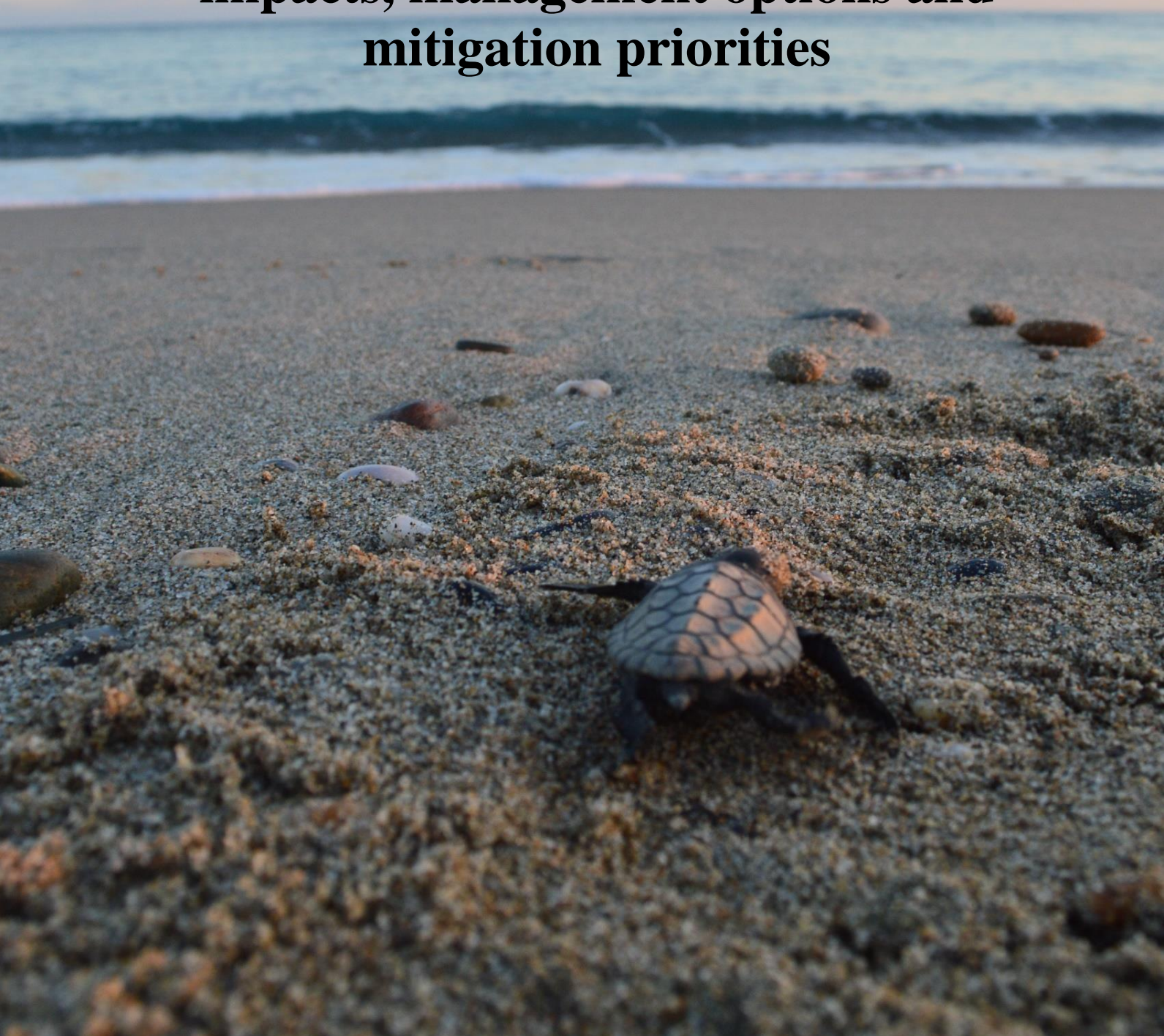




Status, scope and trends of the legal and illegal international trade in marine turtles, its conservation impacts, management options and mitigation priorities



Key partners:



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Extracts from “*Status, scope and trends of the legal and illegal international trade in marine turtles, its conservation impacts, management options and mitigation priorities*”

Front cover photo: *Caretta caretta* hatchling heading to the Mediterranean Sea (©Lauren Lopes).

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List of acronyms and terms

ACP - African, Caribbean and Pacific Group of States
ASEAN - Association of Southeast Asian Nations
ASEAN-WEN – Association of Southeast Asian Nations Wildlife Enforcement Network
BKSDA - Balai Konservasi Sumber Daya Alam (Nature Conservation Agency, Indonesia)
Carib-WEN – Caribbean Wildlife Enforcement Network
CA-WEN – Central America Wildlife Enforcement Network
CCL - Curved Carapace Length
CCP – Conselho Comunitário de Pesca (Community Fishing Council, Mozambique)
CITES – Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS – Convention on the Conservation of Migratory Species of Wild Animals
CSO – Civil Society Organisation
CSP – Centre de Surveillance des Pêches de Madagascar (Fisheries Monitoring Center of Madagascar)
CTI-CFF – Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security
EEZ – Exclusive Economic Zone
FAO - Food and Agriculture Organization of the United Nations
IAC – Inter-American Convention for the Protection and Conservation of Sea Turtles
ICCWC – International Consortium on Combating Wildlife Crime
IDPPE - Instituto Nacional de Desenvolvimento da Pesca de Pequena Escala (National Institute for the Development of Small Scale Fisheries, Mozambique)
IDR – Indonesian Rupiah (currency)
IFAD - International Fund for Agricultural Development
IGO – Inter-Governmental Organisation
INDERENA - Instituto Nacional de los Recursos Naturales Renovables y del Ambiente (National Institute of Renewable Natural Resources and Environment, Colombia)
INPA – Instituto Nacional de Pesca y Acuicultura (National Institute of Fisheries and Aquaculture, Colombia)
INPESCA – Instituto Nicaraguense de Pesca y Acuicultura (Nicaraguan Institute of Fisheries and Aquaculture)
INTERPOL – International Criminal Police Organization
IOSEA – Indian Ocean and South-East Asia
IOSEA Marine Turtle MoU - Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (concluded under the auspices of CMS)
IOTC – Indian Ocean Tuna Commission
IUCN – International Union for Conservation of Nature
IUU – Illegal, Unreported and Unregulated (fishing)
MARD – Ministry of Agriculture and Rural Development (Viet Nam)
MARENA – Ministerio del Ambiente y los Recursos Naturales (Ministry of Environment and Natural Resources, Nicaragua)
MGA – Malagasy Ariary (currency)
MIPE - Ministério das Pescas (Ministry of Fisheries, Mozambique)
MOMS - Management-Oriented Monitoring System
MONRE - Ministry of Natural Resources and Environment (Viet Nam)
MoU – Memorandum of Understanding
MRF - Marine Research Foundation
MZN – Mozambican Metical (currency)
NGO – Non-Governmental Organisation
NOAA - National Oceanic and Atmospheric Administration
POPMPR - Ponta do Ouro Marine Partial Reserve (Mozambique)
QR Code – Quick Response Code
RAAN – Región Autónoma de la Costa Caribe Norte (North Atlantic Autonomous Region, Nicaragua)
RAAS – Región Autónoma de la Costa Caribe Sul (South Atlantic Autonomous Region, Nicaragua)
Ramsar Convention – Convention on Wetlands of International Importance especially as Waterfowl Habitat

RCA – Central American Marine Turtle Conservation Network

RMU – Regional Management Unit

SPAW Protocol - Protocol concerning Specially Protected Areas and Wildlife (concluded under the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region)

TED – Turtle Excluder Device

TEV - Total Economic Value

THPA MoA - Memorandum of Agreement between the Government of the Republic of the Philippines and the Government of Malaysia on the Establishment of the Turtle Islands Heritage Protected Area

TRAFFIC -The Wildlife Trade Monitoring Network

UNODC - United Nations Office on Drugs and Crime

USD – United States Dollar (currency)

WIDECAST - Wider Caribbean Sea Turtle Conservation Network (a Regional Activity Network of the SPAW Protocol)

WWF - World Wide Fund for Nature

Executive summary

This study stems from the implementation of CITES Decision 17.222, by which the CITES Secretariat was directed to collaborate closely with the IAC, CMS and the IOSEA Marine Turtle MoU to undertake a study on the legal and illegal international trade in marine turtles. Supported by funding from Australia, the European Union, and the United States of America, the CITES Secretariat contracted three agencies (the World Wildlife Fund, Inc., the Marine Research Foundation and TRAFFIC) to undertake an *in-situ* assessment of the status, scope and trends of the legal and illegal international trade in CITES-listed species of marine turtle in eight countries within three subregions: Madagascar and Mozambique (in the East African subregion); Colombia, Nicaragua, and Panama (in the Inter-American subregion); and Indonesia, Malaysia and Viet Nam (in the Southeast Asia/Coral Triangle subregion). These countries were selected for assessing based on evidence (collected from recent literature and consultations with researchers and other experts) that indicated that they were significantly implicated in illegal trade markets for marine turtle specimens. In addition to the *in-situ* country assessments, which took place during 2018, this study analysed CITES Trade data on marine turtles and previous findings from available literature.

