canoe landing, and a large open platform that is subject to inundation at high tide. Occupancy of the site has been dated to 1200-1800 CE, with one area possibly dating as far back as 1000 CE. The site is an important element of the island's oral history as it was here that its paramount chiefs are said to have held court prior to the ascendancy of Leluh c. 1400.

3.3.7 Infrastructure

Piped water systems from rivers serve 7 areas in Kosrae, a total population of 6,633 (see Table 2-17). The Lelu sewerage system provides small bore sewers which receive effluent from household septic tanks. Collected sewage is delivered to a pumping station. The Tofol sewerage system collects sewage from Government buildings and provides oxidation ponds treatment which has a capacity of 15,000 gallons a day

Quarries

Kosrae has 20 permitted privately-owned quarry sites (see Figure 3-12). Only Quarry #16 at Tenwak (locally-known as Puk Quarry) has a rock crushing machine and a sorter (see Figure 3-13). The current quarry output is approximately 40m^3 / day with 80% being 1" crushed gravel. DOTC&I have stated aggregates (for asphalt) used in past road paving

projects in Kosrae have been imported but that the local quarries should be able to provide quality fill materials as base course. This needs to be confirmed however.

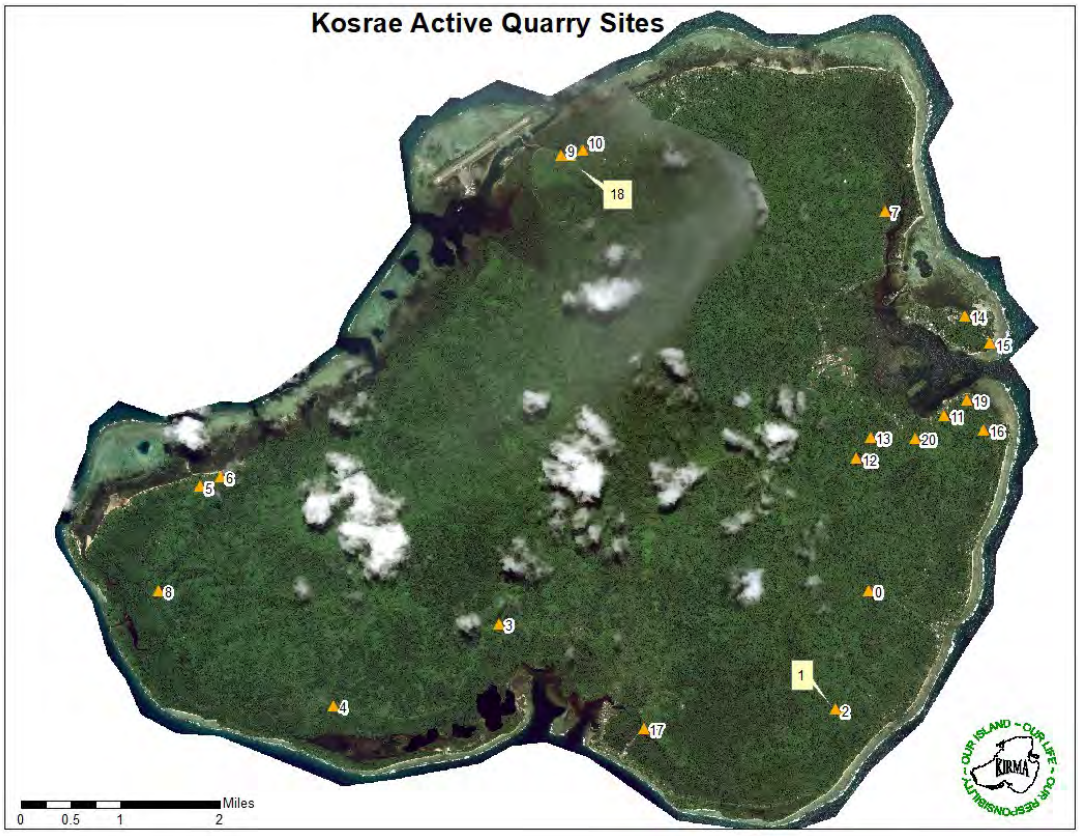


Figure 3-12: Quarry site locations in Kosrae

Figure 3-13: Images showing infrastructure at Puk quarry

Solid Waste Management

The solid waste facilities in Kosrae consist of five dumpsites and an aluminium can compaction and storage facility (FSM DOTC&I 2004). The dumpsites include:

- Lelu Municipality dumpsite which is the largest of the five and occupies a hillside opposite the KUA power plant. . This is the only site to have a public collection service. A dump truck is employed for roadside collection of trash along the circumferential road, two times per week.
- The Tafunsak Municipality dumpsite, a small area located east of the airport and commercial port.
- The Malem Municipality dumpsite, a small area located south of the Lelu causeway along the circumferential road.
- Very small dumpsites located at Utwe and Walung village.

In all cases the dumpsites are located near residential and/or administrative areas and none are fenced or any evidence of an organised operation. No state government body is specifically charged with responsibility for solid waste management, but this role is taken on by default by the Department of Public Works.

Further investigation is required to determine whether the solid waste facility has the ability to dispose of any waste roading material generated from the PRIME Project.

Seawalls

A number of seawalls have been created in response to ongoing coastal erosion issues. The location of existing seawalls is shown in Figure 3-14.

Figure 3-14: Location of existing seawalls in Kosrae

3.4 Primary Data Collection

A range of assets located in the road corridor along the PRIME Road have been identified based on fieldwork undertaken. A map showing the location of these assets (which includes as private fences/walls and gardens, fruit trees, buildings, bridges/culverts, etc.) and other key resources are provided in Figure 3-16. Appendix B presents further detail on this map. Figure 3-15 presents examples of these assets. This information has been used to identify E&S sensitivities for the ESMF.

Figure 3-15: Images showing key assets located in close proximity to the road on Kosrae including walls (top left & right) private residences, garden and power poles (middle left & right), and one lane bridge on Lelu causeway and coastal protection works (bottom left & right).

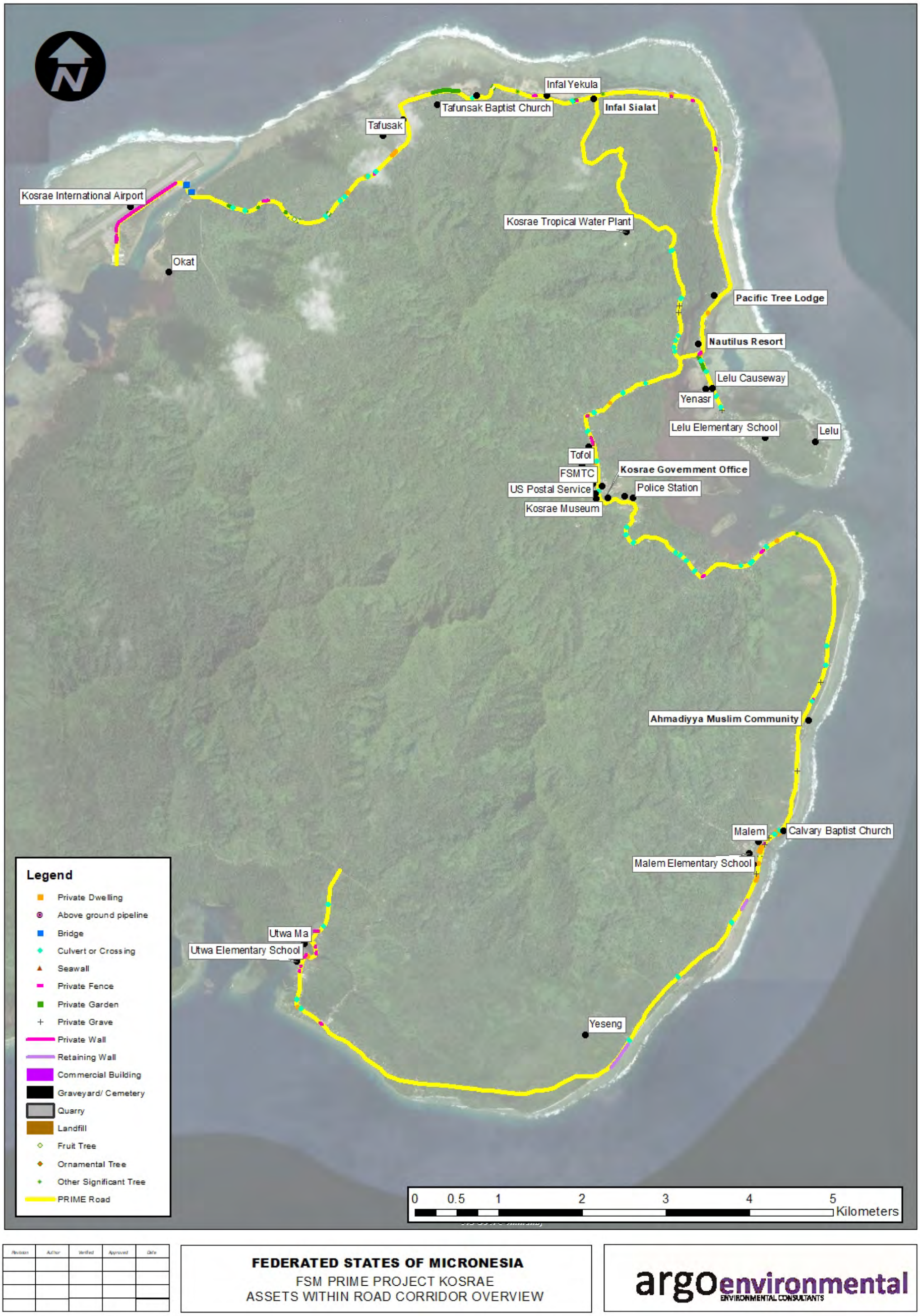


Figure 3-16: Assets within road corridor and location of sensitive social receptors – Kosrae

4. Pohnpei

4.1 Physical Environment

4.1.1 Climate

Table 3-1 presents key climate data for Pohnpei (from https://en.climate-data.org/). The key point to note is the abundant rainfall Pohnpei receives annually (480.7 cm).

Table 4-1: Key climate statistics for Pohnpei including temperature (°C) and rainfall (mm)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Temperature	27.2	27.3	27.3	27.3	27.4	27.3	27	27	27	27.1	27.2	27.3
Min. Temperature	24.2	24.3	24.3	24.1	24	23.7	23.1	22.9	22.9	23	23.3	24
Max. Temperature	30.2	30.3	30.4	30.6	30.8	30.9	31	31.2	31.2	31.2	31.1	30.6
Rainfall (mm)	329	262	341	443	478	427	453	442	413	426	403	390

4.1.2 Topography, Geology, & Soils Hydrology

Pohnpei consists of a main island surrounded by an inner coral reef, 23 small basaltic islets, a number of inshore deposit islet, and an outer encircling barrier reef with about 15 low coral islets. Pohnpei itself is a high volcanic island with a mountainous interior and peaks as high as 798 m above sea level, is about 21 km in diameter and 112 km in circumference. Including lagoon islands, the total land area of Pohnpei is approximately 340km^2.

The distribution of various soil types across Pohnpei has been described by U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in 1982. The five key soil types present are as follows:

- Nansepsep/Sonahnpll/Inkosr - Very deep, well drained to poorly drained, level to gently sloping soils; on bottom lands and alluvial fans
- Nanlak - Very deep, poorly drained, level and nearly level soils; in coastal tidal marshes
- Umpump/Rakled - Moderately deep and very deep, moderately well drained and somewhat poorly drained, level to moderately steep soils; on old lava flows, terraces, and benches
- Dolekel/Fomseng - Shallow and moderately deep, well drained, moderately steep to extremely steep soils; on uplands
- Tolonler/Dolen - Very deep, well drained, strongly sloping to extremely steep soils; on uplands

Figure 4-1 presents a map prepared by the Island Research and Education Initiative (iREi) showing the distribution of the key soil types.

4.1.3 Hydrology

Groundwater

Groundwater development on Pohnpei has been limited mainly to areas in the northern part of the island in and around the town of Kolonia and Palikir (Spengler *et al* 1992). Wells in the Kolonia area exploit local unconformities between flow units of the late-stage volcanics and the unconformity between these volcanics and the underlying shield-building lavas.

More productive wells located in the Palikir area exploit relatively unweathered shield-building lavas.

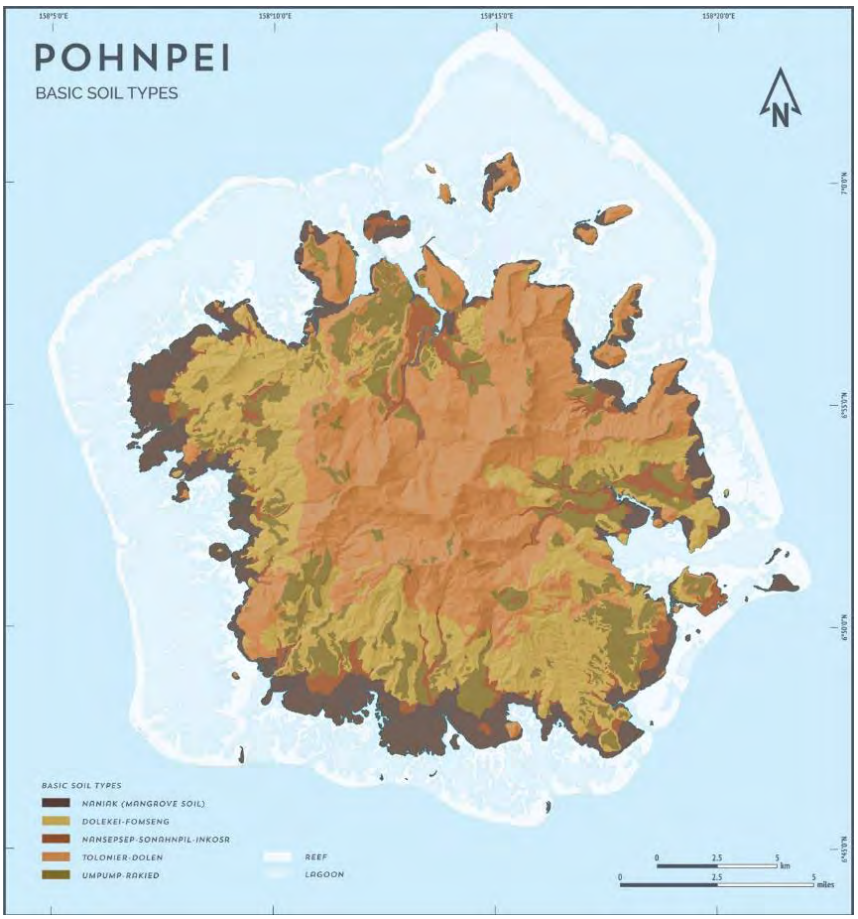


Figure 4-1: The distribution of the key soil types in Pohnpei

Groundwater development in the northern half of the island is hindered by low permeability basement rock and lack of an extensive, low permeability capping layer to impede the movement of basal groundwater into the lagoon. More favorable conditions for the development of basal groundwater are thought to exist in the southern half of the island due to the presence of relatively thick deposits of low-permeability ash near the coast, although groundwater has not yet been developed in this location.

Figure 4-2 presents a map prepared by (iREi) showing distribution of general water resources.

Surface Water

The general distribution of freshwater resources on Pohnpei is shown in Figure _ based on data provided by the U.S. Geological Survey in 1944 (USGS 1944) and complied by iREi. The key point to note is that the majority of the island, primarily in the interior, has numerous streams and springs with a few locations where water is taken from shallow wells (or streams) for consumption. The majority of water for consumption located primarily on the coastal fringes is through collected rainfall. Figure 4-3 presents maps showing location of surface watercourses based on the U.S. Geological Survey (USGS) topographic maps (2001) and reinterpreted by iREi.

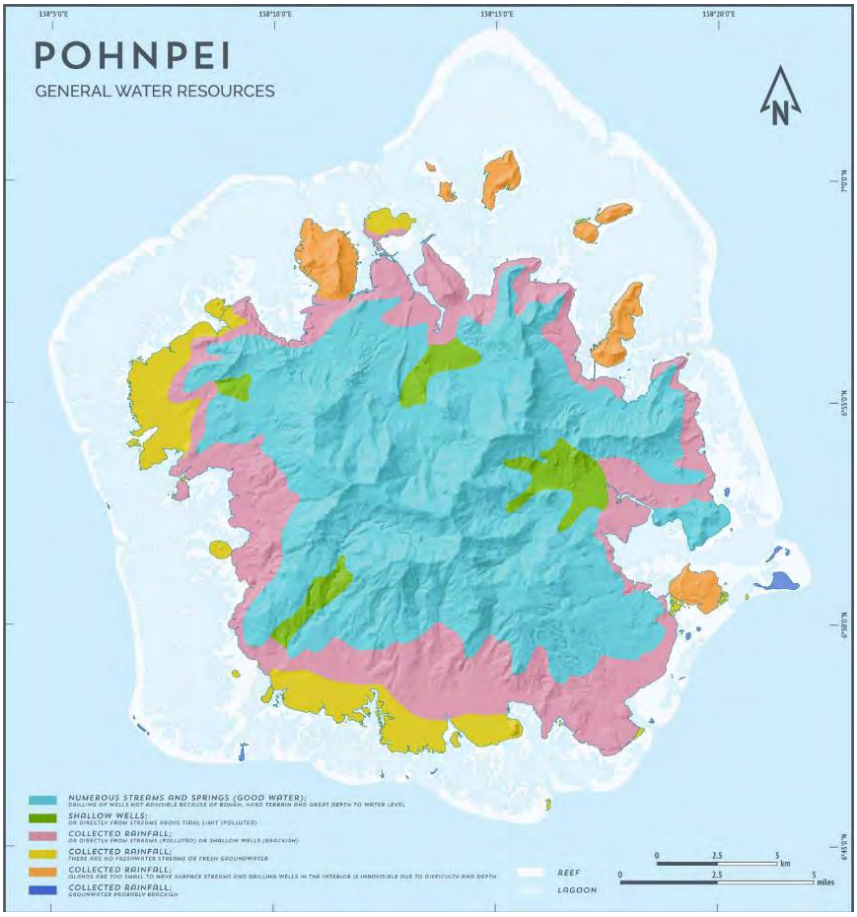


Figure 4-2: The distribution of the general water resources in Pohnpei

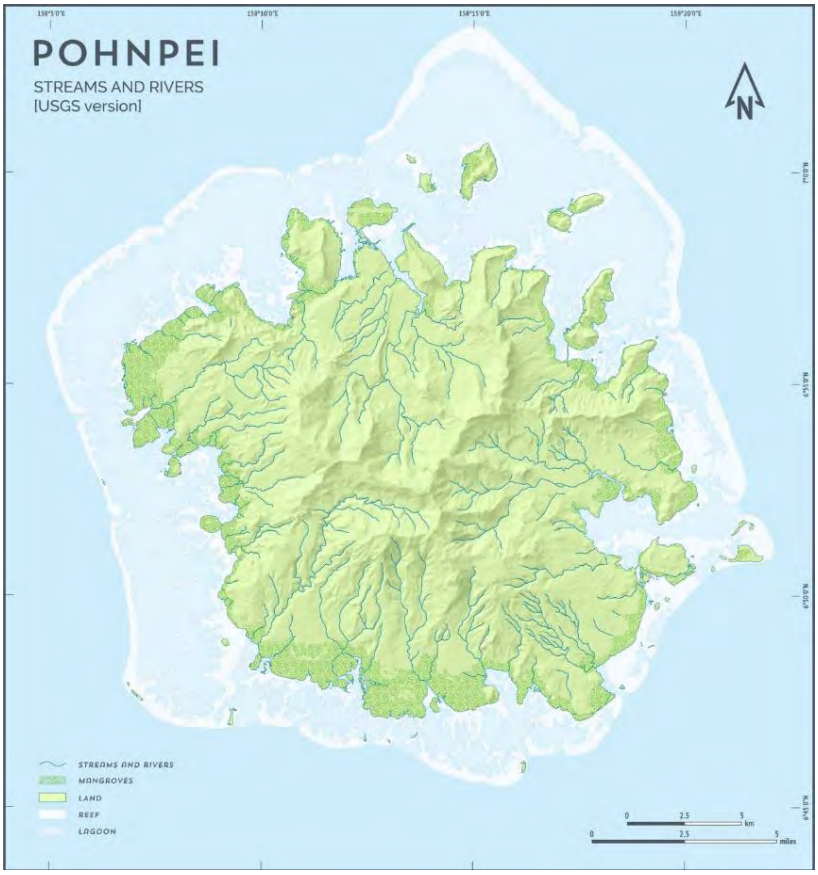


Figure 4-3: The distribution of water courses in Pohnpei

4.1.4 Hazards

Flooding

Figure 4-4 presents a map showing various levels of flooding hazard for Pohnpei prepared by iREi and is based data from the U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS) for local soil type, drainage, and other parameters. The key point to note is that the majority of the low-lying coastal margin is considered at risk of flooding.

Figure 4-4: Areas of flood risk in Pohnpei

Erosion

Figure 4-5 presents a map showing various levels of erosion hazard for Pohnpei prepared by iREi and is based data from the U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS) for local soil type, slope and other parameters. The key point to note is that the majority of 'very high' to 'high' potential erosion hazard areas are located in the stepper areas poorer quality soils of the interior occasional extending towards the coastal margin.

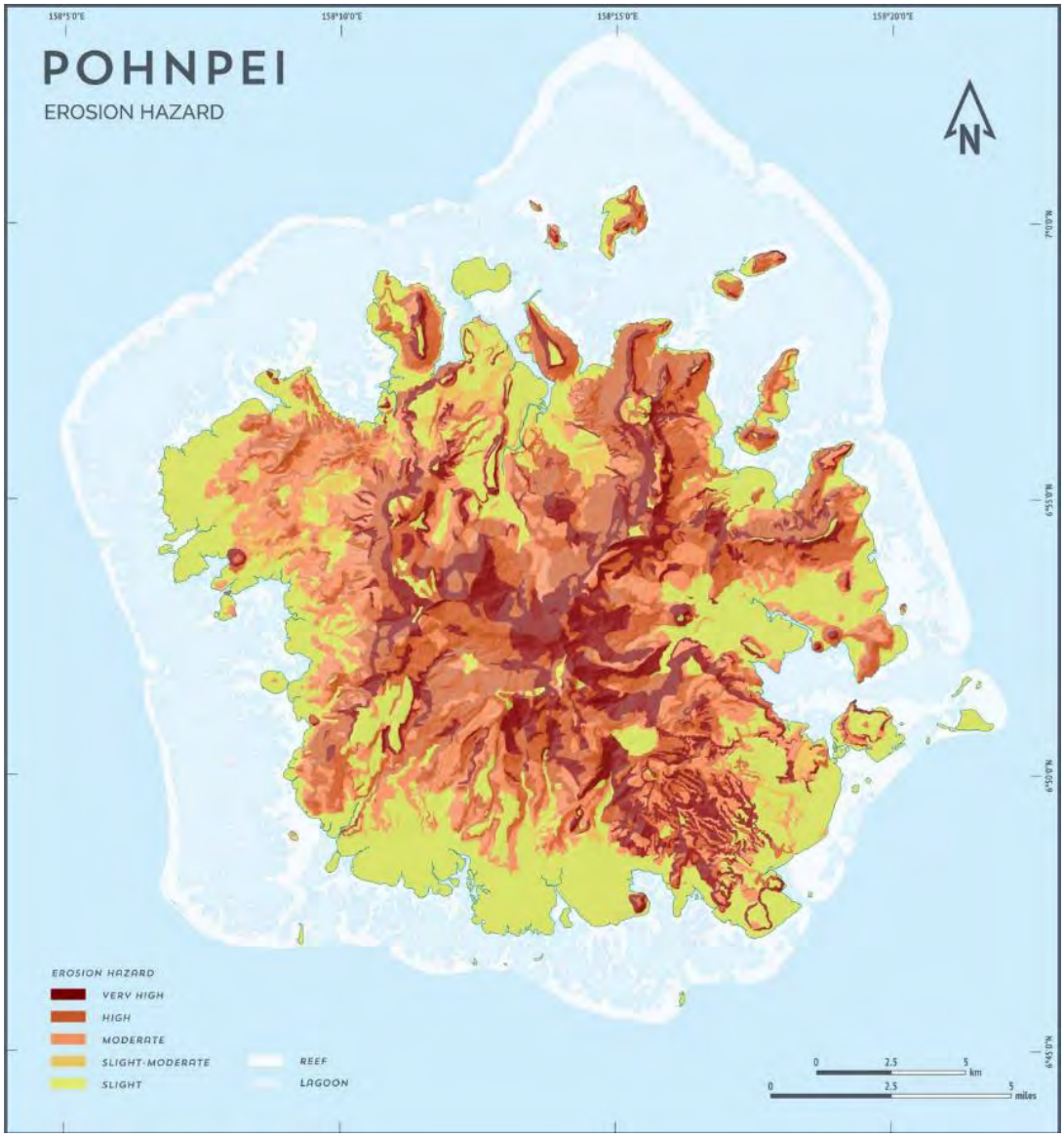


Figure 4-5: Erosion hazard areas in Pohnpei

4.2 Ecology

4.2.1 Terrestrial Ecology – Flora

Vegetation Types

Table 2-2 presents a summary of general vegetation types found in Pohnpei. Key habitat sensitive to development disturbance as a proportion of total area ranges includes mangrove (15.6%), swamp forest (0.6%), upland forest (35.4%) and marsh (0.4%) (from FSM 2001).

Plant Species

A total of 729 species of ferns and flowering plants have been described in Pohnpei. Approximately 438 species are native, including about 106 species of ferns, 138 monocot species and 194 dicot species (Falanruw 2002) (Table 2-3).

A total of 291 species of plants have been introduced to Pohnpei (Zirkus 2001). Some of these introduced species have become invasive pests (Table 2-4) and, of the top 11 invasive weed species in FSM, all are present in Pohnpei including the widespread Giant

Sensitive plant *Mimosa* diplotricha, African tulip-tree *Spathodea campanulata* and *Wedelia trilobata* (FSM 2002).

Figure 4-6 presents a map showing the distribution of various vegetation types across Pohnpei. The data set was developed from 2005 QuickBird satellite imagery by Digital Globe through land cover classification carried out by U.S. Forest Service (2007).

