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

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STATUS, SCOPE AND TRENDS OF THE LEGAL AND ILLEGAL INTERNATIONAL TRADE IN MARINE TURTLES, ITS CONSERVATION IMPACTS, MANAGEMENT OPTIONS AND MITIGATION PRIORITIES:

COLOMBIA, PANAMA AND NICARAGUA

(CITES Report / Submitted by the Secretariat)

Action requested:

- Take note of the report

FINAL REPORT

ASSESSING THE STATUS, SCOPE AND TRENDS OF THE LEGAL AND ILLEGAL INTERNATIONAL TRADE IN MARINE TURTLES, ITS CONSERVATION IMPACTS, MANAGEMENT OPTIONS AND MITIGATION PRIORITIES IN COLOMBIA, PANAMA AND NICARAGUA

SMALL-SCALE FUNDING AGREEMENT

POW 2017-2019 Activity No.: B-6 and B-9

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EXECUTIVE SUMMARY

To implement CITES Decision 17.222, the CITES Secretariat contracted WWF to assess the status, scope and trends of the legal and illegal international trade in marine turtles in Colombia, Nicaragua and Panama. This assessment aimed also to investigate the conservation impacts associated to this trade, as well as possible management options and to identify areas in need of immediate mitigation efforts. The results of these regional assessment efforts, which were conducted during 2018, indicate that regional illegal trade is present along the Caribbean and Pacific regions of these countries, although its features vary. In the Caribbean region there is a profound traditional feature of ethnic groups towards the capture of marine turtles, local consumption of eggs and meat as food source. Additionally, the illegal trade focuses in two species of marine turtle: hawksbill and green, providing an extra source of income. Meanwhile in the Pacific region, the local consumption is driven by modern customs enhanced by fallacies and local gambling (cock fighting) activities that promote the consumption of olive ridley and green turtle eggs and meat, and the use of cock fighting spurs made of hawksbills carapace. However, based on the study of the most serious illegal trafficking problem that is happening in the Caribbean region, which acts as a source of products that surpass the national borders creating a network of international illegal trade not only among the study countries but reaching Costa Rica, El Salvador, Honduras, Mexico, Cuba, Puerto Rico, Dominican Republic, Venezuela, Ecuador and Peru. Specific sites in the Caribbean region in Nicaragua are those that act as source of marine turtle products: Miskitos and Pearl cays, which later are traded to the cities of Bilwi, Bluefields reaching Managua City and then entering the international market to the San Andres Island (Colombia), El Salvador, Honduras and Panama. In the case of Panama, the Bocas del Toro state archipelago and Kuna Yala Comarca are the main sources of marine turtle products that later are traded not only to other cities in central Panama but crossing the border with Costa Rica north towards Mexico and toward Cartagena and Turbo in Colombia. In Colombia, the cities of Cartagena and Turbo act as main receptors of marine turtle products not only from Colombian waters but coming from Nicaragua and Panama and

even in La Guajira state marine turtles are consumed as part of cultural backgrounds but also are traded further to Venezuela.

There is an urgent need to implement not only national actions but to promote regional cooperation in terms of: creation of an efficient interchangeable database of marine turtle illegal trade; a renewed effort of environmental education and media awareness campaign; conservation actions ensuring transnational connectivity of the marine turtle populations; and capacity building among the different security and Law enforcement bodies under the umbrella of the international and national regulations. These actions must target and have a full reduction of illegal marine turtle trade in the region, especially on those species and population that are considered as critically endangered by international bodies. Finally, the present study is a first attempt to elucidate the actual level of illegal trade in the region, but deeper investigation is needed to fully understand for example, the seasonality of the trade, local routes of illegal trade, volume and the value of marine turtles in the different markets. The recommendations included in this document are:

In the case of Colombia in the Caribbean region by engaging fishing communities, curio sellers and local restaurants to implement sustainable activities that might improve livelihoods. For example, in La Guajira state where the poverty is almost the double than registered in Colombia we observed more marine turtle meat consumption than in the rest of the country. For this reason, we must include all stakeholders from the very beginning including future marine turtle conservation projects with considerations of reducing poverty.

In the case of Panama in the Caribbean region, it is necessary to increase the surveillance during the migration of green turtles in sites considered as hotspots like for example: Kuna Yala Comarca and Bocas del Toro state. Meanwhile in the Pacific region of the country, it is necessary to support the establishment of beach patrol programs and ex-situ nurseries to ameliorate the impact of illegal egg collectors and natural threats.

In the case of Nicaragua mechanism for monitoring the utilization quotas established by the governments of the North and South Caribbean Coast must modernize to ensure that the established volumes are not exceeded. In

addition, keeping a statistical control of turtle species that are being marketed internally. On the Pacific coast, environmental authorities should increase controls on the internal traffic of sea turtle parts. The Ministry of Fisheries should coordinate work plans with the Naval Forces to stop artisanal vessels that are directing efforts towards the capture of turtles in the sea, to supply recent internal demand for turtle meat.

BACKGROUND

In 2014, the Secretariat *Pro Tempore* of the Inter-American Convention for the Protection and Conservation of Marine turtles (IAC) published a study on the "Conservation status of hawksbill turtles in the Wider Caribbean, Western Atlantic and Eastern Pacific Regions". Several recommendations arose from this study, highlighting the need for an updated assessment to determine the actual extent of the (international) trade in hawksbill turtle products. This study was funded by the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Secretariat in cooperation with CMS (Convention on the Conservation of Migratory Species of Wild Animals), was referred to in CITES Decision 16.127 (2013).

In 2016, the IAC and the Secretariat of the 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) submitted an information document ("A report on illegal take and trade in marine turtles") to the CITES Standing Committee at its 66th meeting (SC66, Geneva, 2016). This document expresses concern about the levels of illegal trade in marine turtles around the globe.

These documents rendered a need to coordinate integrated scientific research to help determine the current status, scope and trends of the international trade in marine turtles.

Pursuant to this, at its 17th meeting (CoP17, Johannesburg, 2016), the CITES Conference of the Parties adopted Decision 17.222 on *hawksbill turtle (Eretmochelys imbricata) and other marine turtles (Cheloniidae and*

Dermochelyidae), which called for a study aiming to achieve a better understanding of the actual scope of the global trade in marine turtles. To this end, the CITES Secretariat has contract WWF to undertake an assessment of the status of this trade in Colombia, Nicaragua and Panama, contributing to the implementation of Decision 17.223.

