Establishing an MSP for Tarawa – Draft MSP Report

REPORT FOR MINISTRY OF FISHERIES AND MARINE RESOURCES DEVELOPMENT




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Acronyms

AG	Attorney General
AIS	Automatic Identification System
ALDFG	Abandoned, Lost, Discarded, Fishing Gear
CBD	Convention on Biological Diversity
CFD	Coastal Fisheries Division
ECD	Environment and Conservation Division
EEZ	Economic Exclusive Zone
ESRI	Environmental Systems Research Institute
GIS	Geographic Information System
GPS	Global Positioning System
GPX	GPS Exchange Format
GSD	Geoscience Division
ISO	International Organisation for Standardisation
IUCN	International Union for Conservation of Nature
KMSPCC	Kiribati Marine Spatial Planning Coordination Committee
MACBIO	Marine and Coastal Biodiversity Management in Pacific Island Countries
MELAD	Ministry of Environment, Lands and Agricultural Development
MEP	MacAlister Elliott and Partners Limited
MFMRD	Ministry of Fisheries and Marine Resources Development
MIA	Ministry of Internal Affairs
MPAs	Marine Protected Areas
MSP	Marine Spatial Planning
NZ	New Zealand
OAG	Office of the Attorney General
OECMs	Other Effective Area-Based Conservation Measures
PROP	Pacific Islands Regional Oceanscape Program
RAMSAR	The Convention on Wetlands (for conservation of wetlands)
SMART	Specific, Measurable, Relevant, Time-Bound

TEK	Traditional Ecological Knowledge
QA	Quality Assurance
QGIS	Quantum Geographic Information System
UNDP	United Nations Development Programme
VMS	Vessel Monitoring System
WMS	Web Map Service
WFS	Web Feature Service

1. Executive Summary

This report serves as a foundational protocol to guide the ongoing development of a comprehensive marine spatial plan for Tarawa's coastal and marine environment out to 3 nautical miles (nm). Marine Spatial Planning (MSP) represents a dynamic and iterative process essential for the sustainable management of marine resources. The successful implementation of MSP requires a flexible approach, which emphasises continuous improvement based on regular monitoring and evaluation. This adaptability is crucial to accommodate the varying timescales needed due to the complexity of ecosystems, stakeholder engagement levels, and the regulatory frameworks involved.

Previous projects, such as the Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO), have played a pivotal role in shaping the approach adopted in this project, emphasising the importance of learning from past initiatives to refine and enhance MSP strategies continuously. Such learnings include the importance of good governance and effective leadership, and following recommendations made in this project's inception report, the Kiribati Marine Spatial Planning Coordination Committee (KMSPCC) has since been established. For this project, a scenario analysis was conducted to evaluate the implications of different MSP approaches for Tarawa, considering future climate-related threats and increasing demands on marine space. Three sustainability-based scenarios were subsequently developed, reflecting various priorities and potential socio-economic and environmental impacts of MSP strategies. These ranged from strong sustainability, focused on marine ecosystem restoration and biodiversity conservation, to weaker sustainability that prioritises socio-economic growth. The draft spatial management plans have been developed based on these scenarios. A simple protocol has also been developed which highlights key stages within the marine spatial planning process.

During the proposal development and project inception phase, the challenging timeline requested for this work was acknowledged, and discussed with the client. The project timeline and scope were also revised accordingly at the inception reporting phase. However, consistent challenges around data sharing and data accessibility have continued to hamper the project, impacting delivery.

During the length of this project, it became evident that the challenges related to data sharing and accessibility have impeded progress. Inter-ministerial conflicts around data sharing and coordinating MSP activities, which were noted from feedback on the MACBIO project in 2013-2918, were still prevalent and observed during this current project. However, with the establishment of a cross-government coordination committee (expanded in Section 3) and with plans for a rolling chairperson, it is hoped that these challenges can be overcome and strong leadership at a senior level can ensure that all government stakeholders work together to achieve the vision, goals and objectives of MSP in Tarawa.

These ongoing concerns underscore the necessity for robust stakeholder engagement and the establishment of a strong governance framework to support the marine spatial plan implementation. Key steps for the future have been captured under 14 detailed recommendations, and include (but are not limited to) ensuring Tarawa's legislative framework supports the newly

established authority (KMSPCC) to execute MSP, securing long-term financial support, and engaging comprehensively with all relevant stakeholders, including government divisions, local organisations, communities, and the general public. There is a critical need for continuous adaptation and stakeholder involvement to ensure that MSP effectively addresses the diverse and changing needs of marine ecosystems and their dependent communities in the face of escalating climate challenges.

2. Background

Marine Spatial Planning (MSP) is a process that guides where and when human activities occur in the ocean, balancing ecological, economic, and social objectives. The Pacific region, characterized by a vast expanse of ocean, encompassing diverse ecosystems and numerous island nations, presents both unique challenges and opportunities for MSP. Traditionally, marine management in the Pacific has been sectoral, focusing on individual activities such as fishing, shipping, and tourism without considering their cumulative impacts. This fragmented approach has often led to conflicts among different users and unsustainable practices that threaten marine biodiversity and the livelihoods of coastal communities.

There is a well-established suite of guidance and international best practice (Ehler & Douvere, 2009) for the development of MSP, which was expanded upon as part of the MACBIO[1] project, including specific guidance which considers the unique needs, opportunities and challenges that are faced by Pacific Island nations such as Kiribati. This previous work has been pivotal in structuring the process undertaken by MEP and documented within this report. Indeed, (Santos, et al., 2019) highlighted the importance of adapting MSP based on what has been achieved or not achieved in previous iterations. This iterative approach is crucial for continuous improvement and effective management.

The MACBIO project was completed in 2018, and whilst it established the groundwork for setting up national marine spatial plans, efforts and activities related to establishing MSP within Tarawa, Kiribati stopped soon afterwards. This has been attributed to the limited wider public consultation process, lack of data validation (partly down to challenges with capacity building) and various other bureaucratic hurdles, which all contributed to the failure in maintaining MSP momentum. In particular, one of the most significant challenges which impacted the MACBIO legacy was an ongoing dispute between government stakeholders over implementation responsibilities. Specifically, there was a conflict between the Ministry of Fisheries and Marine Resources Development, and the Ministry of Environment, Lands, and Agriculture Development regarding which entity should lead and coordinate MSP initiatives. Addressing these challenges in future projects, such as this, was considered essential to establish a successful and long-term MSP ethos in Kiribati.

[1] http://macbio-pacific.info/Resources/developing-a-marine-spatial-plan-a-toolkit-for-the-pacific/

The timescale required to achieve the vision, goals and objectives of marine spatial planning can vary significantly based on several factors, including the scale of the planning area, the complexity of the ecosystem, stakeholder engagement, and the regulatory framework in place. The literature suggests that MSP should be considered an ongoing and iterative process rather than a one-time activity. For example, the European Commission and Intergovernmental Oceanographic Commission have released an updated, integrated roadmap for maritime spatial planning, published in 2022, superseding the version released in 2008, which emphasised the need for continuous improvement and adaptation of MSP practices based on monitoring and evaluation results (Ehler C. N., 2021). Research has also shown that for the practical application of MSP, it is essential to have a flexible timeline that allows for adjustments based on real-world feedback and changing conditions. This adaptability ensures that MSP can remain effective in achieving its long-term goals (Ehler & Douvere, 2009).

As MSP aims to establish and provide an interactive framework and structure which can be maintained, revised and updated into the future, a number of steps need to be undertaken to establish the groundwork. For example, authority to undertake this process must be established, (long term) financial support must be secured and all stakeholders (both Government and local organisations and communities, along with the wider public) should be fully engaged at relevant stages in the process. These requirements, and the lengths to which the Kiribati Government has achieved these, are discussed in the following chapters.

3. Establishing authority

Establishing an authority is a critical aspect of the MSP process, ensuring that planning and implementation are carried out effectively and with legitimacy. Establishing authority involves creating a clear structure, coordinating among various entities, involving stakeholders, and supporting the MSP process with a strong legal and policy framework. This requirement was raised and discussed with key Government stakeholders during the project inception workshop held on South Tarawa on 14th December 2023 (Yates *et al*, 2024). It was confirmed by attendees that there was no realistic existing legislative framework which could be modified or reinterpreted for the purposes of MSP and dedicated legislation may need to be drafted. The absence of an appropriate level of authority was also further highlighted as a concern within the Risks/Mitigations section (see Appendix 2: Risk & Mitigation) of the inception report (Yates *et al*, 2024), where the importance of establishing appropriate authority through legislation was stressed and in addition, MEP recommended the establishment of an MSP Steering Committee with cross-Ministry membership as soon as possible. Participants at the Inception workshop included the Attorney General's (AGs) office, and MEP highlighted the importance of establishing the above Steering Committee in order to coordinate this legislative agenda with the AGs office.

Following the recommendations made in the project inception report, the Kiribati Marine Spatial Planning Coordination Committee (KMSPCC) has since been established, with membership (see Appendix 3: KMSPCC Membership List) spanning various Ministries. During the recent MSP capacity building workshops held in Tarawa on Monday 24th June 2024, the MEP project team

were invited to provide an update to the KMSPCC. During this meeting, the MEP project team were informed that the Terms of Reference for the KMSPCC were undergoing final review, were with the AGs office, and that the plan was for the role of the KMSPCC to be recognised as a formal, legal entity. It was also highlighted to the project team that the Chair of the KMSPCC was to be rotated around the various Ministries who are members of the Committee. This concept is supported by the MEP Project Team as it will ensure that all Ministries are fully engaged in setting the direction of the MSP process now and into the future.

Recommendations:

3.1 Establishing appropriate authority - Kiribati MSP Coordination Committee (KMSPCC)

With the KMSPCC now established, ensuring that it (1) is recognised as a formal legal entity, (2) is convened regularly, (3) is well-attended with a rotating chair from each of the participating Ministries, is critical to its success. This will result in a well-coordinated MSP process where government stakeholders are fully engaged in achieving the stated vision, goals and objectives.

3.2 Establishing appropriate authority – legislative framework (1)

It is recommended that an in-depth analysis and evaluation of the current legal and institutional frameworks and potential (and new) decision-making governance structures is undertaken urgently, reflecting on these requirements for marine spatial planning.

3.3 Establishing appropriate authority – legislative framework (2)

It is recommended that following the above review, any additional required legislation should be progressed at pace through the Attorney General's office, coordinated by the KMSPCC, to ensure that the outputs of MSP will be enforceable.

4. Securing (and maintaining) financial support

Projects such as MACBIO[2] (from 2013 through to 2018) have raised awareness of MSP in Kiribati and following on from it, this project in particular "*Establishing a marine spatial plan for Tarawa"* which has been funded through the World Bank Pacific Islands Regional Oceanscape Program[3] (PROP), has ensured that momentum to undertake MSP has been maintained within Tarawa in particular. However, these were both discrete, fixed term projects, yet securing and maintaining long-term financial support for marine spatial planning is critical for lasting program success. These longer-term (multi-year) financial commitments are important in order to support continued data collection, scientific research, stakeholder engagement and the ongoing maintenance, update and review of spatial management plans. For example, funding secured over a 5 – 10 year period would allow sufficient time to develop and implement a spatial plan, and as important, provide sufficient time and resource to allow feedback processes to recommend changes to the plan, which can then be implemented. In addition, strategic investment in geospatial data management solutions, including a searchable meta-database and pan-government geospatial data sharing initiatives are required within Tarawa.

It is often recognised that financing the MSP process and its implementation is one of the biggest hurdles in the last decade, and there are various options available such as specific taxes, projects, grants, environmental levies or donations. This may also include adding mechanisms to secure financial resources within MSP legislation during its drafting process. Having a strong financial backing to MSP ultimately leads to more effective and resilient marine spatial plans that can adapt to evolving conditions and continue to protect valuable marine ecosystems and resources. It should be noted that regardless of process, the importance of leadership at the highest level cannot be understated (Plasman, 2008), and coordination at the Ministerial level, with a responsibility to ensure that the various Government Ministries and Divisions work together to deliver MSP.

[2] https://macbio-pacific.info/#:~:text=MACBIO%20support%20sustainable%20economies%20and,GIZ%20from%202013%20to%202018.

[3] https://www.worldbank.org/en/country/pacificislands/brief/pacific-islands-regional-oceanscape-program-prop-supporting-sustainable-management-of-pacific-fisheries

Recommendations:

4.1 Leadership

Secure leadership at the highest level in Government to drive MSP forward, providing an incentive for Government Ministries and Divisions to work together to solve challenges and reach solutions.

4.2 Long-term financial support

Ensure that appropriate long-term financial support for MSP is budgeted and protected, utilising MSP legislation if necessary to ensure continued funding into the future.

5. Organising the Marine Spatial Planning (MSP) process

5.1 Vision, Goals and Objectives

MSP Vision

Having a vision for marine spatial planning is important; it helps to guide the process of allocating marine space and resources in a way that is sustainable, equitable and efficient. It also reflects the values, aspirations and needs of the people who depend on the marine environment and can provide a framework for evaluating the outcomes and impacts of marine spatial planning[4]. A vision can help to communicate the goals and benefits of marine spatial planning to different stakeholders and the wider public, and to foster collaboration and coordination among them. The vision statement should be a concise summary of the future state that the marine spatial planning process will deliver.

A stakeholder led vision for MSP in Tarawa was first discussed at the Inception and Stakeholder workshops in December 2023 (Yates *et al*, 2024) during the participatory sessions, and a draft vision was drawn up by participants during the plenary sessions that followed. This draft vision was circulated to, and discussed at, the KMSPCC where the following text was arrived at:

"A pristine and thriving ocean where resources are well managed, used sustainably and equitably for a resilient and prosperous future."

Following discussion within the MEP project team and then with the KMSPCC during the update meeting (held on 24th June 2024), it was agreed that using the term "pristine" was not realistic considering the marine environment around Tarawa. The following vision was unanimously agreed upon at the KMSPCC:

A vision for marine spatial planning in Tarawa

A healthy and productive marine environment managed by a well-developed and comprehensive system of spatial planning that supports the sustainability of ocean resources and ensures an equitable, resilient and prosperous future for the people of Tarawa.

