

Lady of the Sea

DUGONGS

RESPECT AND PROTECT

Dugong profile for range states in the Pacific Islands



Australian Government

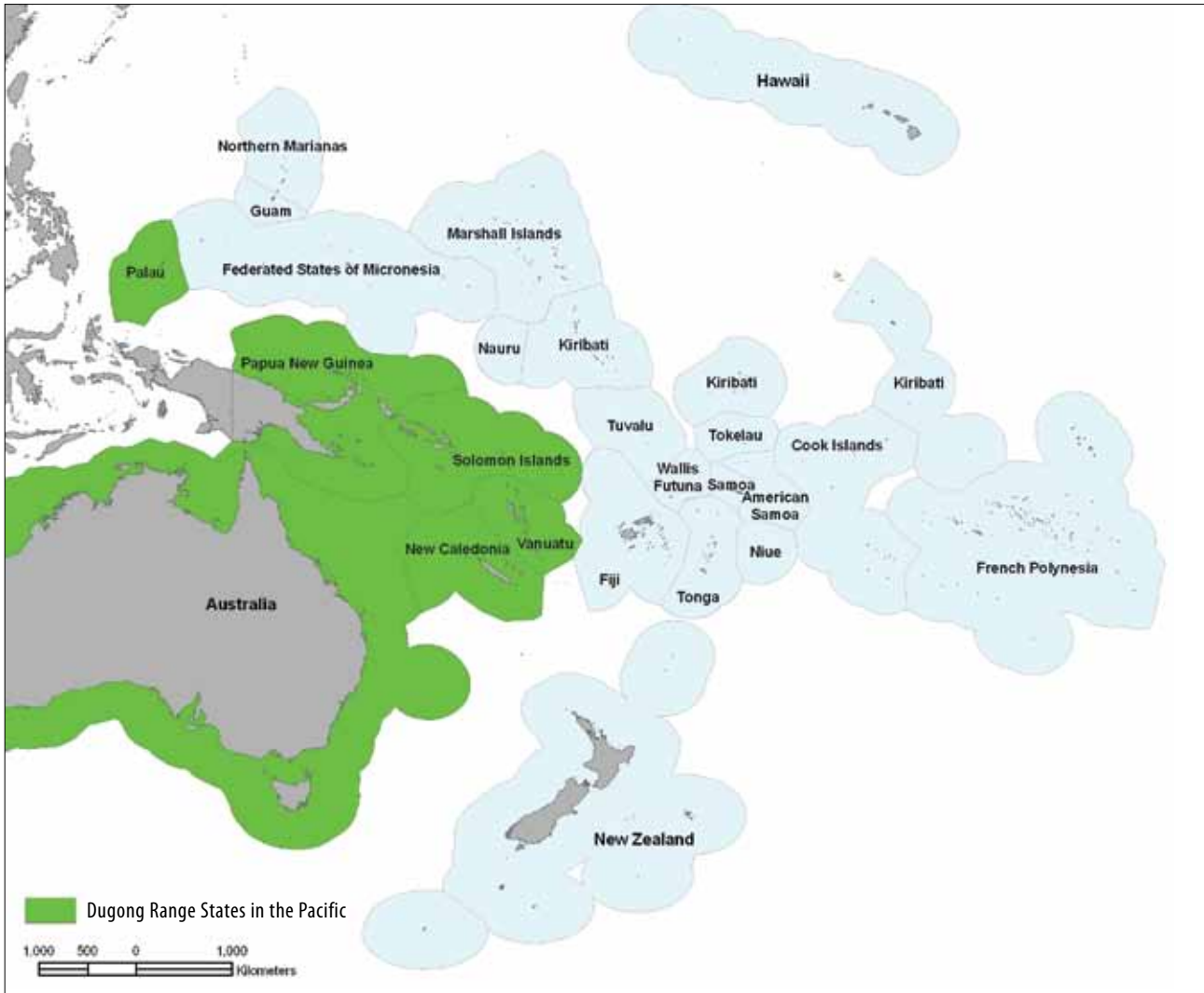
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SPREP

Secretariat of the Pacific Regional
Environment Programme

SPREP MEMBERS DUGONG RANGE STATES



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The Secretariat of the Pacific Regional Environment Programme (SPREP) is the intergovernmental agency charged with the protection and sustainable management of the Pacific island region's environment. SPREP's vision is for a Pacific Environment, sustaining our livelihoods and natural heritage in harmony with our cultures. SPREP works at the forefront of regional efforts to address environmental concerns by providing national-level technical advice programme support, human and institutional capacity building and coordinated regional responses to global issues and international agreements. The SPREP membership comprises 21 Pacific island countries and territories and Australia, New Zealand, France and United States of America. The work of SPREP is guided by a 5-year strategic Plan (2011-2015) which was formally adopted at the 21st SPREP Meeting in Papua New Guinea in September 2010. For more information regarding SPREP and SPREP's contributions to conservation, resource management and sustainable development, please visit: www.sprep.org.

CONTENTS

Introduction	DAVID SHEPPARD, DIRECTOR, SPREP	3
Pacific Year of the Dugong: Respect and Protect		4
Pacific Islanders Celebrate PYOD		5
SPREP Celebrates Regional Launch		6
Palau Unveils Lady of the Sea Carving		9
Australia DUGONG PROFILE		10
New Caledonia DUGONG PROFILE		12
Palau DUGONG PROFILE		14
Papua New Guinea DUGONG PROFILE		16
Solomon Islands DUGONG PROFILE		18
Vanuatu DUGONG PROFILE		20
Pacific Dugong FACTSHEET		22
Pacific Seagrasses FACTSHEET		24
Working together to save Dugong FACTSHEET		26



INTRODUCTION

Pacific Year of the Dugong



David Sheppard, *Director, SPREP*

2011 was declared the Pacific Year of the Dugong (PYOD). With a regional theme “Respect and Protect,” this campaign aimed at increasing protection of dugongs and their habitats by raising awareness, improving knowledge and fostering partnerships for conservation of dugongs and their habitats.

Dugongs have high cultural value and are a valued source of food, medicine and artifacts and thus are an important species for coastal people. Dugongs also play a significant ecological role in maintaining coastal habitats. They feed in shallow waters often within areas that fall under traditional ownership or community fishing grounds.

Even though dugongs occur in the waters of only 6 of the SPREP members (Australia, New Caledonia, Palau, Papua New Guinea, Solomon Islands and Vanuatu), the proposal to declare 2011 as the Pacific Year of the Dugong received strong support and was endorsed by SPREP members at the 21st SPREP annual meeting held in Papua New Guinea in September 2010. Dugongs are one of the three groups of marine animals of conservation concern that the SPREP marine species programme focus on. The others are marine turtles and cetacean (whales and dolphins) and each has a 5-year regional action plan.

The campaign was considered necessary due to several factors, for example:

- Dugongs are considered vulnerable to extinction on the global scale.
- Dugong is the only surviving member of the family Dugongidae, with its closest relative, Stellar’s sea-cow, hunted to extinction within 27 years of its discovery in the eighteenth century.
- They have disappeared from several areas including waters off Mauritius, Taiwan, western Sri Lanka and the Maldives. This can be a reality in our region as well.

- The dugong population in Palau is considered to be the most isolated in the world, and in addition to threats facing this population, it can be classified as “critically endangered”.
- Dugongs are also of high cultural value in many parts of their range, a valued source of food, medicine and artifacts and a flagship species for coastal peoples.
- There is not much information available on dugong populations in the SPREP region and much work is needed to improve information, awareness and ultimately their management and protection.

There were four main objectives to the PYOD campaign. These were to promote awareness and conservation of dugongs at site level targeting key stewards and the fishing industry; reduce dugong mortality from human activities; improve status information and promote sustainable management of dugong populations and protection of their habitats at the national level through effective practical national legislation; and policies and advance partnerships and to secure resources for long term support for dugong conservation in the region.

This publication will give an overview of the six dugong range states in the Pacific region and the measures they have in place to conserve and protect these pristine “ladies of the sea.” It will also highlight some of the events that have taken place since the Pacific Year of the Dugong was launched.

David Sheppard, *Director, SPREP*



Pacific Year of the Dugong: Respect and Protect



Photos © Colin Riddell

The campaign to progress the protection of the dugong, led by the Secretariat of Pacific Regional Environment Programme (SPREP) and its partner the Convention on the Conservation of Migratory Species of Wild Animals (UNEP/CMS), targeted local coastal and fishing communities and water craft users in the Pacific region.

Awareness and outreach activities highlighting the need for protection of dugongs in the Pacific Islands region were the focus of the campaign which was initiated through national launches and country activities in New Caledonia, Palau, Papua New Guinea, Solomon Islands and Vanuatu.

A number of initiatives to build local capacity to deliver positive conservation outcomes for dugongs in the Pacific Islands region were also promoted throughout the Pacific Year of the Dugong.

A new pilot project by CMS using financial incentives to address direct hunting and the incidental capture of dugongs by changing people's practices and improving the livelihoods of local communities in Daru Papua New Guinea was among the initiatives promoted under the Pacific Year of the Dugong 2011.

Dugongs, which play a significant ecological role in the functioning of coastal habitats, live in warm

coastal and islands waters from East Africa to Vanuatu in the Pacific.

