High Seas Enclaves of the Western and Central Pacific

A Greenpeace Briefing to the CBD, 29 September – 2 October 2009, Ottawa, Canada

This Briefing is intended to inform delegates to the CBD Expert Workshop of 29 September – 2 October 2009 about four high seas enclaves in the Western and Central Pacific Region (WCPR). Available scientific information is summarised to demonstrate the ways in which the selected areas meet the CBD criteria for ecologically and biologically significant marine areas. This briefing will also discuss the challenges of applying the criteria to areas for which limited information is available.

This briefing summarises the findings of a technical report on proposed Marine Reserves in the WCPR that explores in greater detail the biological and ecological characteristics of these areas (available at: www.greenpeace.to/publications/Pacific-CBD-report-August-2009.pdf).

Introduction

The Western and Central Pacific Region (WCPR) contains the greatest diversity of marine species in the world1 but remains one of the least studied parts of the globe. The region includes 32 nations and territories and numerous island chains[1] and is home to the most diverse tropical coral reef ecosystems in the world[2]. However, the majority of WCPR consists of open-ocean and deep-sea habitats. The enclaves discussed here fall within the Western Pacific Warm Pool (WARM) and South Pacific Sub-Tropical Gyre (SPSG) biogeographical provinces[3]. Depths range from over 7000m in the Mussau Trench to just 45m at Horizon Bank[4,5]. Seamounts occur in each of the enclaves, including those of the Mussau Ridge, where glass sponges have been retrieved from a depth of 1520 – 1780m[6] (see fig. 2 – Mussau Ridge Seamount 1). Hydrothermal vents are known to occur in the North Fiji Basin and could potentially occur within WPMR[7]. The enclaves are connected by the South Equatorial Current, which flows westwards between 5˚N and 20˚S. The dynamic area of high tuna abundance, created by the advection of forage species from the Eastern Warm Pool Convergence Zone[8], is replicated in WOMAR, where fishing effort is higher during La Niña and neutral phases of ENSO and GOMAR, where fishing effort is higher during El Niño events[9].

WCPR is the site of the world's largest tuna fishery, accounting for 55% of global landings in 2007[9]. Total landings have increased for the past six years and the 2007 catch was the largest on record, at 2,396,815mt[9]. However there are clear signs of overexploitation. Bigeye tuna *Thunnus obesus* are overfished and stock levels are estimated to be at just 20 – 26% of unexploited biomass[10]. Biomass of yellowfin tuna *Thunnus albacares* declined steadily throughout the 1990s and overfishing is occurring[11,12]. Skipjack tuna *Katsuwonus pelamis*, which accounted for 72% of the total catch in 2007[9], has until recently been considered to be in a healthy state[13]. However, it has recently been suggested that the spawning stock of skipjack in the Pacific may have declined drastically and overfishing may be occurring[14]. There is considerable uncertainty regarding the stock size and level of fishing effort on albacore tuna[15]. It has been estimated that approximately 10% of total tuna landings are taken from the high seas enclaves[16]. The level of IUU fishing in the region has been estimated at 21 – 46%, with illegal vessels using the enclaves to take refuge on the high seas[17]. The Western and Central Pacific Fisheries Commission (WCPFC) has agreed to close two of the enclaves (WOMAR and GOMAR) to purse seine vessels from January 2010[18]. New licensing arrangements implemented by the Parties to the Nauru Agreement should largely prevent longline and other fishing activities in these enclaves[19]. There is considerable support amongst Pacific Island Nations for closure of the remaining two

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enclaves, which will be discussed at the 6th Regular Session of the WCPFC, to be held in Tahiti, December 2009[18,20].

The proposed marine reserves in the Pacific high seas enclaves are:

1. **West Oceania Marine Reserve (WOMAR):** located between the EEZs of Papua New Guinea, Indonesia, Palau and the Federated States of Micronesia.

