



SEYCHELLES MARINE SPATIAL PLANNING (MSP) INITIATIVE

ZONING PROPOSAL FOR THE SEYCHELLES EXCLUSIVE ECONOMIC ZONE

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1. Introduction and context

Marine Spatial Planning (MSP) is a "public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process" (Ehler and Douvere 2009). It can be used in the context of ecosystem-based management¹ to address both human and ecosystem needs and move from a sector-by-sector to an integrated management approach. MSP varies regionally and by country because of the differences in public policies and legislation (TNC 2009). Marine areas may have different objectives and management agencies may use different combinations of tools, including zoning (Norse 2005).

A discussion about zoning and decisions for zoning terminology are helpful before embarking on analyses to resolve spatial designations because it is important to know how the spatial designations will or could be implemented. For example, are they being implemented through legal means, i.e., regulations or legislation, or will the spatial designations be implemented through voluntary, policy or non-legal means? What is the definition of the uses or activities? Who will implement zoning? The capacity of institutions and governments to manage zoning should be evaluated to ensure implementation. At this time, there is not the capacity within the Seychelles MSP Initiative to do a capacity needs assessment thus it would be considered for the next phase of planning, or as soon as resources can be allocated.

Zoning has its origins in terrestrial planning, for example community or urban planning. Zoning in urban areas is the mechanism used by local governments to regulate the use, density and location of uses that a landowner can put on a piece of land. In the ocean, property rights and ownership are more akin to strategic land use planning rather than regulating private parcels - common property resources managed by several jurisdictions. The marine environment is extremely dynamic, especially compared to terrestrial environments, thus zones may need to be developed to account for both temporal and spatial variability (Norse 2005). Long distances may separate uses in time and space so intensity and frequency also need to be considered.

Marine spatial planning that uses zoning based on legal designations will mean that draft spatial designations are to be implemented using regulatory measures and authorized through legislation. Comprehensive zoning, such as being undertaken in the Seychelles, differs from single-use based planning such as permitting through Acts, or only creating marine protected areas (Norse 2005; Young et al 2007).

The Seychelles Marine Spatial Planning (MSP) Initiative is a process focused on planning for and management of the sustainable and long-term use and health of the Seychelles Exclusive Economic Zone, a marine area covering 1,374,000km² and encompassing the Seychelles archipelago of 115 islands. The MSP Initiative is a Government-led process, with planning and facilitation of the Initiative managed by a partnership between The Nature Conservancy (TNC) and the Government of Seychelles (GOS) - United Nations Development Programme (UNDP) - Global Environmental Facility (GEF) Programme Coordinating Unit (PCU) - GOS/UNDP/GEF. Funding for the Initiative is being provided through a number of GOS/UNDP/GEF grants as well as an Oceans 5 grant awarded to The Nature Conservancy. The Seychelles Marine Spatial Planning Initiative takes an integrated, multi-sector approach. The process will include input from the major sectors of the Seychelles which use the country's marine space such as fishing,

¹ Ecosystem-based management is an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities.



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tourism, conservation and petroleum development in order to develop a holistic climate-smart multi-use design, integrating the new challenges created by climate change into planning and management efforts.

This multi-use design of the Seychelles MSP Initiative will serve as the basis for guiding the strategies and decisions of the Seychelles Conservation & Climate Adaptation Trust (SeyCCAT) established as part of the Government of Seychelles-led Debt-for-Climate-Change-Adaptation swap². Phase I of the MSP Initiative (February 2014 – June 2015) will produce zoning design options, zoning tools, and draft management strategies (a draft zoning map) as a basis for further development and implementation of the national multi-use plan.

Several marine processes are underway in the Seychelles including a GOS-UNDP-GEF project 'Strengthening Seychelles' Protected Area System through NGO management modalities'³, led by Dr. Rebecca Klaus. The goal of the protected area project is to 'facilitate working partnerships between diverse government and non-government partners in the planning and management of the protected area system in Seychelles'. This protected area project will provide key outputs that will be useful for the Seychelles MSP Initiative, particularly for defining zones with objectives for biodiversity conservation, selecting new protected areas, and identifying potential conflicts amongst all uses. The process for incorporating the results of the Protected Area strategy and other planning processes underway in the Seychelles will be addressed by the MSP Initiative's Steering Committee as per the Initiative's governance model⁴.

Finally, there are government initiatives to promote sustainability in the Seychelles and other Small Island Developing States including the Blue Economy. The Seychelles have developed a concept paper for the Blue Economy⁵ (see glossary for definition) and the European Union recently announced the role of the Blue Economy to realise its goals for the Europe 2020 strategy⁶. The Seychelles is supporting the development of a 'blue economy' that will lead to a more inclusive global development agenda that emphasizes the economic growth potential of the seas while protecting maritime resources. In the Seychelles, on-going maritime security efforts can be matched by a focus on sustainability, resilience and responsibility, leading to economic prosperity for East Africa's coastal and island states⁷.

The Seychelles MSP Initiative, which includes zoning, is intended to incorporate, capture, or connect to other planning processes in the Seychelles, existing management plans for fisheries and other uses, national initiatives and policies, and international obligations including the Debt-for-Climate-Change-Adaptation swap, the GOS-UNDP-GEF Protected Area Strategy and the Blue Economy. If these or other important initiatives are not captured, please share your comments.