Specific to the Pacific Islands region, SPREP has a regional Dugong Action Plan 2008–2012. The plan focuses on nine key areas: education and awareness, habitat protection, management, traditional knowledge and resource management, capacity building, threat reduction, research and monitoring, collaboration and human and financial resources. Also the conservation and plan developed under the United Nations Environment Programme/CMS Memorandum of Understanding on the Conservation and Management of Dugongs and their Habitats throughout their Range (Dugong MoU) provides the framework for the cooperation for the long-term protection of dugongs in their range.

All range states in the Pacific Islands region (Australia, Papua New Guinea, Palau, France (New Caledonia), Solomon Islands and Vanuatu) have committed to the Dugong CMS MoU as signatories.



Photo © Simon Allen

Pacific Islanders Celebrate 2011 YEAR OF DUGONG



Photo © GBRMPA

Dugong protection in the Pacific Islands region was highlighted in 2011 as part of the Pacific Year of the Dugong. It proved to be a boost to the conservation of the species and its seagrass habitats.

The regional campaign was launched in Koror, Palau in March 2011 by President Johnson Toribiong and Minister of Natural Resources, Environment & Tourism, Hon. Harry Fritz.

Palau hosts the smallest, most remote and critically endangered dugong population in the region.

In launching the regional campaign Palau also commenced their national campaign with the reminder by President Toribiong that we are stewards of the environment and have a moral obligation to protect dugongs in the spirit of "I'll save you so some day you'll save me".

He requested support from other nations to join Palau to preserve, protect and cherish this important, unique dugong population.

Minister Fritz urged Palauans to take the task of education to protect, respect and love dugongs and their habitats.

It was also acknowledged at the launch of the Pacific Year of the Dugong 2011 that there is a need to address poaching which is the biggest threat to the fragile population in Palau. Authorities were urged to work together to enforce legislation to prevent this and it was highlighted that publicising arrests and convictions for poaching of dugongs

would be an effective deterrent within the general community.

Raising the awareness on the status of dugongs and related aspects including existing legislation was also raised as an important area for immediate attention.

Hon. Victor Yano, Minister of State, closed the launch by confirming Palau's Government full commitment to support the Pacific Year of the Dugong campaign and shared a personal experience when a local woman released a dugong that was tied up signifying that a single act can make an important change.



His Excellency President Johnson Toribiong launching the PYOD in Palau.



SPREP celebrates the regional launch of the Pacific Year of the Dugong

SPREP operates a regional marine species programme which focuses on three groups of marine species of conservation concern: dugongs, marine turtles and cetaceans. SPREP has a 5-year regional action plan for each of these groups.

SPREP's work for the conservation and management of marine mammals in the Pacific Islands region can be dated back to the mid 1980s when UNEP's Regional Seas Programme supported dugong conservation projects in Palau and Vanuatu.

In 1991 SPREP and UNEP facilitated a regional biodiversity conservation workshop in Vanuatu. One of the outcomes of this meeting was work towards a draft Marine Mammal Conservation Programme.

The Regional Marine Mammal Conservation programme's first meeting was in 1993 where the focus was on briefing members on the significance of and threats to marine mammals in the region. Most of the work of the Regional Marine Mammals Conservation Programme during 1993–2003, was focused on whales and dolphins.

However, in 2002, it was decided to give more recognition to dugongs, and as a result the SPREP regional marine mammal programme was split with dugongs and cetaceans having separate regional action plans. Thus, starting from 2003, separate 5-year regional dugong and cetacean action plans were in place.

The current SPREP regional Dugong Action Plan 2008–2012 centers on nine key areas or themes: (i) Education and Awareness, (ii) Habitat Protection, (iii) Management, (iv) Traditional Knowledge, Customary Marine Tenure and Traditional Resource Management, (v) Capacity Building, (vi) Threats, (vii) Research and Monitoring, (viii) National, Regional, and International Collaboration, and (ix) Human and Financial Resources.

Even though dugongs occur in the waters of only 6 of the SPREP members, the proposal to declare 2011 as the Pacific Year of the Dugong received strong support and was endorsed by SPREP members at the 21st SPREP annual meeting, Papua New Guinea, September 2010.

The campaign has been considered necessary due to several factors, for example:

- Dugongs are considered vulnerable to extinction on the global scale. All dugong populations are listed on Appendix 1 of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Dugongs are additionally listed on Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), which means they

are considered, under CMS, to have an unfavourable conservation status and require international agreements for their conservation and management.

- Dugong is the only surviving member of the family Dugongidae, with its closest relative, Stellar's sea-cow, hunted to extinction within 27 years of its discovery in the eighteenth century.
- They have disappeared from several areas including waters off Mauritius, Taiwan, western Sri Lanka and the Maldives. This can be a reality in our region as well.
- The dugong population in Palau is considered to be the most isolated in the world, and in addition to threats facing this population, it can be classified as "critically endangered".
- Dugongs are also of high cultural value in many parts of their range, a valued source of food, medicine and artefacts and a flagship species for coastal peoples.
- There is not much information available on dugong populations in the SPREP region and much work is needed to improve information, awareness and ultimately their management and protection.

The Pacific Year of the Dugong Campaign has four key objectives:

- Promote awareness and conservation of dugongs at site-level targeting key stewards and the fishing industry;
- Reduce dugong mortality as a result of human activities;
- Improve status information and promote sustainable management of dugong populations and protection of their habitats at the national level through effective and practical national legislation and policies;
- Advance partnerships and secure resources for long-term support for dugong conservation in the region

Dugongs face a host of threats to their survival. They are an easy target and are highly susceptible to coastal hunters. Subsistence hunting of dugongs may have been sustainable in the past. However the combination of increasing human populations in the Pacific and the introduction of new harvesting technologies such as





outboard motors and gill nets has severely impacted the species. The fact that dugongs have a long life span but are slow breeders makes them susceptible to population decline. It has been estimated that a dugong population of only 100 animals would not sustain any human-caused mortality.

Dugongs also face many other threats including incidental by-catch in fishing gear, vessel strikes and destructive fishing practises. The incidental drowning of dugongs caught in fishing gear, such as gill-nets, has contributed to the major decline of dugongs in much of its range. The increase in vessel traffic also increases the likelihood of dugongs being killed by vessel strikes.

Then there are the threats to the food sources of dugongs, seagrasses. Coastal development increases sedimentation and turbidity which not only smother seagrass but also reduce the amount of light reaching them, resulting in the degradation of seagrasses and a reduction in their density and productivity.

SPREP's work is guided by its mandate, which is "to promote cooperation in the Pacific islands region and to provide assistance in order to protect and improve the environment and to ensure sustainable development for present and future generations".

This theme of cooperation and providing assistance is, first of all, reflected in SPREP's commitment to maintain, facilitate and provide support and assistance to implement the regional marine species programme, including the regional dugong action plan.

Secondly, SPREP has sought cooperation of partners and collaborators to implement the action plans, sometimes by entering into Memorandum of Understandings.

SPREP's collaboration with the Convention on Migratory Species (CMS) under a Memorandum of Cooperation signed in 2005 which has since resulted in closer working relationship between SPREP and CMS on marine species work that includes dugongs. It is also worth acknowledging the assistance from UNEP/CSM for dugong work in the Pacific Islands region.

However, there have been over-arching problems and challenges surrounding conservation efforts in the Pacific Islands region. These include:

- Lack of data and information resulting from the absence or lack of ongoing and long-term research and monitoring programmes;
- Limited public awareness and education programmes;
- Limited in-country skills / capacity to provide leadership in marine species conservation management;
- Limited national management mechanisms to protect marine animals and their habitats;
- Limited information exchange, linkages and collaboration.

To address these challenges, SPREP calls on Governments and partners, communities, fishermen, marine tour operators and developers, to all work together:

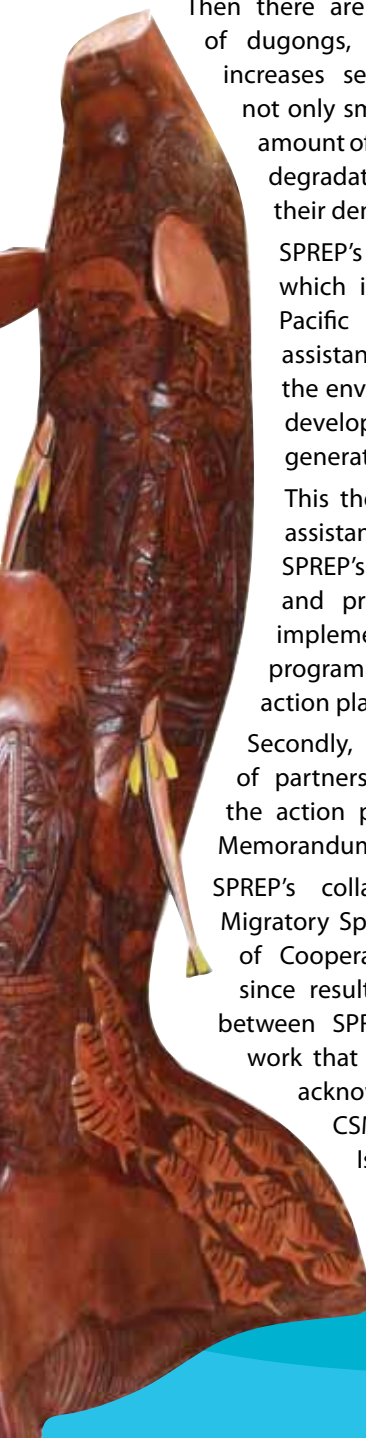
- To establish long-term dugong research and monitoring programmes at both community and national levels to improve knowledge of the status of dugongs for informed decisions on management.
- To develop or review existing legislation to adequately and effectively protect dugongs. A vital component of this is the ability for effective enforcement.
- To protect sea-grass habitats which are vital to dugongs as well as a host of other marine species and consider the impacts of coastal development on sea-grass habitats in Environmental Impact Assessment processes.
- To cease the excessive and illegal hunting of dugongs and the use of destructive fishing methods.
- To minimize impacts from gillnets and boat strikes by following simple guidelines.

