



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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ILLEGAL TAKE AND TRADE OF MARINE TURTLES IN THE IOSEA REGION

The Sixth Meeting of IOSEA Signatory States (Bangkok, January 2012) expressed concern that illegal trade of marine turtles and their derivatives was largely under-reported by Signatory States, suggesting a need for closer examination of the problem. The present paper aims to examine the patterns and trends in illegal turtle take and trade in the IOSEA region since the year 2000, as well as to review measures taken by governments, intergovernmental bodies and NGOs. The study considers only intentional illegal take, leaving aside legal slaughter, traditional/cultural take for personal consumption and unintentional killing of turtles during fishing operations. It considers all IOSEA Signatory States (35 countries) and a number of non-signatories (Brunei Darussalam, China, Japan, Republic of Korea and Singapore). As IOSEA sources alone are insufficient to provide a comprehensive understanding of the issue, the paper also draws upon several other sources of information readily available to the IOSEA Secretariat. The analysis is mostly organized with reference to the four IOSEA sub-regions, namely: South-East Asia and proximity (SEA⁺), Northern Indian Ocean (NIO), Northwest Indian Ocean (NWIO) and Western Indian Ocean (WIO).

Executive summary

1. Illegal take of marine turtles can assume various forms, from poaching of animals and eggs on nesting beaches to illegal take of animals at sea. Typically, green and leatherback turtles are hunted for their meat; the hawksbill turtle is hunted for its carapace as the raw material for craftwork; while the eggs of loggerhead and olive ridley turtles are considered a delicacy. Turtle meat consumption reportedly occurs in 75% of IOSEA Signatory States, while trade in shell products seems to be predominant in East Asian countries. Whereas numerous investigations in this regard have been undertaken over the past decade in various SEA⁺ countries, no studies of comparable nature/scope in the other IOSEA sub-regions were found.

2. Poaching of green and hawksbill turtles appears to be perpetrated mainly by Chinese and Vietnamese turtle fisheries operating in the so-called Coral Triangle area (especially in Indonesian, Malaysian and Philippine waters); and by local poachers particularly in the Western Indian Ocean (especially Kenya, Madagascar, and Mozambique). In southwest Madagascar, in particular, a prolific directed take of marine turtles is well-documented notwithstanding national decrees prohibiting exploitation; and poaching activity appears to be intensifying in other areas of the country. Poaching of turtles on a localised scale is also encountered in many other countries.

3. Throughout the IOSEA region, markets appear to differ considerably in terms of demand, prices, trade volumes, as well as the nature of goods traded. The main regional trade route for whole turtles and turtle derivatives seems to originate in Indonesia, Malaysia and the Philippines. Such products are directed mainly towards East Asia, where mainland Chinese demand for turtle meat and medicine, and Japanese and Taiwanese demand for traditional crafts made of turtle scute (*bekko*) are reportedly

on the rise. Within this trade route, the hotspot for green turtles remains Bali, Indonesia, where trade is reported to have reverted in recent years to its historical form (i.e. live animals rather than cut meat). In former times, at least, these animals were supplied from two main areas: South East Sulawesi and East Java. Chinese turtle poachers (mainly from Hainan province) are reported to have turned also to Malaysian waters for their supply of whole animals. Green and hawksbill turtles caught by fishers in Philippine waters are being traded directly with Chinese buyers in the South China and Sulu Sea, in order to evade enforcement controls. Following the contraction of a large-scale wholesale export market in Viet Nam – as a result of a domestic ban enacted in 2002 – much of the Vietnamese turtle catch was reported subsequently to be traded directly at sea in exchange for commodities brought on vessels from Hainan. Numerous seizures in Viet Nam, including of hawksbill turtles, suggest that Indonesia and Malaysia could still be a source of raw scutes used in *bekko* manufacture. In the Western Indian Ocean, undercover markets were identified in the past in Kenya and Seychelles; and need to be investigated in most other countries. Emerging commercial activities based on marine turtle exploitation were recently reported in Madagascar and Mozambique.

4. Kalimantan, Indonesia, stands out as a regional hotspot for egg collection, with a significant part of the exports being directed towards Malaysian Borneo, especially Sabah and Sarawak, where eggs are reportedly sold openly without controls. In Peninsular Malaysia, Terengganu has historically been a major centre for the egg trade, supplied in part by cheap eggs imported from neighbouring countries and from other Malaysian states where egg collection is illegal – attracting buyers from as far away as Indonesia. However, important egg collection activity has also been documented in many other countries, including Bangladesh, India, Kenya, Mozambique, Philippines, Sri Lanka, and United Republic of Tanzania, among others. In general, more investigation is needed of turtle and egg take in the NIO and NWIO sub-regions, where only limited information is currently available.

5. Drivers of the illegal take and trade of marine turtles and derivatives may fall into three categories: socio-economic (i.e. relatively high prices commanded by turtle meat, basic nutritional needs in the absence of affordable alternatives, poverty relief, and demand for luxury goods); cultural (i.e. long-standing traditional beliefs, specific taste preferences); and political (inadequate legislation and/or enforcement of existing regulations).

6. Virtually all IOSEA countries have enacted legislation to prohibit direct take and domestic trade in turtles and turtle derivatives, with a number of countries having increased fines or tightened prohibitions in recent years. However there is still considerable room for improvement in some countries where existing fines are inadequate as a deterrent to illegal activity, where a lack of harmonisation of legislation across states/provinces induces domestic trade, and where existing legislation is poorly enforced. Enforcement challenges are numerous, particularly in remote areas and where there is a dependency on meat or eggs for subsistence. Even some apparent successes may have been accompanied by unforeseen or undesirable consequences (as noted in Viet Nam, above). In the SEA⁺ region, seizures appear to be relatively well documented through existing enforcement networks and in the media, but they probably represent a small fraction of the actual illegal trade. Moreover, there are indications that law enforcement action is often not followed up by successful prosecution and conviction of offenders. More positively, there are signs in some countries that targeted legislative and management measures, accompanied by enhanced cooperation among government agencies and between federal/state authorities, are having positive results. Training activities focussed on law enforcement officers and awareness campaigns aimed at curbing demand have been undertaken in a number of countries. The potential usefulness of wildlife crime report hotlines at both national and regional level should be explored.

7. Other mitigation options that have been documented in IOSEA Signatory States include direct incentives targeting local stakeholders, such as employment/payment incentive schemes that aim to deter illegal poaching. However, rigorous analyses of their long-term effectiveness are generally absent. The limited extent of these schemes may be explained by the ephemeral presence of turtles, as well as the high financial cost, requirement of staff time and practical/ethical shortcomings.

Indirect incentives, in the form of alternative livelihoods for turtle users – many based on ecotourism or sustainable resource use – are also practiced across the region. The performance of these so-called “conservation by distraction” approaches merits further investigation. Other exemplary measures to try to curb turtle consumption and trade include the use of religious edicts in Indonesia, Islamic Republic of Iran and Malaysia.

8. Moving beyond activities undertaken at a national level, a number of examples of bilateral or multilateral initiatives have shown promise in recent years. They include training and enforcement workshops among countries of the Coral Triangle region, a bilateral agreement between Indonesia and the U.S. state of California focussing on leatherback turtle conservation, and Japanese funding for marine turtle-related programmes in South-East Asia.

9. Wider regional cooperation in combatting illegal wildlife trade falls under the ambit of various intergovernmental organisations and networks, including INTERPOL, the ASEAN-Wildlife Enforcement Network, and a relatively new International Consortium on Combating Wildlife Crime. ASEAN-WEN has been particularly active in recent years in organising training workshops for enforcement authorities. While a number of other United Nations entities appear to be involved in capacity building, reporting and enforcement activities against wildlife trade, the extent to which these activities directly concern marine turtles is not always clear. Nongovernmental organisations such as TRAFFIC, WWF, ProFauna Indonesia and the Freeland Foundation, among others, have also played prominent roles drawing attention to marine turtle trade issues, lobbying governments on perceived legislative and implementation lapses, as well as strengthening enforcement capacity.

10. Future efforts should concentrate on enhancing and enforcing existing legislation; conducting more thorough investigations into the characteristics and drivers of existing markets for turtle and derivatives; exploring direct and indirect incentives that provide sustainable alternatives to turtle poaching and trade; addressing the demand through heightened public awareness; and enhancing regional cooperation among IOSEA Signatory States and through other appropriate mechanisms.

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Introduction

Rationale

1. All species of marine turtles (families *Dermochelyidae* and *Cheloniidae*) are listed in the IUCN Red List of Threatened Species (IUCN 2013). Since 1977, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) prohibits international trade of all marine turtle species and their products among its member states (Lam 2011). However, despite international protection, harvesting of “the world’s most valuable reptile” (Archie Carr, 1944) for tortoiseshell scutes (Van Dijk & Shepherd 2004; Lam *et al.* 2011), meat (Lilley 2009; Dethmers & Baxter 2011) and eggs (TRAFFIC 2009), as well as their trade, has been increasing in the IOSEA region (SAWEN 2008).

2. During the Sixth Meeting of IOSEA Signatory States (Bangkok, January 2012), it was pointed out that national and international illegal trade of marine turtles and their derivatives was largely under-reported by Signatory States, suggesting a need for closer examination of the problem (IOSEA 2011). The present paper aims to examine the patterns and trends in illegal turtle take and trade in the IOSEA region since the year 2000, as well as to review measures taken by governments, intergovernmental bodies and NGOs. However, no attempt is made to assess the impact of this take and trade on turtle populations, which is complicated by biological attributes, such as their long-distance migratory behaviour and late maturation (Dethmers & Baxter 2011).

Scope of the study and geographical area covered

3. The present study considers only intentional illegal take, leaving aside: (1) marine turtles legally slaughtered, estimated to number 42,000 worldwide each year (Humber *et al.* 2014)¹; (2) traditional/cultural take for personal consumption, not commonly integrated in illegal trade networks; and (3) unintentional killing of turtles during fishing operations, except in cases where it is clear that incidental catches end up in trade networks.

4. Considering that illegal trade of marine turtles spreads across international boundaries, this study considers all IOSEA Signatory States (35 countries) and a number of non-signatories (Brunei Darussalam, China, Japan, Republic of Korea and Singapore). The analysis is mostly organized in terms of the four IOSEA sub-regions, namely: Southeast Asia and proximity (SEA⁺), Northern Indian Ocean (NIO), Northwest Indian Ocean (NWIO) and Western Indian Ocean (WIO).

Sources

5. Good indicators of the level of illegal take and trade include the number of seizures at sea and on land, and the volume of products observed in market surveys (McLellan *et al.* 2012). IOSEA sources – such as overviews of implementation prepared for IOSEA meetings, national reports submitted by Signatory States, the online IOSEA Bibliography Resource and Electronic Library, as well as IOSEA features/news items – are insufficient to provide a comprehensive understanding of the issue. Thus, this paper also draws upon several other sources of information readily available to the IOSEA Secretariat, including websites of specialized enforcement networks such as the Association of Southeast Asian Nations’ Wildlife Enforcement Network (ASEAN-WEN)¹, reports published since 2000 by numerous NGOs (TRAFFIC, WWF, Robin des Bois, Wildlife Alliance, Freeland, etc.) and governmental bodies (fisheries and wildlife agencies; customs services; airport, port and coast guard authorities etc.), as well as a wealth of published/peer-reviewed literature. However, it should be noted that even these materials are certainly not exhaustive. Neither the CITES Database nor national

¹ ASEAN-WEN is the world’s largest wildlife law enforcement network that involves police, customs and environment agencies of all 10 ASEAN countries – Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Vietnam and Thailand. It started reporting all wildlife seizures in the ASEAN region in 2008. More information on <http://www.asean-wen.org/>.

custom statistics were used, as such data are mostly limited to legal trade and are said to poorly record the illegal trade of marine turtlesⁱⁱ.

Limits of the study

6. Although the present analysis aims to capture readily available information in a comprehensive manner, it remains limited by an observed lack of studies on both the levels and drivers of take and trade in marine turtles, as well as on initiatives taken nationally and regionally in relation to these two complex issues. Another example of possible bias is that trade in turtle derivatives (shell, meat, oil, fat, eggs etc.) tends to be harder to estimate than trade in whole animals, and therefore often remains under-reported.

7. Sources were found to be most abundant for the SEA⁺ sub-region, followed by the WIO sub-region, while only limited data were discovered for the NWIO and NIO sub-regions. (For the SEA⁺ sub-region, several ASEAN-WEN reports of “turtle” seizures were not considered in the present analysis, so as to avoid the risk of confusion with terrestrial turtles.)

I. Overview: location of take, trade routes and drivers of trade

1.1. Geographic location of take, depending on its nature

8. Illegal take of marine turtles can assume various forms, from poaching of animals and eggs on nesting beaches to illegal take of animals at sea. Numerous investigations in this regard were undertaken over the past decade in various SEA⁺ countries such as **Indonesia** (Dethmers & Baxter 2011; Lilley, 2009; Van Dijk & Shepherd 2004), studies of similar nature/scope were found for other sub-regions. Although this phenomenon could be due to a reporting bias, it may also suggest that direct exploitation of turtles – for meat, eggs or shell trade – is largely concentrated in the Coral Triangle region, which includes the marine waters of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste.

1.1.1. Illegal take of whole animals and turtle parts

9. Although data on the illegal take of turtles are generally deficient and unevenly availableⁱⁱⁱ, certain hotspots have been identified, involving two types of poaching activity. While turtle poaching at nesting beaches is typically undertaken by local coastal communities, turtle fishing activities – often using long-lines and spear guns (Schoppe & Antonio 2009) – are more often transboundary, making its estimation more problematic. Based on available information, intensive turtle poaching at sea appears to be conducted mainly by Chinese and Vietnamese operations concentrated on resource-rich waters of Indonesia, Malaysia and the Philippines. On the other hand, local poaching targeting both nesting and migrating turtles appears to concern not only SEA⁺ countries (especially Indonesia, Papua New Guinea, Philippines, Myanmar and Thailand) but also WIO countries (such as Comoros, France (Mayotte), Madagascar, Kenya, Mozambique and United Republic of Tanzania). Information sources for the NIO and NWIO sub-regions are largely incomplete^{iv}.

ⁱⁱ In the CITES Database Interpretation Guide (ver.6.0) it is specified that “Information on seized or confiscated specimens is often absent or provided in insufficient detail” and that “Many annual reports do not clearly state whether the data were derived from the actual number of specimens traded or from the quantity for which the permits or certificates were issued (often considerably different)”. As for national statistics, they are usually compiled from the declarations submitted to the Customs by importers or exporters – which does not cover illegal trade.

ⁱⁱⁱ A wealth of information for the SEA⁺ sub-region is found in ASEAN-WEN online resources; whereas no information for the NWIO sub-region could be found at all; and only limited information is available for other sub-regions.

