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MEMORANDUM OF UNDERSTANDING ON THE CONSERVATION AND MANAGEMENT OF MARINE TURTLES AND THEIR HABITATS OF THE INDIAN OCEAN AND SOUTH-EAST ASIA

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Da Nang, Viet Nam, 21-25 October 2019
Agenda Item 9.1

SOUTH AFRICA – NATIONAL REPORT 2019

(Prepared by South Africa)

IOSEA MARINE TURTLES MEMORANDUM OF UNDERSTANDING - NATIONAL REPORTING 2019

IOSEA Marine Turtles MoU - National Reports

The purpose of completing the national report is to provide information on your country's implementation of the IOSEA Marine Turtle MoU including, as far as possible, contributions of cooperating non-governmental partners. Implementation will be assessed in terms of the six objectives of the Conservation and Management Plan (CMP). The online questionnaire is divided into these six main objectives, and asks specific questions in relation to the activities that need to be carried out to fulfil those objectives.

Please answer all questions as fully and as accurately as possible. It may seem time-consuming, but once you have completed the first report, the next time will be much easier because you can simply revise your existing report online. Comprehensive responses to the questions posed in Section 1.4 should satisfy many of the reporting requirements of the 2004 FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, thereby avoiding duplication of effort.

Description text is provided below some of the questions to explain what information needs to be provided. Text boxes can be expanded to accommodate longer answers or to explain and provide additional information, beyond what is requested. Details of future plans are especially encouraged. Wherever possible, please try to indicate the source of information used to answer a particular question, if a published reference is available. Remember that you are sharing information with other countries about your progress, so that it may be of benefit to them. At the same time, you may find it useful to look at other countries' reports to get ideas for marine turtle conservation that might be adapted to your context.

When working on the online questionnaire, save your information by clicking on the "Save all" button inside each section. An auto-save feature also saves any changed responses every 30 seconds, and whenever you move between sections. Feel free to attach additional material (published reports, maps etc) to this questionnaire.

Throughout the questionnaire, alongside each question you will find one or more 3-letter abbreviations within square brackets. These are used to indicate the purpose for which the information provided will be used in the subsequent analysis of all of the national reports, as shown in the following table.

To some extent, the order in which these different types of information are listed below is a reflection of their importance – ranging from critical indicators of performance to factual details that are merely informative.

Abbreviation	**Type**	**Treatment / Purpose**
IND	Indicator	The information provided serves, in and of itself, as a key indicator of successful implementation or of pre-requisites for same (eg. of core actions undertaken, resource availability, capacity etc.)
PRI	Priorities	The collective data will be synthesized to give an indication of what has been done already (helping to avoid duplication of effort); what is generally not being done (gaps that need to be addressed); and what interventions or specific assistance may be required.
TSH	Trouble-shooting	

Particular implementation problems and issues (possibly of special interest to a small group of countries) are identified/highlighted with a view to stimulating remedial action in the short-term.

BPR

Best practice

Well-documented examples of best practices / success stories will be compiled and presented as approaches that other Signatory States might consider pursuing (ie adopting or adapting to suit their own circumstances).

SAP

Self-Appraisal

Self-assessment of effectiveness and completeness of actions undertaken – intended to stimulate reflection within a given Signatory State on what more could or should be done in relation to a particular activity.

INF

Information

The information will be collected and compiled, with little or no modification, mainly for purpose of sharing of information that could be of interest or value to other readers and/or other analyses.

GENERAL INFORMATION

Signatory State:
Which agency or institution has been primarily responsible for the preparation of this report?
› Department of Environmental Affairs (DEA)

List any other agencies, institutions, or NGOs that have provided input:
› - Department of Agriculture, Forestry and Fisheries;
- Ezemvelo KZN Wildlife;
- iSimangaliso Wetland Park Authority
- Nelson Mandela University (NMU)
- South African Association of Marine Biological Research

Memorandum in effect in Signatory State since (dd/mm/yyyy):
› Since 22/02/2005

This report was last modified (dd/mm/yyyy):
› 30 June 2019

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OBJECTIVE I: REDUCE DIRECT AND INDIRECT CAUSES OF MARINE TURTLE MORTALITY

1.1 Introduction to marine turtle populations and habitats, challenges and conservation efforts

Please introduce and summarise, in an abstract of less than a page, the marine turtle populations and their habitats in your country. Comment on their status and highlight the main conservation challenges and achievements to date. It is not necessary to list here by name the individual nesting beaches, feeding areas and developmental habitats that are important for marine turtles in your country, as this information can be generated from the 'Site-Threat' data sheets to be completed in Annex 1. **[INF]**

› Five species of sea turtles are shared among the countries of the western Indian Ocean, all of which are common to South Africa. These include the Loggerhead (Caretta caretta) and Leatherback (Dermochelys coriacea) turtles which nest along the beaches of KwaZulu-Natal, with the bulk of nesting for the western Indian Ocean populations taking place between Cape Vidal and South African/Mozambican border in the iSimangaliso Wetland Park (a UNESCO World Heritage Site and forms part of the Network of Sites of Importance). The reefs along the coast of KwaZulu-Natal are also important feeding grounds for juvenile to adult stage green (Chelonia mydas) and hawksbill (Eretmochelys imbricata) turtles. Olive ridley (Lepidochelys olivacea) turtles are thought to be occasional migrants to this region as they are rarely encountered.

The best information for turtle abundances exist for the nesting beaches and reefs in the iSimangaliso Wetland Park where the numbers of nesting female loggerhead and leatherback turtles have been monitored since 1963. The stretch of beach patrolled to monitor nesting turtles was initially 8km and over time, has been expanded to the current approximately 85 km stretch that extends from Sodwana Bay to the South African/Mozambican border. Despite the changing effort expended in monitoring, it is the stretch of beach from Bhanga Nek to the Kosi mouth that has been consistently monitored over time – it is for this reason that this 13km stretch of beach is referred to as the "Index Beach" as nesting data from this stretch is used to determine the nesting trend for the female leatherback and loggerhead sub-population over time. The monitoring is achieved primarily by foot patrol, with vehicle patrols backing them up when conditions allow. The duration of the monitoring is 5 months and includes the entire nesting and most of the hatching season. The nesting leatherback and loggerhead turtle populations are shared with Mozambique with nesting taking place on both side of the border.

South Africa has a robust network of protected areas and all of the nesting areas, as well as a substantial amount of reef habitats within Marine contained in Protected Areas (MPA's). The result is that direct harvesting and habitat destruction are marginal threats in South Africa. Few water surveys for non-nesting species (i.e. green and hawksbill turtles) have been undertaken. Fisheries impacts and bather protection nests are the known threats to turtles while in South African waters, with plastic pollution as an emerging threat, specifically for post-hatchlings. Pelagic long-lining for tuna and tuna like species is known to incur incidental catches of turtles. Catches are well monitored and survival rates are high, Catches in the well-monitored midwater trawl fishery uncommon, but monitoring in other fishing sectors is required. Diseases such as fibropapilloma or fungal infections in nests seem to be largely absent with only one confirmed case of a stranded green turtle. The effect of climate change is largely unknown but could be positive or negative. Studies undertaken to date suggest that the South African nesting beaches are well buffered against temperature changes or erosion; however, the effect of shallow subtidal reefs is less known. Studies can be undertaken in the near future to better understand the threats associated with climate change and South African turtle populations.

1.2 Best practice approaches to minimizing threats

Describe any protocol or approaches practiced in your country, which you consider exemplary, for minimising threats to marine turtle populations and their habitats, which may be suitable for adaptation and adoption elsewhere. **[BRP]**

› 1. DEDICATED TURTLE PROTECTION.

South Africa has a comprehensive turtle monitoring programme to document the nesting activities of female leatherback and loggerhead turtles that involve:

a. Continuous patrolling and monitoring of turtle nesting activity on key nesting beaches (monitoring area of 56km and index area of 8km).

b. Hiring and training community monitors to undertake turtle monitoring..

c. Supporting and enhancing turtle-friendly eco-tourism ventures (ranging from walk-on community tours to lodge developments) to capitalise on turtles and turtle monitoring and nest protection.

d. Supporting and enhancing education and awareness programmes around nesting beaches highlighting the importance of marine turtles and advocating best management practices.

e. Expansion of research associated with all aspects of turtle management but particularly trying to build a population model of nesting species.

2. ENABLING LEGISLATIONENVIRONMENTAL MANAGEMENT

a. A network of protected areas adequately protecting turtles as well as their habitats during various life stages. The bulk of the nesting area fall within a UNESCO World Heritage Site.

b. South Africa has formally declared 20 additional new Marine Protected Areas (MPA's) as part of its MPA network that will benefit all life stages of marine turtles as well as various in-shore and offshore ecosystems. The declaration of these MPAs will take effect on 1 August 2019. Two of these are to protected Dermochelys coriacea's internesting habitat as well as foraging habitat on sea mounts within the country's EEZ.

c. All sea turtles in South Africa are listed in the Threatened or Protected Marine Species Regulations. This affords all turtles a protected status in South Africa.
d. Controlling the use of off-road vehicles in the coastal zone which not only protects turtles, their nests and their hatchlings from disturbance and crushing.
e. The National Biodiversity Assessment (NBA) for the marine environments to the edge of the EEZ. This provides an indication of biodiversity, habitats, threats and conservation targets for each aspect throughout the EEZ. An update version of the NBA is expected in the latter part of 2019.
f. Practical contingency plans during strandings, oil spills and other shipping, pollution or natural disasters. South Africa has a series of stranding networks along its coast that responds to incidences of turtle strandings and provide a rapid response to ensure that they are taken to registered and permitted rehabilitation centres. South Africa is also in the process of updating a National Oil spill Contingency Plan, which will include a National Oiled Wildlife Preparedness Response.
3.FISHERIES LEGISLATION AND MANAGEMENT
a. Basic turtle by-catch information from the pelagic longline fishery has been obtained since 2000. Observer Coverage has been continuously improved and is now legislated at 20%, stratified by area, season and vessel
b. Observers are trained in turtle ID and handling practices
c. Turtle incidental bycatch and release information recording is mandatory and dead animals are to be retained and handed over to the authorities
d. .Handling and release procedures are detailed in the permit conditions for the Pelagic Longline Fishery.
e. De-hookers and line cutters need to be on board every longline vessel.
f. ID guides for turtles have been disseminated to all vessels
4. ENABLING ENVIRONMENTAL LEGISLATION AND MANAGEMENT:
South Africa is in the process of rationalizing its environmental legislation. Most of marine species and marine and coastal related processes were included in numerous acts. The first process was to:
a. Repeal the section on Marine Protected Areas from the Marine Living Resources Act, which largely concentrated on fisheries related issues, to the National Environmental Management: Protected Areas Act. The section on MPAs was gazetted in 2014. Subsequently, South Africa has gazetted 20 new MPAs, and includes numerous offshore protected areas.
b. Threatened or Protected Marine Species Regulations include all turtle species found in South African waters. These regulations were amended from 2012, and were gazetted for implementation in May 2017 updating all marine species and their conservation status, including sea turtles found in South African waters.
c. The Marine Living Resources Act is aimed at regulating the long-term sustainable utilisation of marine lining resources and access to exploitation, utilisation and protection of certain of marine resources.

1.3 Programmes to correct adverse economic incentives

1.3.1 Describe any socio-economic studies or activities that have been conducted among communities that interact with marine turtles and their habitats. **[BPR, INF]**

Elaborate on the nature of the socio-economic study/ activity undertaken, the results obtained (successful or otherwise) and the desirability/ suitability for replication.
Include references to published reports, where available.
› Current Studies:
- A PhD is currently underway using Community Voice Method in a transboundary investigation between Mozambique and South Africa to investigate the value of sea turtles to the local community and the likely impact of a new port development in southern Mozambique on both turtle populations and local communities. Short title of the study is Community David vs Economic Goliaths.
- Attempted a citizen science approachproject (2012 – 2015) which was very unsuccessful. A different approach is needed.
Other published studies:
Troeng, S., Drews, C., 2004. Money talks: economic aspects of marine turtle use and conservation. WWF-International, Gland, Switzerland: 41pp. Online at: http://assets. panda. org/downloads/moneytalks. pdf.
Monitoring Activities:
Interactions with sea turtles takes primary place in iSimangaliso Wetland Park, hence the option for sustainable use is direct and indirect. To deter unsustainable use, members from local subsistence communities are hired annually (for five months of the year) to act as turtle monitors and some are allocated the exclusive right to host guided beach tours (i.e. walk-on concessions). Indirect benefits are generated to the communities by a few exclusive lodges in or around iSimangaliso Wetland Park that have developed around the turtle nesting activities. These ventures pay for the exclusive right to take high-end tourists on exclusive vehicle drives (drive concessions). These lodges and ventures are obliged to employ members from the local or nearby communities and ideally develop a range of business, tourisms and hospitality industry related skills.
Direct negative interactions in South Africa is no incidental (or accidental) although a concern is raised through increased recent interest in turtle products (through an increase in foreign nationals setting up small businesses in the area).

1.3.2 Which of these adverse economic incentives are underlying threats to marine turtles in your country?

[TSH]
☑ Ease of access to the turtle ressource (e.g. by virtue of proximity or ease of land/water access)
☑ Low penalties against illegal harvesting
☑ Others (Please describe)

› Illegal development in protected areas = uncontrolled tourism;
Rapid economic development in the area surrounding the protected area;
The northern sections of the iSimangaliso Park have "open" access since there are communities living in the bounds of the Park. Most of these individuals live a subsistence lifestyle due to the remoteness of the area and a consequent lack of economic opportunities. However, the remoteness also provides a fantastic attraction for tourism with some unregulated developments erected. This is done by both locals as well as outsiders to the area with the intent of bringing more visitors and economic opportunities. Lately, infrastructure (particularly roads) have been upgraded facilitating access which makes access control more complicated. Despite significant effort by the local authorities (iSimangaliso and Ezemvelo) these developments however do not always go through proper authorisation or EIA procedures. However, individuals are eventually prosecuted especially if the effect is the destruction of biodiversity through habitat transformation and/or disturbance of turtles through unregulated beach use during nesting and hatching season, and indiscriminate use of lights.
There is also rapid economic developments outside of the park which attracts more individuals to the area, with greater means of accessing the park. However, enforcement has not been increased despite greater influx of people.

1.3.3 Has your country taken any measures to try to correct these adverse economic incentives? **[BPR]**
☑ Yes (If yes, please describe these measures in detail)

› Empowerment programmes to subsistence communities: Working for the Coast, Sustainable Livelihoods Programme, joint development ventures in and around the iSimangaliso Park.
Capping (and controlling) the number of tourism ventures in the conservation areas: Restricted number of exclusive developments as well as number of drive-concessions.
When process of negotiation is unsuccessful legal action is taken against illegal developments/developers. But resources to law enforcement has not increased accordingly.

1.4 Reduction of incidental capture and mortality

1.4.1 Indicate, and describe in more detail, the main fisheries occuring in the waters of your country, as well as any high seas fisheries in which flag vessels of your country participate and interact with marine turtles.