The continuing health of dugong populations is essential to maintaining a healthy Pacific Ocean. Join us as a Pacific family in making sure we play our part to Respect and Protect dugongs and their habitats.

In 2007 the SPREP Meeting endorsed the Secretariat's proposal to also include sharks in its regional marine species programme. In November 2009, the regional Plan of Action for Sharks was launched jointly by SPC, FFA and SPREP.

This statement was read on behalf of the Secretariat of the Pacific Regional Environment Programme (SPREP) by the Marine Species Officer, Mr. Lui Bell, at the launch of the Pacific Year of the Dugong in Palau.

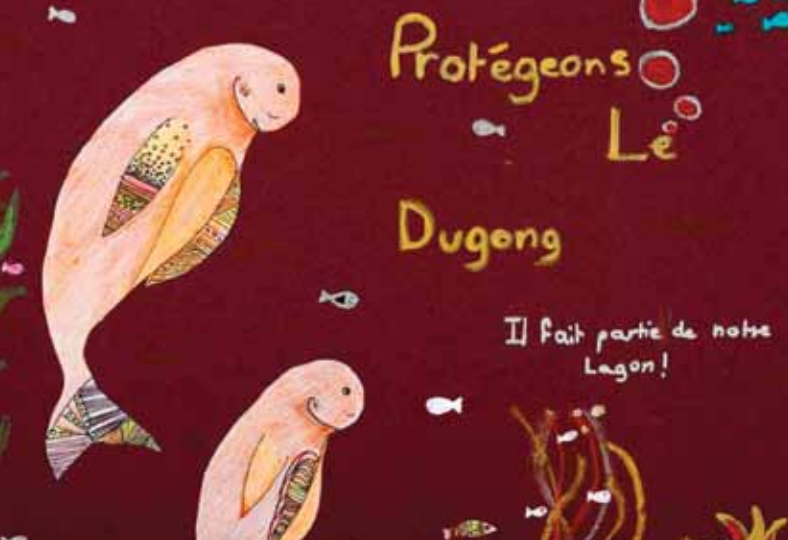
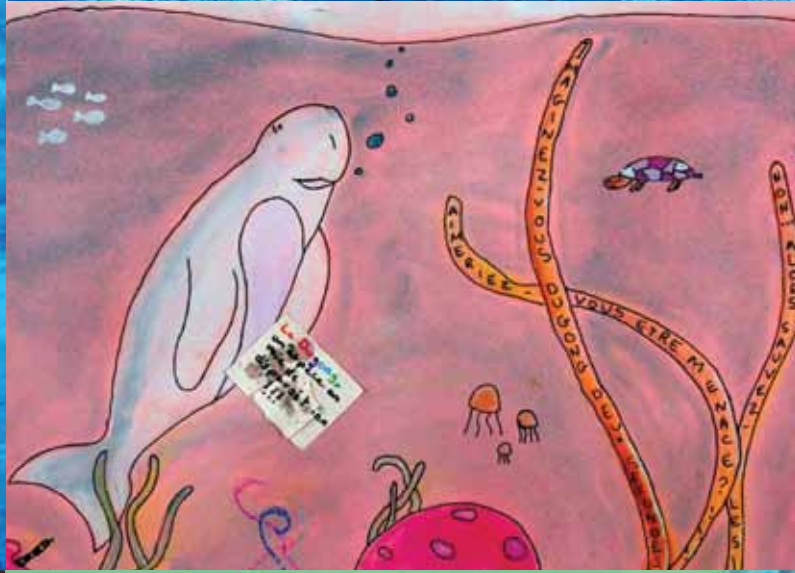
Dugong Carving in the Palau Ministry of State Building



ARRÊTONS le MASSACRE



Protégeons la vache-marin.



Palau Unveils Lady of the Sea

A tribute to the Year of the Dugong was unveiled by the Vice President of Palau Hon. Kerai Mariur in Samoa on the 19th of July as their contribution to the Secretariat of the Pacific Regional Environment Programme (SPREP) for their work on the conservation of dugongs in the Pacific, including the 2011 Pacific Year of the Dugong Campaign.

The stunning carving of a dugong (also known as the 'lady of the sea') was gifted to SPREP from the Government of Palau who are environmental leaders in the effort to protect marine species.

Palau declared a shark sanctuary in its EEZ in 2009. This was further strengthened in 2010 through extending the protection to encompass all marine mammals including dugongs.

During a special unveiling ceremony at the SPREP headquarters in Apia on the 19th of July, the Vice President of Palau expressed their appreciation to SPREP for their generous assistance to Palau and the Pacific region. The presentation of a special letter from the President of Palau to SPREP, the gifting of the carving and a copy of the "Mesekiu" booklet was made.

"This is symbolic of our national commitment toward conservation efforts," said Vice President Mariur.

"The designation of the 'Pacific Year of the Dugong' is indicative of the

enduring efforts of SPREP to continue to lend its assistance toward the protection and preservation of the ecological and rich marine ecosystems that sustain the balance of nature that our Pacific Island Countries continue to be dependent on."

A certificate of Environmental Leadership was presented to Palau by SPREP. The Pacific nation was host of the regional launch of the Pacific Year of the Dugong and has since prepared many different resources to help conserve this species which is vulnerable to extinction.

"There is a saying, 'actions speak louder than words', and we must congratulate and commemorate Palau because they are taking positive actions and we are encouraged by these important efforts," said Kosi Latu, the Acting Director of SPREP.

To learn more about the Dugong and hear the Dugong Song produced by Palau please visit the Pacific Year of the Dugong website: www.sprep.org/Biodiversity/PYoD/index.asp



AUSTRALIA



Traditional value of dugong to local population

"Dugongs are an essential element of Aboriginal and Torres Strait Islander people's living maritime culture along the Great Barrier Reef World Heritage Area. The use of marine food resources such as the dugong greatly strengthens Aboriginal and Torres Strait Islander culture and demonstrates connection with traditional sea country. The activities associated with the hunting of dugong and preparing and sharing the meat have great significance and are an expression of the continuance of long cultural traditions. In remote coastal areas, dugongs have a high social and economic value because they provide subsistence food to communities where a nourishing diet is essential but often expensive to attain" (Great Barrier Reef Marine Park Authority).

Status of the local dugong population

A more than 20-year time series of aerial surveys suggests that dugong populations are large and secure (but they may fluctuate or move in response to large scale changes in seagrass distribution) in Shark Bay and the Exmouth/Ningaloo Reef region of Western Australia, the Gulf of Carpentaria, the Northern Great Barrier Reef, and the Southern Great Barrier Reef regions of Queensland; and fluctuating in Torres Strait, Hervey Bay and Moreton Bay in Queensland (Dobbs *et al.* 2008, Hodgson 2007, Marsh and Lawler 2006, Marsh *et al.* 2007). Dugong distribution may also change independent of seagrass changes, at the moment the causes of this are unknown. However, the power of the aerial surveys to detect population declines is weak unless declines are extreme (Taylor *et al.* 2007). The time series of catch per unit effort data from the Queensland Shark Control Program indicates that the dugong population on the urban coast of Queensland declined steeply (in con-

trast with the fluctuations described above) between the 1960s and early 1980s (Marsh 2000). The nature of the extensive flooding in Queensland (late December 2010/early January 2011) and cyclone Yasi (February 2011) has had a significant impact on seagrass distribution and abundance in the region and as a result, there has been a substantial increase in dugong and green turtle strandings along the Queensland east coast. As at 4 October 2011, 163 dugongs have been found stranded or dead in Queensland in 2011. This is the highest recorded number of strandings since data collection began in 1996.

The total population estimate of dugongs living in Australian waters from the >120,000 km of coastline surveyed since 2005 (aerial surveys) is approximately 57,000 dugongs (Hodgson 2007, Marsh *et al.* 2007, Marsh and Lawler 2006, Hodgson 2007, Saalfeld 2000, Prince *et al.* 2001). However, the population estimates are almost certainly under-estimates. There are large areas of northern Australia, particularly in the west, for which there are no data. This is the total of all the most recent regional estimates. This represents an aggregated estimate of all the regions that have been surveyed. However, there is no definitive figure because significant areas of coastline have never been surveyed, while others have not been surveyed for up to a decade or more.

Known / presumed distribution of dugongs

The distribution of the dugong in Australia is from Moreton Bay in the state of Queensland, across the northern Australian marine environment to Shark Bay in the state of Western Australia.