2. **Greater Oceania Marine Reserve (GOMAR):** located between the EEZs of the Federated States of Micronesia, Marshall Islands, Nauru, Kiribati, Tuvalu, Fiji, the Solomon Islands and Papua New Guinea.

3. **Moana Marine Reserve (MOANA):** located between the EEZs of the Cook Islands, French Polynesia and Kiribati.

4. **Western Pacific Marine Reserve (WPMR):** Located between the EEZs of Fiji, Vanuatu and the Solomon Islands.

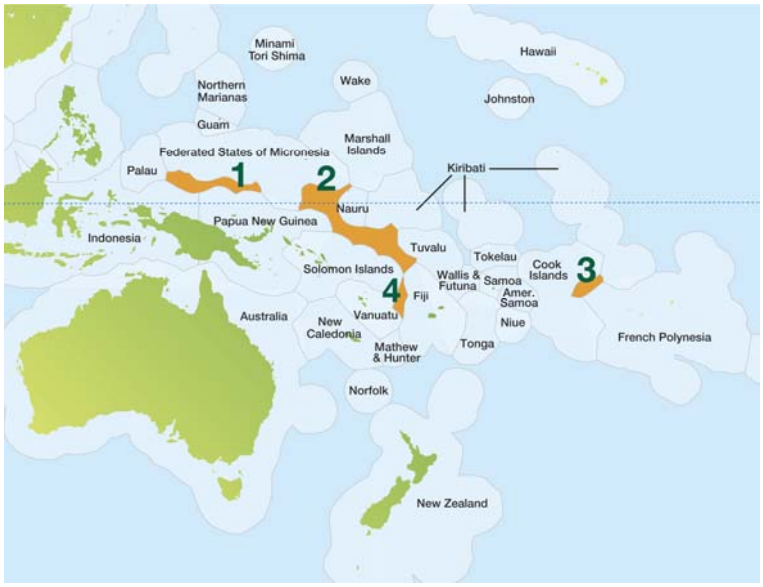


Figure 1: Location of the Pacific high seas enclaves

Data availability and interpretation of the criteria

Direct evidence for the ecological and biological characteristics of the high seas enclaves was limited. Scientific research intensity was low relative to other regions of the world's oceans and those studies that were conducted related largely to nation's EEZs. There has been very limited sampling of seamount communities in the high seas enclaves (three species collected from one seamount – see above[6]) and studies of hydrothermal activity in the North Fiji Basin were confined largely to the Fijian EEZ.

Data availability, and therefore our understanding of the enclaves' ecological and biological characteristics, was dependent on commercial and conservation interests. A large proportion of evidence was related to commercial fisheries, including catch data[9], observer reports[21,22,23], scientific research (eg. Lehodey et al, 1998[8]) and historical whaling logbook data[24]. This lead to a dearth of data relating to areas and species of limited interest to fisheries. For example, direct evidence for the presence of sea turtles and cetaceans in the enclaves was obtained from observer data, which was distributed unevenly across the region due to the uneven distribution of fishing effort and observer coverage[21,22]. Satellite tracking studies conducted by NOAA provided some understanding of the distribution of migrating leatherback turtles *Dermochelys coriacea* in the region, and demonstrated their presence in WOMAR and GOMAR[25]. By contrast, there was no research into the distribution of pelagic sharks. This could potentially lead to a failure to recognise areas that meet some of the criteria but do not contain large numbers of commercially important or iconic species. The reliance on fisheries-related data means that an area is unlikely to be designated as ecologically and biologically significant until exploitation has reached a certain level. This limits the applicability of the naturalness criteria on the high seas, where the conservation of natural ecosystems in marine reserves is not yet a possibility.

Due to the limited availability of direct evidence, analysis of the ecological and biological significance of the high seas enclaves was partially dependant on extrapolation from physical data, as well as biological data relating to the wider WCPR. For example, the presence of seamount species assemblages was inferred from the presence of seamounts. The process of extrapolation favoured the use of some criteria over others. For example, seamounts were deemed to indicate the presence of vulnerable, productive and diverse habitats. However, in the absence of direct evidence, this line of reasoning was not extended to argue for the presence of unique (endemic) species at these sites, as this would have required two levels of extrapolation.