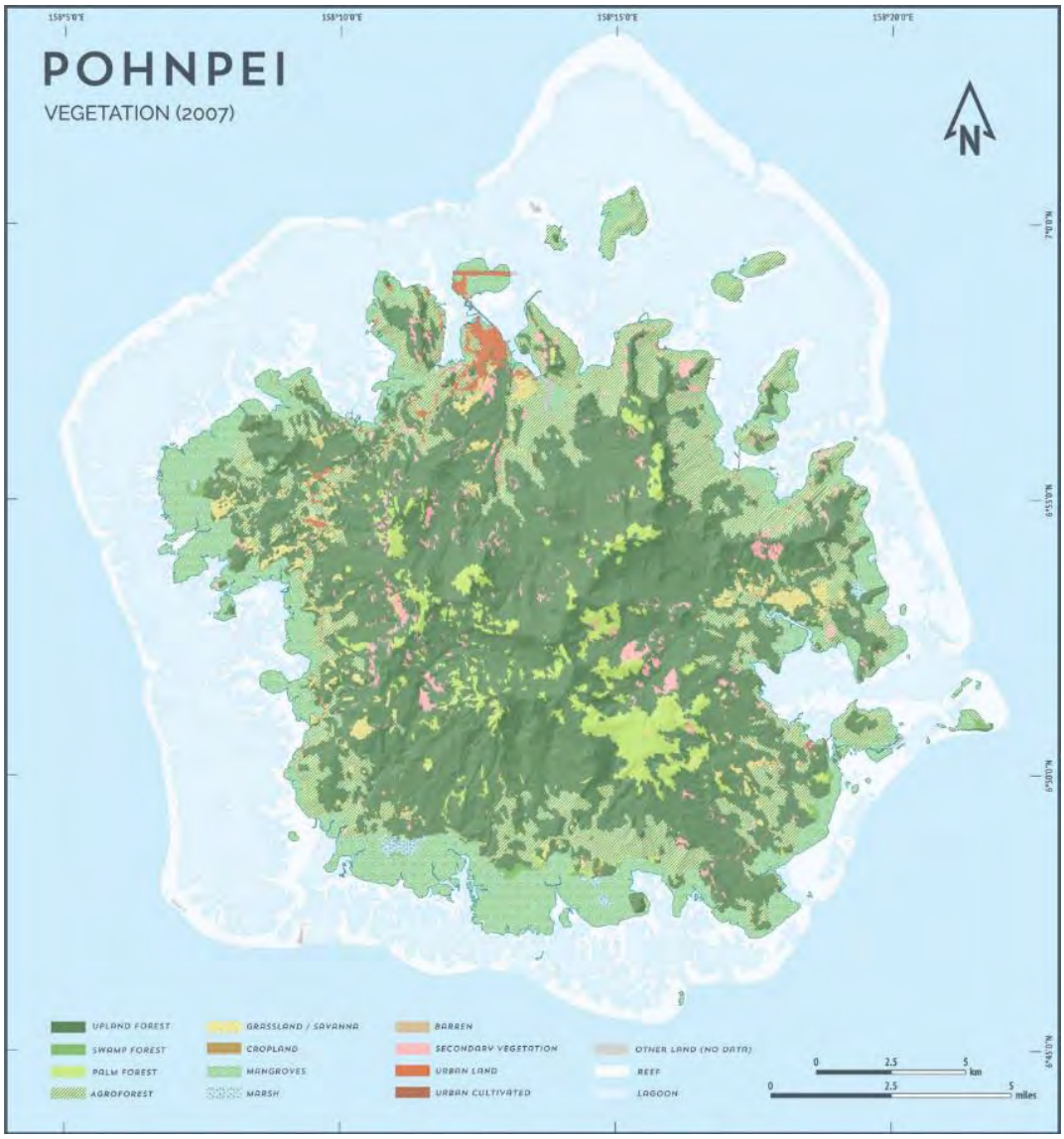


Figure 4-6: Distribution of vegetation types in Pohnpei

4.2.2 Terrestrial Ecology – Fauna

A range of avian, mammalian, reptilian species are present including 73 species of bird (including 20 native species, 19 resident and non-resident seabirds, 20 migratory shorebirds, and 3 introduced bird species) (Table 2-5). A number of mammals (including bats), reptiles (skinks, geckos, snakes), amphibians and freshwater fish are also likely to be present.

The Pohnpei Island skink (*Emoia ponapea*) is the only reptile endemic to Pohnpei, and it is widely distributed in low-land and upland forest (Buden 2000).

4.2.3 Coastal Marine Ecology

Coastal Habitat

A number of significant marine ecological features are located around Pohnpei (from Weeks 2015). Figure 4-7 identifies these key features.

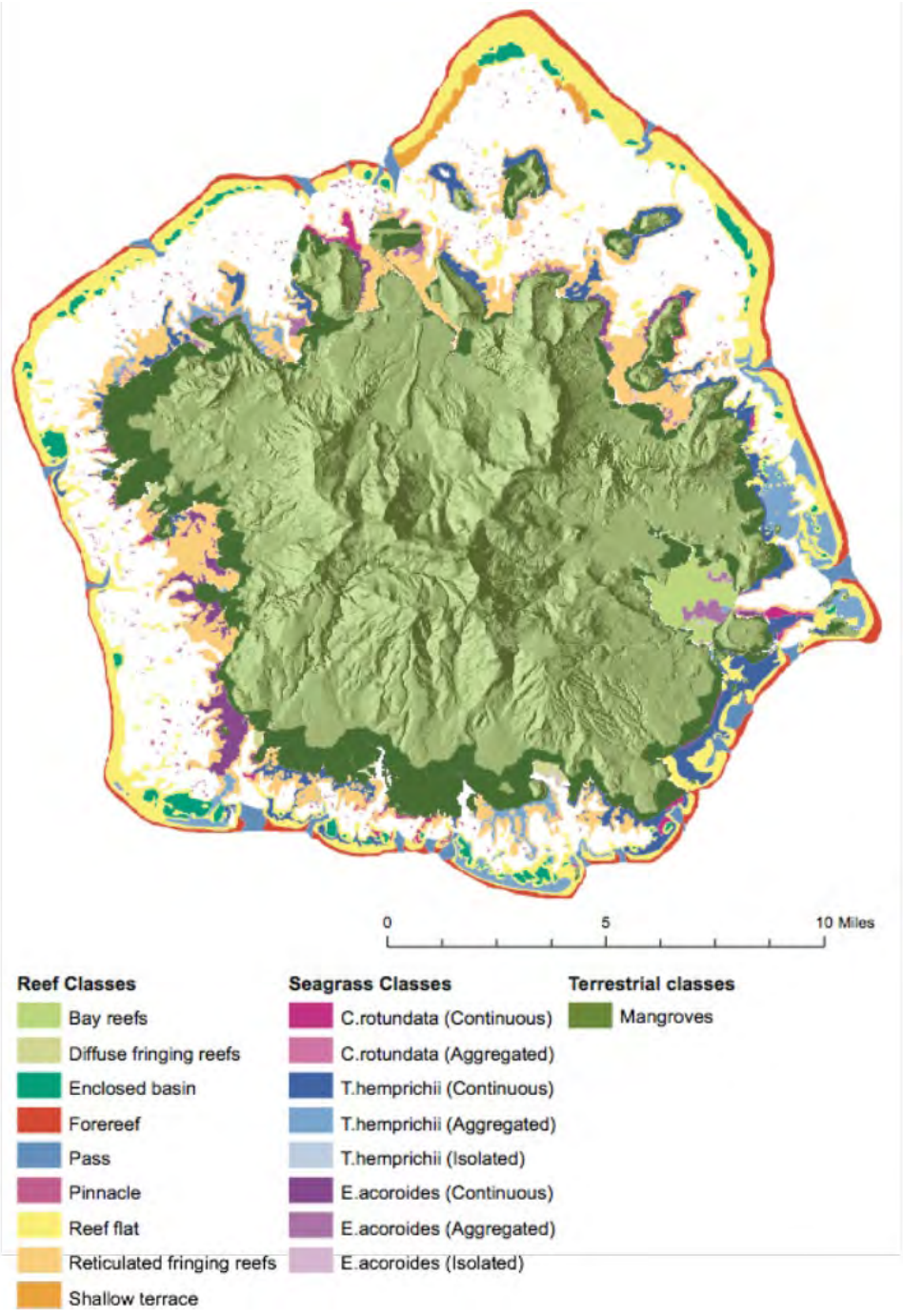


Figure 4-7: Key marine ecological features in Pohnpei

Mangroves

The three most common mangrove species *Bruguiera gymnorrhiza*, *Sonneratia alba* and *Rhizophora apiculata* are present on Pohnpei (Allen *et al* 2001). A total of sevenother mangrove species are present but are generally much less common. Table 2-7 presents

the distribution of the most common species by FSM State. Figure 4-7 presents a map showing the distribution of mangroves around Pohnpei.

Seagrass

Approximately 4,403.6 ha of predominately intertidal and shallow (<3m) subtidal seagrass meadows are present the waters around Pohnpei Island (and Atoll) consisting of three key species (*Cymodocea rotundata*, *Thalassia hemprichii*, and *Enhalus acaroides*) of varying levels of coverage (continuous, aggregated, and isolated) (McKenzie & Rasheed 2006). Figure 4-8 presents a map showing the distribution of seagrass areas around Pohnpei.

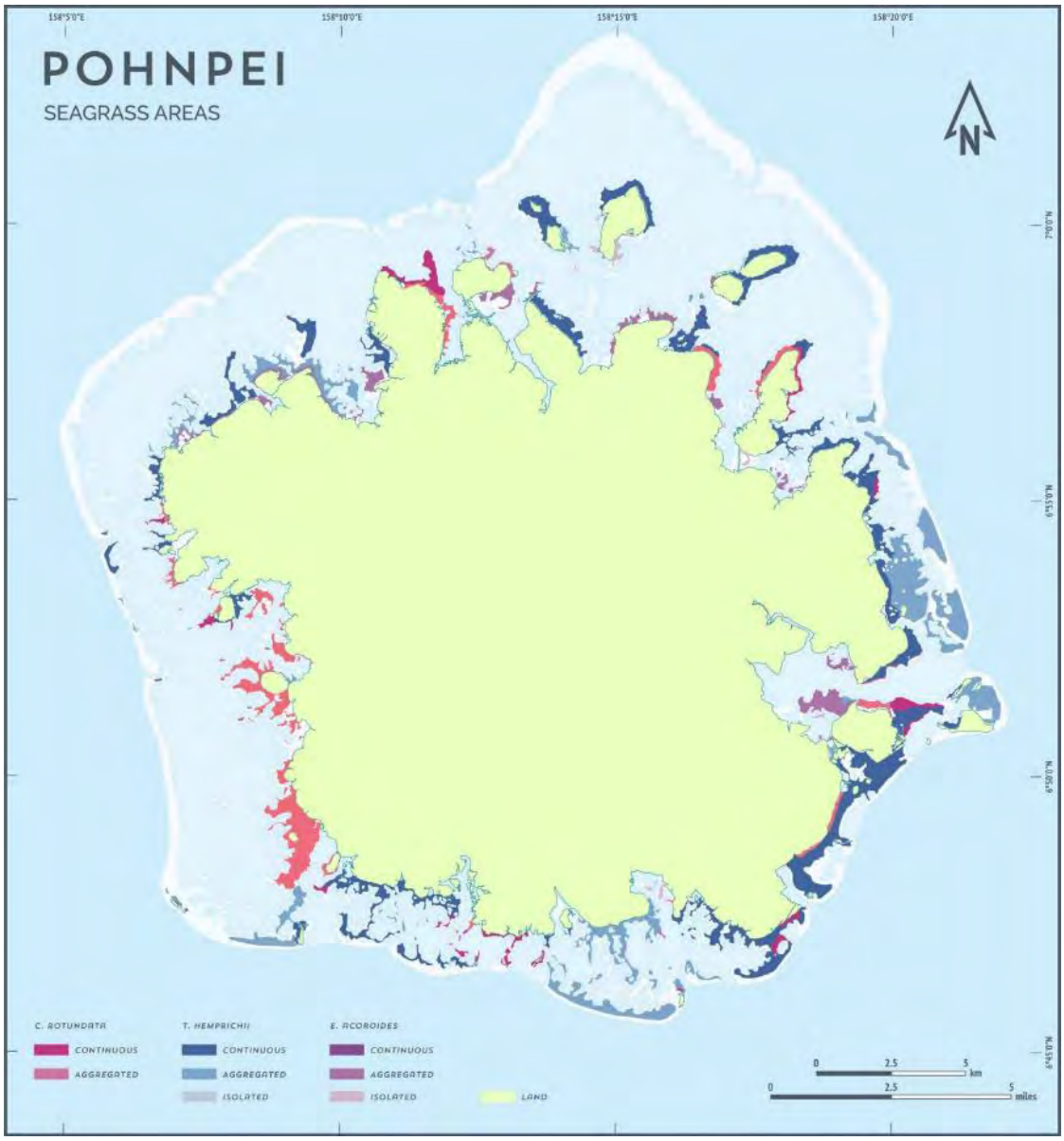


Figure 4-8: Distribution of seagrass beds in Pohnpei

Reef Zonation

The distribution of various reef zones around Pohnpei has been mapped using data collected by the Millennium Coral Reef Mapping Project (IMaRS-USF & IRD 2005). Reef zones describe the locations and ecological conditions of different parts of the reef with respect to the reef system as a whole. The key reef type in close proximity to the coast is described as "*reticulated fringing reef defined as a network of linear or polygonal reef*

framework with intervening depressions". Figure 4-9 presents a map showing the various reef zones.

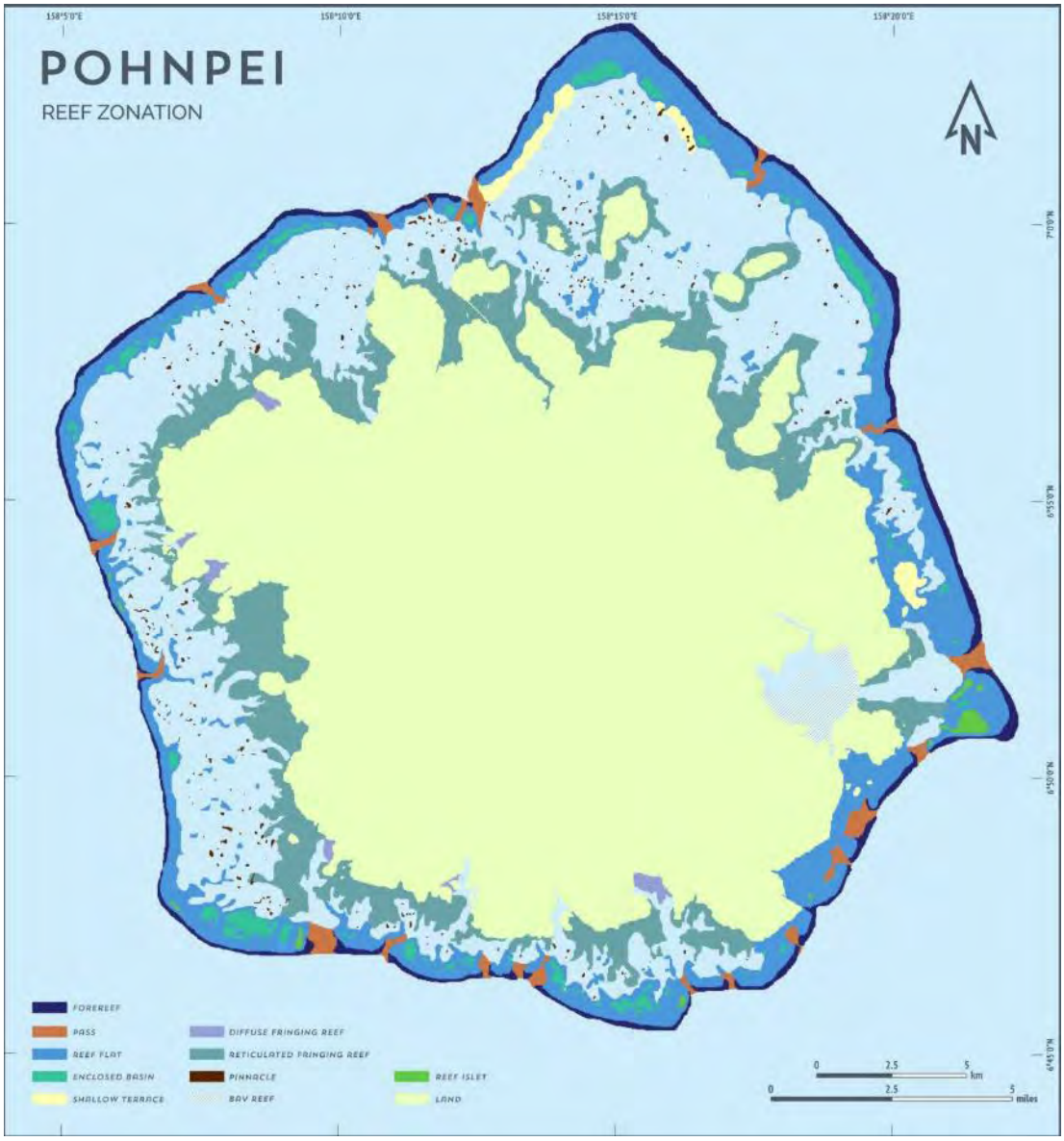


Figure 4-9: Distribution of reef zones in Pohnpei

Fauna

Two species of sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*) are known to occur regularly in surrounding waters (Buden 2000)

4.2.4 Conservation Areas

Figure 4-10 presents a map showing existing designated (12 areas) and proposed (12 areas) protected areas in Pohnpei.

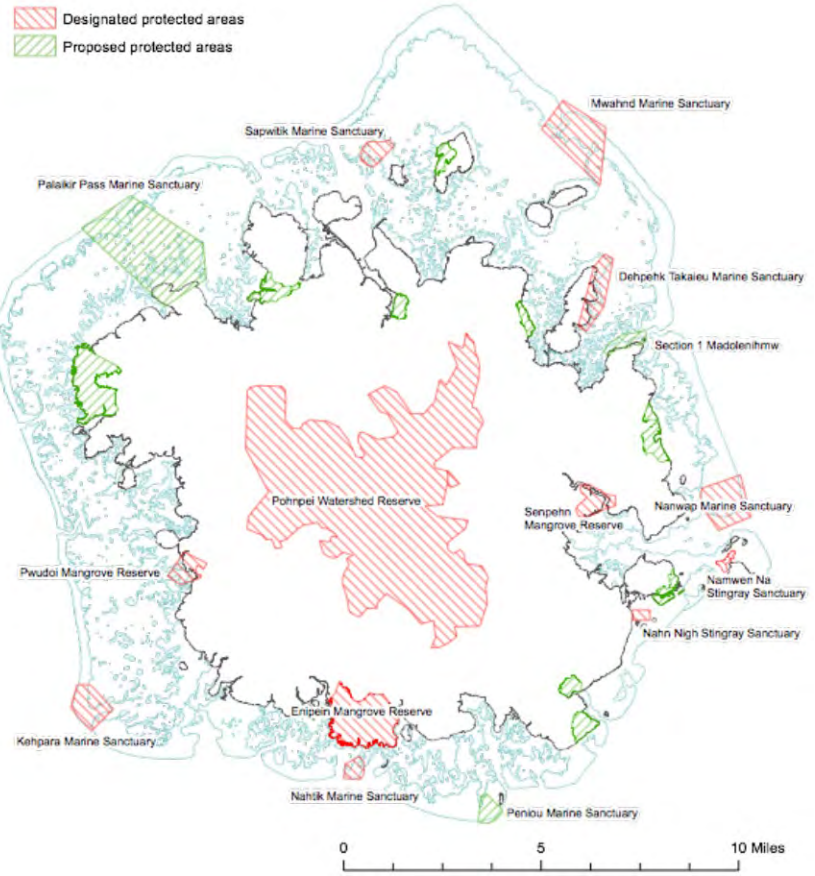


Figure 4-10: Pohnpei existing and proposed protected areas (from Weeks 2015)

In addition, 35 Areas of Biodiversity Significance (ABS) have been identified for Pohnpei including terrestrial (9), marine (5), coastal marine (18) and coastal freshwater sites (3) (Table 2-8). The location of Pohnpei ABSs are shown in Figure 4-11 and Figure 4-12.

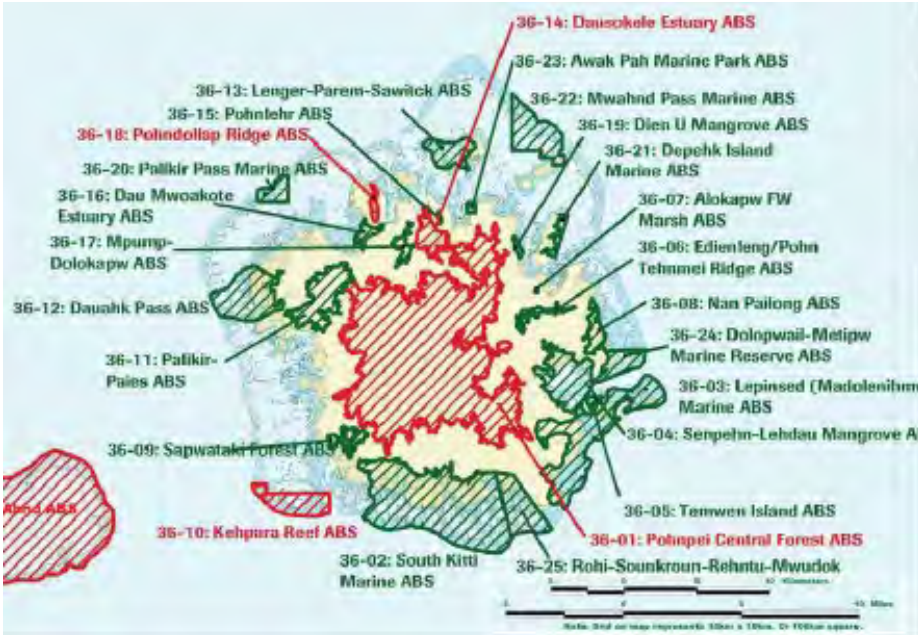


Figure 4-11: Pohnpei existing and proposed protected areas (from Weeks 2015)

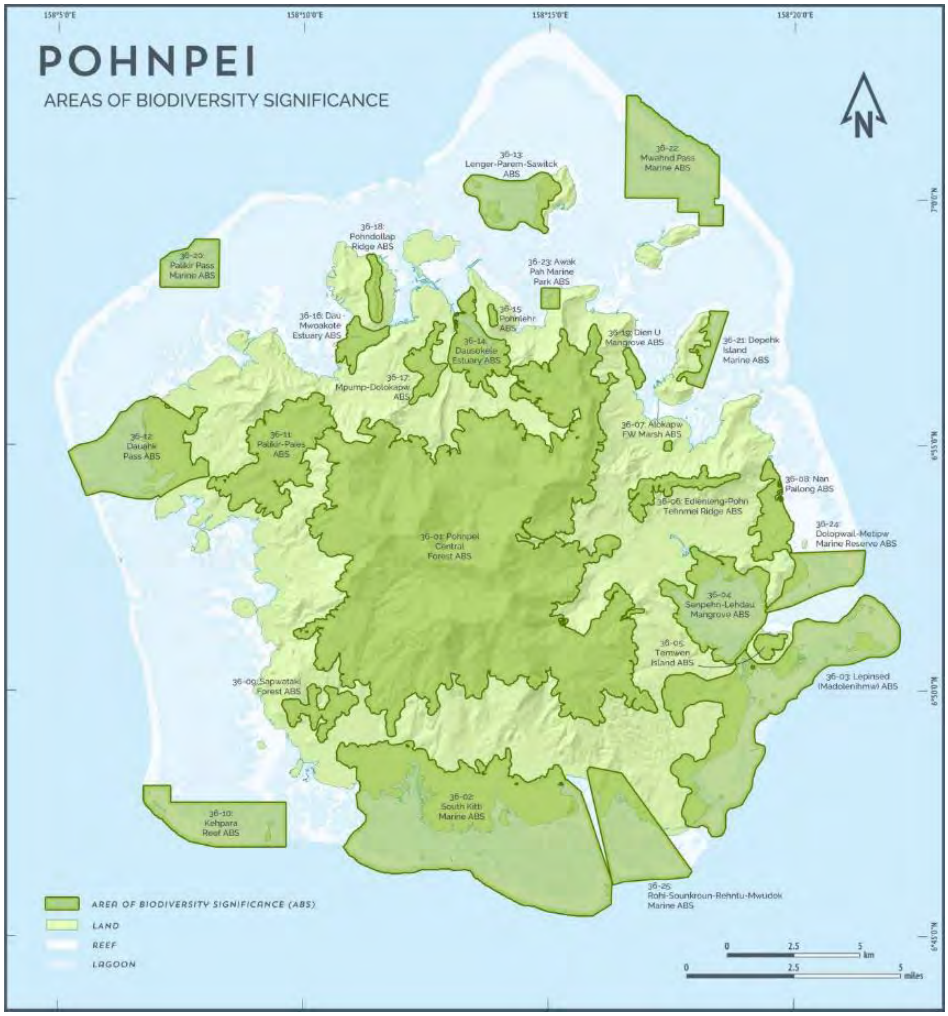


Figure 4-12: Areas of Biodiversity Significance in Pohnpei

4.3 Socio-Economic Environment

4.3.1 Economy

Economic activity consists largely of subsistence farming and fishing and government, which employs two-thirds of the adult working population and receives funding largely - 58% in 2013 – from Compact of Free Association assistance provided by the US. The potential for tourism is limited by isolation, lack of adequate facilities, and limited internal air and water transportation. Pohnpei (and Yap) have been the fastest growing with GDP growth averaging 2% per annum in the FY1987-FY2003 period (FSM Strategic Development Plan 2003). In the early period FY1987-FY1995 of the Compact growth was strong in Pohnpei which experienced rates of growth of 5.4. The private sector expanded vigorously in both states attaining nearly 9.0% and public sector activity in Pohnpei expanded by 2.3%.

4.3.2 Land Tenure & Access

Ownership of land and aquatic areas varies between States. In Pohnpei, land is both privately and State owned, while aquatic areas are managed by the State as public trusts. With the establishment of a system of chieftainship, all land in a given chiefdom theoretically came under the jurisdiction of the paramount chief. Individuals occupied small farmsteads as tenants. State's Legislature amended its laws in September 2018 primarily due to land issues and traditional land owner disputes.

The Constitution requires the Government of Pohnpei to protect the customs and traditions of Pohnpei and allows statutes to be enacted to uphold custom. However, in the event that a statute is challenged as being in violation of other Constitutional rights "*it shall be upheld upon the Pohnpei Supreme Court's determination that the statute has reasonably protected an existing, regularly practiced custom or tradition.*"

Article XII, § 1 states that "*no lease of land, except from the Government or as provided in Section 4 of this Article, may exceed twenty-five years.*" The right for option to renew and other protections shall be provided by statute

Article XII, § 2. limits ownership of land to a specified class of individuals. The Section states that "t*he acquisition of permanent interest in real property shall be restricted to Ponapean citizens*".

Article XII, § 3 prohibits any agreement that "*grants the user of land the unilateral authority to continue use for an indefinite term."*

Article XII, § 5 prohibits the sale of land "*except as authorized by statue.*

4.3.3 Demographics

Geographical isolation and poorly developed infrastructure are major impediments to FSM's long-term growth. Over the years, agriculture's socio-cultural role as a safety net for the disadvantaged has greatly diminished. Inequality of income and the incidence of families with incomes below the poverty line are among the highest in the Pacific region. Poverty is a concern and FSM has, in general, made only limited progress towards achieving the Millennium Development Goals (MDGs) by 2015.

4.3.4 Gender, GBV and Human Trafficking

The Gender Development Office has progressed implementation of the Pohnpei Domestic Issues Act 2017 and helped to establish the Pohnpei Domestic Violence Act Taskforce. In 2018, the Taskforce committed to implementing the protection order sections in the Act with the Adviser supporting the Pohnpei State Women's Interest Officer to submit a recommendation to the Governor – a significant step. The Pohnpei Police Domestic Violence Unit was formed following training provided by the Department of Health and Social Affairs Family Protection Adviser.

Each of Micronesia's four states has its own laws criminalizing trafficking offenses however, Pohnpei did not explicitly prohibit adult sex trafficking. Cases prosecuted at the state level may be heard subsequently at the national level, under national anti-trafficking law, depending on which court hears a case. In Pohnpei discourse on trafficking has mainly related to the resident fishing fleet. Incidences of prostitution (employment in bars and 'houses') and sexual exploitation (of underage women/girls) have been recorded in the past, however, there is a need to distinguish between the two. General opinion is that the sex-related activities are prevalent, however, this is something that is not reported and not discussed (ESIA 2017).

Findings from the report assessing gaps in EVAW services (FSM 2018) are being used to better assist women and children to access services relating to domestic violence including work progressing the reopening of the Pohnpei safe house.

4.3.5 Education

The FSM is eligible for selected US Federal Education Programs that contribute a significant amount to the overall education budget. FSM's only Institute of Higher

Education (IHE) is the College of Micronesia-FSM (COM-FSM) located in Pohnpei. The FSM Education system is composed of the State and National education. The FSM National education provides coordination for development of standards and assessment, reports on the status of education, provides technical assistance, coordinates external funding aid for education, and is responsible to provide support for the post-secondary development of the Nation. Instruction is the responsibility of the State Departments of Education (FSM 2015).

4.3.6 Health

FSM health services are provided at the state level. Health services provide cost-free primary care for pregnant women and infants including basic and routine high-risk antenatal care, delivery, postnatal care, postpartum family planning counselling and contraceptives; and preventive and primary care for children and children with special needs.

The National Health Progress Report (2008–2011) covers annual monitoring of 14 national health indicators on health status, availability of essential drugs, health care utilization, quality assurance and functionality of biomedical equipment (UNICEF, 2013). Information available suggest that FSM generally, and Pohnpei State individually, have made some progress in addressing violence against women and children but generally lack quality essential services to eliminate violence against women and girls. This is especially the case for women and children with disabilities, those living in rural and remote areas and those made vulnerable by other circumstances e.g., poverty. Pohnpei State now has a Domestic Violence Act and an implementation plan is being drafted.