Major threats and relative impacts

The major threats to dugongs in Australia include: loss of seagrass habitat, vessel activity and boat strike, accidental entrapment in fishing nets, marine debris, poaching and illegal harvest and illegal sale of meat, unsustainable indigenous harvest, habitat loss and degradation (coastal development), poor water quality and environmental contaminants (Haynes *et al.* 1999, 2000, 2005, Marsh *et al.* 1996, 1997, 2004, 2005, 2006, 2007). However, the impacts of these threats, either individually or in combination, are largely unquantified and their relative importance varies regionally.



Existing legislation which protects dugongs and other management arrangement

JURISDICTION	LISTING	LEGISLATION
Commonwealth	Migratory Species Listed Marine Species	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
Commonwealth	Protected Species	<i>Great Barrier Reef Marine Park Act 1975</i>
Queensland	Vulnerable	<i>Nature Conservation Act 1992</i>
Northern Territory	Protected	<i>Territory Parks and Wildlife Conservation Act 2000</i>
Western Australia	Specially Protected	<i>Wildlife Conservation Act 1950</i>
New South Wales	Protected	<i>National Parks and Wildlife Act: Amendment (Marine Mammals) Regulation 2006</i>

Australia signed the CMS Dugong MoU on 31 October 2007 in Abu Dhabi.

Recent/current and planned national conservation dugong work

Current and planned dugong work includes:

- Development of community-based management plans to manage the take of turtles and dugongs for Torres Strait Island communities, led by the Torres Strait Regional Authority.
- Development of Traditional Use of Marine Resource Agreements between the Great Barrier Reef Marine Park Authority and Traditional Owners, supported by the Reef Rescue Land and Sea Country Indigenous Partnership Program.
- Implementation of the Saltwater People Network project, incorporating marine turtle and dugong management across northern Australia, administered by the North Australian Indigenous Land and Sea Management Alliance.
- A dugong Task Force was created by the Australian Government in late 2010. The primary role of the Task Force was to examine dugong conserva-

tion in Australia, including traditional owner and stakeholder engagement in conservation efforts, compliance and enforcement of protection measures, and research and monitoring. A key project that has come from this work includes Governmental funding to support leadership and capacity building projects in sea country management, as well as increased participation by traditional owners in monitoring dugong and turtle populations and collecting species data to help with local management planning.

- Support for the 2011 Pacific Year of the Dugong. In 2011, the department contributed \$20,000 to support the Pacific Year of the Dugong, an initiative under the Secretariat of the Pacific Regional Environment Program (SPREP) Regional Marine Species Program 2008–2012 that aims to support dugong conservation in the Pacific.

Dugong captured for satellite tracking in Shoalwater Bay in 2008. © Ivan Lawler



NEW CALEDONIA



Traditional value of dugong to local population

Dugongs hold an important place in Kanak culture. Dugongs can still be hunted under special permits for customary purposes in the Northern province and Province des îles (mainly weddings, funerals and traditional yam feasts), even if this is uncommon. The meat and the blubber are cooked as a special dish, and the teeth are kept as a trophy.

Status of the local dugong population

New Caledonia and Vanuatu are situated at the eastern limits of the dugong range in the southwest Pacific and the New Caledonian dugong stock represents one of the largest populations worldwide, and the largest of Melanesia.

Two aerial surveys conducted in 2003 (during cold season) and 2008 (during warm season) enabled estimation of minimal abundance of dugongs. The estimations were 1814 dugongs (SD= 332) in 2003 and 964 dugongs (SD= 241) in 2008. Juveniles were estimated to be 7.2% of the total estimated population in 2003, and 14.3% in 2008.

It has not been possible to use the results of the aerial surveys to estimate dugong population trend for the last few years. It is however presumed that the dugong population in New Caledonia could be decreasing. A recent genetic study has shown that the New Caledonian stock is genetically different from the large Australian populations, indicating very low level of reproductive exchange (if any) between the two areas.

Known / presumed distribution of dugongs

The 2003 and 2008 aerial surveys indicated that dugongs are mainly distributed along the western coast and the north east coast of the main island during both seasons. Historical hunting permits for customary feasts in operation since 1962 also suggested the past presence of dugongs in the southern part of the east coast, while no dugong was observed in this area.

Current distribution highlights three dugong hot spots located in the south-west, central-west and north-west of New Caledonia. From the 2003 aerial survey, it was estimated that 84% of the dugong population was located on the west coast and 16% on the northeast coast. An important dugong population inhabits the Noumea coastal area, the busiest zone of New Caledonia with high boat traffic and human activities.

Major threats and relative impacts

Even though no specific studies have been conducted on threats to dugongs in New Caledonia, the following could be identified as major anthropogenic threats:

- Fishing and poaching
- Boat collision
- Pollution (organic, mineral and acoustic)
- Degradation and loss of habitats.

The two most important threats are likely to be poaching and boat collision. Half of the stranding reported between 2004 and 2008 occurred in Noumea, the busiest boat traffic area of the territory. While a third of the strandings could be positively identified as due to boat collision, it is estimated that it was the case for most of them.

A dugong consumption study conducted in the North Province in 2005 estimated that 38% of the household had already consumed dugong in this province, and that 8% of the household was hunting dugong. A similar study conducted in 2006 in the Southern Province showed that 20% of the population had already consumed dugong in this Province, mostly during family dinners and customary feasts.



Existing legislation which protects dugongs and other management arrangement

Resolution 68 dated 25th June 1962 prohibits fishing dugong over all Caledonian territories, except for Melanesian customary feasts through special permits.

In 1989, New Caledonia was divided into 3 provinces, each one becoming independent regarding environmental codes. Provincial deliberations on dugongs:

- Northern Province: 2001 (deliberation 23-2001/APN and 85-2001/BPN) and 2006 (deliberation 243-2006/APN). Special Permits for customary feasts allowed. However, the number of special permits granted has remained low (15 between 1995 and 2004, 0 since 2004).
- Southern Province: 2004 (deliberation 03-2004/APS). Deliberation 03-2004/APS fully prohibits

fishing of dugong all over the Southern Province where special permits can be no longer granted.

- Province Iles Loyauté: no deliberation or environmental code declared yet and it still operates under the resolution 68. However no important dugong population has been identified in this area.

The awareness of dugong protection in New-Caledonia has increased over the past few years. As an example, it is now completely forbidden to hunt dugongs in the Marine Protected Area of Hyabé-Lé Jao (Pweevo, North province), even for customary events. The request came from the MPA local management committee which wanted to protect dugongs inhabiting this area.

France signed the CMS Dugong MoU on 31 October 2007 in Abu Dhabi.

Recent/current and planned territorial conservation dugong work

Scientific, awareness and communication work regarding dugong protection had already been initiated in New Caledonia.

A national dugong action plan 2010–2012 has been in place involving various partners including the North Province, the South Province, the Iles Loyauté Province, the New Caledonia Government, the French Government, the Marine Protected Area Agency and two NGOs, WWF and Operation Cétacés. The project has been coordinated by the Marine Protected Areas Agency of New Caledonia with four major components:

- Governance of the national action plan: This plan has been managed by all the partners and lagoon users. All users were informed and have contributed to the process of improving knowledge regarding dugongs. The aim of the governance was also to build shared knowledge of conservation challenges and to follow the SPREP regional dugong action plan and UNEP/CMS Dugong MoU recommendations, thus inscribing the national action plan on a regional and international level.

- Knowledge: This component has aimed to address the limited knowledge regarding dugong biology and ecology through the conduct of scientific works in order to increase the understanding of the dugong population. This has included more aerial surveys, genetics, sea grass mapping, habitat use and movement of dugong, studies on threats and socio-economic aspects including the importance of dugongs to Caledonian culture.
- Education and awareness: Work already initiated in this area has been supported and expanded. Target audiences have included schools, sea professionals, public at large and lagoon users. Awareness resources include: TV spots, educational booklets, posters, calendar and competition in schools.
- Conservation plan 2014–2020: Actions undertaken and results obtained within the framework of the national action plan will be particularly useful in the formulation of the structure of a dugong conservation plan for 2014 and beyond.

PALAU



Traditional value of dugong to local population

Dugongs used to have cultural value in Palau, and, traditionally, was the only meat available to Palauans and was highly valued. The vertebrae were used as bracelets by traditional chiefs. Some jewelry is still made using dugong bones (e.g. the atlas vertebrae and ribs) and illegal hunting for the meat for special occasions still takes place. Dugong meat is mainly reserved for home consumption, particularly for festive occasions, but is also sold.

Status of the local dugong population

Infrequent aerial surveys using Cessna planes were not very effective for dugong surveying in Palau in the past. The start of a daily helicopter tour operation on Palau in recent years has greatly improved Palau's ability to survey dugong movements, especially around Koror, Airai and the Rock Islands. The helicopter pilot has daily sightings of dugong families and mother-calf pairs, and the largest herd recorded of over 40 animals was seen feeding around Ngederrak reef in October, 2010. In 2010, 11 dugongs were recorded killed, most by illegal poaching. Local fishermen estimate 5-15 dugongs are still killed each year.

Palau's dugong population is considered to be the most isolated in the world and unlikely to be supplemented by recruitment from any other area and is likely to be facing extinction. Analyzing by region using IUCN parameters, Marsh (2010) estimated that the dugong population in Palau can be classified as critically endangered.