Ecological and biological significance of the Pacific high seas enclaves

Criteria	WOMAR	GOMAR	WPMR	MOANA
Special importance for life history stages of species	Pre- and post-nesting migratory routes of leatherback turtles that nest at Papua Barat, Indonesia and the Solomon Islands[25]. Yellowfin tuna spawning activity, indicated by the high proportion of unassociated purse seine sets[9,26]. *Juvenile leatherback turtles. Potential presence is indicated by proximity to nesting beaches and a confirmed sighting from waters to the north of WOMAR[27].*	Pre- and post-nesting migratory routes of leatherback turtles that nest at Papua Barat, Indonesia and the Solomon Islands[25]. *Migratory routes of green turtles Chelonia mydas moving between Marshall Islands and Solomon Islands, Australia and PNG. Data obtained from a passive tag retrieval study. The shortest routes between sites would pass through GOMAR[33,34].*		*Potential presence of breeding minke whales Balaenoptera acutorostrata. An above average encounter rate was recorded for the area encompassing MOANA during the month of October, coinciding with the species' peak conception period[40].*
Importance for threatened, endangered or declining species and/or habitats	Pre- and post-nesting migratory routes of leatherback turtles (CR)[28] that nest at Papua Barat, Indonesia and the Solomon Islands[25]. Papua Barat is thought to be the site of the largest remaining nesting population in the Pacific Ocean[27]. The presence of hawksbill *Eretmochelys imbricata* (CR)[28], green (EN)[28] and olive ridley *Lepidochelys olivacea* (VU)[28] turtles, and bycatch mortality, has been recorded by fishery observers[21,22]. Bigeye tuna (VU)[28] and yellowfin tuna are targeted by longline and purse seine fisheries[9]. Populations of both species are declining in the western and central Pacific[10,11].	Pre- and post-nesting migratory routes of leatherback turtles (CR)[28], that nest at Papua Barat, Indonesia and the Solomon Islands[25]. Papua Barat is thought to be the site of the largest remaining nesting population in the Pacific Ocean[29]. The presence of olive ridley (VU)[28] and unidentified sea turtle species, and bycatch mortality, has been recorded by fishery observers[21,22]. Green turtles (EN)[28] are the most commonly recorded sea-turtle bycatch species in tropical waters and their presence is likely[22]. Bigeye tuna (VU)[28] and yellowfin tuna are targeted by longline and purse seine fisheries[9]. Populations of both species are declining in the western and central Pacific[10,11]. *Historically high abundance of sperm whales Physeter macrocephalus (VU)[28] is demonstrated by whaling logbook records[24]. Corresponds to the western extreme of the 'On the Line' whaling ground.*	*Threatened/endangered/ declining pelagic predatory species potentially present at Horizon Bank include: leatherback (CR)[28], loggerhead Caretta caretta (EN)[28], hawksbill (CR)[28] and green (EN)[28] sea turtles[22]; pelagic sharks, including bigeye thresher Alopias superciliosus (VU)[35], oceanic whitetip Carcharinus longimanus (VU)[35] and shortfin mako Isurus oxyrinchus (VU)[35] (all recorded as bycatch in WCP-CA[23]); cetaceans, including sperm whales (VU)[28]; and bigeye (VU)[28] and yellowfin tuna[36].*	