4.3.7 Fisheries and other industries

The mainstays of the FSM economy and in Pohnpei are subsistence farming and fishing. There is limited tourism due to lack of access and facilities, although it has increased in recent years with the opening of a number of small hotels. Geographic isolation and poorly developed infrastructure are major impediments to FSM’s economic growth and poverty is among the highest in the Pacific region. FSM has, in general, made only limited progress towards achieving the Millennium Development Goals by 2015.

4.3.8 Cultural Values

The traditional culture of Pohnpei, which involves strong land and resource management components, is very much alive today and is still in large a strong influence on Pohnpeians' lifestyle. The traditional system still exists within activities observed throughout the year. Despite Pohnpei being the melting pot of the FSM, where people of various races and from islands throughout FSM reside, the Pohnpei culture is very much practiced and respected by the island residents.

4.3.9 Infrastructure

A total of 29 bridges and causeways have been identified around Pohnpei. The location of these key infrastructural assets is shown in Figure 4-13.

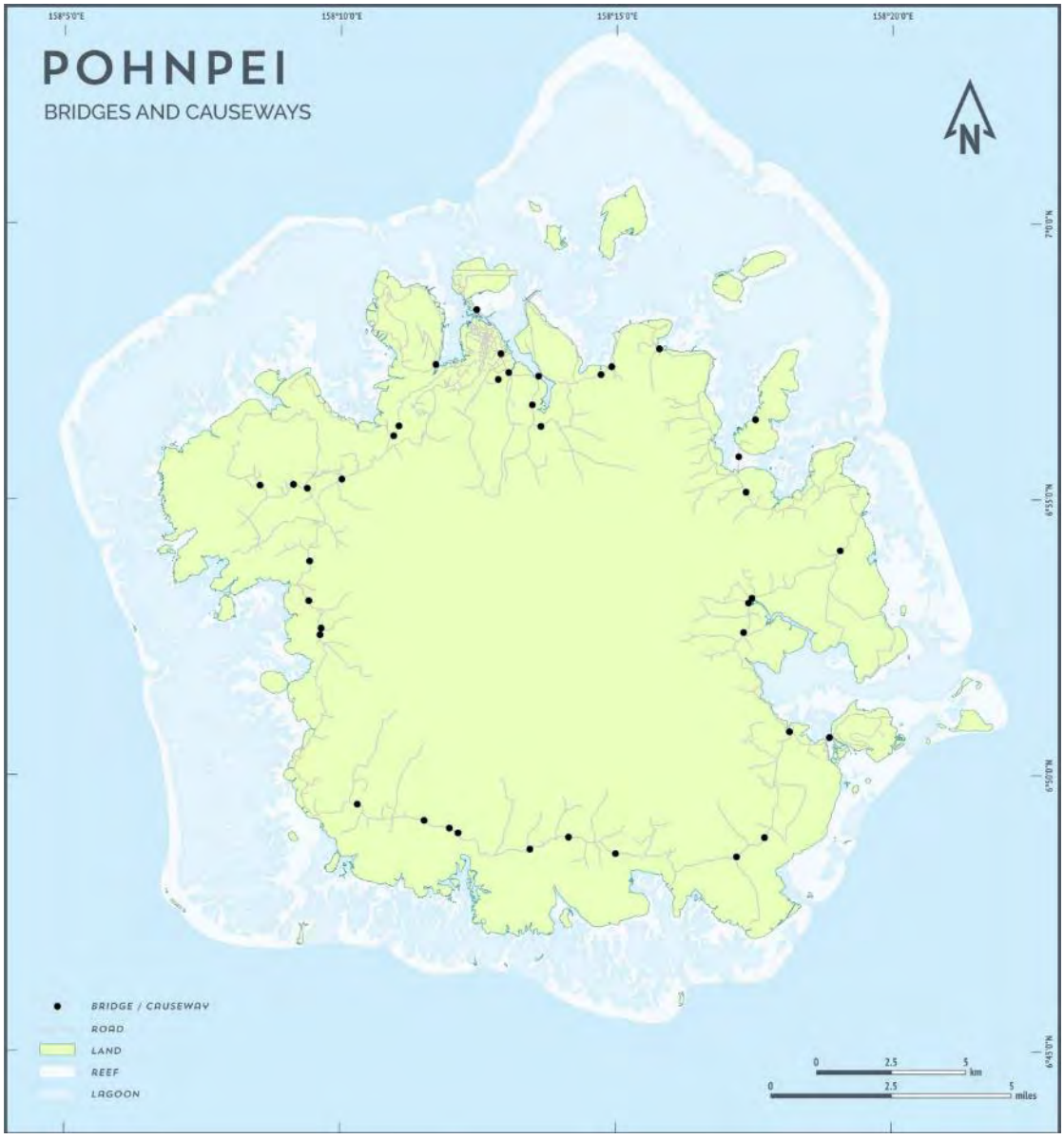


Figure 4-13: Location of bridges and causeways in Pohnpei

Piped water systems from Nanpil River and wells serve populations of 2,500 in Kolonia and Palikir (see Table 2-16). The Kolonia Central Sewerage System, which consists of about 12 miles of sewers, a total of 7 lift stations and a package sewage treatment plant with a capacity of about a 0.8 million gallons a day. The system has about 1,200 connections. Treated sewage is discharged into the Sokehs harbor through a 12-inch diameter pipeline. The location of the key wastewater network assets are shown in Figure 4-14 and Figure 4-15 and the potable water network is shown in Figure 4-16.

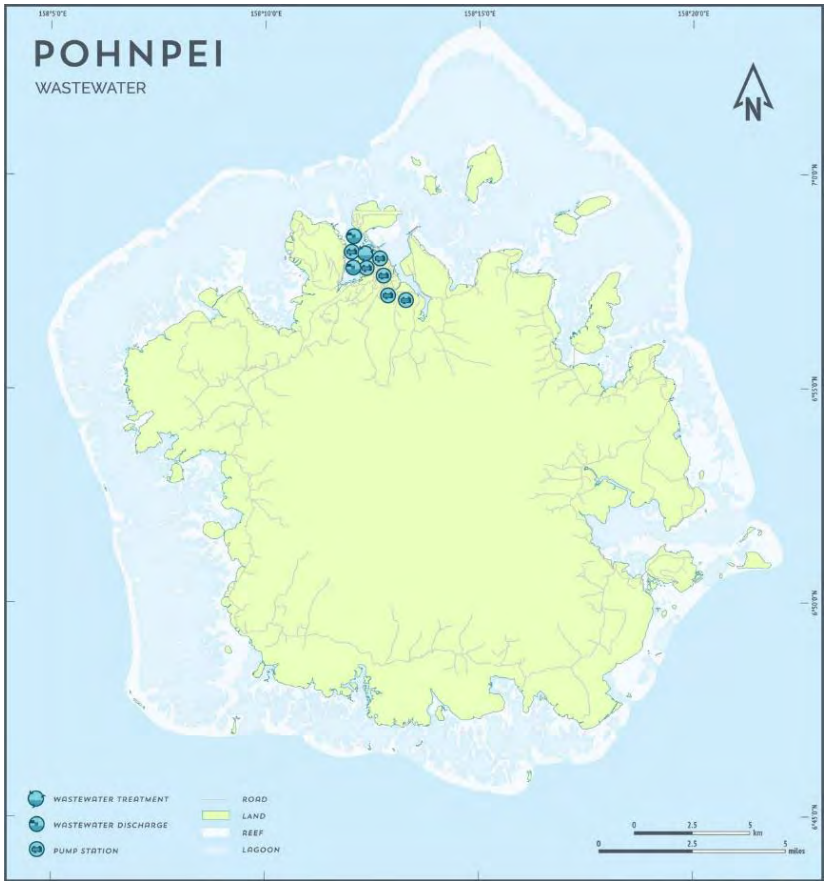


Figure 4-14: Location of wastewater assets in Pohnpei

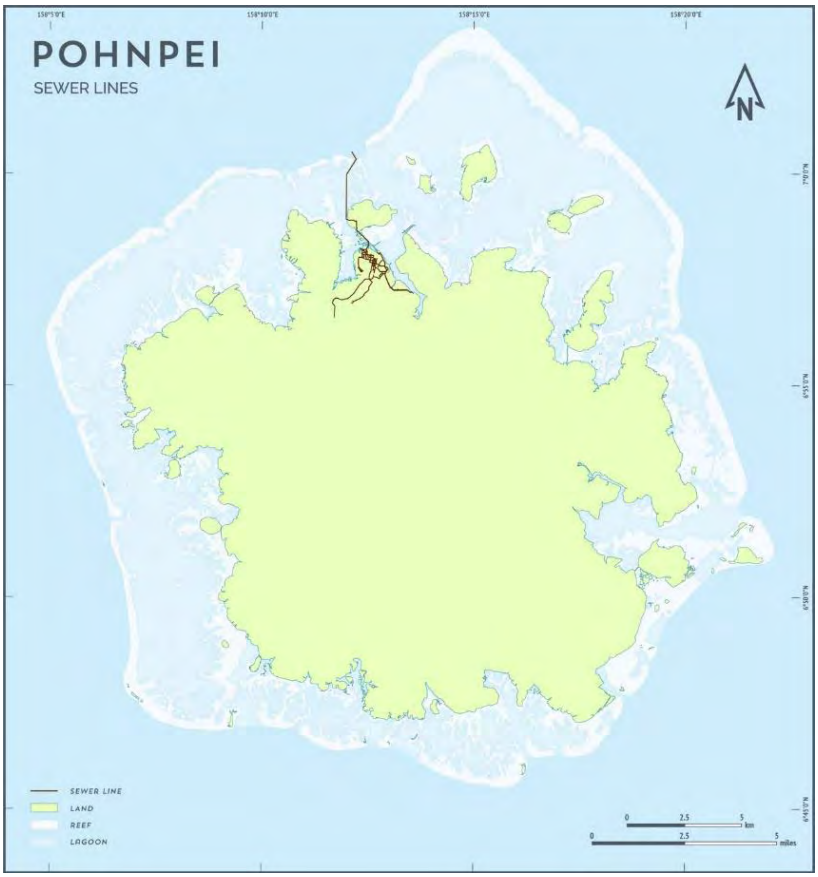


Figure 4-15: Location of sewer lines in Pohnpei

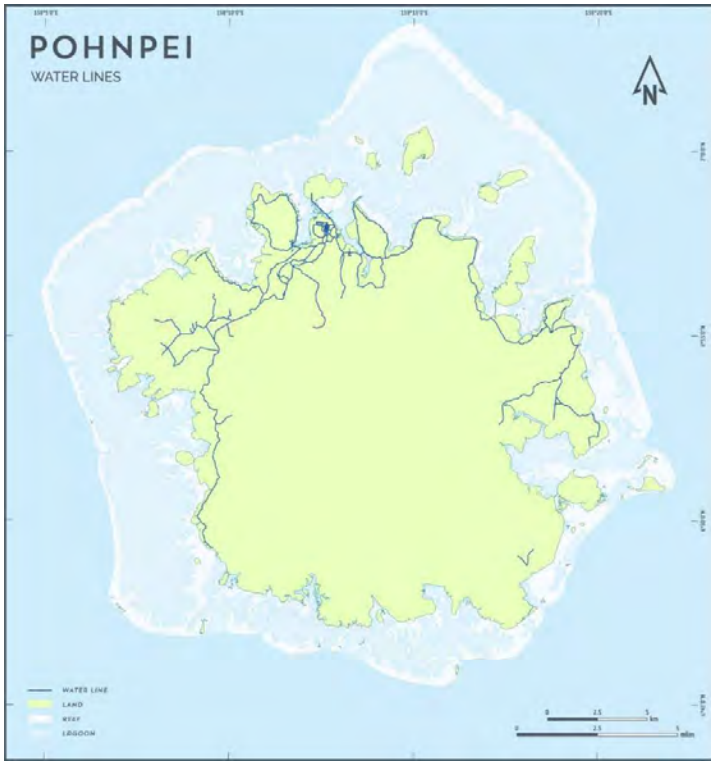


Figure 4-16: Location of potable water lines in Pohnpei

Quarry

Pohnpei has 45 coral sand dredge sites (33 inactive and 12 active) and two rock quarries (Figure 4-17). They all have permits from EPA and are mainly for road maintenance and construction. One of the hard rock quarries is located at Ipwal Sokes and is owned and operated by a company called APSCO (SOPAC 2005) (Figure 4-18).

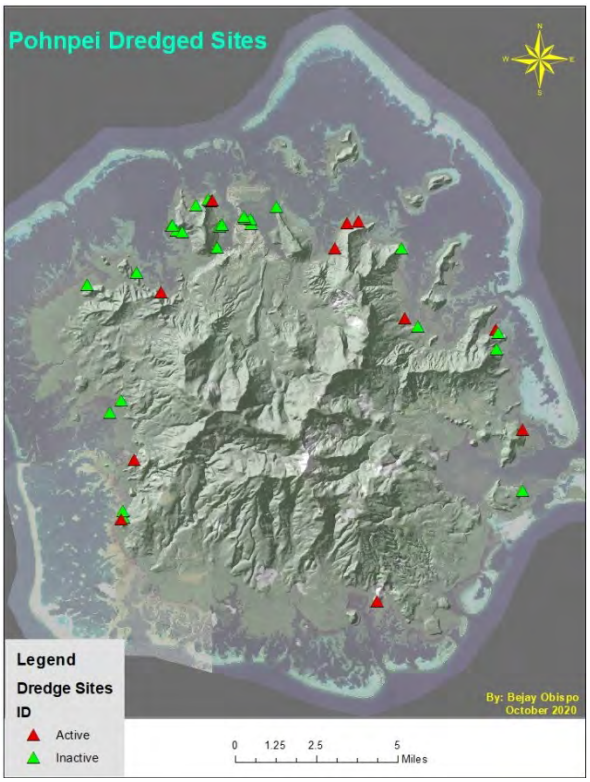


Figure 4-17: Map showing coastal coral 'quarries'

Figure 4-18: Images of quarry sites on Pohnpei

Solid Waste Management

The only solid waste facility on Pohnpei is the dumpsite on Dekethik Island on the east side of the causeway at its northern end (Johnston 2011). The facility has an operations shed, a battery recovery shed, and separated areas for aluminium can compaction and storage and fuel drum sludge product extraction and storage. The larger portion of the area is used for trash intended for disposal, without recovery efforts. A private company, Pohnpei Waste Management Services (PWMS) provides most trash collection services, although the Kolonia Municipal Government provides collection services for about half the residents and commercial establishments in the town. Further investigation is required to determine whether the solid waste facility has the ability to dispose of any waste roading material generated from the PRIME Project.

4.4 Primary Data Collection

A range of assets located in the road corridor along the PRIME Road have been identified based on fieldwork undertaken. A map showing the location of these assets (which includes as private fences/walls and gardens, fruit trees, buildings, bridges/culverts, etc.) and other key resources are provided in Figure 4-19. Appendix B presents further detail on this map. Figure 4-20 presents examples of these assets. This information has been used to identify E&S sensitivities for the ESMF.

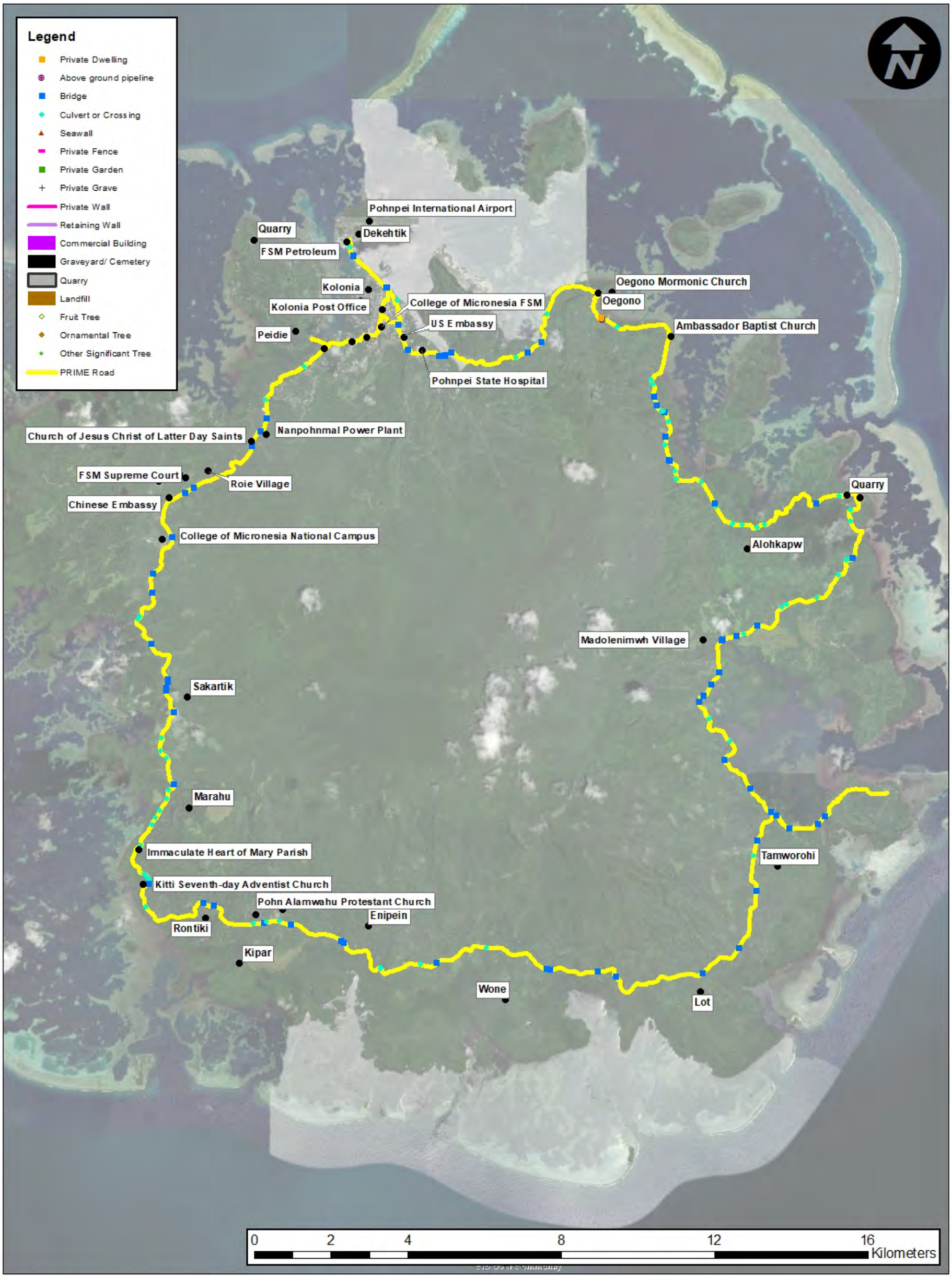


Figure 4-19: Assets within road corridor and location of sensitive social receptors - Pohnpei

Figure 4-20: Images showing examples of assets located in close proximity to the road on Pohnpei including private residences and churches (top left & right), telecoms tower and water pipeline (bottom left & right).

5. Chuuk

5.1 Physical Environment

5.1.1 Climate

Table 5-1 presents key climate data for Chuuk (from https://en.climate-data.org/). The key point to note is the abundant rainfall Chuuk receives annually (352.6 cm).

Table 5-1: Key climate statistics for Chuuk including temperature (°C) and rainfall (mm)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Temperature	27.4	27.3	27.4	27.6	27.6	27.6	27.4	27.2	27.4	27.4	27.5	27.6
Min. Temperature	24.9	24.8	24.8	24.9	24.7	24.6	24.2	24	24.1	24.2	24.5	24.9
Max. Temperature	29.9	29.9	30.1	30.4	30.6	30.6	30.6	30.5	30.7	30.7	30.6	30.3
Rainfall (mm)	228	163	229	295	353	302	361	349	310	355	284	297

5.1.2 Topography, Geology, Soils & Hydrology

Chuuk State comprises a main atoll at Chuuk Lagoon, plus four outer island atoll groups: the Mortlocks (with 11 inhabited atolls or islets) and Oksorod (comprising three groups); Pattiw (having 4 inhabited atolls/ islets); Namonuito (5 inhabited atolls/ islets); and the Halls (4 inhabited atolls/islets). Total land area for all of Chuuk State is 49 km^2.

The islands of Chuuk Lagoon are surrounded by a roughly circular barrier reef about 64 km in diameter. There are 19 high volcanic islands within the lagoon, and numerous low-lying coral islets or motu along the barrier reef. Weno (also known as Moen), the most populous of the islands, is the center of government and commerce.

Weno island is of volcanic origin consisting of olivine-basalt with minor andesite, with steep rugged uplands surrounded by coastal lowlands. The highest point on Weno, Mt. Tonoken, is a distinctive peak that rises some 369 m (about 1,000 feet) above sea level.

In terms of soil types, the five key map units can be grouped into two general landscapes for broad interpretative purposes (Laird 1980).

1. **Coastal mangrove swamps.** Located on coastal strands and bottom lands and comprise 27% of this survey area and include:

    - Chla Insak Variant. Shallow and very deep, very poorly drained, level and nearly level soils in coastal mangrove swamps along the shoreline of many islands which are flooded daily with seawater at high tide. Slope is 0 to 2%.
    - Dublon-Typlc Troporthents (urban land). Very deep, somewhat poorly drained, level and nearly level soils, and urban land on coastal strands along the shoreline of many islands. Slope is 0 to 2%. Elevation is sea level to 2m.
    - Ngerungor. Very deep, very poorly drained, level and nearly level soils on bottom lands on the coastal plains of some islands making up about 6% of the survey area. Slope is 0 to 1%.

2. **Soils on uplands.** The soils in this group are nearly level to extremely steep and comprise about 73% of this survey area. Elevation is 6 to 300 meters. The soils in this group are shallow, moderately deep, and very deep and are well drained. They formed in residuum and colluvium derived dominantly from basic igneous rock and include:

- Tolonler-Dolen**.** Very deep, well drained, sloping to extremely steep soils; on uplands. This map unit is in the interior of all islands in the survey area. Slope is 6 to 75%. The vegetation on this unit is mainly mixed forest. Elevation is 6 to 300 meters. This unit makes up about 65% of the survey area. It is about 60% Tolonier soils and 25% Dolen soils.
- Rocke outcrop Wahrekdam (variant Wahrekdam). Rock outcrop, and shallow and moderately deep, well drained, nearly level to moderately sloping soils; on uplands. This map unit is in the interior of many islands in the survey area. It is mainly on ridgetops. Slope is 2 to 8%. The vegetation on this unit is mainly mixed forest. Elevation is 10 to 300 meters. This unit makes up about 8% of the survey area.

Chuuk is drained by a number of streams most of them short with small drainage areas. The compacted volcanic material results in a shallow (unconfined) ground water lens.

Household water use within Weno is derived from either captured rainwater (typically through a roof-gutter system that feeds a large storage tank) or groundwater. Rain catchment water is preferred for most domestic purposes such as drinking and cooking, whereas groundwater, typically accessed through hand-dug wells lined with concrete or rocks, is used for bathing and washing clothes.

5.1.3 Coastal Erosion Hazards

Figure 5-1 presents an image showing areas of concern in relation to coastal stability in Chuuk based on ArcGIS data provided by Chuuk EPA. Key areas considered to be of high coastal instability are primarily located along the northern (including Pou Bay) and south – eastern coastlines.

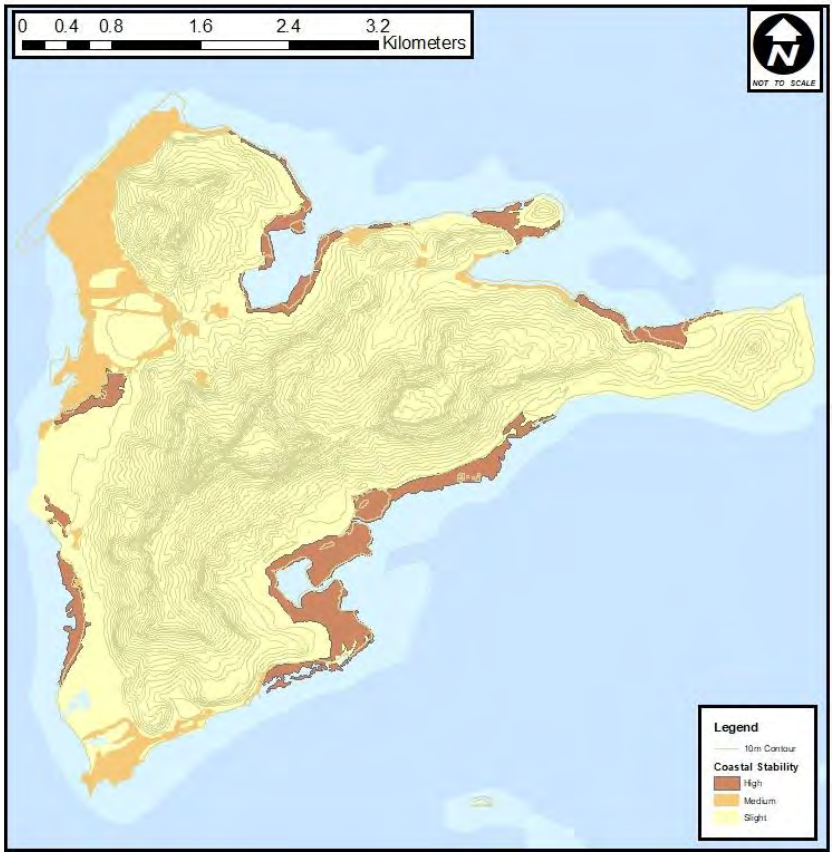


Figure 5-1: Coastal stability areas in Chuuk

5.2 Ecology

5.2.1 Terrestrial Ecology - Flora

Vegetation Types

Table 2-2 presents a summary of general vegetation types found in Chuuk. Key habitat sensitive to development disturbance as a proportion of total area ranges includes mangrove (7%), upland forest (16.2%) and marsh (5.6%) (from FSM 2001).

Plant Species

A total of 470 species of ferns and flowering plants have been described in Chuuk. Approximately 298 species are native including about 45 species of ferns, 95 monocot species and 158 dicot species (Falanruw 2002) (Table 2-3).

A total of 172 species of plants have been introduced to Chuuk (Zirkus 2001). Some of these introduced species have become invasive pests (Table 2-4) and, of the key 11 invasive weed species in FSM, 8 are present in Chuuk including the widespread Siam weed *Chromolaena odorata*, *Merremia peltata* and *Wedelia trilobata* (FSM 2002).

5.2.2 Terrestrial Ecology - Fauna

A range of avian, mammalian, reptilian species are present in Chuuk including 73 species of bird (including 17 native species, 21 resident and non-resident seabirds, 33 migratory shorebirds, and 2 introduced bird species) (Table 2-5). A number of mammals (including bats), reptiles (skinks, geckos, snakes), amphibians and freshwater fish are also likely to be present.

5.2.3 Coastal Marine Ecology

Recently collected data describing coastal marine habitats around Chuuk is currently being processed by Chuuk EPA and wasn't available at the time of wiring of this report. A review of existing information indicates that a total of 4 species were identified in a 2004 survey (see www.seagrasswatch.org).

5.2.4 Conservation Areas

Figure 5-2 presents designated protected / managed areas in Chuuk.

