



Marine and Coastal Biodiversity Management
in Pacific Island Countries

Solomon Islands Ocean Zones Typology and Application Guidelines for Marine Spatial Planning

Technical Brief

August 2018

This Technical Brief intends to provide guidance to MECDM, MFMR, *Ocean12*¹ and other relevant government agencies, sectors and stakeholders on the types of ocean zones in Solomon Islands and associated guidelines concerning their future use within a Marine Spatial Plan. Ocean zones are a management tool in a marine spatial plan and support integrated ocean governance and management.

¹ *Ocean12* is a steering committee working on Integrated Ocean Governance consisting of 12 Ministries with a vested interest in the ocean and its living and non-living resources.



On behalf of:



of the Federal Republic of Germany

Ocean Zones Typology

Ocean zones are a spatial management tool, that in contrast to Protected Areas and Managed Areas are not stipulated in legislation. They complement existing classifications of marine protected areas and can and should be used in combination with the different legislations concerning protected and/or management areas.² Zoning will help the Solomon Islands achieve its vision for its ocean: A healthy, secure, and productive ocean that promotes sustainable and responsible use and development for the benefits of the people of the Solomon Islands now and into the future.

Zoning is used to promote certain activities in some areas and limit uses in other areas, to separate conflicting uses and to protect special places. Ocean zones are often deployed as part of a marine spatial plan or in a management plan to achieve integrated ocean governance. This planning should be done with due recognition and acknowledgement of traditional owners and management systems and should be done with significant, national-scale consultations.

In a workshop organized by *Ocean12* TWG in July 2017, national experts developed a standardized nomenclature for Ocean Zones to be used by planners, communities and managers within Solomon Islands.

Types of Ocean Zones for Solomon Islands

- Ocean zones should apply to all of the Solomon Islands' ocean environment that extends from the high water mark out to the EEZ;
- All legislation concerning illegal activities and current restrictions remain in force throughout Solomon Islands' waters.

Ocean Zone Name	Management Objectives
General Use Zone (transparent)	To allow for and manage multiple uses of Solomon Islands' marine environment.
Locally Managed Marine Zone / Cultural Zone	To benefit local communities by sustainable marine resource use and biodiversity protection as determined by communities.
Sustainable Use Zone	To allow for sustainable use of Solomon Islands' renewable marine resources including non-artisanal commercial fishing.
Limited Use Zone	To protect the integrity of benthic habitat by supporting limited, including non-artisanal fishing, as well as non-extractive activities that do not directly impact benthic habitats.
No-take Zone	To protect natural biodiversity along with its underlying ecological structure, support natural environmental and fisheries processes and replenishment, and to promote education and recreation by restricting all extractive uses.
Special Zone	To protect, conserve and restore specific species, habitats or cultural value of concern by eliminating the key threats.

Note that the Locally Managed or Cultural Zone is intended to be applied only within community areas. The other types of zones may be applied offshore or within community areas, if communities wish to use them

² see: Protected Areas Act 2010, Protected Areas Regulations 2012, Fisheries Management Act 2015, National Parks Act 1996, Mines and Minerals Act 1996, Forest Resources and Timber Utilisation Act 1970, and the legal analysis recently conducted by Muldoon and Wini-Simeon (2016).

Outlined in the table on page 5 are the 6 ocean zones. Each zone has a management objective (table on page 3) which contributes to achieving Solomon Islands vision for her ocean. Based on the overall vision for the ocean and each zone's objective, activities are either permitted or excluded in each zone. In the table, below, items indicated in red with a "No" are not allowed; items in green with a "Yes" are allowed in the respective zone. Note that the General Use Zone is essentially the status quo.

Ocean Zones within community areas

Communities have traditional practices and management systems that apply to their foreshore, coastal or inshore areas. A spatial plan will reinforce and support these existing valuable systems. If communities wish, they can codify their community or local management plans under formal legislations or provincial ordinances.