^{iv} For the sake of identifying hotspots of turtle take, it may be informative to point out that, according to a review of IOSEA national reports done in 2014, nine Signatories (Comoros, Eritrea, France, Madagascar, Maldives, Mozambique, Philippines, Seychelles, and Tanzania) rated meat consumption as being of “moderate to high” prevalence.

10. Turtle poaching in the Coral Triangle region was thought to be on the increase in 2011 (Lam *et al.* 2011), and recent reports suggest that this assessment remains valid. As of 2009, at least, most of the take at sea in South-East Asian waters seemed to be perpetrated by an illegal **Chinese** fishery, targeting mostly hawksbill and green turtles (Pilcher *et al.* 2009) and constituted by a relatively small number of vessels operating out of Hainan province (Chan *et al.* 2009). The number of recent seizures involving Chinese nationals hunting turtles in foreign waters of the Coral Triangle is indicative of the importance of this fishery. Sixteen cases were reported from 2008 to June 2014², and another ten cases involving the seizure of a total of nearly 1,500 whole turtles – only 2.5% of which were alive – were documented between 2000 and 2008 (Lam *et al.* 2011^v). Examples from the past decade, summarised in Table 1, support the idea that there are two hotspots for these illegal activities, namely the Derawan Archipelago in East Kalimantan, Indonesia; and the South China and Sulu Seas in the Philippines (Schoppe & Antonio 2009). In the **Derawan Archipelago**, Chinese turtle hunters were reported, as of 2009, to be operating with small speedboats to unload their catch onto a mother ship in the Sulawesi Sea³. Less detailed descriptions of the Chinese turtle fishery were found for **Malaysia**, where, as of 2004, no national marine turtle fishery was operating (Chan 2004). However, several cases of poaching from illegal foreign vessels, mostly Chinese, were recorded from 2004 to 2008.

Table 1. Selected examples of illegal Chinese marine turtle fishery activities in the Coral Triangle waters

Country	Specific location of taking	Details on cases involving Chinese poaching in waters of the Coral Triangle	Date
Indonesia	Derawan Archipelago, East Kalimantan	More than 110 turtles discovered drowned in Chinese fishing nets ⁴	Nov. 2009
	Derawan Archipelago, East Kalimantan	397 green and hawksbill turtles seized ⁵	2007
	Derawan Archipelago, East Kalimantan	Recovery of a net containing almost 150 dead turtles ⁶	2005
Malaysia		More than 65 turtles (25 alive) seized ⁷	Apr. 2008
		274 turtles (TRAFFIC 2013)	Mar. 2007
		230 stuffed turtles (Bin Wagiman 2006)	early 2006
		160 turtles (TRAFFIC 2013)	May 2004
Philippines	South China and Sulu seas	500 turtles confiscated ^{8,9,10,11}	May 2014
	South China and Sulu seas	150 turtles seized in four operations ^{12,13,14,15,16}	2011-12
	Off Turtle Islands, South China and Sulu seas	More than 100 turtles and 10,000 eggs recovered ^{17,18}	Sept. 2007

11. Marine turtles foraging and migrating in waters of the Coral Triangle have also been captured by an illegal **Vietnamese** turtle fishery since at least the 2000s¹⁹ (Chan & Shepherd 2002). Although the derivatives initially used to enter the *bekko* trade in Viet Nam (Stiles 2008), a reportedly effective enforcement of a ban on trade in turtle products from 2002 may have reduced demand from Vietnamese markets (Stiles 2008). Subsequently however, Pilcher *et al.* (2009) suggested that Vietnamese turtle harvests at sea tended to have reoriented towards Chinese markets, supplying vessels from Hainan directly at sea²⁰. Indeed, as Table 2 indicates, in recent years several Vietnamese vessels carrying marine turtles have been caught in **Philippine** and **Malaysian** waters. In addition, an estimated 4,000 marine turtles were being caught annually along the entire coast of **Viet Nam** as of 2002 (MoFI 2003). Although these turtles were thought to be mostly caught incidentally (Hamann *et al.* 2006), they may also have ended up in trade networks.

^v Also see IOSEA Headline 29 March 2007; IOSEA Headline 27 March 2007; Taiwan News 2007; IOSEA Feature 28 February 2008.

Table 2. Vietnamese marine turtle fishery operations in Philippines and Malaysian waters

Country	Specific location of take	Details on cases involving Vietnamese poaching in waters of the Coral Triangle	Date
Malaysia		A total of 20 turtles recovered in two seizures ^{21,22}	Oct. 2010
Philippines	Palawan	300 frozen turtles seized (Robin des Bois 2013c) ²³	Oct. 2013
	Port of Bongao town, Tawi-Tawi	A total of 93 hawksbill and green turtles seized in two operations ^{24,25}	Apr. 2012
	Palawan	38 live turtles saved while being smuggled out by either Vietnamese or Chinese poachers ²⁶	Jan. 2011
	Palawan	101 dead hawksbill turtles seized ^{27,28}	2008

12. In addition to the available information on Chinese and Vietnamese turtle fisheries in the SEA⁺ sub-region, the following section offers a complementary review of local poaching activities since the 2000s in the same sub-region.

13. Generally, most poaching activities in the SEA⁺ sub-region appear to be conducted in **Indonesian** waters^{29,30,31}. An investigation by ProFauna Indonesia estimated that more than 27,000 green turtles had been slaughtered countrywide for trade in 1999 (ProFauna Indonesia 2003). As of 2008, about 1,115 green turtles were said to be poached every year in South East Sulawesi alone³² – already thought to be the main location for hawksbill turtle exploitation in 2001 (ProFauna Indonesia 2003). Further east, in Maluku province, a modelling study from 2011 predicted that, under the realistic scenario of 50% turtle take and 10-100% egg take locally, the Aru green turtle stock was expected to become extinct within two generations (Dethmers & Baxter 2011). Although a dramatic decline in turtle populations since the 2000s apparently reduced the extent of take in Bali (as of 2005)^{vi}, poaching of green turtles at sea in Sumatra for local meat consumption was still rampant as of 2011^{33,34}. In **Papua New Guinea**, traditional owners reported in 2011 that many local boats were regularly coming at night to the area surrounding Warrior Reef³⁵ to poach turtles. In the **Philippines**, most fishermen reportedly make use of their marine turtle by-catch (Lam *et al.* 2011), but turtles are also largely targeted on their migratory routes³⁶ and consumed locally, at least in Camarines Sur³⁷. In **Malaysia**, three dead hawksbill turtles were discovered in April 2012 at Mantanani Islands, off Kota Belud³⁸, but there have been only isolated reports of poaching since then. Hunting of turtles by locals was reported to be rare (Chan 2006) and the slaughter of 60 turtles in March 2014 for shell in Sabah was rather attributed to Filipino and Indonesian nationals (Robin des Bois 2014). Local turtle meat consumption was also evidenced in **Thailand** in 2010, when three people died from Hawksbill turtle meat poisoning^{39,40}; and again in 2012, apparently supporting the notion that some turtle by-catch may be consumed⁴¹. Although data are largely deficient for **Myanmar**, it was reported as of 2012 that cases of turtle consumption were common along the coast (Win & Lwin 2012).

Northern Indian Ocean

14. Only limited information on the illegal take of turtles in the NIO sub-region was found, perhaps suggestive of less intensive poaching activity, at least in comparison to South-East Asia. In **Bangladesh**, as of 2010, Olive ridley turtles were thought to be targeted by fishermen in the Sundarbans, in Cox's Bazar, and around St Martin's and Sonadia Islands⁴². Mention was recently made of an illegal foreign fishery reported to impact turtles, but more information is needed on its nature and impact (IOSEA Bangladesh National Report 2014). Available data from **India** are largely anecdotal: 13 Sri Lankan fishermen were arrested in 2011 while illegally fishing off Odisha⁴³ and two fishermen were arrested for poaching a green turtle in Tamil Nadu in March 2010⁴⁴. In **Maldives**, it was estimated that 90 to 180 turtles were killed by locals of a nesting island in Shaviyani Atoll from January to March 2013⁴⁵, and a nesting green turtle was reportedly slaughtered for meat and eggs in

^{vi} A single fisherman could catch 200 to 300 turtles a month in Menjangan Island near Bali before 2000 (ProFauna Indonesia 2003).

September 2012 on Funadhoo Island⁴⁶. In **Pakistan** territorial waters, a turtle fishery was reportedly supplying neighbouring countries with turtle meat as of 2011, without any more precisions⁴⁷. Finally, in **Sri Lanka**, a participatory survey conducted in 2007 in six villages along the southern and western coasts revealed that 62.5% of respondents had consumed turtle eggs or meat during the five years prior to the study (Rajakaruna *et al.* 2009). On the west coast especially, the butchery and open sale of live turtles was observed in 2006 (Kapurusinghe 2006) and three live sea turtles and 11 kg of marine turtle meat were seized in 2014⁴⁸.

Northwest Indian Ocean

15. Very limited information is available for the NWIO sub-region. High rates of marine turtle poaching were reported on offshore islands of **Eritrea** and in **Iranian** waters of the Oman Sea (Eritrea and Iran IOSEA National Reports). In **Oman**, small-scale illegal poaching of green turtles by trawling and drift gill nets is thought to have affected turtle populations (Oman IOSA National Report 2014), but the magnitude has yet to be quantified. Marine turtle poaching was deemed not significant in **United Arab Emirates** (UAE IOSEA National Report 2014), while no information was found pertaining to turtle poaching in Bahrain, Egypt or Jordan.

Western Indian Ocean

16. The extent of poaching of turtles is somewhat better documented for the WIO sub-region. In **Comoros**, interviews of about 10% of the local fishermen conducted from 2007 to 2010 revealed that only 27% of the 179 turtles declared captured at sea over the period (mostly green, some hawksbill) had been released, while more than 73% had either been consumed (50%) or sold (23%) (Poonian & Whitty, *unpublished*). Turtle poaching for the sale of meat was reportedly widespread in the Moheli Marine Park as of 2009, especially on the beaches of Itsamia⁴⁹. In Mayotte (**France**), poachers were observed to extract meat directly from live nesting turtles using a local sabre known as a “*T’Chombo*” (Grolleau 2009)⁵⁰. On this island, 84% of the 114 turtle deaths reported by beachgoers in 2012 were thought to be the result of poaching (REMMAT 2013). The killing of 10 turtles made the headlines in September 2010⁵¹. In **Kenya**, it was reported in 2005 that more than 40% of the marine turtle products (such as oil and meat) consumed locally were sourced by fishermen (Nzuki 2005)⁵² who sometimes target juvenile and sub-adults (Zanre 2005). In June 2011, four fishermen were arrested for killing a green turtle in Kenyan waters⁵³, suggesting that this poaching activity was still topical. It was also estimated in 2004 that 10% to 50% of the females coming to nest on Kenyan beaches every year ended up poached to enter underground markets (Nzuki 2004).

17. In southwest **Madagascar**, a study carried out in 2010 in 12 coastal villages estimated that between 10,000 and 16,000 turtles were being caught per year by occupational Vezo turtle fishermen (Blue Ventures 2010)^{54,55}, using modern methods such as threaded lances, fishing guns, fishing nets (Muttenger 2007) and poisoning (Gough *et al.* 2009). It is also noteworthy that a 2003 study focusing on turtle by-catch found 3,656 turtles caught incidentally per year, with an average capture rate of 20 to 25 animals per fisher (Frontier-Madagascar 2003). The existence of a local custom of turtle eating – confirmed in May 2014 with the death of six children and the sickening of about 50 people⁵⁶ – suggests that this by-catch may enter local trade/bartering networks. Poaching at sea seems not to be limited to the southwest Madagascar. An equally widespread turtle poaching activity was also reported in July 2012 in the north⁵⁷, reportedly accounting for the take of 180 to 300 turtles between February and November 2012 (Cétamada 2012). A study conducted in December 2012 confirmed the habit of green turtle hunting in at least two villages (IOSEA Madagascar National Report 2014; Cétamada 2013). Indeed, over the period 2007 – 2010, it was estimated that more than 40% of the green and hawksbill turtles captured at sea by local fishermen off northern Madagascar villages had been locally consumed or sold^{vii} (Poonian & Whitty, *unpublished*).

^{vii} Out of 165 turtles declared: 92 released, 54 consumed, 14 sold, 12 discarded.

18. In contrast, in **Mauritius**, the same study suggested that more than 86% of turtles (mostly hawksbill) captured at sea over the same three-year period had been released^{viii} (Poonian & Whitty, *unpublished*). No further estimations on turtle poaching in this country were found. Along the coast of **Mozambique**, marine turtle killing near fishing camps was still thought to be of serious concern as of 2012 (Louro *et al.* 2012), since aerial surveys of a 300 km coastline identified many abandoned carapaces (Williams 2012). Widespread poaching outside of the Ponta Do Ouro Partial Marine Reserve was also reported in 2014 (Williams 2014). In **Seychelles**, poaching for local use/consumption was documented as of 2003, particularly on remote islands (Mortimer *et al.* 2003). In **South Africa**, cross-border poaching in protected areas was identified as a re-emerging potential problem in the last few nesting seasons, with one to five turtles reportedly taken annually, especially by foreign longliners, trawlers and beachgoers (IOSEA South Africa National Report 2014). In **United Republic of Tanzania**, it was reported in 2012 that turtle populations had declined since 2000 due to an increase of green turtle consumption and trade. On Mafia Island in Rufiji District at least, many migrant fishers admitted to regularly slaughtering turtles (Sea Sense 2012). In BIOT (**United Kingdom**), some turtle poaching in the uninhabited outer islands was mentioned in the past (Mortimer 2007), but the extent of this practice and its effect on the nesting turtle population is unknown (IOSEA UK National Report 2014).

1.1.2. Egg collection

19. In general, availability of data on levels of egg collection is less abundant than on levels of turtle poaching. In National Reports of IOSEA Signatory States, only Maldives and Mozambique indicate high egg consumption; while moderate egg consumption is reported to occur in Bangladesh, Comoros, Eritrea, Indonesia, Madagascar, Myanmar, Philippines and Tanzania (IOSEA 2014). However, based on other sources of information, illegal egg collection seems to be greatest in the SEA⁺ sub-region (WWF 2005a) – mostly in Indonesia and Malaysia.