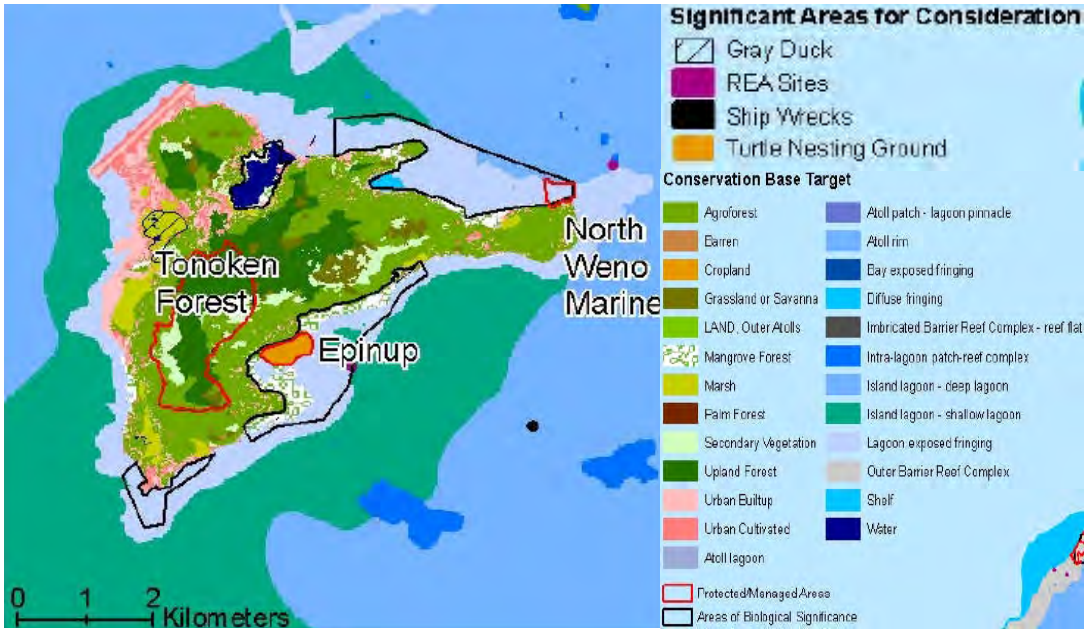


Figure 5-2: Chuuk conservation areas (FSM 2010)

A total of 50 Areas of Biodiversity Significance (ABS) have been identified for Chuuk including terrestrial (9), marine (10), coastal marine (20) and coastal freshwater sites (11) (Table 2-8). The key ABS sites on Weno are Pou Bay and the North Weno Marine ABS as shown in Figure 5-2.

5.3 Socio-Economic Environment

5.3.1 Economy

In 2003 Chuuk's GDP was $83 million (Arnold 2016). Chuuk then experienced a recession for the next 5 years following inception of COFA II. By 2008, Chuuk's GDP was $67 million the lowest since the 1980s due to a decline in public sector spending and private sector activities. After 2008, Chuuk State saw a rise in GDP due to the improvement of the sectors grants allocations. Chuuk State had adopted and implemented the Long Term Fiscal Framework requirements which allowed full utilization of funding sources from Compact II. By 2010, Chuuk had experienced 3% GDP growth and there was an increase in spending from both public and private sectors. Chuuk's economy grew at 1% and it experienced an expansion in the public sector by 4.4% and numbers of hours worked by civil servants increased.

In subsequent years Chuuk has experienced very little growth. Analysts have forecasted the decrease in compact funding ($1.7 million) will hinder government spending with little private sector growth.

5.3.2 Land Tenure & Access

In Chuuk, most land and aquatic areas are privately owned and acquired through inheritance, gift or, recently, by purchase. In early times, land was controlled by matrilineal descent groups or clans that resided in specific locales.

Chuuk State has taken action by passing leasehold mortgage law but has not yet promulgated regulations to implement the law. The extent to which land can be leveraged and mortgaged is important for increasing productive activity and incomes. Land assets that become locked outside the modern market economy cannot be leverage or redeployed for production. The overall effect is that many landowners are asset rich and income poor.

Article IV, § 4 provides recognition for traditional rights over reefs, tidelands, and other submerged lands, including their water columns, and successors rights thereto. It also authorizes the State legislature to regulate their "*reasonable use*." This Section strengthens customary land use practices in marine areas and is unusual in that it does not reference dry land areas. Sections 1 and 2 of this Article give authority to Chuukese custom and tradition as well as to the traditional leadership.

There are a number of provisions of the Chuuk State Constitution that indirectly affect land tenure. Most of these references bolster customary land tenure practices. In various ways, these references also influence the land tenure on Chuuk by limiting land use activities identified as environmentally harmful.

Article IV, §§ 1–2 strongly supports traditional and customary rights to the extent that even the bill of rights (Article III) may be compromised for the protection of Chuukese custom and tradition where a compelling social purpose is evidenced.

Article VII, § 14 supports the traditional culture of Chuuk requiring court decisions to be consistent with the Constitution, local traditions and customs, and the social and geographical configuration of the State.

5.3.3 Governance

Chuuk State is the only state in the FSM that has a bicameral legislature (House of Senate & Representative). There are 10 Senate members, two of whom represent a region - five regions all together. The House of Representatives aka 'House' has 28 members. They are elected by their respective districts. There are 13 districts with number of representatives depends on population size. All together there are 28 members.

Chuuk State has 40 municipalities with their own municipal government. Each municipality has an elected mayor act as the executive side. Legislative side is with the municipal council. Each habitable island in Chuuk has a Traditional Leader known as "Soupun and or Makal' who comes from a clan that rules the island. These Soupun and or Makal are equivalent to Chief of an island. Chuuk State has a council of traditional leaders composed of 42 active members. This council is a strong hold of customs and traditions therefore are the decision makers of such matters

5.3.4 Demographics

Chuuk State, population 53,106, also includes several additional sparsely populated outer island groups, including the Mortlock Islands to the southeast, the Hall Islands (Pafeng) to the north, Namonuito Atoll to the northwest, and the Pattiw Region to west The population of Chuuk State is (approx. 47% of FSM's total population. The main population centre of Chuuk State is the Chuuk Lagoon which has a population of 36,158 and includes FSM's largest city, Weno which has 12,000 people (2010 Census). Chuuk has a population density of 993 per square mile (383 per square kilometre), which is the highest density compared to other states. Chuuk also has a younger population on average than the other FSM states.

The Pattiw Region is of particular interest in that it contains some of the most traditional islands in the Pacific which are culturally related to the outer islands of Yap. Most of the roads and transportation systems are poor or in disrepair. Potholes in the coastal road of the business district of Chuuk are often filled with either saltwater at high tide or runoff that cannot drain due to the low elevation. Drinking water is un-potable (FSM 2017). A large part of Chuuk State still rely heavily on subsistence base living. Food grown on land and

in the ocean are still big part of their source of food. Kon, a pounded breadfruit able to be eaten for a week long is a popular source of starch for many Chuukese.

5.3.5 Gender, GBV and Trafficking

The Chuuk Women's Council is the only non-government organisation in FSM providing GBV counselling services. Findings from the report assessing gaps in EVAW services (FSM 2018) are being used to better assist women and children to access services relating to domestic violence. This includes the launch of the Chuuk Women's Council GBV counselling service.

Each of Micronesia's four states have its own laws that criminalize trafficking offenses however Chuuk State did not explicitly prohibit adult sex trafficking. Cases prosecuted at the state level may also be heard at the national level, under national anti-trafficking law, depending on which court hears a case. Each of the four states' anti-trafficking task forces are comprised of members of state and national law enforcement, the legal community, medical and mental health professionals, immigration officials, and women's empowerment and faith-based groups; only Chuuk (and Pohnpei's) task force were active during the reporting period.

5.3.6 Education

State governments in FSM have responsibility for education, with the majority of funds coming from Compact of Free Association sources. All children in FSM are required by law to attend school through to eighth grade, and many continue to college after graduating high school. As a result, FSM has a high literacy rate. All students learn English as it is the official language of FSM. The National Infrastructure Development Plan earmarked USD$135.4 million for education infrastructure spending across the 20 years between 2004 and 2023.

The Plan describes issues relating to education infrastructure including poor maintenance (including failure of water and power supplies); a number of schools in a highly deteriorated state; a shortage of supplies includes furniture, equipment, books and tools; a lack of diverse facilities (such as music rooms, auditoriums, vocational training facilities); inadequately qualified teachers; inappropriate school curricula; and a lack of vocational training. Grants and US education programs are used to support many FSM students to attend the College of Micronesia (COM), the University of Guam and US colleges.

5.3.7 Health

The primary health challenges affecting FSM include obesity induced illness and increasing substance abuse amongst youth. FSM has been declared as a Public Health Emergency for Non-Communicable Diseases (70% of all deaths are due to NCDs). Most of the divisions of the Chuuk Department of Health share some common challenges. The Chuuk State Department of Health Services (CSDHS) 6 divisions: Hospital & Management, Nursing, Dispensary, Public Health, Dentistry and Environmental Health and Sanitation (Chuuk Strategic Development Plan.

5.3.8 Infrastructure

Water Supply

The Chuuk Public Utility Corporation (CPUC) operates the public water supply on Weno Island, serving 378 residential customers (around 19% of total households) and 101

commercial and government customers (IEE 2020). Figure 5-3 presents a map showing the water supply network.

Sewerage Network

The Weno sewerage network, the only centralized sewer system in Chuuk is located on the north and north-western side of Weno Island and was commissioned in 1973. Figure 5-4 presents a schematic of the sewerage network.

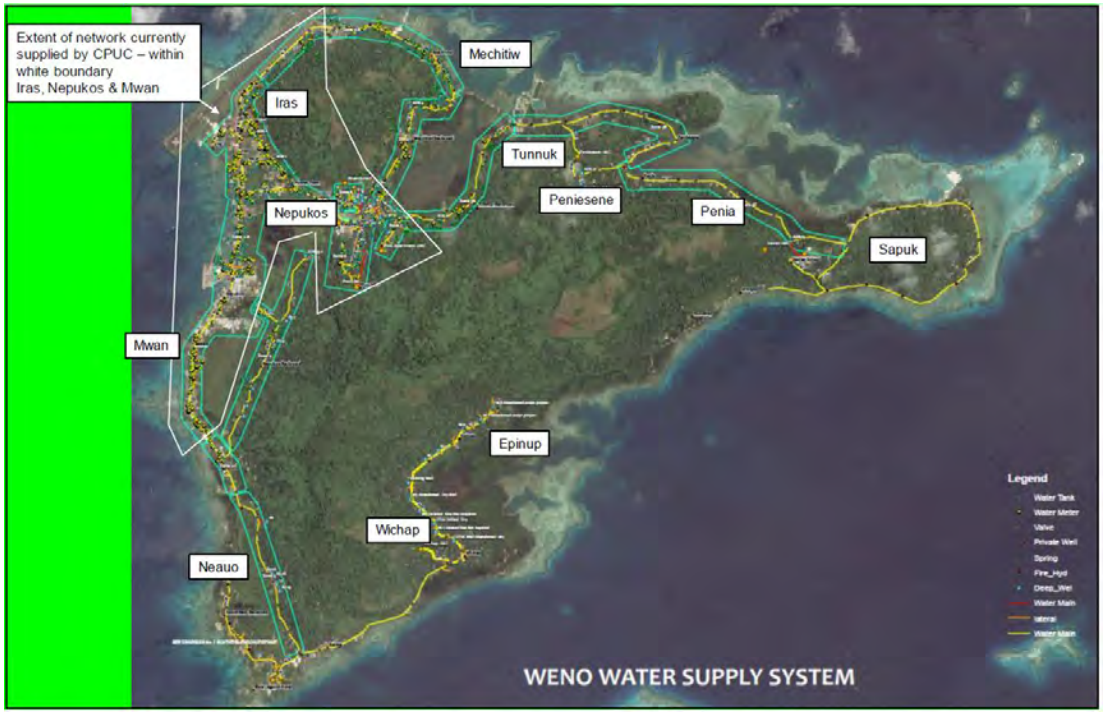


Figure 5-3: Extent of CPUC Water Supply Network (from IEE 2020)

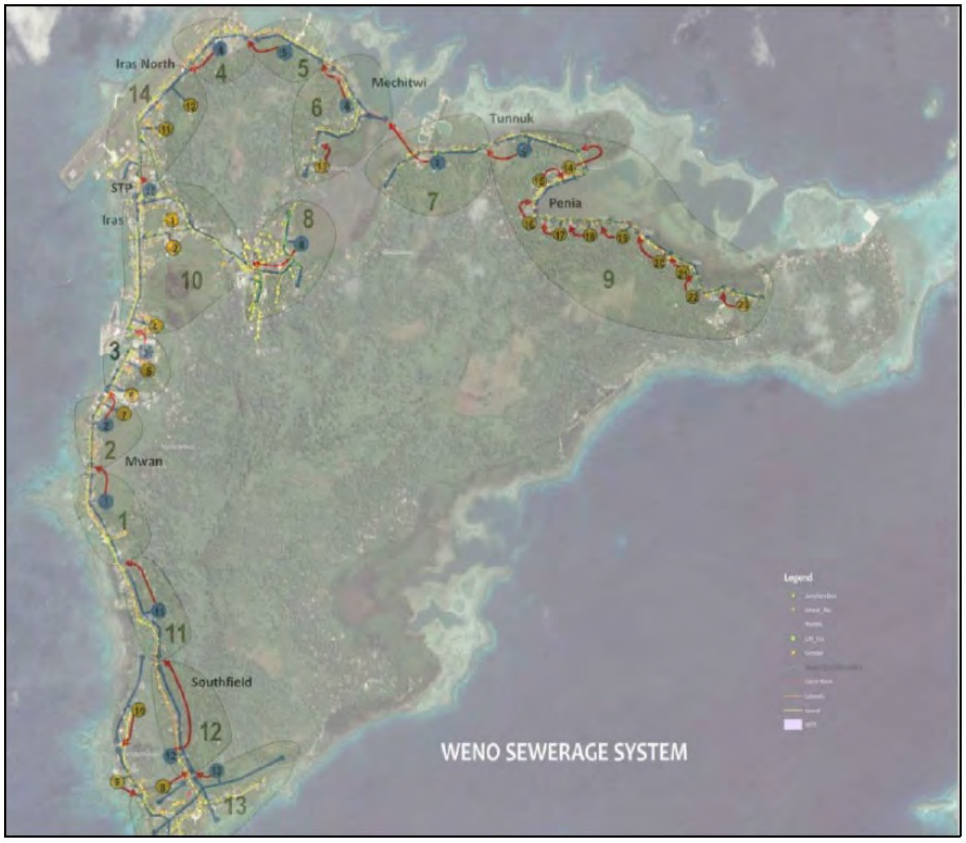


Figure 5-4: Schematic Layout of Sewerage System (from IEE 2020)

The sewerage network is operated by CPUC with 384 residential households and 106 commercial and government customers. Sewage is treated at the Weno wastewater treatment plant (WWTP) which is located next to the Weno airport.

Beyond the sewerage network service area, septic tanks and pit toilets are widely used, particularly among poor communities. Septic tank and pit toilets discharge sewage randomly into shallow aquifers and contaminate Weno's groundwater sources.

Quarry

There are three basalt quarries located on Weno, Chuuk, two of which have not been in operation since the 90s. One of the sites has equipment and is still in operation but output is extremely limited.

There is also a basalt Quarry on Tonoas, Chuuk. Equipment and site are ready but not yet operational. Output Capacity is still unknown.

There are also three coral sand quarries on Weno, Chuuk. All sites are operational but capacity is limited. Equipment consists of excavators, loaders and dump trucks only.

It is considered that none of these sites could be considered to be used for any major project unless the Contractor is able to take over operations.

Solid Waste Management

Solid waste facilities on Weno consist of the Fanipat dumpsite located on the southwest coast (Johnston 2011). The Department of Public Works has the responsibility of solid waste management. There are also several unofficial dumpsites along Weno roads. Trash collection is scheduled three times a week, but is reportedly not reliably operated.

Further investigation is required to determine whether the solid waste facility has the ability to dispose of any waste roading material generated from the PRIME Project.

5.4 Primary Data Collection

A range of assets located in the road corridor along the PRIME Road have been identified based on fieldwork undertaken. A map showing the location of these assets (which includes as private fences/walls and gardens, fruit trees, buildings, bridges/culverts, etc.) and other key resources are provided in Figure 5-5. Appendix B presents further detail on this map. Figure 5-6 presents examples of these assets. This information has been used to identify E&S sensitivities for the ESMF.

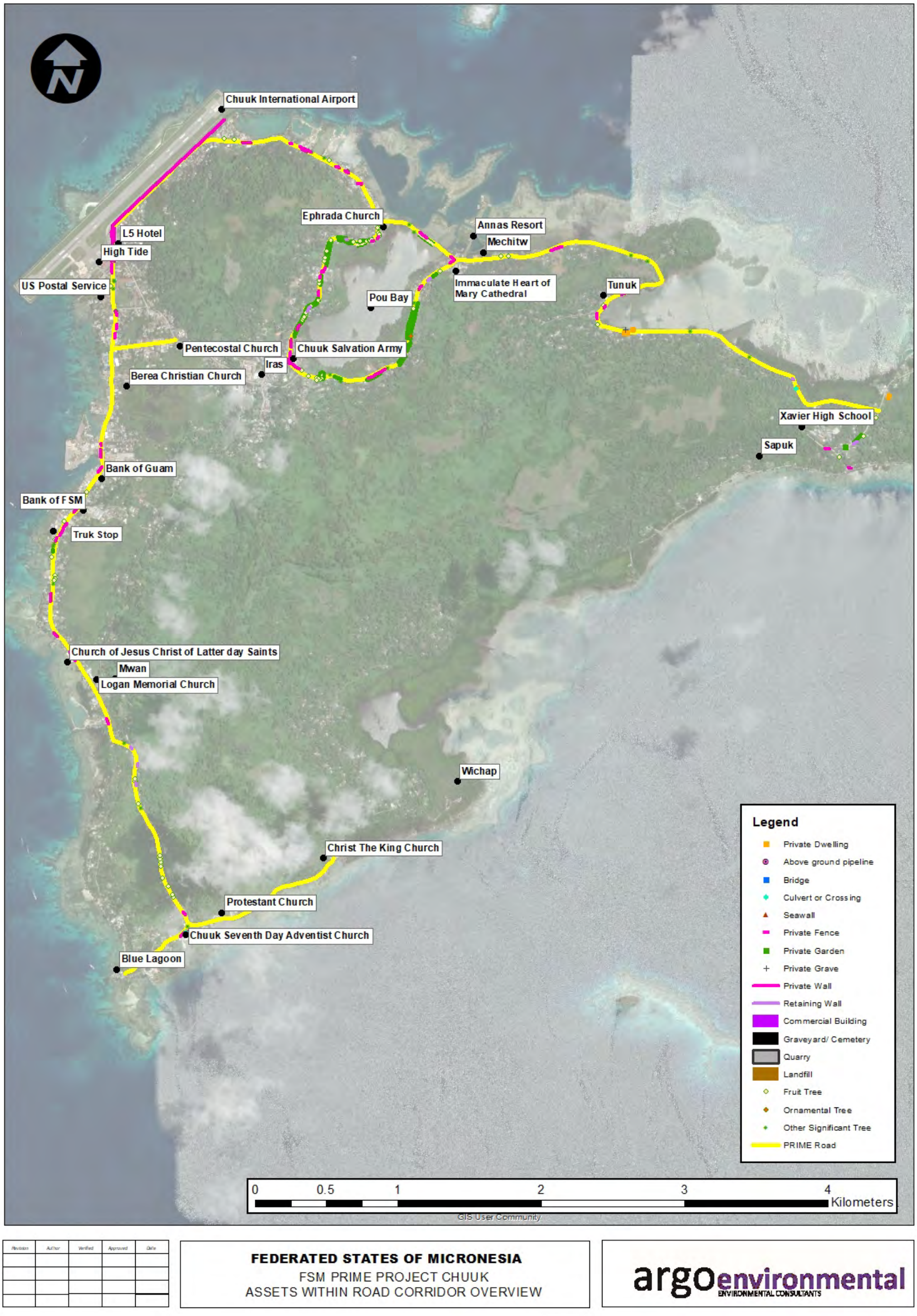


Figure 5-5: Assets within road corridor and location of sensitive social receptors - Chuuk

Figure 5-6: Images of Chuuk showing examples of assets identified during the road corridor on Chuuk inspection including walls and private fences (top and middle left and right), pig pen (bottom left) and power poles (bottom right).

6. Yap

6.1 Physical Environment

6.1.1 Climate

presents key climate data for Yap (from https://en.climate-data.org/). The key point to note is the abundant rainfall Yap receives annually (282.9 cm).

Table 6-1: Key climate statistics for Chuuk including temperature (°C) and rainfall (mm)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Temperature	26.8	26.9	27.1	27.5	27.5	27.4	27	27.1	27.3	27.3	27.2	27
Min. Temperature	23.6	23.7	23.8	24.1	24.1	23.9	23.6	23.7	23.8	23.7	23.8	23.8
Max. Temperature	30	30.1	30.5	31	31	30.9	30.5	30.6	30.8	30.9	30.7	30.3
Rainfall (mm)	201	146	146	149	232	313	360	371	330	319	238	24

6.1.2 Geology, Topography, Soils & Hydrology

The Yap Islands comprise an island arc system on the eastern convergent margin of Philippine Plate. They are composed of continental crust and consist of two distinct sequences: ancient weathered volcanic rock and weathered metamorphic schists, accompanied by coral sand and mangrove mud. The islands are surrounded by a broad fringing barrier reef. Yap itself has a low undulating topography with a maximum elevation of 178 m at Mount Taabiywol in Fanif municipality.

There are four main soil types on the Yap Islands (FSM 2010) that have been derived from the basement rocks (Figure 6-1) as follows:

- **Yap –** '*Very deep, well drained, level to moderately steep soils; on dissected volcanic plateaus*' This soil type is present throughout the islands of Yap and Gagil-Tamil where it has been derived from volcanic rock. The surface soils are loamy and subsoils consist of clay.
- **Gagil** - '*Very deep, well drained, nearly level to steep soils; on hills and plateau*'. This soil type is restricted to the islands of Gagil-Tamil and Yap. On Gagil-Tamil it is present throughout the island whereas it is confined to a small area on southern Yap. Gagil soil occurs on rounded hills that are actively eroding in drainage lines on rounded hills and on plateau. Similar to Yap soils this soil type is derived from volcanic rock. The surface soils are loamy and subsoils are clay.
- **Rumung-Weloy** – '*Shallow and moderately deep, well drained, nearly level to very steep soils; on hills and mountains*'. This soil type occurs on the hills and mountains of the islands of Yap and Rumung. These soils are shallow and well drained and are formed from the underlying schist. The surface is gravelly (from the presence of iron coated schist gravel) and loamy and the subsoil is very gravelly and clayey. Weloy soils also occur on hills and mountains and are similar to Rumung soils in that they are derived from the underlying schist but differ in that they are deeper but are still gravelly and loamy.
- **Gitam** – 'Moderately deep, somewhat poorly drained, level to strongly sloping soils; on toe slopes and upland plains'. This soil type is present on the islands of Yap, Maap, Gagil-Tamil and Rumung. These moderately deep soils have formed from the underlying schist. The surface is covered with gravel. The surface layer is gravelly and loamy over clayey subsoils.

Areas of depositional soils are also present including beach deposits fringing the islands and alluvium, mangrove peats, freshwater swamp and marsh deposits. The sandy beach deposits which occur adjacent to coastal beaches have formed from wind and water deposited coral sand.

Alluvium derived soils occur in valley bottoms and floodplains and are comprised of weathered and eroded material from volcanic rock and schist which has formed soils ranging from loams with gravels to clays. Freshwater marshes and swamps have formed on low lying poorly drained areas of alluvium. Most agricultural activity is undertaken on the alluvium soils in valley bottoms and floodplains.

Mangrove peats which have formed in the intertidal zone adjacent to the shoreline are present on Yap, Maap and Gagil-Tamil. The mangrove peats are saline, very deep and poorly drained and are predominantly derived from mangrove roots and litter.

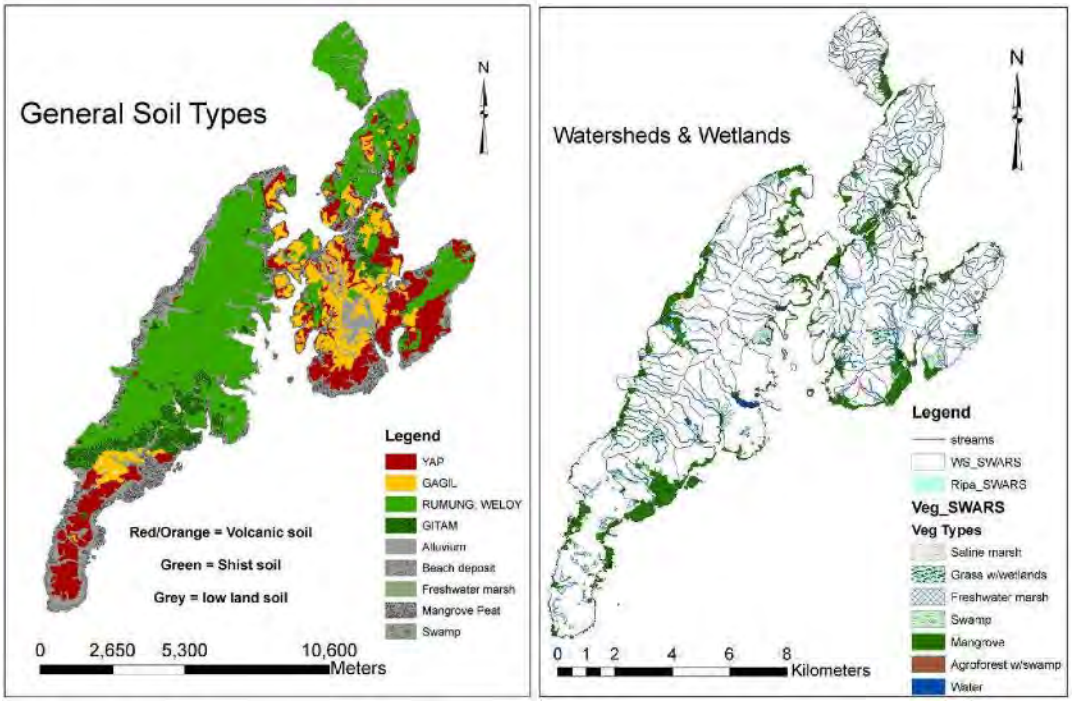


Figure 6-1: Soil types (left) and watersheds & wetlands (right) of Yap (IEE 2019)

6.1.3 Hydrology

Surface water

The primary freshwater source on Yap proper is surface water (Figure 6-1). There are no perennial streams on Yap where most streams will be dry during part of the dry season, ranging from a few days to several months. The streams go dry because they have small drainage areas and the water retention of the soil and rock of their watershed is low. Mukong Stream and Tomil-Gagil streams are a few of the streams that do not dry up during periods of low rainfall. A large water reservoir on Yap proper was constructed to capture surface water in the stream drainage to the ocean.

The geological formation of Gagil-Tamil allows greater percolation of water to groundwater, and subsequent release to streams during long periods of dry weather. In addition, the drainage area of Mukong Stream is much larger than any stream on Yap proper.

Groundwater

A proportion of the surface water percolates into the soils recharging groundwater which eventually escapes as small springs or seeps directly into the ocean. However, given the bedrock on Yap is metamorphic and volcanic, it yields little groundwater for use.

6.2 Ecology

6.2.1 Terrestrial Flora

Vegetation / Habitat Types

Figure 6-2 presents a vegetation map for Yap and Table 6-2 estimated coverage of key vegetation / habitat types. The major land class/habitat types are:

- Non-forest (28%) including grasslands, marshes, savanna grasslands, cropland, degraded sites and areas developed for urban use.
- Agroforest (26%) which includes areas under cultivation for food crops, fruit, wood, and other products. The dominant species on these managed lands include coconut palm, breadfruit, betel nut, papaya, banana, cassava, two species of taro, and a variety of medicinal and ornamental species (Mueller-Dombois & Fosberg 1998).
- Secondary vegetation (6%) such as vines, shrubs, and small trees on recently disturbed areas.

The vegetation of Yap has been greatly modified; other than mangroves, little native forest remains (Figure 6-3). Several factors have contributed to disturbance to the native vegetation including pressure on natural resources to produce food, Japanese agricultural practices, droughts, and repeated burning. A combination of these factors are thought to have contributed to the destruction of the native vegetation and the development or expansion of savanna areas of degraded soils (Falanruw *et al* 1987).

Nothing is known of the original vegetation of the area and very little is known about the character of the vegetation prior to European contact (Zirkus 2001). Yap is thought to have been mostly covered with broadleaf deciduous forests in the past.

Table 6-2: General vegetation / habitat types on Yap

Major land class/ habitat type	Vegetation/habitat type	Cover in 1976 (ha)	Percent cover
Forest	Mangrove	1,171	12%
	Swamp Forest	155	2%
	Upland Forest	2,556	26%
Agroforest	Agroforest	2,538	26%
Secondary vegetation	Secondary vegetation	553	6%
Nonforest	Grasslands	2,175	22%
	Marsh	165	2%
	Other nonforest	403	4%
Total Area		**9,716**	

Plant Species

Table 6-3 presents approximate numbers of native and introduced flora species in Yap. Of the 1,239 species of ferns and flowering plants found in FSM, approximately 618 occur in Yap including 376 native species (45 ferns, 144 monocots, and 187 dicots). Of the 457 species of plants introduced to FSM, a total of 242 species are found in Yap.

