ESIA Consult

Marshall Islands Maritime Investment Project

Environmental and Social Baseline Information

1 DESCRIPTION OF EXISTING BIO-PHYSICAL ENVIRONMENT

1.1 GEOLOGY, TOPOGRAPHY AND SOILS

1. Atolls are geologic structures that rise from the ocean floor and enclose a shallow (less than 100 m) lagoon. The base of the atoll is a basaltic volcano that has subsided. The volcanoes that formed the Marshall Islands were active more than 150 million years ago. Reef growth during subsidence of the volcanoes results in a cap of calcium carbonate minerals that spans the distance from the top of the now-submerged volcano to the sea surface.
2. The shallow subsurface geology of atolls is determined by precipitation and deposition of carbonate minerals, the chemical alteration (diagenesis) of these minerals, and changes in sea level.
3. The RMI is made of 24 atolls and islands, of which the largest ten islands make up 74% (13,403 hectares) of the land area. The islands are low, generally flat bodies of land. On average, land mass in the Marshall Islands is 2 m above sea level.
4. The four atolls of interest for the MIMIP have the following characteristics:
    - Majuro consists of a series of islets connected by causeways on the south rim to form an almost continuous land mass. The atoll is elongated in shape and extends approximately 40km east to west. At the western end of Majuro atoll about 40km from the airport by road, is the highest elevation point on the atoll, estimated at less than 3m above sea level.
    - Kwajalein atoll, home of Ebeye Island, is one of the world's largest coral atolls. Comprising of 97 narrow islands and islets, it surrounds one of the largest lagoons in the world. The average height of above sea water for all of the islands in this atoll is about 1.8m.
    - Jaluit atoll is a large coral atoll of 91 islands with a total land area of 11.34 km^2, and it encloses a lagoon with an area of 690 km^2, which is shaped roughly like a kite. Most of the land area is on the largest island of Jaluit (10.4 km^2). Jaluit is approximately 220 km southwest of Majuro.
    - Wotje atoll comprises 72 islands with a total land area of 8.18km^2 and a total enclosed lagoon area of 624 km^2. Both in terms of land and lagoon area, Wotje ranks among the larger atolls of the Marshall Islands, while it has one of the lower lands to lagoon area ratios. The atoll is oriented east and west and measures approximately 45 km in greatest length (E-W) and about 18 km in greatest width (N-S).
5. Soils developed on the atolls are typically thin and poor. Atolls are generally composed of porous coral sediments. Drainage is generally not a major problem due to rapid percolation of liquids into the soil and substrate.
6. Soil erosion depends on several parameters such as type of soil, slope, vegetation, the nature of topography and rainfall intensity. The loss of soil stability and soil erosion can take place due to the removal of vegetation cover, and numerous construction activities. It can cause the loss of soil fertility and induce slope instability.
7. Rainfall can have a significant impact on the ability to manage environmental impacts, particularly in terms of managing drainage, erosion and sedimentation. Therefore, activities that involve significant disturbance of soil or operating within drainage lines should be planned to be undertaken during the driest months. It is also important to ensure that all required erosion and sediment control mechanisms are in place before the onset of the wet season.

SEISMIC ACTIVITY

8. The Republic of the Marshall Islands is situated along a relatively quiet seismic area but is surrounded by the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. No significant earthquakes have been observed in recent history. However, in 1899, a large earthquake off the eastern coast of New Ireland, Papua New Guinea generated a tsunami that caused a considerable amount of damage in the Republic of the Marshall Islands.

9. Earthquake hazard in the Marshall Islands is classified as very low, there is reportedly less than a 2% chance of potentially-damaging earthquakes in the area in the next 50 years[1]. The Republic of the Marshall Islands has a 40% chance in the next 50 years of experiencing, at least once, very weak levels of ground shaking. These levels of shaking are not expected to cause any significant damage to well-engineered buildings[2].

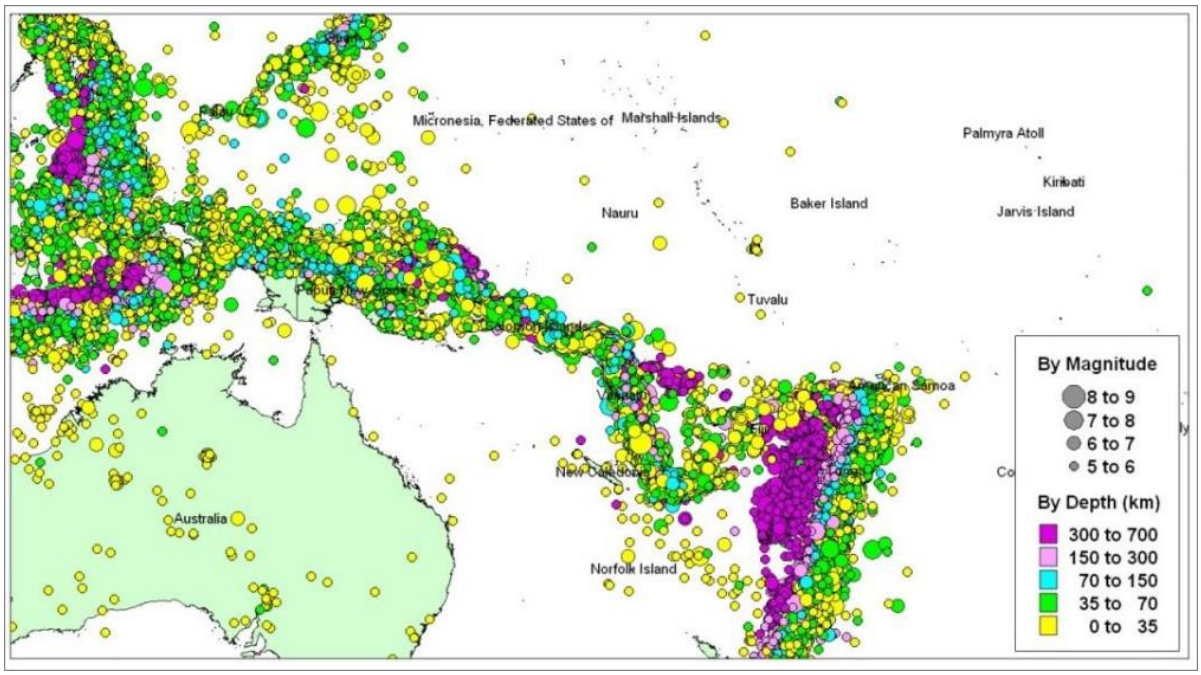

Figure 1 Epicenters of earthquakes in the west Pacific Islands region[3]

1.2 CLIMATE

10. The Climate of RMI is tropical throughout the year and is divided into two predominant seasons: a wet season from May to November and a dry season from December to April. Rainfall averages 300-380 mm per month with October and November the wettest and December to April the driest. Average rainfall increases from the north to the south: the northern atolls receive less than 1,250 mm annually and are very dry in the dry season, while atolls close to the equator in the south receive more than 2,500 mm of rain each year. Majuro itself is recorded as receiving an average of 3,200 mm of rain per year, while Ebeye has an average recording of 2,500 mm per year.

11. The general weather pattern is regularly influenced by the movement of the ITCZ (Inter Tropical Convergence Zone) as well as irregularly by the El Nino Southern Oscillation (ENSO). The Intertropical Convergence Zone brings rainfall to the RMI throughout the year. Rainfall is also sometimes influenced by the West Pacific Monsoon, which brings wetter conditions when it is active over the country. Many Pacific typhoons begin as tropical storms in the RMI region and grow stronger as they move westwards.

12. The islands border the typhoon belt. Typhoons, droughts and storm waves are the main extreme events that impact the RMI. Typhoons affect the country late in the typhoon season, between September and November. They are usually weak when they pass through the region but are more intense in El Nino years.

13. Droughts generally occur in the first four to six month of the year following an El Nino when the rainfall can be reduced as much as 80%.

14. Across the RMI, the average temperatures is relatively constant year-round, averaging between 25°C and 30°C for Majuro and Ebeye across the year. Changes in temperature from season to season are relatively small (around 1°C) and strongly tied to changes in ocean temperature.

15. Rainfall on the islands mostly reflects seasonal variability of the northeast trade winds. Weaker trades, from April to October, coincide with greater rainfall in those months, while stronger trade winds from November to March coincide with decreasing rainfall.

[1] http://thinkhazard.org/en/report/157-marshall-islands/EQ (accessed 11/1/19)
[2] http://siteresources.worldbank.org/EXTDISASTER/Resources/MarshallIslands.pdf
[3] Rong, Park, Duggan, Hahdyiar and Bauzzurro (2012) Probabilistic Seismic Hazard Assessment for Pacific Island Countries. 15 WCEE Lisboa 2012.

16. On a spatial scale, there is a large spread between rainfall totals between the northern and southern area of RMI, with the northern areas (represented by Utrik and Wotje) being significantly dryer than the south (Majuro and Kwajalein). General rainfall patterns vary within RMI along three zones; Zone 1 with atolls/islands located above 8' N latitude, Zone 2 with islands between 6' and 8' N latitude and Zone 3 with atolls/islands below 6' N latitude. During the dry periods, island in the northern Zones 1 and 2 often experience prolonged days without rain, and therefore are more vulnerable to drought (Figure 2).

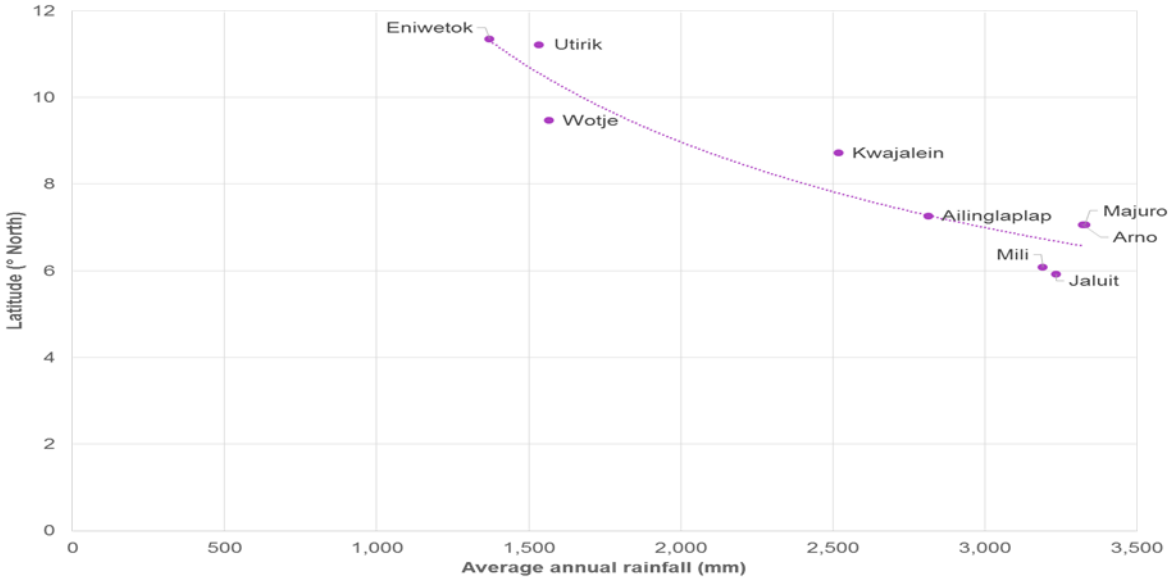

Figure 2 Annual rainfall patterns in RMI

1.3 UNEXPLODED ORDINANCE

17. During World War II the atolls and islands of Micronesia were the focus of military development, extensive fighting and bombardment. By the end of that war the islands were littered with unexpended Japanese ammunition and with US ordnance that had failed to explode on impact.

18. The Pacific War (1941-1945) saw the development of permanent and temporary military bases on several islands and atolls in the central and western Pacific Ocean by both Japanese and Allied forces. Vast quantities of ammunition, ranging from cartridges for small arms to high explosive shells for large coastal defense and naval guns, as well as aerial bombs were moved to the bases and stored in concrete bunkers or open bomb dumps. Small quantities were stored in ammunition ready magazines at the gun emplacements, where they were needed. Some of the ammunition was used up by the Japanese defenders, but much remained unexpended as the guns for which it had been stored were destroyed and made inoperable by U.S. attacks.

19. In addition, enemy action delivered substantial quantities of ordnance on the Japanese bases. There is some data for ammunition used by the US Forces for the Marshall Islands. Table 1 compiles some of that information for the general bombardment, and Table 2 provides the data for the bombardment during the invasion of Kwajalein. It should be noted that the data presented there are near complete only for the atolls of Jaluit and Wotje, while figures are minimum figure only for Kwajalein and Majuro as data is incomplete.

	7th AAF	USN Carriers		USN Land	Fourth marine Air Wing			Naval	
Atoll	Bombs	Bombs	Napalm	Bombs	Bombs	Napalm	Rockets	Gunfire	Total
Wotje	1236.10	166.10		213.10	186.20	10.60	5.07	1016.53	4508.70
Jaluit	1374.00	49.50		232.20	1425.38	54.20	7.32	6.00	3148.60
Kwajalein	315.20	?	?	?	?	?	?	?	?
Majuro	15.00								

Table 1 Tonnage of high explosive bombs, naval shells, napalm and rockets directed by U.S. Army, Navy and Marine units against targets on the Project islands, February 1942-August 1945, (Invasion bombardment exclude)[4]

	7th AAF	US Navy		US Army
Kwajalein Atoll	Bombs	Bombs	Gunfire	Gunfire
Roi-	23	16+	1434.5	
Namur			1220.6	
Kwajalein Is	15		2656.5	1847.4
Northern small islands			2677.4	43+
Southern small islands		33	3926.7	389.9+

Table 2 Tonnage of high explosive bombs, naval shells, napalm and rockets directed by U.S. Army, Navy and Marine units against targets on Kwajalein Atoll, during the invasion of these islands.[5]

20. Most of this ammunition was either expended during military action or was removed after the war. Whilst most of the bombs and shells exploded as intended, some did not. An US intelligence report following the capture of Kwajalein Atoll, Marshall Islands, by US forces indicates that approximately 50% of the naval shells failed to detonate on impact.

21. Multiple missions to remove the remaining ordinance were undertaken following the war. However, despite numerous efforts, not all ordinance has been discovered and removed. Discovery and clearance of ordinance in the Marshall Islands continues, for example in 2016 Golden West Humanitarian Foundation destroyed UXOs on Mili and Wotje in 2016[6].

1.4 Marine Environment

22. The RMI is formed of coral atolls and as such are characterized by calmer sea conditions on the lagoon side shores and larger swells and rougher condition on the ocean side shore. The coastal marine environment in the Marshall Islands hosts a range of fauna ecosystems:

- Seagrass community and meadows
- Supratidal and intertidal
- Sandy areas of the intertidal and subtidal zones
- Coral reefs

[4] Spennemann, D.H.R. (2005). Is Unexploded World War II Ammunition Abandoned Property? Journal of South Pacific Law. Vol 9 Issue 2.
[5] Spennemann, D.H.R. (2005). Is Unexploded World War II Ammunition Abandoned Property? Journal of South Pacific Law. Vol 9 Issue 2.
[6] https://marshallislandsjournal.com/?p=3451

- Reef holes, artificially quarried and bombed
- Sea surface, lagoon water column, open water
- Deep water.