OBJECTIVES

General objective: The main objective of this study is to identify the regional and global conservation management of marine turtles through the knowledge of their legal and illegal international trade through stronger coordination among relevant intergovernmental instruments dealing with marine turtles.

Specific objectives: More specifically, this study aims to:

1. Provide a global review of the status, scope and trends of the legal and illegal international trade in CITES-listed marine turtles (all seven extant species);

2. Acquire a better understanding of the conservation impacts associated to the current trade levels;

3. Identify management options regarding marine turtles;

4. Identify areas where immediate mitigation efforts may be needed; and

5. Encourage communication between CITES and key partners to optimize resources and efforts.

METHODS

Study data was collected in three ways:

1. Visiting locations where marine turtle trade was suspected to occur (based on suggestions by locals). These locations (Figure 1) were as follows:

In Colombia: In the Pacific we visited Buenaventura and Bahía Solano. In the Caribbean we visited Cartagena, Baru, De Rosario Islands, Tolu, Coveñas, San Bernardo Islands, Riohacha, El Cabo de la Vela, Uribía, Palomino, Santa Marta, San Andres Island and Providence.
In these places we contacted inhabitants of local communities and interviewed them on issues related to sea turtle trafficking. In the Pacific we interviewed 30 inhabitants and 23 in the Caribbean, However, not all respondents answered all the questions because in some cases they did not know all the answers or they did not want to share the information.

In Panama: in the Pacific region, we visited La Barqueta Agricola Wildlife Refuge, Cambutal beach, Arenas de Mariato, Torio, Chame and Panama City. In the Caribbean region we visited Bocas del Toro state, Changuinola city, Ngäbe Bugle Comarca and Kuna Yala Comarca. These places were chosen based on the experiences of the consultant and information included in the Diagnostic of the situation of Marine turtles and National Action Plan for Conservation of Marine turtles in Panama (MiAmbiente, 2017). The surveys in the Caribbean region took place from the 16th of May to the 3rd of June of 2018 and in the Pacific region they took place from the 24th of May to the 15th of June. In the Pacific region we interviewed 14 people and 33 in the Caribbean region. At these sites we interviewed key people including government officials, NGO activists, ethnic group leaders, fishermen, divers, park rangers, tour operators, scientific authorities and school teachers. These interviews took place in protected areas, touristic spots, government offices, hotels and restaurants.
We also reviewed information of the Authority of Aquatic Resources of Panama (ARAP) turtle eggs' confiscation database between 2011 and 2013. We also reviewed historic accounts of fines and confiscation of turtle eggs in the websites of local newspapers from 2012 until 2018. We gather also information from the OLX website (www.olx.com.pa) regarding the selling of cock fighting spurs made from hawksbill scutes in Panama.

At these locations (Colombia and Panama), local markets were surveyed to determine the availability of turtle meat, and touristic sites were also visited to

assess the availability of hawksbill handicrafts. These efforts took place on May 1st and 31st 2018, and each location was visited once. At each location, local inhabitants were interviewed to collect information on marine turtle consumption, direct take, bycatch, trade, religious perceptions, local knowledge and management options.

In Nicaragua, Between June 21 and July 21, 2018 we visited neighboring communities to protect areas where turtles arrive to the beaches. We also visited areas where there are frequent sightings of turtles were seen by fishermen. These sites were on the Pacific coast, Padre Ramos; Aserradores; Corinto; El Transito; Masachapa; Chacocente; Pie de Gigante; San Juan del Sur y La Flor. In the Caribbean we visited: Bilwi, Bluefields and Corn Island.

In all these places, we conducted interviews to collect data on the activity that is carried out with participation in the internal trade of turtle parts, prices and perceptions on trends.

2. Analyzing information from databases. In Colombia, we consulted national and regional environmental authorities. The data collected is a historical record of the seizures of wild fauna from 2000 to the present date. This information is registered at the national level by the police of Colombia, and at the state level by regional autonomous corporations. However, we only analyzed the state of Guajira due to the high consumption of marine turtle meat in this state. This analysis aimed to evaluate the trend of trafficking sea turtles in the country and the coordination between national and state authorities. We compared the records of sea turtles seized during the same period in the state of La Guajira and nationally.

3. Searching the online availability of marine turtle products on social networks (Facebook and Instagram) and other webpages (OLX). Special attention was put into researching the availability of hawksbill products due to their well-known high market value (e.g. the price of a single product may reach 25 US in the Caribbean region; Harrison et al., 2017). This online search was conducted for 3 hours per day, over a period of 7 days in each country assessed.

