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Executive Summary

- The Convention on the Conservation of Migratory Species of Wild Animals (CMS) Memorandum of Understanding on the Conservation and Management of Dugongs (*Dugong dugon*) and their Habitats throughout their Range (Dugong MoU) contracted James Cook University to prepare a new edition of the 2002 publication: ‘Dugong: status report and action plans for countries and territories’.
- The new edition, which is titled ‘A global assessment of dugong status and conservation needs’, comprises ten chapters, and has been edited by Helene Marsh, David Blair, Len McKenzie, and Luisa Schramm. The nine regional chapters have each been coauthored with at least five and up to nine regional experts.
- This Executive Summary provides the project’s Key Findings at both a global scale and for each of the following regions: East Africa, Red Sea, Arabian/Persian Gulf, South Asia, Continental Southeast Asia, Maritime Southeast Asia, East Asia, Pacific Islands and Australia.

Global Scale Findings

Range States

- The review indicates that the dugong Range States fall into the following categories:
 - (1) **Range States that support resident populations of dugongs:** Australia, Bahrain, Brunei Darussalam, Cambodia, Comoros (Mohéli), Djibouti, Egypt, Eritrea, India, Indonesia, Japan, Kenya, Kingdom of Saudi Arabia, Madagascar, Malaysia, Mayotte (Department of France), Mozambique, New Caledonia (Territory of France), Palau, Papua New Guinea, Philippines, Qatar, Seychelles, Singapore, Solomon Islands, Sri Lanka, Sudan, Thailand, Timor-Leste, United Arab Emirates, United Republic of Tanzania, Vanuatu, Vietnam, and Yemen.
 - (2) **Range States that possibly support resident populations of dugongs, but further investigation is required to confirm the situation:** Bangladesh, Islamic Republic of Iran, Israel, Kuwait, Myanmar, Oman, and Somalia.
 - (3) **Putative Range States that are currently unlikely to support resident populations of dugongs:** China, Iraq, Jordan, Pakistan. Further investigation is required to confirm this situation.
- The dugong is likely to be **extinct** in Comoros (outside Mohéli), Mauritius (including Rodriguez); and the Seychelles (outside Aldabra).
- There is no evidence that dugongs were ever resident in the Maldives, the Lakshadweep Islands (India) or Taiwan (Province of China).

Conservation Status

- The International Union of the Conservation of Nature (IUCN) lists the dugong as Vulnerable to Extinction at a global scale. IUCN has also listed the following ‘subpopulations’¹ at a regional scale: East Africa Coastal (Critically Endangered); Nansei, Japan (Critically Endangered); New Caledonia (Endangered).

¹ ‘Subpopulation’ is the technical term used by IUCN when making a regional assessment. Population is the more accepted terminology and is used in the report, outside the context of an IUCN regional assessment.

- Dugongs are likely to qualify for IUCN Listing at a regional scale in the following locations: Seychelles (Aldabra); China; Comoros (Mohéli); India (each of the Gulf of Kutch, and Andaman and Nicobar Islands) and Palau.
- Dugongs will not qualify for regional-scale IUCN listing in most other parts of their range without further information, because at least one of the following factors applies: (1) the connections between dugongs in adjacent Range States are not known; (2) the number of mature dugongs cannot be estimated with confidence; and/or (3) the trend in numbers has not been quantified.

Genetics

- Dugongs exhibit considerable genetic diversity across their range and several major genetic groups can be recognised.
- Dugongs in the Australian region, and especially in tropical Australia, appear to be genetically healthy, with good levels of diversity at nuclear loci and in the mitochondrial genome. These dugong populations should be better able to respond to changing environmental pressures, including disease, than dugongs in many other parts of their global range.
- Dugongs in the Western Indian Ocean (East Africa, Red Sea, Arabian/Persian Gulf, South Asia), Palau and New Caledonia have very low mitochondrial diversity. If their nuclear gene diversity is also low, their long-term resilience to changing environmental pressures, including disease, is likely to be lower than the resilience of the Australian dugongs.
- Little genetic data is available for most parts of the dugong's range, making it impossible to define the geographical extent of genetically connected populations. Without such information, it is difficult to determine the appropriate size of management units.