There are seven extant species of marine turtle - loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), hawksbill turtle (*Eretmochelys imbricata*), Kemp's ridley turtle (*Lepidochelys kempii*), olive ridley turtle (*Lepidochelys olivacea*), and the flatback turtle (*Natator depressus*). All species are included in CITES Appendix I, which includes species that are threatened with extinction that are, or may be, affected by trade. As such, international trade for commercial purposes is strictly prohibited for these species. Except for *N. depressus* (included only in CMS Appendix II), all six other species are included in CMS Appendices I and II. CMS Appendix II recognizes the unfavorable conservation status of species and requires CMS Parties to enhance them. CMS Appendix I includes species facing a very high risk of extinction and requires CMS Parties to strictly protect the species, among others, by prohibiting take and controlling other factors that might endanger them. IAC promotes the protection, conservation and recovery of the populations of six marine turtle species (all but *N. depressus*) in the Western Hemisphere, as well as of the habitats on which they depend.

The take and use of, and trade in marine turtles are prohibited in Madagascar, Mozambique, Colombia, Indonesia, and Viet Nam. In Malaysia, Nicaragua, and Panama, exceptions to these prohibitions exist: egg collection is possible through a licensing system in most states of Peninsular Malaysia; there is a legal green turtle fishery in Nicaragua along its Caribbean coast; and subsistence take and use of olive ridley eggs are permitted in Isla Cañas Wildlife Refuge in Panama.

Findings revealed that, despite regulatory frameworks which either prohibit or restrict the exploitation of marine turtles, illegal take and trade in these species and their specimens are present in the eight countries assessed. Physical market characteristics were found to vary among the countries studied. Online trade was found to be more abundant in the Southeast Asia/Coral Triangle subregion, followed by the Inter-American subregion. In the countries assessed in the East African subregion, illegal online trade in marine turtle specimens appears not to be a source of concern, at least at present, and possibly due to the lack of internet connectivity in many areas. Based on the present research, the following overall characteristics were found for illegal trade in the three subregions visited:

East African subregion (Madagascar and Mozambique): Illegal trade seems to be largely for domestic consumption. No online trade was found. Evidence of international trade was quite limited, came from anecdotal reports, and referred only to exports from Mozambique to Tanzania. Findings suggest that the domestic trade in these countries exceeds the magnitude and impact of their international trade.

- **Madagascar:** Take is largely conducted by locals. Artisanal fisheries were found to be a significant source of take in national waters. Domestic trade appears to be a well-organised activity that supports the supply of specimens to areas that are hundreds of kilometers apart, with illegal domestic distribution networks operating via land and sea. No robust evidence was found to support that illegal international trade in marine turtles sourced from Madagascar is an ongoing, well-organised activity. No online trade in marine turtles was detected during the present assessment.

- **Mozambique:** Marine turtles were found to be taken both as targeted and non-targeted catch. Illegal take is largely perpetrated by local artisanal fishers, who capture specimens for consumption and its related trade. In comparison to Madagascar, domestic trade appears to be more localised. Some anecdotal evidence collected through reports suggested that there may be some international trade with Tanzania. However, the scale at which this type of trade may be taking place is currently unknown. No evidence of online trade sourced from Mozambique was found during the present assessment.

Inter-American subregion (Colombia, Nicaragua and Panama): Illegal trade seems to be largely for domestic consumption and for the production of hawksbill handicraft items. Cock fighting spurs are sought-after commodities in trade, and their demand may be rising. Some online trade in cock fighting spurs was found. Evidence from anecdotal reports suggests that international trade exists between the three countries studied and others in the region (e.g. Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Suriname, Venezuela). Anecdotal reports also suggest that international trade focuses largely on hawksbill carapace and its byproducts.

- **Colombia:** The two main markets for marine turtle specimens identified are that for meat and hawksbill carapace. Meat appears to be mainly for domestic consumption, and carapace to potentially serve an international demand. Among other handicrafts, carapace is used to produce cock fighting spurs. Some respondents suggested that the demand for this product was increasing. Evidence of international trade came from anecdotal reports, which suggested that carapaces are imported from countries such as Nicaragua, Panama, and Venezuela to be worked into valuable cock fighting spurs that are then exported to countries such as Guyana, Suriname and Ecuador. Online trade in cock fighting spurs was found to be present.
- **Nicaragua:** It appears that marine turtle meat is transported from the Caribbean coast (where there is a legal green turtle fishery) for retailing along the Pacific coast (where such legal fishery does not exist). Carapace was openly offered at some locations, and some respondents confirmed the existence of domestic artisans who work this material. Evidence of international trade from reports suggests that eggs are exported to El Salvador and Honduras; and that carapaces are exported to Colombia. Recent literature suggests that hawksbill handicrafts are exported to Costa Rica, and that the level and type of international tourism greatly influence the market of hawksbill items along the Caribbean, with vendors switching between selling locally or acting as distributors to inland areas or those along the Pacific. No online trade was found in Nicaragua.
- **Panama:** It appears that meat and eggs are mainly consumed locally, but findings reveal that there is also some intercity and interprovincial trade in these specimens. Turtle carapace is also a commodity in trade, which appears to be mainly sourced in the provinces of Bocas del Toro and Comarca Kuna Yala. Information collected through respondents and from the literature suggests that there is international trade in turtle carapace involving Colombia, Costa Rica and Mexico. Carapace is reportedly exported for processing into cock fighting spurs which are later re-imported. Three individuals dedicated to this processing were identified in the country. Two online advertisements for cock fighting spurs originating from Panama were found.

Southeast Asian/ Coral Triangle subregion (Indonesia, Malaysia and Viet Nam): Illegal trade seems to be largely for domestic consumption, but also for the production of handicrafts. Online trade was found to be commonly present, particularly for handicrafts and eggs. Evidence of international trade came from anecdotal reports and from seizure records, suggesting that it occurs between the countries assessed and others in the subregion (e.g. China and the Philippines). Findings suggest a shift from open market availability to more covert forms of trade; open trade in physical markets was found to be particularly limited in Indonesia and Malaysia.

- **Indonesia:** Take, use and trade are prevalent across the archipelago, which appears to continue to have an important role as a source and consumer country, supplying eggs, meat, and processed and unprocessed forms of turtle carapace. Based on seizure data, the demand from East Asian countries has not yet ceased, as specimens continue to be destined to Malaysia, China, and Viet Nam. Findings revealed a significant shift of trade to online platforms, where 213 trade advertisements were recorded in the span of a month. This number contrasts with the seven sites (out of 61 physically visited) that had marine turtle products for sale.