23. The Marshall Islands has a total of 2,131,000 km^2 of Exclusive Economic Zone (EEZ), of which 0.009% is land. Marine species make up most of the biodiversity. The coastal marine environment has a diverse range of fauna species. There are over 1000 species of fish, 1600 of mollusc species, and more than 250 species of algae and stony coral and is home to endangered species including blue whales, sperm whales, leatherback turtles and the hawksbill turtle.

24. Five turtle species are known to occur in the Pacific region (Table 3).

Table 3 List of marine turtles (IUCN)

Common Name	Scientific Name	Status
Green	*Chelonia mydas*	Endangered
Hawksbill	*Eretmochelys imbicata*	Critically Endangered
Olive ridley	*Lepidochelys olivacea*	Vulnerable
Leatherback	*Dermochelys coriacea*	Vulnerable
Loggerhead	*Caretta caretta*	Critically Endangered

25. Green turtles are the only common species of turtle which nests in RMI, while hawksbill turtles are considered rare.[7] Nesting season normally takes place from May to November. The main nesting sites are Bikar, Erikub and Jemo, with minor nesting sites in the atolls of Bokak, Ailinginae, Rongerik, Bikini, Wotje, and Taka.

26. Coral reef ecosystems in RMI provide key ecosystem services, including food, to the Marshallese people. The condition of the reefs, particularly in the less populated islands, has a major positive impact on sustainable livelihoods, including fisheries.

27. Live coral reef cover is a useful indicator of the overall state of the inshore ecosystems. Coral cover provides an indirect measure of land-use impacts and erosion, fishing pressure, relative sea surface temperature (SST), presence of disease and predators like the crown of thorns starfish, and mechanical damage from anthropogenic sources or natural phenomena like typhoons.

28. Variations in coral cover trends show higher coral cover in rural atolls, compared to urban atolls. However, overall coral cover in RMI is considered to be relatively healthy. High species diversity indicates the coral reef ecosystems are intact and healthy.

29. Fisheries play an important part in RMI's economy.

1.4.1 Marine Ecosystem Management

30. The Marshallese people are reliant on reef fishing for subsistence. Reef fisheries target both reef fish and invertebrates (e.g. crustaceans, clams, sea cucumbers and trochus). Thus, healthy reef systems are critical.

31. The Marshall Islands has a unique management regime where traditional and modern styles are integrated to manage and conserve the nation's marine resources. There are 63 marine managed areas covering about 70% of reef area in the RMI. Most of the areas are yet to have proper management plans. Integrated management of marine and terrestrial systems through a community-based approach implementing the Reimaanlok (National Framework for Conservation Area Planning), a framework developed in 2008

32. There are two designated Ramsar sites in RMI (Figure 3) - the Jaluit and Namdrik atolls, with a combined area of 11.38 km^2 and some of the most diverse wetland in RMI. These sites were declared Ramsar sites for a number of reasons, including hosting a breeding population of critically endangered hawksbill turtles, the coconut crab and other rare species. Namdrik Atoll is one of the smallest, with an enclosed lagoon that cannot be accessed by boats. It is one of a few atolls which support mangroves and other native endangered species, as well as the critically endangered hawksbill turtle. Jaluit Atoll also has mangrove systems and supports a range of endangered and critically endangered species.

[7] Maison, K.A., Kinan Kelly, I. and K.P. Frutchey. 2010. Green Turtle Nesting Sites and Sea Turtle Legislation throughout Oceania. U.S. Dept. Commerce, NOAA Technical Memorandum. NMFS-F/SPO-110, 52 pp

33. Active management of the Ramsar sites is limited by distance and budget limitations. Both Ramsar sites have local management plans that are managed by the local government with support from the RMI EPA office.

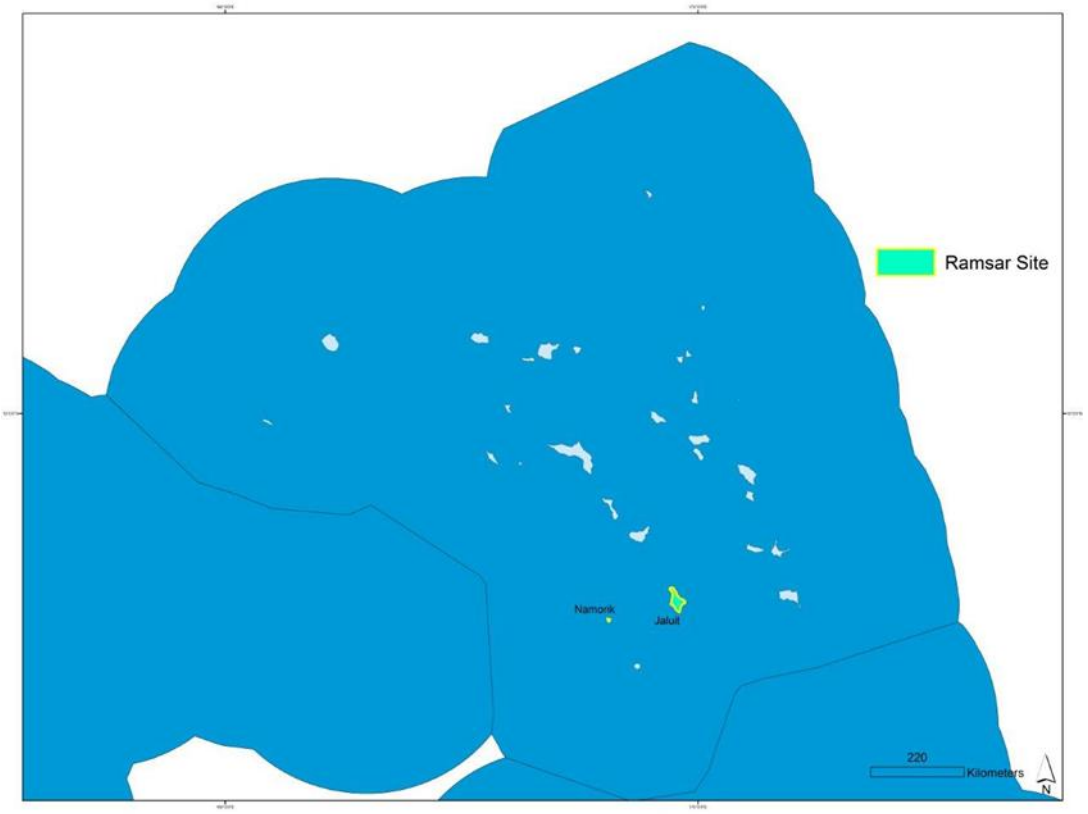

Figure 3 Ramsar wetlands in RMI

34. In 2011, the RMI declared its entire Exclusive Economic Zone a shark sanctuary, banning all activities associated in harvesting sharks and body parts for commercial purposes. The tuna fishery is overfished.

1.4.2 Marine Environment Proximate to Ports

35. The following provides an overview of the benthic ecology study undertaken as part of the work. Full details are included in Annexure C.

1.4.2.1.1 Methodology

36. A number of factors dictated the methods used to describe the benthic marine environment within and adjacent to the areas of the proposed physical investments.[8] Because of the extremely tight timelines for the work (both in terms of field work, and also reporting) and the fact that associates of various levels of professional ability were engaged locally, we employed a simple photographic technique to document benthic environments, that employs easy to use waterproof cameras (most GoPro Hero 7) taking unframed quadrat photographs along randomly placed 30m transects at within and adjacent to Ports. These photos are then analyzed using 'random point count' methodology, which is a common method to enumerate community/habitat statistics in a variety of fields of biology,[9] and is commonly used for coral reef habitats.[10] This method allowed many sites to be assessed using basic habitat descriptors. The broad overview of marine benthic habitats this method produces is by no means a comprehensive biological/ecological inventory and should only be used for semi-quantitative descriptive purposes rather than representing a current biological baseline dataset.

[8] Hoek, Christiaan; Mann, David; Jahns, H.M. (1995), Algae: An Introduction to Phycology. *Cambridge University Press. p. 434.* ISBN 978-0-521-31687-3

[9] Kohler, K.E. and Gill, S.M., 2006. Coral Point Count with Excel extensions (CPCe): A Visual Basic program for the determination of coral and substrate coverage using random point count methodology. *Computers & Geosciences*, 32(9), pp.1259-1269

[10] Carleton, J.H. and Done, T.J., 1995. Quantitative video sampling of coral reef benthos: large-scale application. *Coral Reefs*, 14(1), pp.35-46

37. At Delap, Uliga, Ebeye and Jaluit the site was assessed both from satellite photographs and in situ. At each port the site was assessed both from satellite photographs and in situ. Survey sites were selected for data collection to assess the benthic environment based on both proximity to the physical investments (directly around ports) and adjacent to ports, based on the variety of habitats present (i.e. deep channels, fringing reef slopes, reef flats, intertidal areas etc.). At each site up to four divers (or a single snorkeler) were deployed. The diver/snorkeler randomly placed the start of a 50m surveyors measuring tape on the bottom and deployed 30m of tape in a random direction. The diver (or a second diver) then swam along the transect length, taking 8-15 photographs of the seafloor from directly above the transect tape with the transect tape in-shot. This was performed 4-8 times per site, depending on the number of personnel available. At Yap different cameras to the GoPro's were used, which resulted in higher resolution photography, but a more limited field of view. Hence at this site, more photos were taken and analyzed than at other sites, but ultimately less benthic habitat was sampling due to the field-of-view restriction.

38. Photos were analyzed using the program CPCe,[11] which allows users to correctly spatially scale photographs according to known measures (in this case the surveyors tape). The program then has an algorithm to place random points within a pre-defined area, and database functions that allow the user to catalog the benthic habitat category/taxonomic group under that data point. For this study, photographs had a quadrat (square area of predefined dimension) defined based on as large an area as practical given the field of view of the photograph (for YAP, usually around 40 – 70 cm2, for all other ports usually 1 m^2). Within each quadrat a point was placed at random in each 10cm column of the quadrat, and the user then recorded the benthic habitat category/taxonomic group at this point. Habitat categories and taxonomic groupings used to record data for this report are provided below in Appendix 1.

39. After data was collected for each site, data were summarized per transect such that descriptive statistics (means, standard deviations, standard errors) were generated across transects. Benthic habitat data is presented in graph and table form however all data (photographs, CPCe outputs) is available in electronic appendices.

Delap

40. Delap Port is on the leeward, southern lagoon shore of the large Island on the eastern corner of Majuro atoll. The benthic habitat is predominately macro-abiotic at the main operational area (the northern facing dock), consisting mostly of coarse sand, bare rubble and litter/refuse, with sparse visible epiflora or fauna. This area rapidly changes to deep lagoon habitat to the north via a sandy slope. The area immediately to the east of the port dock is also an operationally busy area with a shallow lagoon benthic habitat: abundant macroalgae (≈30% cover) sparse individual hard coral colonies, and coarse sand. To the west of the port the benthic habitat transitions from a deeper lagoon environment to a fringing reef flat environment, although mostly consisting of algal turf covered hard substrate with sparse hard coral cover. A quantitative description of the benthic habitats around and immediately adjacent to the port is presented in detail below. The port area appears to already be impacted by industrial activity, given the prevalence of industrial and domestic waste on the seafloor. The proposed project appears to pose little threat to the existing marine benthic environment, however some general recommendations, revolving around pollution management are provided considering the likely industrial operations associated with the project and as a result of potentially increased future port capacity and/or use.

Uliga

41. Uliga port is situated on the leeward eastern lagoon shore of the large Island on the eastern corner of Majuro atoll. The benthic habitat around the north and west of the dock is predominately a mix of macroalgae beds on coarse sands with large sandy spaces and sparse visible epiflora or fauna, transitioning via a steep slope to deep lagoon habitat to the west. To the east of the dock, in-between the dock and land, the benthic environment consists of a small reef among coarse sand. To the south of the dock, the habitat transitions from deep lagoon to shallow lagoon abutting fringing reef slope and flat to the island shore. The shallow lagoon here is predominately biotic habitat consisting mostly of macroalgae and algal turf on hard substrate, with some in between coarse sand and sparse individual hard coral colonies. The reef slope to the south-east has relatively high coral cover in a small area (≈35% cover) and abundant algal turf on hard substrate. A quantitative description of the benthic habitats around and immediately adjacent to the port is presented in detail below. The port area appears to already be impacted by industrial activity, given the prevalence of industrial and domestic waste on the seafloor. The proposed project appears to pose little threat to the existing marine benthic environment, however some general recommendations, revolving around pollution management are provided considering the likely industrial operations associated with the project and as a result of potentially increased future port capacity and/or use.

[11] Kohler, K.E. and Gill, S.M., 2006. Coral Point Count with Excel extensions (CPCe): A Visual Basic program for the determination of coral and substrate coverage using random point count methodology. *Computers & Geosciences*, 32(9), pp.1259-1269

Ebeye

42. The dock at Ebeye is on the leeward, lagoon shore of Ebeye Island on the southern corner of Kwajalein atoll. The depth around the main operational port area (the western side of the dock) is around 12-17m, which falls away rapidly to the west to deep lagoon, sandy bottom habitat. The existing benthic habitat at the main operational area and to the north of Ebeye port predominately consists of both macroalgae (*Halimdea* sp. meadows) and macro-abiotic substrate (mostly coarse sand, bare rubble and litter/refuse) with sparse visible epifauna. The area immediate south and SSE of the port is a shallow lagoon area abutting the western shore of Ebeye Island. The shallow lagoon area is where the substrate transitions to higher algal turf cover and there is also sparse hard coral cover of ≈<5%. A quantitative description of the benthic habitats around and immediately adjacent to the port is presented in detail below. The area appears to already be impacted by industrial activity, given the prevalence of industrial and domestic waste on the seafloor. The proposed project appears to pose little threat to the existing marine benthic environment, however some general recommendations, revolving around pollution management are provided considering the likely industrial operations associated with the project and as a result of potentially increased future port capacity and/or use.

Jaluit

43. The port at Jaluit is situated on the leeward, lagoon shore on the southern corner of Jaluit atoll. Excepting the fringing reef around 80m to the NNW of the port, its benthic habitat is predominately macro-abiotic, consisting mostly of coarse sand with sparse visible epiflora or fauna. The area immediately to the west of the port dock has < 10% biotic substrate cover and recedes westward into deeper lagoon habitat. The benthic habitat immediately north of the port consists of small sandy channel which meets a shallow fringing reef habitat abutting the western shoreline of Jaulit. The fringing reef slop is dominated hard substrate with algal turf and relatively high hard-coral cover (≈36%). The shallow lagoon to the south and east of the port dock consists mostly of coarse sand, however sparse hard coral colonies are present (≈10% cover). A quantitative description of the benthic habitats around and immediately adjacent to the port is presented in detail below. The port area appears to already be impacted by port and maritime activity, given the prevalence of industrial and domestic waste on the seafloor. The proposed project appears to pose little threat to the existing marine benthic environment, however some general recommendations, revolving around pollution management are provided considering the likely industrial operations associated with the project and as a result of potentially increased future port capacity and/or use.