Tick ‘YES’ to indicate that a fishery is present and interacting marine turtles or ‘NO’ to indicate that a fishery is not present or is not interacting with marine turtles. **[INF]**
If a fishery is present, use the text box to indicate, for example, the approximate geographic distribution of the fishery, how long it has been operating, how many vessels are involved, etc.

a) Shrimp trawls:
☑ Yes (Please provide details)

› Ephemeral and Erratic – As catch per unit effort (CPUE) in the WIO shallow trawl fisheries continues to decline and consequently effort has also declined. South Africa had virtually zero shallow trawling effort in 2013 owing to poor prawn recruitment and poor prices for prawns. Deep water trawling along the east coast is at a low level. However, several new rights holders have been issued since beginning 2014 but are not yet operational. Approximately three active vessels of a possible max of 7. No observer programme on prawn vessels since 2010. Reports of prawn (and turtle catches) from the rest of the WIO region has also declined. Generally though operational depth on the Tugela Bank is 10 - 50 m; Trawl duration is 4-6 hours. TEDs are not used. Grids to exclude elasmobranchs were introduced in 2006 which also exclude turtles. Fennessy & Isaksen (2007) evaluated the use of BRDs (bycatch reduction devices) in Mozambique. These are comparable fisheries in terms of species composition for catch and bycatch but more stable. They indicated that BRDs can be used successfully, but needs industry buy-in.
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Fennessey, S. & Isaksen, B. 2007. Can bycatch reduction devices be implemented successfully on prawn trawlers in the Western Indian Ocean - South African Journal of Marine Science 29(3): 453-463.
Fennessey, S.T., Vincent, X., Budeba, Y., Mueni, E. M. & Gove, D. Z. 2008. An update on initiatives to reduce prawn trawl bycatch in the Western Indian Ocean. Western Indian Ocean Journal of Marine Science. 7(2): 217-222.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean. Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.

b) Set gill nets:
☑ Yes (Please provide details)

› Gill-nets used as bather protection nets against shark attacks in KwaZulu-Natal. ~27 km of semi-permanent gill net installations scattered over 36 localities. These are set outside of protected areas, and checked ~ 20 times per month. Turtles are caught year-round with a mean number of catches per annum around 50 turtles, of which about half are released alive. (Details can be found in Brazier et al 2012). In February 2007 the Natal Sharks Board started with a systematic replacement of the gill nets with baited drum lines. Drum lines catches are more targeted (to predatory sharks) and should reduce inter alia turtle bycatch. Up to half of the 27km of nets will be replaced with drum lines (http://www.shark.co.za/nets.htm).
A small-scale, coastal St Joseph Shark / Harder fishery is in operation on the Atlantic coast of SA using beach seine nets. It does not seem to interact with turtles since there are no reports of turtles being caught in this activity.
No other gill net fisheries are used legally in the EEZ of South Africa. The illegal use is suspected but should be incidental with negligible towards impacts on turtles.
****
Young, N. 2001. An analysis of the trends in by-catch of turtle species, angelsharks and batoid species in the protective gillnets off KwaZulu-Natal, South-Africa. Unpublished MSc Thesis, University of Reading, 99pp.
Brazier, W., Nel, R., Cliff, G., Dudley, S., 2012. Impact of protective shark nets on sea turtles in KwaZulu-Natal, South Africa, 1981-2008. African Journal of Marine Science 34, 249-257.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean. Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.

c) Anchored Fish Aggregating Devices (FADs):
☑ Yes (Please provide details)

› No permits are issued for any FADs in South Africa but they are sometimes deployed illegally in commercial skiboat line-fishery to attract pelagic fish. Associated direct impact on turtles is unquantified but entanglement at sea or in ghost gear is possible.

d) Purse seine (with or without FADs):
☑ Yes (Please provide details)

› The fishery currently supports around 100 purse-seine vessels of which most are of the pelagic vessels are between 20-24 m long (Nielsen & Nara 2006). These are mostly are operating on the on west and south coast of South Africa with a strong seasonal pattern. The licensed vessels in South Africa target mainly sardines and anchovy with few other small. No information exists on the impacts on sea turtles although it is predicted to be limited. The purse seiners though fishing offshore tend to operate closer inshore (that what turtles seem to frequent) and are mostly restricted to the upwelling regions. Turtles seem to have moved offshore by the time they reach the south and west coast of the country.
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Nielsen, J.R. & M. Hara. 2006 Transformation of South African industrial fisheries. Marine Policy 30(1): 43-50.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean. Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.

e) Longline (shallow or deepset):
☑ Yes (Please provide details)

› An investigation into in the South African Pelagic Longline Fishery between 1995 and 2005 has estimated turtle bycatch as 0.04 turtles per 1000 hooks, with loggerhead turtles being the most frequently caught species and leatherbacks the second most frequently (Petersen et al. 2009). Extrapolating these observer numbers to actual catch figures indicate that about 164 turtles may have been caught per annum of which 84% are released alive. . Demersal longlining also takes place in South Africa and mostly targets hake. No turtle bycatch has been reported in this fishery (Petersen 2008). Three post-graduate studies have been conducted on the impacts of longlines: Samantha Petersen: Environmental impacts of longline fisheries on bycatch (UCT 2008) Anje De Wet: Factors affecting mortality of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles of South Africa (NMMU 2013) Darrell Anders: Spatial and temporal overlap between South African leatherback turtles (Dermochelys coriacea) and pelagic longliners fishing in the South African EEZ (CPUT, 2010). Recommendations from Petersen et al 2009, to mitigate against turtle by-catch have either been fully implemented or are in the implementation phase. These includeaninclude an increase in Observer Coverage, mandatory reporting, training in handling and release procedures for skippers and observers, gear manipulations such as the use of circle hooks, establishment of offshore Marine Protected Areas.
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DAFF 2019: Permit conditions of the Large Pelagic Longline fishery. 45 pp.
DEAT 2007: Government Gazette. Republic Of South Africa. Vol 510. 7 December 2007. No 30535. Notice 1718 of 2007. Draft policy and application forms concerning the allocation and management of the longterm fishing rights in the large pelagic (tuna and swordfish) sector, 2007.
Petersen, S.L., Honig, M.B., Ryan, P.G., Nel, R., Underhill, L.G., 2009. Turtle bycatch in the pelagic longline fishery off southern Africa. African Journal of Marine Science 31, 87-96.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean.

Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

f) Driftnet:
☑ No (Please provide details)

› Illegal in South Africa with no evidence of transgressions.

g) Others (Please provide details)
› Inshore demersal sole & hake fishery ~ south coast (30 vessels) - no obvious interaction with turtles.

› The South African midwater trawl fishery targets horse mackerel Trachurus capensis, a semi-pelagic species found all along the South African coast The bulk of the catch is currently taken by a single vessel, the Desert Diamond, a 120 meter long freezer-trawler and the largest South African registered commercial fishing vessel. The vessel has close to 100% observer coverage in terms of outings and 85% of the trawls were observed during the period from 2005 to 2013 and no turtle bycatch had low turtle interactions have been recorded.

h) None of the above (Please provide details)
› Linefishery - no major interaction with turtles although can have incidental capture through hooking or entanglement, especially in estuaries.

1.4.2 Please indicate the relative level of fishing effort and perceived impact of each of the above fisheries on marine turtles (e.g. in terms of by-catch) [TSH]. Select from one of the following descriptions: RELATIVELY HIGH, MODERATE, RELATIVELY LOW, NONE (i.e. not present), UNKNOWN (i.e. unable to answer for whatever reason).

a) Shrimp trawls
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing efforts:	☐	☐	☑	☐	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification
› Source:
Fennessey and Isaksen evaluated the impacts of prawn trawl fisheries in South Africa and suggested this to be low despite the lack of the use of TEDs. However, recent evidence (i.e. increase in loggerhead nesting numbers coinciding with the decline in trawling) suggests that the historical impact might have been bigger that realised (Nel et al. 2013).
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Fennessey, S. & Isaksen, B. 2007. Can bycatch reduction devices be implemented successfully on prawn trawlers in the Western Indian Ocean - South African Journal of Marine Science 29(3): 453-463.
Nel, R., Punt, A.E., Hughes, G.R., 2013. Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean. Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

b) Set gill nets
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☐	☐	☑	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification
› Young 2001, Brazier et al 2012, and Nel 2014 evaluated the impacts of the shark nets on sea turtles on the

South African sea board. In all instances, the conclusions were that the impacts are not significant, and that the effort by the KZN Sharks Board leads to a continuous reduction in sea turtle mortalities in shark nets.
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Young, N. 2001. An analysis of the trends in by-catch of turtle species, angelsharks and batoid species in the protective gillnets off KwaZulu-Natal, South-Africa. Unpublished MSc Thesis, University of Reading, 99pp.
27km fixed nets / drum lines ~50 Caught per annum; 1/2 released alive.
Brazier, W., Nel, R., Cliff, G., Dudley, S., 2012. Impact of protective shark nets on sea turtles in KwaZulu-Natal, South Africa, 1981-2008. African Journal of Marine Science 34, 249-257.
Nel, R. 2014 50 Years of turtle conservation, monitoring and research: A state of knowledge report. Unpublished report to Ezemvelo KZN Wildlife. Pg43.
Mellet, B. 2015 Ecological Risk Assessment of Fisheries on Sea Turtles in the South Western Indian Ocean. Unpublished MSc Dissertation, Nelson Mandela Metropolitan University. 217 pages.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

c) Anchored Fish Aggregating Devices (FADs)
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☑	☐	☐	☐
Perceived impact:	☐	☑	☐	☐	☐

d) Purse seine (with or without FADs)
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing efforts:	☐	☐	☐	☐	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification
› Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

e) Longline (shallow or deepset)
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☐	☐	☑	☐
Perceived impact:	☐	☐	☐	☑	☐

- Source of information / clarification
› Particularly important for leatherback turtles and somewhat for loggerhead turtles. Probably one of the biggest (known and quantified) threats to leatherbacks.
Source:
DAFF unpublished logbook and observer data for the Large Pelagic Longline Fishery. 2005-2018.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

f) Driftnet
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☑	☐	☐	☐

Perceived impact:	☐	☑	☐	☐	☐

g) Others (from 1.4.1 g))
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☑	☐	☐	☐
Perceived impact:	☐	☑	☐	☐	☐

- Source of information / clarification
› Inshore demersal sole & hake fishery
Source:
Demersal Trawling: Petersen, S. (2008) Understanding Bycatch of vulnerable species. PhD thesis UCT.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

1.4.3 Describe any **illegal fishing** that is known to occur in or around the waters of your country that may impact marine turtles. Describe the measures being taken to deal with this problem and any difficulties encountered in this regard. **[TSH]**
› Across-boarder poaching (in protected areas) is a potential problem, especially by foreign longliners, trawlers and beach poaching. Even though "high tech" surveillance equipment is used, effective enforcement is difficult due to the remoteness (and border location).
The magnitude of non-turtle related illegal imports (drugs, goods, shells etc); it is making local law enforcement difficult; Law enforcement agencies can only concentrate on semi-commercial and commercial scale activities. Continuous "smallscale" imports are therefore ignored.
The targeted harvesting of young green turtles in remote estuaries are from very recent reports without appropriate response yet discussed. (Nel, pers com).

1.4.4 Which of the following methods are used by your country to minimise incidental capture/mortality of marine turtles in fishing activities? [IND]

a) **Appropriate handling** of incidentally caught turtles (e.g. resuscitation or release by fishersusing equipment such as de-hooking, line cutting tools and scoop nets)
☑ YES (Details/future plans)

› Details/future plans:
The use of circle hooks is encouraged as stated in the permit conditions. The South African government has worked closely with WWF to educate skippers on release procedures for turtles. According to the handling and release instructions provided to vessels in their permit conditions, vessels are required, amongst others, to:
• Remove the hook using a long-handled de-hooker on turtles too large to bring onboard and a de-hooker on turtles brought onboard.
• Use a line-cutter when a de-hooker is not possible and to cut the line as close to the hook as possible.
• Use net to bring the turtle onboard and to avoid pulling on the line.
• Handle the turtle with gentle care. Release the turtle headfirst and away from fishing gear once it has recovered onboard.
Observers are present on all foreign flagged vessels fishing South African rights in terms of Joint Venture Agreements. Observer coverage for the entire longline fleet is stipulated as 20% stratified per vessel, time and area; all interactions with marine turtles during the fishing operations are recorded. Since 2013, all vessels have been required to record interactions with marine turtles in their logbooks, and each vessel has been given a species guide to aid identification of turtles to species level. However, despite regulations, reports indicate that lines are preferentially cut rather than to dehook turtles (seen as a waste of time).
Bather protection (shark) nets are regularly inspected (~ daily) and all live bycatch is recorded and released.
H. Winker, S. Kerwath, D. Parker, M. Meyer, and Q. Mketsu, Department of Agriculture, Forestry and Fisheries. South Africa’s Annual Report to the Ecologically Related Species Working Group (ERSWG) of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) 2019. 20 pp.

b) **Devices that allow the escape of marine turtles** (e.g. turtle excluder devices (TEDs) or other measures that are comparable in effectiveness)
☑ YES (Details/future plans)

› Details/future plans:
Fennessey, S. / Oceanographic Research Institute with the help of industry evaluated the need and value of

TEDs. The fishery is not large enough, and the turtle bycatch is not large enough to justify. However, general BRDs are supported (Fennessy & Isaksen 2007) which will also serve to reduce the bycath of sea turtles. .
******
Fennessey, S. & Isaksen, B. 2007. Can bycatch reduction devices be implemented successfully on prawn trawlers in the Western Indian Ocean - South African Journal of Marine Science 29(3): 453-463.

c) **Measures to avoid encirclement** of marine turtles in purse seine
☑ NO (Details/future plans)

› Very low bycatch so specific regulations not warranted.

d) **Appropriate combinations** of hook design, type of bait, depth, gear specifications and fishing practices
☑ YES (Details/future plans)

› Details/future plans:
Petersen, S. evaluated the impacts of longlining on vulnerable species. This thesis makes recommendations on mitigation. For sea turtles there are a range of measures that can be taken to reduce impact.

e) **Monitoring and recovery of fish aggregating devices** (FADs)
☑ UNDER INVESTIGATION or NOT APPLICABLE

› Locally (on the east coast) regular law enforcement exercises are undertaken to remove all FADs encountered.

f) **Net retention and recycling schemes**
☑ NO (Details/future plans)

› Nothing for trawlers or purse seiners. Only the lifting of shark nets during the annual sardine run where the potential for entanglement of target and non-target species (and resultantly net loss or damage) may be elevated.

g) **Spatial and temporal control of fishing** (e.g. seasonal closures of fishing activities)
☑ NO (Details/future plans)

› Nothing turtle specific - although the majority of nesting beaches and coral containing reefs are protected in MPAs. An excellent network of marine protected areas exists with good spatial planning and the achievement of international biodiversity targets. MPA targets just increased to 5% of the EEZ including sea mount reserves for leatherback turtles.

h) **Effort management control**
☑ YES (Details/future plans)

› All of the fisheries have capped effort either through a restricted number of rights holders or catch limits. However, none of these measures are specifically targeting sea turtles.
Tugela banks prawn fishing closed from September to February i.e. includes peak summer - aimed at protecting recruitment of juvenile squaretail kob (Argyrosomus thorpei) and at reducing bycatch ~ 4 years / 6 years: Most likely benefiting developing green turtles.