Vulnerability, fragility, sensitivity or slow recovery	Leatherback, hawksbill, green and olive ridley sea turtles[21,22]. *Mussau Ridge could potentially include areas of fragile and sensitive deepwater benthic habitat[30].*	Leatherback, olive ridley and unidentified sea turtles (likely presence of green turtles)[21,22]. *Historically high abundance of sperm whales[24].*	*Horizon Bank could potentially include areas of fragile and sensitive tropical coral habitat[37].* *Horizon Bank and other seamounts could potentially include areas of fragile and sensitive deepwater benthic habitat[30].* *Vulnerable pelagic predatory species potentially present at Horizon Bank include pelagic sharks, cetaceans, sea turtles and seabirds[36].*	
Biological productivity	High abundance of tropical tuna, characteristic of the Western Warm Pool biogeographical province[3], is indicated by longline and purse seine fishing effort[9]. Productive foraging area for predatory species is created by the advection of low trophic level species from the Eastern Warm Pool Convergence Zone[8]. Phytoplankton blooms in the North Equatorial Counter-Current result from upwelling associated with current meandering[31,32]. *Mussau Ridge could potentially include areas of elevated secondary productivity, associated with deepwater seamount habitat[30].*	High abundance of tropical tuna, characteristic of the Western Warm Pool biogeographical province[3], is indicated by longline and purse seine fishing effort[9]. Productive foraging area for predatory species is created by the advection of low trophic level species from the Eastern Warm Pool Convergence Zone[8].	*Pelagic productivity is potentially elevated at Horizon Bank, due to enhanced primary production and/or increased forage availability[36].* *Horizon Bank could potentially include areas of productive tropical coral habitat[37].* *Horizon Bank and other seamounts could potentially include areas of elevated secondary productivity, associated with deepwater seamount habitat[30].* *Potential presence of hydrothermal vent communities on the central spreading axis of the North Fiji Basin and/or South Pandora/Rotuma Ridge[38,39].*	
Biological diversity	*Mussau Ridge could potentially include areas of elevated species diversity associated with deepwater seamount habitat[30].*		*Potential area of high diversity at Horizon Bank, due to the combined presence of pelagic and shallow- and deep-water benthic species[37].*	

Nb. *Italics* denotes characteristics that have been extrapolated from indirect data
VU = vulnerable; EN = endangered; CR = critically endangered.