Seagrass Habitat

- The total area of seagrass that has been mapped with moderate to high confidence in the dugong's range is ~ 42,693 km² in waters < 20m deep; 60% of this seagrass is in the dugong's Australian range. The global total is believed to be a significant underestimate of the actual area of potential dugong habitat.
- Additional seagrass mapping should be a high priority, especially in Range States where the area of coastal waters < 20 m deep is > 50, 000 km²: Australia, India, Indonesia, Malaysia, Myanmar, and Papua New Guinea.

Threatening Processes

- There are two categories of threats to dugongs: direct threats that cause dugong mortality, and indirect threats that result in dugong habitat loss or degradation, which in turn, negatively affect dugong fecundity. As dugongs are long-lived, slow breeding mammals, threats to mortality are likely to be more serious than threats to fecundity, but both categories can have unsustainable impacts.
- Hunting dugongs for food, medicines, and artefacts was the most serious, historical threat to their survival in many Range States. Hunting is now illegal in most parts of the dugong's range. Indigenous peoples are exempt from hunting bans in some Range States. The global impact of hunting is now much reduced, although illegal poaching can still be a threat.

- The major contemporary threats to dugongs and their habitats are:
 - The incidental and deliberate capture of dugongs in artisanal fisheries, especially gillnets; illegal, unreported and unregulated fishing, and marine debris.
 - Loss of the seagrass habitats of dugongs caused by anthropogenic pressures including: (1) coastal development, ports and reclamation; and (2) pollution including terrestrial runoff in the coastal zone, hydrocarbons, and plastics. Seagrass meadows are ‘among the most threatened ecosystems on earth’ according to a 2009 meta-analysis.
 - Climate change and extreme weather, which change the availability, production, species composition and distribution of the seagrass communities on which dugongs depend, exacerbating the ongoing loss of seagrass caused by anthropogenic pressures. Large-scale seagrass loss caused by extreme events such as marine heatwaves, cyclones and floods has the following impacts on dugongs: increased neonatal, juvenile and adult mortality, reduced fecundity and temporary emigration from areas of seagrass loss.

Conservation initiatives

- Most dugong Range States have enacted laws to protect dugongs and their habitats. Many countries have created Marine Protected Areas in areas of dugong concentration. Implementation of these initiatives is often ineffective.
- Initiatives to protect dugongs from fisheries interactions include: bans on blast fishing; closure of areas to nets and/or destructive trawling; incentive payments to encourage fishers to release dugongs from nets; awareness and education programs in fishing communities; alternative livelihoods and seagrass restoration. The long-term effectiveness of these programs is rarely evaluated.
- Many of the dugong’s Range States are ‘Least Developed Countries’ where levels of poverty are high and rural coastal communities depend on natural resources for their survival and livelihoods. Lack of alternative livelihood options for rural coastal communities in these countries often results in the over-exploitation of marine resources and subsequent use of habitat-destructive harvesting practices as fishery catches diminish; ultimately damaging the marine ecosystems upon which these communities depend.
- In many parts of the dugong’s global range, their numbers are now so low that it may be efficient and effective to address the threats to dugongs as part of actions to address threats to marine megafauna more generically.

Regional Findings

East Africa: Kenya, Madagascar, Mayotte, Mozambique, Republic of Mauritius, Republic of Seychelles, Union of the Comoros, United Republic of Tanzania, Somalia

- Hunting and bycatch in fishing nets have caused very serious declines in the dugong populations in East Africa.
- Dugongs are probably extinct in the waters of both Mauritius and Rodrigues and apparently no longer occur in the Comoros outside Mohéli, and in the Seychelles outside Aldabra.
- IUCN listed the East African Coastal ‘subpopulation’ of dugongs as Critically Endangered in 2022.

- Dugongs in East Africa are likely to have limited resilience to extreme events as the genetic differences between individual animals appear to be very low.
- The only location in East Africa where a globally-significant number of dugongs is known to occur is the Bazaruto Seascape in Mozambique. This location has been recognised internationally as an Important Marine Mammal Area and a Key Biodiversity Area.
- Bazaruto dugongs are actively monitored and the threats to them are managed. There is significant community engagement. These programs are very important.
- Scientifically-designed local-scale surveys informed by local knowledge have the potential to provide important new information about dugongs in Zeyla Archipelago in Somaliland, Mohéli, Mayotte and Aldabra Atoll.
- In Madagascar, Nosy Hara Marine Park, Ampobofobo, Bay of Rigny complex and Ambodivahibe are important habitats for dugongs.
- The 'Northwest Madagascar and Northeast Mozambique Channel' Important Marine Mammal Area, which spans the waters of Comoros, Mayotte and Northwest Madagascar includes the dugong as one of 22 supporting species.
- Outside the locations named in this Executive Summary dugong numbers are apparently so low that management interventions focussed solely on dugongs are unlikely to attract much support. Interventions designed to protect all marine megafauna are likely to be more successful and groups with an interest in the conservation of marine turtles and small cetaceans should be invited to incorporate dugong conservation in their management actions.
- The areas of seagrass in the region are likely to be underestimated. It will be important to undertake further mapping using modern techniques.
- An updated comprehensive 'Dugong Conservation Strategy in East Africa' would be a timely initiative, especially if it included a regional spatial risk assessment of the threats to dugong in areas of local importance.