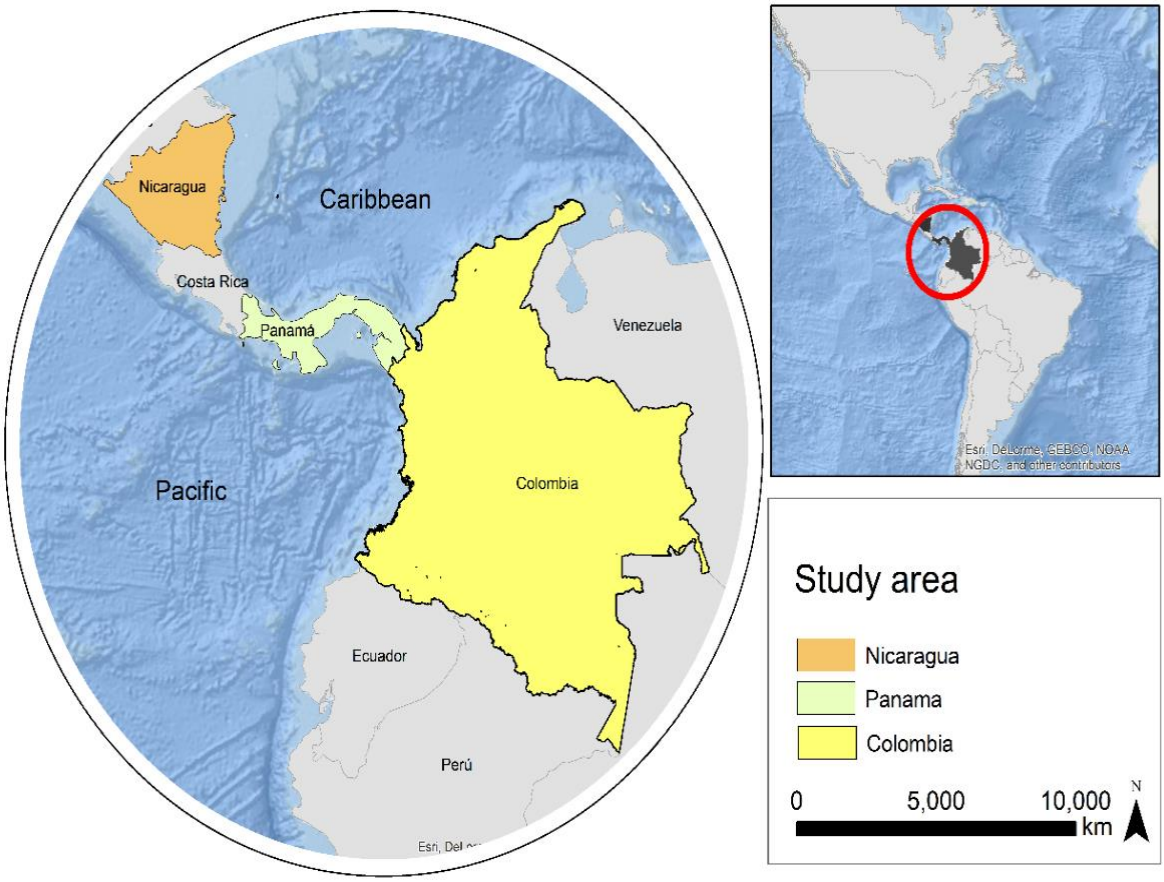

Figure 1. Study Area for marine turtle legal and illegal trade including Colombia, Panama and Nicaragua, SSFA CITES-WWF 2018.

LEGAL FRAMEWORK

Colombia

In terms of legal aspects, the Colombian legislation includes rules, bans and prohibitions whose objective is to guarantee the protection of marine turtles both in Caribbean and Pacific waters. The current legislation is listed below (Table 1):

Table 1. Colombian legislation to protect marine turtles.

Policy / Law / resolution	Subject
Resolution 167 of 1966 by Inderena (National Institute of Renewable Natural Resources and the Environment)	Regulates fishing with trawls in the Caribbean and Pacific Coast and prohibits their operation within one nautical mile (1852 meters)
	Regulation fishing with trawls on the Caribbean and Pacific Coast and prohibited the execution of themselves in distances less than one nautical mile (1852 meters).
Decree 1608 regulation of the Code of natural resources (Decree 2811 of 1974)	Minimum rules and requirements were established for the use of wild fauna and its derivatives. Sets prohibitions of a general nature, including poaching of nests and neonates, disturbing nesting females, and destroying or deteriorating breeding areas.
Resolution 1032 of 1977 by Inderena	National ban for the capture of hawksbills (*E. imbricata*).
Agreement 021 of 1991 by Inderena	Establishes protection norms for all species of marine turtles, as well as nesting beaches and foraging areas.

Resolution 108 of 1992 by INPA (National Institute of Fisheries and Aquaculture)	Prohibits the use of marine turtles caught accidentally (bycatch) during shrimp fishing operations.
Resolution 157 of 1993 by INPA	It requires the use of TEDs (Turtle Excluder Devices) for the trawling fleet of the Colombian Caribbean.
Resolution 107 of 1996 by INPA	Requires the use of TEDs (turtle excluder device) by the trawling fleet of the Colombian Pacific.
Resolutions 726 of 1974 and 709 of 1981 and Agreements 24 of 1983 and 54 of 1988 by Inderena	Prohibit trawling in concentration areas of marine turtles in the Gulf of Morrosquillo, San Bernardo Archipelago, Gulf of Urabá, and Litoral Guajiro, with shallow waters located between San Juan de la Guía and Punta Espada.
Resolution 2879 of 1995 by CorpoGuajira (Regional Corporation of La Guajira state)	Establishes a regional ban on the use of marine turtles in La Guajira state.
Resolution 1644 of 1998 by CorpMagdalena (Regional Corporation of Magdalena state)	Establishes a regional ban on the use of marine turtles in Magdalena state.
Conventions and agreements	CITES, Convention for the protection of flora, fauna and scenic beauties of the Americas, the Convention on Biological Diversity, the Convention on continental shelf, Universal Declaration of animal rights, United Nations Convention on the Rights of the Sea

With the implementation of the new penal code in 2000 and its unique chapter of "*crimes against natural resources and the environment"* the National Police have had the legal tools to protect biodiversity in Colombia, which includes marine turtles and their ecosystems. Table 2 summarizes the new penal code in which police have worked to prosecute Lawbreakers and seize marine turtle evidence (alive animals or any product).

Table 2. New penal code with sections related with marine turtle protection.

Penal code	**Subject**
Section 328. Illicit use of renewable natural resources.	The one that in breach of the existing regulations introduces, exploits, transports, traffics, trades, takes advantage of or benefits from the specimens, products or parts of the animals, forestry, floristic, hydro-biological resources of endangered species or from the genetic resources, will incur a prison term of two (2) to five (5) years and a fine of up to ten thousand* (10,000) minimum legal monthly salaries in force.
Section 331. Damage to natural resources.	Any failure to comply with the existing regulations, destroy, render useless, make disappear or in any other way damage the natural resources referred to in this penal code causing them a serious affectation or those associated with them or affecting specially protected areas will incur in prison from two (2) to six (6) years and a fine of one hundred (100) to ten thousand (10,000) minimum legal monthly salaries in force.

Section 336. Illegal hunting.	Anyone who, without the permission of a competent authority or in violation of existing regulations, exceeds the number of pieces allowed, or hunts in a closed season, will be imprisoned from one (1) to three (3) years and fined from twenty (20) to five hundred (500) current monthly minimum salaries, provided that the conduct does not constitute a crime punishable by a greater penalty.

**Fines are estimated in local money. By 2018, a minimum monthly salary is 781,242 Colombian pesos (USD Representative Rate of the dollar. Bank of the Republic of Colombia. December 17, 2018: 3,196.30 Colombian pesos per US dollar).*

Panama

Panama has an abundant legislation and regulations related directly or indirectly to marine turtle conservation and description of penalties for those breaking the Law. At the forefront of the application of these Laws and regulations are the personnel of the Ministry of Environment with support of security agencies along the country. Table 3 describes the most relevant legal documents on this matter.

Table 3. Legislation and documents related to marine turtles conservation and penalties. In the case of Panamanian Laws and Decrees the paragraphs here have been translated literally without any change to the original text.

