The trade of hawksbill turtles, *Eretmochelys imbricata*

With recommendations for improved conservation action under the Convention on International Trade in Endangered Species

by Tiffany Gibert

Image 1 A hawksbill turtle photographed in Mexico for Joel Sartore's Photo Ark project (Sartore, 2020)

Conservation status of the hawksbill turtle

The world's iconic sea turtles consist of seven species, all of which are listed on Appendix I of the Convention on International Trade in Endangered Species (CITES), thus restricting international commercial trade (CITES, 2019a). Of these species, the hawksbill turtle, *Eretmochelys imbricata*, has been exploited for centuries to meet demand for turtle meat, eggs, and tortoiseshell objects, known in Japan as *bekko* (Lam, Xu, Takahashi, and Burgess, 2012; UNODC, 2016). Due to the thickness, rich colors, and markings of their plates (or scutes), hawksbill carapaces and resulting manufactured products, such as combs and jewelry, have been traded extensively in numerous countries (UNODC, 2016; Miller *et al.*, 2019). Hawksbill populations have declined by about 90 percent from historical averages, with extensive trade concentrated in the increasingly globalized and industrialized twentieth century, before international regulations were established (Nivièrea. *et al.*, 2018; Gomez and Krishnasamy, 2019; Miller *et al.*, 2019). A recent survey of hawksbill turtle trade provides a new, and higher, estimate for the global take and trade over 150 years: about 9 million turtles (Miller *et al.*, 2019).

Today, there are roughly 25,000 nesting female hawksbill turtles (Miller *et al.*, 2019). From Japan's southern archipelago to the coastline of Brazil, the turtles' range includes the waters of about 108 countries (Lam, Xu, Takahashi, and Burgess, 2012; Nivièrea. *et al.*, 2018). Hawksbills are one of few marine creatures adapted to eat the sponges that compete with coral reefs for space and nutrients, thus playing a critical role in the balance of reef ecosystems (Lam, Xu, Takahashi, and Burgess, 2012; Harrison, von Weller, and Nahill, 2017). Given a lack of long-term monitoring and analysis, it is yet unclear how the sea turtles' declines have affected marine life, but Miller *et al.* estimate that sea turtle grazing rates, broadly, have declined by about 800 times historical averages (2019).

Conservation measures

At the launch of CITES in 1975, hawksbill turtles and their parts were traded between 45 countries, and Japan imported nearly 40,000 turtles annually to sustain the *bekko* industry (Mortimer and Donnelly, 2008). By 1977, both Atlantic and Pacific hawksbill populations were listed on CITES Appendix I, though multiple countries—including Japan, Italy, and France—

entered reservations to allow set trade quotas (Mortimer and Donnelly, 2008). To date, Cuba, Palau, and Saint Vincent and the Grenadines still maintain reservations for *E. imbricata* trade (CITES, 2019b).

In addition to CITES, multiple other international, regional, and transnational agreements restrict the take and trade of hawksbill turtles, including but not limited to those outlined in Appendix I. These primarily include regional frameworks, such as the Memorandum of Understanding on ASEAN Sea Turtle Conservation and Protection, and several agreements to facilitate international environmental protections, including the Ramsar Convention on Wetlands of International Importance.

As the 10 enumerated multilateral agreements illustrate, the conservation measures—which build on CITES regulations— to protect and restore hawksbill turtle populations are ambitious. Many key range countries, such as Indonesia, the Philippines, Belize, and Panama, are party to multiple agreements that require various degrees of engagement both regionally and domestically.

Despite these many agreements that acknowledge hawksbill declines, knowledge gaps of illegal trade and legislative inconsistencies persist. From 2015 to 2019, the turtles and parts in eight global seizures represented a minimum of 782 individual hawksbills (Gomez and Krishnasamy, 2019), and multiple assessments in different regions report that poaching and trade continue to threaten the species (Campbell, 2014; UNODC, 2016; Gomez and Krishnasamy, 2019; Bell *et al.*, 2020).

CITES Management Authorities and key stakeholders

As representatives of a CITES Management Authority, we recognize the need to better understand the limitations of current trade regulations and to assess opportunities for improved coordination on policy, enforcement, capacity building, and demand reduction. Given these considerations, Table 1 outlines a general stakeholder guide that may be applicable to parties involved in suspected hawksbill supply, demand, or transport.