Wotje

44. Wotje was not visited by the ESMF consultant team due to logistical issues (airstrip was closed and therefore no flights were possible). See Annexure D for overview information collected by DIDA surveillance visit in early March 2019.

Arno

45. Arno was not visited by the ESMF consultant team due its late inclusion in the project.

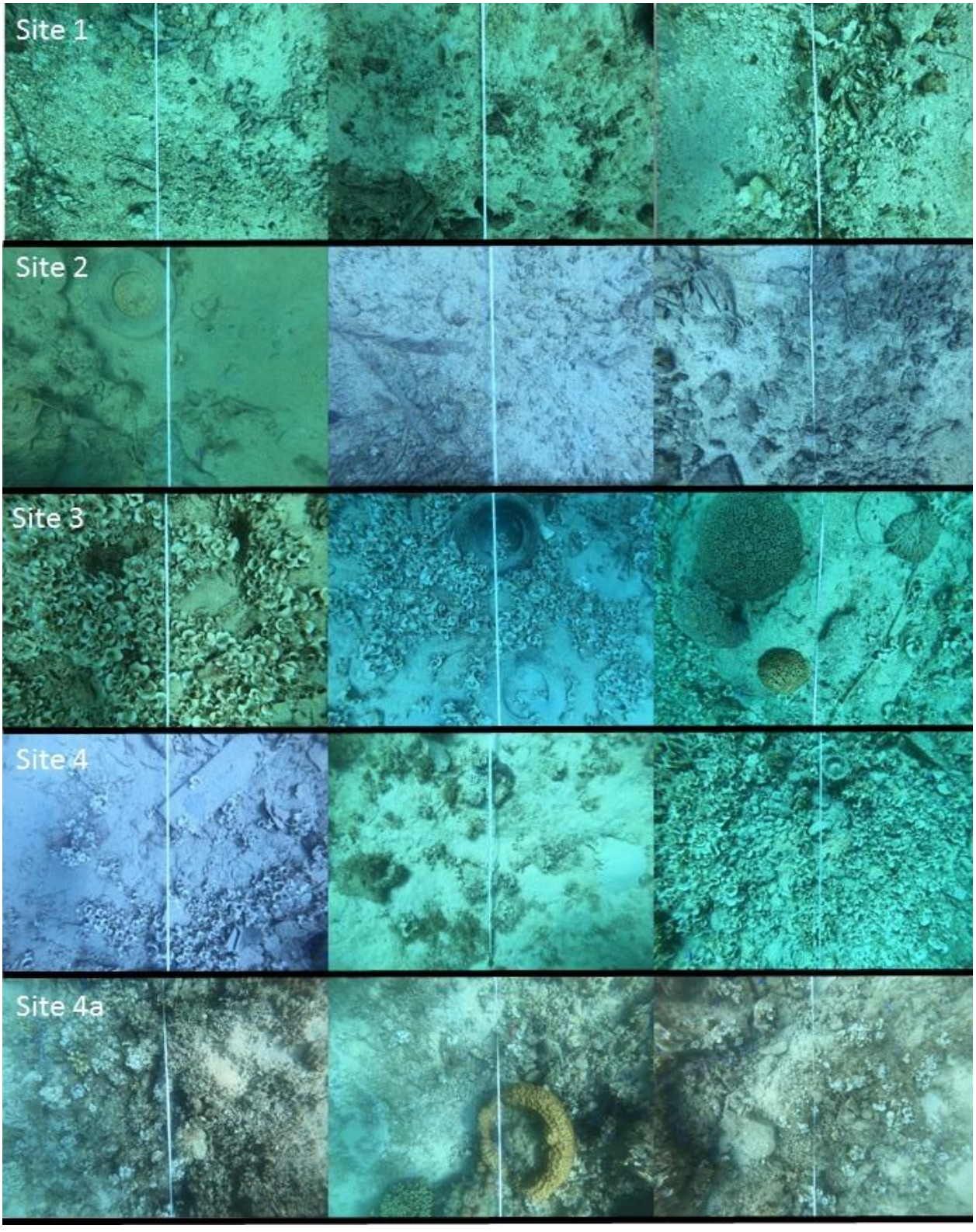

Figure 4 Representative photos of the benthic environment of each surveyed site at Delap Port

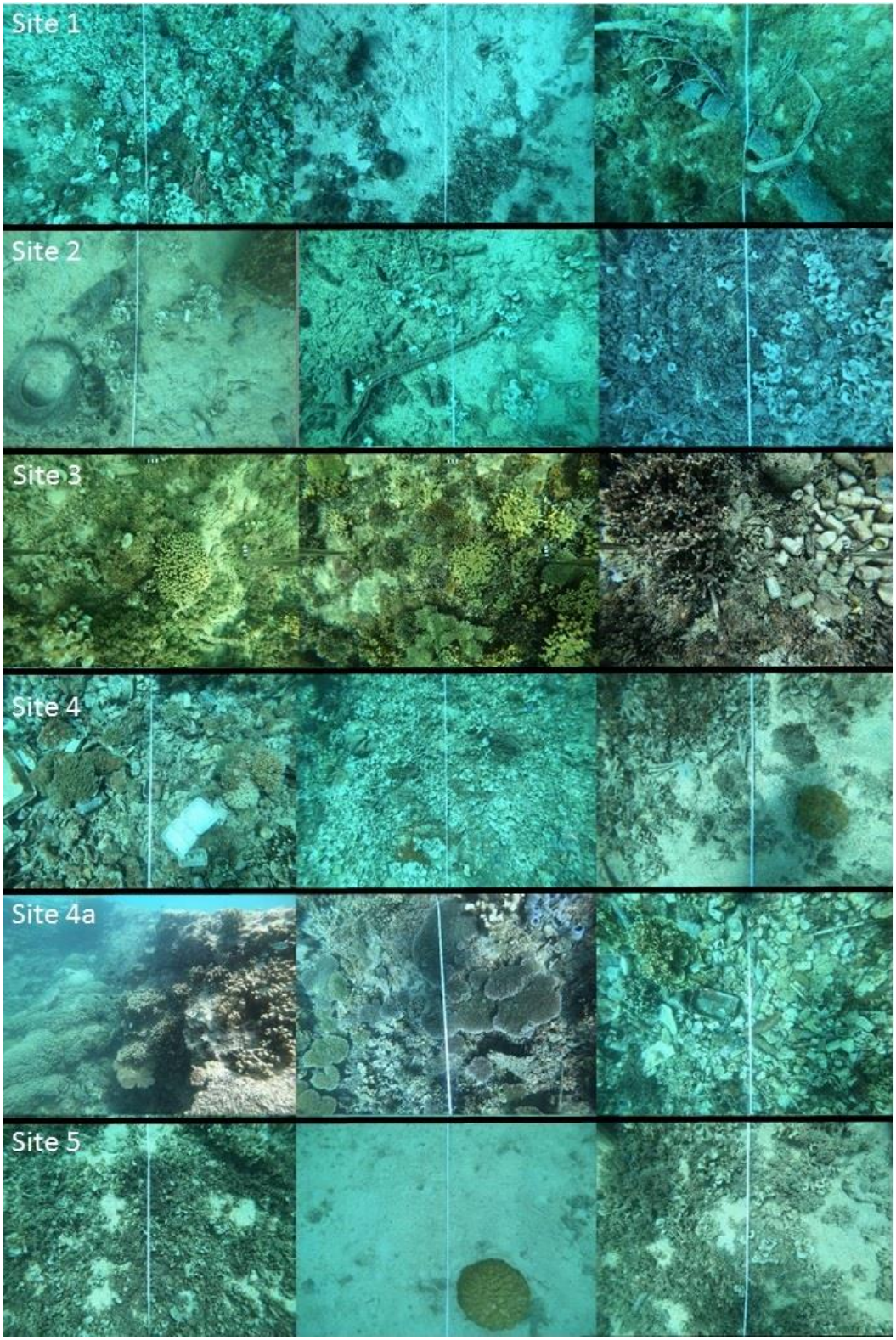

Figure 5 Some representative photos of the benthic environment of each surveyed site at Uliga Port.

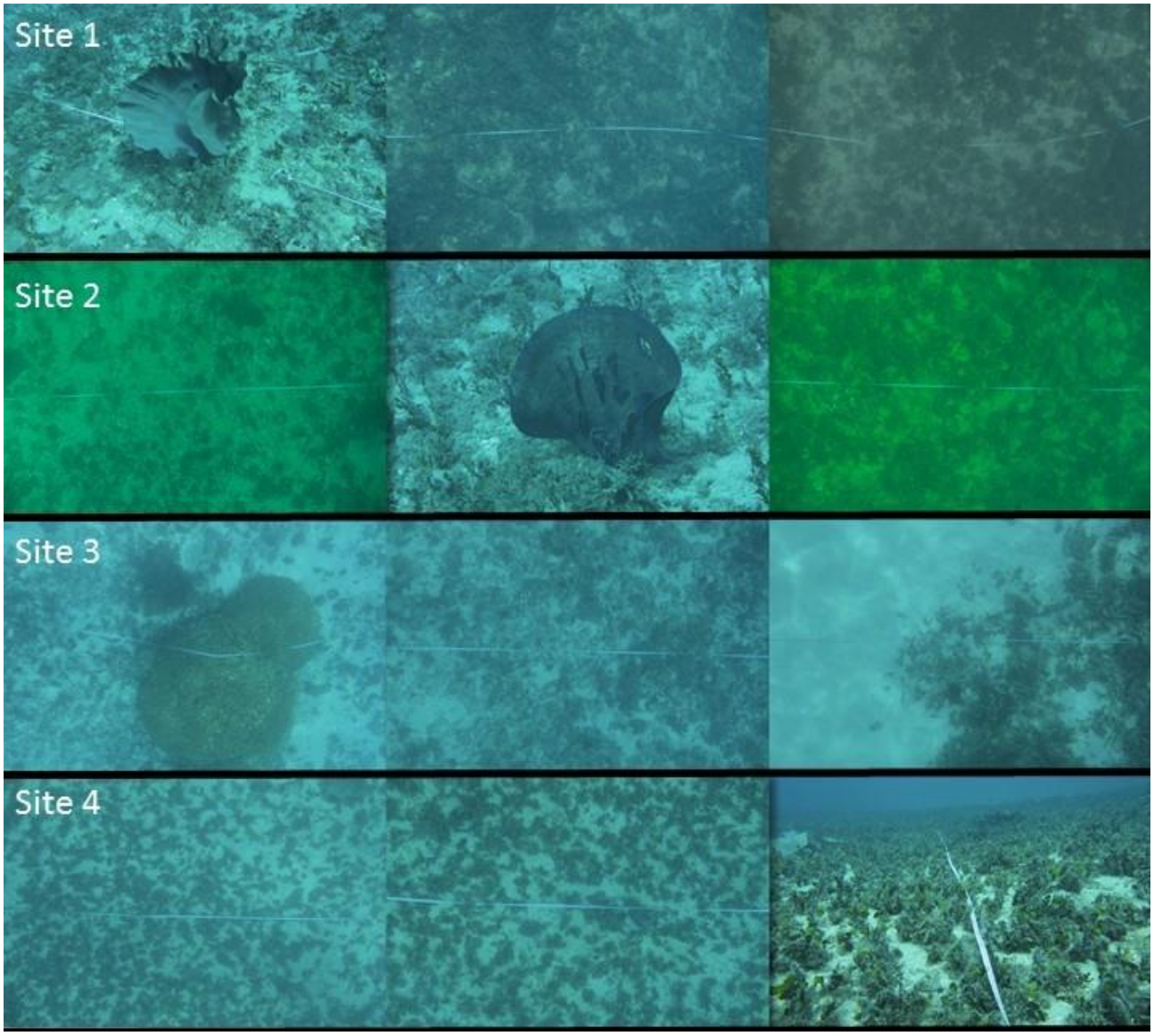

Figure 6 Representative photos of the benthic environment of each surveyed site at Ebeye Port

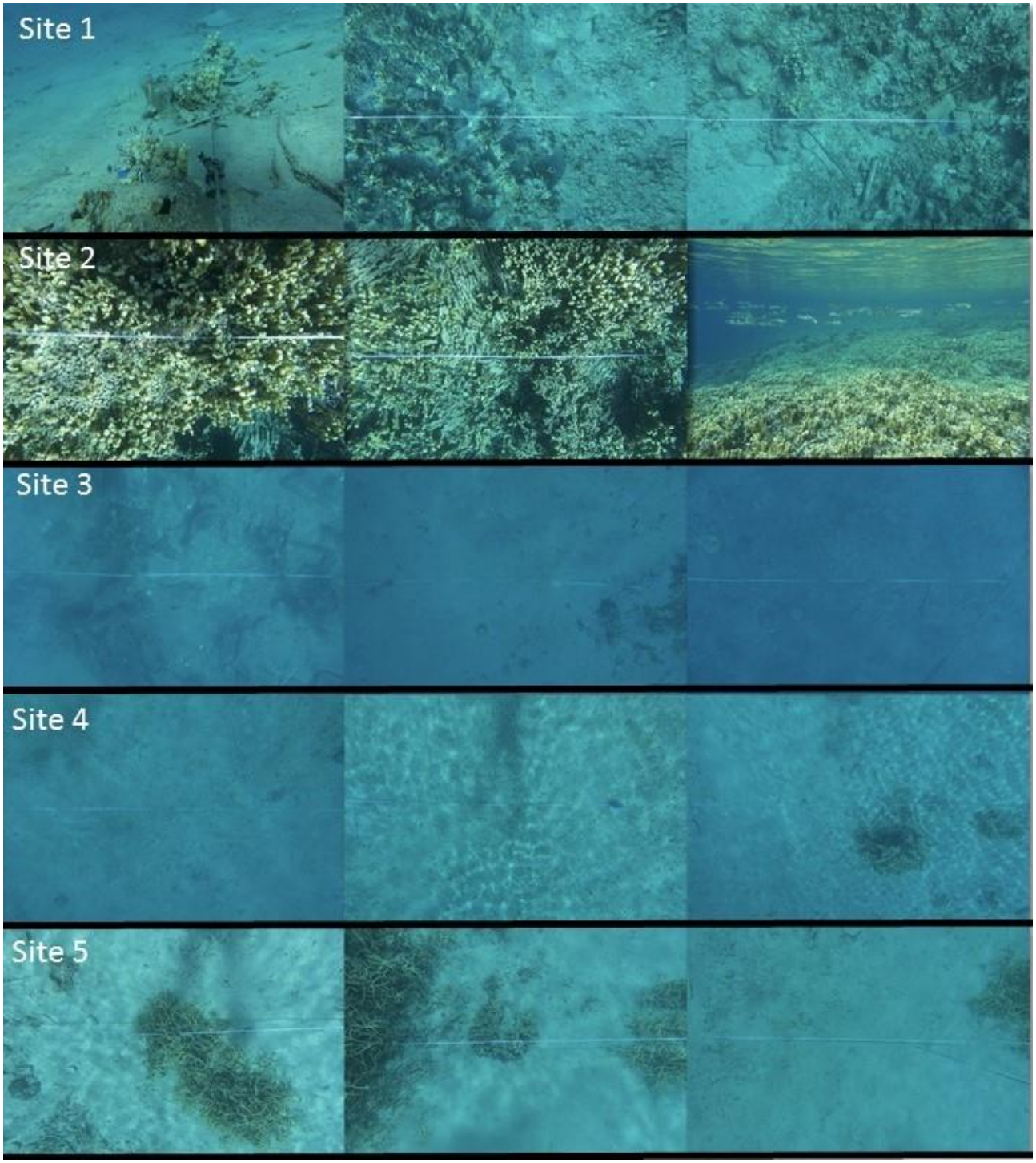

Figure 7 Representative photos of the benthic environment of each surveyed site at Jaluit Port

MARINE WATER QUALITY

Methodology

46. Water quality samples were collected at a range of sites for each port. A YSI Pro DSS unit was used to collect the samples. The water quality equipment located the site using GPS technology and collected the following parameters
    - Barometer (mmHg)
    - Temp (°C)
    - Cond (µS/cm)
    - Sp Cond (µS/cm)
    - Sal (psu)
    - nLFCond (µS/cm)
    - TDS (mg/L)
    - Resistivity (ohms-cm)
    - Sigma-T (s t)
    - Sigma (s)
    - ODO (% Sat)
    - ODO (mg/L)
    - ODO (ppm)
    - pH
    - pH (mV)
    - ORP (mV)
    - Turbidity (FNU).
47. All samples were taken at a depth of 6 meters for consistency.
48. Sample sites were as follows:
    - Majuro – fifteen (15) sites;
    - Ebeye – six (6) sites; and
    - Jaluit – fourteen (14) sites (north and south Jaluit).
49. Data was logged on the YSI Pro DSS and then transferred into an excel spreadsheet. Full data for all ports is contained within Annexure Two of the ESMF.