[4] https://www.mspglobal2030.org/

MSP Goals and Objectives

Specifying clear goals and objectives are critical in ensuring that any marine spatial planning efforts are focussed towards achieving results (Ehler & Douvere, 2009). Goals are a statement of general direction or intent whereas objectives are more a statement of the desired outcome or change that represent the achievement of the aforementioned goal. Whereas goals tend to be broad and abstract in their definition, good objectives are specific, measurable, achievable, relevant and time-bound (SMART).

A suite of goals and objectives were first outlined during stakeholder participatory sessions at the Inception and Stakeholder workshops in December 2023 (Yates *et al*, 2024). Following review by the MEP project team, these were then amended (to ensure objectives were SMART) and presented at the KMSPCC meeting on 24th June 2024. The KMSPCC were invited to partake in a participatory exercise where each member was asked to rank, in order of preference, a list of MSP goals and objectives. The results of this stakeholder ranking for MSP goals and objectives can be seen in Table 1 and Table 2 below. The relative proportions (and thus importance) of each draft MSP goal and each draft MSP objective, as considered and ranked by the KMSPCC has also been charted in Figure 1 and Figure 2 respectively below.

Recommendations

5.1 Agreeing a final suite of MSP goals and objectives

Following the above ranking exercise undertaken by the Kiribati Marine Spatial Planning Coordination Committee (KMSPCC), it is recommended that a final suite of MSP Goals and Objectives are agreed by the KMSPCC and endorsed by the Secretary to demonstrate senior leadership and commitment to MSP.

5.2 Sharing Tarawa's new MSP Vision, Goals and Objectives with stakeholders

The Vision, Goals and Objectives for MSP in Tarawa were originally drafted in December 2023 by stakeholders for stakeholders. It is recommended that this final, agreed Vision, Goals and Objectives are shared and communicated to the wider public through the best available channels, such as Facebook, other social media/websites and a government press release.

Table 1: Draft MSP goals, as ranked by the KMSPCC on 24th June 2024

Draft Goals of Marine Spatial Planning in Tarawa	Rank
Sustainable fisheries management: To ensure the long-term sustainability of fish stocks and other marine resources through effective management and regulation, including the establishment of zones for artisanal and subsistence fishing within 3NM to minimise conflict with other marine activities and protect essential fish habitat.	1
Marine biodiversity conservation: To protect and restore the biodiversity of Tarawa's marine and coastal ecosystems, ensuring the preservation of species and habitats and wider biodiversity.	2
Cultural preservation: To recognize and safeguard the cultural and historical significance of marine and coastal areas for the I-Kiribati people, including traditional fishing grounds and sacred sites.	3
Enhanced maritime security: To improve monitoring and enforcement capabilities to prevent illegal activities, such as unregulated fishing and poaching, which threaten Tarawa's marine resources.	4
Adaptation to Climate Change: To increase the resilience of marine and coastal ecosystems and communities to the impacts of climate change, including sea-level rise, ocean acidification, and extreme weather events.	5
Marine pollution control: To reduce marine pollution levels in the coastal waters of Tarawa by implementing enhanced waste management strategies and controlling land-based sources of pollution.	6
Integrated governance: To establish a coordinated and integrated marine spatial planning governance and legislative framework that includes all stakeholders in the decision-making process for marine resource management.	7
Economic development: To promote sustainable economic growth through marine sectors such as aquaculture and tourism, while ensuring these activities do not compromise ecosystem health.	8
Community Engagement and Education. To engage local communities in a participatory MSP process and increase awareness and understanding of marine issues and the importance of marine conservation for future generations.	9
Scientific Research and Monitoring: To support scientific research and monitoring programs that can provide data and evidence for informing future MSP decisions, adaptive management and climate resilience.	10

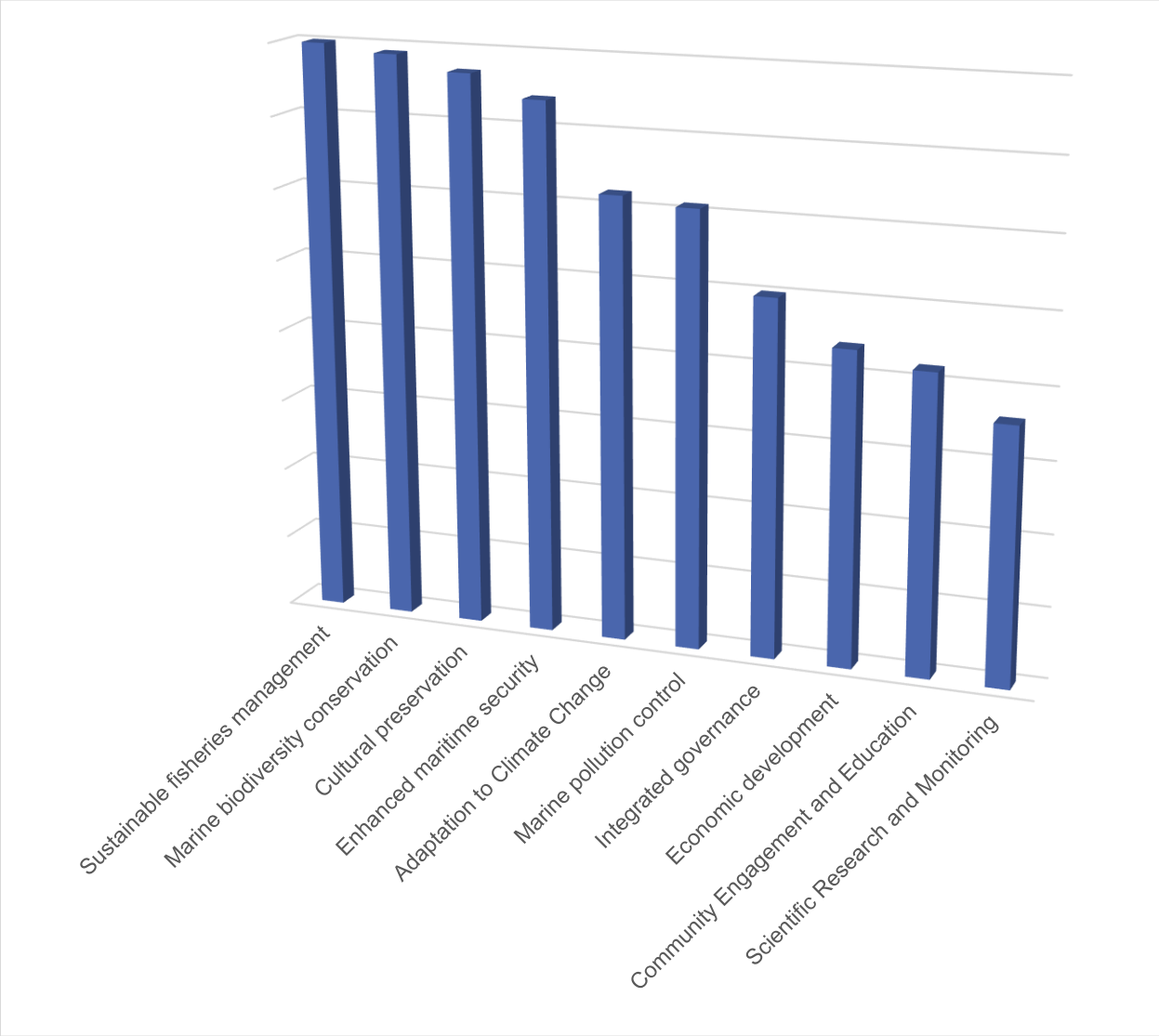


Figure 1: The ranking, in order of importance (with relative proportions), of each draft MSP goal, as considered by the Kiribati Marine Spatial Planning Coordination Committee on 24th June 2024.

Table 2: Details of the draft MSP objectives, as ranked by the KMSPCC on 24th June 2024

Draft objectives of Marine Spatial Planning in Tarawa	Rank
Community engagement: Ensure that at least 75% of local communities are actively participating in the MSP process by 2028 through regular consultation and educational outreach programs.	1
Fisheries sustainability: Achieve a 10% increase in fish stocks within Tarawa's artisanal and subsistence fishing zones within 3nm, through sustainable fishing practices and effective enforcement of fishing regulations by 2028.	2
Establish a suite of protected areas: Designate and implement a representative network of marine protected areas (MPAs) (which may include permanent and seasonal fishing closures) that covers at least 30% of Tarawa's coastal waters (within 3nm) by 2030, to protect a representative suite of marine and coastal habitats and biodiversity.	3
Pollution reduction: Reduce marine and coastal pollution levels by 30% by 2028 through improved waste management, stricter regulations on land-based pollution sources, and community clean-up initiatives.	4
Conflict mitigation: Resolve 95% of spatial conflicts between different marine users, such as between different fishing activities and shipping lanes, by 2028 through stakeholder negotiations and the creation of clear zoning maps.	5
Climate resilience: Develop and implement a climate change adaptation plan for coastal and marine areas by 2028, aiming to reduce the vulnerability of ecosystems and communities to sea-level rise and extreme weather events, including prioritising nature-based solutions such as mangrove and seagrass bed restoration where possible.	6
Maritime security enhancement: Reduce illegal, unreported, and unregulated (IUU) fishing activities by 50% by 2028 through improved education, surveillance and enforcement measures.	7
Economic development targets (marine tourism): Increase the annual revenue from sustainable marine tourism by 15% within the next five years without compromising the health of marine ecosystems.	8
Cultural heritage preservation: Build on the work undertaken by the Tarawa Marine Spatial Plan (MSP) project and identify and map all culturally significant marine and coastal sites by 2026, ensuring this knowledge is incorporated into the marine spatial planning process.	9
Economic development targets (aquaculture): Increase the annual revenue from sustainable aquaculture by 15% within the next five years without compromising the health of marine ecosystems.	10
Research and data management strategy: By 2026, develop a centralised geospatial data repository within Kiribati Government, adopting recommended good practice for metadata curation, and commence the establishment of a baseline for ongoing environmental monitoring and marine biodiversity assessment.	11

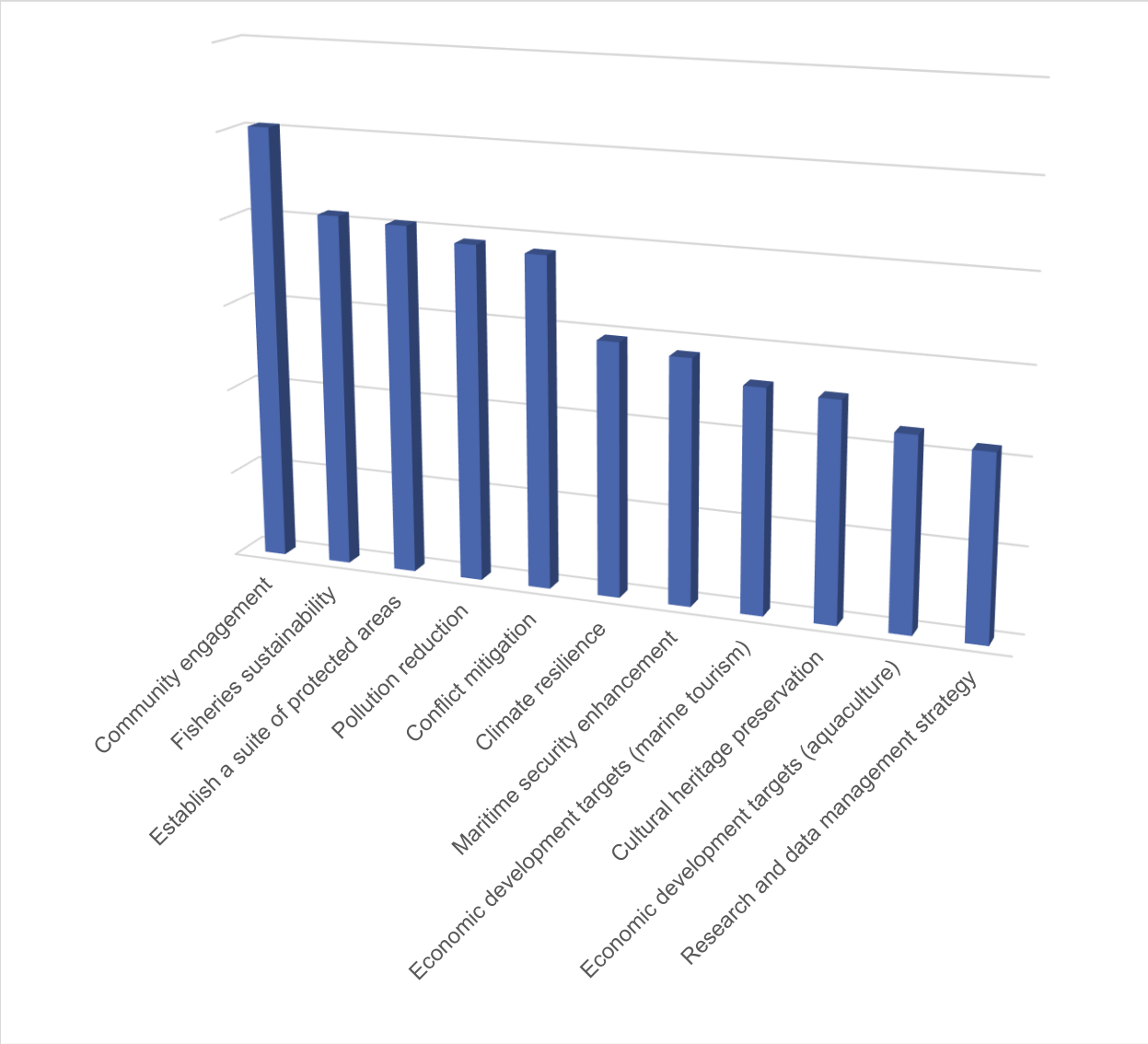


Figure 2: Ranking, in order of importance (with relative proportions), of each draft MSP objective, as considered by the Kiribati Marine Spatial Planning Coordination Committee on 24th June 2024.

7. Stakeholder Engagement

Stakeholder engagement is a key part of the MSP process and can have a significant influence on the success or failure of the project. MSP has multifaceted objectives encompassing social, economic, and ecological dimensions, which demands an understanding of socio-spatial relationships within the planning area (Tarawa Atoll and coastal waters out to 3NM). Recognizing stakeholder practices, expectations, current and future interests is integral to mitigating conflicts among users of the marine environment. It is widely regarded among scientists and resource managers that the involvement of stakeholders through collaborative engagement is a key factor for a successful management regime in the marine environment (Pomeroy & Douvere, 2008).