Table 1 *Overview of hawksbill turtle trade stakeholders, interests, and influences. Informed by USAID (2017) and Moshier, Steadman, and Roberts (2019)*

Stakeholder	Interests	Scale of Influence
Federal funding/ budgeting agency Example: Ministry of Finance	• Fiscal balance • Risk management • Reducing costs • Making effective decisions	National, regional, and international
CITES Management Authority Example: Representatives from federal ministries or agencies	• Compliance with international regulations • Environmental conservation • Economic growth • Cultural heritage	National, regional, and international
CITES Scientific Authority Example: Federally-employed scientists	• Compliance with international regulations • Evidence-based decisions • Support from the international scientific community	National
Regional decision- makers and authorities Example: Protocol or memorandum secretariats	• Compliance with international regulations • Economic growth • Environmental conservation	Regional and international
Non-Management Authority public entities in range countries Example: Municipal and state governments; civil society organizations	• Environmental conservation • Legal compliance • Increasing both high-level and community support for activities • Clarity of roles and responsibilities in management and enforcement	Local and national
Law enforcement and judiciary Example: Customs agents, police officers, court officials (Supreme, district, etc.)	• Legal compliance • Federal and local support and funding • Increased capacity building to understand and enforce environmental regulations	Local and national
Local NGOs	• Environmental conservation • Cultural heritage • Alternative livelihoods and economic growth • Support from international community	Local and national
International NGOs Example: Wildlife Conservation Society	• Environmental conservation • Human well-being and sustainable development • Ethics	Local, national, regional, and international
National tourism operators	• Revenue • Client satisfaction • Cultural heritage	Local
Tourists (international and domestic)	• Affordable souvenirs • Understanding of local culture • Compliance with laws	Local
Community members Example: Artisans, fishers, shop owners	• Job security • Opportunities for increased income • Cultural heritage	Local

Using network analysis for combating wildlife trafficking scenarios (Moshier, Steadman, and Roberts, 2019), we adapted the stakeholder overview to highlight *possible* areas for improved collaboration or conflict resolution.