Known / presumed distribution of dugongs

Dugongs and calves are sighted around Malakal, Koror almost daily, and sometimes gather in large groups for feeding, scattering a few hours later. They moved away from the Koror area for several months in 2010, and not enough is known about their movements to and around the northern states of Babeldaob Island to make accurate population estimates.

Major threats and relative impacts

Major issues on dugong population in Palau include:

- Illegal poaching activity, and
- Increasing development and destruction of dugong habitat.

Other possible impacts include:

- The continuing growth of the tourism industry on the islands;
- Sediment draining to the ocean;
- Oil spills from growing fishing industry;

It is also known that dugong hunters in Palau seem to prefer the meat of female and juvenile dugongs to that of adult males. If this preference is reflected in the catch, it will put added pressure on the stock.





Photo © Bruno Manach/DENV

Existing legislation which protects dugongs and other management arrangement

Palau has a dugong protection law in place that makes hunting for dugongs illegal. The Protected Sea Life, subchapter iv is on dugongs. Subsection (a) of this law states that 'No person shall kill, trap, capture, wound, possess, transport, restrain or otherwise have under his control any dugong or any part or product'. Violation of this law includes imprisonment for a period of 3–12 months and/ or a fine of 'not more than' US\$5,000 for the first offence. For every offense thereafter, the convicted person could be imprisoned for 6-36 months and/ or fined up to US\$10,000. However, no poacher

has been prosecuted to the full extent of this law so far, and illegal poaching continues. This law is currently under review by the Palau congress to increase the penalties.

Palau signed the CMS Dugong MoU on 4 October 2010 at the First Official Signatory State Meeting of the CMS Dugong MoU, Abu Dhabi, 4-6 October, 2010.

In October 2010, the Presidential Declaration No. 10-14 established Palau's Exclusive Economic Zone as a marine mammal sanctuary, which includes dugongs.

Recent/current and planned national conservation dugong work

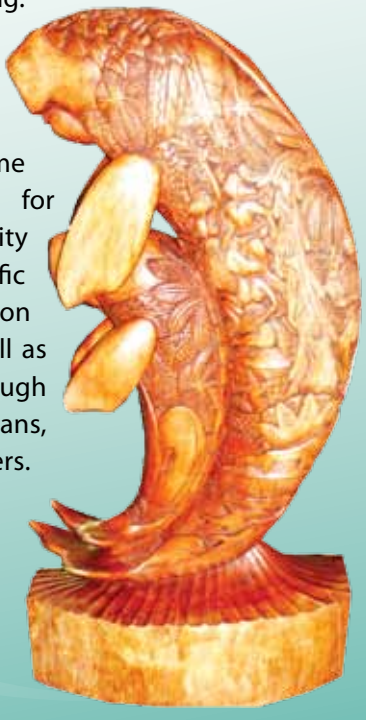
Following the last dugong campaign done by the Palau Conservation Society in 1996-1997, and following the 2010 Biodiversity theme, local NGO's on Palau started a Palau Dugong Awareness campaign in 2010, aimed at educating local children about the rarely seen dugong with printed educational materials and give-away items, studying and learning more about the Palau dugongs with helicopter and boat surveys, and highlighting the ongoing illegal poaching and need for more effective enforcement and action by responsible government agencies. Posters, stickers, office folders and baller bands were distributed locally throughout 2010 as well as daily conservation messages on local TV and regular press releases in local newspapers.

A free 45 page booklet with the most current data, photographs and findings on Palau dugongs was published in December 2010 and distributed to local schools and government agencies. As part of the campaign, the local helicopter operation agreed to keep daily sightings records on dugongs starting in October 2010, which will prove greatly beneficial to future research and surveys.

Continuing efforts in dugong conservation work in Palau have been identified as needing to focus on the following areas:

- Establishment of an on-going regular dugong monitoring and survey program and database;
- Stronger collaboration and involvement between National and State Government agencies;
- Identification of important dugong areas, dugong distribution and range within the country;
- More effective enforcement of existing dugong laws to stop illegal poaching.

The main need for effective delivery and implementation of the Palau national dugong programme includes financial support for on-going surveys, capacity building and training in specific areas, improving education and public awareness as well as effective management through involvement of politicians, communities and stakeholders.



PAPUA NEW GUINEA



Traditional value of dugong to local population

The dugong is regarded as very important to the culture of the residents of the island and coastal Papuan communities of the Torres Strait Region (Laba 1997). Many island groups in Papua New Guinea claim that the dugong is a totemic animal because of its large size and strength. It is believed that by using specific parts of the dugong in ritual ceremonies, plants and humans will be made strong and healthy (Laba 1997). In addition, drums and decorations are made out of the hide of dugongs and spoons and scrapers are carved from their bones (Hudson 1976). In the Morobe Province, the teeth and bones are made into hooks and laces, and in the Milne Bay region the teeth are used as betel nut crushers and as accessories for necklaces (Hudson 1976). In parts of Manus and the adjacent islands, dugong meat is an important component of the Islanders' traditional food while in other areas, such as Ponam Island, traditional taboos against killing dugongs exist (Sanders 1979). Hunting pressure on dugongs is greatest in the Western Province. The principal people involved in the dugong fishery are the Kiwai of the Western Province of Papua New Guinea to the north of Torres Strait.



Status of the local dugong population

PNG has recently entered into a new multilateral arrangement call the Coral Triangle Initiative (CTI) through which dugongs are categorized as a Threatened Species (G5). This is also reflected in PNG's National Plan of Action.

The Dugong population for the whole of the country is unknown. Monitoring has been done in Alotau. Aerial surveys for the last four years have been focused on flying over the same areas and results indicate a decreasing trend.

In a 2009 survey on Manus and Bougainville, Bass (2009) recorded the following results:

- Manus: interviews conducted in 13 locations around the island of Manus. In the first 3 months of 2008, 64 adult dugong and 18 calves were reported. A total of 187 adult and 48 calves were reported since 2005. Respondents estimated to have seen 952 dugongs in the past 5 years.
- Bougainville: interviews conducted in 25 locations in 5 survey areas in Bougainville from January-February 2008. A total of 20 adults and 10 calves were reported during this period, with a total of 37 adults and 17 calves reported overall for 2007 and 2008.

It was also noted that the results from both Provinces were encouraging in that dugong were reported from each location in significant numbers. People generally had respect for the dugong and mortality rates from hunting and strandings were relatively low.



Known / presumed distribution of dugongs

Dugongs have been reported to occur around the entire coast and islands of Papua New Guinea. A postal survey conducted in 1973-74 revealed the greatest concentrations (groups of 20-50) occurred around Manus Island, along the northern coast from the border to the mouth of the Sepik River, in the vicinity of Madang, in parts of West New Britain, and from the mouth of the Fly River along the coast to the Indonesian border (Hudson 1976). In 1975, a shoreline aerial survey of the Daru-Warrior Reef area, the southeast Papuan coast, the Lae area and northwest coast of West New Britain covered over 750 miles (1,200 Km) of the Papua New Guinea coastline (Ligon & Hudson 1977). A total of 186 dugongs were sighted with two concentrations of 29 and 39 dugongs over Warrior Reef. The survey results were not corrected for biases inherent in the survey technique, and so represent a minimum population estimate only. Hudson (1976) listed Samarai Islands, of Milne Bay, Kairiru Island, of Wewak and Lou and St. Andrew Island group off Manus as the most important areas for dugong conservation in Papua New Guinea.

Major threats and relative impacts

Major threats to dugongs in PNG include: loss of habitat, coastal development, logging operations in very remote areas, ship wreckages by log ships, sedimentation from heavy rain fall, pollution from mining (land and sea), direct take by humans from certain provinces, lack of legal mandate, and human population increases.

The main gaps include:

- Limited capacity to conduct work on dugongs;
- Very little emphasis placed on the importance of capacity building;
- Limited sustainable funding to implement national programmes;
- Lack of proper legislation to protect national animals;
- Lack of collaboration with NGO partners and stakeholders on research and monitoring;
- Lack of an overall picture of how many dugongs there are and their distribution.
- Lack of educational and awareness programs.

Existing legislation which protects dugongs and other management arrangement

PNG signed the CMS Dugong MoU on 10 September, 2010 at the 2010 SPREP Meeting in Madang.

Recent/current and planned national conservation dugong work

The Marine Division within the Department of Environment and Conservation was for the first time given recognition and funding in 2010 for the next 3 years. The Division targets at prioritizing 2 or 3 major activities to be implemented in the next 3 years and dugong conservation is included in the Marine National Action Plan as a priority for implementation, aligned with the 2008–2012 Regional Dugong Action Plan.

Other important tasks include working in close collaboration with NGO partners to promote priorities only, working closely with the national network partners through the CTI National Action Plan and the conduct of a legislation review of the Fauna (Protection & Control) Act.

SOLOMON ISLANDS



Traditional value of dugongs to local population

Dugong meat is highly prized in some parts of the Solomon Islands.

Status of the local dugong population

There is very little information on the distribution and abundance of dugongs in the Solomon Islands and no specific/detailed surveys have been conducted.