Due to the role the marine environment plays in the lives and wellbeing of the local population and wider industry, there were likely to be a significant number of potential stakeholders interested in the plans for MSP in Tarawa; examples included commercial fishing, recreational fishing, aquaculture, shipping, conservation, energy and water production, local communities, and others. Even individuals within each community could be considered a potential stakeholder. It is important to note that these stakeholders held varying levels of interest in the marine resource and therefore may be more or less involved in the MSP process.

Types of stakeholder engagement range from one-way communication (where there is no actual participation) through to negotiation (where decision-making power is shared among various stakeholders). The precise level of engagement sought for this project was explored and collaboratively defined with the Government of Kiribati and relevant Ministries including MFMRD. Following discussions with Government, stakeholder workshops held on both South and North Tarawa were deemed to be the most successful method for engaging the widest range of stakeholders in the limited time available for this phase of the project. Specific stakeholders were identified via a rapid stakeholder analysis process, performed using criteria outlined in Ehler & Douvere (2009) (as reported in Yates *et al,* 2024), and these individuals were invited to attend the workshops.

The stakeholder workshops were well attended; participants were engaged in bespoke participatory mapping exercises, in order to gather specific information on cultural and social values, the range of human activities undertaken within the marine environment as well as perceived conflicts and compatibility between these activities. An example of the stakeholder generated data is shown in Figure 3. It is understood that this was the first time that public stakeholders were given the opportunity to contribute their knowledge and information to a marine spatial planning process in Tarawa.

Following the successful workshops, updates to the wider community were posted on the MFMRD (Government) Facebook page, as Facebook is known to be the most used platform with the widest reach compared to other mediums. As this project moves into the next phase, it is important that this dissemination of updates/information to the wider public continues. It is recommended that regular (six monthly) MSP stakeholder workshops are held on South and North Tarawa. This will allow information to flow both ways (from stakeholders to the project team and vice versa). Prior to the formal public consultation process of the marine spatial plan commencing, face to face

meetings and workshops will be a vital part of the stakeholder communication and engagement process, building trust between all parties.

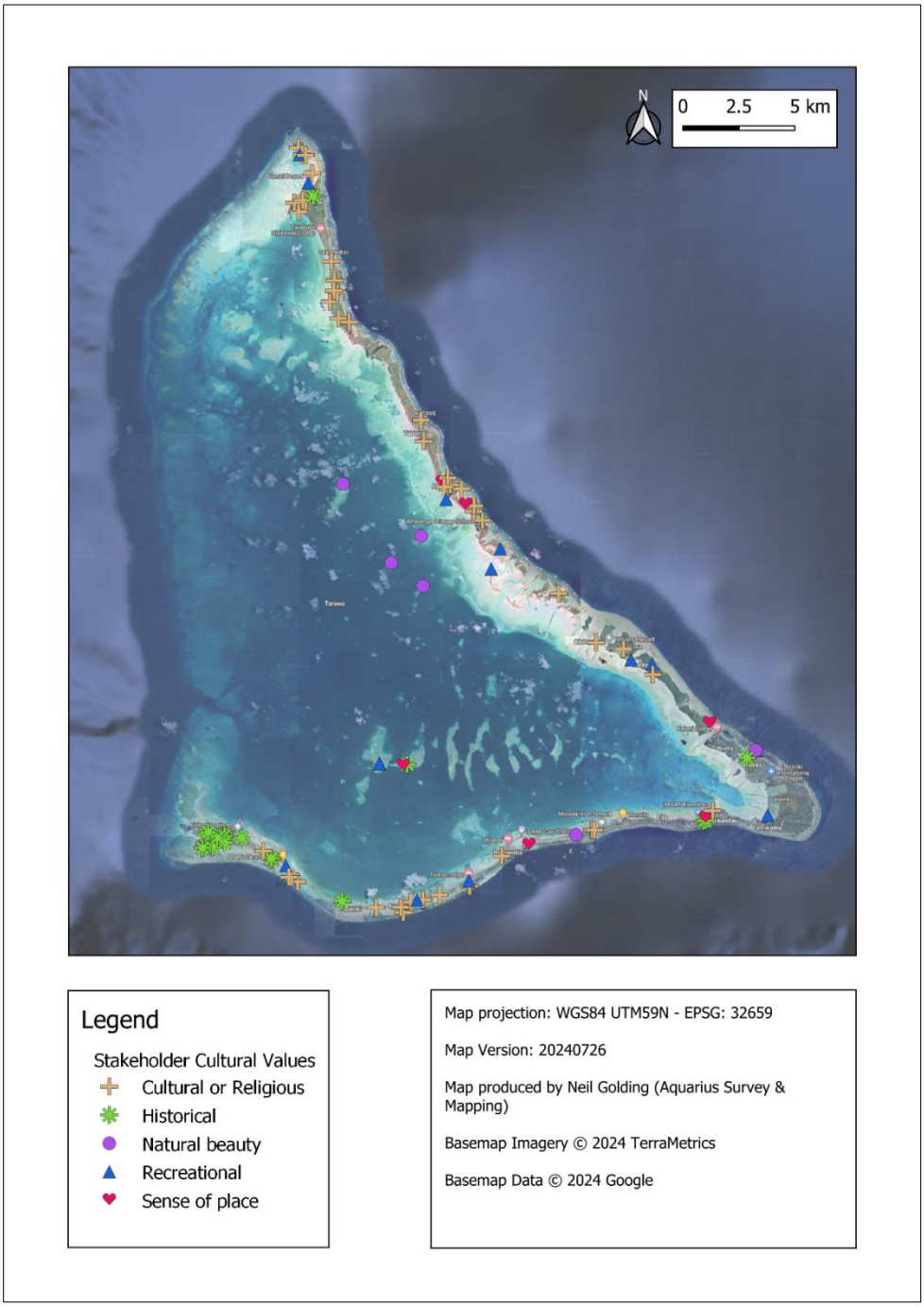


Figure 3: Geographic representation of cultural value data, generated by community stakeholders as part of the MSP stakeholder workshops held in December 2023, Tarawa.

Recommendations

7.1 Maintain dialogue with established MSP stakeholder groups

It is recommended that dialogue is maintained with the stakeholder groups involved in the December 2023 stakeholder workshops, as a minimum, as the MSP project progresses, through a range of fora and media. If the scope of the MSP project is widened, from 3nm out to 12nm, then additional stakeholders will likely need to be brought on board! Consider holding regular (six monthly) MSP stakeholder update workshops on South and North Tarawa, where project updates can be provided to the group and their input can be sought.

8. Analysing existing conditions

This element of the project focussed on collating and mapping existing and new evidence to support marine spatial planning, alongside a review of historic and existing GIS and spatial plans for North and South Tarawa. Consideration was also given to current and future human activities, understanding how humans currently used the study area, including assessing possible conflicts and compatibilities between these human uses and the marine environment.

Parts of this work were also the most challenging, highlighting areas in need of investment and improvement in existing geospatial data management processes within Kiribati Government Ministries. This was compounded by there being no metadata accompanying any of the geospatial datasets. In addition, Ministries seemed unwilling to share data with each other, or with outside institutions and contractors, even after a government data agreement had been signed. Considering that compiling and mapping data for marine spatial planning is expensive and can take a large amount of time and resource, and as a general rule, data should be up-to-date, objective, reliable, relevant and comparable (Ehler & Douvere, 2009), the inability for the project team to readily access data in a timely fashion ultimately introduced delays to the project schedule. However, as a solution, additional work was proposed and commissioned by MFMRD to try and alleviate some of these data management challenges; a review of international good practice with respect to metadata was undertaken (Golding, 2024) and following this, a marine metadata standard originally developed by a New Zealand Government Ministry was recommended as one mechanism to aid the searchability and archiving of marine data collected as part of this MSP project, but also having wider utility across Government for other data holdings.

Critical data gaps regarding existing conditions still occur, despite significant effort and additional resource being targeted by the project team to secure this data for the project. These include, but are not limited to:

- Automatic Identification System (AIS) for relevant vessels (fishing, cargo, passenger, recreational, police, military) for Tarawa lagoon and the surrounding oceanic waters out to 3NM. This may be extended out to 12NM at the discretion of the KMSPCC, as there are advantages to analysing this information with the 12NM territorial seas around Tarawa, Kiribati. This should be in ESRI point shapefile format (vessel pings), annually (1st Jan – 31st Dec), for years from 2018 through to 2023.

- Vessel Monitoring System (VMS) data for relevant fishing vessels for Tarawa lagoon and the surrounding oceanic waters out to 3NM. This may be extended out to 12NM at the discretion of the KMSPCC, as there are advantages to analysing this information with the 12NM territorial seas around Tarawa, Kiribati. This should be in ESRI point shapefile format (vessel pings), annually (1st Jan – 31st Dec), for years from 2018 through to 2023[5].

- A range of data around fishing vessels including:
    - Fishing vessel categorisation (motorized? Inboard; outboard; non-motorized / fishing activity? Capture fisheries; sport fishing; pet trade / fishing gear? Purse seine; gillnet; bag nets etc).

[5] *Note that unprocessed raw VMS data for 2023 in ESRI shapefile polyline format was provided for use by the MEP project team. Due to the unprocessed nature of this data which contained many errors (vessel tracks crossing land) – it was deemed unsuitable for further analysis and was excluded from the MSP data workflow. This should be resolved in future with processed (correctly cleaned and validated using industry standard practices) VMS data provided in line* ***but also ESRI*** **point shapefile; (ping) format**.

  - Number of fishing vessels per category
  - Number of fishing vessels by registered port, harbour, landing site.
  - Number of fishing vessels by length

- Data on port/harbour/landing sites, such as size, capacity, waste facilities etc.

These should be tackled as a matter of priority before any further work is undertaken on spatial plan scenarios and zoning plans, as they may highlight challenges or inadequacies with the current draft proposals, noting the assumptions which have been made during the drafting of these, which would need addressing for a successful marine spatial plan to come to fruition and be accepted by all stakeholders.

8.1 Relevant GIS

As noted above, a comprehensive review of all existing GIS and spatial plans for North and South Tarawa was undertaken; the findings of this review are reported in detail in Golding et al (2024) and will not be repeated here. In summary, the review highlighted that since the completion of the MACBIO[6] project in 2018, there had been a renewed impetus to undertake marine spatial planning activities and projects, particularly over the past six months, with three MSP projects either underway or about to commence. These projects ranged in scope and extent, from being restricted to the 3NM maritime boundary around Tarawa atoll, to the full extent of the Kiribati EEZ. Therefore, regular dialogue and coordination activities across projects will be essential to minimise duplication of effort, maximise data sharing opportunities and ensure that lessons learned can be shared across all relevant projects. While MFMRD are in a unique position (as the Government Ministry involved in all three projects) to lead this coordination role, it may be more appropriate for this coordination role to be undertaken by the newly formed Kiribati Marine Spatial Planning Coordination Committee (KMSPCC).

8.2 Conflict matrix briefing

Following on from the generation of spatial information on human activities and data on conflicting and complementary activities at the December 2023 MSP stakeholder and inception workshops (Yates et al, 2024), a conflict and compatibility matrix was developed on the basis of these activities. They are therefore specific to Tarawa.

The categorisation of the interactions between activities has been determined both by an understanding of the nature of these activities and the degree of their spatial overlap. It therefore provides a snapshot of the issues based on the information available. An initial assessment of the interaction categorisations was undertaken by the project team. A validation exercise of this initial assessment was then undertaken with the KMSPCC, who are more familiar with the Tarawa specific activities in question.

A number of caveats should be borne in mind when considering this data:

[6] https://macbio-pacific.info/

- Given the limited nature of the spatial data, it is acknowledged that there may well be a number of conflicting interactions that are not flagged because they do not appear to interact spatially.

- Some issues may have a temporal component (e.g. seasonal fish spawning, turtle nesting), which are not fully accounted for.

- As the uses/human activities included in the analysis are based on the list of those identified by stakeholders during various workshops. Such a list is inevitably skewed by the values and understanding of the participants which naturally leads to some activities being identified and others not. This is most obvious in the case of vessel pollution (CO_2 emissions, ballast water, anti-fouling paint, sewage, oil, ALDFG etc), all of which were omitted.

Therefore, noting these caveats, the analysis must therefore be contextualised on the basis of its data limitations and may distort the outcome and present a more positive picture than that which is the case in reality. Therefore, the matrix should be used as a starting point for discussion and as a means of validating conflicts and the compatibility of uses across both the lagoon and reef out to 3NM.

In summary, the analysis identifies a range of conflicts between different users and uses of marine space, which spatially are largely concentrated within the lagoon in South Tarawa, in the following key hotspot areas:

- Betio Island
- Nippon Causeway
- Nanikai MPA
- SE Tarawa - covering the area between the main fishing hub and airport.

Recommendations

8.1 Resolve data gaps as a matter of priority

It is recommended that the data gaps that still exist (largely due to challenges around data sharing between Government Ministries and poor data management practices) are filled as a matter of priority. These include collating AIS, VMS and other data related to fishing vessels and related activities.

8.2 Resolve geospatial data management challenges within the Government of Kiribati and its Ministries/Divisions.

It is recommended that there is investment in the Government of Kiribati's geospatial data management infrastructure, including a centralised geospatial database, use of web mapping services (WMS) and web feature services (WFS) to 'serve-up' geospatial information to relevant Ministries and the wider public. Alongside this, a searchable geospatial metadata catalogue (potentially based on the proposed metadata protocol recommended within this project) would ensure that metadata is readily searchable by Ministries or the wider public through a web-based portal.

9. Analysing future conditions

While the earlier discussed element of the project focussed on current conditions, it is important to also consider future conditions, which means, where does Tarawa want to be in the future regarding spatial planning. Therefore, a range of alternative future scenarios were presented to the KMSPCC (see Section 9.1 below).

The impacts of climate change on Kiribati, and on Tarawa in particular, are projected to be severe. Increased air temperatures and precipitation levels are likely to lead to more extreme weather, including extreme rainfall events, which are expected to increase in both frequency and intensity. This combined with sea level rise is projected to increase coastal flooding, which is expected to be a significant issue for Tarawa (and specifically South Tarawa, where the bulk of the population, industry and administrative centres are located), which has the potential to be exacerbated by the projected increase in tropical cyclone intensity. Such wave-driven flooding will place the security of the atoll's existing freshwater reserves at risk and increase soil salinity.[7]

There are however several entry points that can guide decision-making processes in addressing climate security concerns. These include:

- Targeting [engagement with] vulnerable communities and making sure no one is left behind.
- Improving knowledge, capacities and communication to inform action.
- Avoiding mal-adaptation and ineffective mitigation, in favour of climate and conflict-sensitive approaches.
- Promoting and working with locals to gather important Traditional Ecological Knowledge (TEK) and cultural approaches to build resilience.
- Improving water and food security.