Southeast Asia⁺

20. Table 3 gives a breakdown of egg collection reported over the past decade, which appears to be particularly pronounced in Indonesia (West Kalimantan) and in Malaysia (Borneo). It is likely that large-scale egg collection also occurs elsewhere in Indonesia, such as in East Kalimantan and on Flores Island, East Nusa Tenggara, since at least the 1980s⁵⁸. Three recent important seizures suggest that illegal collection is also high in **Malaysia**, particularly in **Sabah**. But in Peninsular Malaysia also, contradictory to claims of local authorities^{59,60}, WWF reported widespread egg poaching activity in Terengganu in 2011 even though the declaration of sanctuaries since 2005 had earlier been praised for mitigating the impact of commercial exploitation (Chan 2006). At Rantau Abang especially, leatherback egg collection along with by-catch were held responsible for a decrease of nesting from an estimated 10,000 nests per year in 1956 to just 3 nests in 2002 (Troëng & Drews 2004).

21. Elsewhere, in the **Philippines**, up to 70% of the eggs in the Tawi-Tawi (Turtle) Islands were estimated to be subject to harvest in the past (Chan & Shepherd 2002), an activity still common as of 2010⁶¹. In **Papua New Guinea**, leatherback egg collection was still widely practiced along the Huon coast as of 2006 (Kinch 2006). Respect for sub-clan rotational systems traditionally regulating egg collection was thought to be fading, and 40% of the respondents of a socio-economic survey conducted in 2005-2006 declared having consumed turtle eggs in the past year (Kinch 2006). Although data are largely deficient for **Myanmar**, illegal egg collection reportedly still occurs along its coast (Win & Lwin 2012) despite a dramatic decrease in nesting activity there. As an example, local villagers on Kadon Galay Island reported that an average of 46 nests could be taken per night as of 2003, compared to hundreds in 1985 (IOSEA Myanmar National Report 2014). Egg collection was also reported to occur in **Viet Nam** (IOSEA Viet Nam National Report 2014), with no further details. No specific information was found for Australia, Brunei Darussalam, Cambodia and Thailand.

^{viii} Out of 29 turtles declared: 25 released, 4 sold.

Table 3. Marine turtle egg collection in Indonesia (West Kalimantan) and in Malaysia (Sabah)

Country of collection	Specific location of collection	Details on marine turtle egg collection cases	Date
Indonesia	Sangalaki Island beaches, West Kalimantan	About 4,000 eggs said to be collected illegally per night ⁶²	2013
	Bau-Bau, Southeast Sulawesi	About 2,000 eggs collected (seized in East Kalimantan) ⁶³	May 2013
	Pontianak, West Kalimantan	3,900 turtle eggs confiscated at sea ^{64;65}	Aug. 2012
	Tanjung Kemuning Beach, West Kalimantan	3,405 turtle eggs – to be smuggled to Sarawak – confiscated ^{66,67}	Apr. 2011
	Jagoibabang, West Kalimantan	Attempt to smuggle 9,000 eggs foiled (ProFauna Indonesia 2010)	May 2010
	Sambit and Berau, East Kalimantan	1,271 eggs seized (ProFauna Indonesia 2010)	Jan. 2010
	Derawan Archipelago, East Kalimantan	3,500 green turtle eggs collected and seized ⁶⁸	Mar. 2008
Malaysia	Sandakan, Sabah, Borneo	10,000 eggs seized while being shipped from the port of Sandakan (Robin des Bois 2013c) ⁶⁹	Oct. 2013
	Sabah, Borneo	1,250 turtle eggs seized from foreign poachers operating on islands off Sabah ⁷⁰	Aug. 2009
	Sabah, Borneo	10,000 green turtle eggs abandoned on a nesting beach by poachers ⁷¹ (TRAFFIC 2013)	Nov. 2008
Philippines	Turtle Islands	600 green turtle eggs reportedly stolen from beaches ⁷²	July 2010

Other sub-regions

22. Northern Indian Ocean: In **Bangladesh**, historically important egg collection rates (Hasan 2009; Islam 2001) were reported to have decreased in St Martin's Island following government projects; but even today turtles are killed for their eggs (IOSEA Bangladesh National Report 2014). In **India**, the fact that practically all of the Olive Ridley nests laid along a particular section of coastline in Tamil Nadu were poached during the January-March 2011 nesting season⁷³, may be indicative of a wider problem. In **Sri Lanka**, where egg poaching was the most common form of turtle exploitation in 2002, local people were said to have collected all turtle eggs laid for the past 40 years on Rekawa beach (Ekanayake *et al.* 2002). Reports from 2009 that turtle eggs were still being eaten and sold in the country, despite a decline in turtle populations (Rajakaruna 2009), suggest that this estimation may still be valid as of today, but an update on the situation would be helpful.

23. Northwest Indian Ocean: Egg poaching has been documented in **Eritrea** and in **Saudi Arabia**, with one recent case in the Farasan Protected Area (Eritrea and Saudi Arabia IOSEA National Reports). Egg collection was reportedly limited in **United Arab Emirates**, but anecdotal information suggests that some consumption occurs (UAE IOSEA National Report 2014). No specific information was found for Bahrain, Egypt, Iran, Jordan, Oman, Sudan and Yemen.

24. Western Indian Ocean: In **Kenya**, it was estimated in 2004 that from 10% to over 50% of nests were poached for egg trade in the country (Nzuki 2004). In **Tanzania**, turtle egg collection persists along most of the coast (Sea Sense, *unpublished data*, in Tanzania IOSEA National Report), although progress has been achieved in places where ecotourism schemes have been implemented (Sea Sense 2012). For instance, on Mafia Island and in Temeke District, the percentage of nests poached had fallen from 100% prior to 2001 to only 1% in 2004 and 4% as of 2005 respectively, following incentive payment schemes implemented by Sea Sense NGO (Ferraro 2007). It would be informative to have updated figures on that apparent success. In **Mauritius**, overexploitation of turtle eggs was observed on Agalega Islands (Griffiths & Tatayah 2007), while in **Mozambique** egg consumption was reported in at least a dozen locations (IOSEA Mozambique National Report 2014). The impact of domestic egg collection on turtle populations was deemed negligible in Comoros, France,

Seychelles, and South Africa (corresponding IOSEA National Reports). No recent evidence of human collection of eggs from nests could be identified for Madagascar and United Kingdom.

1.2. National market characteristics and regional trade routes / hubs

25. This section describes the general patterns of marine turtle trade and the characteristics of national and regional markets. Throughout the IOSEA region, markets appear to differ considerably in terms of demand, prices, trade volumes, as well as nature of goods traded (i.e. eggs, live animals, and products such as meat, carapace, plastron, oil, blood), these being related to the species targeted (Lam *et al.* 2011).

1.2.1. The Coral Triangle, main supplier of a regional market towards East Asia for whole turtles and turtle derivatives

26. Turtles and turtle derivatives from countries of the Coral Triangle – especially Indonesia (Bali), Malaysia and the Philippines – seem to be directed mainly towards East Asian markets – particularly Japan and China (Lam *et al.* 2011). From 2000 to 2008, over 9,180 marine turtle derivatives were reported to have been traded between the two regions, including 2,062 whole specimens, 6,161 crafted products, 789 scutes and 919 kg of raw shell.

27. In 2012, **Indonesian** authorities warned that international trafficking of marine turtles was on the rise nationwide due to increasing demand from East Asian countries⁷⁴. From 2000 to 2008, 397 whole specimens were seized on their way from Indonesia to China or Japan, in 14 separate seizure actions (Lam *et al.* 2011). The exact links between these large-scale exports and an existing domestic turtle market in Indonesia remain unclear but, from 2010 to 2013, a total of 13 cases of marine turtle trade across Indonesia were recorded, mostly in Bali and Borneo⁷⁵ – certainly an underestimate of the real trade.

28. As of 2013, trade in **green turtles** in Indonesia had apparently reverted to its original form: traffic of living turtles, contrasting with an earlier tendency to trade in cut meat⁷⁶. **Bali** was described in 2004 as one of the world's largest markets for green turtles, mostly supplied by other Indonesian locations and intended to serve national but also international markets (Troëng & Drews 2004). It is not known whether the decreasing trend observed in the number of turtles seized in Bali recently, as compared to 2003/2004 (Table 4), suggests a decreasing trend in green turtle trade there, or rather reflects a change in reporting or enforcement. Nonetheless, hundreds of green turtles were traded from various parts of Indonesia to restaurants in Bali in 2012 alone.^{77,78} Historically, green turtles shipped to Bali seem to have been supplied from two main areas in Indonesia: **South East Sulawesi** (ProFauna Indonesia 2007) and **Java**. Back in 2001, it was estimated that a total of 25,000 green turtles found their way to Bali every year, 80% of which were directed to markets in Indonesia and 20% exported to Japan, Singapore, Hong Kong, mainland China and Taiwan (Animal Conservation for Life 2001). The role of Bali in the export of green turtles was exemplified in February 2006 with the seizure of a boat loaded with 158 green turtles intended to be shipped abroad⁷⁹. The integration of Indonesia into international markets appears not to have been assessed more recently. Finally, in **Jakarta**, West Java, dozens of hatchlings were observed to be openly traded in Jatinegara market in October 2013⁸⁰, which may suggest an emerging hotspot to be investigated.

Table 4. Reports of live green turtles in transit to Bali (Indonesia), mainly from South East Sulawesi and East Java

Provenance (to Bali)	Specific provenance (to Bali)	Details of green turtle trade cases towards Bali	Date
East Java	Madura Island	150 kg of turtle <i>meat</i> intercepted ⁸¹	May 2011
		38 turtles intercepted alive ⁸²	Jan. 2011
	Muncar	7 green turtles intercepted alive ⁸³	May 2006
South East Sulawesi		87 green turtles seized alive from a boat ⁸⁴	Nov. 2010
		12 green turtles confiscated alive from a trader ⁸⁵	Dec. 2007
		Motorboat carrying 114 green turtles arrested (ProFauna Indonesia 2003)	Oct. 2002
Other	Unknown	Hundreds of green turtles traded to restaurants in Bali – including at least 55 in 2012 ^{86,87}	2012
		18 green turtles smuggled alive onto a beach ^{88,89}	July 2011
		71 green turtles confiscated alive from a storehouse ⁹⁰	May 2010
		499 green turtles confiscated alive (ProFauna Indonesia 2003)	2003
	From South Sumbawa to Bali	A total of 268 green turtles alive secured by Balinese water police (ProFauna Indonesia 2003) ⁹¹	2004

29. As of 2007, **Yogyakarta** was known as a more limited hotspot for **hawksbill product** trade in **Java** (ProFauna Indonesia 2007). Historically, jewellery made from hawksbill turtle shell was found on display at shops and street stalls mainly in nearby **Kotagede**, where 1,300 souvenirs – some of them bussed from Bali – were found during a 2001-2002 investigation of 40 shops (ProFauna Indonesia 2003). At that time, it was estimated that 32 of these shops were engaged in trade, supplied with raw materials from various places such as Klaten, Bali, Sulawesi, Surabaya and Kangean (ProFauna Indonesia 2003). Hawksbill accessories were then typically sent to Java – mostly in Yogyakarta, in supermarkets in Jakarta, and in Bali – and to South Sulawesi province, two areas where trade in hawksbill turtle parts flourished in 2003 (ProFauna Indonesia 2003). In 2001, a craftsman in Kotagede also reported exporting hawksbill products to Japan, Korea, Singapore and Thailand through distributors in Bali (ProFauna Indonesia 2003, updated 2005). However, as of 2007 only 104 souvenirs were reported in **Kotagede** (ProFauna Indonesia 2007), suggesting that these activities may no longer be as intense as they used to be.

30. As mentioned above, **Malaysian** trade links with China and Japan seem equally if not more important, with 342 whole specimens seized between the two regions between 2000 and 2008 (Lam *et al.* 2011). The fact that such an important number of whole animals were confiscated in only two seizures (in contrast with 14 between Indonesia and East Asian countries) may suggest a bigger trade volume smuggled from Malaysia than from Indonesia, towards East Asian markets. Moreover, Table 1, which indicates a direct involvement of Chinese poachers in Malaysian waters, suggests that a large part of the turtle smuggling from Malaysia to China may remain unrecorded as such. Interviews with Chinese fishermen from Hainan in 2011 suggested that Chinese fishermen, originally targeting turtles in Philippine and Vietnam waters, were turning to Malaysian waters instead (Lam *et al.* 2011).

31. **Philippine** transactions with East Asian countries also appear important. It was reported in 2012 that Half Moon Shoal in the **South China and Sulu seas** served as a “buying station” for Chinese stationed there to purchase turtles, mostly caught by Filipino fishermen around the “turtle corridor” of Balabac Strait.^{92,93,94} Table 1 suggests recent trade activity between nationals of these two countries in a disputed area (Spratly Islands) where enforcement is sporadic. In the past, Philippine trade with East Asian countries was already evidenced by the seizure of 126 whole green and hawksbill (in 4 seizures) from 2000 to 2008 (Lam *et al.* 2011). More recently, several aerial shipments were seized, such as 90.5 kg of green and hawksbill turtle scutes in Palawan in January 2012⁹⁵ and 161 whole hawksbill and green turtles in Manila in May 2011.^{96,97}

32. A large-scale wholesale export market in **Viet Nam**, described by TRAFFIC (TRAFFIC Southeast Asia Indochina 2004) contracted significantly after a ban was enacted in 2002 (Stiles 2008). Between 2002 and 2008, the number of outlets selling marine turtle products dropped from 116 to 84, and the number of items seen for sale dropped from 22,225 to 5,854 in the eight localities surveyed in two major TRAFFIC studies (Stiles 2008). However, as noted elsewhere, Pilcher *et al.* (2009) suggested that much of the Vietnamese turtle catch was subsequently traded directly at sea for commodities with vessels from Hainan bringing mainly agricultural products⁹⁸. In addition, as of 2008, raw scutes used in *bekko* manufacture were reported to be sourced mainly from Indonesia and Malaysia (Stiles 2008). These were sometimes purchased directly from fishermen on the high seas (TRAFFIC Southeast Asia Indochina 2004), as a March 2014 example shows (Robin des Bois 2014). Recent seizures in Viet Nam are mentioned in Table 7, along with anecdotal cases from Thailand and the United States (Guam).