- **Malaysia:** An active local egg demand was found in Sabah and Terengganu. The open availability of products, as well as online trade were found to be limited. Online trade appears to be conducted largely on an opportunistic basis (only one advertisement was found over the period of a month). Trade appears to have shifted to more underground avenues in recent years, with traders using code gestures to signal buyers, and being suspicious of inquiries, particularly by foreigners. Based on seizure data, trade occurs between Malaysian states, but also internationally with countries such as China, the Philippines and Viet Nam. An interviewee stated that it is an “open secret” that large volumes of eggs are exported out of Sabah (where take and trade are illegal) to be sold in Terengganu (where take and trade are legal).
- **Viet Nam:** Marine turtle specimens were observed for sale in 39 out of 436 outlets physically surveyed, confirming that demand persists. Online trade in marine turtle specimens was found to be present in the country, with 45 advertisements having been recorded over a 14-hour period. As observed for physical trade, most online adverts comprised handicrafts and taxidermied turtles. Findings in the literature and present market observations indicate that trade has become less conspicuous over recent years.

Information available in the literature compiled during the present study provides insights into the scope of marine turtle trade in two additional subregions, which were not assessed *in-situ*: the **Mediterranean** and **West Africa**. Egypt (specifically Alexandria) may potentially hold the last major illegal marine turtle market in the Mediterranean basin, given that, overall, exploitation in the subregion is considered to have largely ceased. Existing literature on **West Africa** indicates that despite some protective legislation being in place, illegal take and use of, and trade in marine turtles occur. To a large extent, these activities appear to be mainly for domestic consumption and livelihood needs. It appears also that some trade within the subregion may occur, particularly between neighbouring countries. The scale of these practices, as well as the threat posed by them remain to be assessed.

Concerning legal take, the present study found that there is often confusion regarding what activities are legal, for who, and under what restrictions in countries where a legal take for marine turtle specimens exists (e.g. in Malaysia and Nicaragua). It can be inferred that, where people are unclear about applicable legal frameworks, they are also more likely to inadvertently engage in illegal activities. This reiterates the importance of promoting education and awareness efforts in countries where there is legal take, and of ensuring that those countries’ legal frameworks are robust and non-conflicting among different administration levels.

While the present findings render clear that illegal take and use of, and trade in marine turtles are present in the eight countries assessed, it has not been possible to conclude robustly on the trends of illegal (national and international) trade. This results largely from a general shortage of long-term, consistent monitoring data for marine turtle trade in the countries assessed. Even when people’s perceptions and/or data from the literature were available, this information was often conflicting. In the present study, the best trade trend proxies, therefore, generally came from the apparent prevalence of particular trade characteristics over time, rather than from quantified levels of trade.

Past literature concerning Madagascar had highlighted the presence, back in 2003 and then in 2012, of complex supply networks, involving fishers, their communities, dealers and traders. The present study also found a complex trade network to be operating between north and south of **Madagascar**, along its western coast, suggesting that the *modus operandi* of the trade has likely not changed significantly.

In **Mozambique**, some respondents reported that domestic trade has drastically declined since 1992. Still, in line with a report from 2014, the present study found marine turtle take in the waters of Mozambique to continue to be largely perpetrated by locals. Also, the illegal killing of marine turtles near fishing camps was thought to be of significant concern in 2012, and a more recent (2017) report in the literature has confirmed that this issue prevails.

Respondents in Colombia, Nicaragua and Panama generally perceived illegal trade to have reduced in the last 10 years. However, in **Colombia** these perceptions contrast with existing literature, whereby an expansion of trade in hawksbill items into neighbouring tourist locations from 2012 onwards has been reported.

In **Nicaragua**, respondents reported that they no longer worked carapace as they used to because it can no longer be easily sold. Still, respondents generally perceived an increase in the demand for hawksbill products by other countries in the subregion in recent years. Prior work in Nicaragua in 2011 found trade in certain locations to be three times

superior to that documented in 2002; but found also the level of demand for hawksbill items to be lower than in 2002. Additional research in 2017 identified Nicaragua as having the most widespread availability of hawksbill products among countries assessed in Latin America and the Caribbean; the research also found some vendors to report that they did not intend to purchase further products once stocks got sold.

While respondents generally perceived trade to be declining in **Panama**, some respondents also perceived consumption to have increased in certain areas. Previous research in 2017 reported that the sale of hawksbill carapace items may have declined in Panama, although it is not clear to what extent. In contrast, the sustained volume of eggs seized in Panama from 2012 to 2018 (identified during the present study), does not suggest a decreasing trend in illegal trade (at least in this product) during the referred period.

In **Indonesia**, the open sale of turtle carapace specimens was found to be limited in physical markets when compared to previous work in 2009. It seems that the trade has been driven largely underground, with the availability of specimens now being more apparent in online markets than in physical ones. Illustrating how demand has not ceased, is the reported sale of freshwater softshell turtle (Trionichidae) meat as marine turtle meat in the country.

The present study estimated some 365,000 eggs/year to be sold in Pasar Payang in Kuala Terengganu (Malaysia). This value generally correlates to a 422,000 eggs/year that had been estimated in 2009, suggesting that trade may have not decreased during this period. Moreover, a demand for marine turtle specimens in China and Viet Nam that had previously been reported in 2012 and in 2018, has not yet ceased as recent (2015-2018) seizure incidents confirm.

In **Viet Nam**, a study in 2009 found the number of outlets and turtle items in trade in Ho Chi Minh City and Hanoi to have decreased considerably in relation to 2002. However, trade was found by that study to have increased in other places, including Ha Long, Phu Quoc, and Ha Tien, where marine turtle products were openly purchased. The present assessment found trade to have become less conspicuous.

The analysis of CITES Trade data revealed a declining trend in the number of legal trade transactions reported by CITES Parties as “confiscated or seized specimens” from 2008 to 2013, as well as a somewhat stabilizing trend from 2013 to present. Despite poor reporting compliance by CITES Parties being a well-known, ongoing issue, it is possible that this overall decrease may reflect a global decrease in the volume of specimens traded illegally at the international level. Taking into account this consideration, as well as the information reported above concerning proxies for trends in the different countries assessed, it is only possible to state with confidence in the present study that illegal trade is prevalent in the countries assessed; it was not possible to conclude with certainty on the trend of illegal international trade.

The findings of the present study found illegal take, use and trade to prevail along the Pacific and Caribbean coasts of the Inter-American subregion; along the Eastern coast of Africa; and in the waters and beaches of Southeast Asia and, particularly, its Coral Triangle subregion. While the present study has not included a thorough assessment of the source rookeries from which the marine turtles that are taken in these subregions come from, it is probable that, at least, some of them originate from stocks that have been considered threatened in the literature, particularly given that marine turtles are highly migratory species, and that different Regional Management Units (RMUs) mix in foraging grounds. Further research is needed to better understand how take and trade impact the conservation status of marine turtle RMUs.

It is important to acknowledge that the present *in-situ* assessments were accompanied by challenges which may have influenced estimates of take, interviewees’ responses, and generalizations thereof. The rapid nature of the present research prevented a more comprehensive quantification of trade levels, and of the impact of take and trade on marine turtle populations, as only a limited number of locations could be visited, and researchers may not have gained full trust by interviewees.

The status, scope and trends of the illegal trade vary among the subregions studied, making it challenging to prioritize the allocation of efforts in one subregion over another. Instead, it is more reasonable to discuss the type of activities that must be prioritized within the subregions themselves. Based on the present findings, these are as follows:

East African subregion (Madagascar and Mozambique):

- Collecting baseline information on artisanal, semi-industrial and industrial fisheries (including IUU) operating in national waters to understand the impacts of these fisheries on marine turtles and their linkage to illegal trade
- Working with communities and their traditional leadership/management approaches to identify effective alternatives to the exploitation of marine turtles
- Improving the enforcement of legislation and regulations that apply to marine turtles at coastal areas and transaction points
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Exposing to the public cases of illness/death associated to the consumption of marine turtle specimens

Inter-American subregion (Colombia, Nicaragua and Panama):

- Working with communities to identify effective alternatives to the exploitation of marine turtles
- Improving the enforcement of legislation and regulations that apply to marine turtles at coastal areas and transaction points
- Countering illegal online trade
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Improving cooperation among different domestic governance levels, and also among other countries in the subregion (including Colombia, Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Nicaragua, Panama, Suriname, and Venezuela)

Southeast Asian/ Coral Triangle subregion (Indonesia, Malaysia and Viet Nam):

- Addressing gaps, overlaps and inconsistencies in national legal frameworks applicable to marine turtles
- Working with communities to identify effective alternatives to the exploitation of marine turtles
- Improving the enforcement of legislation and regulations that apply to marine turtles at coastal areas and transaction points
- Countering illegal online trade
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Improving cooperation among different domestic governance levels, and also among other countries in the subregion (including China, Indonesia, Japan, Malaysia, the Philippines, and Viet Nam)

A comprehensive list of recommendations stemming from the present assessment, and which address these priority types of activities is included in the “Recommendations” section at the end of the study. These recommendations have been divided into two main work streams: “CITES-focused recommendations” and “Overarching recommendations”. The former recommendations comprise activities that are most directly relevant to the CITES community; the latter target a wider range of stakeholders and include measures that go beyond the scope of CITES, referring to conservation and management, research, enforcement, and awareness measures.