1.4.5 Which of the following programmes has your country developed – in consultation with the fishing industry and fisheries management organisations – to promote implementation of measures to minimise incidental capture and mortality of turtles in national waters and in the high seas? [IND]

Please use the corresponding text boxes to explain/clarify each of your responses, including ‘NOT APPLICABLE’ responses, and indicate future plans in this regard. [IND]
Please describe the collaboration, when/where the programmes were introduced, any difficulties encountered, and general results obtained (i.e. successful and unsuccessful). Provide references to publications, where available.

a) **Onboard observer programmes**

X
☑ YES (Details/future plans)

› Details/future plans:
Observers are present on all foreign flagged vessels fishing South African rights in terms of Joint Venture Agreements. Observer coverage for the entire longline fleet is stipulated as 20% stratified per vessel, time and area; all interactions with marine turtles during the fishing operations are recorded. Since 2013, all

vessels have been required to record interactions with marine turtles in their logbooks, and each vessel has been given a species guide to aid identification of turtles to species level

b) **Vessel monitoring systems**
☑ YES (Details/future plans)

› All SA-flag commercial vessels are required to have VMS. VMS information can be useful to protect turtles through the identification of spatial overlap with fishing and turtle hot spot areas, as well as entry into protected areas.

c) **Inspections** (i.e. at sea, in port, at landing sites)
☑ YES (Details/future plans)

› The majority of vessels (from all fisheries) are only inspected in port. There is limited coverage of these vessels. National level inspections are estimated to be ~ 80%. However, there is a large inconsistency along the South African coast in of enforcement. There is no national minimum requirement on monitoring authorities. South Africa has four patrol vessels that conduct inspections along SA's coastline. However, the Department of Environmental Affairs along with SA Navy have increased their marine fleet and is in a position to enforce offshore compliance. Current activities along the South African eastern seaboard include anti-piracy activities as well as fisheries permit inspections

d) **Training programmes / workshops** to educate fishers
☑ YES (Details/future plans)

› Awareness campaigns such as the Southern African Sustainable Sea Food Initiative (http://www.wwfsassi.co.za/?m=1) is trying to educate both sellers of sea food as well as consumers to be more critical about their sea food choices. Issues such as by-catch impacts from longlining is addressed, although it is not turtle specific. Training of compliance officers has taken place (as a Birdlife SA - WWF initiative) and awareness campaign for fishers was launched in Jan 2006 by BirdLife/WWF Responsible Fisheries Programme. No recent initiatives have been undertaken especially turtle specific endevours. Training of observers as well as compliance officers should however be expanded before it can be effective.

e) **Informative videos, brochures, printed guidelines** etc.
☑ YES (Details/future plans)

› Southern African Sustainable Sea Food Initiative - National campaign with booklets & training courses (available on http://www.wwfsassi.co.za/?m=1). A practical guide to understanding and reducing vulnerable bycatch by Samantha Petersen (Birdlife SA and WWF) and a brochure Keeping or endangered marine life off the hook: Benefits to fishers and marine life by Samantha Petersen (BirdLife/WWF Responsible Fisheries Programme SA). Identification guides for turtles and other by-catch (Birds, Sharks) are distributed together with the permit conditions of the Large Pelagic Longline Fishery. Guidelines on handling practices are included in the permit conditions. Observers are trained in Turtle ID.

1.4.6 Are the mitigation measures described in 1.4.4 and 1.4.5 periodically reviewed and evaluated for their efficiency? **[SAP]**
☑ YES (Please give details)

› Permit conditions in the Large Pelagic Longline Fishery are reviewed annually. South Africa, being a member of three tuna directed Regional Fisheries Management Organisations (RFMOs), namely ICCAT, IOTC and CCSBT, is required to report data and bycatch mitigation measures to all three RFMOs annually. No in-depth analyses of mitigation measure effectiveness exist, but data from observers suggest that turtle bycatch has decreased by 80% in the last decade and survival has increased to 96%.

1.4.7 In your country, what types of data collection, research and development have been undertaken to support the reduction of marine turtle incidental catch (while taking into consideration the impact of various mitigation measures on other species)? **[SAP]**
› Birdlife SA and WWF have (jointly) reviewed the impacts of longlining and trawling on vulnerable species (see Petersen et al 2009). It assessed the impact of these sectors on vulnerable species including turtles. Kwa-Zulu Natal is collecting data on an ongoing basis to evaluate the impacts of shark nets (now partly replaced by drumlines) on target and non-target species. These figures are released annually with the season report for the nest protection programme by Ezemvelo KwaZulu Natal-Wildlife (Ezemvelo) (see Brazier et al 2012, and Nel 2014). The Department of Agriculture, Forestry and Fisheries has increased observer coverage in the large pelagic longline fishery to a minimum of 20%, with mandatory recording of turtle catch and release success. The increased awareness of industry due to the information included in the permit conditions and during road shows have improved the data collection. DAFF reports turtle by-catch and release by its longline fleet on an annual basis to ICCAT, IOTC and CCSBT. Prawn trawl bycatch impacts have been under review for the last 10 years by the Oceanographic Research Institute. The SA prawn fishery is very small and not really justified to be monitored continuously. However, turtle bycatch can be reduced by the implementation of BRDs targeting elasmobranchs which are caught more frequently (Fennessy & Isaksen 2007). Oceans and Coasts (O&C) and

partners are mapping the paths of leatherback turtles away from the nesting grounds using satellite tags to assess the spatial and temporal overlap of these migratory animals with fisheries.
****** Brazier, W., Nel, R., Cliff, G., Dudley, S., 2012. Impact of protective shark nets on sea turtles in KwaZulu-Natal, South Africa, 1981-2008. African Journal of Marine Science 34, 249-257. Nel, R., 2014. 50 Years of turtle conservation, monitoring and research: a state-of-knowledge report. Ezemvelo KZN Wildlife, Nelson Mandela Metropolitan University, p. 43. Petersen, S.L., Honig, M.B., Ryan, P.G., Nel, R., Underhill, L.G., 2009. Turtle bycatch in the pelagic longline fishery off southern Africa. African Journal of Marine Science 31, 87-96. Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

1.4.8 Has your country exchanged information and provided technical assistance (formally or informally) to other Signatory States to promote the activities described in 1.4.4, 1.4.5 and 1.4.7 above? **[SAP]**
☑ YES (If yes, please give details of the exchanges/technical assistance)

› These exchanges have mostly been informally through activities of parastatals or NGOs. BirdLife SA particularly has sent a country representative to attend and present at an IOTC bycatch working group meeting. Birdlife SA has also developed and distributed material aimed at observers. This material was made available to representatives of neighbouring countries (Namibia and Mozambique particularly).
The Oceanographic Research Institute tested the efficacy of BRDs in local (South African and Mozambican prawn fisheries) and presented the results as 3 different events (two regional FAO workshops and a WIOMSA conference) attended by all of the WIO signatories and non-signatories.
All of these activities were pre-2010 with nothing new since.

1.4.9 What legislative and practical measures has your country taken in support of UN General Assembly Resolution 46/215 concerning the moratorium on the use of large-scale driftnets? **[SAP]**
› Driftnets are banned in South Africa since 1998 when new legislation, the Marine Living Resources Act, came into effect.

1.5 Addressing harvest of, and trade in, marine turtles; and protecting of habitat

1.5.1 Does your country have legislation to prohibit direct harvest and domestic trade in marine turtles, their eggs, parts and products; and to protect important turtle habitats? **[IND]**

Please provide details (title/date) of the relevant legislation, as well as any exemptions (e.g. for traditional harvest) under that legislation.
☑ YES

› • The National Environmental Management Act (NEMA) (Act 107 of 1998) is the overarching environmental legislation. The NEMA has six Specific Environmental Management Acts (SEMA's), among them are the Biodiversity Act (Act 10 of 2004) and the Protected Areas Act (Act 57 of 2003).
-- National Environmental Management: Biodiversity Act (NEM:BA) (Act 10 of 2004) ensures the management and protection of species and ecosystems.
----- Section 51-57 (Chapter 4): Addresses Threatened or Protected species and ecosystems. This is to ensure that these species are protected to ensure their ecological integrity and species survival. The Threatened or Protected Species (ToPS) Regulation (instituted under NEM:BA) is currently under review. However, Section 56 (1) stipulates that any activity involving a specimen listed threatened or protected species requires a permit. The Threatened or Protected Marine Species Regulations was gazetted in 2017, following an amendment from the 2007 TOPS Regulations. All sea turtles in South Africa are protected according to law, and there are specific provisions outlined with regards to turtles. The Regulations under its definition of "Harassing" stipulates that this "means a behaviour or conduct that threatened, disturbs or torments a live specimen of a listed threated or protected marine species, and includes-
a)…
b)…
c…
d. in the case of turtles, photographing or shining a light at al turtle at night, climbing on, touching or flipping over a turtles or digging up turtle nests or eggs;
d….
These regulations provide full protection to turtles/products. The National Environmental Management: Biodiversity Act, under which the TOPMS Regulations are gazetted, also provide protection of habitats in need of protection. A consequence of this regulation is that a permit is needed in terms of the TOPMS Regulations to undertake any activity (excluding research) pertaining to turtles. There are very permits issued to Researchers and national aquaria to be in possession of turtles. The Regulations also covers live strandings (including hatchlings) where anyone in possession of a turtle without a permit can be in contravention of the law. Research of marine species as well as marine and coastal habitats is covered under the Marine Living Resources Act.
----- Chapter 7 of NEM:BA gives clear directions regarding the permit process. This further ensures that the harvesting of turtles and its derivatives are protected.

-- National Environmental Management: Protected Areas Act (Act 57 of 2003) Provides for the protection and conservation of ecologically viable areas representative of the biological diversity.
iSimangaliso Wetland Park has been declared a World Heritage Site under the World Heritage Convention (Act 49 of 1999). The NEM:PAA makes provision in Section 50 for the Management Authority of a protected area to allow for any commercial activity within the protected area provided that it may not impact negatively on the survival of any species or significantly disrupt the integrity of the ecological system of the protected area. In terms of the marines turtles, harvesting was banned in Kwa-Zulu -Natal by the Natal Coastal Fisheries Ordinance (Hughes, 1989). Due to the low levels of breeding females, any harvesting of marine turtles or any of its eggs, parts or products will result in an illegal activity.
The combination of this legislation ensures that the turtles, its eggs, parts and products and turtle habitats are fully protected according to the country's environmental legislation. South Africa is also a Signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) for about 40 years, ensuring that these sentiments are upheld across our borders insofar possible.
Recent reports have recently indicated that impoverished communities living outside of protected areas (in remote areas) are targeting juvenile green turtles.

1.5.2 Which, among the following list, are economic uses and cultural values of marine turtles in your country? [INF]

Please rate the relative prevalence / importance of each consumptive or non-consumptive use. Use the text boxes below each rating to explain or clarify your responses.

a1) Meat consumption

☑ YES

› The conservation and monitoring programme was introduced in 1963. The use of turtle meat has now been reduced to less than one turtle slaughtered per annum from the protected areas. However, there are suggestions of illegal harvesting in the former Transkei areas, harvesting non-nesting juvenile green turtles entering estuaries.

a2) Meat consumption: relative prevalence/importance

☑ UNKNOWN

b1) Egg consumption

☑ YES

› This was a use prior to 1963. The incidence of (attempted) nest raiding by people has dropped and is less than 5 per annum. (Nel, pers obs; Ezemvelo unpublished data; S. Kyle pers comm 2014).
This is also illegal in accordance to the Threatened or Protected Marine Species Regulations gazetted in May 2017.

b2) Egg consumption: relative prevalence/importance

☑ LOW

c1) Shell products

☑ NO

c2) Shell products: relative prevalence/importance

☑ UNKNOWN

› The acquisition of any parts and derivatives is prohibited unless a permit is obtained. Turtles are protected in accordance with the Threatened or Protected Marine Species Regulations

d1) Fat consumption

☑ NO

d2) Fat consumption: relative prevalence/importance

☑ UNKNOWN

e1) Traditional medicine

☑ YES

e2) Traditional medicine: relative prevalence/importance

☑ LOW

› In the late nineties, suggestions that eating sea-turtle eggs will cure HIV/Aids was propagated. It was through the cooperation of the local Thonga amaKhosi and Ezemvelo KZN Wildlife that this was dispelled (Hughes 2012)
Hughes, G. 2012. Between the Tides. In search of sea turtles. Janaca Media. Cape Town, Republic of South

Africa

f1) Eco-tourism programmes
☑ YES

f2) Eco-tourism programmes: relative prevalence/importance
☑ HIGH

› Between 4 - 8 tour operators have concessions in iSimangaliso which operate for approximately 90 days during the nesting season either through walk-on and drive concessions. The number of visitors viewing sea turtles per annum on concession tours is estimated to range between 5000 to 9000 pa. It is thus by far the most important activity related to sea turtles. All of the major aquaria in the country also host rehabilitated sea turtles, with dedicated turtle displays at two rehabilitation centres (uShaka and Bayworld) and rehabilitation programs at these two and Two Oceans Aquarium.

g1) Cultural / traditional significance
☑ YES

g2) Cultural/traditional significance: relative prevalence/importance
☑ MODERATE

› The turtle monitoring programme was initiated in 1963 because nesting were being slaughtered as they emerged from the water to nest. The effect was that nesting numbers of turtles started to recover while incidents of slaughtering and nest raiding dropped significantly (Nel et al 2013). The monitoring programme went from strength to strength and became dependent on greater participation from local communities. The monitoring programme now employs and pay people that were otherwise subsistence farmers in the protected area. Employment notices are sent into the communities and interviews are conducted at the beginning of the season assessing particular basic skills. Successful candidates are then provided with the necessary identification gear (like programme t-shirts, caps, rain gear, torch lights, reflective vests and watches, as well as transport to town on month-end shopping days). The outcome was that there is now "authority" and "prestige" associated with turtle conservation, plus a limited amount of training (possibly increased employability) and support. As a consequence, approximately 15 - 20 households are thus directly supported off the monitoring programme with an additional ripple effect generating (indirect) income and opportunity for other members of the community (through craft and curio selling, carrying gear, guiding, domestic services and babysitting) by attracting turtle-viewing tourist to the area. The attitude/value has thus changed from "consumptive use" to a sustainable non-consumptive, conservation ethic. One superstition that has remained though is that the high fecundity of turtles can be transferred to domestic animals. Sometimes turtle eggs are fed to chickens in the hope that the chickens will increase their production. (R Kyle pers comm).
****
Nel, R., Punt, A.E., Hughes, G.R. (2013) Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.

1.5.3 Please indicate the relative level and impact of traditional harvest on marine turtles and their eggs. **[IND, TSH]**

	RELATIVELY HIGH	UNKNOWN	NONE	RELATIVELY LOW	MODERATE
Level of harvest:	☐	☐	☐	☑	☐
Impact of harvest:	☐	☐	☐	☑	☐

Source of information / explanation:
› De Wet, A., 2013. Factors affecting survivorship of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles of South Africa, Zoology Department. Nelson Mandela Metropolitan University, Port Elizabeth, p. 196.
Nel, R., Punt, A.E., Hughes, G.R. (2013) Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.
New anecdotal information suggests harvesting of non-nesting turtles outside of MPAs in remote parts of the country. The extent of the impacts is not known.

1.5.4 Have any domestic management programmes been established to limit the levels of intentional harvest? **[SAP]**

Use the text box to give details.
☑ YES

› Yes - a very effective turtle monitoring programme with a concomitant law enforcement component exists in South Africa. Nesting beaches are patrolled nightly (and early morning) through-out the entire nesting and hatching season, for the entire peak nesting area which makes it difficult for any person (local or foreign) to harvest turtle/products. This has been in existence since 1963 and covers an approximately 85km stretch of beach from the South African/Mozambican border south to Sodwana Bay. South Africa has supported a monitoring program across the border around Ponto Du Oro / Malongane area.

1.5.5 Describe any management agreements negotiating between your country and other States in relation to sustainable levels of traditional harvest, to ensure that such harvest does not undermine conservation efforts. **[BPR]**
› No formal agreements. As per 1.5.4 the interactions are mostly informal taking place at a provincial/programme to programme level. A Peace Park (Africa's first Trans Frontier Marine Park) has been created between Mozambique and South Africa including the bulk of the turtle nesting area. This park arrangement facilitates close co-operation on across border law enforcement activities. There is an active project currently to expand the iSimangaliso World heritage site with another 100km into Mozambique to Maputo. The nomination to UNESCO will be submitted by end 2021.