The purpose of this document is to provide a short background on zoning approaches, highlight some of the general approaches and challenges to zoning worldwide, summarise input from stakeholder

² MSP Initiative Overview: <http://www.seychellesmarinespatialplanning.com>

³ GOS-UNDP-GEF Protected Areas Strategy: <http://www.pcusey.sc/index.php/top-media-menu/news-menu/84-news/74-new-protected-area-policy-for-seychelles>

⁴ Seychelles MSP Initiative website: <http://www.seychellesmarinespatialplanning.com/structure/>

⁵ Government of Seychelles. 2013. Seychelles Concept Paper on the Blue Economy. September 2013. Unpublished report. 13 pp

⁶ European Union Blue Economy: http://ec.europa.eu/maritimeaffairs/policy/blue_growth/

⁷ Seychelles Blue Economy: <http://www.chathamhouse.org/event/blue-economy-seychelles'-vision-sustainable-development-indian-ocean>



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engagement received to date on a vision for the Seychelles marine environment and planning needs. This document is a draft proposal for zoning in the Seychelles Exclusive Economic Zone. The draft proposal has been reviewed by the MSP Technical Working Group and is being presented to the Steering Committee for their review and approval for presentation and discussion with the stakeholder group at the Workshop #3 in August 2014. The draft zoning proposal will be used to develop draft zones using spatial data layers and non-spatial information from August - December. Zoning is an iterative process (see Section 7), and an on-going aspect is to obtain the spatial locations for uses to support the development of zones and accompanying management plans. As information is provided to the MSP process, the zones will be reviewed and revised, as needed or where necessary.

2. Approaches to zoning

One of the first things to define in a zoning process is the type of zones, or defining your approach. Across the spectrum of marine and ocean plans around the world, the type and number of zones varies according to local needs, uses and activities, and enabling legislation and laws. Zones have been created to manage many activities including: recreation, education, research, cultural, park, military, mineral extraction, shipping-transport-transit, disposal, fisheries, oil and gas, cable infrastructure, anchorages-ports, fisheries, aquaculture, renewable energy, ship wrecks, and non-extractive commercial uses.

The number of zones or categories in a single marine plan has typically ranged from four to eight, with most plans having fewer than six zones in recent years. It is generally recognized that fewer zones are better than many zones for simplification of planning, management and compliance.

There are several approaches to zoning that may be appropriate for the Seychelles: use based, ecologically based, objective based and other.

- a. Use based
 - allocate uses based on existing or historic use patterns, or the status quo;
 - *use-based* divisions such as fishing, transportation, marina;
 - *single use divisions* where only one use in a particular area is permitted, all other uses are banned (likely fragile, rare, high value functions, irreplaceable areas);
 - *dominant use* features a single, priority use but allow managers to permit uses compatible with the purpose of the zone or the dominant use;
 - *compatible use* divisions combine uses that don't impede each other
- b. Ecologically Based
 - based on relative ecological importance of areas within the region, and inherent vulnerabilities of different habitats or species;
 - allocate intensive use in areas that are already impacted;
 - ensure neighbouring zones are compatible (transitions, buffers);
- c. Objective Based
 - objective-based divisions such as development, conservation, multi-use;
 - determine highest or best use, which could include conservation or human uses;
 - provisions can be written so as to preclude most exceptional uses, or to allow exceptional uses on a more regular basis depending on the balance needed between stability and flexibility;
- d. Other characteristics
 - *vertical zoning* can consider the water column, air shed and seabed separately;
 - *temporal zoning* can vary by time of year, or be full time; or be temporary or permanent



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- *proscriptive zoning* - identifies what you cannot do. Limit the ability to set objectives enabling compatible activities;
- *prescriptive zoning* - identifies what you can do and how. The tools also tend to be all or nothing. An activity is permitted or not. This limits the ability to set objectives for uses, to allow more flexibility to identify when an activity or use can occur.

3. Zoning examples

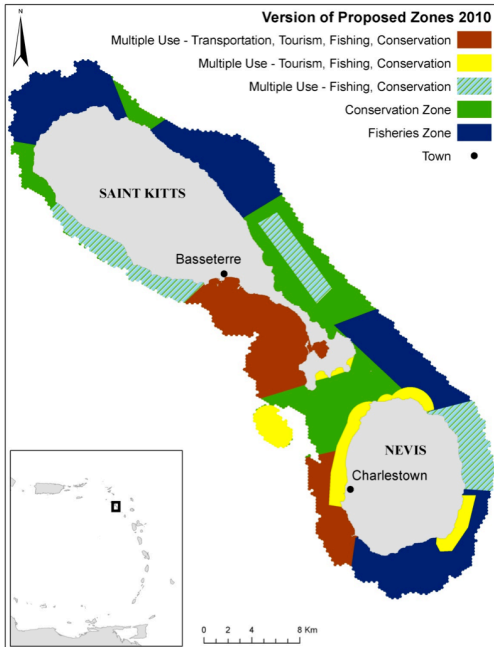


Figure 1. An example of a hybrid use-based and objective-based approach to zoning from St Kitts and Nevis, Caribbean (source: Agostini et al., 2010)

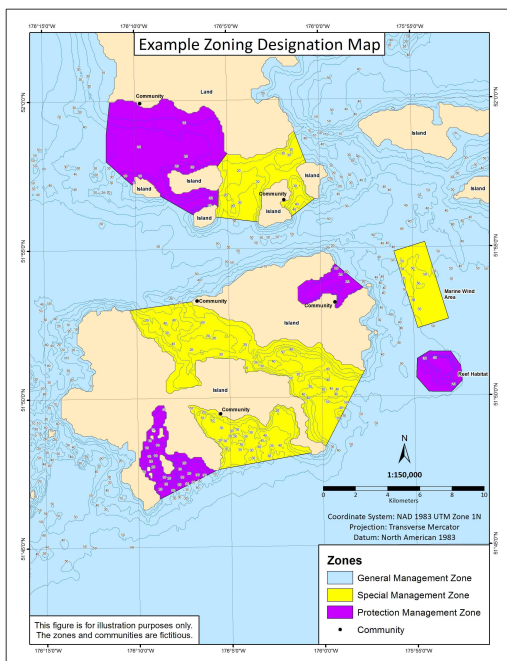


Figure 2. An example of an objective-based zoning approach from British Columbia, Canada. (source: MaPP 2013)