Policy / Law / resolution	**Subject**
Law 8 of 2008*	This Law approves the Inter-American Convention for the Protection and Conservation of Sea turtles (IAC) of 1996.
Law 14 of 1977	This Law approves the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
Law 2 of 1995	This Law approves the Convention of Biological Diversity

Law 5 of 1989	This Law approves the Convention on the Conservation of Migratory Species of Wild Animals
Law 6 of 1989	This Law approves the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat
Law 41 of 1998	This Law approves the General Law of Environment of Panama
Section 67	The State will support the conservation and ideally the activities of biological diversity in its original habitat, especially in the case of species and wildlife variants of special singularity, and complementarily will promote the conservation of biological diversity in installations outside its original habitat.
Law 24 of 1995	This Law creates the wildlife legislation of the Republic of Panama and states other dispositions
Section 15	It is prohibited to use and transport wildlife, its products, parts, and derivatives without the previous approval of the National Directorate of Protected Areas and Wildlife from INRENARE (today Ministry of Environment of Panama).
Section 61	Who kills wildlife specimens in contravention of the dispositions in the present Law will be sanctioned with a fine from one hundred (100.00 USD) to one thousand (1,000.00 USD).
Section 62	The crime described in the previous section will be sanctioned with a fine from one hundred (100.00 USD) to five thousand (5,000.00 USD), when it is executed using atrocious ways. The same sanction will be used if the crime is executed against endangered species, under risk of extinction or during a ban period; or under fraud using the benefit of the subsistence hunting.
Section 63	Who hunts and fishes species endangered or under risk of extinction without the aim of killing them, will be sanctioned with a fine from 25 to 365 days of prison.

Section 64	Who collects, destroys or collects eggs, offspring or nests, causes damage or alteration to the burrows or dens of wildlife specimens will be sanctioned with prison from 6 months to 365 days.
Section 66	Who traffics, trades or does business, exports, imports, re-import or re-export wildlife specimens without permit, will be sanctioned with prison from 6 months to 2 years and from 180 to 365 days of fine.
Ley 14 from 2007	This approves the Penal Code of the Republic of Panama. This code includes the Title XIII which states the crimes against the environment and land use planning
Section 409	Who fishes, hunts, kills, captures or retrieves resources of protected or endangered wildlife specimens from the sea or land, without the corresponding permits, or with the corresponding permits but violating the specifications related to quantity, age, dimensions or size, will be punished with prison between 2 to 4 years. The sanction will increase from one third up to half: 1. If the act is performed in a protected area. 2. If a prohibited tool or a non-authorized device is used. 3. If the activity is performed outside the authorized areas to do so. 4. If the activity is performed during a ban period or season established to protect the species described in this article and its reproduction. 5. If the activity is performed in great proportions.
Section 410	Who without authorization or permit from the compelling authority performs trafficking, trade, export, import, re-import o re-export wildlife specimens, endemic, endangered, or near extinction or any genetic resource, will be sanctioned with prison between three and five years. This fine would be reduced to one third or half if the wildlife specimen or endemic species, vulnerable, endangered or near extinction is reincorporated to its habitat without harm before the initial phase and investigation.

Resolution DM-0657-2016	This Resolution establishes the process for the elaboration and periodic update of the list of endangered species of flora and fauna of Panama and states other dispositions. Under its Annex this Resolution classify *Caretta caretta*, *Chelonia mydas*, and *Lepidochelys olivace*a as endangered, and *Eretmochelys imbricata* and *Dermochelys coriacea* as critically endangered.
Resolution DM-0031-2017	This Resolution approves the National Action Plan for the conservation of Marine turtles in Panama. This Plan establishes strategic actions to preserve the populations of marine turtle present in Panamanian marine waters.
Executive Decree No. 82 of 2005.	By means of which it is compulsory the use of the Marine Turtle Exclusion Device (TED) to all the national vessels dedicated to fishing trawling in all the jurisdictional waters of the Republic of Panama. The Decree establishes as a previous requirement to obtain the license as captain of fishing trawling fleet, the obtaining of an approval Certificate of a Seminar on the use and installation of TED in their boat trawling nets.

*The IAC issued the Resolution IAC-COP6-2013-R1 for Exceptions for Economical Subsistence according to Article IV (3a and b), benefiting Panama and Guatemala. In the case of Panama this Resolution allows the subsistence harvest of turtle eggs of olive ridley in Isla Cañas Wildlife Refuge. Until today however, the fact that he Panamanian authorities have not issued any formal agreement with the local community regarding the egg harvest and the lack of a proper management plan for the protected area, compromise the effectiveness of the Exception granted.

Nicaragua

The legislative aspects that regulate the hydro-biological resources in the territory and territorial sea of Nicaragua as well as the state offices in charge of them, are detailed in Table 4. A free translation of the legislation has been made into English, so some sections are interpreted in a particular way in order to give a better idea of sections and Law.

Table 4. Legislation relative on natural resources, aquatic ecosystems & fauna and flora.

Law	**Subject**
Law 217. General Law on the Environment and Natural Resources. Issued by the Ministry of the Environment and Natural Resources (MARENA). 1996	Section 54. Establishes that natural resources are national assets, their domain and use shall be regulated by what is established by this Law, special Laws and their respective regulations. The State may grant the right to take advantage of natural resources, by concession, permits, licenses and quotas.
	Section 73. It is the obligation of the State and of all natural or legal persons that exercise activity in the national territory and its jurisdictional waters, to protect and conserve aquatic ecosystems, guaranteeing their sustainability.
	Section 89. It is the obligation of the State to protect the marine environment constituted by the waters of the territorial sea and the adjacent economic zone, the marine subsoil, the continental shelf, the beaches and the natural resources found in it and in the space its corresponding air.
MARENA Executive Decree No. 8-98 1988	Law 217. General Law on the Environment and Natural Resources. Issued by Ministry of the Environment and Natural Resources (MARENA). 1996

MARENA Executive Decree No. 07-99 1999	The prohibition system for Wildlife was established, which dictates the procedures for enlisting species under a restrictive regime, whether temporary or permanent. The list of species with permanent or partial closed seasons is published annually and in there we can find the hawksbill turtle with a permanent catch prohibition.
Regional Council Resolution No. 192-02-04-00 2000	Empowers the president of the Environment and Natural Resources Commission of the Council of the Autonomous Region of the South Atlantic, to join forces with MARENA for the protection of the hawksbill turtle and its nesting areas.
MARENA. Ministerial Resolution No. 043-2005	Indefinite ban since 2005 for all species of marine turtles in Nicaragua. Through this regulation, the capture and trade of all species of marine turtles was prohibited, keeping out any type of use, transportation or trade of parts or by-products. This provision is of a national nature. Each year the Ministry of the Environment issues a resolution with the list of species subject to a closure seasons, both indefinite and partial, in 2018 maintains the six species of marine turtles in the permanent closed seasons classification
Law 416. Fisheries and Aquaculture Law. Nicaraguan Institute of Fisheries and Aquaculture	Section 3. Declare of social interest, the protection, conservation, restoration, development and use of hydro-biological resources.