1.6 Minimizing mortality through nesting beach programmes

1.6.1 Measures and effectiveness

First, tick one of the YES/NO-boxes to indicate whether or not your country has any of the following measures in place to minimise the mortality of eggs, hatchlings and nesting females. If yes, then **estimate the relative effectiveness** of these measures. **[IND, SAP]**

Use the text boxes below each rating to elaborate on your responses, including any lessons learned that might be of value to other Signatory States, and indicate your plans for the coming year. Please explain any "Not Applicable (N/A)" responses.

a1) Monitoring/protection programmes
☑ YES

a2) Monitoring/protection programmes: relative effectiveness
☑ EXCELLENT

› This is the strongest aspect of turtle conservation in South Africa. The programme was initiated in 1963 where the highest density rookery (8km) was monitored. Over time the area was expanded and 56km of beach is now monitored for 5 months of the year, either on foot or by vehicle. The consistent increase in the number of nests per season indicates that this programme is very successful.
Nel, R., 2014. 50 Years of turtle conservation, monitoring and research: a state-of-knowledge report. Ezemvelo KZN Wildlife, Nelson Mandela Metropolitan University, p. 43.
Nel, R., Punt, A.E., Hughes, G.R., 2013. Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.

b1) Education/awareness programmes
☑ YES

b2) Education/awareness programmes: Relative effectiveness
☑ GOOD

› Three particular programmes are currently in place:
a) a 3-day training programme for turtle monitors: this training is not limited to only monitoring skills, but include aspects of turtle biology, life history, threats, and potential conservation measures. It has been found that if monitoring and conservation is contextualised the outcomes of the monitoring programme is greater (data more reliable and consistent).
b) a 1-day training programme for tour operators: the training is very similar to the monitor training and also cover turtle biology, life history and threats. The operator training then expands to cover appropriate behaviour and best practice principles of tourists around a turtle.
c) an Eco-School programme was in place. This programme targeted teachers of two grade classes (one junior and one senior) at 10 schools in/around iSimangaliso. The school syllabus is modified and adapted to use sea turtles as a flagship to bring across different concepts. However, this programme is replaced with regular contact between the conservation officer tasked with Community Conservation visiting each school in iSimangaliso informing them about sea turtles and related conservation issues. This message is also expanded to visitors to the Park during peak holidays.
Monitor and tour operator training is conducted at the beginning of each season whereas the school activities takes place on an ongoing basis. Most of the organised programmes are focussed around the conservation areas. This totals to presentations to ~21 schools, 25 groups mainly tourists but Ezemvelo staff.

c1) Egg relocation/hatcheries
☑ N/A

› The long-term monitoring programme negates the current need for relocation/hatcheries. It was however used in the past when there was a serious threat to the main loggerhead rookery due to a potential harbour development. The future need for it is however consistently monitored and will be used if necessary.

c2) Egg relocation/hatcheries: Relative effectiveness
☑ UNKNOWN

› The long-term monitoring programme negates the current need for relocation/hatcheries. It was however used in the past, between 1983 and 1993 when approximately 200 000 loggerhead turtle eggs were translocated from the beaches of the Maputaland MPA to the beaches south of Sodwana Bay within the St. Lucia MPA (both of which are now incorporated into the iSimangaliso MPA). This was done in response to Swaziland claiming that parts of its territory were incorporated unlawfully into South Africa during the 19th Century. The disputed areas include portions of land found in Mpumalanga and the northern KwaZulu-Natal. It was speculated at the time that the Swazi government wanted access to the Indian ocean via Kosi Bay, which remained undeveloped. Kosi Bay would have been developed into a deepwater harbour, and the loggerhead hotspot north of Bhanga Nek would have been destroyed. The future need for it is however consistently monitored and will be used if necessary.

d1) Predator control
☑ N/A

d2) Predator control: Relative effectiveness
☑ LOW

› Predator control Was evaluated by De Wet (2013) indicating low levels of predation and high levels of hatching and emergence success for both loggerhead and leatherback turtles.
******
De Wet, A., 2013. Factors affecting survivorship of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles of South Africa, Zoology Department. Nelson Mandela Metropolitan University, Port Elizabeth, p. 196.

e1) Vehicle / access restrictions
☑ YES

e2) Vehicle/access restriction: relative effectiveness
☑ EXCELLENT

› South Africa has instituted a national ban on the use of offroad vehicles (ORV's) in the coastal zone since 2002. Driving in the coastal zone is only possible under a "permissible use" as identified in the regulations or a permit/exemption granted under these regulations. Within the iSimangaliso MPA, vehicle access to the coastal zone is strictly controlled via a permitting process and is only allowed:
a) at licenced boat launch sites within the park,
b) Conducting scientific research
c) Operating tourism businesses – in this case, ferrying tourists to observe nesting turtles
d) Film/documentary production
e) By an employee or agent of an organ of state acting in the course and scope of their employment or mandate, or by any person contracted by an organ of state, for the purposes of performing the public duties of that organ of state mandated by law
f) Emergencies.

f1) **Removal of debris / clean-up**
☑ YES

f2) Removal of debris /clean-up: relative effectiveness
☑ EXCELLENT

› There are three particular programmes:
a) The international beach clean-up day. This functions as a significant awareness-raising day involving politicians, local authorities, schools etc. while cleaning up the beach. This event is generally very well organised and supported.
b) The Working for the Coast programme. This programme takes place on an ongoing basis. Individuals from poor communities are employed to do various labour intensive, limited-skills tasks on the coast including beach cleaning and removal of alien vegetation. This is a multimillion rand, national programme but is particularly useful in parks and remote areas that do not receive such services from local authorities.
c) Municipal solid waste removal projects: are operating in all urban and peri-urban coastal towns. During peak holiday periods (like new year which overlap with turtle nesting and hatching) the programme is

intensified and beaches are cleaned on a daily basis.
d) The Department of Environmental Affairs has also launched the Good Green Deeds programme in 2019. The programme There are three particular programmes:
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c) Municipal solid waste removal projects: are operating in all urban and peri-urban coastal towns. During peak holiday periods (like new year which overlap with turtle nesting and hatching) the programme is intensified and beaches are cleaned on a daily basis.
d) In 2019, the Department of Environmental Affairs launched the Good Green Deeds programme. A programme aimed to promote a South Africa that is clean of litter and illegal dumping and urges citizens to adopt sustainable living practices through responsible management of waste.
e) South Africa has amended its fiscal and waste management policy to introduce environmental levies for plastic bags and is looking at investments in plastic palletization plants which is looks at way to divert plastic waste from landfill sites. South Africa has also conducted a Plastic Material Flows and End of Life Management Study to assess the current status with regard to the production and management of plastics and identified barriers to improving the diversion of plastics from landfill sites.
f) In 2014, the Department of Environmental Affairs launched its National Coastal Management Programme under the National Environmental Management: Integrated Coastal Management Act to prioritise the management of pollution in the coastal zone. Under that priority, South Africa adopted Management Objective 4.3, which is to develop and implement programmes to address marine litter.

g1) Re-vegetation of frontal dunes
☑ YES

g2) Re-vegetation of frontal dunes: relative effectiveness
☑ EXCELLENT

› All the turtle nesting habitat in SA is located in protected areas with restricted access and very low levels of development. There is however on occasion impacts on frontal dunes. The philosophy applied to date has been that if primary dunes are impacted through natural causes (like wind blow-outs or storm erosion) it has to self-rehabilitate. If the degradation is due to public access, trampling or driving it is rehabilitated through brush-packing and signage erected to redirect traffic, unless it is in a "sacrificial area". Sacrificial areas are areas that are in permanent use and instead of "rehabilitation", "mitigation" is used as a principle. This generally include hardening of ramps using natural material "ladders" across the sand to stabilise the area and redirecting the opening of ramps/access paths not to face into the predominant wind direction which could cause severe blow-outs. Exotic vegetation such as Casuarina trees are also systematically being removed from nesting areas.

h1) Building location/design regulations
☑ YES

h2) Buidling location/design regulations: relative efectiveness
☑ EXCELLENT

› The turtle nesting beaches in SA have been proclaimed RAMSAR sites and protected areas since the mid-70's. The effect is that the coastal area is pristine with a maximum of 7 development nodes, 3 with <1km beach facing extent and 3 undetectable from the beach (out of ~ 180km). The only “not ideal” developments are ironically the turtle management and research station (at Bhanga Nek) and a police camp. These are restricted to 3 houses facing the beach from the frontal dunes and an eroded ramp at the police camp. All other developments are located behind primary or secondary dunes. Any new developments (irrespective of

size) go through an Environmental Scoping procedure. Furthermore, a new Integrated Environmental Coastal Management Act has been passed - protecting the coast and set out specific guiding principles and policies for all developments and activities along the coast.

i1) Light pollution reduction

☑ YES

i2) Light pollution reduction: Relative effectiveness

☑ EXCELLENT

› As per the previous two points, there are very few developments along the nesting beaches and those that are there are sheltered by frontal dunes. The developments around the nesting beaches are generally not on the national electricity grid and many require generators for electricity. The generators do not run past 10pm allowing for a temporal escape from lights for turtles. The larger development nodes generally have sheltered lights.

1.6.2 Has your country undertaken any evaluation of its nest and beach management programmes? **[SAP]**

Use the text box to elaborate on your response, if necessary.

☑ YES

› Turtle monitoring has been taking place annually since 1963. A Season Report is drafted annually highlighting the population nesting trends, shark net catches, tag returns as well as management problems experienced during the season. The report will provide feedback on each of the aspects listed above (if it was problematic). The report is an internal Ezemvelo report that is sent to all other authorities (Park Authority, Oceans and Coasts etc) and donors. A full review of populations trends took place in 2010 which produced two academic publications.

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Nel, R., Punt, A.E., Hughes, G.R., 2013. Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.

Thorson, J.T., Punt, A.E., Nel, R., 2012. Evaluating population recovery for sea turtles under nesting beach protection while accounting for nesting behaviours and changes in availability. Journal of Applied Ecology 49, 601-610.

OBJECTIVE II: PROTECT, CONSERVE AND REHABILITATE MARINE TURTLE HABITATS

2.1 Measures to protect and conserve marine turtle habitats

2.1.1 What is being done to protect critical habitats outside of established protected areas? (NB: It is assumed that legislation relating to established protected areas will have been described in Section 1.5.1) **[BPR, SAP]**

› The National Biodiversity Assessment process evaluate the integrity and status of all terrestrial, coastal and marine habitats. Management actions are enacted based on the outcomes of these assessments. For example, South Africa's cabinet has approved 20 new Marine Protected Areas (MPAs) in October 2018. These new MPA's will be gazetted in accordance with the National Environmental Management: Protected Areas Act (No. 57 of 2003), which will be augment the current network of MPA's. The increase protection from 0.5% to 5% and will increase protection of offshore ecosystem, which will take effect in 1 August 2019.. There are also other marine spatial programs that identify Critical Biodiversity Areas and Ecologically and Biologically Significant areas to ensure additional management of coastal and marine habitats in addition to protected areas.

2.1.2 Are assessments routinely made of the environmental impact of marine and coastal development on marine turtles and their habitats? **[IND, SAP]**

Use the text box to elaborate on your response.
☑ YES

› Existing programmes include:
• Annual turtle nest monitoring
• 5-yearly National Spatial Biodiversity Assessment and KwaZulu-Natal’s spatial use and habitat status (C-Plan)
• Ongoing reef monitoring in iSimangaliso by Ezemvelo and the Oceanographic Research Institute.

2.1.3 Is marine water quality (including marine debris) monitoring near turtle habitats? If yes, describe the nature of this monitoring and any remedial measures that may have been taken. **[SAP]**
☑ NO

› River run-off is measured periodically by the Department of Water & Sanitation (DWS) although the input into the marine environment along the turtle beaches is not measured directly. The reason being that the nesting habitat is in a protected area with relatively low levels of adjacent development/industry/agriculture. It is thus not applicable. However, marine debris, particularly plastic pollution, is becoming a serious problem with near annual mass strandings of sea turtle hatchlings, frequently with plastic in the intestines.
Ryan PG, Cole G, Spiby K, Nel R, Osborse A, Perold V (2016) Impacts of plastic ingestion on post-hatchling loggerhead turtles off South Africa. Marine Pollution Bulletin 107: 155-166.

2.1.4 Are measures in place to prohibit the use of poisonous chemicals and explosives? **[SAP]**

Use the text box to elaborate on your response.
☑ YES

› The nesting beaches of turtles are protected and fall within a World Heritage Site, therefore, these activities are prohibited within the area.
However, there are multiple pieces of legislation that are in place as well as good enforcement thereof. Inter alia:
• Marine Living Resources Act (Act 18 of 1998)
• National Environmental Management Act No 107 of 1998
• National Environmental Management: Waste Act (Act 59 of 2008) • Explosives Act (Act 15 of 2003)
• Hazardous Substances Act (Act 15 of 1973)
Pollution levels were recently evaluated.
du Preez M, Nel R, Bouwman H (2018) First report of metallic elements in loggerhead and leatherback turtle eggs from the Indian Ocean. Chemosphere 197:716-728

2.2 Rehabilitation of degraded marine turtle habitats

2.2.1 Are efforts being made to recover degraded coral reefs? If yes, give details (location, duration, effectveness, lessons learned, future plans etc.). **[IND, SAP]**

Provide sufficient details of the measures taken, especially those measures shown to have been effective in recovering degraded coral reefs. Please indicate future plans in this regard.
☑ NOT APPLICABLE (no degraded coral reefs)

› There is no indication that the rocky reef covered in a coral veneer is degraded in SA. No extractive use is allowed on any of the coral reefs. Further, most of the coral reefs in SA are not only in protected areas but in sanctuary areas unavailable to public access. Coral bleaching is currently not an extensive problem although it should be monitored.

2.2.2 Are efforts being made to recover degraded mangrove habitats that are important for turtles? If yes, give details (location, duration, effectiveness, lessons learned future plans etc.). **[IND, SAP]**
☑ NOT APPLICABLE (no mangrove habitats important for turtles)

› Details/future plans:
Mangrove habitats are marginal in South Africa. They are relatively small and occur to some extent in many of the estuaries along the eastern seaboard. Some of the mangroves are under pressure from poor estuarine management practices; water abstraction has led to a large fraction of the estuaries changing to temporary open-closed systems with a reduced tidal influence and being closed for extended periods of times. However, this habitat has not been of any importance to sea turtles in the past, although there is some anecdotal evidence of young green turtles using estuaries which also have estuaries. It is unclear if these habitats play a significant role in sea turtle life histories in SA

2.2.3 Are efforts being made to recover degraded sea grass habitats? If yes, give details (location, duration, effectiveness, lessons learned future plans etc.). **[IND, SAP]**
☑ NOT APPLICABLE (No degraded sea grass habitats)

› Typical sea grass beds (mostly used by green turtles) are absent in SA. Sea grass occur only in the shallow sub-tidal margin on rocky habitats and in large intertidal rock pools. These habitats are restricted to the most northern part of the country, already protected in the World Heritage Site. There is no degradation of this habitat and thus no rehabilitation required. Dietary studies have indicated that green turtles in South Africa feed extensively on green and red algae including Caulerpa, Gelidium, and Codium.