Majuro

50. Delap Port is located on an area of reclaimed land while Uliga is a concrete structure on the inside of the eastern side of the lagoon.
51. Water quality was sampled at fifteen (15) locations around Delap and Uliga as well as sampling near Kramer Port. Temperature was very consistent across the whole area and ranged from 28 ^{O}C to 28.2^{O}C. Conductivity was similar across all sites. Total dissolved solids was similar across sites with sites seven (7) and fifteen (15) being slightly elevated in comparison to the majority of sites (range between 0.67 and .75 FNU).
52. Oxidation-Reduction Potential (ORP), which is a measure of the cleanliness of the water and its ability to break down contaminants was significantly different across all sites. As an example, site 1, which was taken immediately behind a carrier vessel was -4.4. At one site in proximity to Kramer Port, the ORP was 29.1 (site four (4)). Around Delap port, the ORP was again low at 43.5 (sites seven (7) and eight (8)), while near Uliga, ORP was much higher range between 84.8 and 100.3. This could be explained as a result of the significant weather (winds of > 25 knots) and swells of up to three (3) meters during the sampling period.

53. Marine water quality sampling sites for Majuro are shown in Figure 10.

Ebeye

54. Water quality was sampled at nine (9) locations within the embayment. Water temperature varied across the nine sites sampled with site 1 having higher temperature (29.6^{O}C) while sites 3, 4 and 7 had water temperatures of 28.8^{O}C. Oxygen saturation was highest at sit 1 (108% and only 83% and site 8 which could be a result of water circulation. Sites 8 and 9 had much higher turbidity (5.07 and 5.42 FNU) in comparison to other sites, although site 6 immediately adjacent to the port had a turbidity reading of 3.51FNU. Other variables were similar across all sites.

55. Marine water quality sampling sites for Ebeye are shown in Figure 9.

Jaluit

56. Water quality was collected at both north and south Jaluit (fourteen (14) sites in total. A range of sites were surveyed as part of the water quality sampling, including what could be considered unimpacted sites versus sites in proximity to the port and small vessel area.

57. Water quality across the six sites in north Jaluit was sampled as the team was investigating a potential additional port that could have been included in the MIMIP. Temperature at the sites was fairly consistent (28.3 ^{O}C – 28.4 ^{O}C). Most parameters were fairly similar, although ORP at site one was significantly higher, while site 3 was significantly lower than the other four sites. Marine water quality sites for Majuro are shown in Figure 10.

58. With respect to South Jaluit, water quality samples were collected at eight sites. Temperature was consistent fairly consistent (28.5 ^{O}C – 28.7 ^{O}C). Likewise, conductivity was very similar across all sites as was oxygen saturation and availability. pH varied with a range between 8.06 and 8.23. Turbidity was slightly higher inshore which is to be expected, although it was still low at only 0.62 FNU.

59. ORP was significantly different across the sites. Site nine (9) had an ORP reading of -12.9mV and sites 8 (0.9mV) and 14 (17.4) were very low. By contract, site ten (101.6mV) and eleven (92.5mV) were very high. Marine water quality sites for south Jaluit are shown in Figure 11.

Figure 8 Marine Quality Sites in Majuro

Figure 9 Marine Quality Sites in Ebeye

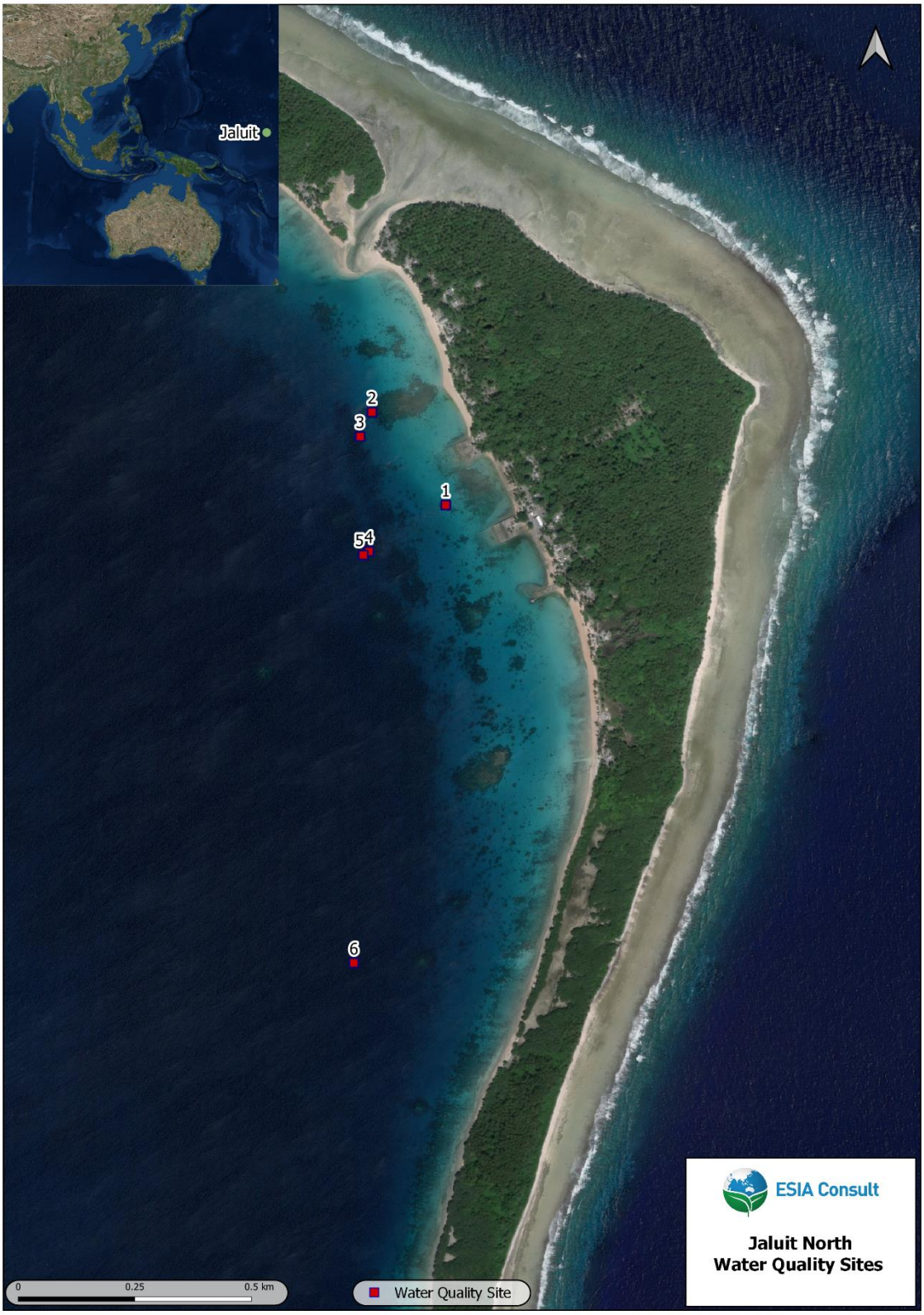

Figure 10 Marine Quality Sites in Jaluit North

Figure 11 Marine Quality Sites in Jaluit South

1.5 TERRESTRIAL ECOLOGY

1.5.1 Terrestrial

60. The land ecosystem of RMI is made up of forests, agriculture and wetlands which have been shaped by Marshallese land management practices.

61. RMI has about 70% total forest cover, which includes native forest, agro-forest, and coconut plantations[12]. The original forests have been replaced by agro-forestry to support human settlements. Today, the agro-forest is a mixt of trees, shrubs and herbaceous species such as coconuts, breadfruits, pandanus and bananas (Figure 12). Due to low soil fertility, there are few crops that can be grown in an atoll soil. Only a few atolls hold the last remaining native forest ecosystems. *Pisonia grandis* is one of the main forest ecosystems found throughout the Marshall Islands.

62. Land cover mapping has been carried out on the ten larger atolls. RMI is mainly covered by forest except in a few select locations where urban areas dominate (12%). These are Majuro (49% urban) and Kwajalein (30% urban). Barren land cover is the second most common land cover type (14%) - this is made up of sand and coral bars along and between islets. About four percent is non-forest vegetation including rangeland and agricultural lands

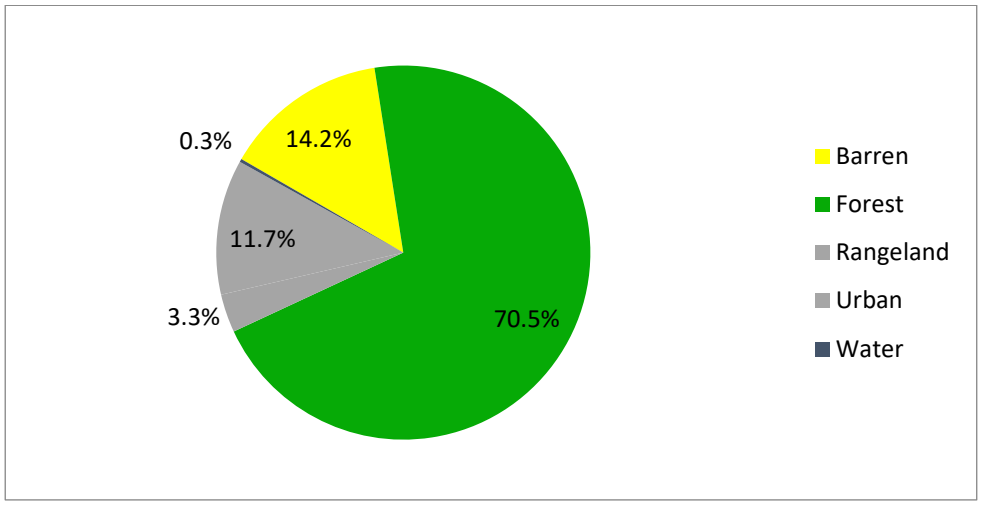

Figure 12 The graph represents the ten largest islands, seventy percent of which is estimated to be forested in a mixture of agro-forest and native species. Urban lands account for 12 percent of the land cover (Donnegan et al, 2008)

63. RMI has a limited number of terrestrial species which are endemic and a low number of terrestrial species. According to Fosberg "little or none of the true original vegetation remains of the Marshall Islands". The original ecological system was altered by the first Marshallese settlers and also during the colonial era.[13] A comprehensive study of botanicals has yet to be carried out although some atolls were studied. Figure 13 shows the average tree species mix on large atolls.

[12] State of Environment Report (2016) SREP
[13] Fosberg, R. F. (1990): "A Review of the Natural History of the Marshall Islands". National Museum of Natural History Smithsonian Institution, Washington, D.C., USA

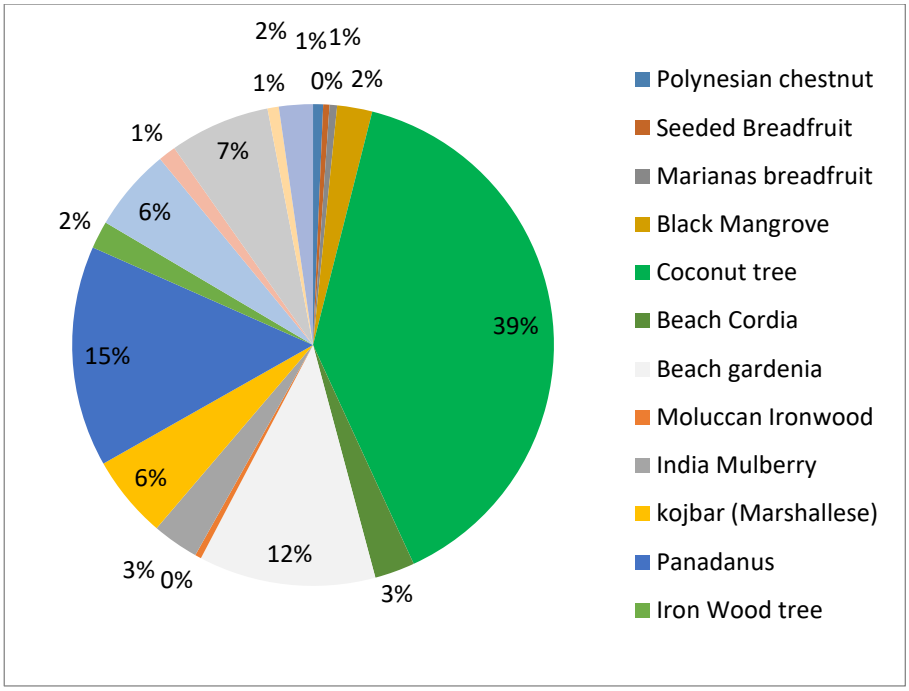

Figure 13 Average tree species mix based on sample plots on the ten largest islands. (Donnegan et al, 2008)

64. The ports are highly disturbed areas with little or no vegetation.

1.5.2 Invasive Species

65. Increased contact with the world brings more invasive species to RMI. However, the primary pathway for spread is infrastructure, related to development such as roads, urban expansion and agriculture. Invasive species compete with indigenous species and habitats with little or no natural predation.