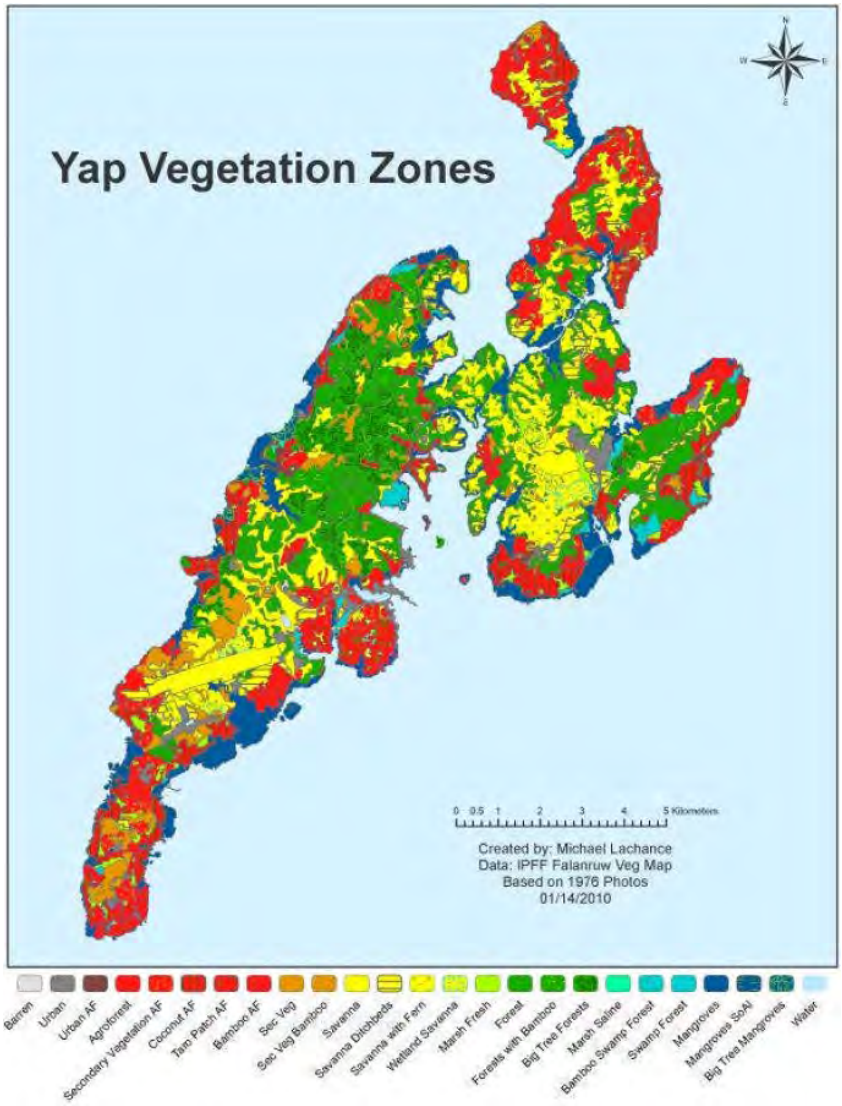


Figure 6-2: Vegetation map of Yap Islands (FSM 2010)

Table 6-3: Approximate number (and % of total) of native and introduced flora species in Yap

	Native	Introduced	Total
Ferns	45 (12%)	2 (1%)	47 (8%)
Monocots	144 (38%)	64 (26%)	208 (34%)
Dicots	187 (50%)	176 (73%)	363 (59%)
Total	376	242	618

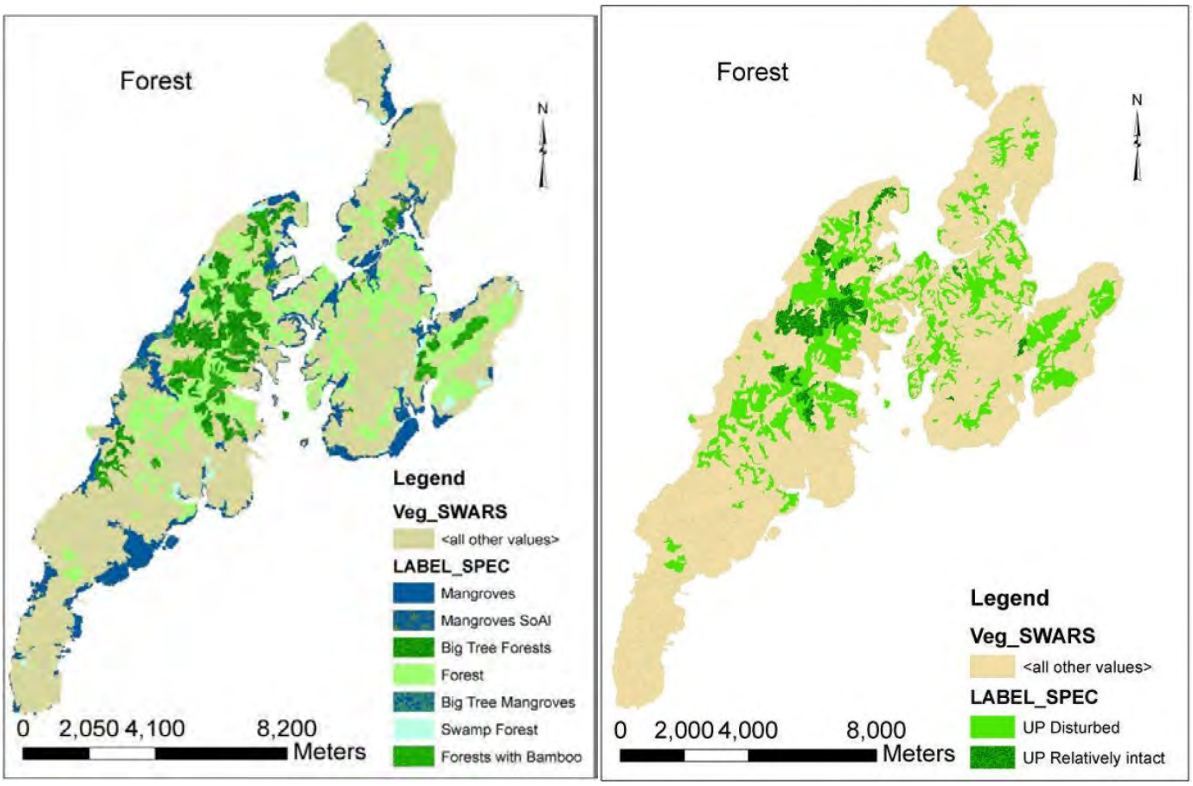


Figure 6-3: Areas of native forest including mangroves (in blue) and terrestrial forests including disturbed forests (left) and areas of relatively intact native forest (right) (from FSM 2010).

Rare, regionally significant or protected flora species.

There are four threated (one 'Endangered' and three 'Vulnerable') and one "Near Threatened' (NT) floral species in Yap (see Table 6-4) (IUCN 2018). Of these species, one species (NT) is not endemic to Yap but instead a cultivar from the islands of Pohnpei and Chuuk (the Ivory nut palm *Metroxylon amicarum*).

All of the threatened species are trees with two (thorrot *Intsia bijuga* and lach *Pterocarpus indicus*) found in lowland forest, one (*Pericopsis mooniana*) from coastal forest and one (faltir *Cycas micronesica*) from closed forest.

Of the 364 vascular plant species considered endemic to Micronesia (Costion & Lorence 2012). Yap has nine endemic plant species, another two also found in either Chuuk or Pohnpei, with a further 16 endemic species found across the Western Carolines (Palau, Yap) (see Table 6-5). In addition, 17 endemic species are found across the Carolines, including Yap and there is a boxlike shrub, *Myrtella bennigseniana*, also endemic to the savanna environments of Yap and Guam (Zirkus, S. 2001 & USFS 2010).

6.2.2 Terrestrial Fauna

Rare, regionally significant or protected fauna species

Yap contains four endemic bird species: the Yap cicadabird (*Coracina tenuirostris nesiotis*) which may be elevated to a separate species and is considered to be 'Endangered', and three 'Near Threatened' species, the Yap monarch (*Monarcha godeffroyi*) and two white-eyes (Yap Olive White-eye *Zosterops oleagineus*) and Yap Plain White-eye Zosterops hypolais) (Table 6-6) (IUCN 2018).

Table 6-4: Threatened or near threated flora species of Yap

Common name	Scientific name	IUCN Category	Comments	Habitat
"faltir"	*Cycas micronesica*	Endangered	Population decreasing. Plants occur on Palau Island and on Guam and Rota Islands of the Marianas group and on Yap Island of the Caroline Islands group	Shrub to tree that occurs in closed forest on coral limestone or coral sand, or occasionally on volcanic soils on islands where these occur.
"thorrot"	*Intsia bijuga*	Vulnerable	Throughout Micronesia, native from Indian Ocean east to Polynesia. Produces one of the most valuable timbers of South East Asia	Lowland rainforest tree (growing up to 25m tall), often found on sand and coral beaches, but also in periodically inundated localities further inland. It also occurs in dryland mangroves.
	Pericopsis mooniana	Vulnerable	Found in Indonesia (Sulawesi - rare, Papua, Jawa, Sumatera, Maluku, Kalimantan); Malaysia (Sabah - almost extinct, Peninsular Malaysia - rare); FSM (Yap, Pohnpei); Palau; Papua New Guinea - possible extinct; Philippines; Sri Lanka	A fairly large tree mainly found scattered within coastal forests
"lach"	*Pterocarpus indicus*	Vulnerable	Widespread in tropical Asia, Malaysia, and the Philippines. Indigenous to western Carolines (Yap, Palau), planted and naturalized in eastern Carolines (Kosrae, Pohnpei, Chuuk)	Found in lowland primary and some secondary forest, mainly along tidal creeks and rocky shores. Occurs at a wide range of altitudse from 600 to 1,300 m above sea level
Ivory nut palm	*Metroxylon amicarum*	Near Threatened	This species is endemic to the islands of **Pohnpei and Chuuk**, but now planted occasionally throughout Micronesia.It also occurs on Guam, but the lack of local name indicates that it is probably not a native species.	A few trees have been planted in moist areas in Yap. Occurs from sea level up to 550 m asl.

Table 6-5: Endemic plant species of Yap

Species	Distribution	Form	Notes
Endemics limited to Yap			
Casearia cauliflora	Yap	Tree	
Drypetes carolinensis	Yap	Tree	
Drypetes yapensis	Yap	Tree	
Garcinia volkensii	Yap	Tree	
Hedyotis cushingiae	Yap		Occurs in open savannas, clearings, and under the forest canopy
Pandanus japensis	Yap	Tree	Do well along the coast and in poor soils but can occur in all habitats
Psychotria arbuscula	Yap	Shrub	
Timonius albus	Yap	Tree/shrub	
Trichospermum ikutai	Yap	Shrub	

Other birds endemic to FSM are also present in Yap including the Caroline Reed-warbler, *Acrocephalus syrinx* and the Caroline Swiftlet *Aerodramus inquietus*.

Table 6-6: Restricted-range and threatened birds of Yap (BirdLife International 2018, IUCN 2018)

Common name	Scientific name	IUCN Category	Occurence	Habitat
Non-migratory species				
Beck's petrel	*Pseudobulweria becki*	Critically Endangered	Only known from Papua New Guinea and Solomon Islands. Has been seen in the Vanuatu archipelago. May occur in FSM as the extent of its breeding range and at-sea distribution is still unknown.	Marine species that is likely to nest in burrows on the slopes of high mountains on larger islands, but may also breed on small islets.
Yap cicadabird	*Edolisoma nesiotis*	Endangered	**Endemic** to Yap. Surveys in the 1980s found the species widely spread but at low density.	Recorded in both forest and savanna habitat, but at four times the density in forest than savanna, and sightings away from forest appear very rare. It is suspected that the species is highly dependent on remaining forest for much of its life cycle, but is likely to roam over relatively large areas.
White-throated ground-dove	*Alopecoenas xanthonurus*	Near Threatened	Known from Guam where it is rare, Mariana islands (uncommon) north of Guam and Yap (uncommon) where the population was estimated at c.195 in 1983.	Inhabits native forest, secondary forest, plantations, introduced tangan-tangan *Leucaena leucocephala* thickets and habitat mosaics including fields, but appears more frequent in native forest than in disturbed habitats. It is largely arboreal; feeding in the forest canopy taking fruits, seeds and flowers.
Yap monarch	*Metabolus godeffroyi*	Near Threatened	**Endemic** to the islands of Yap occurring on Yap, Gagil-Tomil, Rumung (presumably) and Maap, where it is widespread. In 1984, it was estimated to number 26,961 individuals.	Inhabits virtually all forest types including mangroves and secondary growth. Unlikely to be affected by habitat degradation as it is able to utilise the scrubby vegetation which often invades forest-cleared sites.
Yap plain white-eye	*Zosterops hypolais*	Near Threatened	**Endemic** to the four islands of Yap where it is common and in 1984, was estimated to have a population of 86,864 individuals.	Found in nearly all forest and vegetation types, including brushy thickets in open savannas and meadows.
Common name	**Scientific name**	**IUCN Category**	**Occurence**	**Habitat**
Yap olive white-eye	*Zosterops oleagineus*	Near Threatened	**Endemic** to the four islands of Yap. In the 1970s, it could be readily found in any forest area. In 1984, it was estimated to have a total population of 19,619 individuals and was expected to remain common. However, more recently, it appears to have become scarcer.	Widely distributed in all types of forest and woody vegetation, including mangroves, but shows a preference for better-developed forests. Loss of habitat from fire is a threat.
Caroline Reed-warbler	*Acrocephalus syrinx*	Least Concern	**Endemic** to FSM.	Found in subtropical/tropical dry grasslands but has also been recorded in subtropical/tropical moist montane forest and rural gardens.
Caroline Swiftlet	*Aerodramus inquietus*	Least Concern	**Endemic** to FSM and is described as common to abundant. The population on Yap has not been quantified but the species' population in the rest of its range is estimated to be 83,500 individuals.	Breeds in colonies in caves forages over subtropical and tropical moist lowland forest.
Micronesian starling	*Aplonis opaca*	Least Concern	Known from Guam, FSM, Northern Mariana Islands and Palau. Population trend is difficult to determine because of uncertainty over the impacts of habitat modification on population sizes.	Found in across a range of forest and shrubland habitats from heavily degraded former forest to subtropical/tropical moist to dry shrubland or forest. It has a medium dependency on forest habitat.
Micronesian myzomela	*Myzomela rubratra*	Least Concern	Known from Guam, FSM, Northern Mariana Islands and Palau. Population trend is not known, but the population is not believed to be decreasing sufficiently rapidly to approach the thresholds under the population trend criterion (>30% decline over ten years or three generations).	Found in across a range of habitats from urban areas, rural gardens and plantations to mangrove forests and subtropical/tropical moist lowland forest to an altitude of 800 m. It has a low dependency on forest habitat.
Migratory species				
Great knot	*Calidris tenuirostris*	Endangered	Migratory species that has been recorded in FSM during the non-breeding season.	In its wintering range the species occurs in sheltered coastal habitats such as inlets, bays, harbours, estuaries and lagoons with large intertidal mud and sandflats, oceanic sandy beaches with nearby mudflats, sandy spits and islets, muddy shorelines with mangroves and occasionally exposed reefs or rock platforms.

Table 6-7: Restricted-range and threatened birds of Yap (cont.)

Common name	Scientific name	IUCN Category	Occurence	Habitat
Far eastern curlew	*Numenius madagascariensis*	Endangered	Migratory species that has been recorded in FSM during the non-breeding season.	In the non-breeding season it is essentially coastal, occurring at estuaries, mangrove swamps, saltmarshes and intertidal flats, particularly those with extensive seagrass (Zosteraceae) meadows. It often roosts in salt-marshes, behind mangroves, or on sandy beaches.
Buller's shearwater	*Ardenna bulleri*	Vulnerable	Migratory species. The species migrates to the northern Pacific Ocean, from Japan to North America and east to California, and is occasionally found off South America.	Pelagic marine species in non-breeding season.
Bristle-thighed curlew	*Numenius tahitiensis*	Vulnerable	Migratory species that has been recorded in FSM during the non-breeding season.	It winters on coral reefs, sandy beaches, intertidal flats, rocky shores and in palm forests and dense vegetated understorey.
White-necked petrel	*Pterodroma cervicalis*	Vulnerable	Migratory species that has been recorded in FSM during the non-breeding season.	Pelagic marine species in non-breeding season.
Stejneger's petrel	*Pterodroma longirostris*	Vulnerable	Migratory species that has been recorded in FSM during the non-breeding season.	Pelagic marine species in non-breeding season.
Pycroft's petrel	*Pterodroma pycrofti*	Vulnerable	Migratory species. Studies utilising geolocators have shown that, when not breeding, birds disperse to the central and eastern tropical Pacific.	Pelagic marine species in non-breeding season.
Providence petrel	*Pterodroma solandri*	Vulnerable	Migratory species. Its non-breeding distribution is across the western Tasman Sea with some dispersing to the north and northwest Pacific Ocean perhaps as far north as the Bering Sea.	Pelagic marine species in non-breeding season.
Flesh-footed shearwater	*Ardenna carneipes*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	Pelagic marine species in non-breeding season.
Sooty shearwater	*Ardenna grisea*	Near Threatened	Migratory species. The species migrates to the northern hemisphere during the austral winter.	Pelagic marine species in non-breeding season.
Curlew sandpiper	*Calidris ferruginea*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	In the winter the species chiefly occurs on coastal brackish lagoons, tidal mud- and sand-flats, estuaries, saltmarshes, exposed coral, rocky shores and tidewrack on sandy beaches, and also inland on the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and saltpans.

Common name	Scientific name	IUCN Category	Occurence	Habitat
Red-necked Stint	*Calidris ruficollis*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	In the non-breeding season it mainly uses coastal and intertidal mudflats, sheltered inlets, bays and lagoons but it also uses freshwater, brackish and saltwater wetlands and occasionally sandy beaches and rocky shorelines.
Buff-breasted sandpiper	*Calidris subruficollis*	Near Threatened	Mibratory species, recorded as a vagrant in FSM.	During migration it is found on many short grass habitats.
Streaked shearwater	*Calonectris leucomelas*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	Found over both pelagic and inshore waters during non-breeding season.
Micronesian imperial-pigeon	*Ducula oceanica*	Near Threatened	This species occurs in the Micronesian islands of Palau, Yap, Chuuk, Pohnpei and Kosrae, including many small offshore islands. It is probably extinct on Kiribati and many or all of the Marshall Islands. There were estimated to be 572 birds on Yap, 51 on Chuuk, 822 on Pohnpei, 7,474 on Kosrae in 1983-1984. Numbers on Pohnpei are known to have declined by about 70% between 1983 and 1994. The population on Kosrae is inferred to have declined less severely due to the lower rate of forest loss and smaller human population on that island.	Forest species, found predominantly in the mountains of Pohnpei and Kosrae, but widespread where not hunted, including secondary forest, beach forest and mangroves.
Bar-tailed godwit	*Limosa lapponica*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	During the winter it is more common in intertidal areas along muddy coastlines, estuaries, inlets, mangrove-fringed lagoons and sheltered bays with tidal mudflats or sandbars.
Black-tailed godwit	*Limosa limosa*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season. The subspecies *Limosa limosa melanuroides* breeds in disjunct populations in Mongolia, northern China, Siberia (Russia) and the Russian Far East. These birds migrates across a broad front to winter from western South Asia to Australia, encompassing India, Indochina, Taiwan, the Philippines, Indonesia, and Melanesia.	The subspecies *Limosa limosa melanuroides* often winters in saline habitats such as sheltered estuaries and lagoons with large intertidal mudflats, sandy beaches, salt-marshes and salt-flats.
Tahiti petrel	*Pseudobulweria rostrata*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	Pelagic marine species in non-breeding season.
Mottled petrel	*Pterodroma inexpectata*	Near Threatened	Migratory species. It migrates to the north Pacific as far as the northern Gulf of Alaska and the southern half of the Bering Sea and in summer can range as far south as the pack ice.	Pelagic marine species in non-breeding season.
Grey-tailed Tattler	*Tringa brevipes*	Near Threatened	Migratory species that has been recorded in FSM during the non-breeding season.	In the non-breeding season it is found on sheltered coasts with reefs and rock platforms or with intertidal mudflats, as well as shorelines with rocks, shingle, gravel or shells, often roosting in mangroves. On migration, it is predominantly coastal, but may occur at inland wetlands.

In addition, there are four additional, restricted-range bird species including the 'Critically Endangered' migratory species, Beck's petrel *Pseudobulweria becki*, White-throated ground-dove *Alopecoenas xanthonurus* ('Near Threatened'), the Micronesian starling *Aplonis opaca* and Micronesian myzomela rubratra, both of which are of 'Least Concern'. Yap may also be visited by 21 IUCN listed migratory bird species including one 'Critically Endangered' species, two 'Endangered', six 'Vulnerable' and 12 'Near Threatened' species.

A major threat to native bird species is loss of habitat, due to human-set fires during the dry season. In addition all endemic and native bird species on the Yap Islands are at risk from introduced predators, the most notorious being the brown tree snake *Boiga irregularis*, which is responsible for many extinctions on Guam. At present the snake is not known in Yap. The tree sparrow *Passer montanus*, which was introduced in late 1970s from Eurasia, may also pose a threat as it is known to carry exotic diseases.

Two endemic species of flying foxes of the genus Pteropus occur in Yap state; the Yap flying fox *Pteropus pelewensis* ssp. *Yapensis* ('Vulnerable') which is endemic to the four adjacent small main islands of Yap, and Marianas flying fox *Pteropus mariannus* ('Endangered') which is endemic to the northern Mariana Islands, Guam and Ulithi. The sub species, Ulithi fruit bat Pteropus mariannus ulthiensis is endemic to Ulithi Island (Table 6-8).

Three threatened reptiles are known to occur in Yap: two migratory marine turtle species that nest on beaches and the Micronesia saw tailed gecko *Perochirus ateles* which is endemic to the Marianas Islands and FSM are 'Vulnerable' (Table 6-9). In addition, there is one restricted range species thought to occur on Ulithi Atoll, in Yap State, the Giant micronesian gecko *Perochirus scutellatus*.

Table 6-8: Threatened mammals of Yap (IUCN 2018)

Common name	Scientific name	Listing	Category	Comments	Habitat
Marianas flying fox	*Pteropus mariannus*	IUCN	Endangered	This species ranges from the Northern Mariana Islands, Guam, and the Ulithi Atoll (and possibly from nearby atolls) in FSM. The sub species, Ulithi Fruit bat *Pteropus mariannus ulthiensis*, is endemic to Ulithi Atoll.	Found in areas of native tropical forest, coastal strand, and mangroves. roosting within healthy forest – both atoll and upland forests.
		Yap State Code, Title 18 Conservation & Resources, Chp 11 Fruitbats	The taking, hunting, exporting, purchasing or selling of or in any way intentionally interfering with the population growth of fruitbats in the State of Yap is prohibited.		
Yap flying fox	*Pteropus pelewensis* ssp. *yapensis*	IUCN	Vulnerable	Endemic to the four adjacent small main islands of Yap.	Found in forest, mangroves, and agroforest. Although there is virtually no primary forest remaining on the islands, there is significant secondary forest and agroforest, which this species utilizes.
		Yap State Code, Title 18 Conservation & Resources, Chp 11 Fruitbats	The taking, hunting, exporting, purchasing or selling of or in any way intentionally interfering with the population growth of fruitbats in the State of Yap is prohibited.		

Table 6-9: Restricted-range and threatened reptiles of Yap (IUCN 2018)

Common name	Scientific name	Category	Comments	Habitat
Hawksbill turtle	*Eretmochelys imbricata*	Critically Endangered	Migratory species. Has a circumglobal distribution throughout tropical and, to a lesser extent, subtropical waters of the Atlantic Ocean, Indian Ocean, and Pacific Ocean.	Marine species that nests on insular and mainland sandy beaches in more than 70 countries worldwide.
Green turtle	*Chelonia mydas*	Endangered	Migratory species. Has a circumglobal distribution, occurring throughout tropical and, to a lesser extent, subtropical waters. Listed as Endangered on US Endangered Species Act 1973.	Marine species that nests on beaches in more than 80 countries worldwide.
Micronesia saw-tailed gecko	*Perochirus ateles*	Vulnerable	Species is distributed throughout the Marianas Islands (including Guam, where it is now presumed to be extinct); FSM where it is present on about a third of the islands (including Yap, Truk, Chuuk, Pohnpei, Kosrae, Kapingamarangi Atoll); and the Marshall Islands.	This species has been collected from palm leaf axils, in shrubs and bushes, and under loose flaking bark on standing trees. It is apparently highly arboreal and appears to be somewhat adaptable, occurring on islands where the only vegetation consists of coconut and breadfruit trees, as well as in natural forest.
Giant micronesian gecko	*Perochirus scutellatus*	Least Concern	Known only on Kapingamarangi and Ulithi atolls. Its occurrence on Ulithi requires verification.	It is only known to occur a few metres above sea level. It is primarily diurnal and arboreal, with a predilection for Guettarda trunks. There is no remaining primary forest on Kapingamarangi Atoll, and this species has adapted well to occurrence on coconut and breadfruit trees.

There is one threatened freshwater fish species that may occur in Yap, the Japanese eel (*Anguilla japonica*; 'Endangered') which has previously been recorded as a vagrant in FSM (Table 6-10). No threatened invertebrate species listed on the IUCN Red List are known to occur in Yap.

Table 6-10: Threatened fishes of Yap (Pippard 2012)

Common name	Scientific name	Category	Comments	Habitat
Japanese eel	*Anguilla japonica*	Endangered	Migratory species. Occurs as a native species in Japan, China, Taiwan and Korea. The range of this species extends from the southern Pacific coast of Japan and further south to Hainan Island covering large areas of mainland China, Taiwan and the Republic of Korea. It has been recorded as a vagrant in FSM.	The species is catadromous, spending its lifetime in freshwater, estuaries and coastal environments, including rivers, streams and wetlands, but migrates thousands of kilometres to spawn

6.2.3 Conservation Areas

There are 8 protected marine areas in Yap (Figure 6-4). There are currently no legally protected terrestrial areas and all land is privately owned. The use of natural resources has been regulated by customary management but, as populations grow, this is becoming more problematic.

Of the 130 Areas of Biodiversity Significance (ABS) identified in FSM, a total of 32 are located in Yap State (YSESC 2018) including five terrestrial, six marine and 21 coastal marine ecosystems. Figure 6-5 shows areas of biological significance in Yap (identified in 2002) and known areas of importance i.e. dive, cultural heritage or fruit bat/flying fox sites.