OBJECTIVE III: IMPROVE UNDERSTANDING OF MARINE TURTLE ECOLOGY AND POPULATIONS THROUGH RESEARCH, MONITORING AND INFORMATION EXCHANGE

3.1 Studies on marine turtles and their habitats

3.1.1 Give a list of available literature that includes baseline information from studies carried out in your country on marine turtle populations and their habitats. **[INF]**

› Nolte, C. 2019 The distribution of South African sea turtles as indicated by epibionts and stable isotopes. Unpublished MSc Thesis, Nelson Mandela University. 140 pages

Pretorius, D 2019. Zoning the Western Indian Ocean to mitigate conflict between ocean-based hydrocarbon exploration and production on sea turtles. Unpublished MSc Thesis, Nelson Mandela University, 148 pages.

New Literature:

de Vos D, Nel R, Schoeman DS, Harris LR, du Preez, D (2019) Effect of introduced Casuarina trees on the vulnerability of sea turtle nesting beaches to erosion. Estuarine Coastal and Shelf Science 223:147-158.

du Preez M, Nel R, Bouwman H (2018) First report of metallic elements in loggerhead and leatherback turtle eggs from the Indian Ocean. Chemosphere 197:716-728

Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.

Le Gouvello D, Nel R, Harris LR, Bezuidenhout K, Woodbourne S (2017) Identifying potential pathways for turtle-derived nutrients cycling through beach ecosystems. Marine Ecology Progress Series, 583:49-62.

Robinson, NJ, Moreale, SJ, Nel, R, Paladino, FV (2017) Movements and diving behaviour of inter-nesting leatherback turtles in on oceanographically dynamic habitat in South Africa. Marine Ecology Progress Series 571: 221-232.

Le Gouvello D, Nel R, Harris LR, Bezuidenhout K (2017) The response of sandy beach meiofauna to nutrients from sea turtle eggs. Journal of Experimental Marine Biology and Ecology 487:94-105.

Robinson NJ, Stewart KR, Dutton PH, Nel R, Paladino FV, Santidrián Tomillo P (2017) Standardising curved carapace length measurements for leatherback turtles, Dermochelys coriacea, to investigate global patterns in body size. Herpetological Journal 26: 133–136.

Robinson NJ, Morreale SJ, Nel R, Paladino FV (2016) Coastal leatherback turtles reveal conservation hotspot. Scientific Reports 6:37851.

Robinson NJ, Majewska R, Lazo-Wasem E, Nel R, Paladino FV, Rojas L, Zardus JD, Pinou T (2016) Epibiotic diatoms are universally present on all sea turtle species. PLoS ONE 11(6): e0157011.

Ryan PG, Cole G, Spiby K, Nel R, Osborse A, Perold V (2016) Impacts of plastic ingestion on post-hatchling loggerhead turtles off South Africa. Marine Pollution Bulletin 107: 155-166.

Santidrián Tomillo P, Saba VS, Lombard C, Paladino F, Spotila J, Fernández C, López Rivas M, Tuček J, Nel R, Oro D (2015) Global analyses of the effects of local climate on the hatchling output of leatherback turtles. Scientific Reports 5: 16789

Harris LR, Nel R, Oosthuizen H, Meÿer M, Kotze D, Anders D, McCue S, Bachoo S (2015) Paper-efficient multi-species conservation and management are not always field-effective: The status and future of Western Indian Ocean leatherbacks. Conservation Biology 191: 383-390.

Shamblin, B.M., A.B. Bolten, F. A. Abreu-Grobois, K.A. Bjorndal, L. Cardona, C.C. Carreras, M. Clusa, C. Monzón-Argüello, C.J. Nairn, J.T. Nielsen, Ronel Nel, L.S. Soares, K.R. Stewart, O. Türkozan, Peter H. Dutton. (2014) Loggerhead turtle phylogeography and stock structure revisited with expanded mitochondrial control region sequences. PLoS ONE 9(1): e85956.

Tucek J., Nel R, Girandot, M & Hughes, G. (2014) Estimating reproductive age and size of loggerhead sea turtles. Endangered Species Research 23:167-175.

Nel, R., Punt, A.E., Hughes, G.R. (2013) Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles? PLoS ONE 8, e63525.

De Wet, A., 2013. Factors affecting survivorship of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles of South Africa, Zoology Department. Nelson Mandela Metropolitan University, Port Elizabeth, p. 196.

Brazier, W., R. Nel, G. Cliff, & S. Dudley (2012). Impact of protective shark nets on sea turtles in KwaZulu-Natal, South Africa: 1981-2008. Afr. J. Mar Sci Vol 34(2):249-257.

Thorson, James T., Andre E. Punt and Ronel Nel (2012). Evaluating population recovery for sea turtles under nesting beach protection using a robust-design multi-state tag-resighting model to approximate skip-nesting and temporary emigration behaviours. J. App. Ecology, 49(3):601-610.

Boonzaaier, M.K., 2011. The effect of incubation temperature on hatching success an hatchling sex ratios of loggerhead turtles (Caretta caretta) in KwaZulu-Natal, South Africa, Zoology. Nelson Mandela Metropolitan University, Unpublished Thesis, p. 111.

Petersen, S., M.B. Honig, P.G. Ryan, R. Nel, L.G. Underhill 2009. Turtle Bycatch in the pelagic longline fishery off southern Africa. African J. Marine Science : 31(1):87-95.

McALLISTER, H.J., A.J. BASS, H.J. VAN SCHOOR. 1965. Marine turtles on the coast of the Tongaland, Natal. The Lammergeyer 3(2): 10-40.

HUGHES, G.R., A.J. BASS, M.T. MENTIS 1967. Further studies on the marine turtles in Tongaland I. The Lammergeyer 7: 5-54.
HUGHES, G.R., M.T. MENTIS 1967. Further studies on the marine turtles in Tongaland II. The Lammergeyer 7: 55-72.
HUGHES, G R. 1971. Preliminary report to the Southern Africa Wildlife Foundation (World Wildlife Fund) on the status of sea turtles in South East Africa. Section 2 : Madagascar and the Mascarenes. Parts 1 : Europa Island : 2 : South and South West Madagascar. O R I Special Report : 1-52.
HUGHES, G R. 1971. Sea turtle research and conservation in South Africa. I U C N Publ. New Series supp. Pap., (31) : 57-67.
HUGHES, G R. 1971. Preliminary report on the sea turtles and dugongs of Mozambique. Veterin. Mocambicana, 4(2) : 45-62.
HUGHES, G R. 1972. The olive ridley sea turtle (Lepidochelys olivacea) in South East Africa. Biol. Conserv., 4(2) : 128-134. HUGHES, G R. 1972. Preliminary report to the Southern Africa Wildlife Foundation (World Wildlife Fund) on the status of sea turtles in South East Africa. Section 2 : Madagascar and the Mascarenes. Part 4 : Mauritius and the St Brandon turtle fishery. O.R.I. Special Report : 1-10.
HUGHES, G R. 1973. The survival situation of the hawksbill sea turtle (Eretmochelys imbricata) in Madagascar. Biol. Conserv., 5(1) : 41-45. HUGHES, G R. , B. Huntley and D. Wearne, 1973. Sea turtles in Angola. Biol. Conserv., 5(1) : 92-93.
HUGHES, G R. 1973. The sea turtles of South East Africa. Thesis submitted for the degree of Doctor of Philosophy, University of Natal, Durban, 1-409.
HUGHES, G R. 1976. The green turtle fishery of St Brandon. Proc. Roy. Soc. Arts and Science Mauritius. III (2) : 165-189. HUGHES, G R. 1976. Irregular reproductive cycles in the Tongaland loggerhead sea turtle, Caretta caretta L. Zool. Africana II (2): 285-292.
HUGHES, G R. 1977. Sea turtles : a guide. Natal Parks Board, Pietermaritzburg, 1-22.
HUGHES, G R. 1978. Marine turtles. IN : Ed. A E F Heydorn. Ecology of the Agulhas Current Region. Proc. Roy. Soc. S. Afr. 43(2) : 151-190.
HUGHES, G R. 1978. Diving record for leatherback sea turtle. Lammergeyer, 26 : 64. HUGHES, G R., and C. W. Sapsford, 1978. Body temperature of the loggerhead sea turtle Caretta caretta and the leatherback sea turtle Dermochelys coriacea during nesting. Zoo. Africana 13(1) : 63-69.
HUGHES, G R. 1982. Nesting cycles in sea turtles, typical or atypical - IN : Proc. "First World Conference on Sea Turtle Conservation" Ed. K. Bjorndal, Washington D.C. November 1979. pp 81-89.
HUGHES, G R. 1982. The conservation situation of sea turtle populations in the South African Region. IN : Proc. "First World Conference on Sea Turtle Conservation" Ed. K. Bjorndal, Washington D.C. November 1979. pp 297-303.
HUGHES, G R. , and J y LE GALL, 1987. Migration de la tortue verte Chelonia mydas a l'Ocean Indian a partir des marquages su les sites du ponte Europa and Tromelin (1970 1985) Amphibia Reptilia : 277-282.
HUGHES, G R. 1987. The Tongaland sea turtle research programme IN : (Eds. A P Bowmaker, D van der Zyl and J H Ridder). Marine Research in Natal Symposium, ORI, Durban, 10-11 Feb. 1986. CSIR SA Nat. Sc.P.Repr. No. 139 : 160-164.
BALDWIN R., G.R. HUGHES AND R.I.T PRINCE 2003. Loggerhead turtles in the Iindian ocean. (Chapter 14) In Bolten, A. B. Witherington B.E. (eds) Loggerhead Sea turtles. Smithsonian Books, Washington. P218-232.
SCHLEYER, M. L. CELLIERS. 2005. Modelling reef zonation in the Greater St Lucia Wetland Park, South Africa. Estuarine Coastal and Shelf Science 63:373-384.

3.1.2 Have **long-term** monitoring programmes (i.e. of at least 10 years duration) been initiated or planned for priority marine turtle populations frequenting the territory of your country? **[IND, BPR]**

Please give details of the nature, duration and continuity of these programmes.
☑ YES

› In 1963 a long-term monitoring programme was initiated, monitoring the nesting loggerhead and leatherback turtles over a 8km stretch of beach. In 1972 this area was expanded to 60km including the highest density areas of both these species. During the course of the last 5 years, the nest monitoring area has been further expanded to the current 85 km stretch of beach from Sodwana Bay north to the Soutrh African/Mozambican border.
Shark- net bycatch (outside of protected areas) have been monitored for ~ 20 years. This is the only consistent information on non-nesting species in SA (including green turtles, hawkbill and olive ridleys).
Strandings reporting is haphazardly done and reported through rehabilitation programmes at aquaria.
Robinson NJ, Stewart KR, Dutton PH, Nel R, Paladino FV, Santidrián Tomillo P (2017) Standardising curved carapace length measurements for leatherback turtles, Dermochelys coriacea, to investigate global patterns in body size. Herpetological Journal 26: 133–136.

3.1.3 Has the genetic identity of marine turtle populations in your country been characterised? **[INF, PRI]**

Please give details (e.g. which species, which populations?).
☑ YES

› BOWEN B.W., KAMEZAKI N., LIMPUS C.J., MEYLAN A.I. AND AVISE J.C., & HUGHES, G. 1994. Global phylogeography of the loggerhead turtle (Caretta caretta) as indicated by mitochondrial DNA haplotypes. Evolution 48 (6): 1820 - 1828.
DUTTON, P.H., B.W. BOWEN, D.W. OWENS A. BAQRRAGAN AND S.K. DAVIS. 1999. Global phylogeography of the leatherback turtle (Dermochelys coriacea). J. Zool. Lond. 248:397-409.
Shamblin, B.M., A.B. Bolten, F. A. Abreu-Grobois, K.A. Bjorndal, L. Cardona, C.C. Carreras, M. Clusa, C. Monzón-Argüello, C.J. Nairn, J.T. Nielsen, Ronel Nel, L.S. Soares, K.R. Stewart, O. Türkozan, Peter H. Dutton. (2014) Loggerhead turtle phylogeography and stock structure revisited with expanded mitochondrial control region sequences. PLoS ONE 9(1): e85956.
Hickman, S. 2017 The origin of immature loggerhead (Caretta caretta), green (Chelonia mydas) and hawksbill (Eretmochelys imbricata) turtles frequenting South African waters. Unpublished BSc Hons project, Nelson Mandela University. 25 Pages.
The genetic identity of the marine turtles of the iSimangaliso Wetland Park is underway at Nelson Mandela University as part of a Pew Marine Fellowship. Results expected to be completed in 2022.

3.1.4 Which of the following methods have been or are being used to try to identify migration routes of turtles? Use the text boxes to provide additional details [INF, PRI]

a) Tagging

☑ YES (Details/future plans)

› Flipper tagging of both nesting loggerhead and leatherback females.
Flipper tagging of turtles caught alive in bather protection nets.
Satellite tagging of nesting loggerhead and leatherback turtles
Satellite tagging a few non-nesting green and hawksbill turtles as well as rehabilitated turtles released from national aquaria (since 2017).
Spatial modelling of satellite tagging data to identify migration routes for nesting loggerhead and leatherbacks.
Oceanographic modelling of loggerhead and leatherback hatchling dispersal from the nesting ground.
Epibionts and stable isotopes of nesting loggerhead and leatherback turtles.
Epizoic diatoms on nesting loggerhead and leatherback turtles.
Hughes, G.R. 1996. Nesting of the leatherback turtle (Dermochelys coriacea) in Tongaland, KwaZulu-Natal, South Africa 1963-1995. Chel.Cons and biology. 1996 2(2) : 153 - 158.
Hughes, G.R. 1996. The Status of Sea Turtle Conservation in South Africa. IN : Proc. Western Indian Ocean Workshop on Sea Turtles. Sodwana Bay, S. Africa. Nov. 12-18, 1995 UNEP Regional Seas Rept. & Stud. 165: pp 95-102.

b) Satellite tracking

☑ YES (Details/future plans)

› Details/future plans:
A number of loggerhead and leatherback turtles have been tagged giving some indication of the migration routes of both nesting species. Leatherback tracking is ongoing as a partnership between Oceans and Coasts, NMMU and Ezemvelo.
HUGHES, G.R AND F. PAPI, 1997. Information on sea turtle navigation obtained by satellite tracking. IN: Orientation and Navigation - Birds, Human and other Animals. 1997 Spring Conf. Of Royal Inst. Of Navigation 21 - 23 April 1997. pp 10 (-1) - 10(7).
HUGHES, G.R AND F. PAPI, P. LUSCHI & E. CROSIO, 1997. Satellite tracing experiments on the navigational ability and migratory behaviour of the loggerhead turtle Caretta caretta IN: Marine Biology (1997) 129 pp 215-220.
LUSCHI, P., J.R.E. LUTJEHARMS, P. LAMBARDI, R. MENCACCI, G.R. HUGHES AND G.C. HAYS. 2006. A review of migratory behaviour of sea turtles off south-eastern Africa. Botha, M. 2007.
Internesting behaviour of leatherback turtles (Dermochelys coriacea) in the Greater St Lucia Wetland Park. Unpublished Hons Project. NMMU, p32.
Harris, L., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., Bachoo, S., 2018. Managing conflicts between economic activities and threatened migratory marine species towards creating a multi-objective blue economy. Conservation Biology,32(2): 411-423.
Robinson, NJ, Moreale, SJ, Nel, R, Paladino, FV (2017) Movements and diving behaviour of inter-nesting leatherback turtles in on oceanographically dynamic habitat in South Africa. Marine Ecology Progress Series 571: 221-232.
Robinson NJ, Morreale SJ, Nel R, Paladino FV (2016) Coastal leatherback turtles reveal conservation hotspot. Scientific Reports 6:37851.
Ten leatherback turtles will be satellite tagged again in the 2019/20 nesting season in the iSimangaliso Wetland Park by Nelson Mandela University as part of a Pew Marine Fellowship. Results expected to be completed in 2022

c) Other OR None of the above

☑ Other (List and provide details)