Table 7. Numerous recent seizures in Viet Nam, mostly of whole turtles, and anecdotal cases from Thailand and the United States

Country	Details on seizures	Date
Viet Nam	94 frozen turtles bought from a fisherman (Robin des Bois 2013c)	Oct. 2013
	43 turtles butchered ⁹⁹	July 2012
	2 hawksbill turtles seized ¹⁰⁰	Feb. 2012
	7 hawksbill turtles seized ¹⁰¹	Nov. 2011
	102 turtles seized ¹⁰²	Sept. 2011
	120 turtles seized ¹⁰³	Aug. 2011
	6 live and 12 dead green turtles seized ¹⁰⁴	April 2011
	849 turtles raised in a cage ¹⁰⁵	2009
Thailand	> 300 items of jewellery made from coral/hawksbill turtle shells seized ¹⁰⁶	Feb. 2014
Guam (USA)	Attempt to sell a green turtle foiled ¹⁰⁷	Sept. 2010

1.2.2. East Asian markets, the main receivers of exports from Coral Triangle countries

33. Intense smuggling activity from the Coral Triangle to East Asia supports the existence of a huge turtle market in China and a *bekko* industry in Japan, two countries where turtle populations are considerably smaller (Lam *et al.* 2011). **China** has been identified as a major market for illegal trade. As mentioned above, Chinese poachers operating in the waters of the Coral Triangle were recently reported to be associating with local collaborators to stockpile turtle products for sale to Chinese buyers¹⁰⁸. Traditional Chinese medicine markets were found to have sold 159 kg of shell in 2011 nationwide; and more than 2,253 specimens of marine turtles and derivatives were seized in the country between 2000 and 2008. Of these, 2,017 were whole specimens (mostly dead green and hawksbill turtles), representing 98% of the regional trade in whole turtles (Lam *et al.* 2011). Even these numbers fail to give a complete picture of the extent of the trade: in addition, 150 whole specimens and 7,217 processed shell products (worth nearly a half million US dollars) were observed openly for sale – but not seized – in the same period (Lam *et al.* 2011). In 2009 there were reports of hatchlings being sold as pets in Beijing and Shanghai¹⁰⁹.

34. Marine turtle trade was observed to be on the increase in China from 2000 to 2008, and a survey conducted in April 2012 indicated a similar trend¹¹⁰. However, a survey of media coverage conducted in 2007 suggested that public awareness in China was increasing and that less turtle meat was available in selected markets¹¹¹. Geographically, the island of Hainan was considered a major hub for illegal trade in marine turtles in China, while Taiwan was identified as an important market for processed shell items (6,120 pieces were confiscated during a single seizure there). Enforcement

operations in Hong Kong mostly found scutes hidden in cargo consignments – which could weigh over 500 kg (Lam *et al.* 2011). As of 2009, local trade was thought to be concentrated in the tourist-rich Sanya City, but turtle products were also being marketed more widely throughout China on the internet¹¹², particularly through eBay auctions¹¹³. International exports of turtle products from China were made visible by the seizure in March 2010 of hawksbill turtle powder en route to New Zealand¹¹⁴.

35. In **Japan**, marine turtle scutes are traditionally used to make various curios (Van Dijk & Shepherd 2004), mainly for domestic sale (JWCS 2000). Among 58 shops visited in Tokyo, Nagasaki and Okinawa from 2000 to 2008, 11,080 *bekko* items were found for sale (Lam *et al.* 2011). As of 2006, Japan was still the world's principal importer of raw scutes used for the production of *bekko* (Bin Wagiman *et al.* 2006). Surveys conducted in 2004 among traders and artisans across the country found that levels of tortoiseshell stocks and sales were not diminishing, possibly due to illegal importation from Papua, Indonesia (Kinch & Burgess 2009) and other Asian countries such as Papua New Guinea, transiting through Singapore (JWCS 2004). The largest seizures from Indonesia included the confiscation of 89 kg (2003) and 400 pieces (2004) of shell product, adding to many other packages smuggled by mail and by air (Lam *et al.* 2011). The volume of trade to Japan is difficult to estimate due to the nature of the goods traded (scutes) (Lam *et al.* 2011) and to the fact that some *bekko* stocks, which can be stored dry for years, may remain from former imports^{ix} (Lam *et al.* 2011).

36. Finally, it is noteworthy that a total of 6,348 turtle items were seized between 2000 and 2008 in **Taiwan** (Province of China), including 6,120 *bekko* items (Lam *et al.* 2011). Although Indonesia was identified as the main supplier, it would be useful to explore further the integration of Taiwan in marine turtle trade in the IOSEA region.

1.2.3. Turtle egg market within the Coral Triangle region

37. Information available on trade in turtle eggs suggests that it may be geographically contained within countries of the Coral Triangle, especially Indonesia (East and West Kalimantan) and Malaysia (Sabah, Sarawak and Terengganu), among which exchanges appear intense.

38. An important turtle egg market has been reported in **Indonesia** in recent years. An estimated 100,000 turtle eggs per month were sold in 62% of the 29 cities investigated by ProFauna Indonesia in Indonesian **Borneo** between May and August 2010. This trade was concentrated in the cities of Pontianak, Banjarmasin and Samarinda, and supplied by Indonesian islands (such as Midai, Serasan and Natuna), as well as by South Sulawesi Province and Sembilan State in Peninsular Malaysia (ProFauna Indonesia 2010). More recently, increased law enforcement operations led to the seizure of about 10,000 turtle eggs on their way to eastern Borneo between June 2012 and June 2013¹¹⁵. Examples of smuggling towards East Kalimantan are reproduced in Table 5. There, the turtle egg industry in Berau Regency alone was estimated to generate an income of over US\$ 200,000 a year in 2002 (Chan & Shepherd 2002). Increasing smuggling of green turtle eggs from West Kalimantan to **Malaysia**, triggered by high prices, was also noted by WWF-Indonesia in 2013¹¹⁶ after illegal sale of eggs in the Serikin market of Malaysia, at the Sarawak-West Kalimantan border, was reported¹¹⁷. Numerous examples from recent years evidencing this trade route can be found in Table 5. In **West Sumatra**, although egg trade had reached worrying levels at Padang Beach in early 2010, the imposition of fines^x had reportedly improved the situation as of 2014: only three to five traders were seen selling turtle eggs on the beach by the end of January¹¹⁸. The existence of a turtle egg market with East Asian countries needs to be further explored.

^{ix} 40 tons per year in the 1970s and to 30 tons per year in the 1980s (Lam *et al.* 2011).

^x The fine for selling turtle eggs amounted to US\$8,169 as of February 2014.

Table 5. Kalimantan, Indonesia, a regional hotspot for turtle egg trade to Malaysian Borneo

Trade location/direction	Specific trade location/direction	Details on egg trade cases	Date
Towards East Kalimantan		Seizure of about 10,000 turtle eggs in several operations ¹¹⁹	June 2012 – Jun 2013
Seizures conducted in East Kalimantan – unknown direction	Berau, East Kalimantan	1,271 eggs seized (ProFauna Indonesia 2010)	Jan. 2010
	Derawan Archipelago, East Kalimantan	3,500 green turtle eggs intercepted ¹²⁰	Mar. 2008
From West Kalimantan, Indonesia to Sarawak, Borneo, Malaysia	From Pontianak to Sarawak (Malaysia)	3,900 eggs confiscated ^{121,122}	Aug. 2012
	From Pemangkat to Serikin, Sarawak (Malaysia)	3,405 eggs seized ^{123,124}	Apr. 2011
	From Jagoibabang to Serikin, Sarawak (Malaysia)	Attempt to smuggle 9,000 eggs foiled (ProFauna Indonesia 2010)	May 2010
West Sumatra		21 traders selling an average of 78 eggs each per day ¹²⁵	2009
Java	Mangga Besar	Egg trade witnessed by ProFauna Indonesia ¹²⁶	Oct. 2013
From Indonesia to Singapore		Seizure of 40 eggs ^{127,128}	Dec. 2010

39. **Malaysia** also seems to hold a pivotal position in regional marine turtle egg trade within the Coral Triangle region (Table 6). Of the 20,255 turtle parts (eggs, whole turtles, shells) seized nationwide between 2004 and 2010 – including 65% in Sabah – an estimated 99% were eggs¹²⁹. Several recent examples of egg seizures in **Malaysian Borneo** from 2009 to 2011 suggest the existence of two hotspots for trade: **Sabah**, where green turtle eggs were reportedly sold outside markets in the absence of any control as of 2010¹³⁰; and **Sarawak**, where eggs – some sent from Indonesia – were observed in fish markets in that same year¹³¹. In Peninsular Malaysia, **Terengganu** seems to deserve its appellation of “egg trade hub” (WWF, 2011)¹³², considering the estimated 422,000 eggs traded in 2007 alone¹³³ – twice what green turtles lay on the state’s nesting beaches (TRAFFIC Southeast Asia 2009). This paradox is explained by the importation of eggs from neighbouring countries and from other parts of Malaysia where egg collection is illegal¹³⁴, such as from the Philippines and from Sabah^{135,136}, where in 2012 cheaper eggs¹³⁷ were reportedly sent by mail^{138,139}. On the consumer side, buyers apparently come to Terengganu from as far away as Indonesia, where egg consumption is illegal¹⁴⁰.

Table 6. In Malaysia, trade in turtle eggs is concentrated in Sabah and Sarawak (Borneo) as well as in Terengganu (Peninsular Malaysia)

Region	Specific trade location/Direction	Details on egg trade cases	Date
Malaysian Borneo: estimated 20,000 eggs traded from 2004 to 2010 ¹⁴¹	To Sabah	Attempt to smuggle in 5,000 turtle eggs thwarted (TRAFFIC 2013) ¹⁴²	Oct. 2011
	From Sarawak to Brunei Darussalam (seizure in BD)	4,700 eggs from Sarawak seized (TRAFFIC 2013)	Aug. 2011
	Serikin Market, Sarawak	1,200 eggs seized in two operations ¹⁴³	Dec. 2010
	From abroad to Sabah	6,250 turtle eggs seized ¹⁴⁴	Aug. 2010
	From southern Philippines to Sabah	One Filipino man and two boats arrested for attempting to sell 2,900 eggs in Sabah ¹⁴⁵	June 2009
Peninsular Malaysia	Terengganu	422,000 eggs traded ¹⁴⁶	2007
	From Philippines or Indonesia to Malaysian markets	8,000 eggs seized (Robin des Bois 2013a)	June 2013
	From the port of Sandakan (Sabah) to Malaysian markets	10,000 eggs seized (Robin des Bois 2013c) ¹⁴⁷	Nov. 2013

40. In the **Philippines**, it was estimated in 2002 that up to 70% of the eggs laid on the Tawi-Tawi (Turtle) Islands were being smuggled to neighbouring countries (Chan & Shepherd 2002). More recent estimations for this area as well as other parts of the country would be useful.

1.2.4. Other areas where trade in marine turtle derivatives occurs locally

Southeast Asia and proximity

41. Other countries of the SEA⁺ sub-region are involved in marine turtle trade, although less importantly. Information from **Papua New Guinea**, now somewhat dated, indicates that hawksbill turtle parts and eggs were not only traded locally, but also bartered (Koczberski *et al.* 2006). Items made of shell were found for sale in duty-free shops at Jackson's International Airport as of 2009, and a survey across eight provinces between May and August 2007 found that 32 of 59 retailers were selling hawksbill products, with a total of 1,441 items for sale. However, as of 2009, trade seemed limited within national borders, while most exports were personal possessions directed to Australia and the United States (Kinch & Burgess 2009). Trade in turtle eggs was reported in 2006 to be limited within the Huon coast, due to the fact that most eggs were consumed immediately or distributed through clan and kin networks upon harvesting (Kinch 2006).

Northern Indian Ocean

42. There is a paucity of information regarding turtle trade in the NIO and NWIO sub-regions. It was reported in 2009 that **Sri Lankan** villagers had access to turtle meat and eggs, but where and how these products were made available was unknown (Rajakaruna *et al.* 2009). No information regarding turtle trade in Bangladesh, India, Maldives and Pakistan could be found.

Northwest Indian Ocean Indian Ocean

43. Data for most countries of the NWIO sub-region are also lacking. In **Eritrea**, it was reported that an illegal market for turtle meat in the town of Assab remains, that turtle curios were commonly observed in restaurants, and that turtle oil was being sold both nationally and to Yemen (IOSEA Eritrea National Report 2014).

Western Indian Ocean

44. Several decade-old studies on trade in turtle products in the Western Indian Ocean are available. In 2005, illegal trade was occurring in back street houses and fish market shops in **Kenya** (Zanre 2005). Approximately 10% of the turtle products found in the Tana Delta and Malindi – Ngomeni areas were provided by foreign fishermen, mainly from Somalia and Tanzania (Nzuki 2005). In southwest **Madagascar**, local sale of turtle meat for consumption was thought to be common back in 2003 (Frontier-Madagascar 2003) as part of an integrated market involving a chain of fishermen, dealers and traders (Walker *et al.* 2004). More recently (2011), marine turtles constituted a negligible proportion of the important curio trade in the area (Gibbons & Remaneva 2011), possibly due to a paucity of demand from increasingly educated tourists (Frontier-Madagascar 2003). On the other hand, an important traffic of plastrons was identified in Madagascar in January 2012, leading to the arrest of five persons in Androka following the discovery of a stockpile¹⁴⁸. In July 2012, it was estimated that 40kg of plastrons were being shipped every week to Toliara, involving up to 50% of the fishermen of certain municipalities such as Itampolo¹⁴⁹. A new marine turtle smuggling network was also uncovered in northwest Madagascar in 2012, whereby isolated fishing villages were supplying traders established in Mahajanga; but the final destination of the products has not been identified (IOSEA Madagascar National Report 2014).

45. In **Mozambique**, although turtle meat used to be freely shared among villagers (Pascal 2008), it was reported in 2013 that the fishery had turned commercial in the past few years¹⁵⁰. While legal trade in turtle derivatives within **Seychelles** had ceased as of 2005, it was thought then that illegal exports might still occur (Mortimer 2005a). Finally, in **Tanzania**, an undercover investigation conducted in 2008 by Sea Sense found that turtle products (meat, shells, oil) were sold both openly and in secret at main landing sites in the Dar es Salaam area (West 2008), with Mafia Island being the

main provider of curio items (Sea Sense 2012). No information was found about turtle markets in Comoros, France or Mauritius; while in **South Africa** and **United Kingdom**, such trade was deemed not significant (corresponding IOSEA National Reports). The paucity of information pertaining to local and regional turtle markets outside of the Coral Triangle region calls for further investigation.

1.3. Drivers of illegal turtle take and trade

46. Typically, green and leatherback turtles are hunted for their meat; the hawksbill turtle is hunted for its carapace as the raw material for souvenirs (ProFauna Indonesia 2003); while the eggs of loggerhead and olive ridley turtles are considered a delicacy. Turtle meat consumption reportedly occurs in 75% of IOSEA Signatory States (IOSEA 2014), while trade in shell products seems to be predominant in East Asian countries. Drivers of the illegal take and trade of marine turtles and derivatives may fall into three categories: socio-economic (i.e. relatively high prices, poverty relief, nutritional needs, demand for luxury goods); cultural (i.e. traditional beliefs, taste preferences); and political (inadequate legislation and/or enforcement). This last factor will be dealt with in more detail in Part II. These drivers are often complementary and sometimes conflicting. A good example can be found in the Moheli Marine Park of **Comoros** where turtle hunting for meat was reported to be motivated economically, culturally and politically (C3-Comoros 2007). Reasons for hunting included a lack of alternative livelihood options and affordable meat substitute, the fact that turtle meat was considered to have good taste and to bestow strength, and a lack of enforcement of regulations that failed to involve local communities.