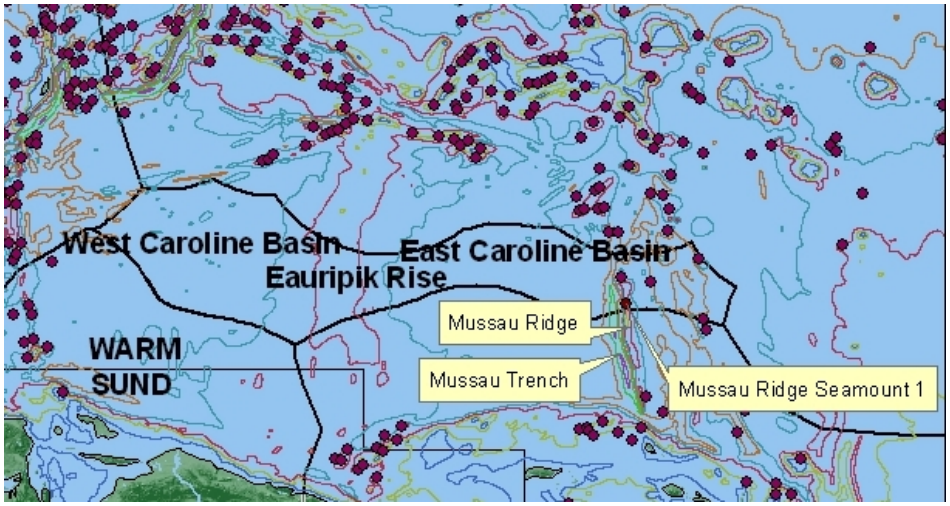


Figure 2: WOMAR

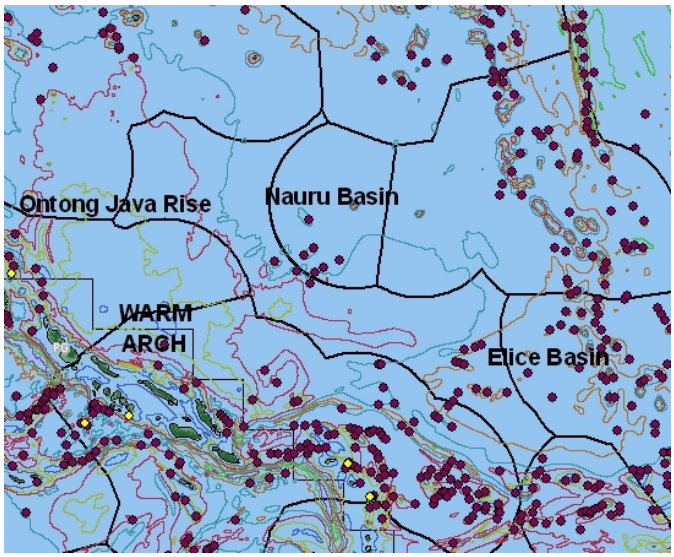


Figure 3: GOMAR

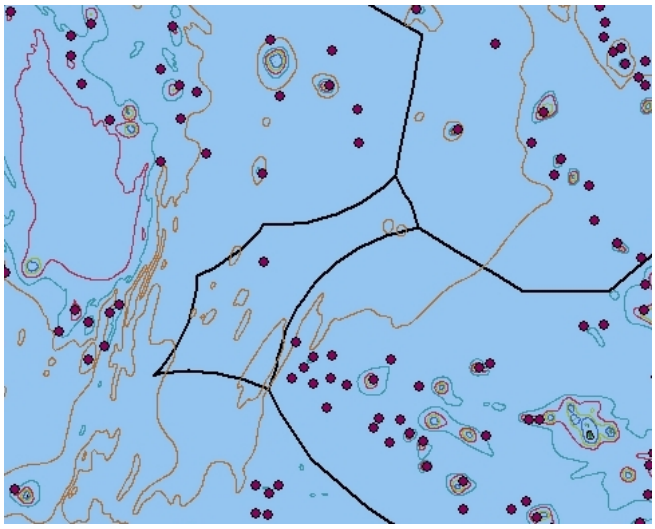


Figure 4: Moana

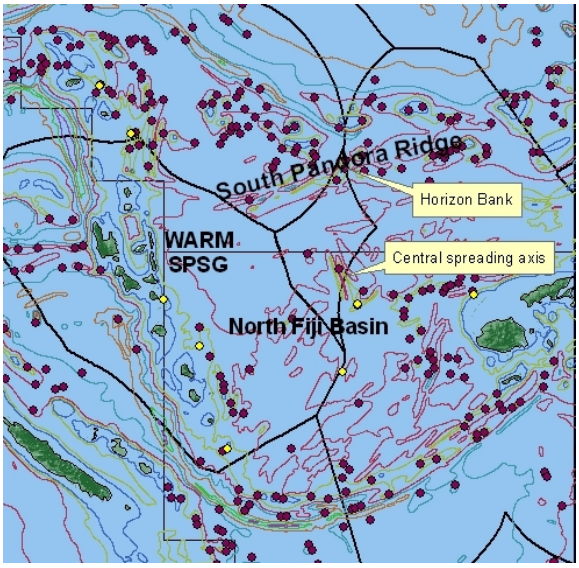
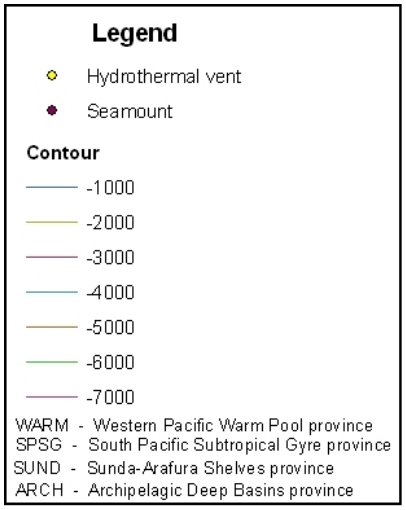


Figure 5: WPMR



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