› Notching of loggerhead hatchlings:
Approximately 100 000 Cc hatchlings have been notched per annum for ~20 years. This provided some indication of the direction and the rate of dispersal of hatchlings in the few months after hatching. The following publication has been produced from this.
Tucek J., Nel R, Girandot, M & Hughes, G. (2014) Estimating reproductive age and size of loggerhead sea turtles. Endangered Species Research 23:167-175.
Past and current student projects.
PhDs:
Jenny Tucek – Recovery potential of loggerhead and leatherback turtles nesting in South Africa. (NMMU, 2015)
Diane Le Gouvello – Factors affecting fitness in sea turtles (NMU, ongoing)
Cristina Louro - Strengthening Marine Turtle Conservation within a Transfrontier Conservation Area: Introducing a Community Voice Approach to Inform Marine Spatial Planning (NMU, ongoing)
MScs:
Deidre De Vos - The effect of Casuarina trees on sea turtle nesting beaches throughout the Indian Ocean and South-East Asia regions: A beach vulnerability assessment.
Christopher Nolte –. The distribution of South African sea turtles as indicated by epibionts and stable isotopes. (NMU 2019)
Dirk Pretorius - Zoning the Western Indian Ocean to mitigate conflict between ocean-based hydrocarbon exploration and production on sea turtles.(NMU 2019)
Marinus Du Preez – Contaminants contained in sea turtle eggs. ((UNW 2017)
Diane Le Gouvello - The fate and effect of nutrients introduced by sea turtle nests on sandy beach ecosystems. (NMMU. 2015)
Bernice Mellet – Ecological Risk Assessment of sea turtles in fisheries in the Indian Ocean. (NMMU, 2015)
Ryan Rambaran – Ecological Role of sea turtles in iSimangaliso Wetland Park. (NMU, Ongoing)
Anje De Wet: Factors affecting mortality of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles of South Africa (NMMU 2013)
Wayne Brazier: Environmental cues driving nesting in Maputaland sea turtles (NMMU 2012)
Melissa Boonzaaier: Factors affecting hatching success and sex ratios in sea turtles (NMMU 2011)
Marie Botha: Nest site fidelity of turtles in South Africa (NMMU 2010)
BTech:
Darrell Anders: Spatial and temporal overlap between South African leatherback turtles (Dermochelys coriacea) and pelagic longliners fishing in the South African EEZ (CPUT, 2010)

3.1.5 Have studies been carried out on marine turtle population dynamics and survival rates (e.g. including studies into the survival rates of incidentally caught and released turtles)? **[INF, PRI]**
☑ YES

› Hughes (1974) provides a comprehensive overview of many of the parameters such as estimates for fecundity and reproductive output per female. This has been re-evaluated after 30 years by a PhD student. There is also some indication of survival rates of turtles caught in shark nets (which differ among species), but this has not been evaluated formally in South African fisheries.
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HUGHES, G R. 1974. The sea turtles of South East Africa. Unpublished PhD thesis, University of Natal, Durban, 1-409.

3.1.6 Has research been conducted on the frequency and pathology of diseases in marine turtles? **[INF, PRI]**
☑ YES

› This has been limited. Only one study described some of the typical diseases developed by sea turtles in captivity (by Wendt 1988). Furthermore, all of the aquaria keep some form of a log of the injuries/problems/disease that they can identify as sea turtles come in for rehabilitation, or that they may develop while in captivity. The pollution load in sea turtle eggs was investigated.
****
WENDT, G.E. 1988. Growth and osmoregulatory studies of loggerhead turtles, Caretta caretta L. An Unpublished MSc thesis, UPE. Pp 138.
du Preez M, Nel R, Bouwman H (2018) First report of metallic elements in loggerhead and leatherback turtle eggs from the Indian Ocean. Chemosphere 197:716-728

3.1.7 Is the use of traditional ecological knowledge in research studies being promoted? **[BPR, PRI]**
☑ YES

› The national funding agency for research (National Research Foundation or NRF) has a specific program that addresses traditional knowledge. A PhD is currently underway to evaluate the value of sea turtles to local communities by Cristina Louro. Project title: Strengthening Marine Turtle Conservation within a Transfrontier Conservation Area: Introducing a Community Voice Approach to Inform Marine Spatial Planning (NMU,

ongoing).

3.2 Collaborative research and monitoring

- 3.2.1 List any **regional** or **sub-regional action plans** in which your country is already participating, which may serve the purpose of identifying priority research and monitoring needs. **[INF]**

Use the text box to elaborate on your response.
› South Africa was instrumental in the establishment of the Western Indian Ocean Marine Turtle Task Force. Through the activities of the WIO MTTF sites of importance have been identified, along with periodic reviews of the regional priorities and work plans.
SA also contributed genetic samples and isotope samples to Reunion for the Coca-Loca project.
DALLEAU M, et al 2016 Connectivity of Loggerhead turtle (Caretta caretta) in Western Indian Ocean: Implementation of local and regional management. 28 pages.
South Africa and Mozambique is currently collaborating on a new submission to UNESCO for the extension of the iSimangaliso Wetland Park, world heritage site, into Mozambique.

3.2.2 On which of the following themes have collaborative studies and monitoring been conducted? Use the text boxes to describe the nature of this international collaboration or to clarify your response. Answer 'NO' if the studies/monitoring undertaken do not involve international collaboration. [INF, PRI]

a) Genetic identity
☑ YES (Details/future plans)

› Details/future plans:
Bowen B.W., Kamezaki N., Limpus C.J., Meylan A.I. and Avise J.C., & Hughes, G. 1994. Global phylogeography of the loggerhead turtle (Caretta caretta) as indicated by mitochondrial DNA haplotypes. Evolution 48 (6) : 1820 - 1828.
DUTTON, P.H., B.W. BOWEN, D.W. OWENS A. BAQRRAGAN AND S.K. DAVIS. 1999. Global phylogeography of the leatherback turtle (Dermochelys coriacea). J. Zool. Lond. 248:397-409.
Shamblin, B.M., A.B. Bolten, F. A. Abreu-Grobois, K.A. Bjorndal, L. Cardona, C.C. Carreras, M. Clusa, C. Monzón-Argüello, C.J. Nairn, J.T. Nielsen, Ronel Nel, L.S. Soares, K.R. Stewart, O. Türkozan, Peter H. Dutton. (2014) Loggerhead turtle phylogeography and stock structure revisited with expanded mitochondrial control region sequences. PLoS ONE 9(1): e85956.
Skin samples are also collected of green turtles that area caught in shark nets or strand to be analysed by France/Reunion. Sharing of skin samples for a regional project under the leadership of Kelonia that evaluated the distribution patterns of loggerhead turtles throughout the Western Indian Ocean.
DALLEAU M, et al 2016 Connectivity of Loggerhead turtle (Caretta caretta) in Western Indian Ocean: Implementation of local and regional management. 28 pages

b) Conservation status
☑ YES (Details/future plans)

› Leatherback SWOT analysis.
Loggerhead SWOT analysis.
Information sharing with southern Mozambique on nest monitoring ongoing.

c) Migrations
☑ YES (Details/future plans)

› Details/future plans:
All projects are currently conducted at a national level.
Previous publications include:
HUGHES, G.R AND F. PAPI, 1997. Information on sea turtle navigation obtained by satellite tracking. IN : Orientation and Navigation - Birds, Human and other Animals. 1997 Spring Conf. Of Royal Inst. Of Navigation 21 - 23 April 1997. Pp 10 (-1) - 10(7).
HUGHES, G.R AND F. PAPI, P. LUSCHI & E. CROSIO, 1997. Satellite tracing experiments on the navigational ability and migratory behaviour of the loggerhead turtle Caretta caretta.IN : Marine Biology (1997) 129 pp 215-220.
LUSCHI, P., J.R.E. LUTJEHARMS, P. LAMBARDI, R. MENCACCI, G.R. HUGHES AND G.C. HAYS. 2006. A review of migratory behaviour of sea turtles off south-eastern Africa.
LAMBARDI, P, J.R.E. LUTJEHARMS, R. MENCACCI, G.C. HAYS, P. LUSCHI. 2008. Influence of ocean currents on long-distance movement of leatherback sea turtles in the Southwest Indian Ocean. Marine Ecology Progress Series 353: 289-301.
Nathan J. Robinson, Darell Anders, Santosh Bachoo, Linda Harris, George R. Hughes, Deon Kotze, Seshnee Maduray, Steven McCue, Michael Meyer, Herman Oosthuizen, Frank V. Paladino & Paolo Luschi. 2018. Satellite Tracking of Leatherback and Loggerhead Sea Turtles on the Southeast African Coastline. Indian Ocean Turtle

Newsletter. No 28
Linda R. Harris, Ronel Nel, Herman Oosthuizen, Santosh Bachoo. 2018. Challenges in Creating a Sustainable Blue Economy: When Cumulative, Multi-National Economic Activities Impact Threatened Migratory Species. Conservation Biology. Vol. 32, No. 2, 411-423
L Harris, R Nel, H Oosthuizen, M Meyer, D Kotze, D Anders, S McCue and S. Bachoo. 2015. Paper-efficient multi-species conservation and management is not always field-effective: the status and future of Western Indian Ocean leatherbacks. Biological Conservation. Vol. 191

d) Other biological and ecological aspects
☑ NO (Details/future plans)

› None currently and none planned.

3.3 Data analysis and applied research

3.3.1 List, in order of priority, the marine turtle populations in your country in need of conservation actions, and indicate their population trends. **[PRI]**
› Population Trends – Dermochelys coriacea and Caretta caretta
Consistent effort has been applied to the 13km stretch of beach from the Bhanga Nek research station to the Kosi estuary mouth. Dedicated patrolling of this area has taken place every nesting season since 1965 and it is for this reason that this area is termed the “Index Area” (Nel and Bachoo 2011). Therefore, nest and track (emergence) counts from this area can be used as an index of abundance of the nesting population trend due to the application of consistent effort in this area. Track counts are particularly favoured as a metric/proxy of population size as this is least dependent on effort, equipment and interpretation and therefore gives a more reliable indicator of population trends (Nel 2014).
The nesting population trends from the 1965/1966 season to the 2018/2019 season for leatherbacks and loggerheads are presented in Figures 1 and 2 respectively in terms of emergences.
• Dermochelys coriacea (Critically endangered, but stable):
There is huge inter-annual nesting variation. Leatherback nest numbers typically range between 100 - 400 nests per season (~ 60 nests per annum in the 8km index area as opposed to 6 at inception). There is huge inter-annual variation exhibited in terms of both emergences and nesting and the overall population trend is considered to be stable. The 2018/2019 season was extremely poor one in terms of both emergences and nesting. Longlining seems to be the greatest current pressure.
• Caretta caretta (Vulnerable and increasing):
The long-term nesting loggerhead population trend, in terms of both tracks and nests, has undergone distinct phases since the implementation of the protection programme:
• An initial rapid increase – this was during the first 5-10 years of monitoring, quite likely an immediate positive response to protection;
• Prolonged stability – following the initial rapid increase, a prolonged period of stability spanning approximately 3 decades;
• Rapid increase – during the early 2000’s to around 2011/2012, where there was a dramatic (almost exponential) increase in the population. Nel (2014) attributed this to the consistent long-term protection afforded to hatchlings which were now coming back to nest. Other contributions noted by Nel (2014) was the increased protection in Mozambique since 1996 as well as the collapse of the prawn trawl industry off the east coast of KZN.
• Peak – the population, reported as having stabilised around between the 2011/2012 -2013/2014 (Nel 2016), seems to have now peaked with no further increase.
• Population decline – the population started showing the first signs of a possible declining trend since the start of the programme after the 2013/2014 season, both in terms of the tracks and nesting. This continued for 3 seasons up to the 2016/2017 season. The cause of the decline is currently unknown. The past 2 seasons do hint at a prospect of recovery and is cause for guarded optimism (Figure 2). The cause of the decline is currently unknown
• Chelonia mydas and Eretmochelys imbricata:
Developmental area - population size unknown. The bather protection catches can be used as proxy to indicate trends. From this information both these species are assumed to have stable populations in the SA borders. The KwaZulu-Natal Sharks Board, which manage the bather protection nets off the coast of KwaZulu-Natal, have embarked on a net reduction programme, replacing nets with baited drumlines to selectively fish out sharks and minimise bycatch. Neither of these species are apparently under pressure from within South Africa. Greatest pressure is likely from net fisheries (including ghost fishing). - The population size and dynamics of these species remain a knowledge gap, as it is scattered and collected unsystematically.
Nel, R. and Bachoo, S. 2011. Season Report: Turtle Monitoring 2010-2011. Internal Report for Ezemvelo KZN Wildlife and iSimangaliso Wetland Park.
Nel, R. 2014. 50 Years of Turtle Conservation, Monitoring and Research: A State-of-Knowledge Report for Ezemvelo KZN Wildlife.

3.3.2 Are research and monitoring activities, such as those described above in Section 3.1, periodically reviewed and evaluated for their efficacy? **[SAP]**

☑ YES

› The routine monitoring activities i.e. nest monitoring is conducted on an ongoing basis. It is evaluated for success and impact at the end of each season. The projects that are aimed at addressing specific questions - such as satellite tagging, genetics, nest fidelity etc. are conducted as research projects. They are once-off until the question is addressed, or is only reviewed periodically.
The information obtained through research and monitoring is most credible for the nesting species (Cc & Dc) with scant information available on the non-nesting species (Ei, Cm & the occasional Lo).
There is an active university research programme reviewing monitoring results and integrating information from various projects. (See Nel 2014). Recommendations from the State of Knowledge Report (Nel 2014) has since been implemented in the turtle monitoring programme and will continue until the next review.
*****
Nel, R., 2014. 50 Years of turtle conservation, monitoring and research: a state-of-knowledge report. Ezemvelo KZN Wildlife, Nelson Mandela Metropolitan University, p. 43.

3.3.3 Describe how research results are being applied to improve management practices and mitigation of threats (in relation to the priority populations identified in 3.3.1, among others). **[SAP]**
› With regards to habitat conservation there is very little room for improvement on current management practices. Research is however conducted to ensure that the current observed trends can/will be maintained into the future.
Nest monitoring – reports produced annually to review population status of nesting species.
Satellite tracking – data extensively incorporated into design of marine protected areas with a 10-fold increase in MPA protection coming into effect in 1 August 2019. Two of the 20 new MPAs are based on sea turtle satellite tracking data.
Incidental capture, fisheries practices and permit conditions have improved considerably. Recently, the Department of Environmental Affairs has been merged with Fisheries, which will largely assist in incidental capture, fishery practices and permit conditions relating to sea turtles. South Africa is also a signatory to various RFMOs where reporting of incidental capture of marine species are reported.
Threatened or Protected Marine Species Regulations have been gazetted in 2017, and warrants all turtle species found in RSA the necessary protection. In addition to this, South Africa's Biodiversity legislation is written in a way that ensures that all international conventions that the country is signatory to applies in the Republic.
The nesting beaches of turtles falls within a World Heritage Site.
South Africa has numerous interventions to dealing with marine litter including plastic pollution (which is an emerging threat for turtles):
- The Department has implemented its Working for the Coast Programme as an Extended Public Works Project aimed at creating jobs through dealing with challenges emanating from the coast, among which includes the clearing of litter from beaches nationally. Additionally in 2014, the Department launched its National Coastal Management Programme under the National Environmental Management: Integrated Coastal Management Act to prioritise the management of pollution in the coastal zone. Under that priority, South Africa adopted Management Objective 4.3, which is to develop and implement programmes to address marine litter.
- The Department will soon launch the Source-to-sea Programme to address the growing concern of litter from inland river systems, including catchment systems, therefore reducing marine litter. One of the other streams that has been prioritised by the Department is packaging waste, which includes plastic waste with the intent is to ensure that the industry commits to specific targets on the diversion of waste from landfill sites.
- Additionally, South Africa has amended its fiscal and waste management policy to introduce environmental levies for plastic bags and is looking at investments in plastic palletization plants to divert plastic waste from landfill sites.
- Lastly, South Africa has also conducted a Plastic Material Flows and End of Life Management Study to assess the current status with regard to the production and management of plastics and identified barriers to improving the diversion of plastics from landfill sites.