4. Challenges for zoning

When considering an approach, it is important to understand the challenges that may be present in the planning area to create and implement zoning. Generally speaking, zoning can be challenging to implement because of scientific, social and political obstacles (Agardy 2010 a, b). Some of these challenges arise due to:

- handling the technical, legal and political complexities of multi-objective ocean zoning;
- competing interests with different or conflicting values attached to specific locations;
- lengthy time horizons for formalising zones;
- zoning for a dynamic ecosystem;
- possible lack of legislative tools (e.g., laws, regulations);
- lack of legal flexibility;
- discussions on property rights and resource ownership (Eagle et al., 2008; Edwards 2008); and
- capacity to implement zones.

5. Zoning in the Seychelles

I. Brainstorming zoning needs

To begin the process of determining what types of zones are appropriate in the Seychelles, a brainstorming exercise was done during workshop #2 (May 2014) to create a list of possible zones types, zone names or zone categories based on the perception of the types of activities that need zoning in the Seychelles, or that would benefit from zoning. This zoning discussion built upon a future visioning exercise that was undertaken during workshop #1 (Feb 2014), an exercise that helps to clarify answers to the question of "what are you planning for?". The resulting list of possible zones or activities to be zoned was not filtered or edited, and served as information to develop a draft zoning approach and propose zone types for the Seychelles:

- Sustainable tourism zones
- Temporal closure zones
- Renewable energy harnessing zones
- Biodiversity habitat protection zones
- Fisheries zones
- (International) shipping lanes/zones
- Recreational zones
- Expansion zones for ecosystem services; areas that may become vulnerable in the future due to climate change effects like sea level rise e.g., mangroves.
- Extraction zones for petroleum, minerals and aggregates
- Cultural zones
- Reclamation zones
- Military zones (possibly in the future).

II. Considerations for zoning

In addition to names for zones or zone types, additional considerations were shared for the Seychelles MSP Initiative to consider while drafting a zoning proposal. The following Seychelles-specific considerations were generated during a group discussion at workshop #2 in May 2014:



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- Harmonise and integrate the zones designated or proposed under the existing and revised Fisheries Acts and Protected Areas policy
- Recognise the specific characteristics of each of the outer islands, e.g., those with lagoons as well as the integration of sustainable tourism and artisanal fisheries.
- Consider ongoing uses and measures outside the Seychelles EEZ which may impact the ecosystems, species, processes and uses within it
- Use “best zones” instead of exclusion zones, as in best use areas.
- Highlight the gaps in marine data, but do not be stalled by these
- Reflect the practicality of managing zones given the size of the EEZ and the current limited capacity for both management and enforcement. This should be reflected in the management objectives.
- Consider potential future uses (such as renewable energy), climate change impacts and ecosystems services, bearing in mind the lack of data and uncertainty surrounding these uses.
- Balance uses and priorities, including overlapping of uses can be achieved through effective stakeholder consultation that draws on inputs from the proposed Technical Working Groups.
- Evaluate the benefits of no take areas and fishery closures as management tools.

III. DRAFT zoning process

Throughout the entire zoning process, consultation and input by all stakeholders is received as per the Seychelles MSP Initiative governance framework. The zoning process proposed for the Seychelles includes both spatial and non-spatial components and consists of multiple steps. Geographic boundaries of zones will be captured and the non-spatial management directions for uses and activities within the zone will be developed. While the zoning process steps appear sequential (listed below), it is intended to be an iterative process, as the steps do not always progress linearly. Several steps may be completed simultaneously, some steps may be only partly completed because information is missing or not available at this time, and steps can be repeated or revisited as new information becomes available. Currently, steps 1-3 are underway, and this document begins steps 4-9.

Draft zoning process:

1. Review existing plans, literature, guidelines for the Seychelles
2. Review global “lessons learned”
3. Gather and review data layers for environment, existing human uses and activities, future potential uses and activities, cultural heritage, historical marine artifacts, governance and administration, and other sources relevant for the planning boundary
4. Develop a zoning process
5. Define zoning scale and scope
6. Draft zoning objectives
7. Decide upon zoning approach and develop names and types of zones
8. Clearly articulate criteria for defining the spatial extents of the zones
9. Develop spatial and non-spatial tools to support development of zones (e.g., compatibility matrix for uses and activities, web-based or interactive spatial tools to display data and sketch zone boundaries, Marxan or Marzone, Recommended Uses Table, definitions of marine uses and activities)
10. Analyse information and data for existing and future uses and activities
11. Draft zones, with management objectives and directions for each zone
12. Review and discuss with government, stakeholder and public
13. Assess, review and adjust zones and management directions.



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IV. Zoning area, scale and scope (Step 5)

The Republic of Seychelles consists of 115 islands across 1,374,000 km² of ocean. The Seychelles archipelago is divided into two distinct geological collections: 1) the Mahe group of 43 granitic islands (with hills and mountains), and the outlying islands and 2) the coralline group of 72 or more islands that are at, or slightly above, sea level (Seychelles Statistical Bureau 2013). Zoning covers all of the marine waters (including species, habitats and ecological processes that support marine life) of the Seychelles EEZ, from 0-200 nautical miles (approximately, actual distance may be longer in some parts of the EEZ). The planning scope is focused on seven major thematic sectors or uses, which are (in no particular order):

- Fisheries
- Tourism
- Marine Transportation and shipping (local and international)
- Renewable energy
- Biodiversity conservation
- Cultural heritage
- Extraction (petroleum, mining, aggregates, non-renewable energy).