1.3.1. Conduct of research on illegal take and trade

47. As noted above, the level of trade, use and consumption of turtles and their socio-economic drivers has been investigated in many IOSEA signatory countries since 2000, and especially in **Indonesia** (Adnyana & Frazier 2003; Hilterman & Goverse 2005; ProFauna Indonesia 2005; Van Dijk & Shepherd 2004), **Madagascar** (Gibbons & Remaneva 2011; Blue Ventures 2010; Walker *et al.* 2004; Frontier-Madagascar. 2003; Walker *et al.* 2004) and **Viet Nam** (TRAFFIC Southeast Asia – Indochina 2004; Stiles 2008; Van Dijk & Shepherd 2004). Other countries where such academic studies have been undertaken to a lesser extent include: **Australia** (Nurse-Bray 2006), **Bangladesh** (Islam 2001; Rahman 2006), **Cambodia** (Lehr & Holloway 2002), **India** (Cornelius *et al.* 2007), **Islamic Republic of Iran** (Mobaraki 2010), **Kenya** (Nzuki 2005; Nzuki 2004), **Madagascar** (Cétamada 2012), **Malaysia** (TRAFFIC Southeast Asia 2009), **Mauritius** (Griffiths & Tatayah 2007), **Papua New Guinea** (Kinch & Burgess 2009; Kinch 2006), **Sri Lanka** (Rajakaruna *et al.* 2012; Richardson 2002), and **Tanzania** (Muir 2005). In addition, the history of turtle exploitation in the **Chagos Archipelago** was documented by Mortimer (2009). ProFauna Indonesia investigated “sea turtle exploitation in the name of conservation” in five locations in Bali (ProFauna Indonesia 2008). In the **Philippines**, a special task force was appointed in May 2012 to investigate the trade, hunting, sale, and killing of marine turtles in Cebu¹⁵¹. As for non-Signatory States, TRAFFIC investigated turtle trade involving **China** and **Japan** (Lam *et al.* 2011) and trade patterns within **Japan** (TRAFFIC East Asia-Japan 2000). The Japan Wildlife Conservation Society also published two reports on hawksbill shell trade in Japan (JWCS 2004; JWCS 2000). Based on available information, one regional study on marine turtle trade issues was identified – on marine turtle use in Southeast Asia (Chan & Shepherd 2002) – although more may have gone unnoticed by this analysis.

48. While many of these studies suggest that inadequate legislation and/or enforcement of existing regulations could be important drivers of illegal trade, a range of socio-economic and traditional/cultural drivers also come into play.

1.3.2. Socio-economic drivers

49. Socio-economic drivers of turtle trade have been identified in about two-thirds of the IOSEA Signatory States (IOSEA 2014). Around the Indian Ocean, turtle trade has become lucrative in response to increased poverty in **Indonesia** (Waayers 2006); while high prices of turtle meat in comparison to average wages were reportedly encouraging a **Vietnamese** illegal turtle fishery as of 2013¹⁵²; and beach poaching in Mayotte (**France**) where, in 2010, a single turtle providing 100 kg of meat could bring US\$950 to the poacher¹⁵³. In Rekawa, **Sri Lanka**, it was reported in 2002 that "beach boys" were either dependent or semi-dependent on the sale of eggs for income (Ekanayake *et al.* 2002). As of 2009, turtle fishing constituted an important source of income for a few Vezo people in **Madagascar** (Gough *et al.* 2009). In **Mozambique**, particularly in Inhambane province, turtle meat is reportedly consumed due to the absence of any affordable alternative source of protein, rather than as a delicacy (Williams 2013). Finally, Lam *et al.* 2011 reported that **Chinese** and **Japanese** poachers at sea were also mostly subsistence fishermen whose livelihoods depend on this activity.

50. The linkage between poverty and marine turtle exploitation is not always clear cut. In mainland Terengganu (**Malaysia**), although the state government reportedly allows egg collection to sustain livelihoods¹⁵⁴, a 2010 study conducted by WWF suggested that only a few villagers were actually relying on egg trade for survival, this part-time activity being rather only a complement to their household income (TRAFFIC Southeast Asia 2009). Similarly, in the **Philippine** Turtle Islands, egg collection in 2003 accounted for only 23% of fisher income (Cola 2003).

51. On the other hand, high living standards may also sustain demand in turtle products, such as in the case of demand for luxury goods. In **China**, there is high demand from the middle-class for meat and fat to cook turtle soup, and for costly accessories such as guitar picks and bags made of shell.^{155,156} In **Japan**, the demand for *bekko* used in decorations and other items (JWCS 2000) was thought to have remained at high levels in recent years (Lam *et al.* 2011). In **Indonesia**, the use of hawksbill shell to manufacture jewellery was reported a decade ago (ProFauna Indonesia 2003). Similarly in **Viet Nam**, the vast majority of tortoiseshell and whole specimens sold were said to be purely ornamental as of 2004 (TRAFFIC Southeast Asia Indochina 2004).

52. Increased living standards can also favour the development of tourism, which may in turn reveal an important driver for turtle trade. In 2011, WWF **Malaysia** pointed out that some local tourist guides in Terengganu were encouraging their clients to eat turtle eggs¹⁵⁷. Similarly, in **Papua New Guinea**, the manufacture of turtle shell jewellery was thought to be mainly driven by international tourist demand (Lam *et al.* 2011). There, while the number of outlets and marine turtle products on display had decreased in some areas, it was on the increase in some newly developing tourist areas in 2008 (Stiles 2008). In the **Maldives** also, trade in turtle parts was thought to be driven by the tourism industry (SAWEN 2008). In **Sri Lanka**, authorities discovered in early 2014 that turtle flesh had been supplied for a long time to tourist hotels in Negombo¹⁵⁸.

53. The unavailability and the inaccessibility of other affordable sources of protein surely play a role in levels of consumption of turtle meat and eggs. By way of example, turtle meat consumption appeared in **Bangladesh** less than a decade ago due to a decline of wild freshwater turtles¹⁵⁹. Understanding this kind of causality chain may help design innovative policies suitable to specific contexts. For instance, in 2007, Conservation International facilitated pig breeding in Ayau Islands, **Indonesia**, as a replacement for turtle meat. The project claimed to have achieved a reduction in turtle take of 80-100 turtles that normally would be consumed for the Christmas feast (Gjertsen & Niesten 2010). A similar **French** initiative from 2010 is noteworthy, where affordable meat substitutes such as chicken were introduced in Mayotte as an alternative to turtle meat consumption (IOSEA France National Report 2014). No evaluation of the efficacy of this measure could be found.

54. Finally, although it seems that links between socio-economic status and turtle consumption have not been thoroughly investigated, an interesting survey conducted in 2007 identified three categories of people most likely to engage in consumptive use in Rekawa, **Sri Lanka**. There, it was

found that females, individuals of no secondary/higher education and fishermen, engaged in less consumptive use than males, educated individuals and non-fishers (Rajakaruna *et al.* 2009). Further studies should be conducted elsewhere to investigate this relation in other contexts.

1.3.3. Traditional / cultural drivers

55. Consumption of turtle products appears to be encouraged by cultural beliefs in many communities around the IOSEA region. Examples from the SEA⁺ sub-region are numerous. In **Papua New Guinea**, tortoiseshell earrings are progressively added to girls' earlobes; and carved pieces of turtle scutes are used for betelnut consumption, as well as to make fish hooks, combs, bracelets, necklaces and ceremonial belts (Kinch & Burgess 2009). In **Indonesia**, marine turtles were commonly sacrificed in traditional Balinese Hindu ceremonies¹⁶⁰. Reports indicate that in Terengganu, **Malaysia**, turtle eggs are believed to cure asthma and promote male virility¹⁶¹. In **Viet Nam**, turtle products are believed to have medical and gastronomical values¹⁶²; and stuffed marine turtles are hung in homes to bring good fortune to the household (TRAFFIC Southeast Asia Indochina 2004). In some islands of **Myanmar**, the practice of offering live turtles to the spirits was reported in 2004 (Mi Mi Maw 2004). Generally, more recent indications about such beliefs would be useful for the purpose of this analysis.

56. Turning to the WIO sub-region, in Mayotte (**France**), it was reported that turtle hunting is a deeply rooted traditional activity which an official ban in 2000 was not able to eradicate¹⁶³. In **Kenya**, turtle oil has been used in the past to treat asthma, impotence, infertility, waterborne diseases, earaches, measles, tuberculosis, and even to induce quicker placenta presentation (Nzuki 2005). The Bajun people in the Watamu area considered turtle hunting as a right which provided them with meat and oil, considered a medicine (Zanre 2005). In northern **Madagascar**, turtle blood and testicles were believed to have therapeutical values¹⁶⁴. In **Maldives**, turtle body fat was believed to be an aphrodisiac¹⁶⁵, while in **South Africa** turtle eggs are sometimes fed to chickens to increase their productivity (R Kyle, pers. Comm., *in* IOSEA South Africa National Report 2014).

57. On the other hand, traditional/religious beliefs may have the potential to deter turtle consumption in some parts of the IOSEA region, typically where Hindus consider turtles as incarnations of gods, and Muslims see turtles as *haram* (Frazier *et al.* 2007). In **Myanmar**, it was reported that some fishermen believe killing and eating of turtle meat brings bad luck and has adverse effect on their income (Win & Lwin 2012). For other reasons, leatherback, hawksbill and loggerhead turtles are spared in **Kenya**, due to beliefs that their meat is poisonous (Zanre 2005). However, the role of such beliefs in preventing turtle trade in the region appears limited. For instance, in southern **India** trade in turtles occurred despite the turtle's reputation as a bad omen (Frazier *et al.* 2007).

58. In any case, it is important to assess the evolution of these beliefs in order to understand the complexity of current and predicted trends on levels of take and trade. Traditional beliefs justifying turtle consumption retain all their importance in **China**, where demand for marine turtle bones for the preparation of medicines (Lam *et al.* 2011); for meat and fat to cook traditional turtle soup; and for stuffed whole turtles as a status symbol to display in homes^{166,167}, has increased despite legislation (Lam *et al.* 2011). Although the dislocation of traditional beliefs is typically thought to reduce turtle trade, modernity may also have adverse effects when it causes the disappearance of sustainable management systems. For example, the arrival of the Catholic Mission in southwestern **Madagascar** stigmatized the deification of turtles by the Vezo people as "supernatural", thus diminishing the positive impact of this belief in limiting the levels of take (Pascal 2008; Langley 2006). In Ifaty, such dilution of traditional knowledge (Muttenter 2007), and other recent changes – including the availability of new capture methods (Pascal 2008), a national population growth rate of 3% and the phenomenon of coastal migration – portends a worrying development of the marine turtle fishery (Jones 2012).

59. The consumption of turtle products seems also to be driven by subjective factors such as taste preferences (Buchanan *et al.* 2009). Different turtle products may be considered as delicacies, depending on geography. Turtle eggs are reportedly consumed for pleasure in **Brunei**

Darussalam¹⁶⁸; in Terengganu (**Malaysia**) according to 78% of the respondents of a 2009 study (TRAFFIC Southeast Asia 2009)¹⁶⁹; and in the **Maldives**, where they are widely cooked¹⁷⁰. Separate surveys found that turtle meat is enjoyed in **Kenya** in the Watamu area (Zanre 2005) as well as in the village of Ifaty in Southwest **Madagascar**, where more than 87 % of the respondents declared consuming marine products “very often”; the majority every day (Jones 2012). Cases of death and sickness induced from eating turtle meat demonstrated the continuing popularity of this product in Bali (**Indonesia**) as recent as March 2013^{171,172}. So too, in **Tanzania**, where in the region of the Temeke Municipality turtle meat consumption (and poisoning) was reportedly common as of 2008 (West 2008) and also in March 2014¹⁷³. In the **Philippines**, where green turtle meat, fat and cartilage are used in the preparation of turtle soup¹⁷⁴, a single eatery at the Pasil Port in Cebu City was said to cook 80kg of it every day¹⁷⁵. Although this information does not intend to be comprehensive, it speaks to the need for awareness campaigns focusing on taste preferences as a means of altering consumptive behaviour.

* * * * *

Knowing the drivers of poaching and trade within national contexts helps to understand which deterrents may be effective. For instance, where commercial demand is the main culprit, accent should be put on bolstering regulations at the national level and/or committing more strongly to implementing the provisions of IOSEA and other instruments. Where inadequate enforcement of an existing corpus of law is to blame, expertise may be sought from regional trade monitoring bodies, such as the ASEAN-WEN network or TRAFFIC. The following sections aim to document initiatives taken over the last decade by governments, intergovernmental agencies and NGOs to fight illegal take and trade of marine turtles both at national and regional levels – as well as to suggest areas for improvement.

II. Initiatives taken to fight illegal take and trade at the national level

60. As a preliminary remark, it should be noted that although the information presented below pertains mainly to the SEA⁺ sub-region, and to a lesser extent to the WIO sub-region, it does not necessarily imply that such initiatives have been more numerous or effective in these sub-regions. The NIO and NWIO sub-regions may also have been the ground for such initiatives, but very limited information was found for these areas.

2.1. State-led initiatives on legislation, interagency collaboration, training and education

61. Public authorities appear to have been at the origin of many initiatives taken over the past decade to combat turtle trade. However, the effectiveness of the measures undertaken is often unknown.

2.1.1. Legislative and management initiatives

62. Virtually all IOSEA countries have enacted legislation to prohibit direct take and domestic trade in turtles and turtle derivatives; and nearly 85% of Signatory States report having some domestic management programmes that include limits on levels of intentional take (IOSEA 2014). It would be useful if Signatory States were to provide copies of relevant national legislation for retention by the Secretariat, as has been requested in the past. The following presents an informative, but not exhaustive, overview of some of the initiatives taken in this area.

63. Based on available information (mostly found for the SEA⁺ sub-region), there is still room for improvement in the application of legislation against turtle take and trade in many countries. Although, in 2013, **Australia** tripled to more than US\$3,000 its fine for illegally killing turtles¹⁷⁶, it

was reported that any attempt to tighten laws faced resistance from the indigenous community¹⁷⁷, most of which has self-imposed harvest limits¹⁷⁸. In **Indonesia**, the joint decrees adopted in 2005 by governors of Bali and West Nusa Tenggara to prohibit the consumption of turtle meat at religious ceremonies¹⁷⁹ were said to have been insufficient to deter trade, at least on Bali and Enu Island (Moluccas) (WWF Indonesia 2005). In **Japan**, fines and imprisonment for poaching turtles were defined in April 2008 (Lam *et al.* 2011), however it was previously noted that domestic demand of "bekko" would not likely decrease as long as trade continued to be permitted. In **Fiji**, a 10-year moratorium on turtle harvesting valid until 2018 was publically reaffirmed this year^{180,181}, but no more information on the concrete (legislative) implications of this announcement could be found. A similar moratorium has been in place in **Maldives** for nearly two decades^{xi}, but anecdotal information scattered throughout this report suggests that it has been widely ignored.