Figure 6-4: Protected areas in Yap Island (Weeks 2016)

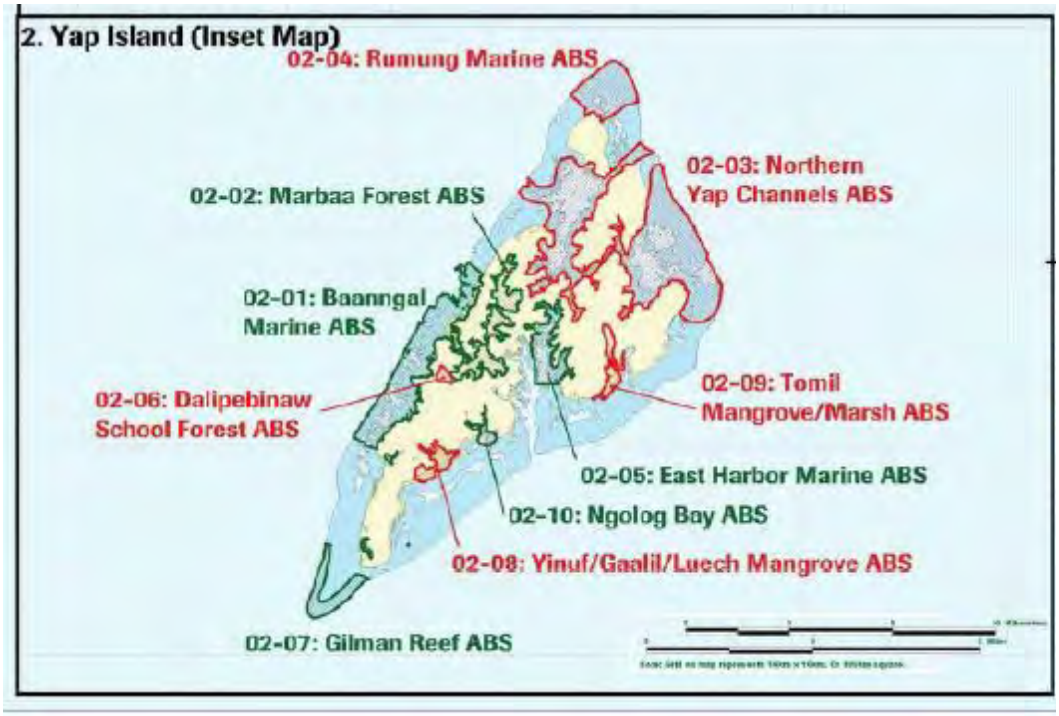


Figure 6-5: Areas of biodiversity significance in Yap (TNC 2002)

6.3 Socio-Economic Environment

6.3.1 Economy

The FSM economy, and the Yap State economy, is firmly dependent on funding from the US, which provides about 75% of revenue. With one of the most productive tuna fishing grounds in the world, the ocean is clearly the FSM's most important natural resource.

On smaller islands and atolls, subsistence or artisanal fishing is often the principal livelihood. But overharvesting, lack of regulation and poor environmental practices, are threatening inshore and near-shore fishing resources.

The Yap state economy achieved the highest rate of economic growth of the FSM states during the original Compact period. Growth of the private sector was the most impressive, achieving an annual average of 5.8% during the 17 years. While the state underwent a public sector contraction similar to the other states after the second step-down, the private sector managed to remain buoyant and assisted the state in maintaining positive GDP growth during the period.

The state achieved the best outcome in the PSRP reform program meeting its ERP targets and achieving the cost-savings anticipated. These policies have been maintained through the end of the original Compact period, and the state has avoided the temptation to utilize the bump-up funds to temporarily inflate public expenditures. The main weakness in the state's performance is a failure to transform investment in public enterprises, which have failed to produce a profit in all but one fiscal period since commencement of operations in the early 1990s.

Economic performance during the last 4 years of the Compact were disappointing reflecting the inability of the private sector to sustain growth, prudential fiscal policies, and poor results of the state owned purseining company (FSM 2003).

6.3.2 Land Tenure & Access

Almost all land and aquatic areas are owned or managed by individual estates and usage is subject to traditional control (FSM 2010). With respect to land tenure, the Yap State Constitution recognizes the authority of traditions and custom, establishment of the Councils of Traditional Leaders,61 prohibits ownership of land by non-FSM citizens and provides for the possibility of 50-year leases involving foreign interest if approved by the State Legislature.

Article II, § 11 deals with the issue of eminent domain and compensation for land appropriated by the government. The Section authorizes the legislature to "*provide by general law for the taking of private property for a public purpose.*" The Section requires that such a general law "*provide for just compensation, good faith negotiations for lease or purchase and consultation with appropriate local government prior to the taking, and the manner of taking."*

Article XIII, § 3. This Section requires the title to land to be "*acquired only in a manner consistent with traditions and customs.*"

Article XIII, § 5 provides recognition for "*traditional rights and ownership of natural resources and areas within the marine space of the State, within and beyond 12 miles from island baselines."* The Section also states that "*[n]o action maybe taken to impair these traditional rights and ownership, except the State Government may provide for the conservation and protection of natural resources within the marine space of the State within 12 miles from island baselines.*"

Article XIV, § 8 identifies a citizen of the FSM domiciled in Yap as a citizen of Yap State. This provision also allows for land ownership in Yap by citizens of the FSM. Traditional leadership is thus accorded a powerful means by which to influence governance in matters of custom. Thus tradition and customs heavily still influence land access, ownership and use.

6.3.3 Demographics

In 2009 the population was 11,780. Yap is comprised of two regions: Yap Islands (or Yap Proper) and the Outer Islands. On Yap Island, the population (7,731) is about twice that of the outer islands (4,006), however the population density is greatest in the Outer Islands (572 people/sq mile) compared with Yap Islands (189). The distribution of Yap's population varies considerably between rural (10,537 people) and urban (840) areas, with the population in rural growing at an average annual rate of 0.52% and declining in urban areas (-3.84%). The greatest population in Yap Islands is located in Rull municipality (2,100) followed by Tomil (1,231) and Weloy (1,030). Tomil recorded the greatest average annual growth rate since 2000 (1.85%), followed by Gagil (1.62%). By comparison, Rull only recorded a 0.39% growth rate and Weloy -1.50%.

In Yap state the average household size (4.9) is smaller than the national average, as is the average family size (3.7).

In 2010, the median age in FSM was 21.5 years, compared to 25 years in Yap State and 26.4 in the Yap Islands. There are 2,311 households in Yap State with 1,680 households in Yap Islands. Of the Yap Islands households:

(i) 1,330 households (79%) source power from a public utility

(ii) 1533 (91%) have access to drinking water via public or community water supply or household tank

(iii) 862 (51%) are connected to a sewer or have a septic tank

(iv) 1179 (70%) have access to a car, bus/truck or motorbike

(v) 1290 (77%) have access to a mobile phone

(vi) 301 (18%) have access to a computer, with 179 (11%) having access to the internet.

6.3.4 Gender, GBV and Human Trafficking

In a survey conducted in 2017 on gender and human trafficking, stakeholders in Yap were mainly concerned with the age consent issues and awareness of internet risks for young people (for their own communities); and with migrant smuggling (of foreigners into Guam). Communities on the outer islands observed suspect behaviour at land and sea but with no understanding of the potential significance of reporting such behavior or of the reporting process. The episode of a migrant ship landing on Yap shores a few years ago pointed at the lack of preparedness to deal with such incidents, both in terms of institutional (procedural) preparedness as well as general awareness and logistics (ESIA 2017).

6.3.5 Education

According to the 2010 census in Yap state 102% of 6-13 year olds go to elementary school (indicating students repeating years), 95% of 14- 17 year olds attend high school and 22% of 18-24 year olds attend college. In addition, 79% of Yapese aged 25 years and over had completed elementary education; 59% had completed high school level and 30% had

attended college or other higher level education institute with approximately 16% graduating. A further 7% were recorded as never having attended school.

6.3.6 Physical & cultural resources

Yap is known as the most traditional island group in the FSM, maintaining many cultural practices and heritage sites. There are three key types of traditional material culture and the associated cultural practices associated with Yap including: Stone fish weirs (aech): Traditional canoes: and stone money. Other items of tangible cultural heritage include traditional stone platforms or foundations, men's and community meeting houses, stone paths, traditional trails and historic sites, and WWII relics.

A number of the buildings, sites, districts, and objects in FSM have been listed on the US National Register of Historic Places. There are currently 26 listed sites located FSM with five listed in Yap (Table 6-11).

Table 6-11: Heritage sites listed on the US National Register of Historic Places (USG 2018)

Name on the Register	Date listed	Location	Municipality	Description
Rull Men's Meetinghouse (faluw)	September 30, 1976	Rull 9°30′19″N138°07′21″E 9.5053°N 138.1226°E	Rull	historic meeting house in Rull village set on a raise stone platform. The faluw, although not the first built on this platform, has historically occupied a central place in the civic life of the community, serving as a place where the men of the village could meet in seclusion, and as a place for social rites
O'Keefe's Island (Tarang)	September 30, 1976	Located roughly in the center of the harbor east of Colonia 9°31′38″N138°07′54″E 9.527222°N 138.131667°E	Weloy	The island has local historical importance as the home of Captain David O'Keefe, an enterprising American who arrived on Yap in the 1870s, and was responsible for not only significant economic growth, but also for the depreciation of the distinctive Yapese currency, the large rai stones which became devalued after O'Keefe introduced iron tools that made manufacture of the stones easier. O'Keefe settled on Tarang, where he had a boat landing, coal warehouse, and house. Of these structures, only the boat landing has survived
Spanish Fort	September 30, 1976	Colonia 9°30′50″N138°07′36″E 9.513889°N 138.126528°E	Weloy	Historic seat of power on the island of Yap. Only foundational remnants of the 19th-century Spanish fortification survive, on a property now occupied by the local government. The site was also where German and Japanese administrators had their headquarters during their respective periods of administration in the decades of the 20th century before World War II.
Dinay Village	April 14, 2004	Dinay 9°30′37″N138°06′12″E 9.510139°N 138.103333°E	Rull	Dinay village in Rull is unique in Micronesia as the site of an ancient pottery complex, and is probably one of the earliest settlements on the island. The ancient village complex includes more than a dozen family platforms (daf) of such age that local folklore has forgotten their lineages, normally a significant cultural feature of such sites. The period of occupation is estimated to have been between about 3000 BCE and 1600 CE
Bechiel Village Historic District	June 19, 1983	Address Restricted	Maap	While now only having a small population (~10) the village was once larger, with a documented population of about 200 in the early 20th century. There are a significant number of stone platforms sites where houses would have stood and the village site is considered archaeologically sensitive.

World Heritage nomination

The Yapese Disk Money Regional Sites World Heritage nomination involves two countries, Palau and FSM. The World Heritage nomination consists of two sites in Yap namely Mangyol Stone Money Bank and O'Keefe Island. The Mangyol site (located in Makiy village, Gagil municipality) has been selected as it represents the most traditional stone money bank and it is the only site in Yap that has intersecting pathways and dancing grounds. In addition, two sites have also been included in Palau namely Uet el Daob ma Uet el Beluu and Chelechol ra Orrak in a Rock Island in Airai State was where the oval / round disk money were quarried by the Yapese before they were transported back to Yap.

6.3.7 Infrastructure

Piped water systems from Gitam Reservoir and wells serve the population of 3,150 in Colonia (see Table 2-16). The sewerage system in Colonia, with about 700 connections provides primary treatment with a capacity of 1,290 m^3 per day.

Quarry

A disused quarry site (see Figure 6-6) is located on the northern side of the western end of the existing Airport runway in Kanif.

Figure 6-6: Disused quarry site in Yap

Solid Waste Management

The only solid waste management facility is the Fitkabeetinaem landfill located adjacent to the YSPSC power plant west of Colonia (Johnston 2011). Waste is regularly collected once or twice a week from a wide area by Department of Public Works and Transportation for delivery to the landfill for compaction. It is estimated that about 60% of the waste generated in Yap is being collected.

6.4 Primary Data Collection

A range of assets located in the road corridor along the PRIME Road have been identified based on fieldwork undertaken. A map showing the location of these assets (which includes as private fences/walls and gardens, fruit trees, buildings, bridges/culverts, etc.) and other key resources are provided in Figure 6-7. Appendix B presents further detail on this map. Figure 6-8 presents examples of these assets. This information has been used to identify E&S sensitivities for the ESMF.

Figure 6-7: Assets within road corridor and location of sensitive social receptors - Yap

Figure 6-8: Images showing examples of assets located in close proximity to the road on Yap including private residences and commercial properties walls (top left & right) fences and walls (middle left & right, bottom left), and public utilities (bottom right)

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Appendix A Gap Analysis Table

Table A-1: Identification of information outlined in the Gap Analysis

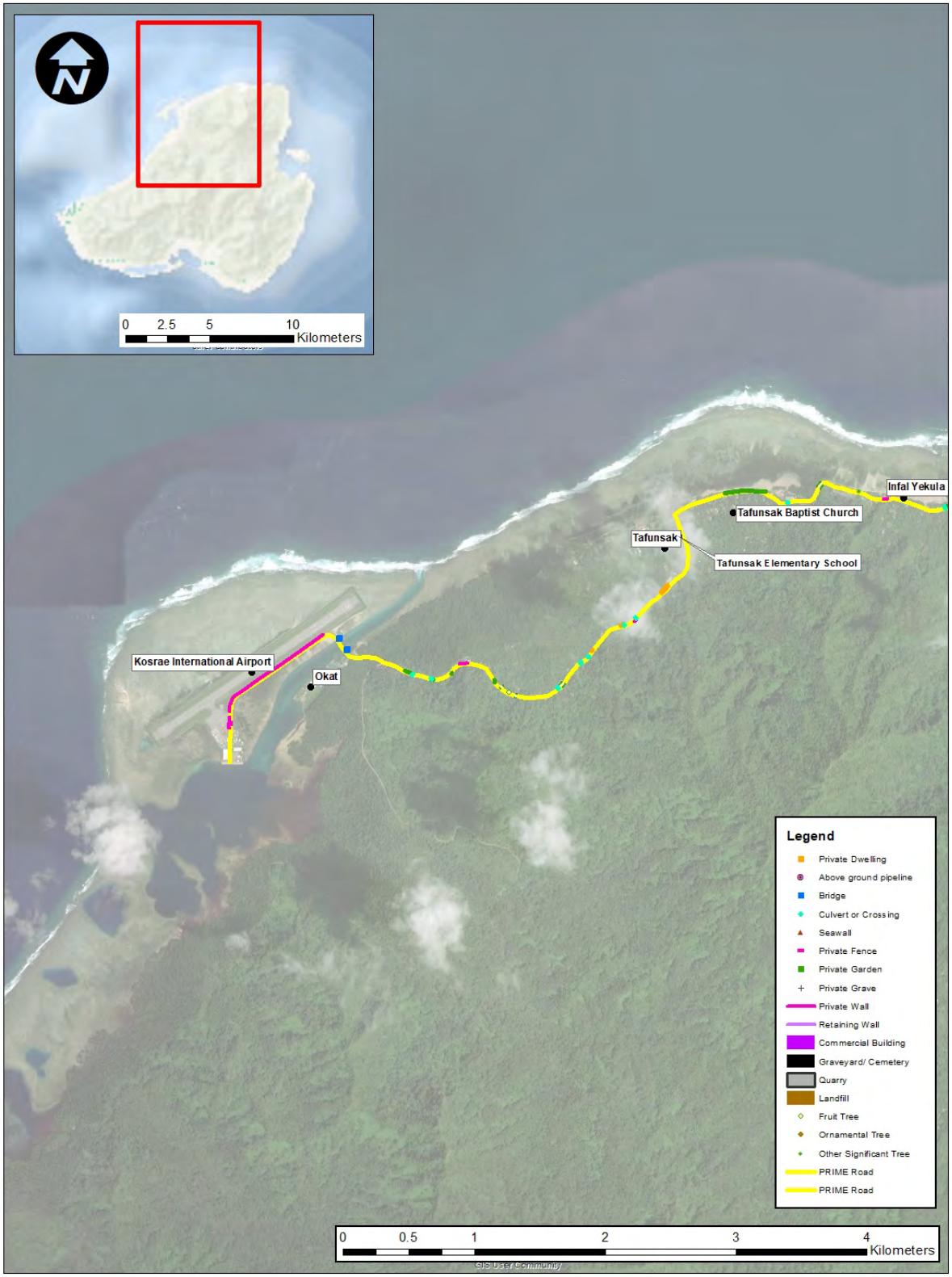
Information Type	Kosrae	Pohnpei	Chuuk	Yap	Comment
Environmental					
Protected/Biological Significance areas	✓	✓	✓	✓	Sourced from secondary data / reports, EPA, KIRMA
Coastal erosion data / information	✓	✓	✓	✓	Sourced from secondary data / reports
Watercourses / Streams	✓	✓	✓	✓	Sourced from secondary data / reports
Watersheds / Catchments	✓	✓	✓	✓	Sourced from secondary data / reports
Sensitive ecological communities (adjacent to PRIME roads or works)	✓	✓	✓	✓	Identify during field survey (where possible). Confirmed from secondary data / reports
Riparian vegetation	×	×	×	×	Data unable to be source.
Freshwater ecology (flora & fauna)	×	×	×	×	Apart from some freshwater fish info for FSM, detailed data unable to be sourced
Landfill location EPA permits (or other relevant licenses), construction details (lined), etc	✓	✓	✓	✓	Identified during field survey / consultation or sourced from secondary data / reports. EPA / KIRMA permits still to be provided
Aggregate sources – Quarry (incl. EPA permits or other relevant licenses)	✓	✓	✓	✓	Identified during field survey / consultation or sourced from secondary data / reports. EPA / KIRMA permits still to be provided
Aggregate sources – Dredging (incl. EPA permits or other relevant licenses)	-	✓	✓	-	Identified during field survey / consultation or sourced from secondary data / reports. EPA / KIRMA permits still to be provided
Sources of potential land contamination (e.g. contaminated sites, storage of hazardous substances etc)	-	-	-	-	Data not available.
Groundwater resource info	✓	✓	×	✓	Information sourced from secondary data / reports.
Air quality / Noise / Vibration Data	-	-	-	-	Data not identified/available. Field measurements to be taken prior to construction

Information Type	Kosrae	Pohnpei	Chuuk	Yap	Comment
Contour Data (10 m resolution)	✓	✓	✓	✓	Sourced from secondary data / reports
Natural Hazard Data (e.g. flood prone / low lying areas, landslides)	✓	✓	✓	✓	Sourced from secondary data / reports
Climate Change Projections	✓	✓	✓	✓	Information for FSM available but not individual States
Social					
Land Tenure / Ownership	✓	✓	✓	✓	Extent of road easement information is known in vicinity of urgent works. These documents can be acquired once scope of works known.
Key Project Stakeholders	✓	✓	✓	✓	Identified during discussions with DoTC&I.
Land / assets encroaching on Road Reserve	✓	✓	✓	✓	A range of encroachments identified
Land Use	✓	✓	✓	✓	Sourced from secondary data / reports
Public utilities (e.g. power, telecom, water) near urgent works	✓	✓	✓	✓	A range of utilities identified during field survey
Sensitive communities and receptors (e.g. schools, health facilities etc)	✓	✓	✓	✓	Sourced from secondary data
Traffic Data	✓	-	-	-	Lelu causeway data only. Any additional traffic data to be sourced prior to preparation of site-specific ESMP (if required)
Cultural heritage sites (e.g. cemeteries, graves sites)	✓	✓	✓	✓	Identified during field survey / consultation or sourced from secondary data / reports.
OHS (Local examples of OHS practice in project situation)	×	×	×	×	Not able to be obtained.
Labor grievance (Local examples of Labor Grievance practice in project situation)	×	×	×	×	Not able to be obtained.
Design & Engineering					

Information Type	Kosrae	Pohnpei	Chuuk	Yap	Comment
Primary Road Network	✓	✓	✓	✓	Extent determined through consultation with DoTC&I
Bridges / Causeways / Crossings	✓	✓	✓	✓	Identified during field survey. Sourced from secondary data / reports
Current Coastal Protection Areas	✓	✓	✓	✓	Identified during field survey. Source from secondary data / reports
Priority Project design	×	×	×	×	DoTC&I to provide once available
Construction material requirements	×	×	×	×	DoTC&I to provide once available
VA & CRRS Studies	×	×	×	×	DoTC&I to provide once available

Notes: ✓ = Information / data identified / obtained. × = no information / data available. – No information / data obtained.

Appendix B Detailed Asset Maps



Revision	Author	Verified	Approved	Date

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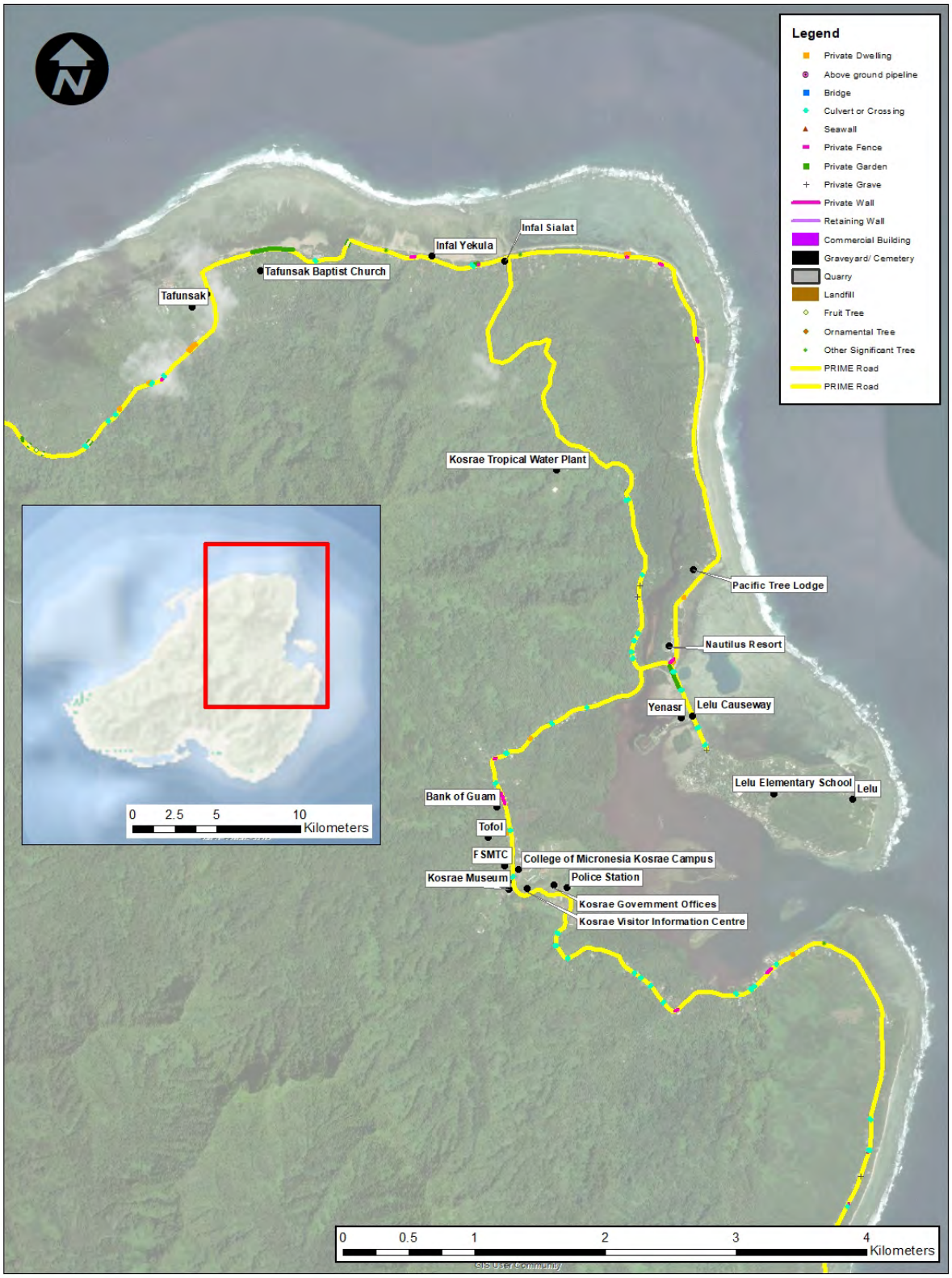

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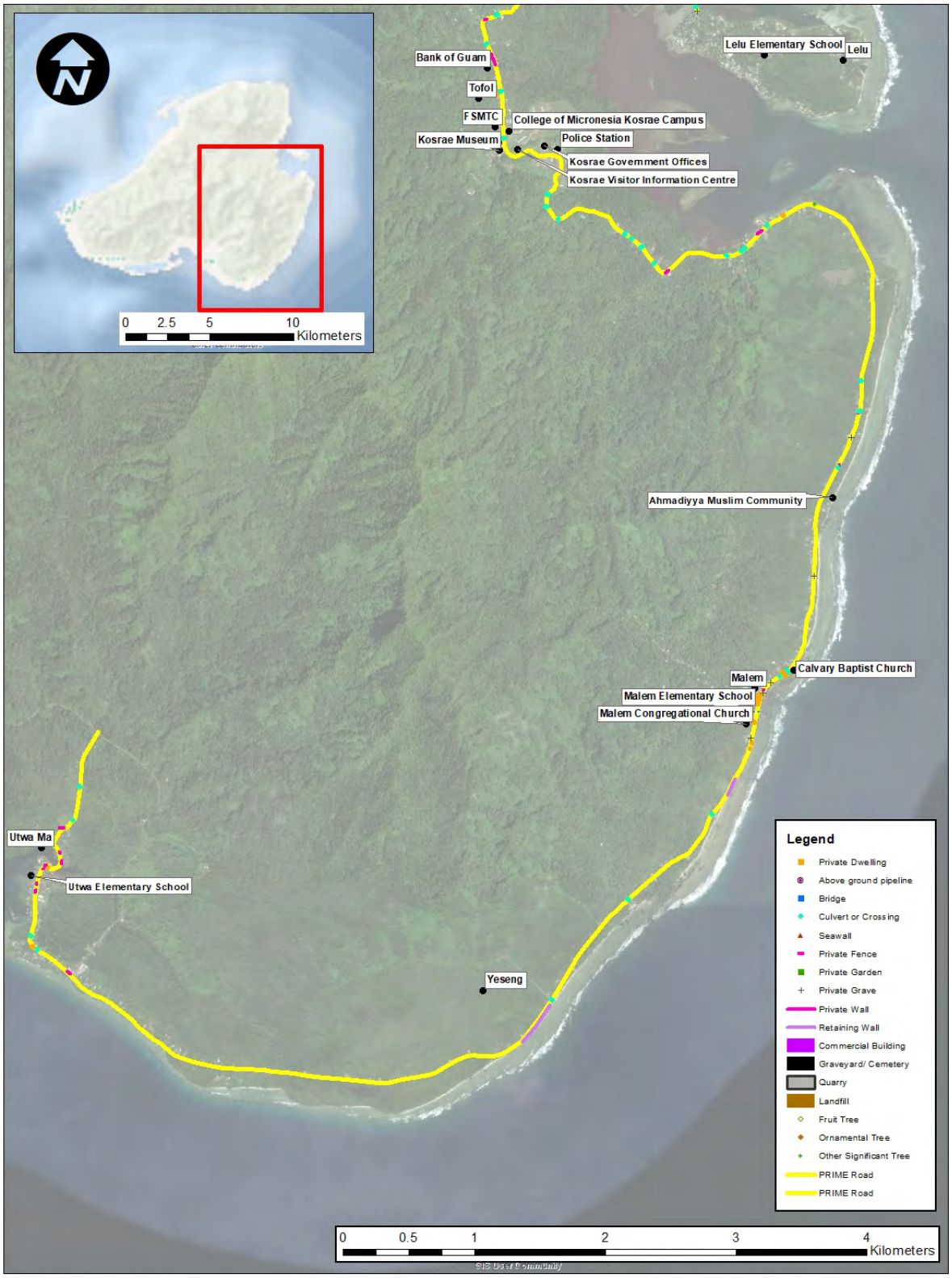