V. DRAFT zoning objectives (Step 6)

Developing objectives for zoning clarifies the overall intention of the zones. These objectives can be used during implementation to measure the performance, or success, of the plan to achieve the intended benefits. The benefits of zoning are many, and include reducing spatial and temporal conflicts between existing and future uses, increasing business certainty, increasing business efficiencies for tenures, permits or licenses, and protecting social, cultural and ecological values or areas.

Draft objectives for zoning in the Seychelles EEZ:

- Reduce spatial conflicts among uses
- Identifying management directions for all uses
- Provide overall guidance for resource managers to increase business certainty and increase business efficiency in the Seychelles marine environment.
- Identify areas for enhanced management for cultural, ecological, and social objectives.

VI. DRAFT zoning scheme: approach, types, objectives and names (Step 7)

The proposed zoning approach for the Seychelles is to use a hybrid of "objective" and "use" based zoning, with an emphasis on identifying and defining objectives and then specifying targeted uses (see Section 2). This approach is proposed for several reasons. Firstly, a use-based approach requires quite a lot of data in order to delineate zones. At this point in the planning process, data layers for uses and activities are relatively sparse thus it is not possible to allocate space based on specific uses alone. Secondly, the vision for the Seychelles is to plan for existing and future uses. By using an objective based zoning approach, it will be flexible enough to include existing uses and possible future uses; zoning will be able to adapt over time to as yet unforeseen activities. Finally, an objective-based approach clearly emphasizes or identifies to the marine users, public, and resource managers the purpose of the zone. Management, enforcement and regulation of the zone can be mandated by the primary objective rather than by each individual use.

Zoning is a process with two components: spatial and non-spatial. The spatial aspects of zoning are often what people think of first however, zoning requires more than geographic boundaries on a chart or map –



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zoning requires management directions and/or objectives for each zone that addresses questions that will arise from users such as: What is the objective of the zone? What activities are permitted, allowable or recommended in the zone? Are there any activities that are excluded? How is the zone regulated or enforced? Who will implement the zones? The Technical Working Group noted that the capacity of institutions and governments to manage the zoned areas needs to be evaluated since there is no use zoning if capacity for implementation is lacking. At this time, there is insufficient capacity within the planning process to conduct a capacity needs assessment and is something that can be planned for the next phase of planning, or as resources are identified by the Government of Seychelles.

For the MSP Initiative, five zone types are proposed. At this time, the zones are labeled A through E, with suggested names and alternatives. Zone names will be created based on input from the Technical Working Group, Steering Committee, stakeholders and scientific or technical advisors to the process. The zone types were developed after careful consideration of advice from the stakeholder workshop in May 2014, Technical Working Group workshop in July 2014, as well as review of marine plans around the world, consideration of the challenges in implementation and governance, lessons learned from other processes, emerging economic opportunities, climate change adaptation, conservation, and balancing innovation with practicality.

In summary, the five zones proposed for the Seychelles EEZ includes:

- minimising conflicts between or among uses and activities, now and in the future
- providing business certainty, now and in the future
- maximising opportunities for sustainable marine uses (e.g., fisheries, tourism, recreation)
- identifying links to national policy and international obligations (e.g., Blue Economy)
- identifying links to parallel planning processes in the Seychelles (e.g., UNDP Protected Area Strategy and SFA Fisheries Management Plans)
- objectives for food security and fisheries
- objectives for essential services and marine infrastructure
- objectives for biodiversity and marine conservation
- objectives for ecosystem services.

At this time, it is recommended that zones encompass the 3-dimensional space of the ocean, from the sea surface to the seabed. In other words, there are not multiple zones at various depths or vertical zoning. The advantage of having one zone from the surface to the sea floor is primarily for implementation. Zoning for the airshed above the ocean or in adjacent valleys is not recommended at this time, but could be considered in the future to address greenhouse gases, or air pollution, that affect the ocean and human communities.

The following are five proposed zone types for the Seychelles EEZ (Table 1). The suggested names, objectives, sample management conditions, targeted uses, potential future uses and considerations are all provided for context and discussion during the review of this zoning proposal. A short list of targeted uses is included that reflect the activities that the zone is meant to plan for specifically. In addition, there will be allowable or compatible uses that could occur in that zone and still allow the Government of Seychelles to meet the objective(s) of a particular zone. The additional uses and activities that may be compatible or allowed are 'To Be Determined' (TBD) in the coming months with the development of draft Compatibility Matrix (Section 14) and Recommended Uses and Activities tables (Section 15).



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Table 1. Proposed zones for the Seychelles EEZ (draft version 1.3)

Zone	Suggested Name	Objective	Targeted Uses
A	<i>Food Security Zone</i>	To allocate space and guarantee access for food security, foreign exchange earning, and income generation from fisheries.	<ul style="list-style-type: none"> • Fishing - industrial (longline and purse seine) • Fishing - semi-industrial • Fishing - artisanal (trap, net, beach seine, handline, etc.) • Marine Aquaculture
B	<i>Marine Protected Area Zone</i>	To allocate space for conserving marine biological diversity and ecological processes within the Seychelles EEZ.	<ul style="list-style-type: none"> • Biodiversity • Cultural heritage • Subsistence fisheries
C	<i>Multi-use Zone: Marine Services and Infrastructure</i>	To allocate space (identify the footprint) for industrial infrastructure.	<ul style="list-style-type: none"> • Disposal at-sea sites • Ferries • Maritime security • Ports, marinas, harbours • Reclamation areas • Renewable Energy - wind • Shipping lanes • Telecommunications • Waste Management
D	<i>Non-Renewable Energy Zone</i>	To allocate space (identify the footprint) for non-renewable developments.	<ul style="list-style-type: none"> • Mining - minerals and aggregates • Non-renewable energy - petroleum
E	<i>Multi-use Zone: Tourism, Recreation and Culture</i>	To allocate space to maximise opportunities for sustainable tourism, recreation and appreciation of culture.	<ul style="list-style-type: none"> • Coastal accommodation • Fishing - recreation • Fishing - sport • Public recreation • Seychelles Culture • Sustainable Tourism

Zone A [insert name]

Suggested name: Food Security Zone

Other suggestion: Fisheries and Aquaculture Zone

The primary objective of this zone is to allocate space and guarantee access for food security, foreign exchange earning, and income generation from fisheries.