It is essential therefore that a draft marine spatial plan seeks to address the conflicting uses of Tarawa's marine space, as identified in the conflict analysis, and provides a range of options that both support vulnerable communities and promote local solutions to build resilience, in addition to enhancing water and food security.

9.1 Scenario analysis

Scenario analysis was conducted to consider the implications of different MSP approaches for Tarawa, in the context of future climate related threats and increasing demands on marine space. A set of three sustainability-based scenarios were developed to reflect the key priorities for marine spatial planning and associated socio-economic and environmental impacts. The various MSP

[7] https://www.undp.org/sites/g/files/zskgke326/files/2022-11/climate-security-risk-assessment-kiribati-profile.pdf

approaches examined range from those focused on delivering strong sustainability through marine ecosystem restoration and biodiversity conservation, through to those which are weaker from a sustainability perspective, but focus on socio-economic growth. These scenarios are outlined in full in Table 3 below.

Table 3: Scenario analysis conducted to consider the implications of different marine spatial planning (MSP) approaches for Tarawa – three scenarios are outlined below.

Scenario	Key priorities for MSP	Implications	
1. Strong sustainability Focus: Ecosystem restoration and biodiversity conservation	Increase the size and number of MPAs / conservation areas. Introduce new and expand existing 'no-take' zones for fisheries, both temporal and permanent. Place restrictions on commercial fisheries to reduce catch levels and sustain fish stocks. Develop a gas station on the ocean side of the island to negate vessels having to come to the lagoon side to refuel, thereby reducing pollution and pressure on the lagoon. Control recreational tourism activities, including placing temporal restrictions	Commercial shipping	- Limits placed on expansion of the main port. - Restrictions on anchoring in the lagoon. - Reduction in commercial fisheries.
		Coastal development	- Restrictive licensing procedure put in place for sand mining and dredging. - Highly restricted coastal development to alleviate urban development issues and associated marine impacts - Construction of sea walls to protect key infrastructure. Other softer methods of coastal engineering should be considered where appropriate to combat the threat of coastal inundation.
		Tourism	- Long-term growth in the tourism sector as ecosystem health restored and sustainable tourism practices adopted. - Short-term - livelihoods negatively impacted as restrictions placed on some recreational activities.

Scenario	Key priorities for MSP	Implications	
	on certain activities to enhance biodiversity etc. Regularly monitor sewer outfall and introduce new wastewater treatment methods to improve coastal and lagoon water quality. Enhance existing waste management measures and introduce circular economy solutions. Secure freshwater reserves by restricting local development, prohibiting sand mining and constructing appropriate sea defences. Limit further land reclamation and control coastal development. In the south to control existing environmental problems (e.g. pollution, overcrowding etc.) and in the north to expand existing conservation measures. Enhance mangrove restoration as a climate mitigation measure.	Fishing (commercial & artisanal)	- Reduced commercial fishing activities – livelihoods negatively impacted. - Increased poaching/IUU as a result of greater protection and reduced fishing grounds. - Enhanced fisheries management incl. sustainable management of marine waste and catch monitoring programme. - Improved food security, as growth in the artisanal fishing sector is supported to meet the island's demand.
		Aquaculture	- New planning system developed to regulate and ensure sustainable development of the aquaculture sector.
		Community	- Improved public health. - Improved food security. - Recreational access to certain areas is limited to preserve marine biodiversity. - Regulation of high impact recreational activities e.g. jet-skiing.
		Water reserves	- Improved water security.
		Biodiversity and conservation	- Enhanced coastal and marine biodiversity. - Enhanced coastal and marine ecosystem health. - Recovery of fish stocks. - Improved water quality in the lagoon. - Mangrove restoration.

Scenario	Key priorities for MSP	Implications	
2. Moderate sustainability Focus: Delivering socio-economic and cultural benefits through environmental conservation	Increase the size and number of MPAs / conservation areas. Develop a new system of regulation for MPAs, i.e. functional zoning - integrating conservation measures with opportunities for cultural / socio-economic activities that benefit the local population (e.g. certain artisanal fisheries, eco-tourism activities, recreation). Introduce new fisheries management measures to control commercial fisheries and reduce marine waste. Explore the potential for a floating marina and gas station on the ocean side of the island to negate vessels having to come to the lagoon side for transhipment and refuelling, thereby reducing pollution and pressure on the lagoon. Introduce new wastewater treatment methods to improve coastal and lagoon water quality.	Commercial shipping	- Expansion of Betio port to accommodate additional marine traffic required for expansion of the tourism sector. - Regulation of commercial fisheries in MPAs.
		Coastal development	- Land reclamation for airport development permitted. - Sustainable coastal development permitted - Construction of sea walls to protect key infrastructure, including that of the tourism industry.
		Tourism	- Increased tourism in the medium-term resulting in improved livelihoods. - Alternative sustainable tourism options promoted to attract a different type of visitor.
		Fishing (commercial & artisanal)	- Enhanced fisheries management incl. sustainable management of marine waste and catch monitoring programme. - Expansion of MPAs likely to result in more sustainable fish stocks.
		Aquaculture	- Expansion/growth of the aquaculture sector encouraged.
		Community recreation / amenities	- Improved public health. - Recreational access across the island enhanced, although managed to ensure sustainable and protection of high value conservation sites.

Scenario	Key priorities for MSP	Implications	
	Enhance existing waste management measures and introduce circular economy solutions. Secure freshwater reserves by restricting local development, prohibiting sand mining and constructing appropriate sea defences. Review/update/introduce new planning guidance that considers impact of coastal development on marine/coastal ecosystems. Permit further land reclamation only if it is in the public interest. Enhance mangrove restoration as a climate mitigation measure. Enhance sustainable tourism Improve community access to marine environment for recreational, cultural, educational and wellbeing purposes.	Water reserves	- Increase in tourism likely to place additional pressure on water reserves – decline in water security. - Development of desalination plants to meet increased water demands.
		Biodiversity and conservation	- Enhanced coastal and marine biodiversity/ecosystem health in marine protected areas. - Impact of commercial fishery on fish stocks counteracted by recovery of fish stocks in MPAs. - Mangrove restoration.
3. Weak sustainability	Develop commercial fishery/aquaculture and limit fisheries management – no catch limits and only minor restrictions within MPAs (e.g.	Commercial shipping	- Port expansion – new wharfs - Development of floating marinas - Expansion of fishing hub - Seawall development – sea level – specific areas – loss of beach

Scenario	Key priorities for MSP	Implications	
Focus: Economic development	prohibiting the most destructive techniques at certain times). Permit land reclamation to support economic development – e.g. port, airport expansion. Increase coastal development – e.g. new marinas, wharfs, resorts etc. Increase tourist numbers. Develop new types of tourism, e.g. capitalise on types used elsewhere in Kiribati e.g. sport fishing.	Coastal development	- Government development (reclamation of land) area near airport - Increased construction of resorts, cafes, coastal amenities. - Widespread construction of sea walls to protect new and existing development.
		Tourism	- Increased coastal development including resorts / recreational sites/amenities to support tourism growth.
		Fishing (commercial & artisanal)	- Remove restrictions on commercial and artisanal fisheries (e.g. on rod fishing from the causeway). - Development of main fishing hub - Increased pressure on fish stocks.
		Aquaculture	- Permit the development of new fish farms in the lagoon and expansion of other existing sites.
		Community recreation / amenities	- Community access to marine areas limited by development of new resorts and promotion of tourism over local needs.
		Water reserves	- Development of desalination plants to meet increased water demands.
		Biodiversity and conservation	- No change in size/number of existing MPAs/conservation areas. - Reduction in coastal and marine biodiversity/ecosystem health

9.2 General principles for identifying marine protected areas.

The Government of Kiribati in Tarawa has been proactively working with local communities and Island Councils to develop community-based fisheries management zones and Marine Protected Areas (MPAs) within the marine environment. These contain zoned areas with a range of management measures, from no-take zones though to multi-use sustainable artisanal fishing areas, with variations in between.

There is however scope to identify further MPAs, depending on the type of spatial plan scenario decided upon by the KMSPCC and Government. For example, Kiribati acceded to the Ramsar Convention on Wetlands in May 2013 and a RAMSAR site[8], located within the lagoon in North Tarawa, was designated for its array of relatively pristine and healthy representative coastal wetland ecosystems. Its current status is unknown, with the RAMSAR Sites Information Service stating that the most recent information was provided in 2013 when the site was designated. Depending on the management plan in place for this protected area, it may be acceptable to adopt this area within the wider network of protected areas within Tarawa, or modifications to its management may be necessary to ensure the conservation objectives of the site are met.

Whilst the identification of MPAs within Tarawa was outside the scope of this project; a process which can take many years, there are an agreed set of good practice principles for MPA identification, which is recommended that the government follow, to ensure that a robust, ecologically coherent network of MPAs can be establish, affording effective conservation and ensuring the sustainable use of marine resources. These include the following:

- **Ecological Representation and Connectivity**:
    - MPAs should represent the full range of marine biodiversity, including different species, habitats, and ecosystems. This principle ensures that all aspects of marine life are protected (Day, et al., 2019).
    - Connectivity between MPAs is crucial for the movement of species and the flow of ecological processes. This linkage helps maintain genetic diversity and resilience against environmental changes (Lewis, et al., 2017).

- **Sustainable Use and Management**:
    - MPAs should promote sustainable use of marine resources, balancing ecological protection with human activities such as fishing, tourism, and recreation. Effective management plans are required to regulate these activities and ensure they do not harm the marine environment (Day, et al., 2019).

[8] https://rsis.ramsar.org/sites/default/files/rsiswp_search/exports/Ramsar-Sites-annotated-summary-Kiribati.pdf

- **Adaptive Management**:
    - MPAs should employ adaptive management approaches to respond to new scientific information and changing environmental conditions. This involves regular monitoring, evaluation, and adjustment of management practices to improve MPA effectiveness (Jones, 2002).

- **Stakeholder Involvement**:
    - Successful MPAs require the involvement of local communities, stakeholders, and indigenous groups in the planning and management processes. Their participation ensures that MPA policies are socially acceptable and culturally appropriate, leading to better compliance and support (Lewis, et al., 2017).

- **Climate Resilience**:
    - MPAs should incorporate principles of climate resilience to protect against the impacts of climate change. This includes identifying areas that are less vulnerable to climate-related stressors and enhancing the resilience of marine ecosystems (Lopazanski, et al., 2023). This is especially important for areas such as Kiribati, which have been identified by the UNDP as having key climate security concerns[9].

- **Scientific Baselines and Monitoring**:
    - Establishing scientific baselines is essential for measuring the effectiveness of MPAs. Baseline data helps identify stressors and levels of degradation, providing a reference point for future monitoring and evaluation (Day, et al., 2019).

Finally, it should be noted that other geographically defined areas may also be used as a conservation tool. These are known as Other Effective Area-Based Conservation Measures (OECMs), and are recognized by the Convention on Biological Diversity (CBD). They are distinct from traditional protected areas but can contribute significantly to biodiversity conservation (IUCN, 2019).

[9] https://www.undp.org/sites/g/files/zskgke326/files/2022-11/climate-security-risk-assessment-kiribati-profile.pdf

Recommendations

9.1 Review "future conditions" analysis and "scenario" analysis after filling of persistent data gaps.

It is recommended that following the filling of persistent data gaps highlighted in Section 8 above, the "future conditions" and "scenario" analysis undertaken as part of this project is reviewed, in light of any changes that may have occurred as a consequence of additional data (for example, consideration of future vessel movements following analysis of AIS data trends over sequential years).

9.2 Undertake a review of the MPA network including OECMs to ensure the presence of an ecologically coherent network.

It is recommended that a review of the entire MPA network within Tarawa (and potentially including adjacent MPAs with the wider Kiribati EEZ) is undertaken, including OECMs. This gap analysis will confirm the presence/absence of an ecologically coherent network of protected areas, with appropriate and relevant management measures in place. If gaps are identified in this network, then options around plugging these gaps around Tarawa could be included within future iterations of the spatial plan, if appropriate.

10. Draft spatial management plan

This draft plan has been developed on the basis of activities identified in the stakeholder engagement element of the project, the spatial data available and the potential conflicts between different marine users and activities identified through the conflict analysis. It has also been informed by the rapid analysis of potential MSP scenarios and stakeholders' views of the goals and objectives of marine spatial planning in Tarawa. However, given the limited nature of the spatial data (acknowledging the persistent data gaps highlighted earlier), and the lack of opportunity to conduct comprehensive ground-truthing to develop an accurate understanding of the current situation, it should therefore be used as a starting point for further discussion and as a means of considering the benefits of allocating the spatial and temporal distribution of human activities across Tarawa's marine space (out to 3NM).

The plan sets out a hierarchical system of zonation which affords varying levels of marine protection within the context of a marine spatial planning system geared towards achieving moderate sustainability, with a focus on delivering socio-economic and cultural benefits through environmental conservation (Scenario 2, the preferred scenario). The following four zones have been delineated, as seen in Figure 4, with levels of marine protection ranging from very high (Zone 1) to low (Zone 4). These are outlined in full in Table 4.