A 2009 rapid assessment used a series of questions with interviews with fishermen and key people from villages in areas where the presence of dugongs was indicated and where suitable habitats for dugong were present. A total of 98 interview surveys were conducted at 24 locations (Malaita, Central, Isabel and Western Provinces, Guadalcanal). The results of the survey were as follows:

- 300 dugongs were reported having been sighted, comprising of 248 adults and 52 calves;
- 742 dugongs were recorded sighted in the past 10 years. There is no recorded trend;
- A total of 56 dugongs were reported stranded from nets but this was reported for both accidental and intentional netting;
- Dugongs were reported to be hunted in 47% of the areas surveyed, and 36% of people reportedly eat dugong, and generally only once or twice a year;
- Dugongs do not generally form part of the main diet for Solomon Islanders;

- The Kiribati communities in the Western Province were reported to have actively involved in the hunt for dugongs, more so than the locals;
- Dugongs were reported to have been hunted in the past, even in tabu areas, however, never at large scale and rare today.

Known / presumed distribution of dugongs

Dugongs have been reported in Marovo Lagoon in the Western Province. The surveys in 2009 in Malaita, Central, Isabel and Western Provinces and the South East region in Guadalcanal reported 300 dugongs sighted, comprising of 248 adults and 52 calves.

Major threats, and relative impacts

Major threats and issues concerning dugongs in Solomon Islands include:

- Lack of specific legislation on Dugongs, Monitoring & Enforcement;
- Lack of respect to customary rights/ownership by certain individuals or groups;
- Overhunting, as was reported between 1970-1980;
- Habitat destruction – logging, pollution, sedimentation, seagrass beds, coral / coastal area dredging etc.;
- Population pressure – fishing pressure, coastal developments;
- Lack of alternative income generating activities for coastal fishers and communities;
- Lack of extension/ dissemination of information, awareness of cultural sensitivities etc.;
- Long-term sustainable financing for dugong work in country.



Existing legislation which protects dugongs and other management arrangement

The paramount law in Solomon Islands is the National Constitution which states that “the natural resources of our country are vested in the people and government of Solomon Islands”. The Constitution recognizes traditional systems of governance, providing that customary practices are part of the law of Solomon Islands.

There is no specific/separate dugong legislation, but it is captured in the following pieces of legislation: (i.e. Threatened species)

- Environment Act (No. 8 of 1998);
- Wildlife Management and Protection Act (No. 10 of 1998);
- Fisheries Act (No. 6 of 1998) (currently under review);
- Environment Regulation 2008;
- Protected Areas Bill 2010 (Regulations in gazettal stage and to be drafted before the end of 2011)

In terms of national policies, strategies and plans, the current Policy Statement on Environment is to “Ensure sustainable utilization and conservation of natural resources, protection of the environment and successful adaptation to climate change”. The MECOM is mandated to coordinate and guide sustainable use and conservation of Solomon Islands natural resources. Dugongs are captured under the National Environment Management Strategy 1993 (outdated and not fully implemented), National Environmental Capacity Development Action Plan (funded by: CBD, UNFCCC & UNDP), National Biodiversity Strategy Action Plan (NBSAP), Coral Triangle Initiative National Action Plan (CTI), NPOA, Marine Turtle Action Plan and the Project, Strengthening Environment Management and Reducing the Impact of Climate Change in Solomon Islands (GEF/UNDP).

Solomon Islands signed the CMS Dugong MoU on 9 September, 2010 at the SPREP Meeting in Madang, PNG.

Recent/current and planned national conservation dugong work

There is currently no dugong work in Solomon Islands but the dugong survey can be captured (because it’s a Threatened Species) in the Ministry Corporate Plan 2010–2014, NBSAP and CTI priority activities / Action Plans, although dugong is not specifically mentioned.

The Ministry is willing to support the initiative on dugong and is willing and prepared to work

along its partners, especially the NGOs, Regional and International organisations (SPREP and CMS). Dugong work is one of the high priority threatened species conservation and management planned activities for Solomon Islands. Solomon Islands is yet to have a national dugong action plan which is a priority for the next two years, to adapt the regional plan into national priority actions and implement it in this country.



VANUATU



Traditional value of dugong to local population

Dugong meat is considered a minor component of the subsistence diet of the people of Vanuatu. Dugongs are traditionally hunted almost entirely for their meat, with oil being a subsidiary product. Some handicrafts made from dugongs exist. While hunting occurs in some areas of Vanuatu, in others it is considered taboo to kill them. UNEP/IUCN (1988) record the presence of a wide variety of traditional practices such as the seasonal custom 'tabu' which is applied in areas important for dugong conservation. Tabu is a practice implemented by village chiefs that restricts the use of certain resources to ensure sustainability of natural resources (Kile et al. 2000). Dugongs appear to be hunted in three main regions of Vanuatu – the Maskelynes area of southeast Malakula, northern Epi and parts of Efate (Chambers et al. 1989).

Status of the local dugong population

No proper study, other than a 1987 report on the population of dugong in Vanuatu (Chambers *et al*), has been undertaken in Vanuatu to document dugong population numbers or their distribution in the past. Apart from the 1987 report, data for population trends do not exist other than the observations by the local people and their own existing traditional knowledge. Communities have reported increased numbers of dugongs due to awareness of laws against killing them, which have come into effect in the last 15–20 years.

Known / presumed distribution of dugongs

Most of Vanuatu's coasts are unsuitable as dugong habitat, however Dugongs have been sighted on

almost all the islands. Anecdotal information seems to indicate that a lot of dugongs are found especially around Malekula (the second largest Island in Vanuatu), Epi islands and Efate. These islands are located in the central part of the country. This is very likely to be linked with the fact that both islands have a relatively high degree of seagrass areas, which are good dugong habitat. Dugongs appear to be hunted, thus indication of their occurrence, in three main regions Vanuatu: the Maskelynes area of southeast Malakula, northern Epi and parts of Efate (Chambers et al. 1989).

Major threats and relative impacts

The absence of data makes it difficult to identify/quantify threats or impacts that affect the dugong populations in Vanuatu. However, information collected from numerous accounts made by fishermen and local people indicate that a large number of dugongs get entangled in gill nets. Increases in coastal developments over the last ten years primarily for housing and tourism, mainly on the most urbanized islands of Efate and Santo, including increased numbers of motorized boats are potentially impacting dugongs and their habitat.

Existing legislation which protects dugongs and other management arrangement

Dugongs, as marine mammals, are protected under the Vanuatu Whale Sanctuary established under the Fisheries Act No. 55 of 2005: (Prior to this, dugongs were also protected under the previous Fisheries Act.)

- It is prohibited to kill, harm, harass, take or move any marine mammal in the Vanuatu Whale Sanctuary;
- It is also prohibited to (a) possess, hold in captivity or restrict the movement of any marine mammal in the Vanuatu Whale Sanctuary; or (b) possess a part of a marine mammal, or a product produced from a marine mammal, taken in the Vanuatu Whale Sanctuary;
- It is also prohibited to export from Vanuatu or facilitate the export from Vanuatu of any marine



mammal, marine mammal part or marine mammal product. It is also prohibited to import into Vanuatu or facilitate the importation into Vanuatu of any marine mammal, marine mammal part, or marine mammal product.

- Only non-lethal research is allowed but which requires a permit from the Director.
- Exemptions for the taking of dugongs and import of marine mammal teeth are made for traditional ceremonial purposes.
- The Director may issue a permit to allow a person to import a marine mammal into, or export a

marine mammal from, Vanuatu if the Director is satisfied that the destination of the marine mammal is a public aquarium, public exhibition or a swim-with-marine mammals program for members of the public.

Vanuatu signed the CMS Dugong MoU on 4 October 2010 at the First Official Signatory State Meeting of the CMS Dugong MoU, Abu Dhabi, 4–6 October, 2010.

Vanuatu has a national Dugong Action Plan, which is based on the SPREP Regional Dugong Action Plan.

Recent/current and planned national conservation dugong work

The year was officially launched in June 2011, as the Pacific Year of the Dugong, by the Minister of Lands Hon. Stephen Kalsakau, and a nationwide survey of the populations of dugongs in Vanuatu was carried out throughout 2011 with questionnaires given to local villagers (especially fishermen) to find out the number of dugong sightings and areas of importance to dugong around the country. In late 2011 awareness talks were given on the Year of the Dugong, and the importance of the dugong, to schools around Port Vila and communities around Efate and its offshore islands, which are prime dugong locations and habitat (especially around north Efate). Presentations on the importance of this dugong campaign were also given in other affected islands, such as Santo Malekula, Epi and Banks Torres, which are also considered prime dugong locations in Vanuatu. The Vanuatu Cultural Centre has been documenting cultural values of dugongs in various areas of Vanuatu, as specified under the DAP

A dugong project was undertaken by the Vanuatu Cultural Center, dealing with surveying dugongs and dugong habitats, and documenting the local knowledge concerning dugongs. The project would work closely with communities targeting two sites, around Efate (where the capital is situated) and Van-

ua Lava and Ureparapara in the Banks group, which is in the northern part of the country.

While the project mainly attempted to map mangrove and sea-grass bed areas suitable for dugongs, it also attempted to identify causes of dugong habitat destruction. One of the end results of the project has been to update existing maps by 2012.

Several community workshops have been carried out on dugongs and whales and a dugong poster explaining the distribution of dugong, the threats that are affecting them, and why they are endangered, has been produced.