(INPESCA) 2004 Reformed in 2014	Fishing activity is considered as the process of research, exploitation, processing and commercialization of hydro-biological resources, as well as the activities carried out for scientific, didactic, sporting and aquaculture purposes.
	Section 4. In the exploitation of the hydro-biological resources of the Caribbean Sea, the state must recognize the rights established for the Autonomous Regions in the Political Constitution, the Statute of Autonomy of the Caribbean Coast Regions and other current regulations.
	Section 9. Fishing and aquaculture activities in Protected Areas and their buffer zones, including respective authorizations for such activities, shall be subject to the provisions of the legislation of Protected Areas, for which MARENA shall establish by means of a Ministerial Resolution, the criteria, requirements and administrative procedure for such purposes. In these areas the use and methods of trawling are prohibited.
	The management plans in Protected Areas that have a marine-coastal zone or fishing and aquaculture areas will be prepared in accordance with the procedure established in the legislation of protected areas in force, and these plans should be consulted with INPESCA.
	Section 29. The closures for hydro-biological resources will be established by Ministerial

	Resolution issued by MARENA, based on INPESCA's technical proposal and after consulting with CONAPESCA. The Resolution must indicate the criteria, requirements and administrative procedures to put into operation the not hunting system, as well as the species to be prohibited, periods and other aspects that may be considered pertinent.
	Section 49. It is prohibited to commercialize: a) Fish and aquaculture products whose legal provenance is not possible to prove. b) Species in closures in Nicaragua or in Central American countries, with the exception of inventories that are reported up to three days after the closure is established. c) Species prohibited in international agreements of which the country is a party. d) Species with sizes smaller than those legally authorized or those that have been prohibited by the competent authority because they are in danger of extinction. e) The species extracted in sport fishing. f) Larvae, post-larvae and fingerlings extracted without any authorization. g) Products that lead to danger to public health.
	Section 77. The capture, killing or exploitation of dolphins and marine turtles of any kind, as well as the commercialization and transportation of products and by-products or any use of them, except for the purposes of scientific research and under the special regulations established by MARENA, in accordance with the provisions of the Convention on International Trade in

	Endangered Species of Wild Fauna and Flora (CITES) of which the country is a party.
Law 641, Penal Code 2007 and its reforms	The main crimes against fauna and flora are included in the Penal Code and correspond to the following sections: Section 373 Illegal use of natural resources. From six months to two years in prison. Section 375 Fishing in closure season. One to two years in prison. Section 380 Hunting of animals in danger of extinction. From one to 4 years in prison. Section 381 Marketing of fauna and flora. Fine of 50 to 100 days.

Constitution of the Republic of Nicaragua, in relation to the use of natural resources by the ethnic groups of the Caribbean area, establishes in Section 89: “The communities of the Atlantic Coast are an indissoluble part of the Nicaraguan people and as such, enjoy the same rights and have the same obligations. The communities of the Atlantic Coast have the right to preserve and develop their cultural identity in the national unity; to equip themselves with their own forms of social organization and administer their local affairs according to their traditions. The State recognizes the communal forms of ownership of the lands of the communities of the Atlantic Coast. It also recognizes entertainment, use and enjoyment of the waters, forests of their communal lands. The first steps directed to the protection of the marine turtles that occurred in the year 1960, when the President of the Republic of

Nicaragua signed an Executive Decree where it was stated that the fishing or capture of adult turtles and the exploitation of their eggs was strictly prohibited (Gaceta 240, October 1960). However, it took more than 15 years for the State to strengthen the legal framework regarding the protection of the environment and of the flora and fauna.

In November 1977 Nicaragua signed and ratified the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention); A summary of the signed conventions can be seen in the Table 5.

Table 5. Conventions to which Nicaragua is a signatory.

Conventions to which Nicaragua is a signatory	**Year of signature**
Convention on the Marshes of International Importance, especially as aquatic bird habitat.	1971
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1977
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).	1977
Cartagena Convention for the Protection and Development of the Marine Environment of the Great Caribbean Region.	1983*
Convention on Biological Diversity	1992
Convention for the Conservation of Biodiversity and Protection of Priority Wild Areas in Central America	1993

Cooperation Agreement for the Conservation of Marine turtles on the Caribbean Coast of Costa Rica, Nicaragua and Panama	1998*
Convention for the Protection and Conservation of Marine turtles (CIT)	1998*
Cartagena Convention on Marine Depletion	2005

* They have not yet been ratified.

RESULTS

Colombia

1. Status, scope and trends

a. In what areas does trade exist?

In Colombia five marine turtle species are distributed. Three are present in both Pacific and Caribbean coasts (Figure 2). They are: green turtle, hawksbill and leatherback. Both olive ridley and loggerhead are only found in the Pacific and the Caribbean. Results obtained to date indicate that illegal trade takes place in both Colombian coasts. However, the characteristics of the trade in marine turtles differ for each species in both the Pacific and the Colombian Caribbean.

Figure 2. Map of Colombia including Pacific and Caribbean coastal states.

In the Pacific coast. There are four states from north to south: Chocó, Valle del Cauca, Cauca and Nariño (Figure 2). Buenaventura (Valle del Cauca) is the main port in this coast. In this City we found a well establish market for marine turtle meat offered as local dishes. The meat is sold by local fisherman to restaurants or “special customers”. All of them know this is an illegal activity. For this reason, it is only sold underground in the black market and clandestine places. A pound of marine turtle meat (Figure 3) cost between 3 and 3.5 USD.

In the marketplace of Pueblo Nuevo in Buenaventura, there are over 12 restaurants where marine turtle meat dishes are sold daily during lunch and dinner times. Dishes are offered as “special meat” to consumers who know it is illegal, as do suppliers. A regular dish of marine turtle meat costs between 5 and 7 USD.

Restaurant owners do not know which species they are selling because they receive the meat directly from fishermen that avoid police controls. Although we tried to find out what species they are selling, this was a complicated task because Buenaventura is a very dangerous city where organized crime has control of many activities, including wildlife illegal trade.

Figure 3. Two pounds of marine turtle meat cost 6-7 USD in Buenaventura, Colombian Pacific.