1. North Tarawa Multi-Purpose Protected Area
2. South Tarawa Multi-Purpose Protected Area
3. Southeast Tarawa Economic Development Zone
4. Southwest Tarawa Economic Growth Zone

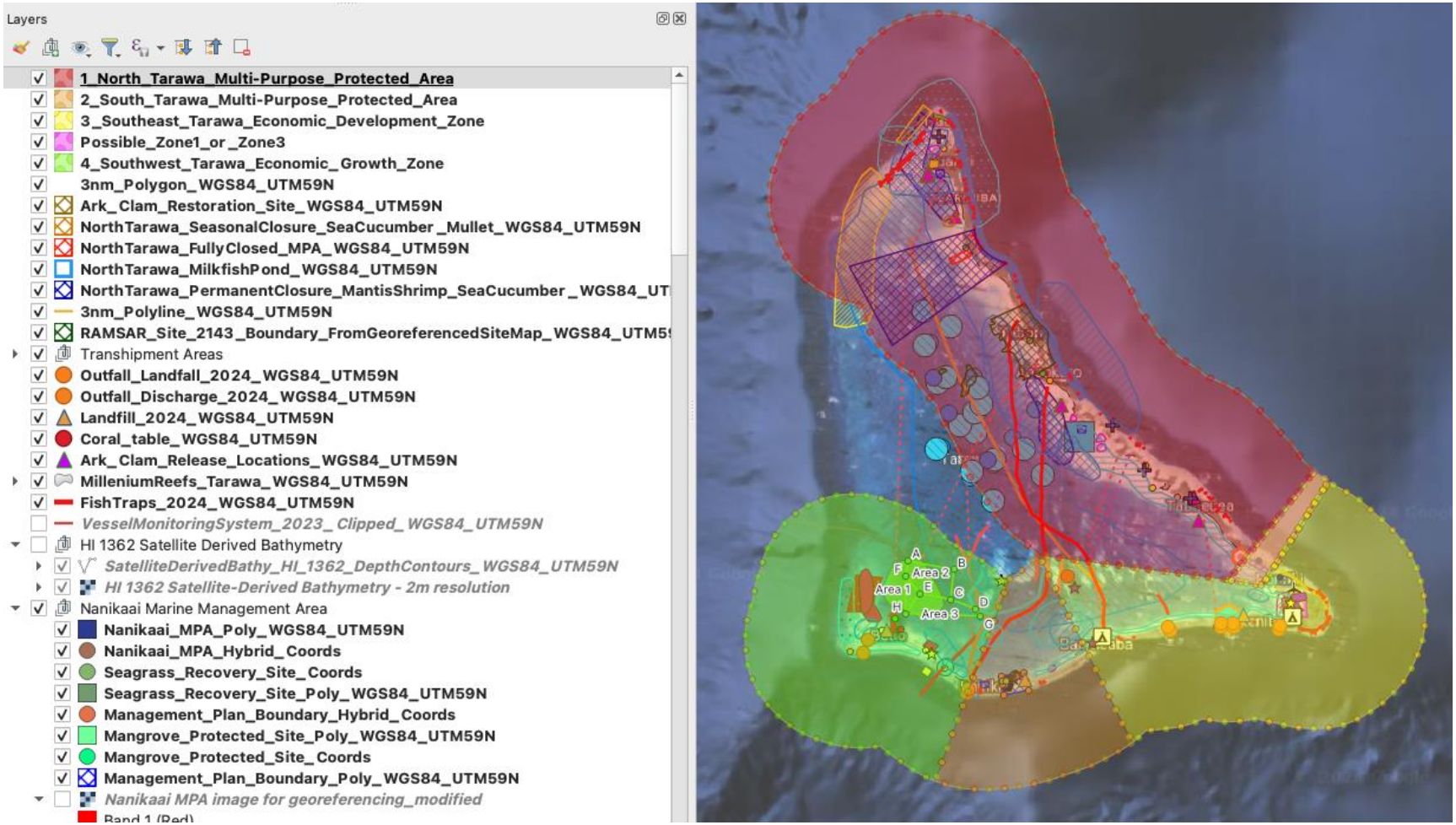
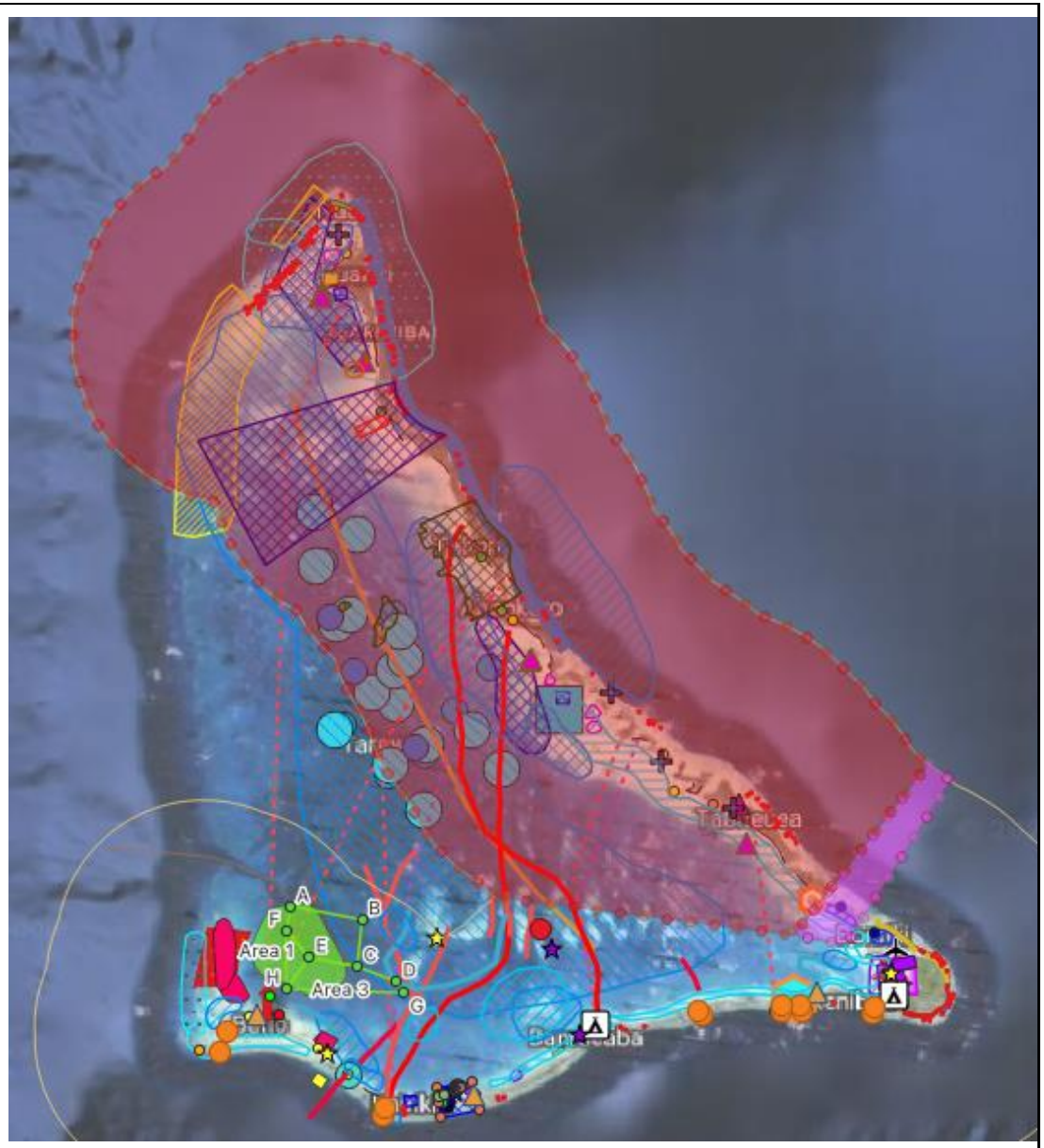


Figure 4. Proposed MSP zones

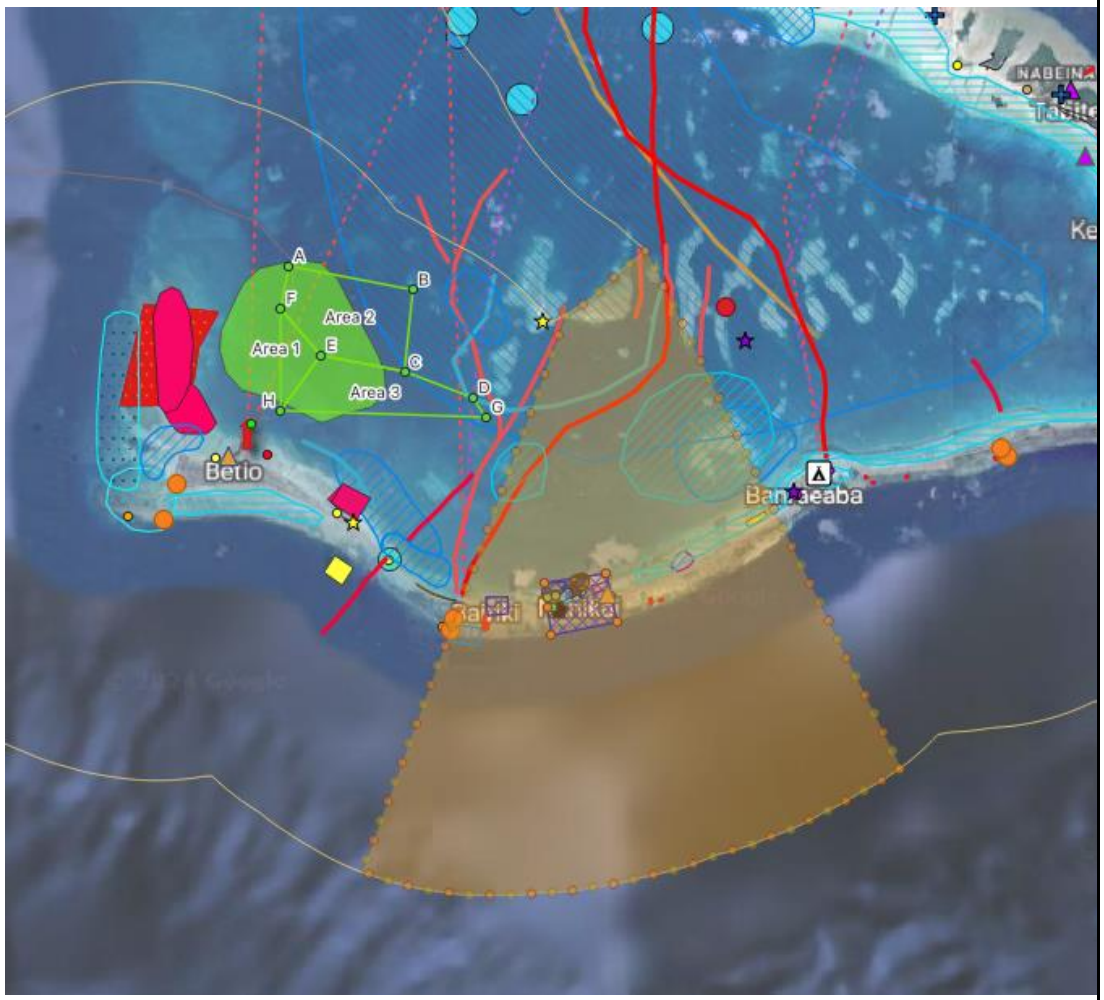
Table 4: Proposed zoning approach.

Zone		Level of marine protection	Extent	Rationale	Benefits	Restricted activities
1	North Tarawa Multi-Purpose Protected Area	Very high	The area to the north of Sue's Creek to the northern most point of Tarawa, encompassing the RAMSAR site and other existing protected areas in North Tarawa. Zone extends to 3nm lagoon and ocean side. This zone could be expanded in the south to align with the jurisdictional area of Eutan Town Council.	This proposed zone would provide a high level of protection for North Tarawa's marine and coastal environment and draw together existing management measures, including the Ramsar site and marine protected areas. The implementation of a range of temporal and spatial fishing restrictions will support the development of sustainable fish stocks, through the safeguarding of spawning grounds, marine habitats and biodiversity. Restoration of coastal and marine ecosystem provides multiple socio-economic opportunities, including the opportunity to enhance community access for educational, wellbeing and recreational purposes, and promote regenerative tourism to restore the island's reefs[10] and provide alternative livelihood options.	Enhanced marine and coastal biodiversity Protection of fish spawning grounds and turtle nesting areas More sustainable fish stocks Enhanced income/livelihoods as a result of increased tourism Reduced erosion and flood risk due to mangrove restoration Improved health and wellbeing due to community access to a healthy marine and coastal environment Community access for cultural and recreational activities	Marina / port / fish landing site development Sewage/landfill outfall Land reclamation Resort development (permitted only under certain conditions) Anchoring / transhipment Commercial and recreational fishing (spatial and temporal restrictions) Recreational activities (spatial / temporal restrictions) Dredging / sand mining

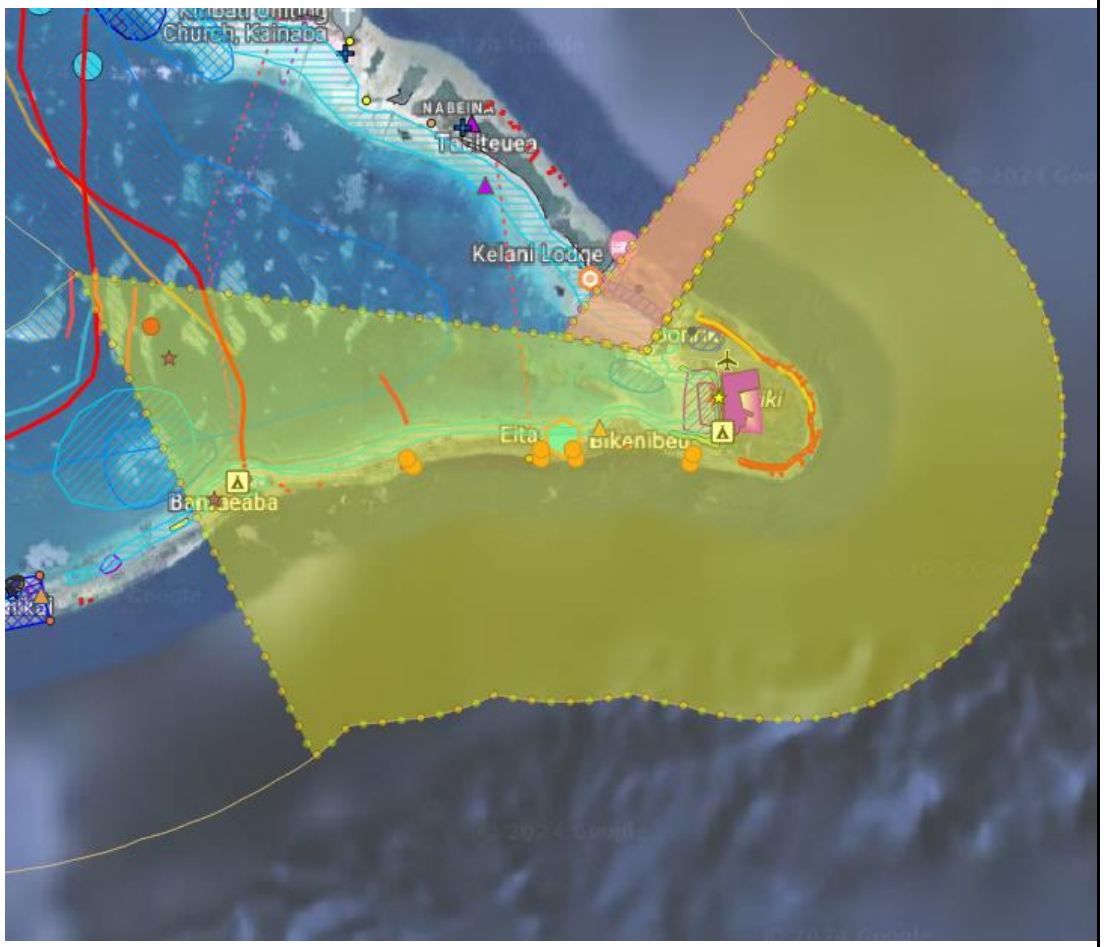
[10] https://oceanallianceproject.org/regenerative-tourism-for-marine-conservation/