3.4 Information exchange

3.4.1 Has your country undertaken any initiatives (nationally or through collaboration with other Range States) to standardise methods and levels of data collection? **[BPR, INF]**
☑ YES [If yes, please give details of the agreed protocol(s)]

› South Africa has one of the longest-running nest monitoring programs in the world and has thus contributed to the development of protocols and training of other programs in the region.
South Africa was instrumental in the establishment of the Western Indian Ocean Marine Turtle Task Force of the WIO MTTF regional meeting. Amongst other issues, standardization of monitoring protocols and prioritization was discussed.
Partnership and informal agreement between Kelonia and Ezemvelo (previously Natal Parks Board) for exchange of information, and occasional staff exchange and training.

3.4.2 To what extent does your country exchange scientific and technical information and expertise with

other Range States? **[SAP, IND]**
☑ OCCASIONALLY

3.4.3 If your country shares scientific and technical information and expertise with other Range States, what mechanisms have commonly been used for this purpose? Comment on any positive benefits/outcomes achieved through these interactions. **[INF]**
› • South Africa and southern Mozambique try to have a close working relationship by inviting representatives to meetings/workshop that are of interest to both countries/programmes.
• South Africa also participates in (sub) regional activities/workshops such as the establishment of the WIO MTTF, or FAO workshops that can impact on regional conservation activities.
• South African scientist attend as many (sub) regional conferences/meetings e.g. WIOMSA to share information and lessons learned with the international audience.
• Two possible opportunities that could be expanded is a) joint multi-national research projects and b) cross-supervision of students doing post-graduate research in the (sub) region.

3.4.4 Does your country compile and make available to other countries data on marine turtle populations of a regional interest?

Please give details **[INF]**
☑ YES

› The objective of South African research has always been publishing findings in international literature as well as contribute reports to the IOSEA website and report data base

OBJECTIVE IV: INCREASE PUBLIC AWARENESS OF THE THREATS TO MARINE TURTLES AND THEIR HABITATS, AND ENHANCE PUBLIC PARTICIPATION IN CONSERVATION ACTIVITIES

4.1 Public education and information programmes

4.1.1 Describe the educational materials, including mass media information programmes that your country has collected, developed and/or disseminated. **[INF, PRI]**

Details/future plans:
› Major Events Showcasing the Turtle Monitoring Programme in South Africa
• In 2012, Ezemvelo, in conjunction with the iSimangaliso Authority, hosted a gala event to celebrate 50 years of turtle conservation at the uShaka Marine World in Durban, South Africa. This was done to commemorate the hard work of those that have served the programme and to celebrate its continued success. Following on from the gala event, VIP's and members of the media were treated to a turtle tour on the beaches at Sodwana Bay. The tour was broadcast on South African national news (SABC3) and is available on YouTube. The address is https://www.youtube.com/watch?v=_-P9dIvaHLA. Dr George Hughes book, "Between the Tides – in Search of Sea Turtles" was officially launched at the gala. Dr Hughes also presented his book at other events around the country.
• The Royal Show – a major event in 2013 where the Turtle Monitoring Programme was showcased to the public. The display, which specifically focused on "50 Years of Sea Turtle Conservation" won the Gold Medal at the event for having the best display.
• An article detailing the 50 years of turtle conservation in South Africa was done for a major tourism magazine in KZN. The article is available at http://southcoaststyle.co.za/monitoringleatherback-and-loggerhead-sea-turtles-in-kzn
• The former Chief Executive Officer of Ezemvelo KZN Wildlife, Dr Bandile Mkhize, authored an article on the turtle monitoring programme for a major newspaper in KZN in 2014, hailing it as one of the most successful conservation programmes in the country. The article is available at http://www.iol.co.za/dailynews/opinion/our-success-stories1.1656387#.U7PZS6Lb7fs
Details/future plans:
Posters describing the nesting programme (in both English and Zulu)
Z-folder describing the turtle monitoring programme.
Regular Television coverage in natural science programmes (~6 pa)
Popular or web articles (~ 1pa) Newspaper articles highlighting turtle nesting events (1/2 pa)
Training of monitors and concessionaires
Public talks to conservancies / donors / public / schools
Eco-schools programmes
Scientific Conferences
Current plans: Through Pew Fellowship will redesign a previous turtle information booklet, along with an awareness campaign (using satellite tagging program as basis) and launching the awareness campaign on World Turtle Day 2020.

4.1.2 Which of the following groups have been the targets of these focused education and awareness programmes described in above in Section 4.1.1? **[PRI, INF]**
☑ Policy makers
☑ Fishing industry
☑ Local/Fishing communities
☑ Indigenous groups
☑ Tourists
☑ Media
☑ Students
☑ Military, Navy, Police
☑ Scientists
☑ Other (describe):

› Others: Tour Operators.
These programmes are targeting compliance officers and observers making them aware of impacts of long-lining on turtles (and other by-catch species).
School children that are targeted through the Community Conservation programme around iSimangaliso, as well as turtle monitors and/or concessionaires. Information to the tourists are generally disseminated through the tour operators or direct interactions with scientists in the field.
Research findings are communicated to government officials as part of Working Groups or as part of the national biodiversity assessments.

4.1.3 Have any community learning / information centres been established in your country? **[BPR, SAP]**

Please give details and indicate future plans
☑ NO

› Non per se. There are no centers where the public can freely visit or access turtle information or nesting sites. However, the (fairly exclusive) tourist lodges have targeted programmes where visitors can attend a talk presented before they go on a turtle trot/drive. Also a flagship research programme has been established at NMU (Port Elizabeth) with a number of provincial aquaria hosting turtle displays, rehabilitation programmes and awareness programmes.

4.2 Alternative livelihoods opportunitiesDescribe initiatives already undertaken or planned to identify and facilitate alternative livelihoods (including income-generating activities) for local communities. **[IND, BPR]**
› The alternative livelihood issues especially around turtle nesting beaches are complex since turtle nesting beaches are in protected areas (a world heritage site) that has been under conservation for an extended time (~1965). The area is an area of high poverty with limited economic opportunities. There are various programmes within the World Heritage Site that offers opportunities for economic upliftment – one of them being the turtle monitoring programme. The monitoring programme is of critical importance as it has effectively monitored and protected these marginal turtle subpopulations for 55 years while simultaneously changing the value of turtles from a short-term food source to a long-term sustainable source of income derived from tourism and the provision of employment for turtle monitors. It demonstrates great synergy between conservation and the creation of economic opportunities – two goals that otherwise generally seem to be at loggerheads.
The programme currently employs close to 40 community members for 5 months of the year during the nesting/hatching season.
In addition, Individuals are employed by their own community through walk concession operations (~ 3 months of the year), and ~6-10 individuals are employed through other drive concessions to act as guides or assistants with tourists. Other tourist related activities (like community accommodation camps etc) benefit from high occupancy during this period. There is scope for expansion with more creative thinking.

4.3 Stakeholder participation

4.3.1 Describe initiatives already undertaken or planned by your country to involve **local communities**, in particular, in the planning and implementation of marine turtle conservation programmes. Please include details of any incentives that have been used to encourage public participation, and indicate their efficacy. **[BPR, IND]**
› As per description above, the local community in the Park that is dependent on economic opportunities from within the park and are included in the planning and prioritization of activities (e.g. community monitors and walk-on concessions). The success of the monitoring programme is due to the involvement and participation of the local communities. Close to 40 individuals are selected, trained and paid to undertake data collection on nesting turtles. In addition, they spread the word of turtle conservation to tourists and their own communities.
There is a new port development across the border in Mozambique, hence the research project to investigate the community perspective on these livelihood opportunities sustained by turtle nesting.

4.3.2 Describe initiatives already undertaken or planned to involve and encourage the cooperation of **Government institutions, NGOs** and the **private sector** in marine turtle conservation programmes. **[IND, BPR]**
› Conservation, monitoring and research in South Africa is driven by the national and provincial government entities. These are Department of Environmental Affairs, Ezemvelo KZN Wildlife, iSimangaliso Wetland Authority, and KZN Sharks Board.
NGOs (WWF, Birdlife and Conservation trust) have historically been involved especially regarding particular themes. Private sector has been involved through operating hospitality industry within the park and paying for the right to drive on otherwise restricted beaches and expose the public to turtles. Also, there are rehabilitation centres that play a major role in the conservation of turtles, through their exhibition facilities and research conducted.
Research is mostly driven and coordinated by Nelson Mandela University. All these entities are however cooperating strongly for the purpose of turtle conservation. There is also the planned campaign to enhance awareness raising, data sharing and cooperation for the 2019/2020 year (as part of a Pew Marine Fellowship).

OBJECTIVE V: ENHANCE NATIONAL, REGIONAL AND INTERNATIONAL COOPERATION

5.1 Collaboration with, and assistance to, signatory and non-signatory States

5.1.1 Has your country undertaken a national review of its compliance with Convention on International Trade in Endangered Species (CITES) obligations in relation to marine turtles? **[SAP]**
☑ NO

› Data suggests that turtle trade through South Africa is of low importance. However, there is continuous screening of import/export product (at harbours, airports and border crossings) since there is a large fraction of other (mostly non-marine) wildlife products moving through South Africa. There are 15 designated ports through which legal, permitted exports of CITES products may take place.

5.1.2 Does your country have, or participate/cooperate in, CITES training programmes for relevant authorities? **[SAP]**
☑ YES (If yes, please provide details of these training programmes)

› This is Ongoing, although limited, and nothing turtle specific. The latest training session for CITES officers took place in 2018. Turtles are not common in international trade (as picked up through port inspections). However, under the national environmental legislation, leatherback, hawksbill and loggerheads are listed as “critically endangered” and therefore do receive specific attention during inspections.

5.1.3 Does your country have in place mechanisms to identify **international** illegal trade routes (for marine turtle products etc.)? Please use the text box to elaborate on how your country is cooperating with other States to prevent/deter/eliminate illegal trade. **[SAP]**

Please give details of particularly successful interventions and prosecutions; and/or mention any difficulties experienced that impede progress in this area. Please provide references to any published reports (e.g. already prepared for CITES purposes) that give a more ample explanation.
☑ YES

› Yes - (covert) but turtles have not been identified as problem species. The marine species that are encountered include mollusc shells and hard and soft corals. These cases are investigated and if there are irregularities in permits etc. they are prosecuted. No cases of international turtle trade transgressions have been reported or gone to court. Regular compliance inspections take place take place at the national borders, and therefore, increases the chances of illegal products to be recovered.

5.1.4 Which international compliance and trade issues related to marine turtles has your country raised for discussion (e.g. through the IOSEA MoU Secretariat, at meetings of Signatory States etc.)? **[INF]**
› None. South Africa receives very few CITES applications annually specifically on turtles. Precaution, however, is taken as there is a potential for local (illegal) market on the SA/Mozambique border

5.1.5 Describe measures in place to prevent, deter and eliminate domestic illegal trade in marine turtle products, particularly with a view to enforcing the legislation identified in Section 1.5.1**. [INF]**
› Nothing new since the last report other than a few incidents of egg poaching. However, the individuals were apprehended and fined.
Turtle poaching although largely under control, with approximately 1 poached every 2-3 years. One person, from a nearby community, was apprehended in 2010 and received a five-year jail sentence. Any take/possession of turtle products from protected areas is taken very seriously and is prosecuted

5.2 Prioritisation, development and implementation of national action plans

5.2.1 Has your country already developed a national **action plan** or a set of **key management measures** that could eventually serve as a basis for a more specific action plan at a national level? **[IND]**

Please explain.
☑ NO

› South Africa, in section 43 of its National Environmental Management: Biodiversity Act (No. 10 of 2004) has a provision to develop Biodiversity Management Plans for Species or ecosystems. None has been developed yet, as there are adquate legislation in place to address threats on turtles.

5.2.2 From your country’s perspective, which **conservation and management activities**, and/or which particular **sites or locations**, ought to be among the highest priorities for action?
(List up to 10 activities from the IOSEA Conservation and Management Plan). **[PRI]**
› Priorities – in no order of importance:

1. Identify and document threats to marine turtle populations and their habitats. (1.1);
2. Reduce to the greatest extent practicable the incidental capture and mortality of marine turtles in the course of fishing activities. (1.4) [Engage with multiple fishing industries to reduce bycatch]
3. Establish necessary measure to protect and conserve marine turtle habitats (2.1) [With respect to plastic pollution and climate change which are not buffered by MPAs].
4. Conduct studies on marine turtle and their habitats targeted to their conservation and management (3.1) [Particularly on non-nesting species]
5. Analyse data to support mitigation of threats to asses and improve conservation practices (3.2) [Good observer & strandings data are being recorded but it is not being analysed in a regular or rigorous way]
6. Establish public education awareness and information programmes (4.1);
7. Promote public participation (4.3);
8. Capacity building and training (5.4) [throughout the Western Indian Ocean];
9. Seek resources to support the implementation of the MoU (6.3);
10. Improve coordination among government and no-government sectors in the conservation of marine turtles and their habitats.

5.2.3 Please indicate, from your country's standpoint, the extent to which the following **local** management issues require **international** cooperation in order to achieve progress. **[PRI]**
In other words, how important is **international** cooperation for addressing these issues?
Please select only one per line

	NOT AT ALL	LIMITED	IMPORTANT	ESSENTIAL
Illegal fishing in territorial waters	☐	☐	☑	☐
Incidental capture by foreign fleets	☐	☐	☑	☐
Enforcement/patrolling of territorial waters	☐	☐	☑	☐
Hunting/harvest by neighboring countries	☐	☐	☐	☑
Poaching, illegal trade in turtle products	☐	☐	☑	☐
Development of gear technology	☐	☐	☑	☐
Oil spills, pollution, marine debris	☐	☐	☐	☑
Training / capacity-building	☐	☐	☐	☑
Alternative livelihood development	☐	☑	☐	☐
Identification of turtle populations	☐	☐	☑	☐
Identification of migration routes	☐	☑	☐	☐
Tagging / satellite tracking	☐	☑	☐	☐
Habitat studies	☐	☐	☐	☑
Genetics studies	☐	☑	☐	☐

Use the text box to list and rank any other local management issues for which international cooperation is needed to achieve progress.
› Mozambique:
- protection of nesting population and offshore habitats from illegal fishing.
- Overall equivalent application of best practice (banning of drift nets, gill nets), mitigatory actions (VMS, TEDs, long-lining time and speed of setting / release of caught turtles) data collection (Observer recordings).
- Potential development of a deep-water port in the middle of the shared rookery of a critically endangered leatherback turtle population.