Communities are encouraged to adopt zone planning and use the different types of ocean zones in managing their coastal areas.

Footnotes of the Typology table on page 5:

1. Requires a licence or permit

1a. May require a license or permit

2. Industrial fishing is defined by FAO as capital-intensive fisheries using relatively large vessels with a high degree of mechanization and that normally have advanced fish finding and navigational equipment (includes, but not limited to, tuna and deepsea snapper fishing)

3. Artisanal fisheries are defined by FAO as small-scale fisheries for subsistence or local, small markets, generally using traditional fishing techniques and small boats; non-artisanal fisheries do NOT have these qualities and include, for example, harvesting of sea cucumber, trochus, clam, aquarium fish, coral, live rock for export.

4. To be determined per site

5. For the purpose of future extraction

6. No-take/extraction of all natural resources including plants, animals and mineral such as mangroves, fish, coral, rocks etc.

7. Point source pollution from marine vessels to be disposed of beyond 12nm

8. NOT for future extraction (but to enhance spillover effects etc.)

9. Artificial reef is defined by FAO to refer to materials placed on the sea floor that serve as habitat for marine organisms.

NB: For further definition see FAO <http://www.fao.org/fishery/glossary/en>

	General Use Zone	Locally Managed Marine Zone / Cultural Zone	Sustainable Use Zone	Limited Use Zone	No-take ⁶ Zone/Marine Protected Zone	Special Zone
Activities						
Mining - (other than non-commercial sand, gravel and aggregate mining) incl exploration, prospecting	Yes	No	No	No	No	No
Benthic disturbance (trawling/ dredging, weighted lines)	Yes	No	Yes	No	No	tbd per site ⁴
Industrial Fishing ^{1,2}	Yes	No	Yes	No	No	tbd per site ⁴
Other non-artisanal fishing ^{1,3}	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁵
Non-commercial sand, gravel and aggregate mining	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁶
Fish Aggregating Devices (FADs)	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Anchoring/walking/standing	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Traps, Pens and Fences	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Gleaning	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Hand spearing	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Netting (mesh, gill, cast, etc)	Yes	tbd per site ⁴	Yes	No	No	tbd per site ⁴
Hand-line Fishing	Yes	tbd per site ⁴	Yes	Yes	No	tbd per site ⁴
Tow-line fishing	Yes	tbd per site ⁴	Yes	Yes	No	tbd per site ⁴
Non-extractive uses (diving, swimming, snorkelling, kayaking, sailing, boating, canoeing, etc)	Yes	tbd per site ⁴	Yes	Yes	Yes	tbd per site ⁴
Mariculture ^{1a}	Yes	tbd per site ⁴	Yes	No	No	No
Works (dredging, reclamation, building, laying cables) ¹	Yes	tbd per site ⁵	Yes	No	No	No
Artificial modification (e.g. beach nourishment, restocking ⁵ , artificial reefs ⁹)	Yes	tbd per site ⁴	Yes	No	No	No
Ecosystem restoration (e.g. coral or clam re-introduction, stock enhancement ⁸ , removal of crown-of-thorns starfish)	Yes	tbd per site ⁴	Yes	Yes	Yes	Yes
Research	Yes	tbd per site ⁴	Yes	Yes	Yes	Yes
Dumping of solid and liquid waste including sewage and ballast water from marine vessels beyond 12nm	Yes	No	No	No	No	No
Baitfishing	tbd per site	tbd per site ⁴	tbd per site	No	No	No
Prescribed development	Development consent only (CD)	DC	DC	No	No	No
Research	By permit	By permit	By permit	By permit	By permit	By permit

Solomon Islands Ocean Zone Application Guidelines for Marine Spatial Planning

In 2017, the *Oceans12* Technical Working Group identified that it would be helpful to have guidelines to assist in making decisions about how to apply zoning and where to place the various types of Ocean Zones. Ocean Zone Application Guidelines help guide decisions on where to best place different zones within the ocean. This is particularly important when developing a nation-wide marine spatial plan that must meet a variety of ecological, social and economic objectives – as the Solomon Islands is doing.