The present study therefore contributes to enhancing regional and global conservation, management and sustainable use of marine turtles through improved knowledge on the legal and illegal international trade in these species, as well as through stronger coordination among relevant intergovernmental instruments dealing with marine turtles.

Discussion and overarching conclusions

Legislation and protection measures for marine turtles vary among the eight countries assessed in this study. In **Madagascar** and **Mozambique** the killing, capture and trade of any specimens are prohibited; in **Colombia**, the take and use of, and trade in marine turtles and their specimens are also prohibited; in **Nicaragua**, capture and trade have been banned since 2005, except for in the RAAS and the RAAS, where there are legal green turtle fisheries regulated by quota systems (specimens cannot be traded beyond the benefitting communities though); in **Panama**, the take and use of, and trade in marine turtles and their specimens are illegal, except for in Isla Cañas Wildlife Refuge, where subsistence harvest of olive ridley eggs is permitted; in **Indonesia**, the capture of, and trade in marine turtles and their specimens is prohibited, though some lack of harmonization in regulations may challenge enforcement efforts; in **Malaysia**, the consumption of, and trade in marine turtles and their specimens are prohibited in the states of Sabah and Sarawak, but egg collection is possible through a licensing system in most states of Peninsular Malaysia (conflicting regulations also challenge enforcement efforts in this country); and lastly, in **Viet Nam**, the capture and exploitation of marine turtles are prohibited.

Legal take

In Malaysia, Nicaragua, and Panama, where the legal take of marine turtle specimens is possible, the present study found illegal take, use and trade to be widespread. Concerning Malaysia, findings in the literature (IOSEA, 2014) point to organised trading schemes whereby specimens are taken in areas where this practice is illegal (e.g. in Sabah, Malaysia; or in Indonesia) and are sold in areas where trade is legal (e.g. Terengganu, Malaysia), akin to a “money laundering scheme”. It has been reported in the literature (Humber *et al.*, 2014; and references therein) that legal take schemes for marine turtle specimens may facilitate illegal take and trade. Although the global impact of legal take on mortality has been suggested to be likely low when compared to the combined threats of bycatch and illegal take (Humber *et al.*, 2014), information from the literature and the present findings highlight the importance of countries closely monitoring domestic take and trade levels where these are legal.

The present study found that there is often confusion regarding what activities are legal, for who, and under what restrictions in countries where there is a legal take for marine turtle specimens (e.g. Malaysia, Nicaragua). It can be inferred that where people are unclear about the legislation and regulations that apply to these species, they are also more likely to inadvertently engage in illegal activities. This reiterates the importance of promoting education and awareness efforts in countries where there is a legal take, and of ensuring that those countries’ legal frameworks are robust and non-conflicting among different administration levels.

Status and scope of the illegal trade

The present findings have revealed that, despite regulatory frameworks which either prohibit or restrict the exploitation of marine turtles, illegal trade in these species and their specimens are present in the eight countries assessed – Colombia, Indonesia, Madagascar, Malaysia, Mozambique, Nicaragua, Panama, and Viet Nam – with online trade being more available in some countries than in others. Illegal online trade in marine turtle specimens was found to be more abundant in the Southeast Asia/Coral Triangle subregion, followed by the Inter-American subregion’s countries assessed. In the countries assessed in the East African subregion, illegal online trade in turtle products appears not to be a source of concern, possibly due to the lack of internet connectivity in many areas.

Physical market characteristics were found to vary among the countries assessed. Based on *in-situ* findings, the following overall patterns can be drawn on illegal trade in the three subregions visited:

East African subregion (Madagascar and Mozambique): illegal trade seems to be largely for domestic consumption; no online trade was found; evidence of international trade was quite limited, came from anecdotal reports, and referred only to exports from Mozambique to Tanzania.

Inter-American subregion (Colombia, Nicaragua and Panama): illegal trade seems to be largely for domestic consumption and for the production of hawksbill handicraft items; cock fighting spurs revealed to be a sought-after commodity in trade, with demand potentially rising; some online trade in cock fighting spurs was found to be present; evidence of international trade came from anecdotal reports that suggested

that trade exists among the three countries and others in the region (e.g. Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Suriname, Venezuela); based on those reports, international trade seems to focus largely on hawksbill carapace and its byproducts.

Southeast Asian/ Coral Triangle subregion (Indonesia, Malaysia and Viet Nam): illegal trade seems to be largely for domestic consumption, but also for the production of handicrafts; online trade was found to be commonly present, particularly for handicrafts and eggs; evidence of international trade came from anecdotal reports and from seizure records, suggesting that international trade occurs among the countries assessed and with others in the subregion (e.g. China and the Philippines).

Generalizing findings on illegal trade at the subregional level neglects the characteristics of the trade that were found for the different countries assessed. These characteristics were found to not only vary among the countries in each subregion, but also within those countries themselves.

Within the East African subregion, illegal take of marine turtles was found to be widespread in **Madagascar**. Findings indicate that take is largely conducted by locals. Domestic trade appears to be a well-organised activity that involves the supply of specimens between areas that are hundreds of kilometers apart. Illegal distribution networks operate via land and sea. Artisanal fisheries were found to be a significant source of take of marine turtles in Malagasy waters. As no robust evidence was found supporting that illegal international trade in marine turtles sourced from Madagascar is an ongoing, well-organised activity, rather than providing for international trade, marine turtle take in Madagascar seems to primarily provide for local consumption and domestic trade. No online trade in marine turtles was detected in the present assessment. Reports from different stakeholders revealed that corruption at different levels appears to be playing a role in permitting illegal activities to take place, as it was suggested that village chiefs and enforcement officials were involved in the illegal trade. In addition to addressing this, conservation efforts in Madagascar should need to account for the important role that traditional management approaches such as *dina* and *fady* have.

In **Mozambique**, marine turtles were found to be taken both as targeted and non-targeted catch. Illegal take is largely perpetrated by local artisanal fishers, who capture specimens for consumption and its related trade. Domestic trade appears to be more localised than in Madagascar, as reports of trade across large distances within the country were not evident. Some (anecdotal) reports of cross-border trade with Tanzania indicate that Mozambique is involved in international trade in marine turtles. However, the scale at which this type of trade takes place is currently unknown. No evidence of online trade sourced from Mozambique was found. The present findings suggest that the domestic trade in this country exceeds the magnitude and impact of its international trade. There is potential for Mozambique's semi-industrial, industrial and IUU fisheries to contribute to the trade, but this remains to be assessed, as does the degree to which shark finning, crayfish, live crab, and dried sea horse fisheries in the country contribute to, or influence marine turtle take and trade. As in Madagascar, accounting for traditional leadership structures when determining management approaches for marine turtle conservation is important in Mozambique.