Red Sea: Djibouti, Egypt, Eritrea, Saudi Arabia, Sudan and Yemen.

- The dugong distribution in the Red Sea is fragmented, reflecting the availability of suitable seagrass habitat.
- The dugong population of the Red Sea was estimated to be up to 4,000 animals in the 1980s, an estimate extrapolated from an aerial survey estimate of the number of dugongs in the Saudi Arabian waters of the Red Sea in 1987, plus interview surveys in Yemen in 1988.
- There is a lack of contemporary data on both dugongs and their seagrass habitats for most countries bordering the Red Sea, especially the Range States along the western coast. Recent research assessing the status of dugongs in the region is largely based on local-scale research including interviews with fishers, studies of feeding trails and photo-identification of individual dugongs and unpublished reports of recent aerial surveys along parts of the Saudi Arabian coast.
- The following Important Marine Mammal Areas of relevance to dugongs have been declared in the Red Sea: the 'Northern Red Sea Islands' and the 'Southern Egyptian Red Sea Bays, Offshore Reefs and Islands' in Egypt; and the 'Farasan Archipelago' in Saudi Arabia.
- In addition, there are Important Marine Mammal Areas of Interest, which are still being evaluated, for which the dugong is listed as a supporting species: (1) the 'Golfe de Tadjoura' and (2) 'Seven Brothers Islands and Gondoya', in Djibouti; (3) 'Dhalak and Adjacent Southern

Waters' in Eritrea; (4) 'Dungonab Bay–Mukawar Island', and the 'Suakin Archipelago and Sudanese Southern Red Sea' in Sudan.

- The dugong status in the region is currently 'data deficient'
- It is likely that dugongs have declined in the Red Sea in recent decades due to human-caused mortalities relating to past hunting pressure and current incidental bycatch and habitat loss.
- The Programme for the Environment of the Red Sea and Gulf of Aden (PERGSA) offers an established framework for regional co-operation on the marine environment and conservation in the Red Sea. A constructive way forward might be to invite PERGSA to co-ordinate a regional strategy for dugongs in the Red Sea.

Arabian/Persian Gulf: the Kingdom of Bahrain, the Kingdom of Saudi Arabia, the State of Qatar, the United Arab Emirates and the Islamic Republic of Iran

- The core habitat for dugongs lies in the western and southern Gulf between about Ras Ghanadha, east of Abu Dhabi in the UAE through Bahrain and Qatar to Ras Tanura on the Saudi Arabian central coast.
- Whether the coastal waters of Iran currently support a resident population of dugongs is uncertain and will only be determined by research explicitly designed to investigate the situation.
- Although the status of the dugong in The Gulf region is 'data deficient', the available evidence suggests that it supports a stable population of ~ 5,000 dugongs, ~ 3,000 of which are in the water of the UAE. A coordinated series of surveys across this core habitat is required to confirm the status of the dugong in The Gulf.
- The largest dugong aggregations recorded globally occur in the Gulf of Bahrain/Gulf of Salwa region. These fluid groups account for ~ 60% of the dugongs found in Bahrain waters and an estimated ~ 12% of all dugongs in The Gulf. The core occupancy area of these aggregations straddles the Bahrain–Qatar border, reflecting their transboundary nature.
- The global importance of The Gulf for dugongs has been recognised by the declaration of 'the Southern Gulf and Coastal Waters' and 'the Gulf of Salwa' as Important Marine Mammal Areas, both with the dugong as a qualifying species.
- Given the transboundary nature of The Gulf's dugong population, a regional network of marine protected areas spanning all the dugong range states in The Gulf to conserve the core dugong areas would be highly desirable and should encompass at a minimum: (i) UAE: Murawah Island and Al Yasat Island, (ii) Bahrain: Hawar Island, Fasht Buthur, and Fasht Jarim, (iii) Qatar the north-western waters of Qatar, and (vi) the shallow waters between Saudi Arabia, Qatar, and UAE.
- The Gulf is the world's hottest sea. The effects of climate change dugongs and their habitats in the context of the other threatening processes they are exposed to in The Gulf merits investigation, especially as dugong genetic diversity appears to be low in this region.