The objective provides business certainty now and in the future for fisheries and aims to minimise existing or future conflicts between fisheries and other marine uses or activities. The management plan for this zone is intended to be developed in conjunction with the Seychelles Fishing Authority fisheries management plans and be consistent with international agreements, laws and policies that pertain to fisheries in the Seychelles and Western Indian Ocean (e.g., Indian Ocean Tuna Commission, International Convention on Migratory Species, Blue Economy).

Sample Management conditions

- Use would have a management plan in place, or being drafted, to demonstrate sustainability or commitment to the blue economy approach; use does not erode or destroy ecological integrity or ecosystem services
- Compliance with all existing federal Acts, regulations and policies including permitting, licenses, and fees



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Targeted uses:

- Fishing - industrial (longline and purse seine)
- Fishing - semi-industrial
- Fishing - artisanal (trap, net, beach seine, handline, etc.)
- Marine Aquaculture
- etc.

Potential future uses

- Fishing - new gear types or species
- Marine Aquaculture - new species or locations

Compatible and/or Recommended Uses:

- TBD

Considerations in developing this zone:

- Fishing - recreation
- IUU fishing (illegal, unreported, unregulated)
- Piracy
- distribution and mapping of migratory species
- dynamic nature of fishing for pelagic species
- overlap with conflicting uses
- etc.

Zone B [insert name]

Suggested name: Marine Protected Area Zone

Other suggestions: Conservation Zone, Biodiversity Zone, Protection Zone

Note: the GOS-UNDP-GEF Protected Areas Strategy project will provide key information for the development of this zone.

The primary objective of this zone is to allocate space for conserving marine biological diversity and ecological processes within the Seychelles EEZ including genes, species, populations and habitats. The secondary objective of this zone is to plan for climate change adaptation as per commitments in the debt-for-climate adaptation swap. This secondary objective will also be relevant for all marine waters in the Seychelles as climate change will affect other objectives.

This zone is proposed to meet the Seychelles objectives for marine protected areas and is an important component for climate change adaptation and Seychelles initiatives to support this (e.g., Debt-for-Adaptation swap⁸). Marine protection zones may also be used to address and manage for ecosystem services however this will need more discussion to determine if the protection zone is the best place for an ecosystem services objective. In this zone, "replenishment" areas may be identified to conserve economically valuable fish populations.

⁸ MSP Initiative overview: <http://www.seychellesmarinespatialplanning.com>



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In this zone, the International Union for the Conservation of Nature (IUCN) categories for marine protected areas (Dudley 2008; Day et al, 2010) may be used to identify the level of protection once objectives for this zones, or the individual areas within this zone, are determined. The recommendations by the IUCN are to not determine the zone based on uses however the IUCN categories are sometimes used for guidance in defining areas and the level of protection that will be achieved. decisions that need to be made for this zone type include whether this zone does or does not include existing marine protected areas, or proposes new marine protections. Also, whether all areas in this zone must be considered for legal protection, or can they be managed using other tools?

Sample Management conditions

- Uses must not erode, harm, destroy or degrade biological diversity.
- Allowable uses will be permitted in consultation with appropriate agencies and regulatory authorities

Targeted uses:

- Biodiversity
- Cultural heritage
- Subsistence fisheries

Possible uses that might be compatible with a protection objective

- Sustainable Tourism
- Restocking adjacent areas (for fisheries)
- Public recreation
- etc.

Potential future uses:

- Biotechnology (e.g., biomedical)
- Carbon sequestration
- Education
- Oxygenation
- Research
- etc.

Compatible and/or Recommended Uses:

- TBD

Considerations:

- no-take areas
- identifying and managing for ecosystem services - consistent with this zone?
- buffer zones with neighbouring zones
- management of MPA: legal tools or other options
- overlap with conflicting uses
- migratory species and international obligations,
- etc.



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Zone C: [insert name]

Suggested name: Infrastructure Zone

Other suggestion: Multi-use Zone: Marine Services and Infrastructure; Essential Services Zone

The objective of this zone is to allocate space (identify the footprint) for industrial infrastructure.

The uses in this zone are not easily moveable, tend to be fixed in permanent or predictable locations or routes, and tend to be regulated by national or federal authorities. Renewable energy is included in this zone because the renewable energy technology and associated infrastructure tend to be long-term and fixed in space (e.g., wind turbines, transmission cables). The Seychelles national goal is for 15% of energy to come from renewable sources by 2030⁹. The general intent is to target uses within existing areas such as those located on the east coast of Mahe, Baie Ste Anne, and La Digue.

This zone provides business certainty now and in the future for industrial activities primarily from the public sector and government, that support the Seychelles economy and community infrastructure. The purpose of this zone is to minimise existing or future conflicts between marine infrastructure and other marine uses or activities. The uses in this zone tend to be fixed in location. Infrastructure, such as hotels, that is needed for the private sector is targeted in Zone E [Multiple Use Zone].

Sample Management conditions

- Uses are permitted in this zone according to their consistency with the objective.

Targeted uses

- Disposal at-sea and dredging
- Ferries
- Maritime security (e.g., Coast Guard, docks)
- Ports, marinas, harbours
- Reclamation areas
- Renewable Energy - wind
- Shipping lanes - international and local
- Telecommunications
- Waste Management
- etc.