5.3 Cooperation and Information exchange

5.3.1 Identify existing frameworks/organisations that are, or could be, useful mechanisms for cooperating in marine turtle conservation at the sub-regional level. Please comment on the strengths of these instruments, their capacity to take on a broader coordinating role, and any efforts your country has made to enhance their role in turtle conservation. **[INF, BPR]**
› WIOMSA as a research forum and an opportunity for exchange through MASMA grants. WIO MTTF to facilitate even implementation of the IOSEA CMP across WIO countries.

5.3.2 Has your country developed, or is it participating in, any networks for cooperative management of shared turtle populations? **[BPR, INF]**
☑ YES (if yes, give details)

› Information exchange between South Africa and Mozambique through the Transfrontier Park and Peace Parks programs.
Informal exchange and research partnerships with Kelonia, Reunion

5.3.3 What steps has your country taken to encourage Regional Fishery Bodies (RFBs) to adopt marine turtle conservation measures within Exclusive Economic Zones (EEZs) and on the high seas? Please describe the interventions made in this regard, referring to specific RFBs. **[SAP]**
› South Africa is a member of ICCAT, IOTC and CCSBT. It has recently emerged as a leader in collecting data on and mitigating against bycatch and one of a only a few countries fully compliant with reporting and adherence to conservation measures of Long-line bycatch. Permit conditions in the Large Pelagic Fishery are refined annually. Turtle monitoring has improved and mortality reduced.

5.4 Capacity-building

5.4.1 Describe your country's needs, in terms of human resources, knowledge and facilities, in order to build capacity to strengthen marine turtle conservation measures. **[PRI]**
› The country is fairly strong on most aspects of turtle research and conservation and has an excellent history in monitoring. Collaboration with expert scientists from within the region and outside of the region (through the WIO MTTF) has provided insights into turtle movements not previously known. The sub-regional working groups is definitely a strength of the region. Better alignment between government departments and improved communication and information sharing is needed to strengthen and refine conservation measures.

5.4.2 Describe any training provided in marine turtle conservation and management techniques (e.g. workshops held, training manuals produced etc.), and indicate your plans for the coming year. **[PRI, INF]**
› Turtle monitor training: 2-day per annum before the nesting season begins.
Concession training: 1 day per annum before tourist seasons begins.
A number of post graduate degrees.
Observer training. This includes species identification, data collection, mitigatory measures and release of turtles (one day course).
Compliance officer training: One day workshop discussing legislation/permit conditions / mitigatory measures.

5.4.3 Specifically in relation to **capacity-building**, describe any partnerships developed or planned with universities, research institutions, training bodies and other relevant organisations. **[BPR]**
› WWF (Green Trust) used to fund most of the education and awareness programmes and materials on the nesting grounds. Birdlife SA & WWF used to fund the training related to the offshore training. Department of Environmental Affairs is funding monitoring, conservation and postgraduate research.

5.5 Enforcement of conservation legislation

5.5.1 National policies and laws concerning the conservation of marine turtles and their habitats will have been described in Section 1.5.1. Please indicate their effectiveness, in terms of their practical application and enforcement. **[SAP, TSH]**
› Very effective especially in proportion to the demand. (Relatively low demand with high enforcement). The National Environmental Management: Biodiversity Act protects turtles and their habitats. Furthermore, the National Environmental Management: Protected Areas Act allows for protected areas including marine protected area to be established. RSA has gazetted 20 additional MPAs to its network of MPAs.

5.5.2 Has your country conducted a review of policies and laws to address any gaps, inconsistencies or impediments in relation to marine turtle conservation? If not, indicate any obstacles encountered in this regard and when this review is expected to be done. **[SAP]**

Please give details.
☑ YES

› South Africa is in the process of rationalizing its environmental legislation. Most of marine species and marine and coastal related processes were included in numerous acts. The first process was to:
a. Repeal the section on Marine Protected Areas from the Marine Living Resources Act, which largely concentrated on fisheries related issues, to the National Environmental Management: Protected Areas Act. The section on MPAs was gazetted in 2014. Subsequently, South Africa has gazetted 20 new MPAs, and includes numerous offshore protected areas.
b. Threatened or Protected Marine Species Regulations include all turtle species found in South African waters. These regulations were amended from 2012, and were gazetted for implementation in May 2017 updating all marine species and their conservation status, including sea turtles found in South African waters.

5.5.3 From the standpoint of law enforcement, has your country experienced any difficulties achieving cooperation to ensure compatible application of laws across and between jurisdictions? **[TSH]**

Please give details.
☑ NO

› National perspective: turtle nesting is only taking place in one province (KZN) and conservation therefore originated in this province. It has been very successful. It is only recently that it has received national attention - through the two CMS MoUs that required national participation. The level of importance of turtle conservation issues with our neighbouring countries are not on quite the same level (as it has been in KZN). No national working group in place (yet) but it is expected to be established.

OBJECTIVE VI: PROMOTE IMPLEMENTATION OF THE MOU, INCLUDING THE CMP

6.1 IOSEA Marine Turtle MoU membership and activities

6.1.1 What has your country already done, or will it do, to encourage other States to sign the IOSEA MoU? **[INF]**
› All WIO Countries are signatories.

6.1.2 Is your country **currently** favourable, in principle, to amending the MoU to make it a legally binding instrument? **[INF]**
☑ YES

6.1.3 Would your country be favourable, over a **longer time horizon**, to amending the MoU to make it a legally-binding instrument? **[INF]**
☑ YES (Use the text box to elaborate on your response, if necessary)

6.2 Secretariat and Advisory Committee

What efforts has your country made, or can it make, to secure funding to support the core operations of the IOSEA MoU (Secretariat and Advisory Committee, and related activities)? **[IND]**
› SA has provided good financial support to the operations of the Secretariat. It will be re-evaluated in time for South Africa to host a signatory states meeting in the future.

6.3 Resources to support implementation of the MoU

6.3.1 What funding has your country mobilised for **domestic** implementation of marine turtle conservation activities related to the IOSEA Marine Turtle MoU? Where possible, indicate the specific monetary values attached to these activities/programmes, as well as future plans. **[IND]**
› All marine turtle conservation activities related to the IOSEA Marine Turtle MoU are conducted within the budget of the respective organisations.
The figures from 2014 are as follows:
Turtle Nest Monitoring: ~Rand 0.8M pa
Observer Programme: ~Rand 1.0M pa (estimate)
Bather Protection Nest monitoring: ~Rand 2.0M pa (estimate)
Education and Awareness: ~Rand 0.1M pa (estimate)
Meetings (Coordination): Rand 0.04M pa Research: ~Rand 0.25M pa

6.3.2 Has your country tried to solicit funds from, or seek partnerships with, other Governments, major donor organizations, industry, private sector, foundations or NGOs for marine turtle conservation activities? **[IND]**
☑ YES (If yes, give details of the approaches made (both successful and unsuccessful))

› For 2019, Ezemvelo KZN Wildlife sought funding for the turtle monitoring programme in conjunction with WildOceans from the following sources:
• The US Fish and Wildlife Services – Still awaiting outcome of the application
• Blue Action Fund - Application has been successful. We are awaiting the allocation

6.3.3 Describe any initiatives made to explore the use of economic instruments for the conservation of marine turtles and their habitats. **[BPR]**
› None

6.4 Coordination among government agencies

6.4.1 Has your country designated a lead agency responsible for coordinating national marine turtle conservation and management policy? If not, when is this information expected to be communicated to the IOSEA MoU Secretariat? **[IND]**

Please elaborate, as necessary.
☑ YES

› South Africa's National Environmental Management: Biodiversity Act and National Environmental Management: Protected Areas Act has provisions in the acts that designate various organisations to the conservation and the management of marine turtles. The Management Authority can develop a Protected Area Management Plan for the areas they manage. Furthermore, the Department of Environmental Affairs provides oversight.
Due to the long history of turtle conservation by the provincial conservation agency (since sea turtles nest in

KwaZulu-Natal), it has been a "bottom-up" approach under the initiative of the Natal Parks Board. The provincial responsibility is now with Ezemvelo KZN Wildlife and the iSimangaliso Wetland Authority. The national responsibility (including the at sea distribution of turtles) falls under the jurisdiction of the Department of Environmental Affairs: Oceans and Coasts Branch. Monitoring of fisheries impacts and fisheries related data is the responsibility of the Department of Agriculture, Forestry and Fisheries.

6.4.2 Are the roles and responsibilities of all government agencies related to the conservation and management of marine turtles and their habitats clearly defined? **[IND]**

Use the text box to elaborate.
☑ YES

› The roles of the conservation agencies are legislated, although there are some overlaps on some responsibilities. South Africa's environmental legislation is written in a way that the different spheres of government has a concuurent function in terms of environmental legislation.
The responsibilities are as follows:
Department of Environmental Affairs: Is the custodian of the National Environmental Management Act (Act 107 of 1998). This is the overarching act of South Africa’s Environmental Legislation. The National Environmental Management Act among other things encourages cooperative governance in terms of realising the conservation of biodiversity.
Department of Agriculture, Forestry and Fisheries – Is the custodian of the Marine Living Resources Act (Act 18 of 1998). The act introduces regulating measures for the conservation of the marine ecosystem and the long-term sustainable utilisation.
iSimangaliso Wetland Park Authority – Are the overall Protected Area Manager of the breeding sites under various legislations (World Heritage Convention (Act 49 of 1999); National Environmental Management: Protected Areas Act (Act 57 of 2003); National Environmental Biodiversity Act (Act 10 of 2004); Marine Living Resources Act (Act 18 of 1998); UNESCO’s World Heritage Convention and Operational Guidelines and the Ramsar Convention (Convention on Wetlands of International Importance Especially as Water Fowl Habitats, 1971). iSimangaliso Wetland Park Authority have also entered into a contractual agreed Implementation Protocol regarding the Park with the Department of Environmental Affairs.
Ezemvelo KZN Wildlife – Is the Provincial Authority mandated to carry out environmental legislation in the Province of KwaZulu-Natal under which iSimangaliso Wetland Park falls. There are other organisations that provide support to government departments (e.g. KwaZulu-Natal Sharks Board; Oceanographic Research Institute; Nelson Mandela Metropolitan University; World Wildlife Fund for Nature (WWF); Birdlife SA).
There are overlaps in some areas; however government entities and various organisations take it upon themselves to minimize duplication through contractual agreements or Memoranda of Understanding (MoU).

6.4.3 Has your country ever conducted a review of agency roles and responsibilities? If so, when, and what was the general outcome? If not, is such a review planned and when? **[SAP]**

This question seeks to ascertain whether Signatories have made a serious examination of which agencies have a role to play in marine turtle conservation, either directly or indirectly, and which therefore should be apprised of the IOSEA MoU and its provisions.
If no internal review of interagency roles and responsibilities has been or will be undertaken, please elaborate if only to indicate that the necessary arrangements are already clear and not in need of further review.
☑ YES (Use the text box to elaborate)

› South Africa is in the process of reviewing its current environmental legislation, some of which include the functions of agencies.

OTHER REMARKS

Please provide any comments/suggestions to improve the present reporting format.
› - Some boxes can be increased as it is difficult to scroll through and read your answer.

ANNEX 1: SPECIES, HABITAT AND THREAT DATA [PRI, INF]
PLEASE COMPLETE A SEPARATE SECTION FOR EACH SITE/AREA

Site 1

Name of site/area:
› iSimangaliso Marine Protected Area, iSimangaliso Wetland Park World Heritage Site

Geographic coordinates (North/South)
☑ South

› 28° 31' 20.51" S
32° 24' 2.88" E

On-site research activities:
☑ Tagging
☑ Genetic Sampling
☑ Satellite tracking

Province / State:
› KwaZulu-Natal, Republic of South Africa

Name of person / agency wwho has provided the information:
› Ezemvelo KZN Wildlife

Information was last updated: (dd/mm/yyyy)
› 27June 2019

Short description of the site (optional):
› The iSimangaliso Marine Protected Area in KwaZulu-Natal is a coastal and offshore Marine Protected Area stretching from the South Africa-Mozambique border in the north, to Cape St Lucia Lighthouse in the south, extending offshore to a maximum depth of almost 2000m (Gazette 42478). This encompasses an area of approximately 11000 sq km and is of direct relevance to turtle conservation. This area protects both the nesting and interesting phases of the leatherback (Dermochelys coriacea) and loggerhead (Caretta caretta) turtles in South Africa, as well as their eggs and hatchlings. The entire nesting beach is bound within the boundaries of the iSimangaliso Marine protected area, and the coral reef complexes contained within the boundaries also provide important foraging habitats for loggerhead, hawksbill, green and quite possibly the very occasional olive ridley turtles.
Republic of South Africa Government Gazette No. 42478; Vol 647; 23 May 2019

Indicate the species occurence / use and relative importance of the site:

Abbreviations: Loggerhead Caretta caretta (CC); Olive Ridley Lepidochelys olivacea (LO); Green Chelonia mydas CM); Hawksbill Eretmochelys imbricata (EI); Leatherback Dermochelys coriacea (DC); Flatback Natator depressus (ND)
Use one of the following symbols or letters to indicate the presence or absence of a species at this site in the table above, including details (if known) about the relative importance of the site for nesting, feeding or development.

Insufficient information is available on the presence or absence of the species (leave box empty)

The species is **not present** or does not use this particular habitat type at this site.
?
It is speculated (only) that the species is present at this site and may be using one or more particular habitat types. In the absence of definitive information, place a **?** in the appropriate box(es).
✓
The species is definitely **known to be present** at this site; however no information is available on the relative importance of the site for nesting, feeding or development.
✓
H
The species is known to be present at this site and definitely uses this particular habitat. The site is considered to be of **high importance** for this species, relative to other sites in the country.
✓
A
The species is known to be present at this site and definitely uses this particular habitat. The site is considered to be of **average importance** for this species, relative to other sites in the country.
✓
L
The species is known to be present at this site and definitely uses this particular habitat. The site is considered to be of

lower importance for this species, relative to other sites in the country.
a - h
Additional information on nesting habitat (where available):

Indicate the estimated number of nests per year for each species by inserting, in the appropriate boxes, one of the letters ' **a** ' through ' **f** ', corresponding to the following scale: **a**: 1 - 10 nests ; **b**: 11 - 100 nests ; **c**: 101 - 500 nests ; **d**: 501 - 1,000 nests ; **e**: 1,001 - 5,000 nests ; **f**: 5,001 - 10,000 nests ; **g**: 10,001 - 100,000 nests; **h**: more than 100,000 nests

	ND Flatback	DC Leatherback	EI Hawksbill	CM Green	LO Olive Ridley	CC Loggerhead
Nesting	--	✓ H c	--	✓ L a	--	✓ h e
Feeding	--	?	✓ H	✓ H	--	✓ A
Developmental	--	✓ H	✓ H	✓ H	?	✓ H

Describe the nature of and intensity of threats to marine turtles at this site:

	High (common occurence)	Medium	Low (rare event)	None	Unknown
Exploitation of nesting females (i.e. direct harvest on land)			X		
Direct harvest of animals in coastal waters at or near the site				X	
Egg collection (i.e. direct harvest by humans)			X		
Incidental capture in coastal fisheries		X			
Boat strikes					X
Marine debris (e.g. plastics at sea, flotsam)					X
Industrial effluent				X	
Inshore oil pollution			X		
Agricultural/urban/tourism development (e.g. construction that disrupts nesting activities)		X			
Artificial lighting (on land or near shore)		X			
Habitat degradation (e.g. coastal erosion, debris that obstructs nesting etc.)		X			
Vehicles			X		
Sand mining / removal				X	
Natural threats, disease, predation of nests/nesting females (e.g. by domestic / feral animals), or natural predation at sea	X				
Other (type in):					

Please give further details or clarification about any of the information provided, as appropriate /

necessary.
› None