To support the Solomon Island's Government efforts to establish a nation-wide marine spatial plan the MACBIO³ Project was commissioned to review the biophysical design principles for offshore networks of no-take MPAs and additionally draft a set of socioeconomic, cultural and management feasibility principles using global best practice.

Internationally, Ocean Zone Application Guidelines are made up of two different types of design principles:

1. Socio-economic, cultural and management feasibility design principles; and
2. Biophysical design principles.

The socioeconomic, cultural and management feasibility design principles are aimed at achieving a variety of social, economic, cultural and management feasibility objectives. The biophysical design principles are aimed at supporting the integrity of the marine environment upon which all human benefits rely. Together, these principles make up the 'Ocean Zone Application Guidelines' and are recommended for use during the development of Solomon Islands' Marine Spatial Plan.

Ocean Zone Application Guidelines for offshore versus inshore areas

As indicated above, the Ocean Zone Application Guidelines (which include the biophysical principles and the socio-economic principles) below are largely intended to be used in management of the ocean beyond the reef edge. However, they may, of course, be used by communities in their coastal environments, which is why the guidelines do make reference, also, to inshore environments.

Guidelines for ocean zones to be placed within community areas

Local communities and the Government are encouraged to ensure 100% management of their coastal and marine environment including through use of Community Based Fishery Management (CBFM) and Locally Managed Marine Areas (LMMAs). The ocean zones, which are mainly intended to be used in management of the ocean beyond the reef edge, may, of course, be used by communities in their coastal environments and even within their LMMAs, if they wish.

Ocean zones differ from LMMAs and other spatially-defined community management areas in that the activities that are and are not allowed within each type of ocean zone is prescribed and standardized across the Solomon Islands (with the exception of Special, Unique Ocean Zones).

Any ocean zone can be applied within coastal environments but only with the agreement of local communities and in the location(s) identified by those communities.

³ Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO). See <http://macbio-pacific.info/>

Socio-Economic, Cultural & Management Feasibility Application Guidelines for placement of ocean zones

There are four (4) key socio-economic and cultural (SEC) principles and the respective guidelines apply to all types of ocean zones.

Principles	Ocean Zone design considerations ⁴
SEC Principle 1: Maximise complementarity of ocean zones with human values, activities and opportunities	<p>Ocean zones have been identified through a comprehensive consultative process that is participatory, balanced, open and transparent;</p> <p>Ocean zones are designed to minimise conflict with communities and other stakeholder's aspirations for their ocean;</p> <p>Local communities or other stakeholders have identified areas that would benefit from the range of ocean zones;</p> <p>Protect areas that the community identifies as special or unique e.g. places of biological, cultural, aesthetic, historic, physical, social or scientific value;</p> <p>Ocean zones are chosen to minimise conflict with non-commercial extractive users such as subsistence fishers;</p> <p>Ocean zones are chosen to minimise conflict with commercial extractive users; and</p> <p>Ocean zones are chosen to minimise conflict with all non-extractive users.</p>
SEC Principle 2: Ensure that final site selection of ocean zones recognizes social, cultural and economic costs and benefits	<p>Consider relative social costs and benefits, including community resilience;</p> <p>Include protection, if desired by communities, of social, cultural, historical or other values as identified by communities;</p> <p>Spatial equity of opportunity within and between communities who may use resources beyond their coastal environment;</p> <p>Consider planned and approved future activities; and</p> <p>Consider requirements for monitoring the effectiveness of the ocean zones.</p>