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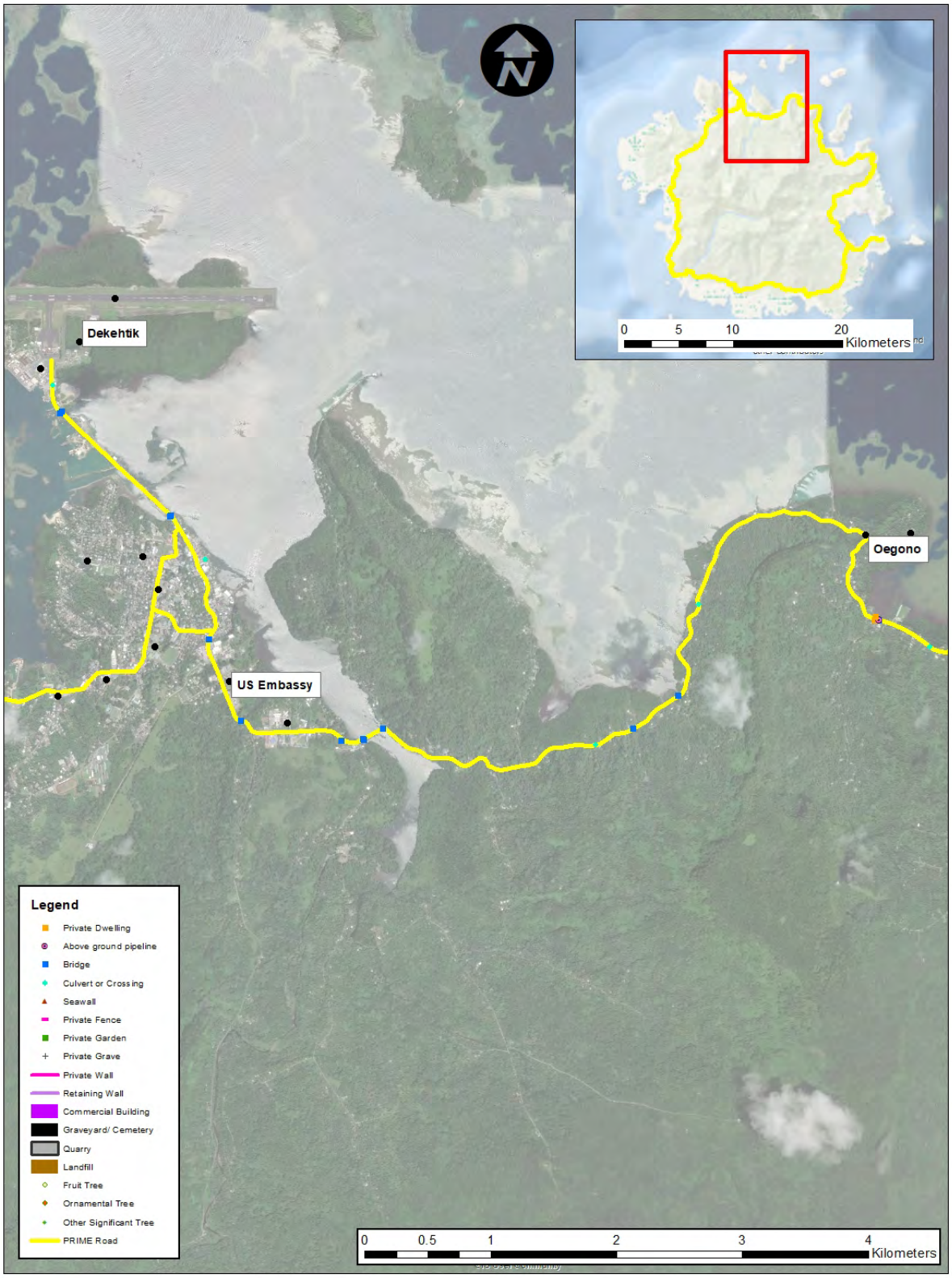

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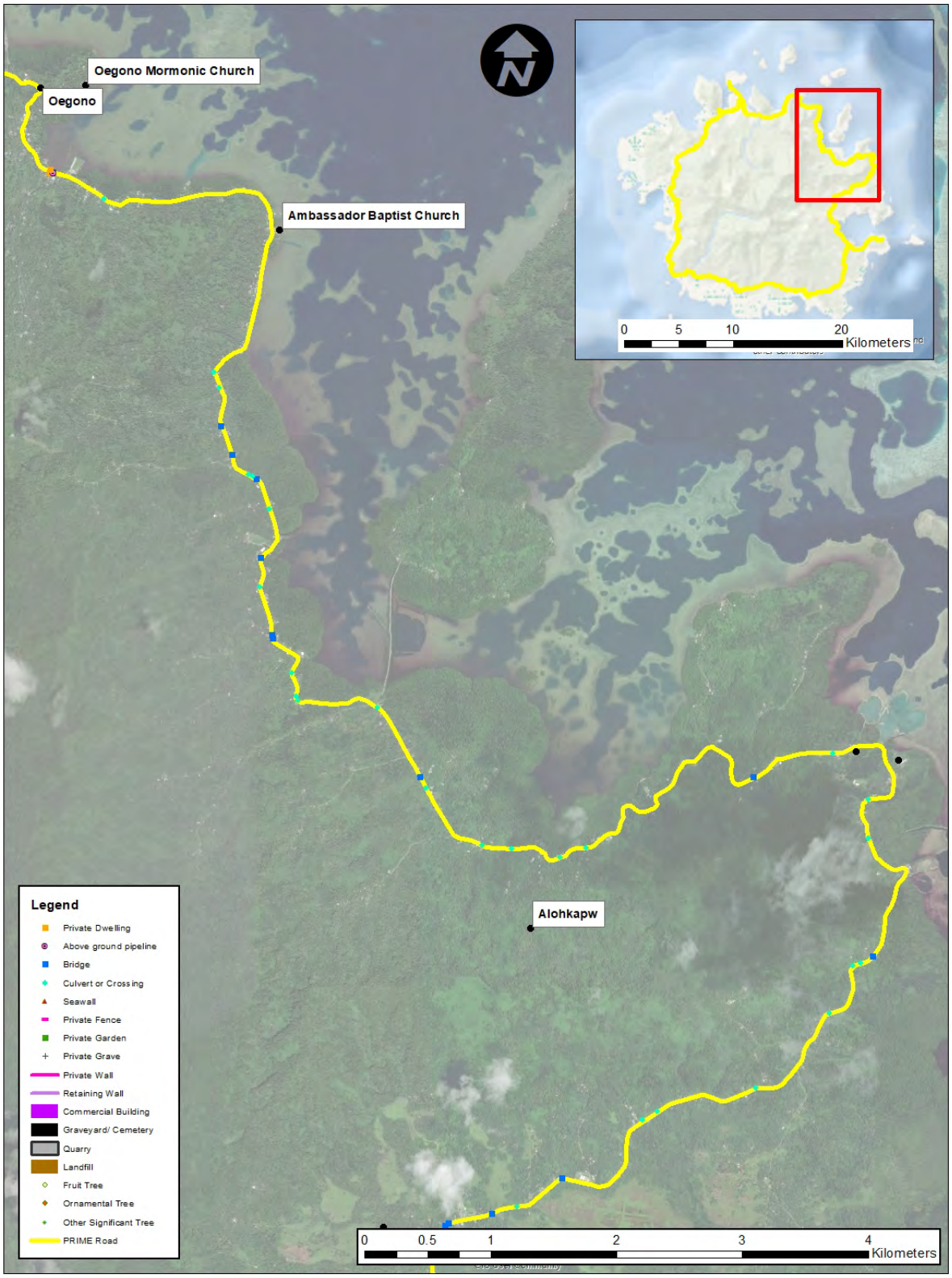

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ASSETS WITHIN ROAD CORRIDOR MAP 2

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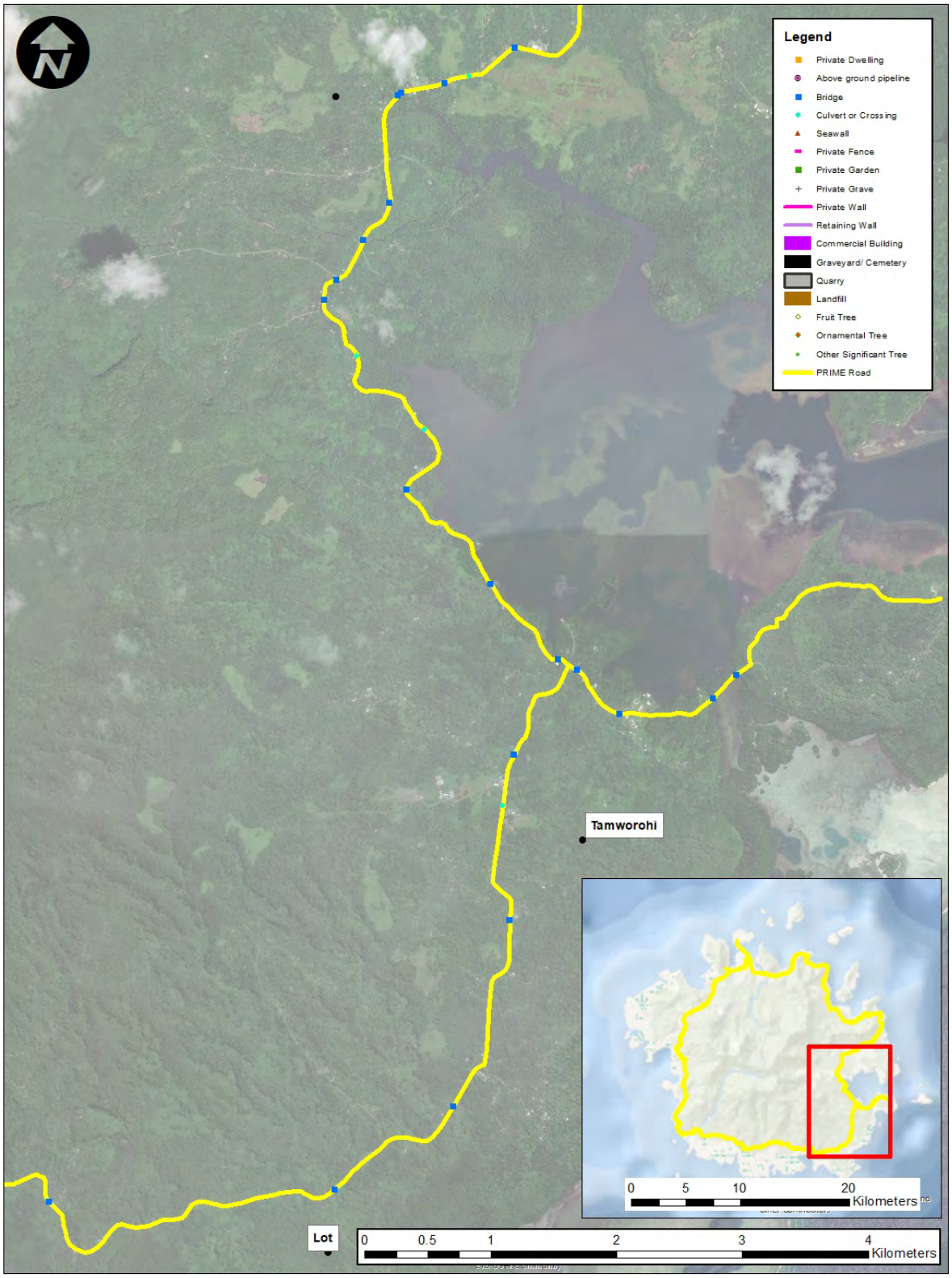

FEDERATED STATES OF MICRONESIA
FSM PRIME PROJECT POHNPEI
ASSETS WITHIN ROAD CORRIDOR MAP 3

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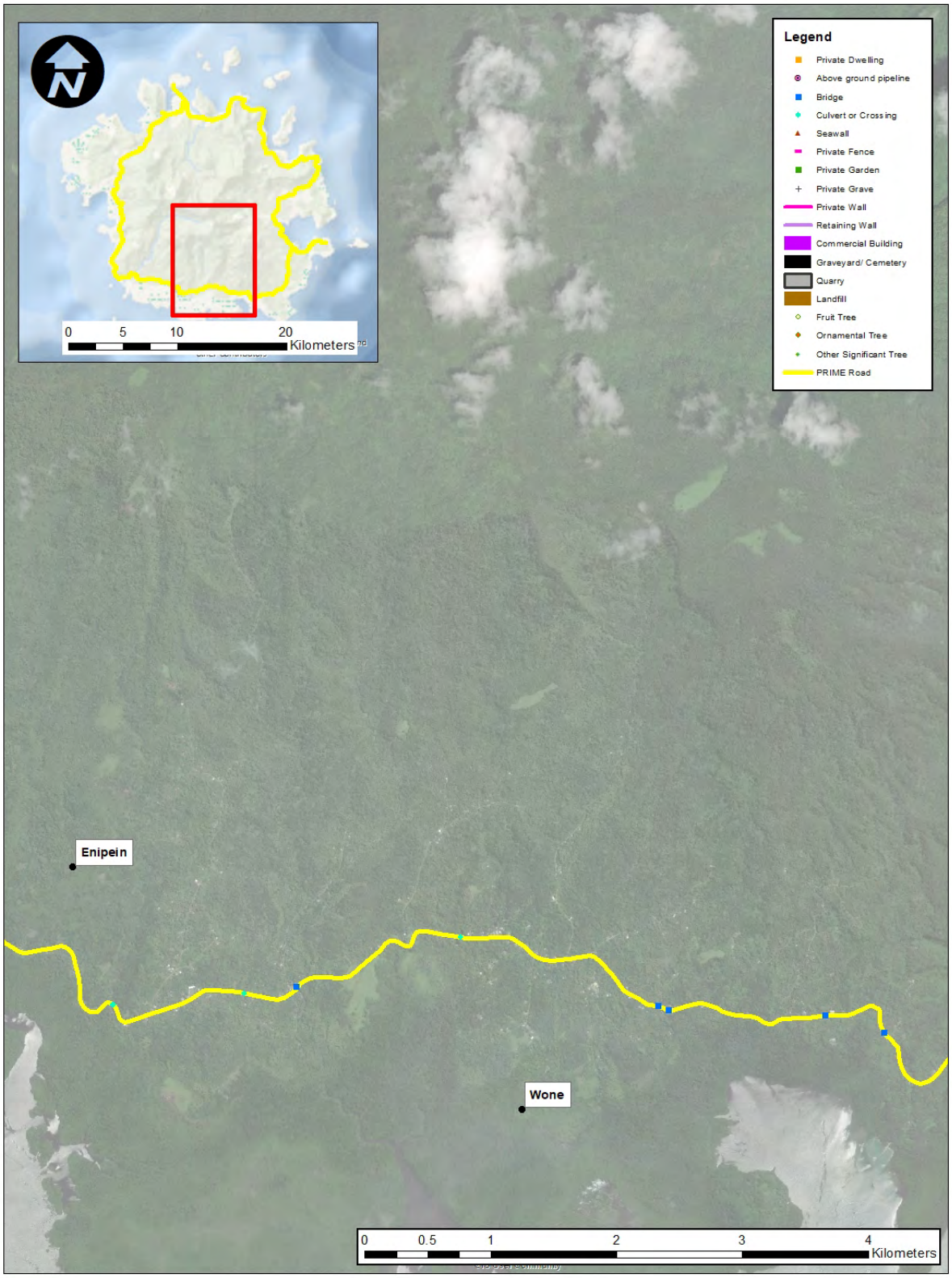

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ASSETS WITHIN ROAD CORRIDOR MAP 4

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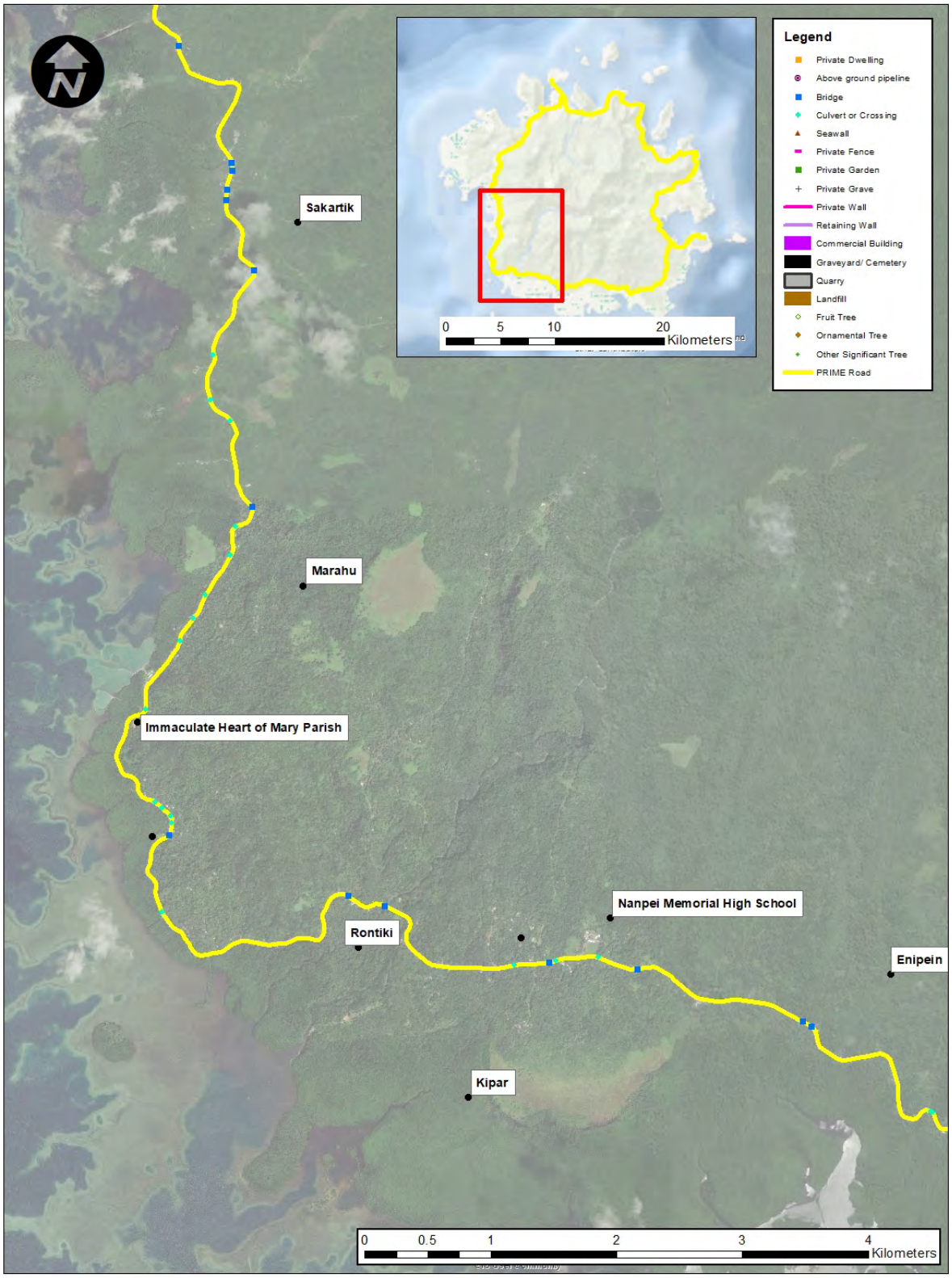

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ASSETS WITHIN ROAD CORRIDOR MAP 5

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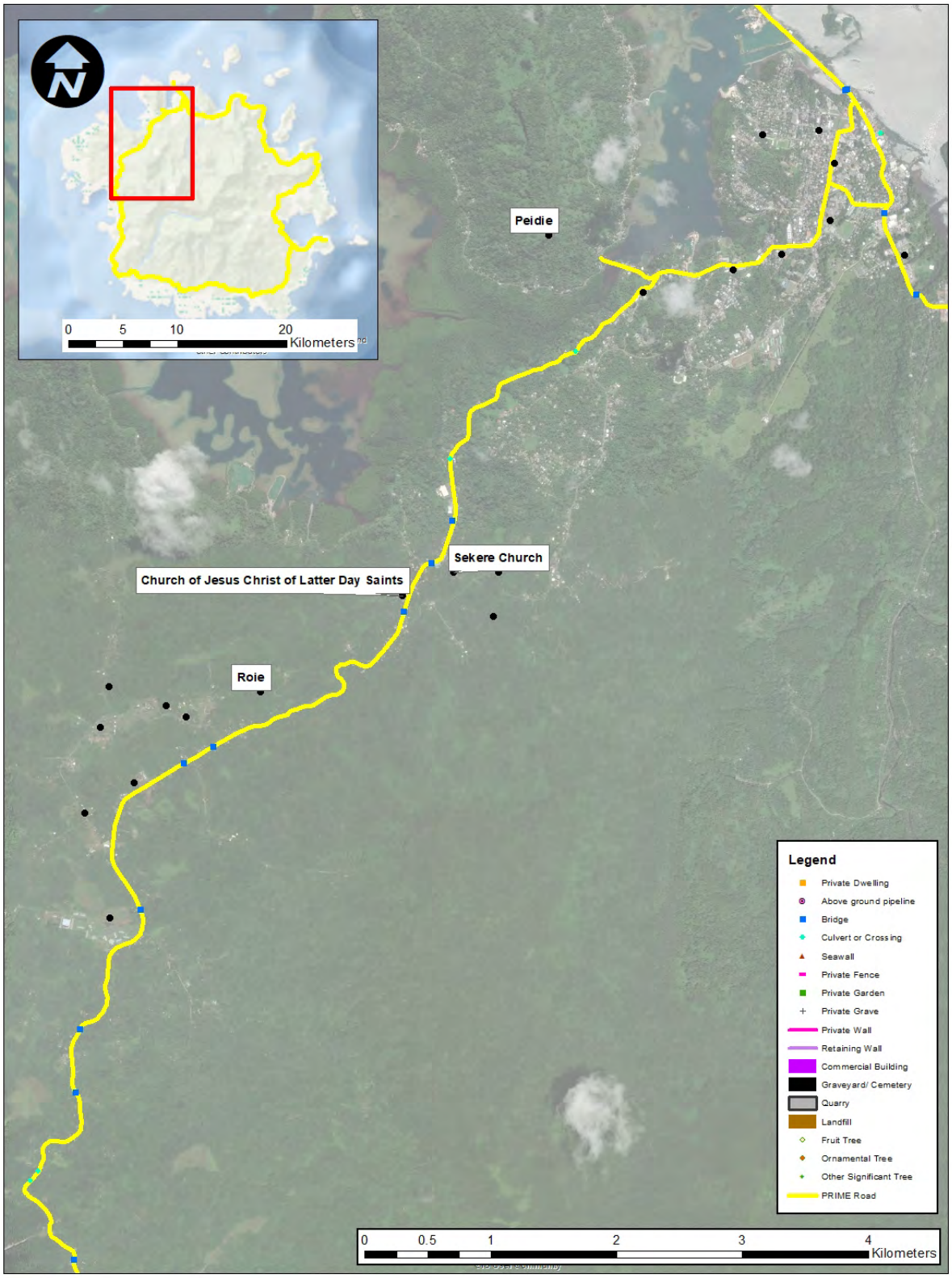

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ASSETS WITHIN ROAD CORRIDOR MAP 6

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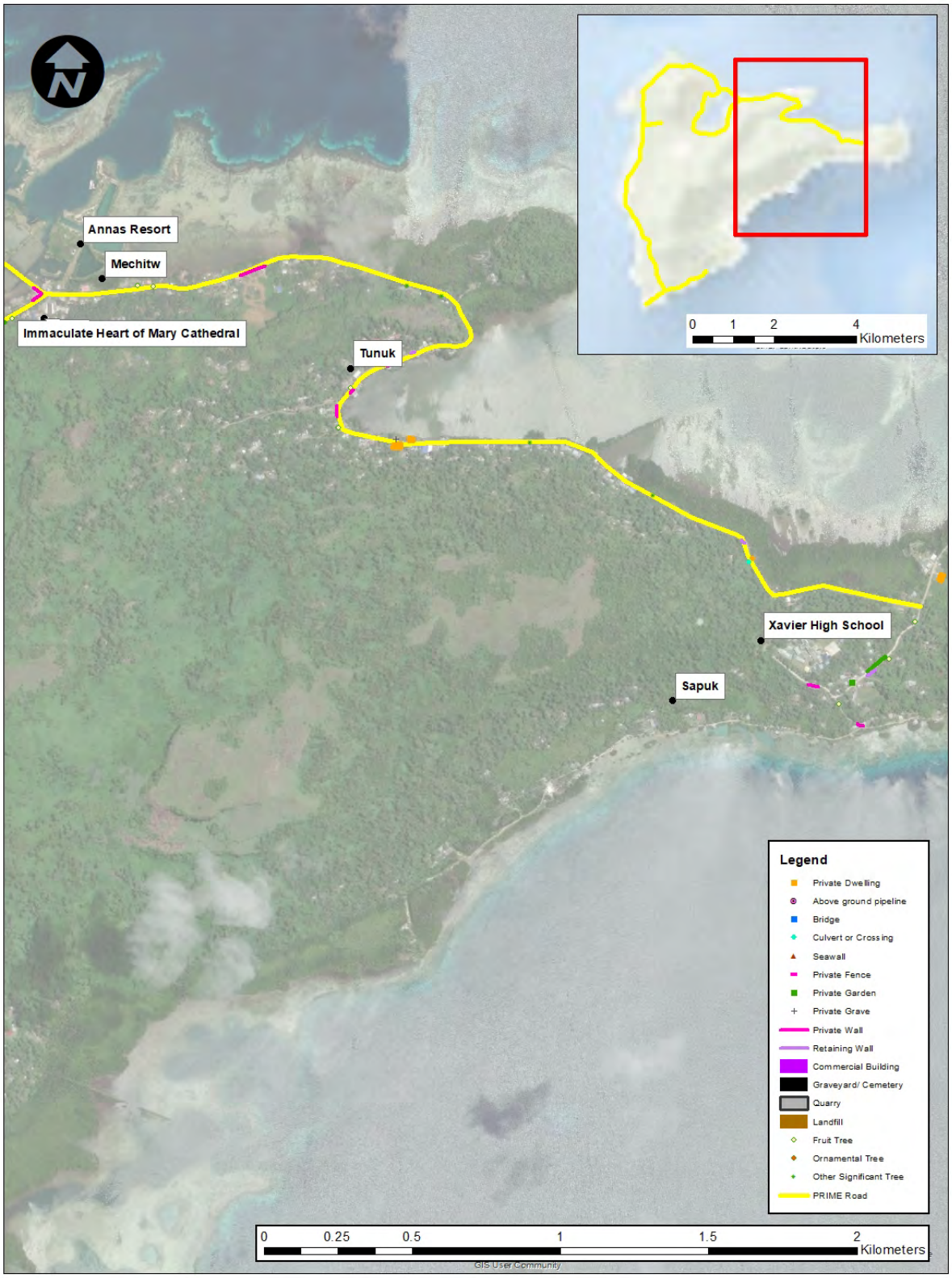

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FEDERATED STATES OF MICRONESIA
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ASSETS WITHIN ROAD CORRIDOR MAP 1

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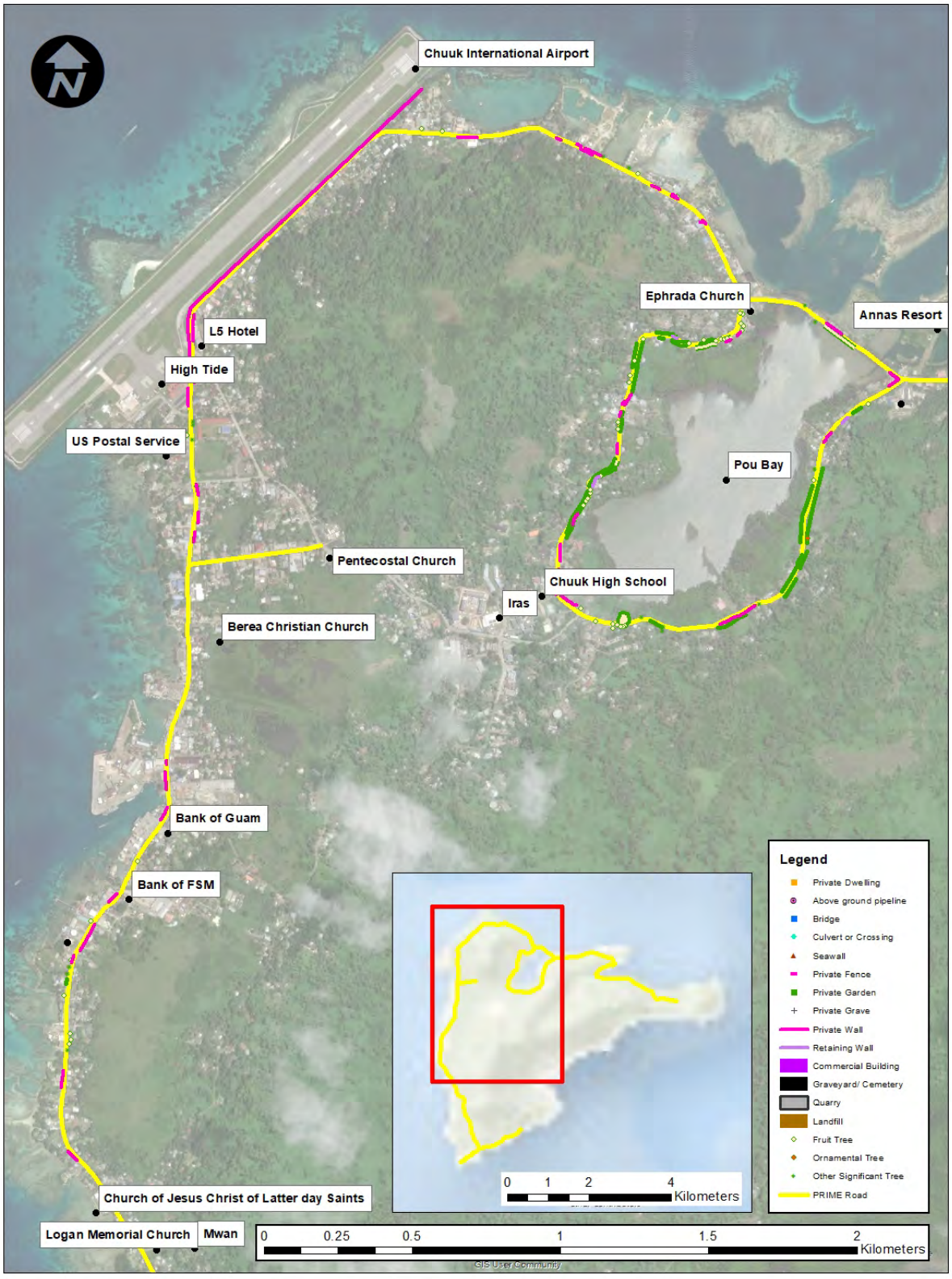