In **Colombia**, findings revealed the presence of a market for marine turtle meat in different departments of the country, along both its Caribbean and Pacific coasts. This market for marine turtle meat appears to serve mainly a domestic demand. On the other hand, a market for marine turtle carapace was found to be present and to potentially serve international demands. Information obtained from interviews suggests that there is an increasing demand for cock fighting spurs that are made from hawksbill carapace. Some anecdotal evidence from reports suggested that carapaces may be imported from countries such as Nicaragua, Panama, and Venezuela to be worked into valuable cock fighting spurs. Through interviews it was also suggested that these - then worked and more valuable - products may then be exported back to those countries and to others such as Ecuador, Guyana, and Suriname. An online trade in cock fighting spurs made of hawksbill carapace was also found to be present in Colombia. Other sought-after marine turtle commodities observed in trade included turtle penis and eggs. Efforts to improve the conservation of marine turtles should include engaging with different community members, including fishers, curio sellers and restaurant owners, to identify viable alternatives to the use of marine turtles.

In **Nicaragua**, marine turtle products were found to be consumed along both of the country's coasts, even though a legal fishery for green turtles only exists along its Atlantic coast. It appears that turtle meat may be transported from the Caribbean coast for retailing along the Pacific. In addition to meat, other products found to be illegally used and traded include eggs and carapace. The latter was found to be openly offered at some locations, and interviews

confirmed the presence of artisans who work this material. Evidence of international trade was found through reports, and suggested that eggs may be exported to El Salvador and Honduras. Some of the carapaces sourced in Nicaragua are also thought to be exported to Colombia, and Harrison *et al.* (2017) recorded statements by several vendors along the Pacific coast of Nicaragua who indicated that there was a hawksbill handicraft export market to Costa Rica. It has been suggested (Harrison *et al.*, 2017) that the level and type of international tourism greatly influence the market and value of hawksbill items along the Caribbean, with vendors switching between selling locally and acting as distributors to inland areas or those along the Pacific. No online trade in marine turtles was found to be present during the present assessment. Past marine turtle conservation efforts in Nicaragua which have proven to be successful in reducing poaching of eggs and adults on nesting beaches have involved community-led crime prevention and incentives. Further efforts in Nicaragua should consider similar approaches.

In **Panama**, as for Colombia and Nicaragua, marine turtles were found to be illegally used and traded across the different provinces assessed. It appears that meat and eggs are mainly consumed locally, but findings reveal also that there is some intercity and interprovincial trade in these specimens, which are often served as traditional dishes. Turtle carapace is also a commodity in trade, and it appears to be mainly sourced in the provinces of Bocas del Toro and Comarca Kuna Yala. Based on information reported during interviews, but also on information available in the literature, it appears that there is international trade in turtle carapace involving Colombia, Costa Rica and Mexico. Some respondents suggested that raw carapace is exported from Panama for processing abroad, being later imported into the country as valuable cock fighting spurs. During the present assessment, three people dedicated to the processing of carapace were identified in Panama, indicating that this activity is not necessarily outsourced. Two online advertisements for cock fighting spurs originating from Panama were found. Available literature suggests that marine turtles do not comprise the main source of income for those involved in the trade. Concerning future efforts in the country, the fact that communities have in the past proven willingness to adhere measures set by their regional administrative authorities illustrates the potential for success that future measures that are adopted for marine turtle conservation can have.

In the Southeast Asia/Coral Triangle subregion, findings suggest a shift from open market availability to more covert forms of trade. Open trade in physical markets was found to be particularly limited in Indonesia and Malaysia. Still, it is clear that take, use and trade in **Indonesia** are prevalent across the archipelago, including in Kalimantan, Java, Bali, Sulawesi, Maluku and Papua. Indonesia appears to continue to have an important role as a source and consumer country, supplying eggs, meat, and processed and unprocessed forms of turtle carapace. It was reported in 2014 that the international trade in marine turtles out of Indonesia was rising nationwide largely to meet a demand from East Asian countries. While it has not been possible to conclude on the evolution of the volume of trade over time, the analysis of recent seizures in the present study indicates that the demand from East Asian countries has not ceased, as specimens continue to be destined to China, Malaysia, and Viet Nam. Findings reveal a significant shift of trade in marine turtle products to online platforms, as 213 online trade advertisements were recorded in the span of a month. This number contrasts with the seven sites (out of 61 visited) that had marine turtle products for sale.

In **Malaysia**, illegal trade in marine turtles was found to be present, with an active local demand for eggs in Sabah and Terengganu. The open availability of products, as well as online trade were found to be limited. The latter, in particular, appears to be conducted rather on an opportunistic basis, as only one advertisement was found over the period of one month. It appears that trade has shifted to more underground avenues in recent years, with traders being suspicious of inquiries, particularly by foreigners. In Sabah, traders now roam around town covertly approaching potential buyers with code signals. Reports during interviews and the analysis of seizure data, revealed that trade occurs domestically between Malaysian states, and internationally with countries such as China, the Philippines, and Viet Nam. An interviewee stated that it is an “open secret” that large volumes of eggs are exported out of Sabah (where take and trade are illegal) to be sold in Terengganu (where take and trade are legal). Some respondents indicated also that they often obtain meat from enforcement officials, suggesting that corruption plays a role in trade, as reported for Madagascar. Although it could not be confirmed in this study, WWF-Malaysia *et al.* (2018) suggested that marine turtle poaching had seen an increased involvement of local community members in recent years, with these being paid to capture turtles which are then collected in centralized locations for packaging and exporting to foreign markets.

In **Viet Nam**, local demand for marine turtle meat still exists and marine turtle products were observed for sale in 39 out of 436 outlets surveyed. The majority of specimens in trade comprised handicraft items and taxidermied specimens. The predominance of handicraft items in trade had previously been identified during surveys by TRAFFIC from 2016 to 2018 in Viet Nam (TRAFFIC, unpubl.). Online trade in marine turtle specimens was also found to be present in Viet Nam: 45 advertisements were recorded over a 14-hour period. As with the physical trade observed, most online adverts comprised handicrafts and taxidermied turtles. While it is unclear how trade has evolved over the past years, findings in the literature and present market observations indicate that trade has become less conspicuous over recent years.

The analysis of seizure data from 2015–2018 involving Indonesia, Malaysia and Viet Nam revealed that the three countries play an active role in the international trade in marine turtle products in the Asian region, with China emerging as a key destination on several occasions. Viet Nam appears to act mostly as a destination market and as a transit route in the trade of products into China. Indonesia appears to function mostly as a source country, with seized shipments destined to China, Malaysia and Viet Nam. Malaysia appears to act both as a destination country for turtle eggs from Indonesia and the Philippines, and as a source of turtle products to Viet Nam.

Despite not assessed *in-situ*, information available in the literature and compiled during this study provides insights into the scope of the trade in marine turtles in two additional subregions: the Mediterranean and West Africa. In the **Mediterranean**, to a small extent, some reports of domestic use and trade exist for Libya, Morocco and Syria. It is, however, unclear whether these reports remain valid. It seems that Egypt may be the country of most concern in this subregion, with Alexandria potentially being the last major illegal marine turtle market in the Mediterranean basin. Still, in comparison with other subregions where marine turtles are used and traded, such as the Inter-Americas, East Africa, and Southeast Asia/Coral Triangle, the levels at which these illegal activities take place in Egypt appear to be negligible. Exploitation in the Mediterranean subregion is reported in the literature to have ceased for the most part, although limited levels of consumption cannot be excluded.

Concerning **West Africa**, existing literature indicates that despite some protective legislation being in place, illegal take and use of, and trade in marine turtles occur in this subregion. To a large extent, these activities appear to provide for local nutritional and livelihood needs, with harvested specimens generally being consumed locally or traded domestically. It appears that some trade within the subregion may occur between neighbouring countries, and be facilitated through foreign fishing vessels landing (by)caught specimens in their countries of origin. The scale of these practices, as well as the threat posed by them remain to be assessed.

Trends in illegal trade

While the present findings render clear that illegal take and use of, and trade in marine turtles are present in the eight countries assessed, it is not possible to conclude robustly on whether trade is increasing, decreasing, or plateauing in any of the countries assessed. This is because there is generally a shortage of consistent, long-term monitoring data for marine turtle trade in the countries assessed.