66. A study conducted in RMI recorded 523 alien species that impact the environment, as invasive and potentially invasive species. Of the 523 alien species, 41 are animals, the remainder are plants.[14]

67. Many of the invasive species arrived over the past century and efforts are underway to prevent their spread. For example, the Mangrove Monitor lizard was introduced as a pet during the Japanese era of colonization and are known to prey on birds and their eggs. The most harmful ones to native flora and fauna are cats and rats. Many land and marine invasive species, plants or animals are threatening the biodiversity. Once an invasive species establishes itself, eradication and control can be extremely difficult and costly. The well-established merremia vine, the crazy ant and red-vented bulbul bird are already having negative impacts by taking over ecosystem niches.

68. Invasive species are unevenly distributed across the nation (Figure 14). Majuro and Kwajalein have the highest number of invasive species, 244 and 187 respectively, as the two atolls are the main ports of entry to the country.

[14] Pagad, S. (2015). Compile and Review Invasive Alien Species Information for the Republic of the Marshall Islands. Report for the Secretariat of the Pacific Regional Environment Programme

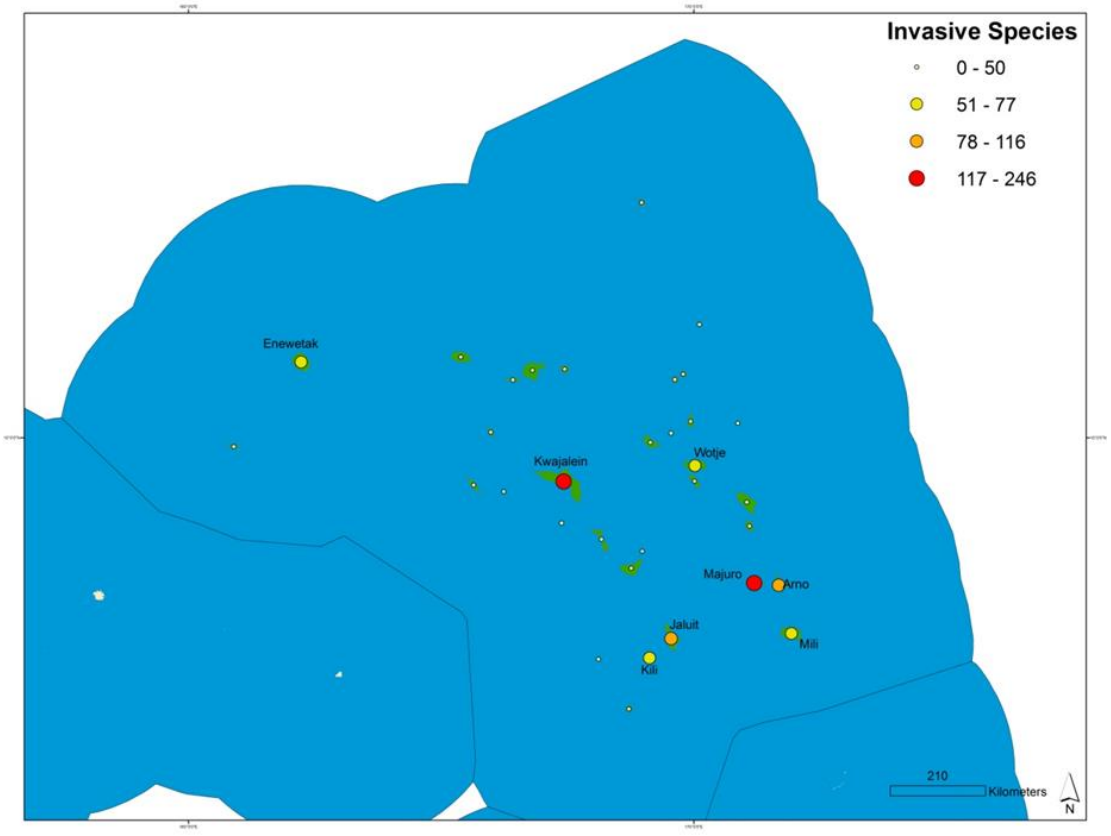

Figure 14 Map of Atolls with high invasive species presence. (SPREP, 2016)

69. RMI is a member of the Micronesia Regional Invasive Species Committee and joined with FSM and Hawaii to develop the Micronesia and Hawaii Regional Biosecurity plan. Invasive species are also costly to eradicate, control and monitor. In 2015, RMI approved its National Invasive Species Strategy and Action Plan. Biosecurity procedures exist at international ports of entry and there is capacity in Early Detection Rapid Response (EDRR). There are also weed management actions on Majuro, Bikini and Kili atolls.[15]

1.6 SURFACE WATER

70. Fresh water is a very scarce resource in the Marshall Islands. There are no rivers, streams or lakes on any of the atolls. One atoll, Lib Atoll, has a brackish lagoon. Due to the nature of surface substrates on coral atolls, water generally percolates quite quickly into the soil and through to the underlying substrate, often accumulating as a freshwater lens that floats on the underlying saline water.

71. On outer islands, household catchments are the main source of drinking water, usually water tanks. Testing by the RMI EPA has shown that many household tanks contain contaminated water (Figure 15). The scarcity of fresh water, the high and increasing demand for fresh water, as well as the water quality issues, put an increasing pressure on both the population and the environment.

[15] SREP (2016) The Republic of the Marshall Islands: State of the Environment Report 2016, Apia, Samoa

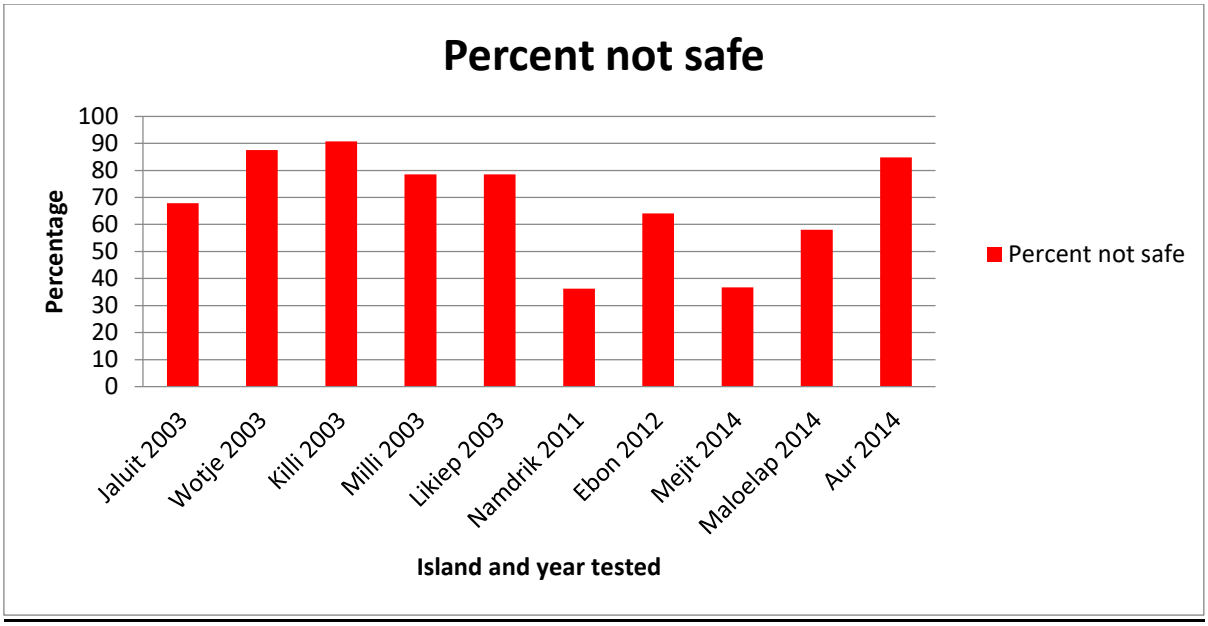

Figure 15 Percentage of unsafe water sampling in the outer islands. (RMI-EPA datasets, 2015)

1.6.1 Lagoon water quality

72. The lagoon ecosystems in the Marshall Islands are some of the most significant natural assets. They provide food, storm protection and habitats, and are one of the biggest attractions for tourist. These lagoon ecosystems are particularly sensitive to water quality impacts from land-based activities and waste disposal associated with recreational use and aquaculture. The impact of lagoon water quality plays an important role for local community incomes and daily subsistence.

73. Water quality monitoring started in 1984 when the Environmental Protection Act came into effect, which the Environmental Protection Authority was mandated to carry out. The monitoring sites are mainly in the urban areas of Majuro and Ebeye where coastal water quality checks are conducted quarterly. There are over 40 monitoring sites in the two populated centers.

74. Marine lagoon water quality has deteriorated mainly in the urban centers. The three most contaminated sites in 2014 were Alwal, Jenrok 2 and Small Island. Enterococci - a bacteria found in the intestines of humans and animals - is used as an indicator for fecal pollution in marine waters. Bacterial counts have been measured above safe recreational guideline of 104MPN/100ml (Figure 16).

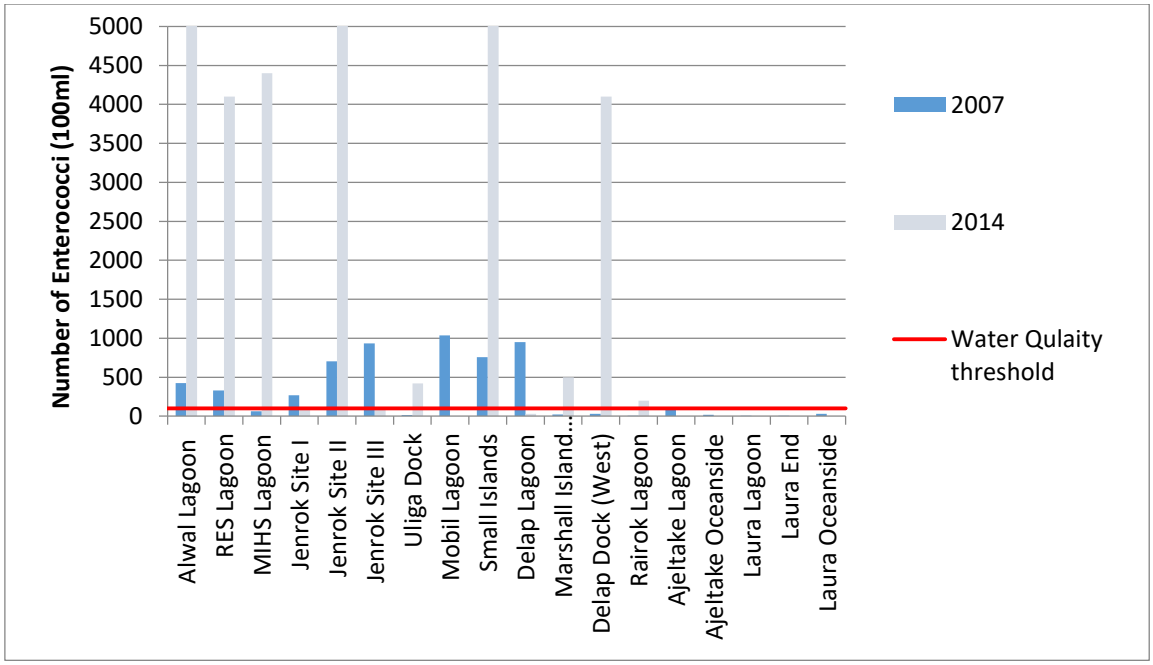

Figure 16 2007 and 2014 Majuro Lagoon Sampling sites (EPA Coastal water quality monitoring reports of 2007 and 2014)

75. Impacts from impaired lagoon water quality include environmental, social and economic factors. Poor water quality is a result of excessive nutrients, harmful bacteria and sedimentation which can accelerate algal bloom, leading to environmental and health issues. Reef habitats in lagoons are susceptible to smothering from algal growth, stimulated by excess organic and nutrient matter. Other factors contributing to lagoon pollution is runoff from residential areas, road drainage that links directly to the lagoon, discharge of RO brine, and continual use of lagoon or shoreline areas for defecation and dumping of domestic wastes. The degradation of lagoon habitats impacts on people who rely on inshore environment for subsistence, income and health.

1.7 GROUNDWATER

76. Atoll aquifers are recharged by rain infiltrating through a thin unsaturated zone. Recharge from rainfall typically forms a thin lens of freshwater that is buoyantly supported by dense saline water from the ocean. Mixing between the infiltrated rain and saltwater forms a zone of transitional salinity. The thickness of this transition zone is determined by the rate of recharge, tidal dynamics, and hydraulic properties of the carbonate aquifer.

77. Uncontrolled and unmanaged land-based activities are known to have impacts on the groundwater quality resulting in contamination. RMI is no exception to this rule.

78. RMI EPA currently routinely monitors the quality of Majuro groundwater for fecal and nitrate contamination. Also, through contractual service by JIRCAS, Laura groundwater boreholes and some private wells are monitored for water levels, electrical conductivity, nitrate-nitrogen, COD, calcium, chloride, pH and turbidity.

79. Testing has revealed that groundwater on many of the atolls is contaminated, in particular by bacteria associated with human and animal faces, *E.coli*.

80. No groundwater bores or wells were observed at the ports.

1.8 AIR QUALITY

81. Outdoor air pollution is a mix of chemicals, particulate matter, and biological materials that react with each other to form tiny hazardous particles. It contributes to breathing problems, chronic diseases, increased hospitalization, and premature mortality.

82. The concentration of particulate matter (PM) is a key air quality indicator since it is the most common air pollutant that affects short term and long-term health. Two sizes of particulate matter are used to analyze air quality; fine particles with a diameter of less than 2.5 µm or PM2.5 and coarse particles with a diameter of less than 10 µm or PM10. PM2.5 particles are more concerning because their small size allows them to travel deeper into the cardiopulmonary system.

83. The World Health Organization's air quality guidelines recommend that the annual mean concentrations of PM2.5 should not exceed 10 µm/m3 and 20 µm/m3 for PM10.

84. Vessels and machinery operated at ports are a source of active emissions (exhaust), while fuel farms can be a source of fugitive emissions. Shipping currently contributes around three per cent of global GHG emissions. By 2050, greenhouse gas emissions from international shipping are expected to increase by up to 250 per cent, equivalent to between 6 and 14 per cent of total global emissions. RMI is currently the world's third largest shipping registry.[16]

85. The Majuro port is adjacent to the RMI power station, which is a major source of emissions in RMI.

86. As a nation with little heavy industry and flat topography that is subject to oceanic winds, the air quality in the Marshall Islands is generally considered to be high. Localized sources of pollution include power stations, shipping fleets, motor vehicles, air craft and industries, such as tuna processing facilities. However, the small size of the islands and prevalence of strong maritime winds ensure that any air emissions from vehicles, stationary sources or fires is quickly mixed with clean maritime air and no pockets of lower air quality are likely to exist.