Potential future uses:

- Utilities - desalination plants
- Ports - new uses

Compatible and/or Recommended Uses:

- TBD

Considerations

- marine pollution or sedimentation transport that may affect uses outside this zone

⁹ Masdar Port Victoria Wind Power Project in Seychelles: <http://www.masdar.ae/en/media/detail/seychelles-wind-farm>



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- buffer this zone for incompatible uses or activities
- Renewable energy could expand offshore. Renewable energy is normally located near the coast however proposals under the Ocean Thermal Energy Conversion (OTEC) project are considering pumping cold water from depth, an activity that would be located on the edge of the Mahe plateau.
- etc.

Zone D: [insert name]

Suggested name: Non-Renewable Energy Zone

Other suggestion: Multi-use Zone: Non-Renewable Energy and Mining

The objective of this zone is to allocate space (identify the footprint) for non-renewable developments such as petroleum and gas extraction and mining.

This zone would create business certainty now and in the future and minimise conflicts between the petroleum industry and other uses. The zone's objectives and management plans would link or connect to Seychelles national policies for petroleum development including exploration and transportation. The uses in this zone are large-scale, are not easily moveable, depend on exploration to locate economically viable opportunities for extraction, and tend to be regulated by national or federal authorities.

Sample Management conditions

- Compliance with all existing federal Acts, regulations and policies including permitting, licenses, and fees

Targeted uses:

- Mining - minerals and aggregates
- Non-renewable energy - petroleum

Potential future uses:

- Mining - deep sea
- Non-renewable energy - natural gas
- Shipping - LNG (liquefied natural gas)
- Shipping - petroleum
- Petroleum exploration - offshore

Compatible and/or Recommended Uses:

- TBD

Considerations

- overlap with conflicting uses
- existing licenses and tenures
- seismic exploration results, including in areas 2,000 m depth
- marine pollution that may affect uses outside this zone
- assigned/leased oil exploration zones on the central Mahe plateau
- PetroSeychelles areas for oil prospecting (see website)



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- upstream and downstream effects of activities
- etc.

Zone E: [insert name]

Suggested name: Multi-use Zone: Tourism, Recreation and Culture

Other suggestion: Special management Area for Tourism, Culture and Recreation

The objective of this zone is to allocate space to maximise opportunities for tourism, recreation and appreciation of culture.

The zone would create business certainty and protect non-economic values now and in the future for tourism, recreation, and culture. Some uses in this zone are seasonal and locations need to be secured to ensure opportunities are maintained from year to year when the marine resources are used.

Sample Management conditions

- Uses are permitted in this zone according to their consistency with the objective.

Targeted uses:

- Coastal accommodation
- Fishing - recreation
- Fishing - sport
- Public recreation (local population)
- Seychelles Culture
- Tourism
- etc.

Potential future uses:

- Mining - deep sea
- Non-renewable energy - natural gas
- Shipping - LNG (liquefied natural gas)
- Shipping - petroleum
- Petroleum exploration - offshore

Compatible and/or Recommended Uses:

- TBD

Considerations

- existing licenses and tenures
- local tourism
- recreation by the Seychelles public vs. recreation by tourists
- recreation and sports fishing - do they belong with tourism or fisheries?
- recreational fishing is nearshore and sport fishing is both nearshore and 5 nm off the dropoff.
- socio-economic impact of sports fishing relative to recreation fishing
- etc.



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VII. Implementation of zoning

Developing an implementation plan is an important component of a marine spatial planning process. An implementation plan typically covers several topics including governance, financing, monitoring, and evaluations. Some ideas for implementation relative to zoning were suggested by the MSP Technical Working Group in July 2014:

- Establish a process that would monitor the implementation status of each zone periodically to ensure that each zone is meeting its intended.
- The capacity of institutions /government to manage the zoned areas needs to be evaluated since there is no use in zoning if capacity for implementation is lacking. It was assumed that a capacity need assessment would be part of the process even at this early stage; a capacity assessment would be useful during the MSP process

VIII. Data and criteria for spatial extent of zones (Step 3 and 8)

The spatial locations of uses are needed in order to proceed with developing a draft zoning map for the Seychelles. The ecological and socio-economic members of the Technical Working Groups are asked to contribute spatial locations for their uses during and after the workshop on July 9, 2014. The MSP Technical Team is interested in the areas or locations that are important for uses, as well as areas with known or potential conflicts between uses. It is also helpful to know what areas are not important to uses, or never used, to specify that overlap between certain activities will not occur in geospatial analyses. If areas or locations cannot be specified, perhaps there are proxy data that can be used to identify important or high priority locations, for example, coral reefs for certain fisheries or tourism activities.

Some general criteria for defining the spatial extent of zones and design considerations for zoning include but are not limited to:

- jurisdictional boundaries
- existing spatial plans
- existing uses
- local knowledge
- targets (what percentage of the EEZ will the zone cover?)
- shape (are the lines straight? do they follow bathymetry or other features?)
- buffers (will zones need a buffer? which ones?)
- overlap (will zones overlap existing zonation or spatial regulations?)
- intensity (how intense is the use?)
- frequency (how often is the use?)
- temporal (when does the use occur?)
- spatial (where does the use occur?)