64. In **Malaysia, Indonesia and Thailand**, individual concession systems for turtle egg harvesting, in place since at least the 1950s, were said to have become obsolete by 2009. For example, in the Indonesian Derawan Islands, concessions were phased out due to recent dramatic declines in turtle populations there (Ferraro & Gjertsen 2009). In Peninsular **Malaysia**, licensing systems regulate the collection of eggs only from species other than leatherback turtles (TRAFFIC Southeast Asia 2009)^{182,183}, and existing laws in most other states define penalties that are too low^{184,xii}. Moreover, some Malaysian states (Perlis and Selangor) still have not adopted any legal protection for their turtle populations in the absence of a national legislative corpus on turtle conservation. The urgent need to harmonise legislation among the states of Malaysia has been repeatedly pointed out as a prerequisite for improving the effectiveness of some states' existing legislation (Chan 2006)^{185,186,187,188}. This call seems to be supported by the fact that in states where a ban in all trade and consumption of eggs has been enacted, such as in Sabah and in Sarawak's Turtle Islands¹⁸⁹, a recovery of the local green turtle population has been reported (Ahmed *et al.* 2006).

65. More positively, in the **Philippines** the military met with local authorities in Palawan in May 2014 to pledge increased joint efforts in marine turtle conservation in the Turtle Islands¹⁹⁰, where an administrative order provides for the conservation of a certain percentage of collected eggs (IOSEA 2014). In **Indonesia**, a federal request for provinces to support marine turtle conservation (ProFauna Indonesia 2010) was followed by increased law enforcement operations responsible for the seizure of about 10,000 turtle eggs on their way to eastern Borneo between June 2012 and June 2013¹⁹¹. Interestingly, in **Seychelles** it is reported that protected areas where all hunting is prohibited have proven to be more effective than 'selective' regulations (IOSEA 2014).

66. No specific information was found for the NIO sub-region, but it is noteworthy that egg collection was still occurring in **Maldives** as of 2013, despite a partial moratorium^{192,193}. Recent information from the WIO sub-region is more encouraging. In **Madagascar**, governmental representatives met in 2013 to set an agenda for the National Committee for Integrated Marine and Coastal Zone Management (CN-GIZC, in French) with a view to finalising a national action plan for marine turtles¹⁹⁴. In southwest Madagascar, some regions such as Androy have implemented a so-called "lilintany", a commitment to put an end to turtle smuggling¹⁹⁵, but with no reports on its implementation so far. In **Kenya** and **Tanzania**, *de facto* rights stem from social norms and rules of reciprocity, rather than any legal mechanism (Ferraro & Gjertsen 2009).

67. Initiatives involving the public also warrant mention. In the SEA⁺ sub-region, the ASEAN-WEN Program Coordination Unit based in Bangkok, Thailand, allows individuals to report on suspected or observed marine turtle crime. In addition, many ASEAN-WEN member countries, agencies and support groups also run national wildlife crime report hotlines, namely **Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore,**

^{xi} A 10-year moratorium banning the killing or catching of any turtle species enacted in June 1995. While turtle eggs were not included in the original ban, the prohibition was extended to cover the taking eggs from 14 particular islands when the moratorium was extended in January 2006.

^{xii} The fine still amounts to only about US\$30 for killing a turtle in most states (IOSEA Headline 15 July 2012(b)).

Thailand and **Viet Nam**¹⁹⁶. In **France**, the Mayotte Marine Park manages an information network that allows members of the public to report any turtle found dead or in distress, with encouraging results as of 2012 (REMMAT 2013). If such hotlines are in use in other countries of the IOSEA region, they could not be identified based on information available.

2.1.2. Training and awareness-raising initiatives

68. Training initiatives by public authorities in the area of enforcement appear not to have been well documented, however a couple of recent initiatives are noteworthy. In June 2013, the Philippine Coastal Law Enforcement Alliance in Region 7 (**CLEAR7**)^{xiii} trained hundreds of enforcement officers from 12 provincial and national agencies in the fight against marine wildlife crime^{xiv} 197. In **Tanzania**, a two-day marine legislation seminar was held in Tanga Region in 2014 to educate a wide range of law enforcement officers on the need to address domestic trade in marine turtle products; and similar seminars were planned at three other locations in the country (Tanzania IOSEA National Report 2014). In **Eritrea**, the Ministry of Marine Resources sent official letters in 2009 to invite certain ground force offices to cooperate on deterring turtle poaching¹⁹⁸. **Viet Nam** reportedly achieved good results^{xv} with its awareness campaign initiated in 2003^{xvi}, targeting government agencies as well as souvenir business owners and managers (Stiles 2008). In contrast, in **Mozambique**, a lack of motivation and knowledge among law enforcement officials, rather than a lack of means or human capacity, was said to be responsible for inadequate enforcement (IOSEA Mozambique National Report 2014), suggesting a need for awareness-raising initiatives aimed at public authorities. This may also be true of other countries.

69. The potential for increased awareness-raising efforts directed to the general public should not be underestimated in many countries, especially in **Malaysia**. In Terengganu for instance, most egg dealers apparently believe that egg collection does not impair the survival of turtle populations¹⁹⁹. In Sabah also, the need to conduct surveys and public awareness campaigns to curb turtle egg trade was identified in 2013²⁰⁰. Such public education programmes were initiated in **Myanmar** in 2012, targeting coastal communities (Win & Lwin 2012), but no performance assessment could be found.

70. In the WIO sub-region, an awareness campaign in **Comoros** to achieve zero poaching in 2015 was launched by the Moheli Marine Park and the ADSEI NGO in April 2014, in partnership with government authorities²⁰¹.

2.2. Enforcement actions and identified gaps

71. Enforcement operations against the illegal take and trade of marine turtles carried out at a national level include: beach patrolling, monitoring of ports and airports, judicial condemnations, and controls over shell stocks. Overall, a number of Signatories draw attention to enforcement challenges in their IOSEA National Reports, particularly in remote areas and where there is a dependency on egg or turtle take for subsistence (IOSEA 2014). Based on available information, it appears that the majority of seizures have been conducted in the SEA⁺ sub-region, at sea, while fewer land operations conducted at airports, on nesting beaches, in restaurants or at private venues, were reported. Attention should be given to actual outcomes of enforcement operations, considering that some of them may

^{xiii} CLEAR7 is a regional task force of law enforcement agencies implementing coastal, fisheries and wildlife laws in central Philippines.

^{xiv} The US Coral Triangle Initiative Support Program, US National Oceanic and Atmospheric Administration (NOAA), US Coast Guard, and USAID-funded ARREST Program partners ASEAN-WEN and FREELAND Foundation also provided specialized inputs in the development of CLEAR7's upcoming operational activities.

^{xv} A TRAFFIC survey conducted in 2008 found that most businessmen in Viet Nam were aware that the capture, processing and sale of marine turtle products was illegal; and a decrease in domestic demand in turtle products (price decrease for worked items notwithstanding a great reduction in shell supply) (Stiles 2008).

^{xvi} In the framework of the Marine Turtle Conservation Action Plan to 2010 (MTCAP) formulated with assistance from IUCN, WWF, TRAFFIC and the Danish Government (MoFI 2004). The programme also aimed at destroying all remaining marine turtle products found for sale (Stiles 2008).

bring adverse effects. These can include poaching operations shifting underground, where enforcement is all the more difficult, or to more remote areas (often also the most vulnerable ones), as well as raising poachers' profits due to additional risk premiums put on products.

2.2.1. SEA⁺: a wealth of information

Quantitative analysis of enforcement operations

72. Details of seizures and prosecutions conducted from 2008 to 2013 abound in the SEA⁺ sub-region. This is mainly thanks to the consistent tracking record kept by ASEAN-WEN, but also to case-by-case reports highlighted in online newspapers. Of the 65 enforcement operations reported during that period – certainly not a complete picture – 60% concerned dead or live whole animals, more than 25% eggs, and less than 15% turtle derivatives. About 70% of all seizures concerned items that were being transported to trade hotspots. These in transit confiscations occurred at sea in 80% of cases (mainly by Indonesian authorities); with the remainder occurring at airports, railway stations, roads and river checkpoints. Less than one-third of the recorded seizures were conducted at private homes or in markets, stores and restaurants. As for the countries involved, the present analysis suggests that Philippine authorities have been the most pro-active (21 operations), largely distancing Indonesia (14), Malaysia (12) and Viet Nam (8), while one operation was reported in Australia, two in Brunei Darussalam, and one each in Myanmar, Thailand, New Zealand and United States. More than 25% of the total number of seizures identified over the period were carried out in 2011 alone, while fewer seizures were recorded during the years 2010 (20%), 2012 (18%) and 2013 (17%), and even less through 2008 (10%) and 2009 (8%) – possibly due to bias in reporting. Details are provided in Table 8, and a more detailed breakdown of seizures is also found in Annex 2.

Table 8. Breakdown of seizures conducted from 2008 to 2013 in the SEA⁺ sub-region, sorted by nature of product traded and by location of enforcement operation

South-East Asia ⁺ Data from 2008 to 2013		No. of seizures of whole specimens	No. of seizures of turtle eggs	No. of seizures of turtle products	TOTAL NUMBER OF SEIZURES	%
TRANSPORTING	At sea (mainly Indonesia)	21	12	3	36	80
	Airport, Railway station, Road, Checkpoint, River	3	4	2	9	20
SUBTOTAL		24	16	5	45	100
POSSESSING / SELLING	Markets / stores / restaurants	6	2	2	10	50
	On land (private possessions)	9	0	1	10	50
SUBTOTAL		15	2	3	20	100
Total Number of Seizures (%)		39 (60%)	18 (28%)	8 (12%)	65	

Seizures /year	2008	2009	2010	2011	2012	2013	Total
Number	7		13	17	12	11	65
Percentage	11	8	20	26	18	17	100

Enforcement gaps

73. Among all IOSEA signatories, **Indonesia** appears to have undertaken the most anti-poaching and anti-trade enforcement operations, after the Philippines, over the past decade; however, enforcement gaps are also largely documented in that country. A huge egg illegal market continues to thrive, especially in Borneo, where strong legislation is reportedly not adequately enforced^{xvii} (ProFauna Indonesia 2010). In the past, local authorities apparently condoned the trade in some areas, such as in Pantai Pangumbahan, West Java, where in 2006 some officials were accused of being directly involved in the egg trade²⁰²; and in West Kalimantan where in August 2009 an official was reportedly selling thousands of turtle eggs to finance a local nature resort (ProFauna Indonesia 2010). In East Kalimantan, the fight against egg poaching was impaired after residents forced conservation NGOs to leave Sangalaki islands in 2012^{203,204,205,206}. In the Derawan Archipelago, enforcement authorities lack basic resources such as fuel needed to conduct patrols²⁰⁷. In Padang, authorities were reported in 2010 to be powerless to curtail the trade of eggs from customarily owned islands²⁰⁸.

74. Enforcement gaps were also noted in other SEA⁺ countries, especially in **Malaysia**. In Sabah, the authorities' inaction against poaching by seaweed farmers, artisanal and foreign fishermen, was highlighted in April²⁰⁹ and March 2014 (Robin des Bois 2014). Eggs are reportedly collected from that state for smuggling to Terengganu in Peninsular Malaysia.^{210,211} In Terengganu also, the licensing system restricting the right to collect and sell green turtle eggs to 35 licensed collectors was reported in 2010 to be not well-respected²¹².

75. Notably, out of some 16 or more cases of poaching recorded in **Philippines** waters from 2008 to May 2014, only one led to conviction in court²¹³. In the Turtle Islands, crimes are either unsolved or settled out of court due to fact that the closest prosecutor's office, court and detention facilities are 14 hours away by boat^{214, 215}. Enforcement caveats arising from a lack of resources were also pointed out in **Papua New Guinea** (Kinch 2006). In **Viet Nam**, the remoteness of poaching sites, insufficient enforcement capability and corruption among law enforcers were denounced in 2009 (Schoppe & Antonio 2009). The country's 2002 national ban on turtle products was said to have been insufficient to stop all trade, due to uneven enforcement (Stiles 2008). No information for **Myanmar, Thailand** and **Guam** (USA) could be found from the sources available.

2.2.2. Enforcement weaknesses in other sub-regions

76. The limited availability of information on the effectiveness of management initiatives to deter turtle take and trade in other sub-regions may be an indication of their restricted impact.

77. In East Asia, only a few reports of enforcement operations were found for **China** and **Singapore** (one each, in 2012 and 2010 respectively). In China, most vessels returning to Hainan port in 2009 managed to avoid control, due to checks being performed only occasionally (Lam *et al.* 2011) and catch often being offloaded to smaller boats prior control. Furthermore, it was noted that most vessels that were apprehended, fined and blacklisted continued their illegal activities unnoticed²¹⁶. Lam *et al.* (2011) drew attention to a shortage of funds allocated for enforcement actions and public awareness programmes against illegal trade. Pilcher *et al.* (2009) also found that most shop owners selling turtle products over the counter were little concerned by local enforcement at that time.

78. Many enforcement pitfalls were also identified in the WIO sub-region. In **Comoros**, a lack of funds in recent years has allowed the return of alarming rates of poaching which had decreased since the creation of the Moheli Marine Park²¹⁷. Although the "Brigade Nature" in Mayotte (**France**) has been fighting poaching at sea and on nesting beaches with some success since 2003 (Grolleau 2009) (IOSEA France National Report 2014), a decision not to renew local personnel²¹⁸ has impaired the effectiveness of these activities. In **Mozambique** it was reported that the 2,600 km coastline was patrolled only occasionally by a single official boat (Williams 2013) and that no control was being

^{xvii} A theoretical imprisonment of five years and a fine of about US\$9,000 (ProFauna Indonesia 2010).

conducted outside formal Conservation Areas (IOSEA Mozambique National Report 2014). In **Tanzania**, a lack of enforcement has allowed widespread take and sale of turtle products in Dar es Salaam (West 2008; Sea Sense 2012). In **Madagascar**, on the other hand, it was reported that a ban on turtle hunting in the Nosy Hara marine park has been followed by an increase in the turtle population (Razafindrakoto 2013).