Another product with a great demand in Buenaventura is marine turtle penis. It is pursued apparently for its aphrodisiac properties. An inch is sold at 8 USD. The entire penis bottled in alcohol with herbs can cost 40 USD (Figure 4).

Figure 4. Marine turtle penis beverage sold in Buenaventura, Colombian Pacific.

In Bahía Solano (Chocó state), where two important nesting beaches for olive ridley are located in the Pacific coast, a small part of the community consumes marine turtle eggs. Ten eggs can be sold for 1.5 USD. This information was collected from local inhabitants. However, marine turtle meat consumption is not present due to the efforts implemented by local associations which depend on marine turtle ecotourism.

In the Caribbean coast of Colombia an important hawksbill marketplace has been identified in the city of Cartagena (Bolivar state). Handicrafts made of hawksbill carapace scutes are commonly offered in street sales along the main touristic places of the Old City. In some cases, two or more street sales are owned by the same retailer. These handicrafts are not exposed to people's eyes and they are only available if you ask for them. In the modern City of Cartagena, in Bocagrande beach, rings from hawksbill carapace are offered openly. Prices range from 2.5 USD to 10 USD depending of handicraft size and quality (Figures 5, 6 and 7).

Figure 5. Earrings and jewelry items made of hawksbill scutes offered in Cartagena, Colombian Caribbean.

Figure 6. Bracelets and jewelry items made of hawksbill scutes offered in Cartagena, Colombian Caribbean.

Figure 7. Bracelets made of hawksbill scutes offered in beaches of Boca Grande Cartagena, Colombian Caribbean.

In the Baru town (Bolivar state), a few kilometers south of Cartagena, we found that the main trade in the region is based on hawksbills products. Carapace scutes are used to made cock fighting spurs (Figure 8). One kilogram of the thickest part of a hawksbill's carapace used to elaborate cock fighting spurs can be sold at 150 USD (personal observations of a group of eight craftsmen from Baru). On the other hand, one kilogram of the less thick part of the carapace can be sold in the form of spurs from 10 to 15 USD. A pair of cock fighting spurs can be sold from 7 to 10 USD, depending on its length.

Figure 8. Cock fighting spurs made of hawksbill in Baru, Colombian Caribbean.

In Tolu (Sucre state), another touristic place in the Caribbean coast, South West of Baru, we found a fisherman who sells marine turtle carapaces to people from different cities, especially from Medellín (second largest city in Colombia). The carapaces are sold at a price between 20 and 60. This fisherman had at least 6 carapaces by the time we he visited him, with the exception of one of them from a loggerhead, the others were from green turtles (Figure 9). He also sells hawksbill carapaces at a higher price than others ranging from 40 to 120 US.

Figure 9. Local fisherman from Tolu selling marine turtle, Colombian Caribbean.

In the insular state of San Andres and Providence (Figure 2), located in the Caribbean Sea, South East of Nicaragua, we found a strong market (local consumption) where the main product is marine turtle meat. We did not find any handicrafts or products such as marine turtle penis. Even though many people in the food market and restaurants know it is illegal to sell marine turtle meat, some places continue to offer meat from green and hawksbill turtles. In Figure 10, a portion of meat is served in a local dish which is sold at 8 USD.

In the fisherman association (fish market) of San Andres Island, we only found one fisherman who sells marine turtle meat. However, he was not interested

in selling a couple of pounds (because he had the animal alive by the time he was asked), he rather prefers to sell it in bigger proportions to known people (restaurants owners). If he decided to sell it by weight, he would have had to kill the animal, missing the chance to sell it alive for a higher price. We found other two restaurants (Figure 11 and 12) where marine turtle meat is sold as a typical dish. The price ranged from 8 to 10 USD. One of the restaurants just sold this meat on weekends, and the other one daily at same prices.

Figure 10. A typical dish (marine turtle meat) is sold in San Andres Island, Colombian Caribbean.

Further North East of the continental Caribbean region of Colombia, along La Guajira state we have found this is the most concentrated area regarding to illegal trade of turtle meat, carapaces and other products (E.g. in our survey we found four restaurants selling meat from marine turtle, however, locals inhabitants from Riohacha suggested than the number of sites selling this meat can reach 15) (Figure 11 and 12). In Riohacha City (State Capital city), we did not find handicrafts from marine turtles, however we found four restaurants where marine turtle meat is sold. The number of restaurants could increase to six, according to information provided by local inhabitants.

Figure 11. Local restaurant in San Andres Island where marine turtle meat is sold on weekends as a local dish, Colombian Caribbean

Figure 12. Local restaurant in San Andres Island where marine turtle meat is commonly sold as a local dish, Colombian Caribbean.

People from this area eat marine turtle meat from childhood and it is very easy to find a place to buy it. There are places known as Carmita, El Pulpo and Calamar, where marine turtle meat is sold every weekend and in some places daily depending if they have animals to slaughter (Figure 13 and 14).

In the northern part of La Guajira peninsula is El Cabo de la Vela, a small coastal town where the local community has nets specifically to catch turtle ("turtle nets" for its name in Spanish). When this place was visited, at least seven nets were deployed in the sea. Locals know this is an illegal activity, however this is an area where life conditions are low due to poverty and starving conditions. For these reasons, they continue with this illegal activity to

survive. It is important to mention that the percentage of poverty in Colombia was 26.9, while in La Guajira was 52.6 for 2017 (https://www.dane.gov.co/files/investigaciones/condiciones_vida/pobreza/2017/Guajira_Pobreza_2017.pdf). In this state, poverty is almost double than reported at the national level. This factor will be decisive when NGOs and government organizations begin to implement conservation measures regarding the consumption of marine turtles.

Figure 13. Local restaurant in Riohacha where marine turtle meat is commonly sold as a local dish, Colombian Caribbean.

Figure 14. Local restaurant in Riohacha where marine turtle meat is commonly sold as a local dish, Colombian Caribbean.

In the Magdalena state (Figure 2), between La Guajira and Bolivar states we have found hawksbill handicrafts being sold in two souvenir market from the capital of Santa Marta. These products are made of hawksbill carapaces,

prices range from 5 to 9 USD (Figure 15 and 16). When we asked a seller how they get them, she said all of them came from the city of Cartagena.

Figure 15. Hawksbill diadem sold in Santa Marta, Colombian Caribbean.

Figure 16. Hawksbill Bracelet sold in Santa Marta, Colombian Caribbean.