IX. Compatibility matrix - SAMPLE (Step 9)

To begin drafting a zoning map, compatibilities between uses must be identified and articulated. The level of compatibility can be articulated simply as yes or no, or be provided on a relative scale from compatible, to incompatible, or by using high, medium, low (Table 2). A draft compatibility matrix for the Seychelles is displayed below (Table 3). The draft matrix was developed by reviewing information from the Seychelles,



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examining matrices from other geographies (e.g., Caribbean, Canada, USA), and with input from the MSP Technical Working Group in July 2014 - the matrix is still in draft form. More input is needed to complete the matrix and understand the relationships between existing and potential future activities. It is possible that some uses do not overlap in space (or time), and either "no overlap" can be used, or N/A for not applicable. Once compatibilities are identified, or approximated, decision-support tools can be used, such as Marxan or Marxan with Zones (Ball et al. 2009) can be employed to begin drafting a map with the spatial layers that are relevant for each activity. If spatial information is not available, it is very difficult to incorporate the activity into the zones. In these cases, proxy information may be available or expert input from the sector in the Seychelles may be needed to provide the best available information.

Table 2. Compatibility matrix for the Grenadines, showing relative compatibility by colour code (source: Baldwin 2012).

Zones	Tourism	Fishing	Conservation	Industrial	Mariculture
Tourism					
Fishing	Yellow				
Conservation	Yellow	Orange			
Industrial	Orange	Orange	Red		
Mariculture	Orange	Green	Green	Red	

(N.B. Green = compatible, Yellow = somewhat compatible, orange = somewhat incompatible, red = entirely incompatible)

Table 3. Draft compatibility matrix for the Seychelles EEZ, showing relative compatibility by colour code. See MS Excel spreadsheet for larger format.

version: 2.0 Date: 28 July 2014
 This is a DRAFT for discussion purposes only. Input is needed from all stakeholders to ensure accuracy and proper representation of the uses, activities, and their definitions.
 This draft has not been approved by the Seychelles MSP Initiative.

Draft Zone Types	Uses and Activities by Draft Zone Types (italics indicates a new use added in July 2014; f = future use)	Artisanal	Industrial tuna	Marine Aquaculture	Semi-industrial	Biodiversity	Disposal-at-sea Sites	Ferries	Ports, Harbours, Marinas	Reclamation	Renewable Energy: wind	Shipping: International	Minerals and Aggregates	Natural Gas Exploration	Shipping: Petroleum	Petroleum extraction	Public recreation	Recreation	Seychelles Culture	Sport fishing	Tourism	Conservation	
		Food Security - Fishing	Artisanal																				
Food Security - Fishing	Industrial tuna	Yellow																					
Food Security - Fishing	Marine Aquaculture		N/A																				
Food Security - Fishing	Semi-industrial		TBD	Green																			
Marine Protection	Biodiversity protection					Red																	
Infrastructure	Disposal-at-sea Sites	?	Yellow	?	?	Red																	
Infrastructure	Ferries	Green	Green	Green	Green	Green	?																
Infrastructure	Ports, Harbours, Marinas	Green	Green	Green	Green	Green	?	Green															
Infrastructure	Reclamation	Green	Green	Green	Green	Green	?	N/A	Yellow														
Infrastructure	Renewable Energy: offshore wind (f)	Green	N/A	Yellow	Yellow	Yellow	?	N/A	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow							
Infrastructure	Shipping: International	Green	Green	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow							
Non-Renewable	Mining: Minerals and Aggregates (f)	Orange	Orange	Orange	Orange	Orange	?	N/A	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange							
Non-Renewable	Natural Gas Exploration (f)	Orange	Orange	Orange	Orange	Orange	?	N/A	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange							
Non-Renewable	Shipping: Petroleum (f)	Orange	Orange	Orange	Orange	Orange	?	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange							
Non-Renewable	Petroleum Development	Orange	Orange	Orange	Orange	Orange	?	N/A	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange							
Multi-Use: Rec/Tour/Cult	Public Recreation	Green	N/A	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Multi-Use: Rec/Tour/Cult	Recreation	Green	Green	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Multi-Use: Rec/Tour/Cult	Seychelles Culture	Green	Green	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Multi-Use: Rec/Tour/Cult	Sport fishing	Green	Green	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Multi-Use: Rec/Tour/Cult	Tourism	Green	Green	Green	Green	Green	?	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Multi-Use: Rec/Tour/Cult	Conservation	Green	Green	Green	Green	Green	H	Yellow	Yellow	Yellow	Yellow	M	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	M	Yellow

KEY
 compatible High
 somewhat compatible Medium
 somewhat incompatible Low
 incompatible No
 No overlap N/A

X. Descriptions for uses (Step 8)

Another planning tool that is developed during zoning is a list and description for each use or activity that is included in the compatibility matrix and zone types. A Master List of Uses and Activities is being developed and the MSP Technical Team is looking to the Government of Seychelles, MSP Technical



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Working Groups, stakeholder engagement workshops and others to assist with providing the correct terminology and descriptions for all of the uses that are included in the draft Seychelles marine plan (see: 'Draft Master List of Uses and Activities' report).

XI. Recommended Uses tables - SAMPLE (Step 8)

Once the zone types are determined, and the primary objective, targeted uses and management conditions drafted, other allowable are identified for each zone type. This information can be displayed in a 'Recommended Uses Table' (for example, see Table 4). A sample table has been created for illustrative purposes only; the MSP Initiative will develop the tables once the zones are described.

Table 4. Sample 'Recommended Uses Table' that identifies allowable activities by zone type, a planning tool that assists with developing management plans as well as regulation, enforcement and compliance for each zone.