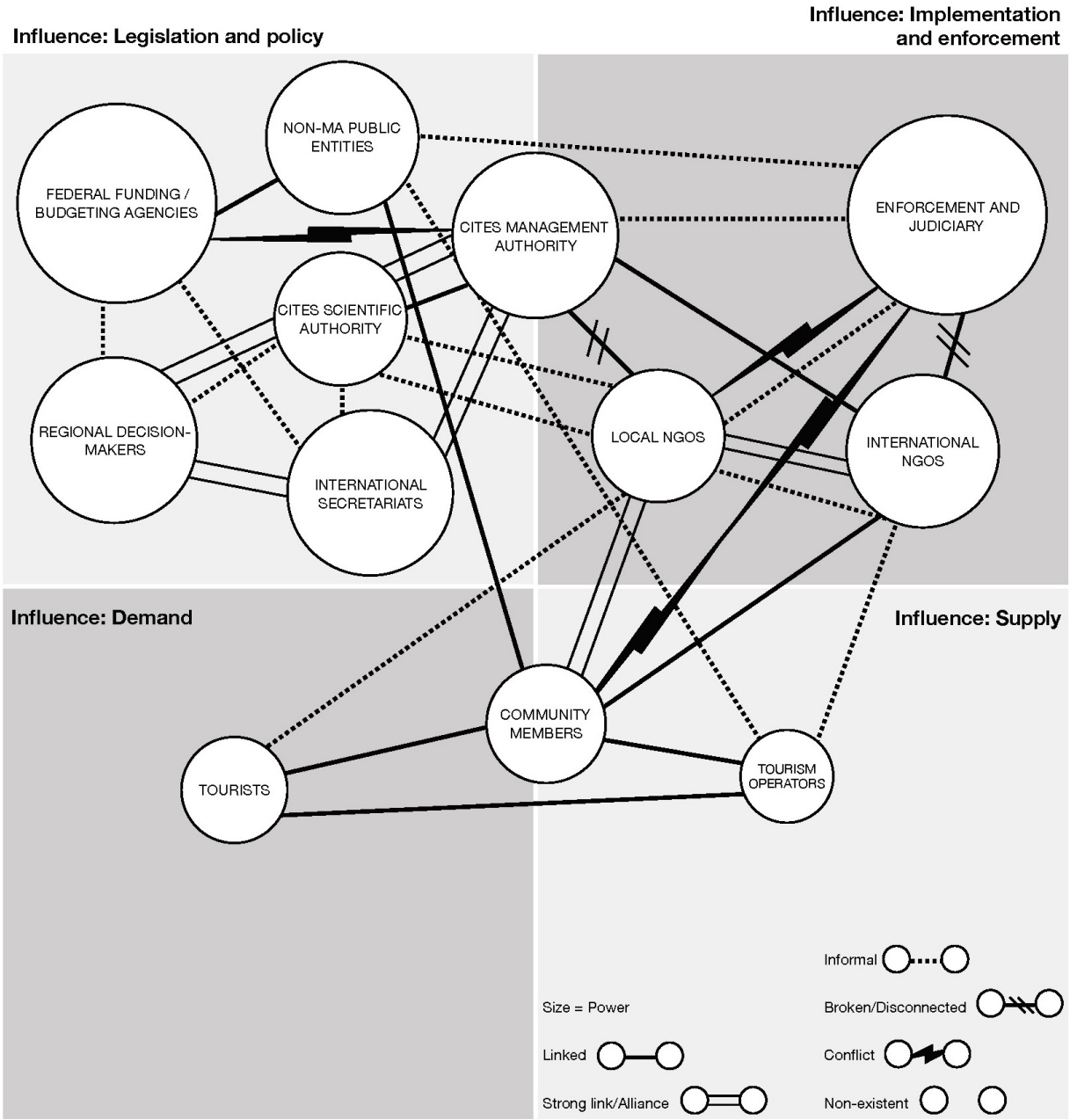

Figure 2 *Potential hawksbill turtle trade stakeholder network map. Informed by USAID (2017), Vogler, Macey, and Sigouin (2017), and Moshier, Steadman, and Roberts (2019)*

The lack of standard protocol for collaboration—including information sharing, reporting, and training—is denoted by a dashed line in the network analysis. For example, on the Caribbean island nation of Antigua and Barbuda, the Fisheries Department reported in 2014 that it had no cases of non-compliance with turtle or turtle egg harvesting laws, but, simultaneously, the department acknowledged that it relies on the Coast Guard for confiscation and enforcement (Campbell, 2014). Similar disconnects between policy and enforcement have been reported in Belize (Figueroa and Andrewin, 2017), Costa Rica (Chaćon *et al.*, 2018), and China (Lam, Xu, Takahashi, and Burgess, 2012). While two regional turtle trade secretariats noted in 2016 that certain countries could enhance national legislation to counter illegal trade, the report emphasized the more urgent need to coordinate and improve *enforcement* in countries with high volumes of trade (CITES, 2016).

As illustrated in the hypothetical network analysis, stakeholders often have the strongest connections and communications within, rather than across, spheres of influence (Moshier, Steadman, and Roberts, 2019). One potential connection for improvement also lies between community members and enforcement entities. In a 2017 survey of multiple Latin American countries, including Nicaragua, Honduras, and Colombia, thousands of turtleshell products were openly sold in marketplaces, suggesting a power imbalance between vendors and law enforcement (Harrison, von Weller, and Nahill, 2017). With direct knowledge of the community and compliance breaches, law enforcement officers can play a critical role as intermediaries between vendors and conservation implementers (Campbell, 2014), and, in some cases, it may be appropriate to engage community members in local monitoring of trade (USAID, 2017).

With foundational frameworks like CITES in place and accepted by most international governments, our next step is to improve coordination, implementation, and knowledge sharing. Stakeholder analysis is a critical tool that other Management Authorities may use individually or collaboratively to assess gaps and prioritize initiatives.

Challenges and Opportunities of CITES

Japan imported the equivalent of about 1.3 million hawksbill turtles from 1950–1992 (Mortimer and Donnelly, 2008), a staggering figure that emphasizes how influential CITES has been in initiating the decline of trade in endangered turtles.