A
B
C
D
E
F
G
H
Area 1
Area 3

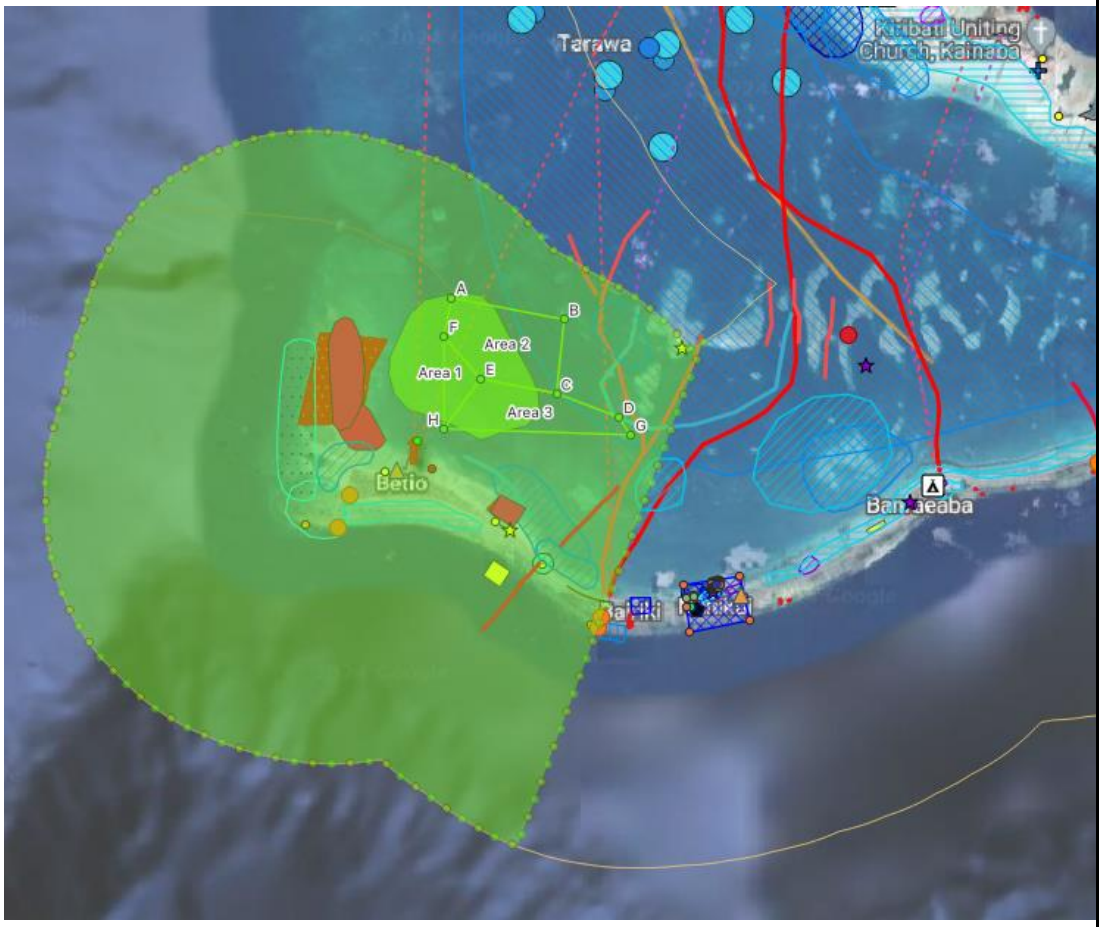
Zone		Level of marine protection	Extent	Rationale	Benefits	Restricted activities
2	South Tarawa Multi-Purpose Protected Area	High	The area between Bairiki in the west and Banraeaba in the east, encompassing the existing Nanikai MPA. Zone extends to 3nm lagoon and ocean side.	This proposed zone represents an important management step to safeguard an extended area of the coastal and marine environment within highly developed South Tarawa. This multi-purpose protected area would involve the creation of a buffer zone around the existing Nanikai MPA, to provide an additional layer of protection to support the restoration of mangroves and seagrass beds. Notably, this buffer zone would be open to community access to the coastal and marine environment, which would be safeguarded from further economic development. This can provide multiple health and wellbeing benefits through the provision of natural space for purposes such as recreational, artistic, spiritual and educational.	Enhanced protection for Nanikai MPA Enhanced marine and coastal biodiversity Reduced erosion and flood risk due to mangrove restoration Enhanced fish stocks, due to development of nursery habitat (seagrass meadow) Improved health and wellbeing due to community access to a healthy marine and coastal environment Community access for cultural and recreational activities	Marina / port / fish landing site development Sewage/landfill outfall Land reclamation Resort development (permitted only under certain conditions) Anchoring / transhipment Commercial and recreational fishing (spatial and temporal restrictions) Recreational activities (within the Nanikai MPA) Dredging / sand mining

Zone	Level of marine protection	Extent	Rationale	Benefits	Restricted activities
					

Zone		Level of marine protection	Extent	Rationale	Benefits	Restricted activities
3	South East Tarawa Economic Development Zone	Medium	The area from Banraeba in the west to Sue's Creek in the east, encompassing the main fishing hub, airport and water reserves. Zone extends to 3nm lagoon and ocean side. This zone could be expanded to the north to provide access to the economic development	This zone is proposed to facilitate sustainable economic development in the south east of Tarawa, where the main fishing hub and the airport are located. However, it is proposed that restrictions be placed on the type and location of development to ensure the protection of vital resources, such as the island's freshwater reserves, shellfish beds, and mangroves.	Sustainable economic development permitted in an already developed part of the island Potential for expansion of fishing hub Airport expansion / development permitted Areas delineated for aquaculture sector expansion Water reserves secured Enhanced coastal protection due to mangrove restoration	Dredging / sand mining Port development Anchoring Transhipment

Zone	Level of marine protection	Extent	Rationale	Benefits	Restricted activities
		zone for Eutan Town Council.			

Zone		Level of marine protection	Extent	Rationale	Benefits	Restricted activities
4	South West Tarawa Economic Growth Zone	Low	The area to the west of Bairiki, encompassing the port. Zone extends to the 3nm lagoon and ocean side.	This zone is proposed to enable economic growth in south west Tarawa, inclusive of Betio international port and the anchoring / transhipment area. It is expected that restrictions would be limited to facilitate economic growth; however, some spatial restrictions would be required to prevent conflict, e.g. between fishers and dredgers, transhipment area and recreational activities.	Sustainable economic development permitted in an already developed part of the island Potential for expansion of fishing hub Airport expansion / development permitted Areas delineated for aquaculture sector expansion Protection of water reserves Enhanced coastal protection due to mangrove restoration	Spatial restrictions on a range of activities including recreational and fishing to prevent conflict with dredging/sand mining, and port transhipment areas.

Zone	Level of marine protection	Extent	Rationale	Benefits	Restricted activities
					

Recommendations

10.1 Review the draft spatial plan following the filling of persistent data gaps

It is recommended that draft spatial plan is reviewed and revised following the filling of persistent data gaps highlighted in Section 8 above. This revised spatial plan, along with proposed management options for each zone, should then be subjected to a formal public consultation process.

10.2 Bilateral discussions between the KMSPCC, relevant Secretaries and each senior Island Council representative.

Noting the persistent challenges raised during stakeholder workshops in December 2023 and June 2024 around local fisheries management, marine areas under the jurisdiction of relevant Island Councils and the occurrence of poaching incidents, it is recommended that the draft boundaries between the different management zones as set out in the draft spatial plan (and thus different Island Council areas of jurisdiction) are taken as an opportunity to discuss this issue in an open and transparent forum, in order to resolve these challenges and agree a way forward. A fully consulted and publicly endorsed marine spatial plan for Tarawa may provide a way to resolve these challenges.

11. Recommendations and future steps:

This section recommends a series of 'next steps' steps to take, to further the establishment of a marine spatial plan for Tarawa, based on the assumption that the recommendations at the end of each report section, and reiterated below, have been completed.

Recommendations (1)

Establishing appropriate authority - Kiribati MSP Coordination Committee (KMSPCC)

With the KMSPCC now established, ensuring that it (1) is recognised as a formal legal entity, (2) is convened regularly, (3) is well-attended with a rotating chair from each of the participating Ministries, is critical to its success. This will result in a well-coordinated MSP process where government stakeholders are fully engaged in achieving the stated vision, goals and objectives.

Establishing appropriate authority – legislative framework (1)

It is recommended that an in-depth analysis and evaluation of the current legal and institutional frameworks and potential (and new) decision-making governance structures is undertaken urgently, reflecting on these requirements for marine spatial planning.

Establishing appropriate authority – legislative framework (2)

It is recommended that following the above review, any additional required legislation should be progressed at pace through the Attorney General's office, coordinated by the KMSPCC, to ensure that the outputs of MSP will be enforceable.

Leadership

Secure leadership at the highest level in Government to drive MSP forward, providing an incentive for Government Ministries and Divisions to work together to solve challenges and reach solutions.

Long-term financial support

Ensure that appropriate long-term financial support for MSP is budgeted and protected, utilising MSP legislation if necessary to ensure continued funding into the future.

Recommendations (2)

Agreeing a final suite of MSP goals and objectives

Following the above ranking exercise undertaken by the Kiribati Marine Spatial Planning Coordination Committee (KMSPCC), it is recommended that a final suite of MSP Goals and Objectives are agreed by the KMSPCC and endorsed by the Secretary to demonstrate senior leadership and commitment to MSP.

Sharing Tarawa's new MSP Vision, Goals and Objectives with stakeholders

The Vision, Goals and Objectives for MSP in Tarawa were originally drafted in December 2023 by stakeholders for stakeholders. Following the finalisation of the MSP Goals and Objectives, it is recommended that the MSP Vision, Goals and Objectives are shared and communicated to the wider public through the best available channels, such as Facebook, other social media/websites and a government press release.

Maintain dialogue with established MSP stakeholder groups

It is recommended that dialogue is maintained with the stakeholder groups involved in the December 2023 stakeholder workshops, as a minimum, as the MSP project progresses, through a range of fora and media. If the scope of the MSP project is widened, from 3nm out to 12nm, then additional stakeholders will likely need to be brought on board! Consider holding regular (six monthly) MSP stakeholder update workshops on South and North Tarawa, where project updates can be provided to the group and their input can be sought.

Resolve data gaps as a matter of priority

It is recommended that the data gaps that still exist (largely due to challenges around data sharing between Government Ministries and poor data management practices) are addressed as a matter of priority. These include collating AIS, VMS and other data related to fishing vessels and related activities. Only after these gaps have been filled can work continue on finalising spatial plans for Tarawa.

Resolve geospatial data management challenges within the Government of Kiribati and its Ministries/Divisions.

It is recommended that there is investment in the Government of Kiribati's geospatial data management infrastructure, including a centralised geospatial database, use of web mapping services (WMS) and web feature services (WFS) to 'serve-up' geospatial information to relevant Ministries and the wider public. Alongside this, a searchable geospatial metadata catalogue (potentially based on the proposed metadata protocol recommended within this project) would ensure that metadata is readily searchable by Ministries or the wider public through a web-based portal.

Recommendations (3)

Review "future conditions" analysis and "scenario" analysis after filling of persistent data gaps.

It is recommended that following the filling of persistent data gaps highlighted in Section 8 above, the "future conditions" and "scenario" analysis undertaken as part of this project is reviewed, in light of any changes that may have occurred as a consequence of additional data (for example, consideration of future vessel movements following analysis of AIS data trends over sequential years).

Undertake a review of the MPA network including OECMs to ensure the presence of an ecologically coherent network.

It is recommended that a review of the entire MPA network within Tarawa (and potentially including adjacent MPAs with the wider Kiribati EEZ) is undertaken, including OECMs. This gap analysis will confirm the presence/absence of an ecologically coherent network of protected areas, with appropriate and relevant management measures in place. If gaps are identified in this network, then options around plugging these gaps around Tarawa could be included within future iterations of the spatial plan, if appropriate.

Review the draft spatial plan following the filling of persistent data gaps

It is recommended that draft spatial plan is reviewed and revised following the filling of persistent data gaps highlighted in Section 8 above. This revised spatial plan, along with proposed management options for each zone, should then be subjected to a formal public consultation process.

Bilateral discussions between the KMSPCC, relevant Secretaries and each senior Island Council representative.

Noting the persistent challenges raised during stakeholder workshops in December 2023 and June 2024 around local fisheries management, marine areas under the jurisdiction of relevant Island Councils and the occurrence of poaching incidents, it is recommended that the draft boundaries between the different management zones as set out in the draft spatial plan (and thus different Island Council areas of jurisdiction) are taken as an opportunity to discuss this issue in an open and transparent forum, in order to resolve these challenges and agree a way forward. A fully consulted and publicly endorsed marine spatial plan for Tarawa may provide a way to resolve these challenges.

11.1 Develop a draft spatial management plan ready for public consultation

Once all data gaps have been filled, it may be necessary to review the future conditions analysis and scenario analysis, to ensure no updates are required in light of the new data being considered. At this time, it is also recommended that an MPA network gap analysis be conducted, as any modifications to the MPA network could be implemented via a revised spatial and zonation plan and associated management.