This project has created a lot of community awareness and using about 80 field workers who have been given educational material and involved in workshops.

Surveys have been carried out through questionnaires asking local fishermen, villagers to report on dugong sightings, areas of importance, etc. And these questionnaires were sent to various communities, volunteers stationed around the islands, field workers provincial officers, various government officers around the country to help get these questionnaires done and sent back to get a good overall picture of dugong populations existing in Vanuatu today.

Pacific Dugongs

Fast facts

Type: Mammal
Diet: Herbivore
Lifespan in wild: 73 years
Age at first breeding: 7 - 17 years
Calving interval: 2.5 – 6 years
Lactation: ~1.5 years
Length (fully grown): 2.4 to 3 metres (8-10 ft)
Weight (fully grown): 231 to 500 kg (510 – 1,100 lbs)

Scientific Classification

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Sirenia
Family: Dugongidae
Subfamily: Dugonginae
Genus: *Dugong*
Species: *Dugong dugon*



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Range and Habitat:

Dugong occurs in 38-45 countries and territories, tropical and subtropical coastal and island waters from east Africa in the Indian Ocean to Vanuatu in the Pacific Ocean, between about 260° and 270° north and south of the equator. In the Pacific Islands region, dugongs are found in Australia, Palau, Papua New Guinea, Solomon Islands, New Caledonia and Vanuatu.

What are dugongs?

Dugongs are large marine mammals and are the only strictly marine herbivorous mammals. They are sometimes called “sea-cows” and are usually found in shallow waters protected from large waves and storms. The word “dugong” derives from the Tagalog term for “lady of the sea”.

Biology: Dugongs are the only surviving species of the family Dugongidae - its closest relative, Stellar’s sea-cow, was hunted to extinction within 27 years of its discovery in the eighteenth century. They have a thick layer of fat giving them a distinctly rotund posture, small paddle-like flippers positioned far forward on the body and a broad, flattened powerful tail that resembles the tail of a whale. Calves at birth are about 1.2 metres long weighing about 30kg. Dugongs have few natural predators. However, sharks, crocodiles and killer whales will feed on young dugongs.

Diet: Dugongs feed mainly on seagrass, rooting for them with their bristled, sensitive snouts and chomping them with their rough lips. They maximize the intake of nutrients by selecting, for food, seagrass species that are highly digestible and have high nutrients. They can supplement their diet with invertebrates (polychaete worms, sea squirts and shellfish).

Status: The 2008 IUCN Red List classifies dugong as vulnerable to extinction on a global scale. While they are still present at the extreme ends of their range, they have disappeared from several areas. In the Pacific Islands region the status of dugong populations is generally unknown with the exception of that in the Torres Strait.

Value of dugongs

Dugongs play a significant ecological role in maintaining coastal habitats. Dugongs are also of high cultural value in many communities, a valued source of food, medicine and artifacts and thus an important species for coastal people.

Threats to dugong habitat

Coastal development including human settlement: These activities increase sedimentation and turbidity in coastal waters where seagrasses are found. Sedimentation and turbidity not only smother seagrass but also reduce the amount of light reaching them, resulting in the degradation of seagrasses and a reduction in their density and productivity.

Nutrient runoff from land: Nutrient enrichment due to land runoff leads to algal bloom which in turn results in reduced light levels for seagrasses. Nutrient enrichment may also change the community structure of seagrass habitat, eg. increased seaweeds and fewer seagrasses.

The continuing health of dugong populations is essential to maintaining a healthy Pacific Ocean.



Threats to dugongs

Dugongs die every year for many reasons, both natural and human related. Dugong deaths need to be minimised to ensure that enough baby dugongs continue to be born to maintain long-term adult population numbers. Although it has been estimated that a dugong population of only 100 animals would not sustain any human-caused mortality (the most common reason for dugong deaths), further research is needed to determine what constitutes a sustainable dugong population in the Pacific.

Hunting for food, medicine and artifacts: These languid animals make an easy target for coastal hunters and they have been long sought after for their meat, oil, skin, bones and teeth. Specific parts of the dugong are used in customary events (e.g. weddings) as well as for making traditional items, including drums, hooks and necklaces.

Incidental by-catch and vessel strikes: The incidental drowning of dugongs caught in fishing gear, such as gill nets, has largely contributed to the decline of dugongs in much of its Pacific range. The increase in vessel traffic also increases the likelihood of dugongs being killed by vessel strikes.

Challenges for dugong conservation and management

Lack of data and information, including basic population parameters and long term data sets;

Limited information exchange, linkages and collaboration;

Absence and lack of ongoing and long term research, survey and monitoring programmes through much of its range;

Limited public awareness and education programmes;

Limited in-country skills/capacity to provide leadership in marine species conservation management;

Limited national management mechanisms to protect marine animals and their habitat;

Lack of resources, including accessing sustained funding.



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Dugong Regional Management Effort in the Pacific Islands Region

The Pacific Islands region supports the world's largest remaining population of dugongs, although much of this is shared between Australia and Papua New Guinea.

Concerns over the state of marine mammals in the region resulted in a marine mammal conservation programme at SPREP which currently has a 5-year regional Dugong Action Plan (2008-2012) in place.

All dugong range states in the Pacific Islands region (SPREP members that have dugongs in their waters) have signed the Convention on Migratory Species Memorandum of Understanding on the Conservation and Management of Dugongs and their Habitats throughout their range.

International agreements to protect dugongs



The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale.

CMS Link: <http://www.cms.int/about/index.htm>

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THIS PROJECT IS FUNDED BY THE EUROPEAN UNION

Pacific Seagrasses



Seagrasses are flowering plants (angiosperms) that grow exclusively in the marine environment. Seagrasses are marine plants like mangroves and algae (seaweeds) and are found throughout most Pacific Islands. They relate more closely to water lilies and orchids than land grasses. Scientists believe that seagrasses originated from land plants, either directly from the land, or via freshwater.

They have extensive underground systems (rhizomes) and strong roots that anchor the plant to sandy and muddy substratum. The roots absorb nutrients but, unlike land plants, do not take up water. To cope with living in oxygen-poor mud, seagrasses have air canals that carry oxygen from the leaves to the buried rhizomes and roots. Excess oxygen is secreted from the roots to help create a suitable environment for bacterial growth to speed up the breakdown of detritus.

Seagrass diversity and habitats

There are 60 species of seagrasses globally, distributed from the Arctic to the southern end of New Zealand. Tropical regions have the greatest species diversity. The Pacific Islands have 15 species found mostly in the western Pacific, with species numbers declining as you go eastward. Endemic seagrasses are rare with *Halophila ovalis* subspecies *bullosa* found only in Fiji, Tonga and Samoa.

Seagrasses form beds or meadows comprising of one or more species. These beds are common at water depths of 2-15 metres but can grow at depths of 50 metres or more.

Seagrass reproduction and growth

Seagrass reproduction takes place underwater; pollen is carried by the current until it attaches to the stigma.

Once fertilised, seed pods are produced and these are dispersed by the currents. The expansion of seagrass beds is often not due to the growth of new individual plants from seeds but from the continual growth of rhizomes.

Importance of seagrasses

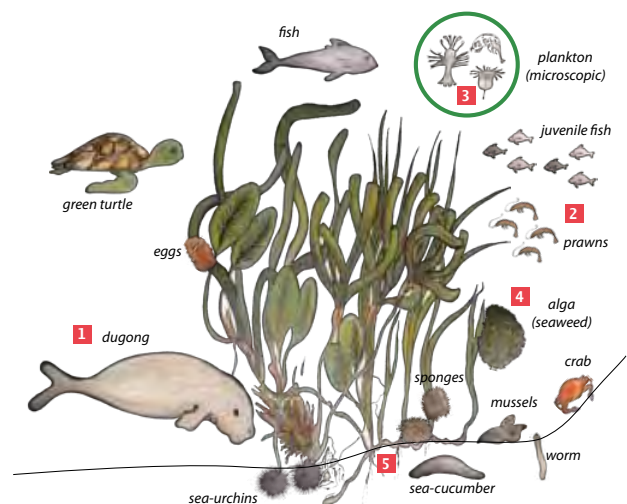
Seagrasses provide food, shelter, breeding and nursery areas for many marine organisms. Big animals graze on them; small animals live amongst them. Research has found that in a 400 square kilometre of seagrass can support 2,000 tonnes of fish a year, of which many species are important for subsistence and commercial fisheries. Our fisheries rely on the health of our seagrass beds.

Seagrass as food 1 2 3

Seagrasses are food for many culturally important species, including dugong, sea-turtles, fishes, sea-birds and invertebrates. Decaying leaves provide food for small organisms such as bacteria, worms and crabs; these in turn are eaten by juvenile fish, prawns and sea-birds.

Coastal erosion 5

Seagrasses prevent coastal erosion by trapping sediments and stabilising the substratum with their rhizome and root systems. Wave energy is lessened as it flows over seagrasses minimising the impact on coastal areas. Seagrass leaves trap sediments making the water clear.



Seagrasses are vital for the ongoing health of our coastal waters and fisheries. The numbers shown here correspond to some of the important features of seagrasses identified in the text.