79. Turning to the NIO sub-region, only nine seizures were identified over the past decade, all occurring between 2010 and 2014: one in **Bangladesh**²¹⁹, four in **India**^{220,221,222,223}, one in **Maldives**²²⁴ and three in **Sri Lanka**^{225,226,227}. Qualitative information was found only for **Maldives** where, as of 2013, little action had been taken to enforce existing local conservation laws²²⁸ and problems of turtle slaughter, egg collection and keeping hatchlings as pets, were reportedly not taken seriously by local authorities²²⁹. As for the NWIO sub-region, only one enforcement operation was identified during the last decade, namely in **Eritrea** in 2009, where a trade case was condemned by court²³⁰.

* * * * *

Apart from seizures and prosecutions, other mitigation options include direct economic incentives to deter illegal take and trade, and the creation of alternative livelihoods. Such initiatives were found in most countries of the IOSEA region, albeit limited in scope.

2.3. Economic incentives and exemplary measures taken in IOSEA States

2.3.1. Direct incentives: employment and compensation

Employment of local stakeholders

80. Examples of apparently successful payment incentive schemes – mostly carried out by NGOs – to reduce turtle by-catch and hunting in selected countries of the SEA⁺, NIO and WIO sub-regions are documented in Table 9. It should be noted, however, that rigorous analyses of long-term effectiveness are generally lacking.

Table 9. Apparently successful examples of local stakeholder employment in the IOSEA region

Region	Country	Specific location	Details on programme and performance assessment	Timeframe
SEA ⁺	Indonesia	Pulau Banyak	Employment of former egg poachers for beach patrolling: all egg poaching from the main nesting site reportedly stopped ^{231,232}	2007 - 2011
	Papua New Guinea	Morobe Province	Beach patrolling of coastal community members diminished their reliance on harvesting leatherback turtle eggs for income (Kinch 2006)	2000s
	Vietnam	Bai Thit Turtle Station	Former turtle hunters, engaged as turtle rescuers for US\$14 a month under the WWF programme, had protected 50,000 turtles – even though this income was equivalent to one night fishing as of 2012 ²³³	2002-2012
NIO	India	Tamil Nadu	Beach patrolling activities against poaching creating jobs for youths from the fishing community, under a programme run by the TREE Foundation ²³⁴	Since 2002
		Andhra Pradesh	Beach patrolling activities against poaching creating jobs for local fishermen organized in a Sea Turtle Protection Force set up by the Visakha Society for Protection and Care of Animals (VSPCA 2013)	Since 2004
		Odisha	Beach patrolling activities against poaching creating jobs for 40 former poachers employed by the Forest Department ²³⁵	As of 2012

	Sri Lanka	Kosgoda and in Rekawa	Former egg poachers hired by Turtle Conservation Project (TCP) to patrol beaches (Kapurusinghe 2012; Ekanayake <i>et al.</i> 2002) ^{236,237,238,239}	1996 - 2011
WIO	Kenya	Lamu	Ex-poachers hired as beach guards by the NGO Lamu Marine Conservation Trust (LAMCOT 2010)	2008 - 2010
		Mombasa	Ex-poachers hired as beach guards by the Baobab Trust (Baobab Trust 2010)	1990s –2010
		Kiunga Marine National Reserve	Ex-poachers hired as beach guards both by the Watamu Turtle Watch (WTW) programme of the Local Ocean Trust (LOT), targeted at local villagers (Church and Palin 2003) and by the Conservation and Development Project (a partnership between the Kenya Wildlife Service and WWF), targeted at women (Ferraro 2007)	Since 1996
	Madagascar	Southeast	Egg collectors paid twice the per-egg market price to leave nests intact as part of a pilot project (Rakotonirina <i>et al.</i> 2004)	As of 2004
	Tanzania	Mafia Island	Payment by WWF of US\$3 for nest reporting deemed conclusive (WWF 2005b) ²⁴⁰	2002 - 2005
			34 community Conservation Officers trained and paid by the Sea Sense NGO to effectively monitor nests (Sea Sense 2012), accounting for a drop of nest poaching rate from 100% prior to 2001 to 1,6% in 2008 (Gjertsen & Niesten 2010). Note: The mean payment per nest in 2004 was US\$4, and a casual laborer wage was US\$0,60 per day (Ferraro 2007).	2001-2008
		Temeke District	Poaching rate of nests lowered to only 4% as of 2005 reportedly due to nest monitoring programme (Ferraro 2007)	As of 2012

81. The limited extent of payment incentive schemes targeting local stakeholders may be explained by the ephemeral presence of turtles, as well as the high financial cost, requirement of staff time and ethical shortcomings pertaining to such approaches (Ferraro 2007). In Indonesia, for example, the nest protection payment program initiated in 2000 by the Sangalaki Dive Lodge on Sangalaki Island (East Kalimantan) terminated in 2002 due to budget constraints (Ferraro & Gjertsen 2009). Similarly, the governmental cash incentive programme to employ local beach guards in Bali and on the Derawan Islands lapsed in 2006 due to too low levels of payment (Ferraro & Gjertsen 2009). The same kind of problem was reported in **Malaysia**, where the Sea Turtle Research Unit programme paid licensed collectors on Redang's major nesting beach to protect nests between 1993 and 2005. Here the programme's effectiveness was impaired by too low levels of payment compared to market prices (Ferraro 2007). In the **Philippines**, the Zambales Turtle Conservation Programme offered former poachers rewards for eggs (EPAFI 2005), but the effectiveness of the initiative is unknown.

Financial compensation to turtle exploiters and provision of loans

82. A few compensation schemes organised in former times apparently brought mixed results. In **Indonesia**, WWF and SEACOLOGY provided 13 three-year scholarships to village students (worth US\$23,000) in 2005 under the condition that they maintain a 280-acre no-take leatherback nesting beach, reportedly with successful results (Gjertsen & Niesten 2010). On the other hand, most loans provided to fishermen by WWF-**Philippines** in the Turtle Islands from 1999 to 2004 for abandoning destructive and illegal means of fishing were either never reimbursed or led to an increase in unsustainable fishing activities (WWF 2005a). In **Seychelles**, the unconditional compensation of 40 artisans with US\$15,000 each following a ban in turtle trade in 1993 (Ferraro & Gjertsen 2009) did not prevent widespread sales on the black market (Mortimer 2004).

2.3.2. Indirect incentives: facilitation of alternative livelihoods for turtle-users

83. “Conservation by distraction” approaches (Ferraro and Simpson 2002) consider that illegal take and trade can be curbed by encouraging poachers and smugglers to engage in alternative livelihoods – such as aquaculture, beekeeping, agricultural, forest or horticultural activities, handicraft production and ecotourism – and that turtle and egg consumption can be decreased if consumers are offered alternative sources of protein and products. The most widespread type of indirect incentives to switch to alternative livelihoods, identified in ten IOSEA Signatory States, seems to be the transfer of skills to former fishermen and poachers, initiated almost exclusively by NGOs. Past examples of training, mostly in ecotourism, are listed in Table 10. Their performance has not been independently assessed. It is likely that other proactive measures conducted throughout the IOSEA region are not reflected in the present analysis, and readers should refer to IOSEA document MT-IOSEA/SS.7/Doc. 10.3, *Socio-economic and Cultural Implications of Marine Turtle Use and Conservation*, prepared for the Seventh Meeting of IOSEA Signatory States (Bonn, 2014).

Table 10. Examples of facilitation of alternative livelihoods for turtle-users in the IOSEA region

Region	Country	Specific location	Type of training	Implementing organisation	Source	Time-frame
SEA ⁺	Indonesia	Bali	Ecotourism	WWF	IOSEA Indonesia National Report 2014	2005 - 2006
		off West Sumatra	Ecotourism	Yayasan Pulau Banyak NGO	Muurmans 2011	Since 2007
	Philippines	Turtle Islands	Micro-entrepreneurship	WWF	²⁴¹	2004
	Thailand	Phra Thong Island	Ecotourism	Naucrates	²⁴²	Since 2012
	Vietnam	Con Dao National Park	Ecotourism	WWF	Van der Meeren & Huong Thuy Phan 2009	2007 - 2009
WIO	Madagascar	Bay of Ranobe	Ecotourism	Reef Doctor	²⁴³	Since 2002
	Seychelles		Various activities under the “Hawksbill Artisan Training and Compensation Project”	Seychelles government	Mortimer & Collie 1998	1993
NWI	Islam. Rep. of Iran	Hengam Island	Ecotourism	Local authorities	²⁴⁴	Since 2012
NIO	Bangladesh		Horticulture, fish processing and fishing	UNDP	Green & Islam (2012)	2001 - 2007
	India	Orissa	Honeybee keeping and net mending for 80 fisherwomen	Alacrity	Alacrity 2011	1995-2011
	Sri Lanka	Koskoda	Ecotourism	Turtle Conservation Project	²⁴⁵	As of 2009

2.3.3. Examples of good practice

84. Religious leaders have been used as a source of authority in at least three IOSEA Signatory States to help curb the level of illegal use of turtles. In **Indonesia**, Balinese Hindu priests have helped to reduce the use of turtle meat in religious ceremonies by declaring this practice non-compulsory (IOSEA Indonesia National Report 2014). In March 2014 Indonesia's top Islamic clerical body was singled out by WWF as a pioneer for issuing a *fatwa* against the illegal hunting and trade in endangered wildlife²⁴⁶. In Terengganu, **Malaysia**, mosque and village talks and radio are increasingly

used to communicate messages on marine turtle conservation (TRAFFIC Southeast Asia 2009). In the **Islamic Republic of Iran**, Grand Ayatollahs have orally prohibited turtle egg and meat consumption (IOSEA Iran National Report 2014). Such initiatives might be worthy of exploration in other countries where religious and other institutional authorities are held in high regard by the general public.

* * * * *

While these initiatives taken by states at a national level are laudable, an even greater potential may be found in regional cooperation and sharing of expertise and experience. The following section describes past initiatives in this regard.

2.4. Voluntary multilateral / bilateral cooperation between States

85. According to national reports submitted to IOSEA, relatively few Signatory States (e.g. Australia, Comoros, Kenya, Mauritius, Saudi Arabia, Seychelles, and Viet Nam) appear to have engaged in voluntary exchange of information over illegal international trade issues, such as through bilateral discussions and international forums.

86. Over the past decade, however, several initiatives have been undertaken by IOSEA members on a trans-regional scale. In February 2014, during the London Conference on the Illegal Wildlife Trade, hosted by the **United Kingdom**, representatives from 46 countries and 11 international organizations committed to “*eradicate markets for illegal wildlife products*”²⁴⁷. The need to strengthen border security to tackle trafficking of wildlife was previously identified by **G8** leaders in June 2013²⁴⁸.

87. Recent cooperative initiatives within the SEA⁺ sub-region have also involved the **United States**. As of July 2013, that country was providing more than US\$ 2 million to support efforts in relation to wildlife trade awareness, investigation and prosecution in East Asia and the Pacific²⁴⁹. In October 2013, **California** and **Indonesia** signed an agreement to try to stop Pacific leatherback poaching by educating Indonesian communities, training local researchers, and possibly establishing links between marine sanctuaries in the two states²⁵⁰. In August 2012, government agencies from Asia^{xviii} and the United States Humane Society participated in “Operation Wild Web”, resulting in 154 seizures in the United States, including turtle shells and turtle skin boots²⁵¹. **Japan** also appears to be playing a leading role: in 2013, the Japanese government and the East and Southeast Asia Biodiversity Information Initiative (**ESABII**) funded a project to train officers in **Myanmar**, delivering workshops on wildlife trade and species identification to 60 law enforcement officers in January 2013²⁵².

88. Other examples of bilateral or multilateral initiatives in the SEA⁺ sub-region have been documented. In January 2013, 45 government officials from the Coral Triangle – including **Indonesia**, **Malaysia**, and the **Philippines** – agreed new guidelines to address many marine issues including turtle poaching, and made plans for their implementation²⁵³. In June 2014 **Indonesia**, **Malaysia**, **Viet Nam** and the **Philippines** pledged to enhance regional cooperation in the crackdown on illegal trade in marine turtles in the waters of the Coral Triangle during a workshop hosted by the Philippine government²⁵⁴. Finally, in April 2011, enforcement agencies from **Cambodia** and **Viet Nam** organized a common workshop to strengthen collaboration to combat illegal trade in wildlife between the two countries²⁵⁵. One of the most iconic examples of cooperation was the establishment in 1996 by **Malaysia and the Philippines** of the Turtle Island Heritage Protected Area, the world’s first transborder protected area for marine turtles (Sabah Parks 2013) – later expanded in the Sulu-Sulawesi Seas Tri-National Sea Turtle Conservation Corridor which includes the Indonesian Derawan Islands (Trono & Cantos 2002).

^{xviii} Indonesia’s Ministry of Forestry and National Police, Singapore’s Agri-Food and Veterinary Authority, and Thailand’s Royal Thai Police and Department of National Parks, Wildlife, and Plant Conservation.

III. Intergovernmental and nongovernmental initiatives

89. Three-quarters of the IOSEA Signatory States reportedly have mechanisms in place to cooperate in enforcement of legislation with collaborators such as CITES, INTERPOL, domestic and foreign customs services, airport, port and coast guard authorities, specialised enforcement networks (such as ASEAN-WEN), wildlife agencies and NGOs. A similar number of countries declared having their own CITES training programmes or are participating / cooperating in those of other bodies (IOSEA 2014).

3.1. United Nations bodies

90. Although many United Nations entities appear to be involved in capacity building, reporting and enforcement activities against wildlife trade, the extent to which these activities directly concern marine turtles is not always clear. Available information rather suggests a concentration of activity on illegal trade in high value terrestrial commodities, such as elephant ivory, rhinoceros horn and timber.

91. Many activities focus on training, capacity-building and awareness-raising. Created in November 2010, the International Consortium on Combating Wildlife Crime (**ICCWC**), an alliance comprising CITES, INTERPOL, the United Nations Office on Drugs and Crime (UNODC), the World Bank and the World Customs Organization (WCO)²⁵⁶, held its first meeting in March 2013²⁵⁷. In October 2013, the alliance delivered a two-day training workshop to officers and representatives from wildlife enforcement networks on the use of available tools and services²⁵⁸ – such as the *ICCWC Wildlife and Forest Crime Analytic Toolkit*, developed in 2012²⁵⁹.

92. About three-quarters of IOSEA Signatories reportedly have undertaken a national review of their compliance with CITES obligations in relation to marine turtles (IOSEA 2014). In February 2011, **Viet Nam** was the first country in the region to organize its own CITES and species identification course²⁶⁰. In **China**, a Provincial Inter-agency CITES Enforcement Coordination Group (PICE-CG) was established in June 2012²⁶¹. The UNODC Regional Office for Southeast Asia and the Pacific has drawn attention to the seriousness of wildlife crime, emphasising that buying, selling, and consuming protected species is illegal and finances organized crime²⁶². The Commission on Crime Prevention and Criminal Justice (CCPCJ) adopted Resolutions 22/6²⁶³ and 20/5²⁶⁴, in 2013 and in 2011 respectively, aimed at assisting Member States and UNODC in tackling wildlife trafficking at sea²⁶⁵.