In **Madagascar**, the local sale of turtle meat for consumption was thought to be common in 2003 as part of a market involving a chain of fishermen, dealers and traders; and in 2012 supply networks, whereby fishing villages were supplying traders established in Toliara and Mahajanga, were uncovered (IOSEA, 2014; and references therein). The present assessment found a complex trade network to be present in Madagascar operating between north and south of the country, along its western coast, suggesting that the *modus operandi* of the trade has likely not changed significantly.

In **Mozambique**, some respondents reported that domestic trade has drastically declined since the end of the civil war in 1992. Still, in line with what has been previously reported by IOSEA (2014), the present study found marine turtle take in the waters of Mozambique to continue to be largely perpetrated by locals. Also the illegal killing of marine turtles near fishing camps was thought to be of significant concern in 2012 (IOSEA, 2014; and references therein), and more recently, Williams (2017) confirmed that this prevails.

For the Inter-American subregion, where previous attempts to assess trade were found to be more widely reported in the literature, temporal comparisons are frequently not possible because assessments have often not focused on

consistent locations, survey efforts have differed, and/or clear trends cannot be drawn. For example, respondents in Colombia, Nicaragua and Panama generally perceived illegal trade to have reduced in the last 10 years. However, for example, in **Colombia** these perceptions contrast with existing literature, whereby an expansion of trade in hawksbill items into neighbouring tourist locations from 2012 onwards has been reported (Harrison *et al.*, 2017; and references therein).

In **Nicaragua**, respondents reported that they no longer worked carapace as they used to because it can no longer be easily sold. Still, they perceived an increase in the demand in recent years for hawksbill products by other countries in the subregion. Among countries in Latin America and the Caribbean assessed by Harrison *et al.* (2017), Nicaragua was found to have the most widespread availability of hawksbill products, although a few vendors reported that the hawksbill items that they had for sale were old stock, and that they would not purchase further stock once all of it was sold. Additional work in Nicaragua by Fauna & Flora International (2011) found trade in certain locations to be three times higher than previously documented (by Chacón, 2002), but found also the level of demand for hawksbill items to be lower than in 2002.

While respondents generally perceived trade to be declining in **Panama**, some respondents also perceived consumption to have increased in particular areas. Previous research (Harrison *et al.*, 2017) reported that it is possible that the sale of hawksbill carapace items may have declined in Panama, although it is not clear to what extent. On the other hand, the sustained volume of eggs seized from 2012 to 2018 in Panama identified during the present study does not suggest a decreasing trend in illegal trade (at least in this product) during this period.

In the countries assessed in the Southeast Asia/Coral Triangle subregion, trade appears to have generally become more secretive, as mentioned above. In **Indonesia**, findings indicate that the open sale of turtle carapace specimens is limited in physical markets when compared to previous work in 2009 (TRAFFIC, 2009; TRAFFIC Southeast Asia, 2009). It seems that the trade has been driven largely underground. The open availability of specimens is now more apparent in online markets than in physical ones. This shift is possibly due to increased enforcement efforts and media coverage of incidents. A trend that was also noticed during the present work was the sale of freshwater softshell turtle (Trionichidae) meat as marine turtle meat, illustrating how demand prevails.

In Terengganu, **Malaysia**, some 365,000 eggs/year were estimated (this study) to be sold in Pasar Payang in Kuala Terengganu. As this value generally correlates to the 422,000 eggs/year that had been estimated in 2009 (TRAFFIC, 2009), this suggests that trade may not have decreased during this period. Moreover, a demand for marine turtle specimens in China and Viet Nam had previously been reported (Lam *et al.*, 2012; WWF-Malaysia *et al.*, 2018; Riskas *et al.*, 2018), and recent (2015-2018) seizure incidents analysed in the present study confirm that trade implicating Malaysia and those countries continues to occur.

In **Viet Nam**, a study in 2009 found the number of outlets and turtle items in trade in Ho Chi Minh City and Hanoi to have decreased considerably in relation to 2002 (TRAFFIC, 2004; Stiles, 2009). However, trade was found to have increased in other places, including Ha Long, Phu Quoc, and Ha Tien, where marine turtle products were openly purchased. The present assessment found trade to have become less conspicuous.

While the analysis of CITES Trade data from 2000 to 2017 did not allow to draw solid conclusions on the trend of illegal international trade, its findings are still worthy of consideration. The analysis indicated a declining trend in the number of legal trade transactions reported by CITES Parties as “confiscated or seized specimens” from 2008 to 2013. From 2013 to 2017, the volume of these transactions somewhat plateaued. The observed decline from 2008 to 2013 could indeed reflect a global decrease in the volume of specimens traded illegally at the international level (although it could also just reflect poor reporting compliance by CITES Parties, which is a well-known, ongoing issue [D’Cruze *et al.*, 2016; and references therein]). Taking into account this consideration, as well as the information reported above concerning proxies for trends in the different countries assessed, it is only possible to confidently state that illegal trade is prevalent in the countries assessed; it is not possible to conclude with certainty on the trend of illegal international trade.

Conservation impacts associated to take

The findings of the present study found illegal take, use and trade to prevail along the Pacific and Caribbean coasts of the Inter-American subregion; in the Eastern coast of Africa; and in the waters and beaches of Southeast Asia and, particularly, its Coral Triangle subregion.

While the present study has not included a thorough assessment of the source rookeries from which the marine turtles that are taken in the different countries come from, it is probable that some of these individuals originate from stocks that have been considered threatened (e.g. by Wallace *et al.*, 2011), given that marine turtles are highly migratory species, and that different Regional Management Units (RMUs) mix in foraging grounds. In 2011, Wallace *et al.* identified the world's eleven most endangered marine turtle regional management units (RMUs) and, considering the geographical location of the countries assessed in the present study, it seems very probable that the pressure of illegal take, use and trade reported in this study for marine turtles in the countries assessed may be contributing to further endangering, at least some, of the critical RMUs identified by Wallace *et al.* (2011).

Despite the seizure records analysed not having always revealed the marine turtle species that were involved in each incident, or the structuring of interviews not always enabling the identification of the species that respondents referred to, information reported in the literature and during the present study, indicate that green and hawksbill turtles are very commonly found/sought-after in trade.

Limitations of the present assessment

It is important to acknowledge that the present *in-situ* assessments were accompanied by challenges which may have influenced estimates of take, interviewees responses, and generalizations thereof. The relatively short time frame available for *in-situ* work only allowed for site assessments of rapid nature. This could be problematic, as researchers would preferably have been embedded in communities for lengthy periods to gain respondents' trust. The limited time available for field work also meant that only a limited number of locations on the ground could be assessed, and therefore other locations which could bear significant data may have been excluded.

In some locations, interviews with relevant stakeholders (e.g. fishers) had to be undertaken in the presence of senior representatives, and this may have influenced responses, particularly those reporting on illegal activities.

The rapid nature of the research prevented a more comprehensive quantification of trade levels, and on the impact of take and trade on marine turtle populations. Of further note, when extrapolating take numbers to larger scales (e.g. provincial or national levels) was possible, this was based on qualitative methodologies, which may be problematic for different reasons: not all coastal locations could be assessed; only small samples of respondents were surveyed; some respondents' were illiterate and because of this there was confusion among on the questions being asked; in some areas there was confusion between targeted and non-targeted take given that bycaught specimens would typically be retained; underreporting is likely common given the illegality of the activities being surveyed; take/fisheries effort varies within the country, geographically and seasonally; and species distribution also varies, and therefore so do potential conservation impacts.

Way forward

The status, scope and trends of the illegal trade vary among the subregions studied, making it challenging to prioritize the allocation of efforts in one subregion over another. It is instead more reasonable to discuss the type of activities that must be prioritized within the subregions themselves. The following paragraphs elaborate on these type activities.