1.9 Ambient Noise

149. Due to the limited urban development and heavy industry, environmental noise is relatively low. However, the low topography and large expanses of water means that noise is readily transmitted across large distances. Sources of noise include aircraft (limited flights), motor vehicles, ships and boats utilizing the lagoons, generators and power stations and general urban noise.

87. Ports are industrial sites and therefore are a source of noise, particularly ship engine and operating machinery noise. Loading and unloading of cargo also creates some noise.

1.10 Visual Amenity and Ambient Light

88. Being an island nation, with a history in seafaring, boats are part of the cultural landscape of RMI and a common visual presence. The major ports are industrial sites with large wharves, container yards, offices, and heavy machinery making up the visual landscape.

89. The islands of RMI are very low and flat, therefore viewsheds of the ports are extremely limited. Primary views are gained from the marine side of port areas.

90. Vessels moored in the lagoon can have a considerable impact to shoreline developments in terms of light emission from deck floodlights.

1.10.1 Majuro and Ebeye

Both Majuro and Ebeye are highly urbanized islands. The port areas are surrounded by development, including industrial development, therefore impact of security lighting general limited in terms of sensitive receptors. The area around the port at Jaluit is somewhat urbanized with low buildings close by and a modified shoreline.

1.10.2 Wotje

Wotje is far less developed that Majuro and Ebeye. The development at Wotje is set back somewhat from the shoreline, so that the port is set in a more natural appearing environment. The shoreline at Wotje is one of sandy beaches fringed with palm trees (Figure 17).

[16] http://www.airclim.org/acidnews/marshall-islands-calls-cuts-shipping-emissions

Figure 17 Beach adjacent to Wotje wharf

91. The ports are existing facilities and the proposed new or updated infrastructure is of a type and scale that is in keeping with that already in place (refer to Annexure A).

2 DESCRIPTION OF SOCIO-ECONOMIC ENVIRONMENT

92. The following section provides an overview of the bio-physical environment of RMI.

2.1 POPULATION

93. RMI's population totals about 53,125 (2017)[17], of which about 28,000 (53 percent) reside in Majuro (the country's capital) and about 9,600 (18 percent) in Ebeye. The migration from the outer islands to the urban centers of Majuro and Ebeye is primarily due to: (i) lack of employment opportunities in other locations; and, (ii) greater reliance on the cash economy as compared to a subsistence lifestyle. Concurrently, the combination of declining incomes and rising costs of living is causing Marshallese residents to leave the country for better jobs and educational opportunities abroad, mainly in Hawaii, United States mainland and Guam.

94. The Marshall Islands was one of the fastest growing island nations with an annual growth rate of 4.2 % from 1980 to 1988. This slowed to 0.4% in the last decade (SOE 2016).

95. Based on the census report 2011, 74% of the population live in urban areas, which is high on a world basis. Internal migration from rural areas to the urban centers continues. Majuro, the largest urban center, the next largest urban area is Ebeye. The remaining population is spread throughout the atolls.

96. The official language is Marshallese. English is widely used in business and Japanese spoken by a section of the population

97. The average Marshallese household comprises of 7.2 members. Most households are headed by men (76%). In urban areas, 33 percent of households have nine or more members, compared with 25 percent in rural areas, indicating a need for housing in urban areas. Large household sizes and limited land area make for dense living conditions, with one quarter of all households using only one room for sleeping.

98. Large household size is not just a reflection of a growing population but is also indicative of specific Marshallese cultural practices. Over 4 in 10 households included one or more children who stayed with neither their natural father nor their natural mother. The percentage is higher in rural areas (50% compared to 44%). Survey results (RMI DHS 2007) showed that almost one quarter (23.2%) of Marshallese children under 18 were not living with either parent.

99. The population of RMI is the second youngest in the Pacific Islands, with a median age of 19.2, with just over half of the country's population younger than 20 years of age.[18] The older age groups are very small in comparison, as can be seen in the population pyramid (Figure 18). There are only slightly more men (51%) than women (49%), which is the same for both urban and rural areas. This age structure means that when the young population eventually reaches reproductive age, the result will be a high population growth rate for some years to come.

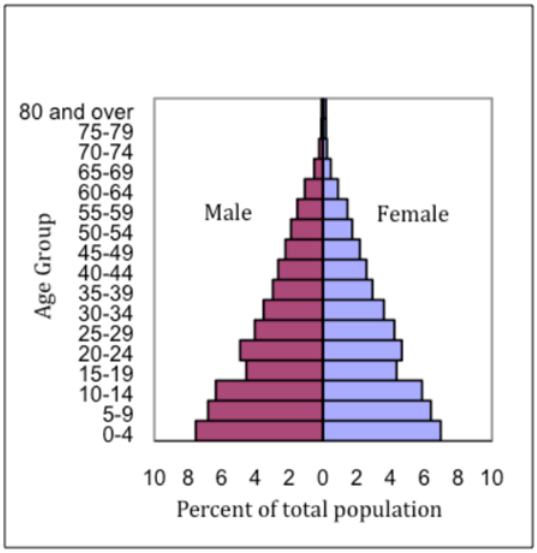

Figure 18 Population pyramid[19]

[17] World Development Indicators database, last updated 9/21/2018.
[18] Republic of the Marshall Islands 2007 Demographic and Health Survey
[19] SREP (2016) The Republic of the Marshall Islands: state of the environment report 2016. Apia, Samoa.

2.1.1 Health

100. The Ministry of Health works collaboratively with the Community Health Councils to provide health-care services. The Marshall Islands has two hospitals (one each in Majuro and Ebeye) and 56 health care centers in the outer atolls and islands. Both hospitals provide primary, secondary, and limited tertiary care.[20]

101. The Marshall Islands is burdened by high mortality and morbidity for both noncommunicable and communicable diseases. Diabetes-related diseases and cancer remain the leading causes of death. The high consumption of imported canned and instant food, lack of physical exercise and use of tobacco products are all associated with the high prevalence of noncommunicable diseases (NCDs) and obesity. Tuberculosis (TB) is also a leading cause of death, and the country has reported multidrug-resistant TB.

2.1.2 Education

102. The Ministry of Education provides for public education at the elementary, secondary, and higher education levels. Marshallese citizens have a compulsory primary education system but few options for tertiary education. That means most children only complete the eighth grade. Higher education in the Marshall Islands consists of vocational and tertiary instruction primarily at only two institutions. Still, only around 10%t of the population graduates from college.

103. The College of the Marshall Islands offers two associate degrees (sciences and liberal arts) and a variety of professional certificates. The regional University of the South Pacific's Marshall Islands campus has bachelor's degree programs and even a master's degree in business administration.

104. Marshallese students also have opportunities to pursue an education elsewhere. They can travel to the United States without a visa to study and work. Marshallese citizens can also earn education entitlements by joining the U.S. military

105. The College of the Marshall Islands also teaches adult education programs to allow students an opportunity to complete high school equivalency education.

2.1.3 Religion

106. Religion in the Marshall Islands is dominated by major Christian faiths introduced by Western missionaries since around 1857, but indigenous interpretations of these beliefs differ substantially from common European and American significances.

107. The Constitution provides for freedom of religion, and the Government generally respects this right in practice. Major religions include the United Church of Christ (formerly Congregational); the Assembly of God; and the Roman Catholic Church. Also represented are Bukot Nan Jesus (also known as Assembly of God Part Two); the Church of Jesus Christ of the Latter-day Saints (Mormons); Seventh-Day Adventists; Full Gospel; and the Baha'i Faith.

2.1.4 Cultural Heritage

108. Cultural history, folklore, assets and places are important matters for future planning. There is a need to understand the implications of cultural heritage assets on affecting future urban structure and land uses. Cultural heritage sites, areas, places and practices should be protected and celebrated via subsequent planning tools as an important feature of local identity and sense of place.

109. The culture, history and natural environment of the Marshallese cannot be separated because specific places, rocks, trees and animals have powerful cultural meaning. With over 3000 years of human habitation there are some very significant prehistoric sites. These include battle sites, burial sites and others that are central to local myths and legends. The management of natural cultural sites is coordinated at the national level by the Historic Preservation Office

110. The Marshallese people have long been cultivating the land for food, medicinal and other traditional purposes. The cultural change over the past 100 years is evidenced by Marshallese food sources. In the early 1900s, the Marshallese depended on local sources for most of their carbohydrate needs. The consumption of local root and tree crops (taro, breadfruit, banana, pandanus and arrow roots) has declined since the early 1900s. Coconut consumption in urban centers has also decreased. These traditional food sources have been replaced by food imports.

[20] WHO (2018) Marshall Islands. Country Cooperation Strategy at a Glance

111. While no cultural heritage places, buildings and monuments are known to exist in areas where the MIMIP will be undertaken, further investigation of places and practices of cultural and historic heritage significance should be undertaken as part of the preparation process.

112. In the past, the people of the Marshall Islands used many methods to sustainably harvest natural resources. One of the methods remaining in use in some areas is *mo* – the traditional system to designate all or part of an island, or a reef area, as a restricted site. Special permission from the Iroij was required to visit a *mo*. Harvesting from the *mo* was done for special occasions, or in times of famine. The rules and regulations for *mo* varied across the archipelago and often involved rituals and chants. There was a belief that failure to comply with the rules, rituals and chants could result in a bad storm for the homeward journey, or a tragic accident for a member of the visiting party.

113. Other methods for conserving natural resources included seasonal harvesting of different species, and other restrictions, such as those practiced on Wotje Atoll, where the size of coconut crabs was restricted and no females with eggs were to be taken. On some atolls *mo* are still known by the community and are respected. In other places (e.g. urban centers), the community has no living memory of *mo* and how this important method of conservation and sustainable use is being lost, along with the deep ecological understanding that accompanied it.

114. There are 118 prehistoric sites and 212 historic sites in RMI. Most have general management plans except for Jaluit Atoll.

2.2 Land Use, Land Ownership and Customary Tenure

115. The following summary of land ownership and tenure is from de Bie (2004)[21].

116. Traditional Marshallese society was organized around matrilineal kin groups, with the ultimate control of land being held by chiefs. The society was also stratified, with individual rights and responsibilities differing based on whether one was of a royal or commoner lineage. The senior ranking member of a royal matrilineage was the paramount chief, or Iroijlaplap, and this person was considered the owner of the land and all the fixed and mobile property upon the land. During this time, all land in the Marshall Islands was controlled by only eighteen to twenty Iroijlaplap.

117. As with most of the original inhabitants of Micronesia, the Marshallese endured a long period of colonization by Spain, Germany, Japan, and the United States. Spain was the first outside nation to claim the islands in 1565. In 1886, Germany purchased the islands outright from Spain and declared them a protectorate. Germany attempted to supplant the chiefs as the paramount authorities and to introduce western land ownership practices but had relatively little success in this area.

118. In 1914 during the First World War, Japan displaced Germany from the Marshall Islands; and in 1920, the League of Nations granted a mandate over the islands to Japan.18 In 1934, Japan withdrew from the League but retained possession of the islands and strategically fortified them for military purposes. In 1944 during World War II, the United States won a battle with Japan and took military control of the Marshall Islands. In 1947, the United Nations created a Trusteeship Agreement which designated the Marshall Islands and the rest of Micronesia—except for Guam—as the Trust Territory of the Pacific Islands (TTPI), to be under the administration of the United States Navy. During the 1960s the U.S. began to encourage political developments based on the American model and contributed significant amounts of money to the TTPI to make this happen. Significantly, the Marshall Islands were closed to U.S. private investment until the mid-1960s and to private investment from other countries until the mid-1970s.

119. Regarding land ownership, the Navy civil administration completed a cadastral survey of most of the Marshall Islands in 1949 and 1950.32 The approximate locations (no surveying was done) of every land parcel, or weto, was recorded, along with the names of the associated Iroijlaplap, Iroijedrik, Alap, and Senior Dri Jerbal.33 The information was mimeographed for each atoll, but due to a lack of preservation measures only five or six of these atoll reports are still available today.

120. The RMI became self-governing in 1973. In order to gain true independence, however, the RMI and other Trust Territory nations signed Compacts of Free Association with the U.S. in 1982. In 1990, the United Nations Security Council belatedly approved the termination of the Trusteeship Agreement with respect to the RMI, so the RMI was at last internationally recognized as an independent nation.

121. During the long colonial period of the Marshall Islands, each successive occupying nation attempted—to some extent—to convert the land ownership practices of the Marshallese from customary group rights to individual freeholds; but because these attempts were never very advanced, most of the land owned by Marshallese today remains under customary tenure.

[21] .de Bie, G. (2004) Private Lands Conservation in the Republic of Marshall Islands. Natural Res. Law Ctr., Univ. of Colo. Sch. of Law

2.3 GENDER BASED VIOLENCE AND HUMAN TRAFFICKING

122. The MIMIP appraisal document[22] considered gender-based violence and human trafficking issues in RMI and noted the following.

123. RMI is a source of, and a destination for, human trafficking for commercial sexual exploitation linked to the fishing industry. Trafficking within RMI tends to be related to prostitution, including child prostitution, servicing crew from international fishing boats. Women and girls represent the greater share of victims of human trafficking for commercial sexual exploitation and are therefore considered a particularly vulnerable group.

124. RMI's Systematic Country Diagnostic 2016 (SCD), Country Partnership Strategy FY13-FY16 (CPS), and Pacific Regional Strategy (May 2000) all identify Gender-based Violence (GBV) as an issue that needs addressing, and human trafficking for sexual exploitation is a form of GBV. Most abused women in the Pacific report that they have not sought help from either formal services or from people in positions of authority, such as police, non-government organizations, religious or local leaders. There are prevailing social and cultural attitudes and stigma that prevent reporting of violence against women. There also is a lack of safe houses/shelters and other services for victims.

125. RMI recognizes human trafficking as an issue of concern and has ratified the United Nations Convention against Transnational Organized Crime (UNTOC), which encompasses human trafficking, and has comprehensive national laws in terms of definitions and criminalization of all aspects of human trafficking. Furthermore, RMI has established a National Action Plan to Combat Trafficking and set a National Taskforce on Human Trafficking (NTHT).

126. Within this framework, several awareness campaigns and training programs have been provided to local authorities such as the police, Ports Authority, etc. Similarly, awareness campaigns have targeted vulnerable groups such as school children.

127. Additional analysis is required to improve RMI's understanding of the compound vulnerability associated with economic and social status, ethnicity or other factors. This information will help inform the identification of cases of human trafficking as well as the design of mitigation strategies and programs. Furthermore, there is a need to establish a systematized referral mechanism for victims of trafficking and to provide appropriate follow up even when victims are identified.

128. Gender. MIMIP has identified two key areas where it can address a gender gap in RMI:

- Gender Gap in Mobility. Given that women and children need safe facilities at the ports (e.g., better lighting, gender differentiated facilities, monitored or attended waiting areas, and information about where to report complaints), the MIMIP will support the security of women using maritime transport.
- Gender-Based Violence. The MIMIP will support awareness-raising on family and sexual violence, and on human trafficking for sexual exploitation (awareness, resources, where and how to report abuse, etc.).