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FEDERATED STATES OF MICRONESIA
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ASSETS WITHIN ROAD CORRIDOR MAP 2

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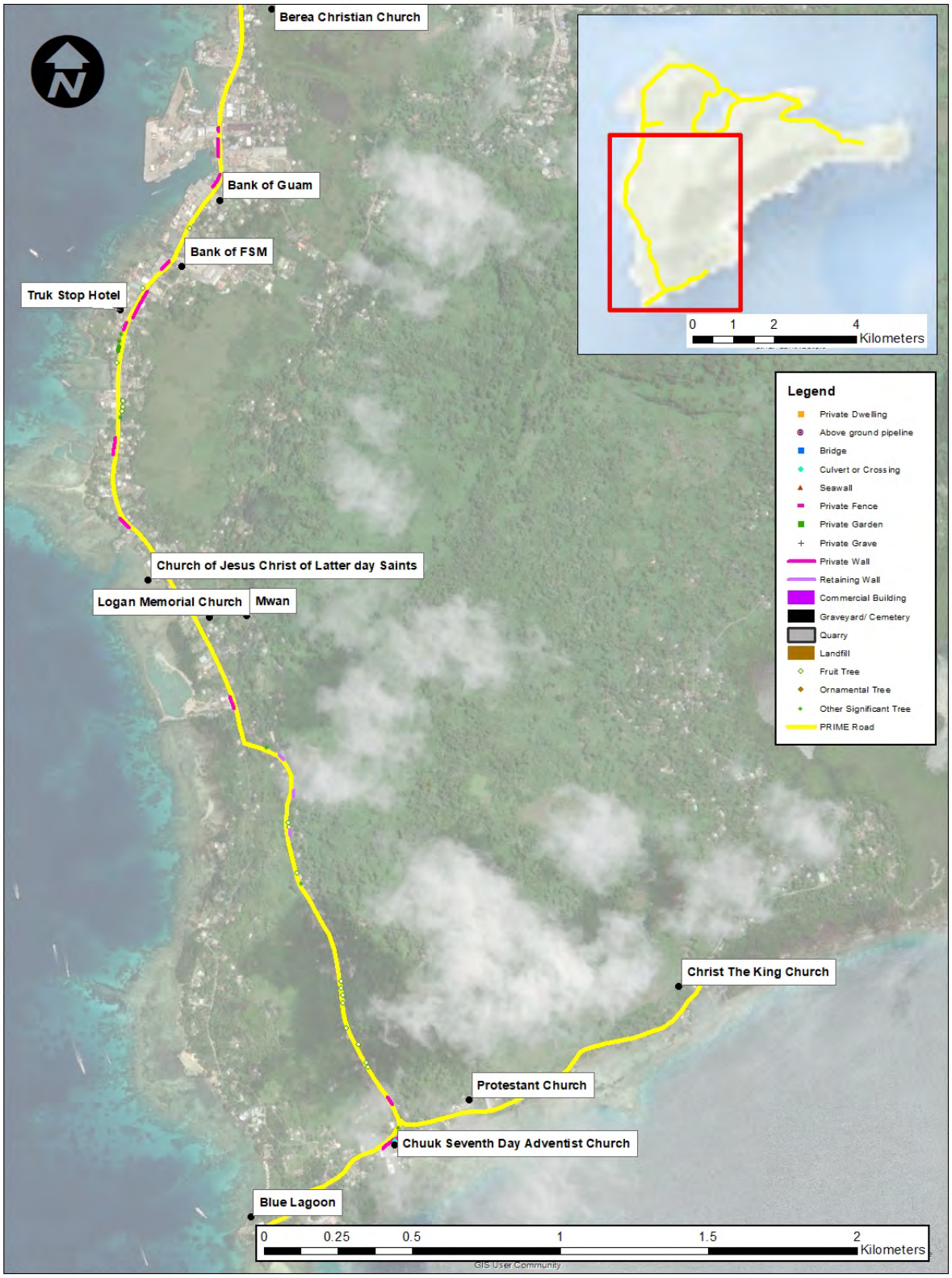

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FEDERATED STATES OF MICRONESIA
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ASSETS WITHIN ROAD CORRIDOR MAP 3

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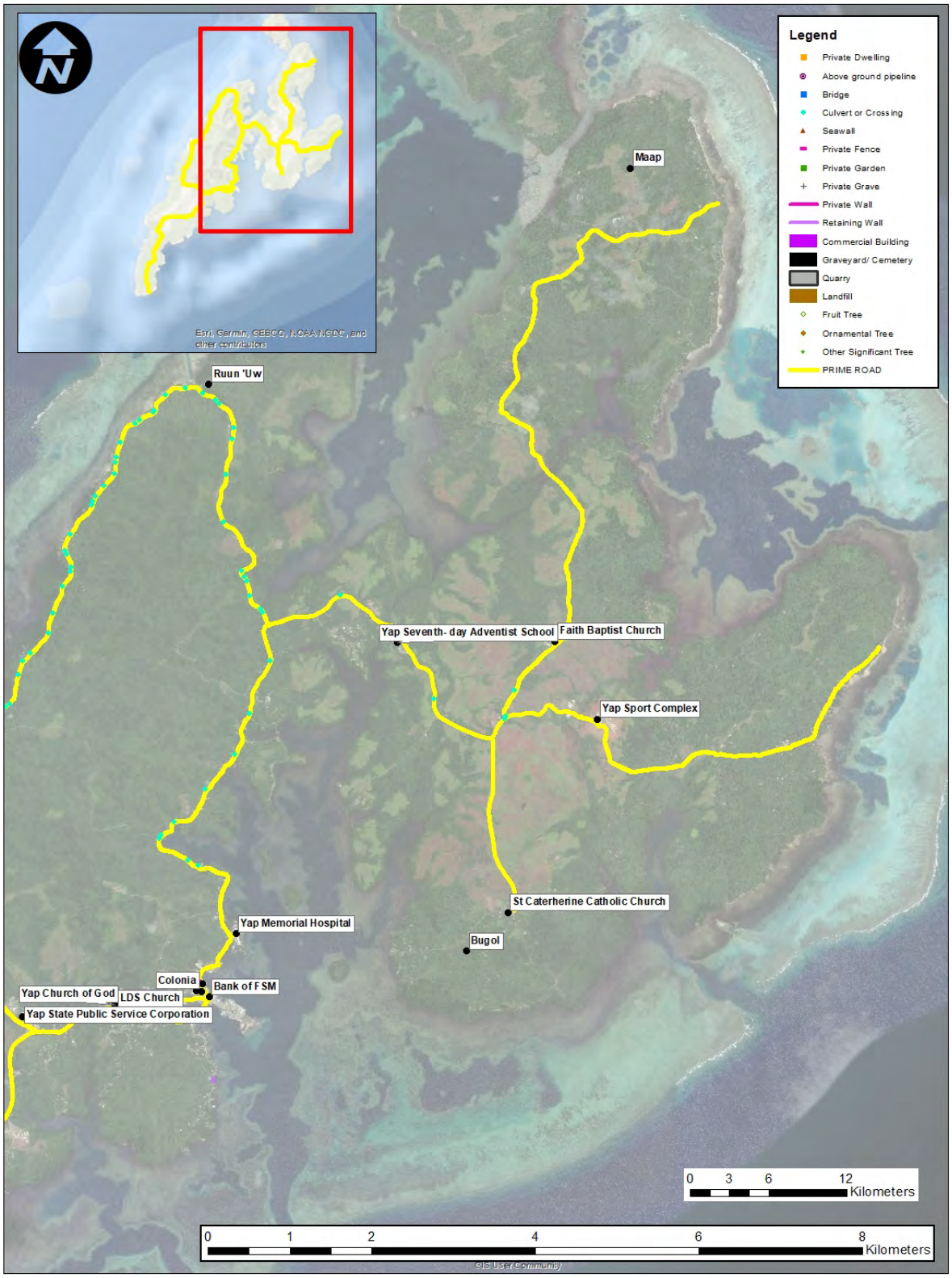

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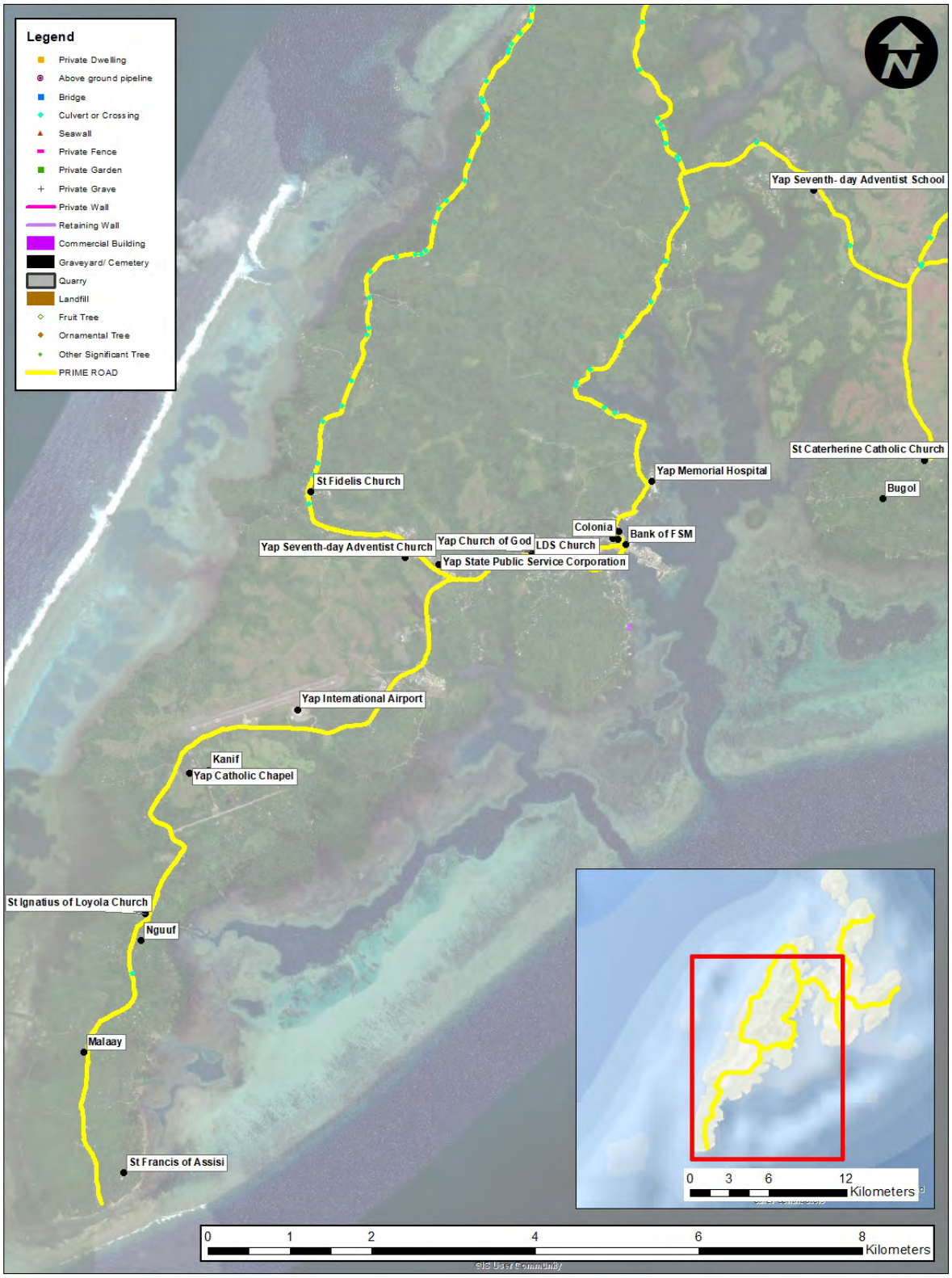

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FEDERATED STATES OF MICRONESIA
FSM PRIME PROJECT YAP
ASSETS WITHIN ROAD CORRIDOR MAP 2

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Appendix B Data used in E&S Sensitivities Maps

Table 1: Types of sensitive resource s or hazards and their location - Kosrae

Attribute	Type	Locations
Physical	Coastal change & inundation	- Finfokoa & Pukushruk (Lelu) - Pal and Mosral, Yeseng, Kuplu and from Yewak to Tenwak (Malem) - Finfoko and Wiya (Tafunsak)
	Flooding and erosion hazards	Numerous
Ecological	Areas of Biological Significance	*'Areas of Biological Significance':* 39-05: Yela-Okat Terminalia Mangrove ABS 39:12: Foko Finfoko Marine ABS 39-04: North East Kosrae Marine ABS 39-07: Tofol FW Marsh ABS 39-09: Lelu Marine ABS 39-08: Foko Puk Marine ABS 39-07: Malem Marsh ABS 39-11: Malem Utwe Mangrove ABS *Protected/Managed Areas:* - Tafunsak - Awarne (includes Lelu Causeway) - Olum Watershed - Malem
Social	Assets (such as trees, buildings, fences, gardens, etc)	Numerous

Table 2: Types of sensitive resources or hazards and their location - Pohnpei

Attribute	Type	Locations
Physical	Erosion – Prone land (based on soil type, slope angle, stability of soils, etc)	Numerous
	Flood-Prone land (based on soil type, elevation, etc)	Numerous
	Coastal erosion (areas potentially requiring stabilisation)	Key locations: - Ipat & Dolleki (Net Municipality) - Nansalohhi to Maramasok (Uh Municipality) - Nanrohi to Nanwei (Kitti Municipality)
Ecological	Areas of Biological Significance	'Areas of Biological Significance': 36-01: Pohnpei Central Forest ABs 36-14: Dausokele Estuary ABS 36-19: Dien Mangrove ABS 36-07: Alokapw Marsh ABS 36-08: Nan Pailong ABS 36-0_: Dolopwail-Metipw Marine Reserve ABS 36-0_:Senpehn-Lehdau Mangrove ABS (Sapwalap Mangroves ABS) 36-05: Tewmen Island ABS 36-02: South Pohnpei Marine ABS (including: Lapinsed ABS, Rohi to Mwudok Marine ABS)

Attribute	Type	Locations
		36-10: Southern Kitti Marine ABS 36-09: Nan Mand Forest ABS (Sapwatkai Forest ABS) 36-09: Palikir-Paies ABS 36-16: Dau Mwoakote Estuary ABS *Protected/Managed Areas:* - Enipen Mangrove Reserve
	Stream crossings	Numerous
Social	Assets (such as trees, buildings, fences, gardens, etc)	Numerous

Table 3: Types of sensitive resources or hazards and their location - Chuuk

Attribute	Type	Locations
Physical	Coastal stabilisation areas	Key locations with 'High' coastal stability issues: - Mechitiw to Pou Bay - Pou Bay - Meseltruk - Fanachau to Nemwan - Mwan (bridges x2)
Ecological	Conservation Areas	'Areas of Biological Significance': 24-19: Pou Bay ABs 24-34: North Weno Marine ABS
Social	Assets (such as trees, buildings, fences, gardens, etc)	Numerous

Table 4: Types of sensitive resources or hazards and their location - Yap

Attribute	Type	Locations
Physical	Coastal stabilisation areas	Key locations with 'High' coastal stability issues:
Ecological	Conservation Areas	'Areas of Biological Significance': 02:02: Marbaa Forest ABS 02:05: East Harbour Marine ABS 02:03 Northern Yap Channels ABS 02:20: Ngolog Bay ABS *Protected/Managed Areas:* - Tamil traditional management zone (upper reaches)
Social	Assets (such as trees, buildings, fences, gardens, etc)	Numerous

Appendix C Environmental & Social Screening Forms

FORM 1 – Initial E&S Risk Screening

(To be completed by CIU Safeguards Team, with on-ground support from PIU State Focal Point where appropriate)

Note: Refer ESMF Risk Assessment & Impact Identification table (Section 5.6.1) for overview of potential impacts, risks and mitigation summary.

Timing: To be completed after Component 1 Assessments (e.g. VA/CRRS), and prior to preliminary design

Purpose: 1) To identify high risk environmental and social aspects of the proposed works;
2) Inform confirmation of eligibility of works for funding

Name of Works:	
Location of Works:	
Description of Works:	
Date of Form Completion:	
Name of Person Completing Form:	
Date of Site Visit:	
People consulted to date (to inform completion of form):	
Attached concept description (circle one)	Yes / No

	Activity	Impact Screening (without mitigation)[1] (Put only 1 ✓ in each row)			Justification (Nature, scale, duration of impacts or sensitivity of receptors)	Recommended Action
		NO Impact	Low or Moderate Impact (can be managed)	Potentially High or Extreme Impact		
1.0	**Environmental**					
1.1	Any vegetation clearance (incl. riparian vegetation) or works within a stream upstream of or within areas of biological significance).					
1.2	Any disturbance of (either works located within, or potential impact upon) protected coastal marine areas (CMAs).					

[1] Use Risk Rating tables in ESMF to determine level of potential impact.

Activity		Impact Screening (without mitigation)[1] (Put only 1 ✓ in each row)			Justification (Nature, scale, duration of impacts or sensitivity of receptors)	Recommended Action
		NO Impact	Low or Moderate Impact (can be managed)	Potentially High or Extreme Impact		
1.3	Is the site in an area identified as a protected or conservation area.					
1.4	Works within an identified hazard zone (e.g. erosion, flooding, coastal inundation).					
2.0	**Socio-cultural**					
2.1	Any likely physical displacement / relocation of people.					
2.2	Any likely economic displacement (e.g. temporary or permanent land acquisition, disturbance of physical assets, crops/fruit trees etc).					
2.3	Any identified cultural sites (e.g. graves, historic buildings etc) directly adjacent to road easement in vicinity of the works (i.e. within 50m of site) or otherwise could be affected by physical works.					
2.4	Any potential access restriction to sensitive receptors / essential services (e.g. hospital, school, church etc).					
2.5	Risk to community health & safety from the proposed works (i.e. communities in close proximity to work site) or construction workforce (e.g. imported/migrant labour related risks)?					
2.6	Is there a risk of UXOs being present in the works footprint?					

FORM 2 – Environmental and Social Screening

(To be completed by CIU Safeguards Team, with on-ground support from PIU State Focal Point where appropriate)

Timing: To be completed after concept or preliminary design)

Purpose: 1) To scope potential environmental risks from proposed works that could be minimized through participatory design;
2) Inform E&S Assessment and Management Plan Requirements (Form 3);
3) To inform scope of Terms of Reference for and E&S Consultants to be engaged.

Name of Works:	
Location of Works:	
Date of Form Completion:	
Name of Person Completing Form:	
Date of Site Visit:	
People consulted to date (to inform completion of form):	
Attached concept description (circle one)	Yes / No

Form 2a – Environmental Risk Screening

Potential Impact		Potential Impact (without mitigation)[2] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
1.0	**Physical**				
1.1	Dust / noise / vibration impacts on sensitive receptors (e.g. residential communities, businesses, essential services etc).				
1.2	Generation and discharge of solid and liquid waste (e.g. spoil, roading material, refuse, domestic waste/ wastewater, hazardous substances etc).				

[2] Use Risk Rating tables in ESMF to determine level of potential impact.

Potential Impact		Potential Impact (without mitigation)[2] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
1.3	Erosion and sedimentation risk as a result of works (e.g. stream bank, slope, coastal margin, channel modification and hydrology etc).				
1.4	Works within an identified hazard zone (e.g. erosion, flooding, coastal inundation zones).				
1.5	Is construction material required for the design (e.g. rock/ aggregate/ asphalt/ cement) able to be sourced locally from a licensed facility (e.g. quarry)[3].				☐ Yes ☐ No *Describe:*
1.6	Could an alternative design be explored to decrease / avoid physical environmental impacts[3].				☐ Yes ☐ No *Describe:*
2.0	**Ecological**				
2.1	Removal of terrestrial vegetation and/or habitat (incl. riparian vegetation).				
	(a) Native / natural vegetation.				
	(b) Invasive / exotic vegetation (e.g. weeds).				
	(c) Privately owned trees / crops / gardens (refer Form 2b).				

[3] Discuss with design engineer, if required

Potential Impact		Potential Impact (without mitigation)[2] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
2.2	Potential impacts on freshwater ecosystem, including:				
	(a) Direct disturbance of freshwater habitat (e.g. works footprint within watercourse).				
	(b) Indirect disturbance of freshwater habitat (e.g. from sedimentation, water quality pollution).				
	(c) Risk of barriers to fish passage.				
2.3	Works within or potential disturbance of coastal marine area (CMA)				
2.4	Could an alternative design be explored to decrease / avoid ecological impacts or improve ecological outcomes[3].				☐ Yes ☐ No *Describe:*

Form 2b – Social & Resettlement Risk Screening

Potential Impact		Potential Impact (without mitigation)[4] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
1.0	**Land**				
1.1	Impacts on land outside of the road easement?				☐ No ☐ Yes (Temporary Use) ☐ Yes (Permanent Loss)
1.2	Estimated extent of land loss outside of road easement.				*Estimated area:*
1.3	Estimated number of private landowners are affected?				*Estimated No. of landowners:*
1.4	Is the ownership status and current usage of land to be acquired known?				☐ Yes ☐ No *Describe:*
1.5	Easement paperwork available and obtained?				☐ Yes ☐ Available, not yet obtained ☐ No easement paperwork available ☐ Not yet sure if easement paperwork available (to be confirmed)
1.6	How is this land to be provided:				☐ Voluntary Land Donation (VLD) ☐ Lease / Rental ☐ Willing-seller-willing-buyer ☐ Available Government land ☐ Involuntary acquisition ☐ To be confirmed *Describe:*

[4] Use Risk Rating tables in ESMF to determine level of potential impact.

Potential Impact		Potential Impact (without mitigation)[4] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
1.7	Could an alternative design be explored to decrease / avoid land loss[5]?				☐ Yes ☐ No *Describe:*
2.0	**Assets**				
2.1	Are there likely to be loss of physical assets and/or crops/productive trees due to works footprint or associated facilities?				☐ Yes ☐ No
2.2	Estimated number of asset owners affected?				*Estimated No. of landowners:*
2.3	What type of assets are affected:				☐ Residential house ☐ Business/commercial structure ☐ Secondary structure (e.g. fence, wall, driveway, pavement, shed or similar) ☐ Crops (including type) ☐ Productive Trees ☐ Perennial Trees ☐ Cultural sites (e.g. grave sites, historic buildings etc) *Describe:*
2.4					☐ Yes

[5] Discuss with design engineer, if required

Potential Impact		Potential Impact (without mitigation)[4] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
	Could the assets be relocated or repaired?				☐ No *Describe:*
2.5	Could an alternative design be explored to decrease/avoid asset loss?				☐ Yes ☐ No *Describe:*
3.0	**Livelihoods**				
3.1	Will the works have any impact on people's livelihood (e.g. economic displacement)?				☐ Yes ☐ No *Describe:*
3.2	Estimated number of people/households with livelihoods affected?				*Estimated No. of people/households:*
3.3	What kind of livelihoods are likely to be impacted?				☐ Business/commercial – Owner ☐ Business/commercial – Employee ☐ Agricultural / Farming ☐ Fishing ☐ Other: _____ *Describe:*

Potential Impact		Potential Impact (without mitigation)[4] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
3.4	Could an alternative design be explored to decrease/avoid livelihood impacts?[5]				☐ Yes ☐ No *Describe:*
4.0	**Access Restrictions**				
4.1	Are there likely to be access restrictions?				☐ Yes ☐ No *Describe:*
4.2	What kind of access restriction are expected?				☐ Pedestrians (including closure of road verges) ☐ Driveways – Residential Agricultural / Farming ☐ Driveways – Business/commercial ☐ Transport Network ☐ Access to essential services ☐ Coastal margin ☐ Other (e.g. natural resources, communal land/facilities, services etc)
4.3	Is an alternative means of access required (e.g. temporary diversion or water crossing etc)?				☐ Yes ☐ No *Describe:*
4.4	Could an alternative design be explored to				☐ Yes ☐ No

Potential Impact		Potential Impact (without mitigation)[4] (✓)			Describe
		NO Impact	Low Impact	Moderate to Extreme Impact	
	decrease/avoid access restriction impacts?				*Describe:*
5.0	**Other Social Impacts**				
5.1	Impacts on Sensitive receptors in close proximity to the works (e.g. residential communities, businesses, essential services etc).				
5.2	Disproportionate Impacts on vulnerable groups or road users				
5.3	Risk to community health & safety from the proposed works (i.e. communities in close proximity to work site).				
5.4	Risk posed to the community from the construction workforce (e.g. imported/migrant labour related risks).				
5.5	Risk of UXOs in works footprint, and resultant risk to worker health and safety.				

FORM 3 – E&S Assessment and Management Plan Requirements

(To be completed by CIU Safeguards Team, with on-ground support from PIU State Focal Point where appropriate)

Timing: To be completed after concept or preliminary design together with Form 2 and 4

Purpose: 1) To confirm which whether work specific ESIA/ESMPs are required;
2) To determine which Land Access Procedure Plans are required

Name of Works:	
Location of Works:	
Date of Form Completion:	
Name of Person Completing Form:	

Potential Impact		Assessment (✓)		Documents Required
		Yes	No	
1.1	Does the Generic ESMP adequately address the potential environmental and social risks identified in Form 1 and 2?			*(Note: If 'No', then works specific ESIA & ESMP required)*
1.2	Is the site in an area, or could potentially impact an area, identified as a protected or conservation area.			*(Note: If 'Yes', then works specific ESIA & ESMP required)*
1.3	Do the works involve land loss outside of the road easement, asset loss, or loss of income sources or impacts livelihoods?			*(Note: If 'No', then Land Access Due Diligence Report required).*
1.4	Will the land and/or assets be acquired via Voluntary Land Donation (VLD)?			*(Note: If 'Yes', then Voluntary Land Donation Report (VLDR) required)*
1.5	Will the land and/or asset loss, or livelihood impacts require financial compensation, as per entitlement matrix in RF?			*(Note: If 'Yes', then Resettlement Plan (RP) required)*

FORM 4 – Agreed Environmental and Social Documents Required

(To be completed by CIU Safeguards Team, with the support of PIU State Focal Point where appropriate)

Timing: To be completed after concept or preliminary design together with Form 2 and 3

Purpose: 1) To confirm which ESMPs or land access plans are to be prepared and/or implemented for the works;

2) To confirm which additional management plans are to be prepared by the Contractor (as informed by the ESMF).

Name of Works:	
Location of Works:	
Date of Form Completion:	
Name of Person Completing Form:	
Name of Person Approving:	

As per the PRIME E&S Management Framework (ESMF) the following safeguard documents are to be prepared/implemented for the above works:

- ☐ Generic ESMP
- ☐ Works specific ESMP
- ☐ Works specific ESIA

As per the PRIME Resettlement Framework (RF) the following safeguard documents will be prepared for the above works:

- ☐ Land Access Due Diligence Report
- ☐ Voluntary Land Donation Report
- ☐ Resettlement Plan

Signature:	**Signature:**
Signed by: *(Completed Form)*	**Signed by:** *(Approver)*
Date:	**Date:**