93. Further initiatives that could be relevant to marine turtle trade have been taken by various other UN bodies. In March 2014, on the occasion of World Wildlife Day, the United Nations University (UNU) organised the Tokyo Conference on Combating Wildlife Crime²⁶⁶. In October 2012, the Global Taxonomy Initiative (GTI) of the **Convention on Biological Diversity (CBD)** and its related Capacity-building Strategy were agreed in India, with a view to assisting enforcement officers to identify illegally traded species²⁶⁷.

94. As for enforcement operations, the **INTERPOL** Environmental Crime Programme launched “Operation Ramp” in September – October 2010 against illegal trade in endangered wildlife²⁶⁸, which resulted in thousands of inspections²⁶⁹. Previously, “Operation TRAM”, focussing on the illegal trade in traditional medicines containing wildlife products²⁷⁰, led to the condemnation of a New Zealand company in March 2010 for smuggling hawksbill turtle powder from China²⁷¹.

95. Although the focus of the initiatives mentioned may be peripheral to the fight against illegal marine turtle trade, they suggest an opportunity and capacity for concerned institutions to become more involved in marine turtle trade issues.

3.2. Regional intergovernmental networks (ASEAN-WEN, SAWEN)

96. Created in 2005 and covering part of the SEA⁺ sub-region, the **ASEAN-WEN** network appears to be successfully reporting and combatting illegal turtle trade, both through the implementation of its ASEAN-WEN Support Program at a national level and through regional initiatives.

97. In recent years, especially in 2010, ASEAN-WEN has built capacity for member states to fight against turtle trade in South-East Asia. In September 2010, ASEAN-WEN partnered with national authorities in **Indonesia** to train 80 enforcement staff on relevant national legislation and species identification and handling²⁷² using identification guides produced in 2009²⁷³. **Cambodia** hosted a two-day ASEAN Wildlife Crime Workshop in August 2010, aimed at identifying potential weaknesses in the country's national legislation²⁷⁴, and an inter-agency capacity-building workshop to constitute a new Cambodian Wildlife Enforcement Network Coordination Unit to be integrated into ASEAN-WEN²⁷⁵. In August 2010 the **Vietnamese** Government partnered with ASEAN-WEN to launch a new Inter-agency Executive Committee for Viet Nam Wildlife Enforcement, comprising the Viet Nam Wildlife Enforcement Network (Viet Nam - WEN)²⁷⁶. In July 2010 and March 2008, respectively, **Thailand** organised two "Judiciary Workshops on Wildlife Crime and Prosecution" under the ASEAN-WEN Support Program – targeting national judges, police and customs officers – in cooperation with TRAFFIC Southeast Asia²⁷⁷.

98. In addition to operations focusing on specific countries, ASEAN-WEN has fostered regional cooperation and has organised meetings, often in partnership with NGOs. In April 2009, an ASEAN-WEN meeting held in Thailand facilitated the conclusion of an agreement to coordinate enforcement efforts to halt wildlife crime between Asian countries²⁷⁸. In May 2010, during ASEAN-WEN's Fifth Annual Meeting in Myanmar, Southeast Asian governments and international partners committed to further improve law enforcement and to strengthen collaboration against wildlife crime in the region²⁷⁹. In January 2011, the network joined with **TRAFFIC Southeast Asia** to train law enforcers from ten countries on how to identify threatened reptile species, and familiarized them with international wildlife protection policies²⁸⁰.

99. In recent years, ASEAN-WEN has also developed a strong partnership with the **Freeland Foundation**. Since 2011, both have helped to implement the USAID-funded ARREST Program (Asia's Regional Response to Endangered Species Trafficking)^{xix}, aimed at strengthening law enforcement capacity – scheduled to run until 2016.²⁸¹ One of the components of this programme is iThink, a demand-reduction awareness campaign launched in Thailand in January 2013, and subsequently in Vietnam and China²⁸² – however it is unclear whether trade in marine turtle products is included in that campaign. In December 2012, ASEAN and Freeland signed an MoU to strengthen and harmonize legislation across member countries²⁸³. From March 2009 to 2010, both organisations carried out a "Wildlife Trafficking Stops Here" campaign at airports in Thailand, Laos, Vietnam and Philippines²⁸⁴. This included a component to train airport staff on wildlife trade regulations, government officials on law enforcement, and freight companies on species identification and handling²⁸⁵. In November 2010, the two organisations held a 5-day planning session in Bangkok gathering enforcement officers from eight Southeast Asian countries as well as from China, Africa, and India, to identify and combat global wildlife trafficking syndicates operating across their borders²⁸⁶.

100. Elsewhere, the South Asia Wildlife Enforcement Network (**SAWEN**) was launched in 2011 by the South Asia Wildlife Trade Initiative (SAWTI)^{xx}. Modelled on the example of ASEAN-WEN, its eight member countries include five IOSEA Signatory States, namely Bangladesh, India, Maldives,

^{xix} In partnership with ASEAN-WEN, Freeland Foundation, ASEAN Centre for Biodiversity, ACRES, AsiaWorks TV, Conservation International (CI), Education for Nature Vietnam (ENV), International Fund for Animal Welfare (IFAW), INTERPOL, JWT, National Geographic, MTV-Exit, Wildlife Alliance, US Department of State, US Department of Justice, US Fish and Wildlife Service, and the US Forest Service (USAID 2011).

^{xx} SAWTI was developed by the South Asia Cooperative Environment Programme (SACEP) and TRAFFIC

Pakistan and Sri Lanka. During its first meeting in June 2012, SAWEN identified illegal wildlife trade routes and discussed regional operational plans for the fight against marine turtle trade²⁸⁷.

3.3. NGOs active in political lobbying, training and education

101. Nongovernmental organisations have also played an important part in the fight against turtle trade, complementing actions by governmental authorities. Actions conducted by **TRAFFIC** have included training more than 120 enforcement officers in Hainan Province in China²⁸⁸, conducting an awareness workshop for enforcement officers in **Brunei Darussalam** in April 2010²⁸⁹, and attempting to dissuade Chinese consumers from using threatened wildlife species during 2012 New Year festivities²⁹⁰.

102. In the SEA⁺ sub-region, **ProFauna Indonesia** has been active in political lobbying²⁹¹, demanding an end to marine turtle exploitation²⁹² and urging the Indonesian government to take action against illegal egg trade (ProFauna Indonesia 2010). Following a major poaching case in the Philippines in May 2014, an online petition was launched by environmentalists demanding the prosecution of Chinese poachers²⁹³, supported by a similar call from 15 civil society organizations²⁹⁴. **Conservation International** asked national authorities to adopt an action plan to better enforce anti-poaching regulation in Palawan in June 2010²⁹⁵. **WWF** had already developed a partnership with the Philippines Government in 1997 – suspended from 2001 to 2004 following a change in legislation – to allocate 40% of eggs collected by permit holders for conservation²⁹⁶. In Malaysia, **WWF** has repeated numerous calls for a national ban on turtle egg trade since at least 2011^{297,298}. In Thailand, an educational programme initiated by **Naucrates** in 1996 claimed responsibility for ending localised egg poaching at one site (Aureggi 2010). In Viet Nam, NGOs such as “**Education for Nature – Vietnam**”, which uncovered 4 marine turtles in two operations in January and February 2014 (Robin des Bois 2014), seem to be trying to fill a gap in public authorities’ inaction against poaching.

103. In the WIO sub-region, Madagascar-based **ReefDoctor** helped to create the first *dina* (traditional law) to prohibit the hunting of turtles under 70 cm in 2013 through a participatory approach involving 13 Vezo communities (Andriamalala & Gardner 2010)^{299,300}. Earlier efforts in **Mozambique** are also notable. The Mozambique Marine Turtle Working Group trained 24 community rangers who performed anti-poaching awareness programs among local communities in the Primeiras and Segundas Islands (Costa *et al.* 2007); while, in 2004, **WWF** initiated a campaign on the trade of marine protected species, involving 500 school pupils from Maputo and Matola, as well as some shop owners (Louro *et al.* 2006).

Conclusions: Areas for potential improvement

Harmonisation and enhanced enforcement of existing legislation

104. Although a need to enhance and harmonise national legislation has been identified in certain countries, notably Malaysia and Japan (non-Signatory), the need to improve enforcement of *existing* legislation is even more acute – particularly in Indonesia, Kenya, Madagascar, Malaysia, Philippines, United Republic of Tanzania, Viet Nam and China (non-Signatory), and possibly many more countries where significant trade is known to occur. This also implies strengthening bilateral and international cooperation in enforcement, through existing networks or possibly new trans-national partnerships between countries that are linked by illegal exports and imports. Challenges and opportunities for improving enforcement include identifying and articulating actual resource needs, increasing human and material resources, building field-level capacity at national and regional levels, and addressing weaknesses identified in the judicial process in some countries, probably not limited to the Philippines.

Socio-economic research focussing on local stakeholders

105. The socio-economic drivers of illegal take and trade of marine turtles and derivatives in the IOSEA region need to be investigated more thoroughly and more targeted strategies developed to address issues of supply and demand – particularly in hotspots where important sources of turtles or trade routes have been identified, such as Indonesia, Madagascar, and China (Hainan province). A better understanding and incorporation of traditional knowledge and practices is already proving to be crucial to conservation efforts in many countries, and needs to be extended. The potential application to the IOSEA region of innovative techniques such as the Community Voice Method (CVM) – used effectively elsewhere to gain a better understanding of the motivations of resource users and to ensure that their concerns are incorporated in decision-making – warrants exploration. Signatory States are encouraged to refer to the separate IOSEA document MT-IOSEA/SS.7/Doc. 10.3, *Socio-economic and Cultural Implications of Marine Turtle Use and Conservation*, where additional areas in need of investigation are described.

Potential to develop alternative livelihoods such as turtle-based ecotourism

106. Unexploited opportunities for non-consumptive marine turtle use, such as ecotourism, can be found throughout the IOSEA region. Many examples of good and bad practice exist to help guide new initiatives to approaches that are genuinely sustainable and beneficial in the long run for both humans and turtle populations. Similarly, the identification of alternative livelihoods adapted to local circumstances can draw upon lessons learned elsewhere in the IOSEA region and further afield.

Need for more education and awareness-raising

107. Windows of opportunity for education and awareness-raising to reduce egg consumption are seen in many places around the IOSEA region, such as in Malaysia, where one study showed that a majority of egg consumers would stop consuming marine turtle eggs if they knew that it contributed to the depletion of marine turtle populations (TRAFFIC Southeast Asia 2009). Similarly, in China, there is a clear need for an awareness campaign targeting local public, tourists, vendors and fishers about issues and existing regulations on the illegal sale and/or capture of marine turtles. Whereas most IOSEA Signatory States have engaged in public awareness campaigns with a specific focus on marine turtles, it is probably safe to say that the efficacy of these initiatives is rarely assessed to determine their impact on human behaviour. Any new undertakings should benefit from examples of approaches attempted elsewhere as well as lessons learned, and include a post-campaign evaluation component.

Need for enhanced regional cooperation

108. The present review has highlighted a number of intergovernmental mechanisms and processes concerned with fighting international wildlife crime, which IOSEA should tap into. Where they already have a marine turtle component, IOSEA may be able to benefit from new sources of information, expertise, and opportunities for networking. Where they do not yet have any particular focus on marine turtles, IOSEA may be in a position to introduce a new dimension to their ongoing work. The ASEAN-WEN network might serve as a model for other sub-regions where similar mechanisms do not already exist. Finally, the importance of China and Japan to marine turtle trade, highlighted in this review, reinforces the need for renewed efforts to encourage these countries to become signatories to the IOSEA Marine Turtle MoU.

ENDNOTES

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Annex 2 – Detailed breakdown of seizures conducted from 2008 to 2013 in the SEA⁺ sub-region

SEA+ 2008 - 2013		Whole specimens	Turtle eggs	Turtle products	Total
TRANSPORTING	At sea (mainly Indonesia)	2013 (unknown hawksbill) 2013 (unknown hawksbill) 2013 (300 unknown) 2013 (94 unknown) 2012 (33 green & hawksbill) 2012 (22 green & hawksbill) 2012 (50 hawksbill) 2012 (43, 24 green & 19 hawksbill) 2011 (18 green) 2011 (38 unknown) 2011 (32 green) 2011 (161 hawksbill & green) 2011 (9 unknown) 2011 (38 unknown) 2010 (87 green) 2010 (18 various) 2010 (2 hawksbill) 2009 (19 unknown) 2008 (65 unknown) 2008 (12 unknown) 2008 (101 hawksbill) = 21 SEIZURES	2013 (10,000) 2013 (2,000) 2013 (3,500) 2013 (3,000) 2013 (10,000) 2012 (3,900) 2011 (4,700) 2011 (5,000) 2010 (6,250) 2009 (1,250) 2008 (3,500) 2008 (10,000) = 12 SEIZURES	2011 (150 kg meat) 2010 (hawksbill turtle powder) + 2009 (dozens of sea turtle shells) = 3 SEIZURES	36
	Airport, Railway station, Road, Checkpoint, River	2013 (94 unknown) 2011 (120 hawksbill & green) 2011 (18 green) = 3 SEIZURES	2011 (252) 2011 (3,405) 2010 (9,000) 2008 (3,500) = 4 SEIZURES	2012 (90.5 kg green & hawksbill scutes) 2011 (pack of chopped sea turtle) = 2 SEIZURES	9
SUB-TOTAL		24	16	5	45
POSSESSING/ SELLING	Markets / stores / restaurants	2011 (102 unknown) 2010 (71 green) 2010 (4 unknown) 2010 (5 unknown) 2010 (1 green) 2008 (1 green) = 6 SEIZURES	2010 (1,200) 2009 (2,900) = 2 SEIZURES	2012 (5 kg green turtle scutes) 2011 (1 head hawksbill turtle and 1 piece turtle derivative) = 2 SEIZURES	10

	On land (private possessions)	2013 (3 unknown) 2012 (43 unknown) 2012 (100 unknown) 2012 (1 green) 2012 (2 Hawksbill) 2012 (17 unknown) 2011 (7 hawksbill) 2010 (1 hawksbill) 2009 (849 unknown) = 9 SEIZURES		2010 (1 stuffed green & 1 stuffed hawksbill)		10
SUB- TOTAL		15	2	3		20
	TOTAL	39	18	8		65