11.2 Formal public consultation process with relevant amendments if necessary

Undertake a transparent, open public consultation process of the proposed spatial plan, alongside any proposed management that will be required to implement/enforce the plan. Typically, a three-month consultation period allows all community stakeholders the opportunity to attend information events hosted by Government on the proposed plans, formulate a view and respond to the consultation. Consideration should be given to how the consultation material will be prepared (keeping it simple and jargon-free), language (providing material in i-Kiribati and English language) as well as the hosting of consultation events.

Once all consultation responses have been assimilated, a consultation report should be produced highlighting what amendments are to be made to the spatial plan. This should be communicated to all stakeholders in an open, transparent way.

11.3 Approving the spatial management plan

Following the formal public consultation process on the draft spatial plan and its associated management activities, the plan will be amended following comments from stakeholders and the wider community. A final marine spatial plan will then be approved and endorsed by the Government of Kiribati.

11.4 Implementing and enforcing the spatial management plan

Having a final, endorsed marine spatial plan is not the end of the process. Arguably the more challenging phase is its implementation and enforcement. Obviously, relevant legislation needs to be established and in place to provide legal backing and the ability to enforce the spatial plan. Penalties may be required for non-compliance, although other mechanisms, such as providing incentives for adherence, may prove valuable. While the KMSPCC may provide a coordination role over the MSP process, it could be more appropriate to establish a dedicated institution or organisation to oversee the implementation, noting the significant time resource which will be required to undertake this process. It may also be necessary to undertake capacity building to train relevant personnel and build the capacity of institutions to effectively manage and enforce the plan.

11.5 Monitoring and evaluation

As part of the MSP monitoring and evaluation phase, systems will likely be required to monitor compliance with the plan, its zones and then assess its effectiveness. This may include wider use of satellite tracking for vessels, patrols, and community reporting mechanisms for aspects such as fishing catch (increases/decreases), sustainable tourism offerings etc. It is likely that such monitoring and evaluation activities may require dedicated staff resource to lead this work.

Periodic reviews of the plan will allow an evaluation of its effectiveness to be undertaken and make adjustments if necessary. As per our MSP protocol flow chart in Figure 5., it will also be important to provide feedback mechanisms, where stakeholders can feedback on the plan and its implementation, or submit new information/data for consideration by the KMSPCC.

12. Protocols

A simple protocol has been developed which highlights key stages within the marine spatial planning process (see Figure 5), including feedback loops, where new data from stakeholders may be provided, or when the performance of the spatial plan against its established goals and objectives suggests that significant changes need to be made. Any significant changes to zones/management will likely require consultation with stakeholders and the wider community.

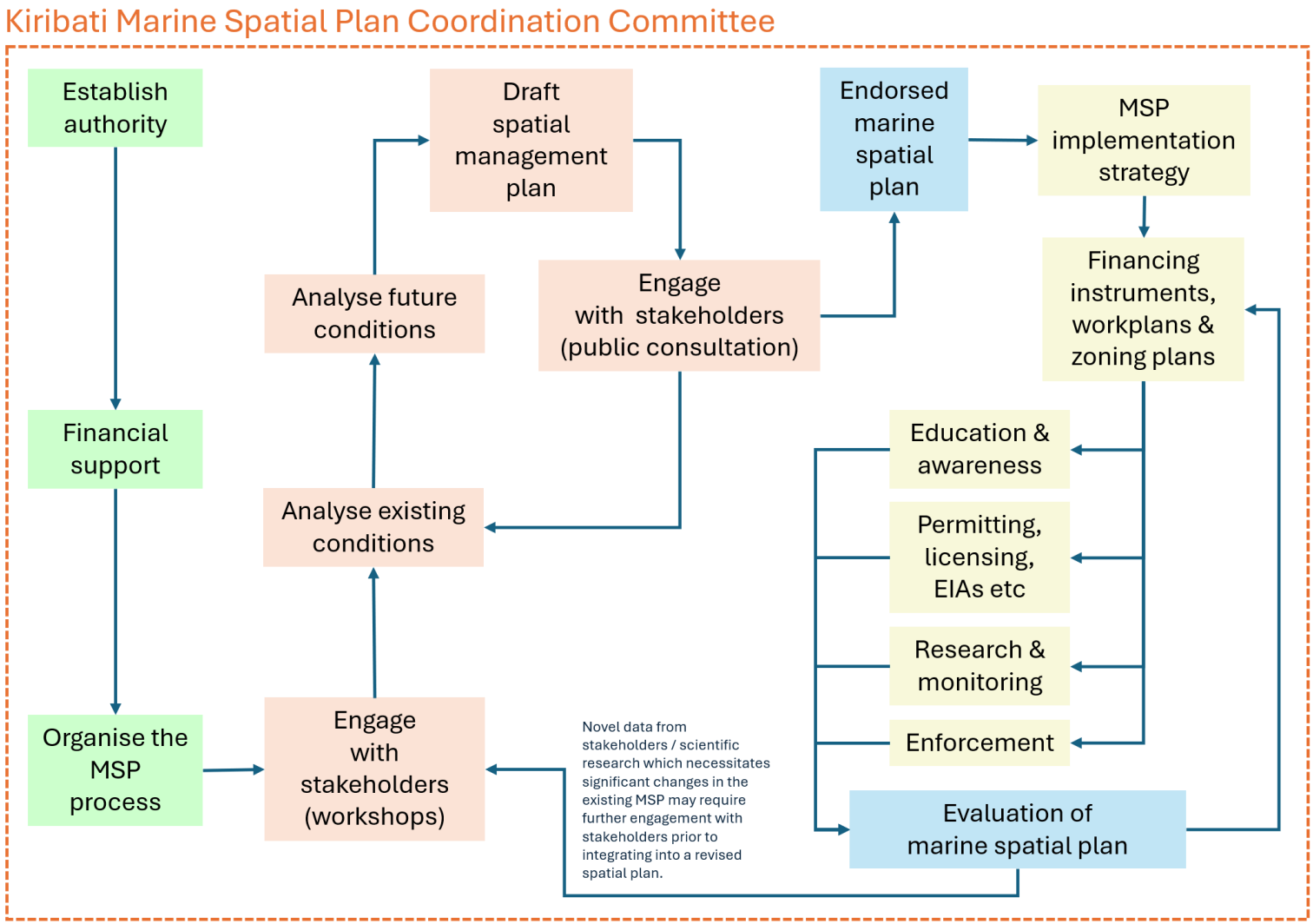


Figure 5: A simple protocol for establishing a MSP in Tarawa, highlighting a number of feedback loops, where stakeholders can provide be consulted on MSP products or provide new data.

13. Conclusions

In conclusion, this eight-month project has successfully developed and delivered the foundational protocol to support the establishment of a marine spatial plan on Tarawa.

Despite the challenges experienced during the project and outlined in this report around data management, open and transparent data sharing and conflicts between Ministries within government, proposals to tackle these challenges have made and are making a practical difference. Through widening the scope of the original terms of reference, suggestions to enhance the curation of metadata within Government have been made, through undertaking an extensive good practice review of international metadata standards. In addition, specific capacity building on these aspects of data collection and data management have been successfully delivered. An MSP coordination committee is now up and running, with a rotating chair affording the opportunity to include all relevant Ministries in the decision-making process. Furthermore, a clear vision set by government and community stakeholders has been finalised, accompanied by an ambitious set of goals and objectives for delivering MSP.

Community stakeholders have been engaged and there is a clear desire from them for the Government to progress MSP at pace within Tarawa. Despite persistent data gaps (which should be filled as a matter of urgency), scenarios were considered, and proposals were made as to what a spatial plan could look like on Tarawa, and what socio-economic and conservation benefits could be delivered consequently. The middle scenario (No 2) balancing socio-economic and conservation benefits was the preferred option. Finally, wider capacity to harness tools and develop processes (such as an introduction to GIS and habitat mapping) to further MSP progress within Government, and strengthen its capacity to undertake this work into the future, through dedicated training workshops.

However, into the future, it is important to consider stakeholders that fall outside this 3NM delineation, due to the potential influence of their associated activities and operations on the marine environment, culture and socio-economics of the Tarawa lagoon and its coastal waters. t is recommended that future projects consider the full extent of the territorial sea limit, whilst ensuring that additional stakeholders, which operate/are active beyond 3NM, are included in the conversation.

Moving forward, a suite of recommendations have been set out in Section 11, further highlighting some of the key challenges that should be addressed in order for the establishment of MSP to continue.

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Appendices

Appendix 1: Kiribati Marine Spatial Planning Coordination Committee (KMSPCC) update and Capacity Building Workshops

KMSPCC Update Meeting

The Kiribati Marine Spatial Planning Coordinating Committee (KMSPCC) update meeting convened on June 24th, 2024, to discuss the progress and challenges of the Tarawa Marine Spatial Planning (MSP) Project. The meeting was attended by key project team members and stakeholders involved in the MSP process.

- **Overview of Marine Spatial Planning (MSP)**

  Neil Golding commenced the meeting with an overview of Marine Spatial Planning (MSP), highlighting the key stages of the MSP process, establishing authority, securing financial support, organising the MSP process, engaging stakeholders, analysing existing and future conditions, developing a spatial management plan, implementation and enforcement, monitoring and evaluation (Figure 6).

- **Current Status of the Tarawa MSP Project**

  To date, significant milestones of the Tarawa MSP Project have been achieved. These include:

  - Establishment of the Kiribati Marine Spatial Planning Coordinating Committee as the MSP authority.
  - Organisation of the MSP process and engagement of stakeholders through various workshops/for a.
  - Development of agreed vision for MSP and a suite of draft goals and objectives.
  - Analysis of existing and future conditions pertinent to marine spatial planning.

  Additionally, the project has addressed challenges related to data sharing, data management and metadata enhancement, through expanding the scope of the original project.

- **Key Outcomes and Discussions**

  The meeting focused on several critical outcomes:

  - **Finalisation of Tarawa MSP Vision, Goals, and Objectives**: The committee deliberated and finalised the vision, goals, and objectives of the Tarawa MSP, laying a foundation for future activities.

  - **Challenges with Data Gaps**: Several challenges were highlighted, including the inability to obtain vessel AIS data or processed and validated fisheries VMS data from Government Ministries, a lack of information sharing about fisheries and fishing vessels within the fleet, and the absence of formal datasets for various categories of information generated through stakeholder events.

Figure 6: Updating the KMSPCC on progress with the Tarawa MSP project.

Capacity Building Workshops

To ensure that stakeholders of the Kiribati Marine Spatial Planning Coordinating Committee possessed adequate knowledge and skills in key areas, a set of dedicated capacity building workshops were planned and implemented. Specific workshops were dedicated to different aspects of MSP related activities, such as metadata, introduction to GIS, introduction to habitat mapping and field survey recording training utilising GPS. The training aimed to support the successful implementation of the Marine Spatial Planning (MSP) for Tarawa Island and future MSP projects in Kiribati. The capacity building workshops were held from June 24th through to July 3rd, 2024.

- **Metadata Training**

The metadata training was a crucial step towards enhancing the data management capabilities of KMSPCC stakeholders. By adopting a metadata standard developed by the New Zealand government[11], compatible with ISO 19115, Kiribati can improve the management and use of geospatial data, thereby supporting the successful implementation of MSP initiatives. The metadata training began with an assessment of the KMSPCC stakeholders' understanding of metadata and its importance. It was observed that while some stakeholders had a fair understanding of metadata, the majority had very limited knowledge. This highlighted a critical need for the training.

The training emphasised the significance of maintaining metadata for every geospatial dataset. Proper metadata practices ensure data quality, usability, and interoperability, which are essential for effective MSP (Figure 7). It was noted that Kiribati currently lacks a standardised approach to metadata, a common issue across various government ministries. The absence of metadata standards can lead to inconsistencies and inefficiencies in data management.

To address this gap, a metadata standard developed by the New Zealand government was introduced to the committee. This standard provides a comprehensive framework for creating and managing marine geospatial metadata. The training included detailed sessions on how to use this NZ standard and how it could potentially be adopted as a Metadata Standard for use by all Ministries within the Government of Kiribati. Stakeholders were trained on the practical application of this standard to ensure its effective implementation.

[11] https://www.linz.govt.nz/guidance/marine-information/marine-geospatial-information/managing-and-reusing-mgi

Figure 7: Building capacity on the creation and use of metadata with the KMSPCC.

- **Introduction to GIS**

The Introduction to GIS training was delivered to the Kiribati Marine Spatial Planning Coordinating Committee (KMSPCC) stakeholders following the Metadata training. This initiative aimed to equip stakeholders with fundamental QGIS skills essential for effective Marine Spatial Planning (MSP). The training covered crucial topics such as understanding data types (vector and raster), working with projection systems, editing datasets, managing GPS files (GPX) in QGIS, and creating maps.

It was evident during the training (Figure 8) that the majority of KMSPCC members had limited prior knowledge of QGIS, an open-source GIS system, highlighting the importance of this training. By providing comprehensive coverage of basic QGIS functionalities, the training aimed to bridge this knowledge gap, ensuring that all stakeholders possess the necessary skills to utilise QGIS effectively in their MSP tasks.

Figure 8: Building capacity within the KMSPCC to utilise GIS for MSP purposes.

- **Introduction to Habitat Mapping**

In addition to the Metadata and QGIS training, the Geoscience Division requested specific training on Habitat Mapping, as this was a skill they were likely to require in the near future. This addition aimed to equip KMSPCC stakeholders with the skills and knowledge necessary for effective habitat mapping. Despite the initial suggestion coming from the Geoscience Division, the committee members expressed a strong interest in participating in this training as well. The Habitat Mapping training focused on the process of developing fine scale modelling/mapping outputs from raster data, such as drone imagery, using a range of GIS and modelling tools.

The training was intensive (Figure 9) and may require additional time and effort for participants to fully master the use of these habitat modelling/mapping tools. However, this foundational training provided participants with adequate knowledge and skills to build upon, setting a solid groundwork for future learning and application in habitat mapping.

Figure 9: Building capacity within the KMSPCC to undertake fine scale habitat modelling/mapping.

- **Field survey recording & GPS**

A training session on field survey recording and GPS usage was conducted with members of the Kiribati Marine Spatial Planning Coordinating Committee. The training was designed to provide participants with basic knowledge and proper procedures for conducting field surveys using customised survey sheets and a GPS device to capture ground point (Figure 10).