However, illegal trade continues—openly in some marketplaces, through clandestine black markets, and, increasingly, in online transactions (Gomez and Krishnasamy, 2019). As with many species—and particularly marine megafauna—the mix of regional and federal management and implementation plans, porous borders between range countries, and insufficient funding make effective protection a challenge.

Enforcement challenges: A recent survey of the north-east Queensland, Australia, hawksbill turtle population found that despite the highest marine reserve protections within the Great Barrier Reef Marine Park, the nesting turtle numbers had still declined significantly (57 percent) from 1990 to 2017 (Bell *et al.*, 2020). The authors indicate that ongoing illegal take within the turtles' range is likely one of the chief drivers of declines (Bell *et al.*, 2020).

Legislative challenges: In Malaysia, federal legislation governs the import and export of wildlife, but turtle species do not receive federal protection under the Wildlife Conservation Act or the Fisheries Act (Gomez and Krishnasamy, 2019). Consequently, the country's 13 individual states are responsible for turtle management, with notable gaps and inconsistencies; only Sabah and Sarawak ban trade in marine turtles, and Malaysia is frequently cited as one of the main suppliers of raw turtle scutes (CITES, 2016; Gomez and Krishnasamy, 2019).

Transnational challenges: Involving many different actors and shifting supply chains, the hawksbill trade between nations remains a significant knowledge gap (Campbell, 2014). While Japan was traditionally the largest hawksbill turtle consumer and does continue to drive some trade, China has risen has a key trade destination, with demand for decorative objects,

jewelry, and the use of scutes in traditional Chinese medicine (Lam, Xu, Takahashi, and Burgess, 2012; UNODC, 2016).

As delineated in Table 1, differing stakeholder interests can impede the alignment of goals across groups, creating underlying challenges that may exacerbate other issues. For the three examples above, lack of political will and lack of capacity (staffing, appropriate training, funding) may represent more deep-rooted obstacles to CITES implementation.

Recommendations

Championing political will

Migratory marine species, generally, are found in four times more countries than terrestrial animals, requiring four times as many governments to enact and enforce the needed protections (Mcclenachan, Cooper, and Dulvy, 2016). Political will, however, involves more than legislation; for hawksbill turtles, ongoing transnational coordination and funding for enforcement, demand reduction, and alternative livelihoods programs significantly contribute to the success of trade regulations. Collaborative efforts between researchers (e.g., CITES Scientific Authorities), implementers (e.g., NGOs), and CITES Management Authorities should include strategies to share the latest and most relevant evidence with funding agencies. For example, WWF has demonstrated that sea turtle ecotourism can generate three times more income than turtle parts, including eggs, meat, and shells (Harrison, von Weller, and Nahill, 2017). Strategic messaging that aligns with funders' interests (see Table 1) is more likely to increase political will for hawksbill protections.

Knowledge exchange

Cross-species learning can also be a valuable tool in the unique case of migratory marine animals. Researchers recently used hammerhead sharks as a case study to identify marine species movements, population genetics, and key habitats to better inform national and regional planning (Chin *et al.*, 2017). A similar research proposal could initiate neutral cross-country dialogues about hawksbill turtles and result in key species information to share with decision-makers.

Similarly, discussion of and research on hawksbill protections have largely been siloed in two regions, Asia and the Americas, with ongoing illegal trade in both. Increased dialogue between different national stakeholders may facilitate more efficient planning. In the Seychelles (a country often excluded from both regional pools), for example, prohibition of all turtle hunting in protected areas has been more successful than "selective regulations" (CITES, 2016). Countries such as Malaysia, with disparate regulations across states, and others that continue to allow limited turtle harvesting could benefit from an assessment of management in the Seychelles.