East African subregion (Madagascar and Mozambique):

- Collecting baseline information on artisanal, semi-industrial and industrial fisheries (including IUU) operating in national waters to understand the impacts of these fisheries on marine turtles and their linkage to illegal trade
- Working with communities and their traditional leadership/management approaches to identify effective alternatives to the exploitation of marine turtles

- Improving the enforcement of legislation and regulations that apply to marine turtles at coastal areas and transaction points
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Exposing to the public cases of illness/death associated to the consumption of marine turtle specimens

Inter-American subregion (Colombia, Nicaragua and Panama):

- Working with communities to identify effective alternatives to the exploitation of marine turtles
- Improving the enforcement of legislation and regulations that apply to marine turtles at coastal areas and transaction points
- Countering illegal online trade
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Improving cooperation among different domestic governance levels, and also among other countries in the subregion (including Colombia, Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Nicaragua, Panama, Suriname, and Venezuela)

Southeast Asian/ Coral Triangle subregion (Indonesia, Malaysia and Viet Nam):

- Addressing gaps, overlaps and inconsistencies in national legal frameworks applicable to marine turtles
- Working with communities to identify effective alternatives to the exploitation of marine turtles
- Improving the enforcement of legislation and regulations that apply to marine turtles at beaches, entry/exit points and market places
- Combating illegal online trade
- Building awareness at the community and government levels on marine turtles and respective applicable legal frameworks
- Improving cooperation among different domestic governance levels, and also among other countries in the subregion (including China, Indonesia, Japan, Malaysia, the Philippines, and Viet Nam)

A comprehensive list of recommendations stemming from the present assessment, and which address these priority types of activities, is included in the “Recommendations” section that follows.

Recommendations

This section contains the final recommendations that stem from the present assessment. They aim to address the identified challenges in conserving marine turtles, and those relating to the legal and illegal take and use of, and trade in these species. The recommendations apply to the eight countries studied - Colombia, Indonesia, Madagascar, Malaysia, Mozambique, Nicaragua, Panama, and Viet Nam -, but are also be relevant to other countries in the East-African, Inter-American, and Southeast Asian/Coral Triangle subregions. The recommendations are tabled below, and are accompanied by a list of relevant stakeholders that should be involved in their implementation. These stakeholders have been categorized as follows:

- **Academia:** universities, research institutions and other bodies undertaking scientific research
- **Communities:** people involved in the take and use of, and trade in marine turtles
- **CSOs** (Civil Society Organisations)
- **Government agencies:** national environmental authorities, fisheries authorities, enforcement authorities, education authorities, policy-makers, and other relevant ones
- **IGOs and related instruments:**
 - **CITES** (Convention on International Trade in Endangered Species of Wild Fauna and Flora, and/or CITES Management and Scientific Authorities)
 - **CMS** (Convention on the Conservation of Migratory Species of Wild Animals)
 - **FAO** (Food and Agriculture Organization of the United Nations)
 - **IAC** (Inter-American Convention for the Protection and Conservation of Sea Turtles)
 - **IOSEA Marine Turtle MoU** (Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia [concluded under the auspices of CMS])
 - **Ramsar Convention** (Convention on Wetlands of International Importance especially as Waterfowl Habitat)
 - **SPAW Protocol** (Protocol concerning Specially Protected Areas and Wildlife [concluded under the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region])
 - **WIDECAS**T (Wider Caribbean Sea Turtle Conservation Network [a Regional Activity Network of the SPAW Protocol])
- **Private sector**
- **RFBs** (Regional Fisheries Bodies)
- **Wildlife enforcement networks:** ASEAN-WEN, CA-WEN, Carib-WEN, CTI-CFF, ICCWC, INTERPOL, UNODC, and other (sub)regional networks, as appropriate.

CITES-focused recommendations

1. Convey to the relevant CITES Management and Scientific Authorities the findings of the present study with a view to inform targeted conservation and management efforts.

2. Subject to the availability of resources, support Parties, upon request, with the development, implementation and/or update of management and action plans for the conservation of marine turtles.

3. Encourage Parties to fully implement the provisions of CITES that are relevant to the seven Appendix I-listed species of marine turtle.

4. Encourage Parties to use the fora provided by CITES to raise and discuss challenges relating to illegal trade in marine turtles.

5. Continue communication and collaboration with other multilateral agreements with mandates relating to the regional and global conservation, management and sustainable use of marine turtles, such as CMS, its IOSEA Marine Turtle MoU, IAC, the Ramsar Convention and the SPAW Protocol to ensure the compatibility of activities, optimize resources, and enhance synergies concerning the conservation of marine turtles.

6. Subject to the availability of resources, assist Parties, upon request, with the identification of inconsistencies, overlaps and gaps in national legislation and regulations relating to the implementation of CITES for marine turtles.

7. Encourage Parties to collect illegal wildlife trade data in a standardized manner, including at different governance levels, that can be used for monitoring trade in CITES-listed species, including marine turtles.

8. Subject to the availability of resources, and upon request by Parties, build national capacity on the implementation of CITES provisions relevant to marine turtles.

9. Encourage CITES Parties to submit data on illegal trade in marine turtles in their annual illegal trade reports to the CITES Secretariat.

10. Encourage ICCWC to use data on illegal trade in marine turtles submitted to the CITES Secretariat in its research and reports.

11. Convey to FAO the findings of the present study as to inform efforts by RFBs addressing marine turtle bycatch and illegal take, and collaborate, as appropriate.

12. Collaborate with RFBs, including through the exchange of information on illegal take in marine turtles, to better understand the extent to which illegal take at sea contributes to illegal trade.

Overarching recommendations

	<u>Conservation and management</u>	<u>Stakeholders involved</u>
Support to conservation and management planning	1. Convey to marine turtle range States and those involved in marine turtle trade novel information on marine turtle conservation status, take, use and trade that can inform national targeted marine turtle conservation and management efforts.	- CITES, CMS, IAC, IOSEA Marine Turtle MoU, UNEP SPAW / WIDECAST - Academia, CSOs
	2. Support marine turtle range States, as needed, with the development, implementation and/or update of management and action plans for the conservation of marine turtles.	- CITES, CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAST - RFBs - Academia, CSOs
	3. Ensure that the needs of the people involved in the take and use of, and trade in marine turtles are accounted for when determining conservation and management measures for countering illegal take and use of, and trade in marine turtles.	- Government agencies - Communities - Academia, CSOs
	4. Explore long-term funding options to support national efforts for marine turtle conservation and management.	- Government agencies - UNEP SPAW / WIDECAST - RFBs
Legal take	5. Where harvest quotas for marine turtle specimens are necessary, develop robust and standardized frameworks for determining national harvest quotas. These should be science-based, integrate a determination of sustainable offtake levels, account for existing quotas in other States sharing the marine turtle stock(s), and account for national enforcement capacity.	- Government agencies - RFBs - Communities - Academia
	6. Fully implement marine turtle bycatch mitigation-related regulations (e.g. those relating to the use of TEDs, circle hooks, particular bait types, fisheries logbook and observer schemes) where these regulations are already in place.	- Government agencies - RFBs - CSOs
Fisheries	7. Encourage States' adherence to marine turtle bycatch mitigation-related regulations (e.g. those relating to the use of TEDs, circle hooks, bait types, fisheries logbook and observer schemes) where such regulations are not yet in place.	- UNEP SPAW / WIDECAST - RFBs - CSOs
	8. Work with States and their fisher communities to ensure that there is effective documentation at the national level of marine turtle fisheries bycatch and mortality that can inform posterior conservation and management measures.	- Government agencies - UNEP SPAW / WIDECAST - RFBs - CSOs
	9. Ensure that there is periodic verification of the implementation of existing marine turtle bycatch mitigation-related regulations by vessels operating in national waters.	- Government agencies - RFBs
	10. Collaborate with FAO and RFBs to identify best approaches to address marine turtle fisheries bycatch, mortality and illegal take.	- Government agencies - FAO - RFBs