⁴ Multiple scientific sources have been reviewed to provide these rationales and can be accessed as per this footnote. FAO. 2011. Fisheries management, MPAs and fisheries. FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 4. FAO, Rome; Baker JL 2000. Guide to MPAs. DEH, South Australia; Weeks et al. 2017. Using reef fish movement to inform marine reserve design. J. Appl. Ecol. 54: 145-152; Day JC & Roff JC 2000. Planning for Representative MPAs. Report to WWF Canada, Toronto; Davey AG (1998). National System Planning for Protected Areas. IUCN, Gland; Lewis et al. 2017. Large-Scale MPAs: Guidelines for design and management. Best Practice Protected Area Guidelines Series, No. 26, Gland; Lundquist CJ & Granek EF. 2005. Strategies for successful marine conservation: integrating socio-economic, political, and scientific factors. Conserv. Biol. 19(6):1771–1778; GBRMPA 2002. Social, economic, cultural and management feasibility operational principles. GBRMPA, Townsville; The Ecology Centre, UQ 2009. Scientific principles for design of MPAs in Australia. UQ, Brisbane; Green et al. 2007. Scientific design of a resilient network of MPAs, Kimbe Bay, West New Britain, PNG. TNC Pacific Island countries Report No. 2/07. TNC, Brisbane; Reef Resilience Network 2018. Coral Reef Module, Socioeconomic Criteria. TNC, Seattle; Mangubhai et al. 2015. Explicitly incorporating socioeconomic criteria and data into MPA zoning. Coast Manage. 116. 10.1016/j.ocecoaman.2015.08.018; Geange et al. 2017. Integrating conservation and economic objectives in MPA network planning. Biol. Conserv. 210. 10.1016/j.biocon.2017.04.011.

Principles	Ocean Zone design considerations
SEC Principle 3: Maximise placement of ocean zones in locations which complement and consider present and future management and tenure arrangements	Existing or proposed management plans or other related management arrangement for marine areas by national, provincial or local government authorities and local communities; and Existing or proposed tenure and management strategies for adjacent coastal areas (mainland and islands).
SEC Principle 4: Maximise community and public understanding and acceptance of new ocean zones, and facilitate compliance	Zones that are simple shapes and mainly straight edges; Zones with boundaries that are easily identified; A minimum width of "buffer" added to the edge of each zone to mitigate against non-compliance; and Fewer, larger zones rather than more, smaller zones (facilitate/promote cooperation between communities to reach this goal)

Biophysical Ocean Zone Application Guidelines for use outside community, coastal environments

Unlike the socio-economic, cultural and management feasibility guidelines, above, different biophysical guidelines apply to each type of ocean zone beginning first with the zone which offers the highest level of protection.

Biophysical guidelines - No-Take Zone (NTZ) – Red

Objective: To protect natural biodiversity along with its underlying ecological structure, support natural environmental and fisheries processes and replenishment, and to promote education and recreation by restricting all extractive uses.

Principles	Rationale and notes ⁵
NTZ Principle 1: Include at least 20% of each bioregion in NTZ	Protection of all fish habitats, all plants and animals and of entire ecosystem health, integrity and resilience can be achieved only if adequate examples of every habitat are included in no-take areas. To ensure achievement of biodiversity and ecosystem resilience objectives, best available science informs that at least 20 percent of the marine environment should be included in no-take areas. If aiming to protect species with lower reproductive output or delayed maturation (e.g. sharks or some groupers) more area will be required. Recent work indicated that in diverse, unassessed or poorly regulated fisheries, to maintain fish productivity, 20-30% of the marine environment should be protected in no-take areas. Lesser levels of protection were likely to fail to achieve fishery benefits.
NTZ Principle 2: Ensure a minimum amount of each community type, habitat and physical environment type in the overall network is included in NTZs⁷	In general, marine habitats are connected and interdependent either physically or biologically or both. To ensure future sustainability of Solomon Islands entire marine environment, examples of the full range of biophysical habitats must be included in NTZ. This includes minimum amounts of, for example, algal gardens, seagrass beds, mangroves, coral reefs, canyons, seamounts etc., to be included in NTZs. Where possible, physically adjacent habitats should be protected in NTZs to optimise potential connectivity between them, including different geomorphological habitats at depth.