Suggested Zone Name (version 1.2)	Blue Economy Zone	Protection Zone	Infrastructure Zone	Ecosystem Services Zone
Activity	A	B	C	D
Biodiversity Conservation	Allowable	Allowable	Allowable	Allowable
Ferries	Conditional	Conditional	Allowable	Conditional
Fishing - industrial tuna	Conditional	Not Allowable	Conditional	Not Allowable
Fishing - nearshore	Conditional	Conditional	Conditional	Conditional
Fishing - recreation	Conditional	Conditional	Allowable	Conditional
International shipping	Conditional	Not Allowable	Allowable	Not Allowable
Marine Aquaculture	Conditional	Not Allowable	Conditional	Conditional
Marine Protected Areas	Not Allowable	Allowable	Conditional	Allowable
Minerals and Aggregates	Conditional	Not Allowable	Conditional	Not Allowable
Petroleum extraction	Conditional	Not Allowable	Conditional	Not Allowable
Public recreation	Allowable	Conditional	Conditional	Conditional
Reclamation	Allowable	Allowable	Conditional	Conditional
Renewable Energy	Conditional	Conditional	Conditional	Conditional
Seychelles Culture	Allowable	Allowable	Conditional	Allowable
Sustainable Tourism	Allowable	Conditional	Conditional	Allowable
Research	Allowable	Allowable	Conditional	Allowable
Required	Use or activity is specifically targeted for that zone type			
Allowable	Use or activity is compatible with the objective of the zone.			
Conditional	Use or activity is conditionally compatible with the objective of the zone. Management directions would describe the conditions.			
Not Allowable	Use or activity is not compatible with the objective of the zone			
Not Applicable	The use or activity does not occur now or into the foreseeable future (1-20 years)			

6. Abbreviations and Glossary

Abbreviations

EBM - Ecosystem-based Management

GEF - Global Environmental Facility

GOS - Government of Seychelles

IPCC - Intergovernmental Panel on Climate Change

IUCN - International Union for the Conservation of Nature



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MPA - Marine Protected Area
MSP - Marine Spatial Planning
NGO - Non-Governmental Organisation
PCU - Programme Coordinating Unit
SeyCCAT - Seychelles Conservation & Climate Adaptation Trust
SIDS - Small Island Developing States
TNC - The Nature Conservancy
UNDP - United Nations Development Programme

7. Glossary

Airshed - An area where the movement of air (and thus air pollutants) can be hindered by local geographic features such as mountains, and by weather conditions (British Columbia 2014). An airshed is a geographic area within which air pollutant concentrations tend to be similar and pollutants do not tend to mix with those in adjoining airsheds (except during windy periods) (Nelson City Council 2014).

Biodiversity - means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD 1992).

Blue Economy - A developing world initiative pioneered by the Small Island Developing States and relevant to all coastal states and countries with an interest in waters beyond national jurisdiction. The Blue Economy paradigm goes far beyond the concept of ocean-based economies to constitute a sustainable development framework for developing countries addressing equity in access to, development of and sharing of benefits from resources; offering scope re-investment in human development and the alleviation of crippling national debt burdens. The Blue Economy espouses the same desired outcome as the Rio +20 Green Economy initiative namely: "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP 2013; Seychelles 2013). Fundamental to this approach is the principle of equity for developing countries. At the core of the Blue Economy is the de-coupling of socioeconomic development from environmental degradation. For more information, see the Seychelles Concept Paper on the Blue Economy 2013 and the Blue Economy, Abu Dhabi Declaration 2014.

Climate change adaptation - Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities (IPCC 2007)

Compatibility matrix - A commonly used planning tool to assist planning bodies and decision-makers in determining whether a use, or activity, should occur in a geographical area or space (Ehler and Douvere 2009).

Conservation - The maintenance or sustainable use of the Earth's resources in order to maintain ecosystem, species and genetic diversity and the evolutionary and other processes that shapes them (CBD 1992).

Ecosystem-based management - Ecosystem-based management is an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics of ecosystems such that component species and ecological processes can be sustained, and human well-being supported and improved (Foley et al. 2010).

Ecosystem services - The benefits people obtain from ecosystems, including provisioning services, such as food and water; regulating services such as the regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other nonmaterial benefits (Hassan et al. 2005).

Mapping Ocean Wealth - A process to describe and quantify the natural benefits of the ocean to people. A process moving from broad global averages to specific local details, evaluating nature as an asset and incorporating its benefits into all coastal planning decisions (TNC 2014).

Marine Protected Area (MPA) - A clearly defined geographic space that is recognised, dedicated and managed through legal or other effective means to achieve the long-term conservation of nature with associated ecosystem services, heritage resources, First Nations cultural resources (Laffoley 2008).

Marine Spatial Planning (MSP) - A public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process (Ehler and Douvère 2009).

Marxan - Marxan is software that delivers decision support for conservation planning. It was designed to help inform the selection of new conservation areas for minimal cost, and facilitate the exploration of trade-offs between conservation and socio-economic objectives. Marxan can help set priorities for conservation action by highlighting those places that are likely to be important inclusions in an efficient reserve network. Marxan can also be employed as a tool for evaluating how well existing reserve networks achieve the goals of representativeness and comprehensiveness (Ball et al. 2009).

Stakeholder - All parties participating and engaged in the planning process including government agencies, marine sectors for uses and activities (e.g., aquaculture, conservation, energy, fisheries, transportation, tourism), and coastal communities.

Sustainable development - Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is a term that has been criticised as being ambiguous, and open to a range of interpretations, including contradictions. Sustainable development is intended to mean improving the quality of human life while living within the carrying capacity of supporting ecosystems (World Commission on Environment and Development 1987).

Sustainable harvest rate - The rate of harvest that is within an ecosystem's natural ability to recover and regenerate (Environment Canada 1995).

Sustainable use - Applicable only to renewable resources, and refers to using them at rates within their capacity for renewal. Minerals, oil, gas and coal are effectively nonrenewable and thus cannot be used sustainably. However, the length of time that these nonrenewable resources are available can be extended by recycling materials, using less of a resource to make a product, and switching to renewable substitutes (IUCN, UNEP and WWF 1991). The use of components of biological diversity in a way and at a



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rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations (CBD 1992).

Zoning - Method to delineate areas of the coastal and marine environment for specific activities in time and/or space (Agardy 2010).

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