South Asia: India and Sri Lanka

- Dugong distribution in the South Asian Region is limited to: (1) the Gulf of Kutch in northwestern India; (2) Tamil Nadu and Sri Lanka; and (3) the Andaman and Nicobar archipelagos in Indian waters in the Bay of Bengal.
- No dugongs or seagrasses have been recorded in Pakistan. It is uncertain whether Bangladesh supports a resident dugong population. There is no evidence that dugongs ever occurred in the Maldives or the Lakshadweep Islands (India).

- The Gulf of Kutch supports a small, isolated, resident dugong population. The limited extent of the potential seagrass-supporting habitat in this Gulf means that it is able to support only a relatively small dugong population, a situation which makes their survival there very challenging.
- The southern Gulf of Kutch has been identified as an Important Marine Mammal Area with the dugong listed as a qualifying species.
- The transboundary Tamil Nadu-Sri Lanka region, which includes Palk Bay and the Gulf of Mannar, is the most important habitat for seagrasses and dugongs in South Asia. The 'Palk Bay and the Gulf of Mannar' has been identified as an Important Marine Mammal Area, with the dugong as the only qualifying species.
- Palk Bay and the Gulf of Mannar apparently support a much lower number of dugongs than in the recent past. Procedures need to be developed to enhance the governance arrangements, research findings and community support required to improve the management of dugong population in this area, especially the impacts of fisheries interactions on dugongs and seagrasses.
- Dugongs in the Gulf of Mannar-Palk Bay also likely face challenging development pressures from the high-level commitment to connect India and Sri Lanka by building a land link across Palk Strait.
- The Andaman and Nicobar archipelagos support a small, isolated, resident dugong population. The limited extent of shallow coastal water around the Andaman and Nicobar Islands means that these archipelagos can support only a relatively small dugong population, a situation that makes their survival there very challenging.
- The 'Southern Andaman Islands' have been identified as an Important Marine Mammal Area with dugongs as a qualifying species.
- Given the small sizes of dugong populations in both the Gulf of Kutch and the Andaman and Nicobar archipelagos, it may be effective and efficient to develop and implement conservation arrangements for marine megafauna, rather than dugongs *per se* in both these areas.
- Research is required to determine if dugongs are resident outside the northwestern region of Sri Lanka and along the Chittagong coast of Bangladesh.
- The status of dugong populations in South Asia remains data deficient. Dugongs in each of the Gulf of Kutch and the Andaman and Nicobar Islands, likely qualify for separate IUCN 'subpopulation' assessments.
- Robust quantitative information on the size of the Tamil Nadu-Sri Lanka dugong population would be essential for an IUCN 'subpopulation' assessment.

Continental Southeast Asia: Cambodia, Malaysia (Peninsular Malaysia only), Myanmar, Singapore, Thailand, and Vietnam

- Dugongs face significant challenges in this region, primarily from incidental bycatch, habitat loss and degradation. The underlying causes of these threats vary across Range States, but their root causes are inadequate law enforcement, coastal development, and poverty.
- The status of dugongs in the Region remains data deficient, despite the efforts by many researchers and NGOs.
- The following globally-important Important Marine Mammal Areas with the dugong as a qualifying species have been recognised or are in the process of being evaluated:

- (1) the 'Mersing Archipelago' IMMA, off the eastern coast of Johor in Peninsular Malaysia;
 - (2) the transboundary 'Kien Giang and Kep Archipelago' IMMA, which spans the Kep Province in Cambodia and the Kien Giang Province in Vietnam;
 - (3) the 'Côn Đảo' IMMA in Vietnam;
 - (4) 'Trang' in Thailand (under evaluation).
- The Andaman coast of Thailand and the east coast of Johor in Peninsular Malaysia are the only locations with confirmed populations ranging from tens to hundreds of dugongs. Effective protection of these populations is particularly important.
 - Throughout most of the region, dugongs persist in fragmented, relatively small populations in recognized locations of local importance. Thus, it may be more efficient and effective to consider dugong conservation in these locations in the context of the conservation of marine megafauna more generically than to develop specific dugong management plans.
 - Increased attention to transboundary management and the conservation of seagrass meadows known to support dugongs would be highly desirable.
 - The largest knowledge gaps are:
 - (1) the inadequate mapping of seagrass in most areas, particularly Myanmar;
 - (2) the lack of quantitative data about most of the dugong populations;
 - (3) the lack of understanding of the contemporary transboundary movements of dugongs;
 - (4) the limited understanding of the genetic structure of the dugong populations outside Thailand;
 - (5) a spatial understanding of the threats posed by fisheries; and
 - (6) the human dimensions of dugong interactions with fisheries and coastal development.