	11. Consider implementing reward schemes for compliance with marine turtle bycatch mitigation-related regulations where these regulations are in place (e.g. market access, preferential treatment at ports, government recognition); and penalty schemes for non-compliance (e.g. licensing penalties).	- Government agencies - RFBs
Captivity and hatchery establishments	12. Reassess the role of existing marine turtle captivity and hatchery establishments (including those used as tourist attractions) to ensure that these provide conservation value to marine turtle populations.	- Government agencies - CMS, IOSEA Marine Turtle MoU, UNEP SPAW / WIDECAS - Academia/CSOs
	13. Develop science-based operational protocols for marine turtle captivity and hatchery establishments to follow as a way to ensure that their operations provide conservation value to marine turtle populations.	- Government agencies - CMS, IOSEA Marine Turtle MoU, UNEP SPAW / WIDECAS - Academia/CSOs
	14. Monitor the activity of marine turtle captivity and hatchery establishments to ensure that these establishments do not facilitate the illegal use of, and trade in marine turtle specimens.	- Government agencies
	15. Invite States in the IOSEA subregion which have marine turtle populations and are not yet CMS Parties and IOSEA Marine Turtle MoU signatory States, to ratify the Convention and its MoU.	- CMS, IOSEA Marine Turtle MoU - CSOs
Cooperation	16. Invite States in the Inter-American subregion which have marine turtle populations and are not yet IAC Parties, to ratify the Convention.	- IAC - CSOs
	17. Encourage States to fully implement the provisions of existing multilateral agreements which they have ratified, and which relate to the regional and global conservation, management and sustainable use of marine turtles, including CITES, CMS, IAC, IOSEA Marine Turtle MoU, the Ramsar Convention, and the SPAW Protocol.	- CITES, CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAS - CSOs
	18. Encourage States to use the fora provided by existing multilateral agreements relating to the regional and global conservation, management and sustainable use of marine turtles, including CITES, CMS, IAC, IOSEA Marine Turtle MoU, the Ramsar Convention, the SPAW Protocol and WIDECAS to raise and discuss challenges relating to the conservation and management of marine turtles.	- CITES, CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAS - CSOs
	19. Enhance the exchange of information on illegal trade in marine turtles between different national and subregional governance levels to counter illegal take and use of, and trade in these species.	- Government agencies - CITES, CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAS

		<ul style="list-style-type: none"> - RFBs - Wildlife enforcement networks
	20. Continue communication and coordination among CITES, CMS, IAC, IOSEA Marine Turtle MoU, the Ramsar Convention, the SPAW Protocol and other agreements to address marine turtle conservation and management challenges, including illegal trade.	<ul style="list-style-type: none"> - CITES, CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAST
Needs assessment	21. Assess staffing and equipment needs for implementing marine turtle conservation and management measures at the national level (e.g. patrolling equipment, prosecutors with an understanding of relevant legislation, etc.), and consider how civil society organisations, or other entities can support governments in this regard.	<ul style="list-style-type: none"> - Government agencies - UNEP SPAW / WIDECAST - RFBs - CSOs - Private sector
	22. Review national legislation and regulations relating to marine turtle conservation and management to identify inconsistencies, gaps and overlapping areas that need to be addressed by policy-makers. Special attention should be given to reviewing legislation and regulations that enable the harvest of marine turtle specimens by particular communities and/or in particular administrative areas.	<ul style="list-style-type: none"> - Government agencies - CITES, CMS, IAC, IOSEA Marine Turtle MoU, UNEP SPAW / WIDECAST - RFBs - CSOs
Research		Stakeholders involved
Alternative livelihoods	23. Assess the needs of the people involved in the take and use of, and trade marine in turtles to identify alternative livelihoods that can effectively reduce these sources of exploitation. This assessment should examine the potential for different social and economic incentives to simultaneously benefit marine turtle conservation and communities.	<ul style="list-style-type: none"> - Government agencies - UNEP SPAW / WIDECAST - Communities - Academia/CSOs
Extent of take	24. Undertake future comparative research in the locations and communities covered in the present assessment to understand how trade has evolved.	<ul style="list-style-type: none"> - UNEP SPAW / WIDECAST - Academia/CSOs
Impact	25. Undertake comprehensive assessments of the scale and impact that national artisanal, semi-industrial and industrial fisheries, including IUU, have on marine turtle populations.	<ul style="list-style-type: none"> - Government agencies - UNEP SPAW / WIDECAST - RFBs - Academia/CSOs
	26. Undertake research to determine the origin (i.e. the Regional Management Unit) of marine turtles taken in the eight countries studied, the productivity of those RMUs and their threats to better understand the impact of take levels.	<ul style="list-style-type: none"> - UNEP SPAW / WIDECAST - Academia/CSOs

	27. Develop holistic regional marine turtle survival probability models to assess the sustainability of current harvest levels. These should take into account threats from multiple countries (number of turtles of different age classes taken from populations), limitations of source rookeries (number of turtles recruited per year), natural survival probabilities, and marine turtle biology. Where possible, these models should build on existing models, such as those developed by the IUCN Marine Turtle Specialist Group.	- Academia/CSOs
Protection measures	28. Undertake biological and socio-economic research that can support the development and implementation of (additional) (spatial) protection measures for marine turtle foraging, nesting and migratory areas.	- Government agencies - UNEP SPAW / WIDECAS - RFBs - Communities - Academia/CSOs
<u>Enforcement</u>		Stakeholders involved
	29. Ensure that existing legislation and regulations that apply to marine turtles are effectively implemented at the national level, and that appropriate judicial processes are effectively followed in cases of non-compliance.	- Government agencies - RFBs
	30. Consider standardizing marine turtle trade monitoring procedures at different governance levels within States and amongst them to facilitate cooperative enforcement efforts.	- Government agencies - Wildlife enforcement networks
	31. Examine the feasibility of implementing a standardized collection of genetic samples of seized marine turtle specimens at the national level, and the potential for this to inform management decisions aiming to counter illegal take and trade.	- Government agencies - RFBs - Academia/CSOs
Monitoring	32. Undertake periodic monitoring of marine turtle legal harvest levels where harvest quotas exist to ensure that these are respected.	- Government agencies - RFBs
	33. Improve monitoring and enforcement patrols at nesting sites; at sea; onboard; at points of landing, transshipment and transactions; at land borders; at markets; and at airports to ensure that marine turtle specimens are not illegally taken, retained or traded.	- Government agencies - UNEP SPAW / WIDECAS
	34. Work with online platforms with commercial potential to determine effective ways to address illegal online trade in wildlife specimens.	- Government agencies - UNEP SPAW / WIDECAS - Wildlife enforcement networks - CSOs
	35. Support activities by civil society organisations working on the ground to promote marine turtle conservation and counter illegal harvest.	- Government agencies - UNEP SPAW / WIDECAS
Reporting	36. Encourage CITES Parties to submit data on illegal trade in marine turtles in their annual illegal trade reports to the CITES Secretariat.	- CITES, UNEP SPAW / WIDECAS - CSOs

Building capacity	37. Encourage ICCWC to use data on illegal trade in marine turtles submitted to the CITES Secretariat in its research and reports.	- CITES
	38. Build capacity of national enforcement authorities and prosecutors on the legislation and regulations that apply to marine turtles.	- Government agencies - CITES, CMS, IAC, IOSEA Marine Turtle MoU, UNEP SPAW / WIDECAST - RFBs - CSOs
	39. Build capacity of national enforcement authorities on the identification of marine turtle specimens in trade at key points in the trade chain.	- Government agencies - RFBs - Wildlife enforcement networks - CSOs
	40. Build awareness of conservation management and enforcement authorities on the importance of protocols for systematic monitoring and reporting of illegal wildlife trade incidents.	- Government agencies - CITES, UNEP SPAW / WIDECAST - RFBs - CSOs

<u>Awareness</u>		Stakeholders involved
People and policy	41. Implement public education and awareness programmes that focus, amongst others, on exposing the conservation status of marine turtles, their ecological importance, the national legislation and regulations that apply to these species, opportunities to minimize bycatch, and meaningful conservation actions that can be taken.	- Government agencies - UNEP SPAW / WIDECAST - RFBs - CSOs
	42. Build fishermen's awareness on the importance of reporting marine turtle bycatch and mortality.	- Government agencies - UNEP SPAW / WIDECAST - RFBs - CSOs
	43. Build political awareness on the conservation status of marine turtles and on the national-level importance of promoting the conservation of these species.	- CMS, IAC, IOSEA Marine Turtle MoU, Ramsar Convention, UNEP SPAW / WIDECAST - CSOs