129. A separate report on GBV and HT in the RMI has been prepared and is attached as Annexure N.

2.4 ECONOMIC ASPECTS AND LIVELIHOODS

2.4.1 Employment, Labour and Working Conditions

130. In 2007, the Marshall Islands joined the International Labor Organization, which means its labor laws will comply with international benchmarks.

131. In 2011, the labor force participation rate was 41.3% and the employment-to-population ratio was 39.3%. Both of those rates are more than 23 percentage points higher for men than for women. The total unemployment rate was 4.7%[23]. Employment is heavily reliant on services (Figure 19).

[22] World Bank (2018) IDA Project Appraisal Document for the Marshall Islands Iaritime Investment Project Report No. PAD2926
[23] ILO (2018) Marshall Islands Employment and Environmental Sustainability Fact Sheet 2017

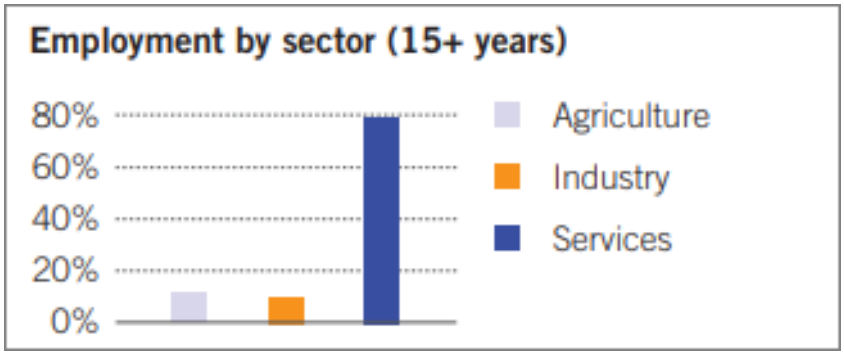

Figure 19 Employment by sector (ILO 2018)

2.4.2 Shipping

132. The Marshall Islands plays a vital role in the international shipping industry as a flag of convenience for commercial vessels. The Marshallese registry began operations in 1990 and is managed through a joint venture with International Registries, Inc., a US-based corporation that has offices in major shipping centers worldwide. As of 2017, the Marshallese ship registry was the second largest in the world, after that of Panama.[24]

133. Unlike some flag countries, there is no requirement that a Marshallese flag vessel be owned by a Marshallese individual or corporation. Following the 2015 seizure of the *MV Maersk Tigris*, the United States announced that its treaty obligation to defend the Marshall Islands did not extend to foreign-owned Marshallese flag vessels.[25] at sea.

134. As a result of ship-to-ship transfers by Marshallese flag tanker vessels, the Marshall Islands have statistically been one of the largest importers of crude oil from the United States, despite the fact that the islands have no oil refining capacity.[26]

2.4.3 Fisheries

2.4.3.1 Main fisheries

135. The main commercial fisheries in the RMI Exclusive Economic Zone (EEZ) focus on targeting tropical tunas. Three main sectors exist, defined by the type of gear they use: purse seine, longline and pole and line. Catches are dominated by the purse seine sector, which primarily harvests skipjack tuna (*Katsowonus pelamis*) and yellowfin tuna (*Thunnus albacares*) for canning (Figure 20). The longline sector harvests the next highest volume, targeting bigeye tuna (*Thunnus obesus*) and yellowfin tuna for higher value sashimi markets. The pole and line sector targets skipjack tuna almost exclusively for canning, although has been largely inactive in recent years.

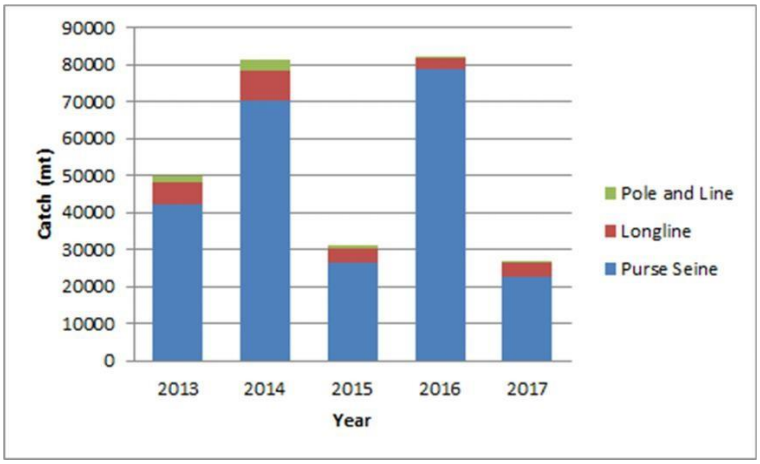

Figure 20: Total catch by the different gears operating in the RMI EEZ[27]

[24] https://en.wikipedia.org/wiki/Marshall_Islands#Government
[25] https://en.wikipedia.org/wiki/Marshall_Islands - cite_note-66
[26] https://en.wikipedia.org/wiki/Marshall_Islands - cite_note-66
[27] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

136. Both the purse seine and longline sectors comprise both domestic-based and foreign vessels, while the pole and line fishery are comprised exclusively of Japanese flagged vessels.

137. In addition to oceanic fisheries targeting tunas, an active coastal fishery exists primarily targeting reef fish.

138. The sections below provide an overview of the characteristics of each main sector, including baseline figures on catch, effort and vessel numbers.

2.4.3.2 Purse seine

Domestic vessels

139. The domestic (RMI-flagged) purse seine fleet remained relatively stable at between ten to twelve vessels, each over 1001 GRT, during the 2013 to 2017 period (Table 4). RMI flagged purse seine vessels are typically licensed to fish in a number of EEZs within the Western and Central Pacific Fisheries Commission Convention Area (WCPFC-CA) (including the high seas), with most holding Regional Access Licenses (RALs) under the Party to the Nauru Agreement's (PNA) Federated States of Micronesia Arrangement (FMSA). RALs allow the vessel to fish within the EEZs of any one of the eight members of the PNA.[28]

140. Catch of RMI-flagged vessels varied during the period 2013 to 2017, ranging between 50,000 t and 90,000 t (Table 4). In 2017, the total catch was estimated at 64,527 t, dominated by skipjack which accounted for around 79% of the catch. Yellowfin comprised around 13% of the catch, while bigeye tuna accounted for 8%. All other species combined accounted for <1% of the total catch.

	Vessel size (GRT)			
Year	0-500	501-1000	1001-1500	1500+
2013	0	0	7	3
2014	0	0	7	5
2015	0	0	7	5
2016	0	0	7	3
2017	0	0	7	3

Table 4 RMI-flagged purse seine fleet by vessel seize, 2013-2017[29]

[28] Membership of the PNA includes the Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu.

[29] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

Species	2013	2014	2015	2016		2017	
				Retain	Discard	Retain	Discard
SKIPJACK	60,645	62,182	77,021	50,522	355	50,936	195
YELLOWFIN	12,461	10,333	7,253	7,783	65	8,612	40
BIGEYE	4,528	3,381	2,595	1,749	6	4,971	31
BLUE SHARK	0	0	0	0	0	0	0
BLUE MARLIN	24	18	32	4	8	7	14
BLACK MARLIN	14	13	13	4	8	1	10
OCEANIC WHITETIP	0	0	0	0	0	0	1
STRIPED MARLIN	1	0	1	1	1	0	2
SWORDFISH	0	0	0	1	0	0	0
MAKO SHARK	0	0	0	0	0	0	0
SILKY SHARK	0	5	4	0	29	0	190
THRESHER SHARK	0	0	0	0	0	0	0.3
PORBEAGLE SHARK	0	0	0	0	0	0	0
HAMMERHEAD SHARK	0	0	0	0	0	0	0
WHALE SHARK	0	0	1	6	22	0	0

Table 5 Annual catch and effort estimates for the Marshall Islands purse seine vessels, by species and year, in the WCPFC Convention Area[30]

141. Trends in fishing effort largely mirrored total catches, with the number of fishing days ranging between 1,700 and 2,500 fishing days annually between 2013 and 2017.[31]

142. The distribution of catch and effort in the RMI EEZ is strongly influenced by prevailing environmental conditions, with higher catches recorded during or immediately following strong El Nino periods.[32] In 2017, the majority of fishing by domestic purse seine vessels occurred in EEZs adjacent to RMI, largely concentrated in the Kiribati (Gilbert) EEZ (Figure 21). Where purse seine fishing occurs in the RMI EEZ, it is largely concentrated in the southern part of the EEZ.

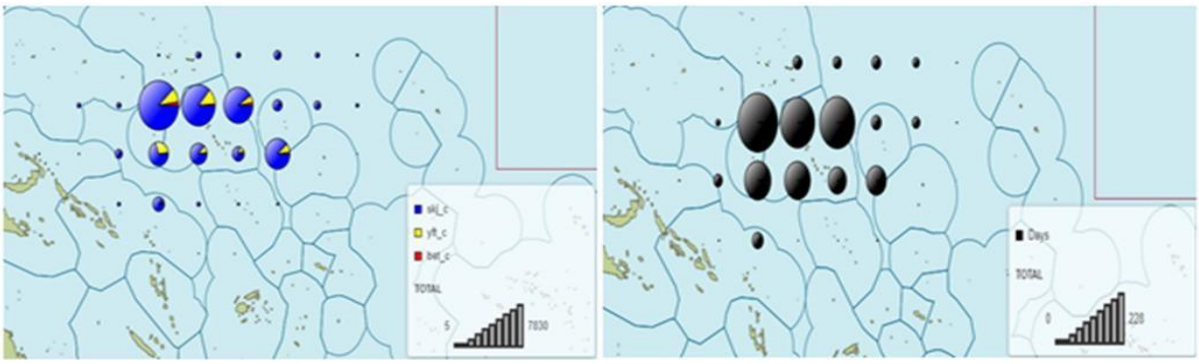

Figure 21: Catch composition (left panel) and effort distribution (right panel) of RMI-flagged purse seine vessels in the WCPFC Convention Area, 2017 (on the left panel, blue = Skipjack tuna; Yellow = yellowfin tuna; red = bigeye tuna)[33]

[30] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13
[31] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13
[32] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13
[33] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

143. In addition to the domestic fleet, around 182 foreign flagged purse seine vessels were licensed to operate in RMI waters in 2017[34] (Table 6), although not all were active. The main foreign fleets included the FSMA fleet (essentially a Pacific domestic fleet, comprising vessels with a demonstrated economic connection to one of the PNA Parties), the US fleet (accessing the RMI EEZ under the terms of the US Treaty[35]) and the distant water fleets of China, Taiwan, Japan and Korea.

144. Like domestic catches, foreign purse seine catch and effort in the RMI EEZ is strongly influenced by prevailing climatic conditions. Much of the RMI EEZ is outside the 'core' skipjack fishing grounds (centered on latitudes between 5ºN and 5ºS), so foreign vessels will ramp up effort in RMI only when climatic conditions (and therefore distribution of stocks) is favorable. As a result, between 2013 and 2017 catches varied by 300%+, ranging from 15,544 t to 69,746 t. Skipjack dominates the catch, averaging around 92% of the catch between 2013 and 2017, with yellowfin accounting for 7% and bigeye 1%. For context, the total 2017, purse seine catch taken in the RMI EEZ (domestic + foreign vessels) represents around 1.3% of the WCPFC-CA wide purse seine catch of 1,812,474 t.[36]

145. The other key influence on the level of purse seine effort in the RMI EEZ is the availability of fishing days under the PNA's Vessel Days Scheme (VDS). Under the VDS, the total number of fishing days across all Parties' waters are capped (the 'Total Allowable Effort', or TAE), with each Party allocated a share of the TAE ('Party Allowable Effort', or PAE) expressed as a number of fishing days. Each Party is then free to distribute their PAE to domestic or foreign vessels, or trade days to other PNA Parties, as they see fit. Where days are sold to foreign vessels, the fee must meet a benchmark price agreed annually amongst Parties to avoid intra-Party competition and ensure a fair economic rent is received for access.

FLAG	GEAR	2013	2014	2015	2016	2017
CHINA	LL	23	26	26	27	30
	PS	2	6	7	0	6
FSM	LL	11	14	14	12	13
FSMA	PS	38	57	54	76	76
JAPAN	LL	1	8	8	2	6
	PL	15	20	13	11	16
	PS	24	28	29	30	25
KOREA	PS	27	26	5	25	26
NZ	PS	0	0	2	0	0
CH-TAIPEI	LL	2	2	2	0	0
	PS	6	25	25	26	27
TUVALU	PS	1	1	1	0	1
USA	PS	39	39	39	33	31
VANUATU	PS	3	3	0	0	0
TOTAL	LL	37	50	50	41	49
	PL	15	20	13	11	16
	PS	140	185	162	190	192

Table 6 Number of foreign purse seine, longline and pole-and-line vessels licensed to fish in the RMI EEZ, by year and flag, 2013-2017.[37]

[34] Note that the RMI domestic fleet is included in the 'FSMA' figures in **Error! Reference source not found.**.
[35] Full name: The Multilateral Treaty on Fisheries Between Certain Governments of the Pacific Island States and the Government of the United States of America
[36] Williams, P. and Reid, C. (2018). Overview of Tuna Fisheries in the Western and Central Pacific Ocean, including Economic Conditions - 2017 Rev 1 (22 July 2018). Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. GN-WP-01
[37] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

		Catches (metric tonnes)				
Flag	Year	SKJ	YFT	BET	OTH	TOTAL
China	2013	1,797	35	0	0	1,832
	2014	2,019	229	20	0	2,268
	2015	80	5	0	0	85
	2016	0	0	0	0	0
	2017	0	0	0	0	0
FSM	2013	316	28	14	0	358
	2014	2,536	247	47	0	2,830
	2015	812	275	26	0	1,113
	2016	1,665	142	56	0	1,863
	2017	5	5	0	2	12
Japan	2013	80	5	0	0	85
	2014	0	0	0	0	0
	2015	86	6	5	0	97
	2016	0	0	0	0	0
	2017	112	60	2	0	174
Kiribati	2013	60	0	0	0	60
	2014	243	126	6	0	375
	2015	435	80	0	0	515
	2016	4,078	632	31	0	4,741
	2017	649	118	14	0	781
Korea	2013	5,761	80	5	0	5,846
	2014	5,312	378	25	0	5,715
	2015	0	0	0	0	0
	2016	18,745	1,296	103	0	20,144
	2017	779	180	27	0	986
PNG	2013	3,093	90	5	0	3,188
	2014	10,997	528	44	0	11,569
	2015	2,845	537	30	0	3,412
	2016	11,232	1,159	42	0	12,433
	2017	2,564	360	178	2	3,104
Philippines	2013	0	0	0	0	0
	2014	770	14	0	0	784
	2015	93	0	0	0	93
	2016	1,850	248	10	0	2,108
	2017	0	0	0	0	0

		Catches (metric tonnes)				
Flag	Year	SKJ	YFT	BET	OTH	TOTAL
RMI	2,013	12,372	654	388	4	13,418
	2,014	16,268	1,043	401	18	17,730
	2,015	3,074	536	11	0	3,621
	2,016	8,737	170	114	0	9,021
	2,017	6,404	623	221	4	7,252
Solomon Is	2,013	0	0	0	0	0
	2,014	0	0	0	0	0
	2,015	0	0	0	0	0
	2,016	1,040	120	10	0	1,170
	2,017	0	0	0	0	0
Tuvalu	2,013	1,779	98	3	2	1,882
	2,014	213	2	0	0	215
	2,015	0	0	0	0	0
	2,016	0	0	0	0	0
	2,017	0	0	0	0	0
Chinese Taipei	2,013	1,779	98	3	0	1,880
	2,014	11,406	522	38	0	11,966
	2,015	3,363	1,033	14	0	4,410
	2,016	11,725	1,200	163	0	13,088
	2,017	5,808	803	138	10	6,759
USA	2,013	6,538	213	60	0	6,811
	2,014	15,697	378	87	0	16,162
	2,015	11,135	1,823	40	0	12,998
	2,016	13,257	823	119	0	14,199
	2,017	3,252	297	90	0	3,639
Vanuatu	2,013	6,538	213	60	0	6,811
	2,014	735	10	0	0	745
	2,015	0	0	0	0	0
	2,016	0	0	0	0	0
	2,017	0	0	0	0	0
TOTAL EEZ	2,013	40,113	1,514	538	6	42,171
	2,014	66,196	3,477	668	18	70,359
	2,015	21,923	4,295	126	0	26,344
	2,016	72,329	5,790	648	0	78,767
	2,017	19,573	2,446	670	18	22,707

Table 7 Annual catches of purse seine fleets operating in the RMI EEZ, by flag and species, 2013-2017 - unraised log sheet data[38]

2.4.3.3 Longline

146. A total of 49 longline vessels were licensed to fish in the RMI EEZ in 2017, flagged to China (30), FSM (13) and Japan (6) Table 8).