⁵ Multiple scientific sources have been reviewed to provide these rationales and can be accessed as per this footnote. Ceccarelli DM (in prep) Offshore MPA biophysical design guidelines for ocean protection – a literature review. Report to MACBIO. Suva: GIZ, IUCN, SPREP; Pers. Comm. N Krueck (https://www.coralcoe.org.au/crs_event/marine-reserve-network-design-for-unregulated-fisheries Accessed 31 May 2016); Fernandes, L., Green, A., Tanzer, J., White, A., Alino, P.M., Jompa, J., Lokani, P., Soemodinoto, A., Knight, M., Pomeroy, R., Possingham, H., and R. Pressey. 2012. Biophysical principles for designing resilient networks of marine protected areas to integrate fisheries, biodiversity and climate change objectives in the Coral Triangle. Report prepared by TNC for the CTSP, 152 pp. (<http://earth2ocean.com/publications.html> Accessed 31 May 2016); Environment Australia 2003 A User's Guide to Identifying Candidate Areas for a Regional Representative System of Marine Protected Areas. Australian Government, Canberra. (<http://www.environment.gov.au/resource/australias-south-east-marine-regional-users-guide-identifying-candidate-areas-a-regional> Accessed 31 May 2016); C M Roberts, JP Hawkins, J Fletcher, S Hands, K Raab and S Ward. 2010. Guidance on the size and spacing of Marine Protected Areas in England. Commissioned Report prepared for Natural England.

⁷ Shelf valleys, slope terraces, slope, abyssal and hadal escarpments, shelf-incising canyons connected to river systems, other shelf incising river systems, blind canyons, basins, ridges, troughs, bridges, fans 10% each; trenches and plateaus 15% each; shelf, abyssal and hadal sills, each type of seamounts 20% each; coral reefs and oceanic islands that emerge from >80m 25%; epipelagic, mesopelagic, bathypelagic, abyssopelagic, hadopelagic and any other habitats 20-30%.

Principles	Rationale and notes
NTZ Principle 3: Have at least 3 replicate NTZs per bioregion	Replication of protection minimizes risk that all examples of a bioregion will be adversely impacted by the same disturbance. If some well-distributed protected bioregion areas survive an impact, then they may act as a source of recovery of other damaged areas. Replication also helps enhance representation of biological heterogeneity within bioregions that are less understood.
NTZ Principle 4: Ensure that NTZs include critical habitats and biologically or physically special or unique sites	<p>These places might not otherwise be included in the network but will help ensure that the network is comprehensive and adequate to protect biodiversity and the known special or unique areas. This may include, for example, areas important for fish aggregation, nurseries or spawning, turtle or seabird foraging, whale calving or migration, biodiversity, endemism, productivity or threatened species. It may include special or unique geomorphological features, or rare organisms or habitats or isolated habitats.</p> <p>Productive areas are important due to their contribution to ecosystem functioning and potential for high biodiversity. Some areas may have been productive in the past, may be known to be productive now, or may be inferred from the activities of indicator organisms. For example, seabirds, fish and marine mammals commonly use productive waters.</p>
NTZ Principle 5: Have larger (versus smaller) areas	For the same amount of area to be protected, protect fewer, larger areas rather than more smaller areas, particularly to minimise 'edge effects' resulting from use of the surrounding areas. This will also simplify compliance. Nearer to shore (from the reef edge out to about the 80m depth contour, so outside coastal community areas) these might be at least 2-10km across; more offshore (beyond the 80m depth contour) these should be at 50-200km across. Incidentally, science recommends inshore no-take areas (within the reef edge) to be at least 0.2km ² to 2km across with a minimum diameter of 400m.
NTZ Principle 6: Separate NTZs by 5 to 20 km apart (with a mode of ~1 to 10 km) in near-shore areas within or around archipelagic waters; 20- 200km offshore	Tropical marine species are demographically connected at much smaller scales than previously thought. For example, in inshore coastal areas (within reef edges) connectivity occurs mainly from 100s of metres up to about 5 km. Connectivity nearshore (i.e. beyond the reef edge out to about 80m depth contour) and in the open ocean (beyond 80m depth) is over much greater distances (5-20km) and 20-200km respectively). Connected NTZs will allow self-replenishment thus ensuing internal integrity and sustainability of all the NTZs as a network.
NTZ Principle 7: Maximise use of environmental information to determine the configuration and location of NTZs to form viable networks	The network of areas should accommodate what is known about migration patterns, currents and connectivity among habitats.