Shelter and nursery grounds 4

Seagrass beds are often refuge for small animals and plants, receiving protection from predators, and from harsh sunlight or fluctuating salinity and temperature. Many young animals use seagrass beds as nursery areas before moving into other habitats. Commercially important prawns hatch in the open ocean and make their way to coastal waters where they settle in seagrass beds. When they become large juveniles, they move back out to sea. Prawns are very important to fisheries in countries like Australia and Papua New Guinea. Many animals also lay their eggs in seagrasses. If seagrasses disappear, so will many of the animals and plants that depend on them, as well as our food source.

Carbon storage and ocean acidification

The oceans are our greatest source for absorbing carbon dioxide (CO₂), one of the most potent gases responsible for global warming. Since the industrial revolution, CO₂ emissions into the atmosphere have increased by 30 per cent. The excess CO₂ absorbed by the ocean is reducing the pH making the seawater more acidic (known as Ocean Acidification). Ocean Acidification harms calcified organisms such as corals and shellfish. However, seagrasses and other marine plants can convert this CO₂ into oxygen and simple carbohydrates through photosynthesis, thus trapping the CO₂. This is known as carbon sequestration. Depending on the species, local environment and time of the year, seagrasses can sequester up to 1.33 metric tons of carbon per hectare per year. By removing the excess CO₂ from the ocean, seagrasses are able to help balance the ocean pH and contribute to safeguarding ocean life and to slowing down the overall effects of global warming.

Threats to seagrass

Because seagrass beds are found in shallow coastal waters close to human habitation, they are vulnerable to human activities such as boating, coastal development, dredging and fishing. Natural processes, such as storms, floods and tsunamis, can also cause damage to seagrass beds.

Dredging

Dredging of shipping channels, ports and canals can kill seagrass by their physical removal, or by smothering caused by too much sediment in the water blocking out sunlight.

Nutrients

Nutrients in the sea may come from sewage, fertiliser runoff from agricultural areas, soil eroding from the land and runoff from cities and towns. Nutrients such as nitrogen and phosphorous encourage growth of algae, which can overgrow and smother seagrasses.

Oil

Oil spills damage seagrasses by poisoning them and the organisms that live within them. Oil droplets can attach themselves to the mud and sand making them easy to float away with the current. This leads to the seagrass beds eroding.

Save our Seagrasses

Seagrass beds are directly affected by the way we treat the land and by what we put into the sea. Our population is increasing along the coastline, which puts pressure on our marine environment including seagrass beds. What we do to help the environment will also help seagrasses. By managing our land and activities carefully we will save our seagrasses and our own future.

How can you help?

Your actions will make an important contribution to saving our seagrasses and protecting the marine environment. Some of the things you can do:

- Keep an eye on your seagrass beds. Join or form a group to carry out regular monitoring and conservation of seagrass beds;
- Tell friends and family about the importance of seagrass to marine life and our 'Pacific life';
- Discourage activities such as dredging, dumping rubbish and destructive fishing that affect seagrass;
- Be careful about what you put down the drain- it may be harmful to seagrass and marine life;
- When boating, go slow and don't anchor around shallow seagrass beds;
- Consider the impacts to seagrass beds in environmental impact assessments for coastal development, such as dredging reclamation and construction work.



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Working together to save Dugongs

In the Pacific Islands region, the dugong is found in the waters of six SPREP members (Australia, Papua New Guinea, Palau, New Caledonia, Solomon Islands and Vanuatu). It is important in many traditions and cultures. Some of the most important remaining dugong habitats are in the Pacific region.

Dugongs have been in existence for millions of years but they are now threatened. Their numbers have decreased in many areas and some populations have now completely disappeared. The dugong is considered vulnerable to extinction on a global scale and all dugong populations are listed in Appendix 1 of the Convention on Trade in Endangered Species (CITES). In the Pacific, the status of dugong populations is generally unknown. However, the dugong population in Palau can be classified as critically endangered of extinction.

SPREP has in place a regional dugong action plan, which was developed and endorsed by members.

2011 Pacific Year of the Dugong



2011 has been declared the Pacific Year of the Dugong. This is a regional campaign aimed at increasing protection of dugongs and their habitats by raising awareness, improving knowledge and fostering

partnerships for conservation of dugongs and their habitats.

Campaign Objectives

- 1 Promote awareness and conservation of dugongs at site-level targeting key stewards and the fishing industry;
- 2 Reduce dugong mortality from human activities;
- 3 Improve status information and promote sustainable management of dugong populations and protection of their habitats at the national level through effective and practical national legislation and policies;
- 4 Advance partnerships and secure resources for long-term support for dugong conservation in the region.

Community management

Dugongs have high cultural value and are a valued source of food, medicine and artefacts. Dugongs feed in shallow waters often within areas that fall under traditional ownership or community fishing grounds. Commercial fishermen, particularly fishermen that use gillnets, also use areas where dugongs occur. Dugong mortalities from by-catches in gillnets, boat strikes from commercial operations are significant. SPREP and partners will work to strengthen community-based initiatives within the following focus areas:

Identifying and protecting dugong feeding areas in range states;
Improving information bases to be used by communities and schools;

Strengthening community and industry involvement to reduce threats from over-harvesting, habitat destruction, by-catch, and marine pollution.

National guidance and leadership

Government (including researchers, legislators and policy makers) play a vital role in the strengthening of national activities that include:

Establishing/improving programmes (e.g. research and monitoring) to obtain and update information on dugong and its habitats, identification and minimizing threats;

Establishing effective legislation and policies concerning dugong conservation, where none exist;

Reviewing the effectiveness and relevancy of existing legislation and policies concerning dugong conservation; and

Improving enforcement mechanisms

Working together to strengthen Pacific Dugong conservation partnership

Given their status, dugong conservation requires long-term regional collaboration and partnership for the efforts to be effective. Dugongs are part of the Pacific biodiversity and their conservation is a shared responsibility. SPREP is promoting the need for communities, governments and industry to work together to strengthen dugong conservation.

This regional campaign is facilitated by SPREP in collaboration with other conservation organisations and agencies, international species conventions particularly the Convention on Migratory Species (CMS), national governments and other organizations and agencies.

The success of the campaign is dependent on the participation of partners and the integration of the campaign activities into national programme plans.



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What you can do to help:

Stop excessive and illegal hunting

Many countries have laws that control the harvesting of dugong. Respect the law. In the absence of national laws, respect relevant traditional laws and use the precautionary approach.

Develop appropriate legislation

Some countries may not have laws to protect dugongs and some laws may not be adequate to effectively conserve dugongs. Effective legislation is necessary.

Consider the impacts of coastal development on sea-grass habitats in the EIA processes

Coastal development easily impact negatively of sea-grass beds on which dugongs and other marine organisms rely for food. Environment Impact Assessment processes need to incorporate these impacts.

Minimize impacts from gillnets

Dugong mortality from gillnets is high. Minimize drownings by setting gillnets in areas not frequented by dugongs and never leave nets unattended to enable freeing of any caught dugong. Do not dispose old nets in the sea or on the shore.

Control boating where dugongs occur

Dugong mortality from boat strikes is increasing due to growing fishing and marine tourism activities. Slow down your boat and be on the alert for dugongs when in areas where dugongs occur.

Protect important habitats for dugongs

Seagrass beds are of vital importance to the coastal ecosystem. Conservation work for dugongs would also benefit a host of other marine organisms that depend on seagrass for food and shelter.

Start and support dugong conservation work

The status of dugong in most Pacific Island range states is unknown. This is due mainly to the absence of in-country dugong programmes. Priority should be given to establish dugong programmes at both community and national levels.

Spread the word!

Share what you know about dugong with your friends, family and communities. Learn about local conservation projects in your country and find out what you can do to help.



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Dugong Regional Management Effort in the Pacific Islands Region

The Pacific Islands region supports the world's largest remaining population of dugongs, although much of this is shared between Australia and Papua New Guinea.

Concerns over the state of marine mammals in the region resulted in a marine mammal conservation programme at SPREP which currently has a 5-year regional Dugong Action Plan (2008-2012) in place.

All dugong range states in the Pacific Islands region (SPREP members that have dugongs in their waters) have signed the Convention on Migratory Species Memorandum of Understanding on the Conservation and Management of Dugongs and their Habitats throughout their range.

International agreements to protect dugongs



The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale.

CMS Link: <http://www.cms.int/about/index.htm>

The continuing health of dugong populations is essential to maintaining a healthy Pacific Ocean.



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Respect and Protect Dugongs and the Coastal Environment!

Dugongs are a treasured and unique part of our Pacific marine heritage. Many dugong populations are declining due to excessive and illegal hunting, drowning in gillnets and boat strikes. The seagrass beds on which they depend for food are also under threat from uncontrolled coastal development, pollution and natural disasters.



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Some things we can do:

- ✓ Know and obey the law with respect to dugong protection;
- ✓ Stop excessive and illegal hunting;
- ✓ Prevent uncontrolled coastal development;
- ✓ Don't dump rubbish or chemicals in rivers and the sea; (they poison seagrasses and other marine life);
- ✓ Avoid catching, and release dugongs caught in gillnets;
- ✓ Control boating where dugongs occur;
- ✓ Stop the use of destructive fishing methods like dynamite;
- ✓ Support work on dugongs and conservation effort.



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Our Vision is a Pacific environment, sustaining our livelihoods and natural heritage in harmony with our cultures