147. While there are currently no RMI-flagged longliners operating in the fishery, 31 of the China and FSM flagged longliners were chartered to the Marshall Islands Fishing Venture (MIFV) in 2017 (Table 8). This fleet is managed and operated by MIFV, a subsidiary of Luen Thai. The fleet is domestically-based and fishes almost exclusively in the RMI EEZ. Each of these chartered vessels was between 51-200 GRT (Table 8).

[38] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

	Vessel size (GRT)			
Year	0-50	51-200	201-500	500+
2013	0	0	3	0
2014	0	0	0	0
2015	0	0	0	0
2016	0	24	0	0
2017	0	31	0	0

Table 8 Numbers of chartered longline vessels, according to vessel size, 2013-2017[39]

148. Catch estimates for the 2013-2017 period by vessel flag are provided in Table 5.

149. Vessels fishing under charter to MIFV ('RMI-flag' catches) have dominated catches in recent years, accounting for 66% of total catch. Bigeye tuna and yellowfin tuna are the main target species, comprising 53% and 39% of the retained catch between 2013 and 2017 respectively. The remainder of the retained catch is made up of other species (12%) and albacore tuna (*Thunnus alalunga*) (2%).

150. As with the purse seine fishery, longline fishing effort is concentrated in the southern areas of the RMI EEZ however effort is more widely distributed throughout the zone (Figure 22).

[39] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

		Catch (metric tonnes)				
Flag	Year	ALB	BET	YFT	OTH	Total
China	2013	125	1,763	1,235	470	3,593
	2014	84	2,817	1,419	360	4,680
	2015	63	1,200	740	152	2,155
	2016	16	280	185	75	556
	2017	0	4	3	0	7
FSM	2013	84	1,001	665	217	1,967
	2014	49	1,445	738	258	2,490
	2015	56	953	529	178	1,716
	2016	26	475	338	150	989
	2017	16	440	350	116	921
Japan	2013	1	11	3	1	16
	2014	17	278	112	44	451
	2015	2	122	81	25	230
	2016	2	89	89	21	201
	2017	12	108	148	29	297
RMI	2013	7	80	47	10	144
	2014	0	0	0	0	0
	2015	0	0	0	0	0
	2016	23	678	515	174	1,390
	2017	43	1,147	888	299	2,379
CH-Taipei	2013	20	117	64	40	241
	2014	22	140	77	18	257
	2015	1	11	30	4	46
	2016	0	0	0	0	0
	2017	0	0	0	0	0
TOTAL EEZ	2013	237	2,972	2,014	738	5,961
	2014	172	4,680	2,346	680	7,878
	2015	122	2,286	1,380	359	4,147
	2016	67	1,522	1,127	420	3,136
	2017	71	1,698	1,389	445	3,604

Table 9 Annual catches of longline fleets operating in the RMI EEZ, by flag and species, 2013-2017 - unraised log sheet data[40]

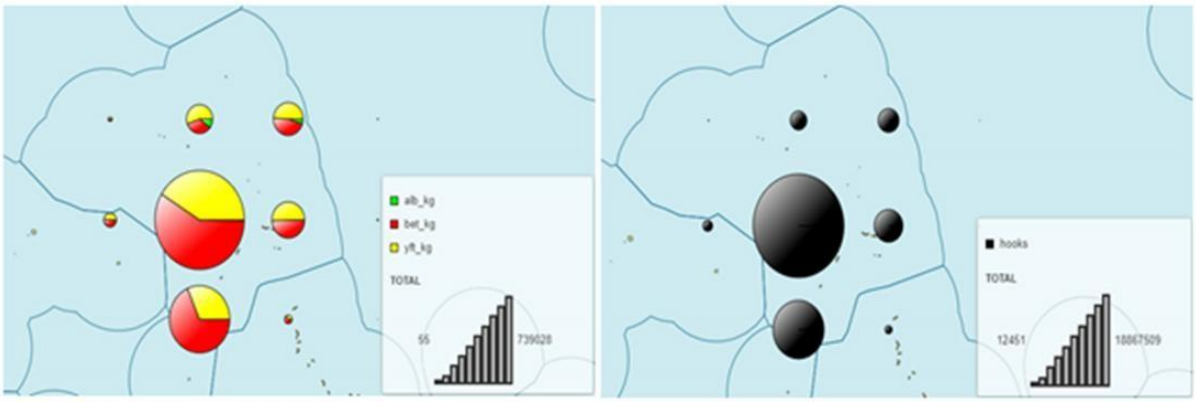

Figure 22: Catch composition (left panel) and effort distribution (right panel) of RMI-flagged longline vessels in the WCPFC Convention Area, 2017 (on the left panel, yellow = yellowfin tuna; red = bigeye tuna; green = albacore tuna)[41]

[40] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

[41] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

2.4.3.4 Other sectors

151. The Japanese fleet has been the only fleet active in the pole and line fishery in the 2013 to 2017 period (Table 10). Numbers licensed vessels have ranged from 11 to 20, although catches over the period have declined. The total catch of 72t in 2017 was the lowest recorded (Table 10). The fishery is almost exclusively focused on skipjack, with very minor catches of yellowfin and bigeye tuna also retained.

		Catch (metric tonnes)			
Flag	Year	BET	SKJ	YFT	TOTAL
Japan	2013	3	1,719	4	1726
	2014	3	3,317	21	3341
	2015	0	615	2	617
	2016	0	429	1	430
	2017	0	72	0	72

Table 10 Annual catches of pole and line fleets operating in the RMI EEZ, by flag and species, 2013-2017 - unraised log sheet data[42]

152. The coastal fishery is almost exclusively undertaken by small local vessels undertaking short trips, with catch sold on local markets. Small collection fisheries for trochus and aquarium fish also exist.

153. Gillett (2016)[43] estimated the total coastal fisheries production in Marshall Islands in 2014 at 4,500 mt, of which the commercial fisheries component is 1,500 mt. Based on Marshall Islands Marine Resources Authority (MIMRA) buying prices in the outer islands and prices paid to fishers in Majuro, he estimated the dockside value of the 2014 coastal commercial catch at about US$4,350,000. Coastal subsistence catches (3,000t) were estimated to be US$6 million per year.

2.4.4 Transhipment and unloading

154. Majuro port is the only designated port for transshipment in the RMI, although under the Ports of Entry Act (PEA) foreign fishing vessels also have permission to enter Jabor Anchorage, Jaluit for the purpose of granting shore leave to crew members.

155. Majuro is a key transhipment for purse seine vessels operating in the Western and Central Pacific Ocean (WCPO), accounting for around 37% of all transhipments during 2015 to 2018 (Figure 23). In 2017, an estimated 423 transhipments occurred with a provisional total of 292,552 mt transhipped (Figure 23). The central location within the WCPO and relatively good access to logistics and support services (e.g. air networks to replace crew and reprovision vessels; net yard) means Majuro port is used by purse seine vessels flagged to a range of countries and fishing in a range of EEZs and high seas areas throughout the WCPO.

[42] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

[43] Gillet, R. (2016). Fisheries in the Economies of the Pacific Island Countries and Territories. Philippines: Asian Development Bank.

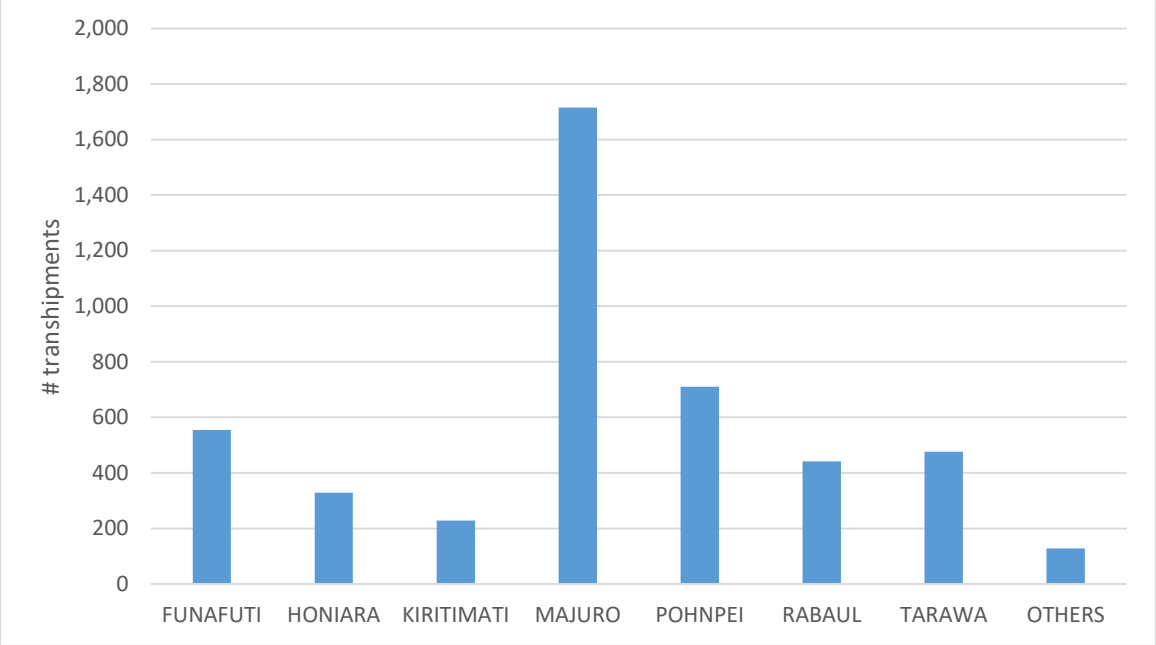

Figure 23: Estimated numbers of transhipments by port for purse seine vessels fishing within the WCPFC Convention Area, 2015-2018 combined. 'Others' includes around 26 other ports[44]

Flag	Number of PS Transshipment	SKJ	YFT	BET	TOTAL
China	72	37,460	9,815	784	48,059
FSM	25	12,159	3,473	223	15,855
Kiribati	8	4,795	426	10	5,231
Korea	5	3,055	646	434	4,135
RMI	44	29,555	3,970	124	33,649
PNG	48	25,293	8,930	1,146	35,369
Phillipines	5	2,580	1,393	567	4,540
Solomon Islands	14	6,635	2,355	48	9,038
Tuvalu	2	1,575	90	-	1,665
CH-Taipei	132	69,295	23,100	1,538	93,933
USA	60	28,916	8,490	1,023	38,429
Vanuatu	8	2,101	473	75	2,649
TOTAL	423	223,419	63,161	5,972	292,552

Table 11 Provisional purse seine transshipments in Majuro port in 2017[45]

156. MIFV operates the Longline Fish Base in Majuro port, unloading catch and reprovisioning vessels (e.g. bait, ice, food, crew) in the domestically-based foreign (chartered) fleet. In 2017, a provisional total of 4,067 mt of fish unloaded by the longline fleet, with almost all bound for export markets.

157. MIFV exports mainly fresh chilled tuna species to markets in the US, China and Canada.[46] Frozen fish (rejects and bycatch) are shipped to Asia via transport containers and/or sold locally. In 2017, MIFV also purchased purse seine-caught fish, mostly whole frozen skipjack (1,777 mt), which were included with container shipments destined for Asian markets.

[44] SPC
[45] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13
[46] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

Species	Export	Local	TOTAL
Albacore	0	34	34
Bigeye	2,088	66	2,154
Blue Marlin	14	264	278
Opah	2	0	2
Mahi Mahi	5	23	28
Sailfish	0	7	7
Swordfish	6	21	27
Wahoo	7	35	42
Yellowfin	1,288	207	1,495
TOTAL	3,410	657	4,067

Table 12 Total unloaded catch (mt) for domestically-based longline vessels in 2017[47]

2.4.5 Onshore processing

158. Pan Pacific Foods (PPF) operates a loining plant in Majuro, supported by ongoing hiring and recruitment of local Marshallese employees. The company also operates three RMI-flagged and two chartered purse seine vessels which supply the plant with raw materials. Total exports, as reported by the company in 2017, were 2,398 mt.

	Product (mt)		
Destination	Loin (SKJ)	Whole (SKJ&YFT)	Fishmeal
China	0	44	0
CH-Taipei	0	49	40
Fiji	130	52	0
Japan	0	196	0
Korea	0	99	0
Philippines	0	248	0
Thailand	223	828	0
Vietnam	0	1,666	0
TOTAL	353	3,182	40

Table 13 Total Purse Seine exports (mt) in 2017, by product and destination

2.4.6 Governance and port state controls

159. The MIMRA has day-to-day responsibility for the management of fisheries, including compliance. The main piece of fisheries legislation is Title 51 – Management of Marine Resources and the various chapters therein.

160. Entry into Majuro port is controlled by the RMIPA, established under the *RMI Ports Authority Act 2003*. The RMIPA is responsible for the development, maintenance and operations of all sea ports, including Uliga and Delap in Majuro and reports to the MoTC.[48] The Authority is governed by a seven-member Board of Directors appointed by the Cabinet and day-to-day operations are managed by a Director and staff of 60.

[47] MIMRA (2018). Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Scientific Committee Fourteenth Regular Session. Busan, Republic of Korea 8-16 August 2018. WCPFC-SC14-AR/CCM-13

[48] http://rmipa.com/about-us/