In addition to the field survey recording and GPS training, an additional training session was conducted to address the process of copying GPX datasets from GPS devices for further processing and mapping in GIS. This training complemented the earlier sessions on GIS, providing a comprehensive skill set for effective data handling and mapping in Marine Spatial Planning initiatives.

Figure 10: Building capacity within the KMSPCC to undertake field recording using a GPS and bespoke recording sheet.

Appendix 2: Risk & Mitigation

Table 5: Risk & Mitigation table from the Inception Report - reproduced here.

Risk No.	Identified risk	Potential impact on project	Mitigation action
R01	Limitations around data / information availability.	Limited data to inform baseline assessments and undertake marine spatial planning, resulting in an incomplete or flawed marine spatial plan for Tarawa.	It is acknowledged that the analysis could encounter data availability constraints; challenges accessing existing datasets created from previous projects has already been experienced during the Inception Phase. To supplement or compensate for lack of data, where possible (and appropriate), assumptions may be made based on similar data from other contexts. However, note that it may not always be appropriate or possible to extrapolate, which may result in significant caveats (with data gaps) around the draft marine spatial plan.
R02	International & Regional Travel Restrictions	Limit's ability of MEP team to engage with stakeholders	The MEP team are experienced in the use of virtual meeting platforms. If local restrictions mean that team member(s)/contacts are unable to travel for data/information collection/verification activities (if/where required), MEP may seek to use a combination of MFMRD persons in country and virtual meetings, where required.
R03	On-island internet connectivity (especially during inclement weather) impacting the ability of the local (Tarawa) team members to participate in project activities / meetings.	Could impact day to day progress of work / completion of activities undertaken by the in-country team.	The MEP team has taken this into account and will work with MFMRD personnel involved in the project to re-arrange such meetings. Both MEP and MFMRD staff will be flexible and communicative, scheduling meetings to ensure the participation of the Tarawa team.
R04	Team Member Illness or Exposure	Experts' delivery of project delayed or hindered due to illness	If a team member were to fall ill to the extent that project quality or delivery would be affected (due to COVID-19 or indeed other illness), MEP has access to a network of international experts who would be able to provide backstopping, if the MFMRD agreed.

Risk No.	Identified risk	Potential impact on project	Mitigation action
R05	Existing 2017/2018 MSP Tool (including GIS data layers) from the MACBIO project not available / accessible to the project.	The ToR briefly discussed the 2017/18 MSP tool reportedly developed by MFMRD's GSD in collaboration with MACBIO and various GIS Stakeholders. MEP had based project plans and resources on updating this existing GIS tool with relevant data layers. To date (4th Jan 2024), it has not been possible to obtain a copy of this MSP tool, or to collate all the data layers presented in this original MACBIO output. GIS data which has been shared with the project is currently missing industry-standard (ISO 19115) metadata and its origins are unknown. Therefore, additional data gaps currently exist in addition to those outlined in the original ToR.	It may be necessary to create a new MSP/GIS tool from scratch, which may impact the delivery schedule and have resource implications. This matter should be discussed with the PROP data manager as a matter of priority. Going forward, MEP will keep this risk item under review and update the PROP project manager appropriately if the status of data gaps changes.
R06	Format of new GIS baseline maps not agreed.	The ToR (Task 2.2) stated that an updated MSP will be comprised of a set of GIS baseline maps. MEP understood that this updated MSP GIS toolkit would be compiled in an open-source GIS (QGIS) containing relevant (and available) spatial datasets. This was confirmed during the Inception phase with MFMRD GSD.	No additional mitigation is currently required as this potential issue has already been discussed with the MFMRD GSD team and all spatial data work and project outputs will be completed in QGIS.

Risk No.	Identified risk	Potential impact on project	Mitigation action
R07	Advice on establishment of MPAs outside the scope of the MSP project.	The ToR (Task 2.4) stated that the project "will include specific advice on the establishment of potential provisions for areas of environmental, ecological and biological sensitivity (MPAs)". The process of identifying and implementing marine protected areas (MPAs) can be a lengthy process and is considered outside the scope of this project. However, MEP offered to advise on the recommended / best practice approach for identifying and designating an MPA network as part of an ecosystem-based approach.	This aspect of the project is planned for completion in Phase 2. No additional mitigation over and above what was clarified within the original proposal is proposed at this time. MEP offered to advise on the recommended / best practice approach for identifying and designating an MPA network as part of an ecosystem-based approach
R08	Changing the scope of MSP project from 3nm to 12nm.	The original ToR specified the scope of the MSP project to extend out to 3nm; the project proposal was drafted, resourced, and submitted with this scope in mind. Following proposal submission, a request was made by GSD to extend the project scope out to 12nm. This change of scope has potential resource and delivery implications, as well as requiring a wider range of stakeholders to be engaged at the initial inception phase and throughout the project lifecycle.	The potential increase in scope from 3nm to 12nm was discussed with both the PROP project manager and with workshop participants at the Inception Workshop. There was general agreement that the scope of the project should remain at 3nm. Therefore, no further mitigation is required at this stage and the scope of the project out to 3nm will remain.

Risk No.	Identified risk	Potential impact on project	Mitigation action
R09	The requirement for the provision of specific habitat and species distribution data from around Tarawa for advice on establishment of MPAs not being fulfilled.	This data requirement was highlighted by MEP within their original proposal. Notwithstanding the fact that providing specific advice on the establishment of MPAs was considered outside the scope of the project (see R07), specific requests for spatial data on target fish species, fishing areas, local fisheries management areas (incl. seasonal) such as no-take zones, ciguatera sites and cage farms have been made by MEP.	Requests for datasets listed within the original ToR have been made to MFMRD/GSD and MEP are awaiting receipt of the data. Going forward, MEP will keep this risk item under review and update the PROP project manager appropriately if this data is not provided in a timely fashion.
R10	The absence of an overseeing authority/MSP steering committee in Tarawa.	Best practice recommends establishing an MSP team with a diverse range of skills This team, with cross-ministry support, can function as a steering committee, providing oversight and strategic direction to the process, as well as acting as a decision-making group. This group should be established, ideally by the start of Phase 2 of the project. The absence of such group will likely result in the MSP process stagnating following completion of this initial project by MEP.	The establishment of an MSP Steering Committee was discussed at the Inception Workshop and all participants agreed that such a committee with cross-Ministry membership was essential and should be established as soon as possible. MEP will continue to highlight the importance of establishing this group and will keep this risk item under review, updating the PROP project manager appropriately if this risk has not been mitigated and an MSP Steering Committee is not established in a timely fashion.
R11	Lack of funding to continue MSP process following this initial MEP project	Best practice highlights the importance of having multiple financing mechanisms to support MSP activities. These activities may include, but are not limited to, implementation, management, enforcing and monitoring. Marine spatial planning is not possible without adequate financial resources; absence of funding	The importance of funding (particularly into the future) was discussed at the Inception Workshop. All agreed that this was an area which the newly established MSP Steering Committee (R10) should consider.

Risk No.	Identified risk	Potential impact on project	Mitigation action
		may will result in the failure of establishing MSP.	
R12	Lack of authority (such as legislation) to plan for and implement MSP	Best practice highlights the importance of having authority to both plan for and implement MSP, most commonly achieved through legislation. During the MSP implementation phase, any management measures set out also need to be enforceable. Establishing this authority with a legislative agenda should be a priority for the new MSP Steering Committee (R10) to tackle. Absence of authority/legislation may result in the failure of establishing a MSP in Tarawa.	The importance of establishing appropriate authority/legislation was discussed and agreed at the Inception Workshop. Participants at the workshop included the Attorney General's office, MEP will continue to highlight the importance of establishing the group outlined in R10 in order to coordinate this legislative agenda.
R13	Important project communications not being shared effectively with local communities by relevant Island Councils	As highlighted during the North Tarawa Stakeholder Workshop, where information and invitations regarding the planned workshop were not shared in a timely fashion with the local communities by the North Island Council Clerk – significantly impacting attendance at the workshop.	The MEP team is aware of this risk now and will ensure that the Island Councils are reminded of workshops regularly.

Appendix 3: KMSPCC Membership List

Table 6: Membership list of the Kiribati Marine Spatial Planning Coordination Committee (KMSPCC).

KMSPCC member	Division / Ministry
Kabure Yeeting	Geoscience Division, MFMRD
Catherine Paul	Geoscience Division, MFMRD
Kaon Tiamere	Oceanic Fisheries Division, MFMRD
Nterei Bakoa	Oceanic Fisheries Division, MFMRD
Manibua Roota	Coastal Fisheries Division, MFMRD
Taati Eria	Planning Development Division, MFMRD
Tarateiti Uriam Timiti	Coastal Fisheries Division, MFMRD
Karibwa Patrick	Coastal Fisheries Division, MFMRD
Rateiti Vaimalie	Coastal Fisheries Division, MFMRD
Aranteiti Tekiau	Coastal Fisheries Division, MFMRD
Bwebwetaake Willy Uan	Coastal Fisheries Division, MFMRD
Laitele Peletele	Environment and Conservation Division, MELAD
Tiaontin Enari	Lands Management Division, MELAD
Mika Bita	Environment and Conservation Division, MELAD
Nenebati Tawita Tainimaki	Attorney Generals Office, Ministry of Justice
Karasno Antonio	Kiribati Ports Authority, MICTTD
Tion Uriam	KOITIIP Project, MICT
Domingo Kabunare	Digital Transformation Office, MICT
Atanrerei Kabiriera	Digital Transformation Office, MICT
Erirau Timeon	Marine Division, MICT
Tebaiti	Office of the President
Tekimwau Otiawa	Office of the President
Kaiea Awira	External stakeholder, Tarawa MSP project

Appendix 4: Conflict/compatibility Matrix

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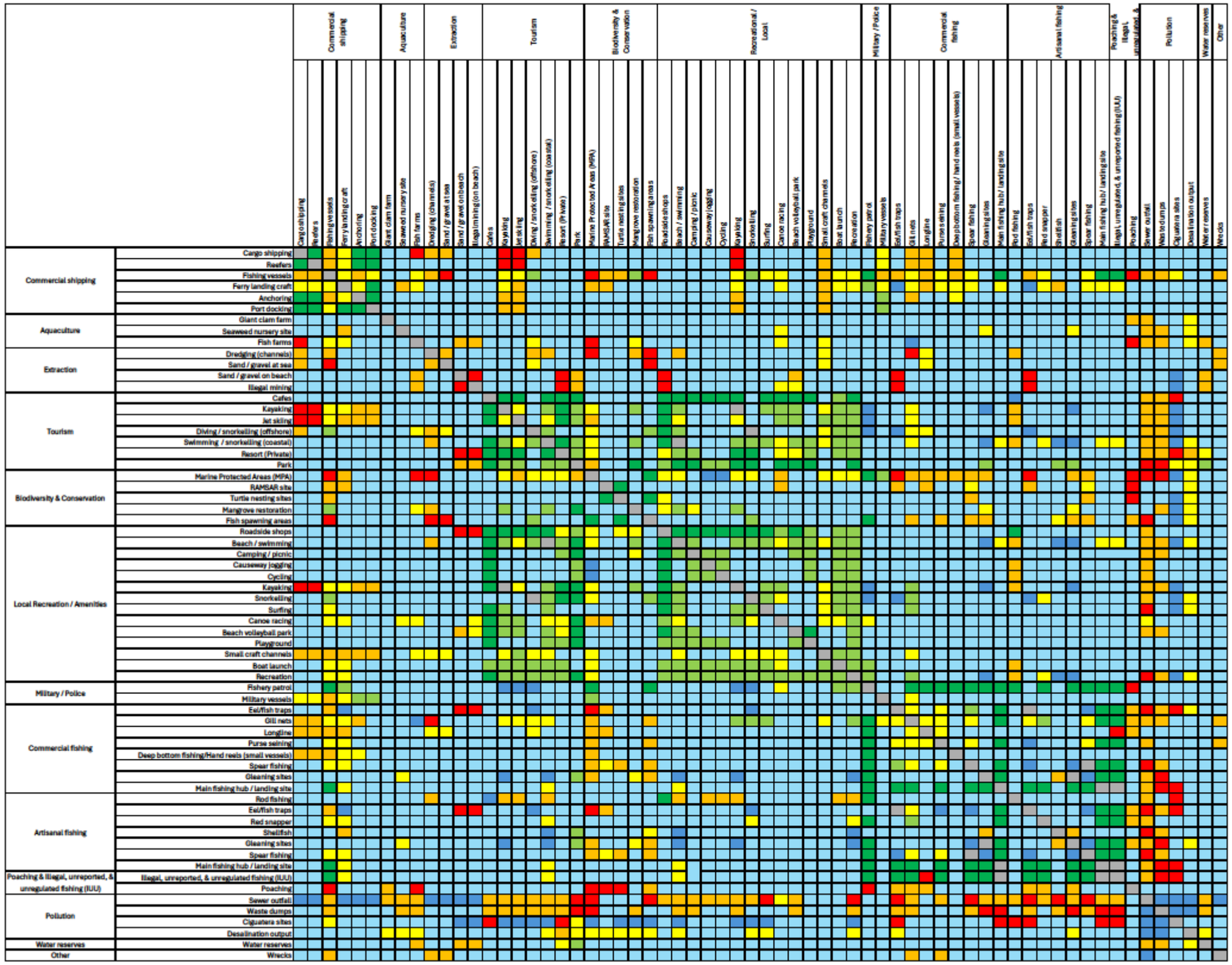

Key for the conflict/compatibility matrix

Conflicts	High risk of conflict		Uses that are spatially incompatible with a high risk of associated conflict. E.g. sewer outfall into MPA / swimming within transhipment area.
	Moderate risk of conflict		Uses that may be spatially compatible if managed effectively, however, without this there is a moderate risk of conflict. E.g. Overlapping fishing grounds and dredging sites, which could cause conflict if dredging sites are not out of action for fishers during active dredging periods.
	Low risk of conflict		Uses that are spatially compatible but still require some level of management to avert conflict. E.g. conflict between kayakers and ferry landing craft could occur should kayakers not be aware of ferry routes and terminals.
Neutral	No spatial overlap		Uses that spatially do not overlap.
	Neutral side-by-side activities		Neutral side-by-side activities that do not impede one another. E.g. Beach swimming in areas where fish gleaning occurs.
Synergies	Multi-use		Multiple similar uses of same space. E.g. swimming/kayaking area offshore of a playground.
	Mutually beneficial		Mutually beneficial co-location. E.g. fishery patrols within fishing grounds.