Biophysical guidelines - Limited Use Zone (LUZ) – Orange

NOTE: Much of the rationale and notes applied to the NTZ design principles also apply to LUZ design principles. See table above for more details.

Zone Objective: To protect the integrity of habitats, biodiversity, food security and livelihoods by allowing limited fishing, including limited non-artisanal fishing, as well as non-extractive activities that do not directly impact habitats.

LUZ Principle 1: Locate LUZs where activities that damage habitats should not occur and which have not been protected in NTZs.

LUZ Principle 2: Where biologically important areas for marine resources, critical habitats, biologically or physically special or unique areas have not been protected in NTZs, and require additional protection, apply LUZs

LUZ Principle 3: Have larger (versus smaller) LUZs (as per Principle 5, above)

LUZ Principle 4: Have LUZs at distances apart that ensure connectivity (as per Principle 6, above)

LUZ Principle 5: Maximise the use of environmental information to determine the location of LUZs.

LUZ Principle 6: Where physically distinct habitats are included in LUZs, the entire feature and, where possible, adjacent habitat, should be incorporated.

LUZ Principle 7: These Ocean Management Areas should be in place for 20-40 years or, if possible, permanently

Biophysical guidelines - Sustainable Use Zone (SUZ) – Blue

NOTE: Some of the rationale and notes applied to the NTZ design principles also apply to SUZ design principles)

Objective: To allow for sustainable use of Solomon Islands' renewable marine resources including non-artisanal commercial fishing.

SUZ Principle 1: Apply SUZs in locations that would bring fisheries benefits if protected but not yet protected under NTZs or LUZs.

SUZ Principle 2: Where important areas for marine resources, critical habitats, biologically or physically special or unique areas have not been protected in NTZs or LUZs and require some protection, apply SUZs

SUZ Principle 3: Have larger (versus smaller) SUZs.

SUZ Principle 4: Maximise the use of environmental information to determine the location of SUZs.

SUZ Principle 5: Where physically distinct habitats are included in SUZs, the entire feature and, where possible, adjacent habitat, should be incorporated.

Biophysical guidelines - Special, Unique Zone (SPZ) – Pink

NOTE: Activities that negatively impact on the health or survival of the species, habitat and/or cultural value that the SPZ is intended to protect are not to be allowed, regardless of any license or permit

Objective: To protect, conserve and restore specific species, habitats or cultural value of concern by eliminating the key threats.

SPZ Principle 1: Apply SPZs in locations of importance for special, unique and/or threatened species, habitats or cultural features that are not already protected within NTZs, LUZs or SUZs and where additional protection would benefit identified habitats, species or cultural features.

SPZ Principle 2: The SPZ should include the entire feature of interest including a 5km buffer.

SPZ Principle 3: The duration of the SPZ should align with the requirements of the species, habitat and/or cultural value being protected and the nature of the threat from which it is to be protected.

Biophysical guidelines - General Use Zone (GUZ) – Transparent

Objective: To allow for and manage multiple uses of Solomon Islands' marine environment.

GUZs should be located everywhere that other zones are not located including in coastal areas not otherwise formally protected. All informal community-based rules or LMMA rules remain in place.

Developing these Ocean Zone and their Application Guidelines is part of the Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) project.

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