An aspect of special concern about this illegal trade in the Colombian Caribbean, is the current increasing demand for cock fighting spurs. This is not a widely open market, and we are only watching the tip of the iceberg. All sales related with these items are made discreetly, and probably large amounts of money flow through it. This seems to be part of a bigger outlaw activity. We were able to identify retailers and cock fight places by asking taxi drivers, which

offered us to contact them. Five pairs of cock fighting spurs can be sold for 10 USD (mean value in the Colombian Caribbean).

1. **Status, scope and trends**

i. What are the source, transit and destinations countries/locations involved in the trade?

In addition to the information presented in the previous section, specific places for trade are mentioned in the map shown in Figure 2 and details on the source, transit and destination locations of the marine turtle trade in Colombia are summarized in Table 6.

Table 6. Details about source, transit and destination of major marine turtle´s trade.

Location	Source	Observations	Final destination
Pacific / Chocó	Bahía Solano	Locals from Bahía Solano poached eggs from olive ridley	Local consumption
Pacific / Valle del Cauca state	Buenaventura port	The fishermen catch the turtles at sea. The specimens are processed before reaching the port to avoid controls by the environmental authorities. It is believed that they capture hawksbill, green pacific, leatherback and olive ridley.	The meat is sold in local restaurants of Buenaventura.
			The penis is sold processed and unprocessed in the same city.
	Tolu	Local people consume marine turtle meat and their	Local consumption of marine turtle meat. Carapaces are sold to visitors from main country cities (Bogotá,

Caribbean / Sucre state	Santa Cruz Island and surroundings islands	carapaces sell are sold as a sub product	Medellin, Monteria and Cali)
		Fishermen catch green turtles on feeding grounds. Hawksbills caught have a different fate as they are exchanged for chicken with a conservation program operating in the area. Turtles are tagged and released in other places.	Hawksbill products (made of carapace scutes) are the main target, which can reach international destinations such as Venezuela and Surinam. It also depends on the tourist destination.
			Meat is consumed by locals.
Caribbean / Bolivar state	Cartagena	This is one of the biggest selling points of handicrafts made of hawksbill carapace in Colombia. This is due to the high flow of national and international tourists.	Handicrafts are bought by national and international tourist. These items are taken for sale in other touristic places in the Colombian Caribbean such as Santa Marta.
	Baru, Islas Del Rosario and surroundings	Fishermen catch hawksbills directly and sell their carapaces. They also make cock fighting spurs to trade. The	Domestic consumption of meat. Hawksbill carapace products goes through the entire country.

		meat is locally consumed.	
Caribbean / San Andres and Providence Archipelago state	San Andres, surrounding islands and cays	Turtles are caught directly in Providence and surrounding cays by fishermen. Hawksbill, green and loggerhead turtle meat are locally consumed.	Some meat is for local consumption and the other offered to visitors by the street vendors. Hawksbill carapaces are mostly sent to make handicraft and sale them in Cartagena.
Caribbean / La Guajira state	Riohacha	High traditional demand of marine turtle meat. The biggest consumption in Colombia (based on official databases - Autonomous Corporation of La Guajira State - CorpoGuajira)	Domestic consumption is the major use. However, it is believed that this meat is taken to other in-country cities such as Bogota.
	Cabo De La Vela and surroundings	Local residents use turtle nets for direct take of juveniles and subadults. Consumed meat is from hawksbill, green, loggerhead and leatherbacks.	Most of the animals caught are transported to main cities of Riohacha, Uribia and Maicao. These are the main consumption places for meat and from where it is distributed to other cities in the country.

ii. How many specimens (what species) are estimated to be traded in the country assessed?

The number of specimens involved in this illegal activity is difficult to estimate with the current data. Local communities do not share this information easily and estimates from surveys could reflect biased values. For this reason, we requested databases of wildlife traffic from La Guajira (one of the states with the highest consumption of marine turtle meat and carapaces traded) and the city of Cartagena (highest production of hawksbill handicrafts). We have analyzed in the following sections the data reported from La Guajira, however databases from Cartagena were not obtained.

In terms of volume of trade, we calculated that at least four green turtles are sold in Riohacha per week (information based on the restaurants surveys with marine turtle meat). It means that more than 200 turtles from this species are trafficked per year in the capital city of La Guajira state.

In Cartagena, hawksbill products are the major trade. The volume of seized products can reach 250 items in one operation (Cartagena Police). We assume that at least this is constant per month; we calculate that 3,000 hawksbill products might be sold per year in this city.

iii. How does the level extrapolate to regional scale?

Green turtles have been traditionally caught (direct take) in La Guajira state by Wayuu indigenous people during migratory movements of adults departing Costa Rica (Tortuguero), heading to nesting grounds in Aves Island in Venezuela and Florida (USA) and subadults coming from Bermuda and Turks and Caicos. Most of these breeding females are illegally taken while feeding on grounds near shore waters of La Guajira Peninsula between Colombia and Venezuela (Barrios-Garrido, 2018).

iv. Can the countries in the region be ranked to the relative size of the trade?

Data available to date highlights two important aspects in the illegal trade of marine turtles in Colombia. The first one is related to hawksbill carapace, which has the biggest market of manufactured items in the city of Cartagena. The

second one is the consumption of marine turtle meat by Wayuu indigenous people and inhabitants of La Guajira. Animals are sold to local restaurants in Riohacha (where turtle meat is highly consumed) and illegal slaughter houses, of meat and carapaces are dispatched to Cartagena, Santa Marta and inland cities like Bogota, Medellin and Cali.

b. What are the features and the characteristics of the trade?

i. How can the trade be characterized?

During the present study, we accessed a database of the Environmental Crime Research Group at National Police for crimes committed between 2000 and 2017. In this document, we were able to analyze the seizures made (of all wildlife, not only of marine turtles) and the circumstances of prosecuted people (Table 7). This data is reflecting an important fact, more than 96% from reported cases come from flagrance, which demonstrates a lack of research by the judicial authorities as the nation's attorney general's office, which is the main authority responsible for issuing court orders.

Each state of Colombia must have at least one prosecutor in charge of environmental crimes. However, their work is often affected by other types of crimes that saturate the judicial system. This appreciation came from one of the workshops that WWF carried out with the National Police in the city of Cartagena to combat the hawksbill traffic in 2017.

Table 7. Number of crimes against all wildlife in Colombia documented by National Police between 2000 and 2017.