Maritime Southeast Asia: Brunei, Indonesia, Malaysia (East Malaysia only), the Philippines and Timor Leste

- The dugong populations in Maritime Southeast Asia are fragmented and data deficient because information is largely based on local sightings at a subset of possible habitats.
- Important Marine Mammal Areas with the dugong as a qualifying species have been declared for the following sites in Indonesia: (1) 'Balikpapan, Adang and Appia Bays' in East Kalimantan; (2) 'Tolitoli' in Central Sulawesi; (3) 'Kaimana in West Papua'; and (4) the 'Eastern Lesser Sunda Islands and Timor coast'.
- The following areas are under evaluation as Important Marine Mammal Areas with the dugong as a qualifying species: (1) 'Brunei Bay' bordered by Brunei and the Malaysian state of Sarawak and the Malaysian Federal Territory of Labuan, and (2) 'Mayo and Pujada Bays' on the Pacific coast of Mindanao in the Philippines.
- It has been assumed that dugong populations are declining in the region because of unsustainable historical hunting, incidental entanglement in gill nets, destructive fishing, boat collisions and seagrass habitat degradation but there is no quantitative trend data.
- Especially in Indonesia and the Philippines, there is a mismatch between the spatial scale of marine conservation, which is largely organized at a local level, and strategic planning for dugong conservation, which has been at a national level. Coordinated governance of marine conservation at a regional level could be advantageous.
- It would be desirable to design and apply survey techniques suitable for both:

- (1) the spatial scale of the distribution of dugongs and their seagrass habitats, and
- (2) local capacity in each Range State.
- The following sequence of surveys could provide important new information for management:
 - (1) fisher surveys to identify dugong areas of local importance and threats to dugongs at the desired governance scale,
 - (2) seasonal 'hotspot surveys' using small drones to provide baseline information on dugong distribution and abundance,
 - (3) seagrass surveys using the globally standardized Seagrass-Watch protocols which were applied in the International Climate Initiative project 'Conservation of biodiversity, seagrass ecosystems and their services – safeguarding food security and resilience in vulnerable coastal communities in a changing climate',
 - (4) focus groups with local experts to identify threats to dugongs and other megafauna and their habitats could inform:
 - (a) a review of the adequacy of existing MPAs to protect megafauna, including dugongs and their habitats; and
 - (b) the design of new or modified MPAs to achieve effective conservation management of marine megafauna.
- Given that most dugong populations are likely small, conservation planning and management might receive more community support if it were organised for all megafauna rather than only dugongs *per se*.
- At the key location of Brunei Bay on the island of Borneo, international coordination across the state government of Sarawak and the federal territory of Labuan in East Malaysia and the country of Brunei would be highly desirable.

East Asia: China and Japan

- Dugongs are in critically low numbers in the coastal waters of China (Vietnamese-Chinese border to the northern border of the Fujian Province including offshore islands) and Japan (waters of the Nansei Islands).
- It is extremely unlikely that dugongs will recover in this region given the low likelihood of dugongs migrating into the area, successful captive breeding programmes, or translocating dugongs into the region from elsewhere.
- IUCN formally classified the Nansei 'subpopulation' as Critically Endangered in 2019. An assessment for the Chinese 'subpopulation' would almost certainly reach the same conclusion.
- Given this situation, interventions designed to protect coastal marine megafauna more generically in Chinese waters as part of its Ecological Conservation Redline strategy, may be more successful than dugong-specific interventions.
- Some segments of the Japanese public consider the remaining dugong population in Japanese waters to be very important, a situation that could be harnessed to address the threats to megafauna in the Nansei Islands region more generically.

Pacific Islands Region: New Caledonia, Palau, Papua New Guinea, the Solomon Islands and Vanuatu.