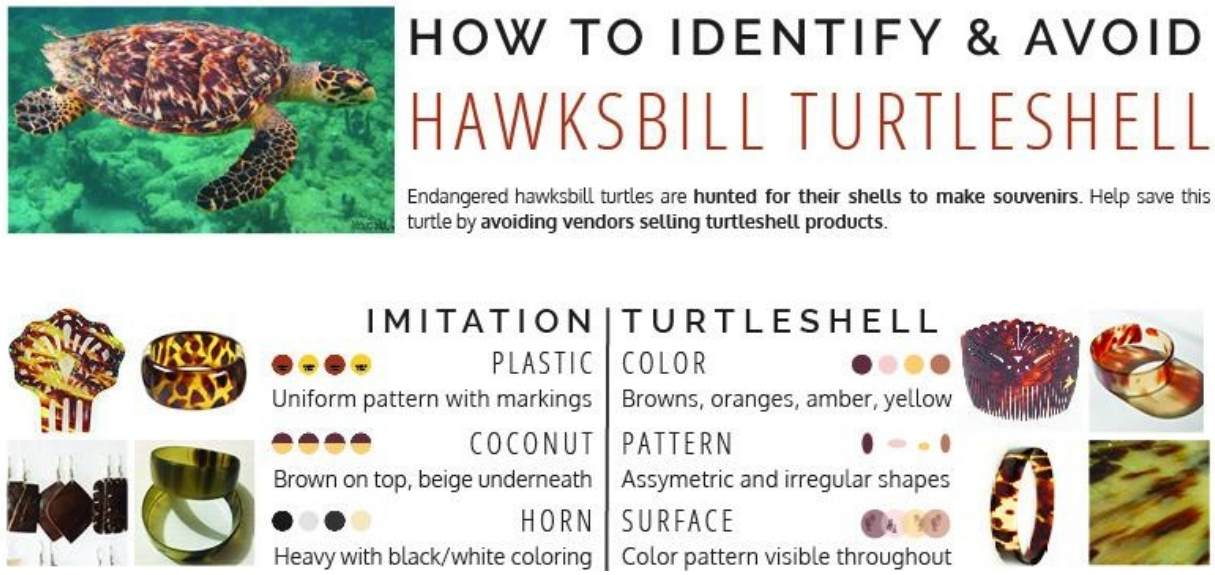

Figure 3 *Demand reduction content, targeting tourists in Latin America and the Caribbean (Harrison, von Weller, and Nahill, 2017)*

Demand reduction

Ultimately, demand for hawksbill turtles and their parts will continue unless stakeholders prioritize consumer engagement. In East Asia, these consumers are primarily interested in traditional *bekko* objects and ornamental turtle taxidermy (UNODC, 2016). In Latin America, both domestic and international tourists largely drive demand (Harrison, von Weller, and Nahill, 2017). According to the United States Fish and Wildlife Service, turtle parts are the second most confiscated product by customs agents (Harrison, von Weller, and Nahill, 2017).

The campaign Too Rare to Wear—funded by local and international conservation organizations, tourism businesses, and media companies—has attempted to raise

awareness among tourists and to improve understanding of the tortoiseshell market in Central America and the Caribbean (Figure 3) (Too Rare to Wear, n.d.). In Japan, the government invested more than $6 million in hawksbill resources research from 1991 to 2006 (Mortimer and Donnelly, 2008). Independently, neither action has resulted in significant outcomes for any stakeholder, emphasizing the larger need for collaborative, evidence-based efforts. While the needs in Japan (with consideration for the country's cultural heritage) do not necessarily align with the needs in Central America (with consideration for socio-economic drivers), the CITES framework provides a high-level, transnational goal that can be supported through demand reduction, knowledge exchange, and strengthened political will.