- Dugongs persist in locations of local importance in all these Range States. Active engagement with communities and government initiatives to protect dugongs within these areas is crucial.
- Information on dugong habitats, abundance and conservation status is limited outside New Caledonia, especially for Papua New Guinea and the Solomon Islands. Lack of capacity and funding are the main drivers for this persisting gap in investment in research and monitoring.
- IUCN listed the New Caledonia 'subpopulation' as Endangered in 2022.
- The dugong is explicitly cited as an attribute of the Outstanding Universal Value in the 'Lagoons of New Caledonia' World Heritage property.
- The 'New Caledonian Lagoons and Shelf Waters IMMA' was listed as an Important Marine Mammal Area in 2021, with the dugong as a qualifying species.
- The 'Main Solomon Islands IMMA' encompasses the coastal and offshore waters of the main group of Solomon Islands. The dugong is believed to be widely distributed within the IMMA and is one of the qualifying species.
- The Palau dugong population is not only the most isolated dugong population in the world but also appears to have very low genetic diversity.
- An important priority should be to build on the history of regional cooperation to develop a program of coordinated research on and monitoring of the distribution and abundance of dugongs and their seagrass habitats across the region, using techniques that are appropriate to the capacity of each Range State, but which would enable cross-country comparisons.
- Once this foundational work has been established, consideration should be given to understanding the connectivity between dugongs at locations within the region using modern genetics and tracking techniques, especially as genetic diversity appears to be very low for dugongs in both Palau and New Caledonia.

Australia: Queensland, Northern Territory, and Western Australia from Shark Bay north.

- Australia is the most important location for dugongs and their seagrass habitats in the world. The vast areas of shallow continental shelf in northern Australia provide extensive areas of seagrass supporting habitat and the human population density of most of this region is very low.
- The total estimated dugong population is ~ 165,000. The total area of seagrass estimated with moderate to high certainty in the dugong's Australian range is ~ 57,500 km², including 19,005 km² in waters > 20 m deep in the urban coast of the Great Barrier Reef World Heritage Area that has not been surveyed for dugongs.
- The dugong is a Matter of National Environmental Significance under national law and receives protection under the laws of all relevant jurisdictions in their Australian range.
- Ten Important Marine Mammal Areas (IMMAS) with dugongs as a qualifying species are recognised in Australian coastal waters: five in Queensland, one straddling Queensland and Northern Territory waters, and four in Western Australia. Dugongs in most of these IMMAS receive some statutory protection under marine park and/or fisheries legislation.
- The dugong population is explicitly recognised as an attribute of Outstanding Universal Value in both the Great Barrier Reef and the Shark Bay World Heritage Areas.
- The results of the large-scale aerial surveys that have been conducted over dugong habitats in Australia since the 1980s suggest that dugong conservation status varies regionally within Australian coastal waters from stable along the remote coast of the Great Barrier Reef World

Heritage Area, the Gulf of Carpentaria coast of the Northern Territory and Shark Bay, declining along the urban coast of the Great Barrier Reef World Heritage, and uncertain in most other parts of their Australian range.

- Confidence in these assessments varies because of regional and temporal differences in survey recency, frequency, and different approaches to assessing trends. Much of the dugong's range in Western Australia and the Northern Territory has only been surveyed once and key areas have not been surveyed for more than ten years including: Torres Strait, which supports the largest dugong population, the Gulf of Carpentaria Coast of Queensland, and the Pilbara coast of Western Australia.
- Dugong hunting by Traditional Owners (Aboriginal or Torres Strait Islander individuals or groups who can prove a traditional or historical connection, attachment, and/or relationship to an area of land or sea) is legal under Australian Law. This situation is unlikely to be having a significant impact on Australia dugong populations.
- Extreme weather events (cyclones, floods, and marine heatwaves) have been the most significant threats to dugongs in their Australian range in recent years. Loss of the seagrasses eaten by dugongs results in dugong life history changes including an increase in mortality, especially neonatal and early juvenile mortality, and a decrease in fecundity. In such circumstances, some dugongs undertake temporary emigration, presumably to locations where seagrass has not been lost.
- As a developed country, Australia has the potential to conduct research and develop monitoring techniques that inform dugong conservation globally and a high proportion of modern dugong research has been conducted in Australia.
- A national Wildlife Conservation Plan could enable a more systematic and prioritized approach to research and monitoring than has occurred to date.