Appendix I: Conservation agreements addressing hawksbill turtle trade

Agreement	Purpose	Signatories
Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa	To safeguard "six marine turtle species that are estimated to have rapidly declined in numbers during recent years due to excessive exploitation (both direct and incidental) and the degradation of essential habitats" (Convention on Migratory Species, 2020a)	Angola, Benin, Cameroon, Cabo Verde, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Morocco, Namibia, Nigeria, São Tomé and Príncipe, Senegal, Sierra Leone, South Africa, Togo
Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of the Indian Ocean and South-East Asia (IOSEA Marine Turtle MoU)	The MoU "puts in place a framework through which States, territories, inter- and non-governmental stakeholders of the Indian Ocean and South-East Asian region, as well as other concerned States, can work together to conserve marine turtle populations and their habitats for which they share responsibility" (Convention on Migratory Species, 2020b)	Australia, Bahrain, Bangladesh, Cambodia, Comoros, Egypt, Eritrea, France, India, Indonesia, Iran, Jordan, Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Papua New Guinea, Philippines, Saudia Arabia, Seychelles, South Africa, Sri Lanka, Sudan, Thailand, United Arab Emirates, United Kingdom, Tanzania, United States of America, Viet Nam, Yemen
Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol)	Under the Cartagena Convention, SPAW is a regional agreement for the protection and sustainable use of coastal and marine biodiversity in the Wider Caribbean Region, aiming to improve management of protected areas, conserve threatened and endangered species, and assist with other regional and global biodiversity agreements and commitments. (UN Environment, n.d.)	The Bahamas, Barbados, Belize, Colombia, Cuba, Dominican Republic, French overseas departments, Grenada, Guyana, Honduras, Kingdom of the Netherlands constituent countries, Panama, Saint Lucia, St Vincent and the Grenadines, Trinidad and Tobago, United States of America and Puerto Rico, Venezuela
Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC)	The IAC "promotes the protection, conservation, and recovery of the populations of sea turtles and those habitats on which they depend, on the basis of the best available data and taking into consideration the environmental, socioeconomic and cultural characteristics of the Parties" (IAC, 2015)	Belize, Brazil, Costa Rica, Ecuador, Honduras, Mexico, the Netherlands, Nicaragua, Peru, United States of America, Uruguay, Venezuela
Inter-American Tropical Tuna Commission (IATTC)	The IATTC is responsible for the conservation and management of tuna and other marine resources in the eastern Pacific Ocean (IATTC, 2019)	Belize, Canada, China, Colombia, Costa Rica, Ecuador, El Salvador, European Union, France, Guatemala, Japan, Kiribati, Korea, Mexico, Nicaragua Panama, Peru, Taiwan, United States, Vanuatu, Venezuela
Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific	The Southeast Pacific Action Plan's general legal framework is the "Lima Agreement" of 1981, which obliges the High Contracting Parties to take, whether individually or through bilateral or multilateral cooperation, appropriate measures "to prevent, reduce and control pollution of the marine environment and coastal areas of the Southeast Pacific and to ensure adequate environmental management of natural resources" (Comisión Pemanente del Pacífico Sur, 2019)	Chile, Colombia, Ecuador, Panama, Peru

Agreement	Purpose	Signatories
Ramsar Convention on Wetlands of International Importance (Ramsar)	Resolution XIII.24: "The enhanced conservation of coastal marine turtle habitats and the designation of key areas as Ramsar Sites, encourages improved management, research, and protections" (Ramsar Convention on Wetlands, 2018)	Countries with known *E. imbricata* habitats: Antigua and Barbuda, Australia, Bahrain, Benin, Brazil, China, Colombia, Costa Rica, Dominican Republic, El Salvador, Fiji, France, Gabon, Grenada, Guinea, Guinea-Bissau, Honduras, India, Indonesia, Iran, Jamaica, Japan, Kenya, Madagascar, Marshall Islands, Mexico, Myanmar, Netherlands, Nicaragua, Pakistan, Panama, Peru, Philippines, Sudan, Tanzania, Thailand, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States of America, Venezuela, Vietnam
Memorandum of Agreement between the Government of the Republic of the Philippines and the Government of Malaysia on the Establishment of the Turtle Islands Heritage Protected Area (TIHPA MoU)	A bilateral agreement between the government of the Philippines and Malaysia for the first and only transboundary protected area for marine turtles in the world (Gomez and Krishnasamy, 2019)	Malaysia and the Philippines
Memorandum of Understanding on ASEAN Sea Turtle Conservation and Protection	The MoU's objectives are "to promote the protection, conservation, replenishing and recovery of sea turtles and of the habitats based on the best available scientific evidence, taking into account the environmental, socio-economic and cultural characteristics of the Parties" (ASEAN, 2012)	Brunei, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF)	The CTI-CFF was launched in 2009 "to sustain extraordinary marine and coastal resources including coral reefs, seagrasses, mangrove ecosystems, and their fishes in the coral triangle area by addressing crucial issues such as food security, climate change and marine biodiversity" (CTI-CFF Regional Secretariat, 2016)	Indonesia, Malaysia, Philippines, Papua New Guinea, Timor Leste, and the Solomon Islands

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