Penal code	Number of reports	Circumstance	
		Flagrance	Court order
Section 328	2580	2515	65
Section 331	606	565	41
Section 336	161	144	17

Section 337	26	26	0
Total	**3373**	**3250**	**123**

Regarding to any crimes relating to marine turtles from 3373 cases reported against all wildlife, we have only found 92 reports for marine turtles carried out by National Police from 2000 to 2017. In Colombia these reports were registered with only three species: hawksbill, green and leatherback (Figure 17).

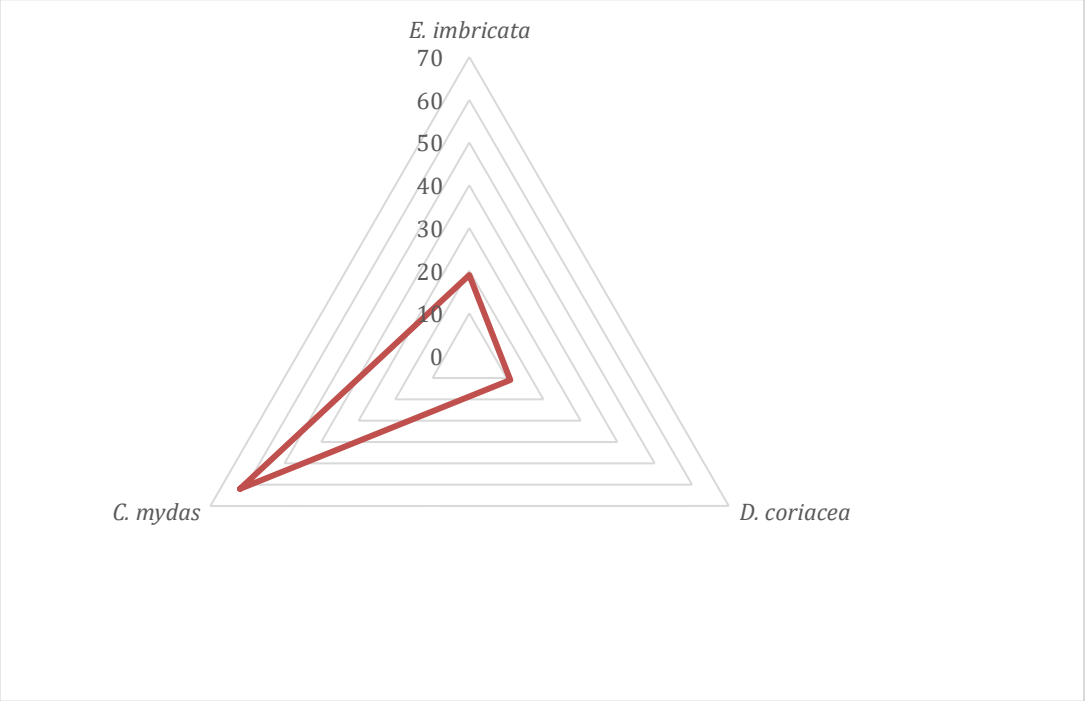

Figure 17. Radar diagram, cases of marine turtle crimes reported by National Police between 2000 and 2017 in Colombia.

In La Guajira region, we had access to the database that reports all seizures of fauna in the state, which was provided by CorpoGuajira (Regional Environmental Authority). This document shows a greater number of seizures by local environmental authorities (CorpoGuajira and police at the state level) compared to those reported by the National Police at the central level in Bogotá. 250 cases of four species were reported between 2000 and 2018 (Figure 18), however green turtle and hawksbill are the most representatives with 65% and 28% respectively. This fact is relevant because it reflects a lack

of cooperation between regional and national environmental authorities for which seizure records did not matched.

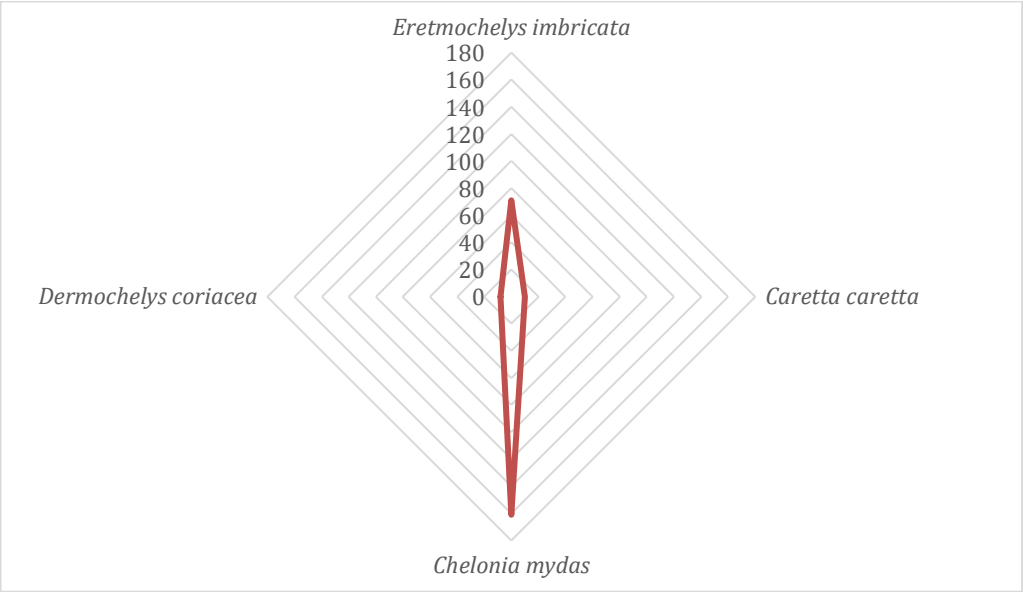

Figure 17. Radar diagram, Reported cases of crimes against marine turtles in La Guajira state between 2000 and 2018 by Regional Autonomous Corporation (CorpoGuajira), Colombian Caribbean.

These findings reflect some gaps in information and evidence the lack of training by the National Police and its technical teams to fight against wildlife crime. This was corroborated when comparing the records of La Guajira state to National databases (Figures 17 and 18), in which more cases were reported by one state (Guajira, n=250) than the national level (National Police, n=92).

With current data available, local consumption of marine turtle can be differentiated by two patterns according to the final destination of the product at national level. The first one is the use by local communities that depend on these products for subsistence and generate income, which is based on marine turtle meat consumption. The second feature is an “export scheme” of products for which the final destination is Cartagena. In the last case, supply and demand of hawksbill handicrafts and cock fighting spurs are the underpinning pillars.

ii. Who is involved in the trade?

In the Pacific region there are different parameters involved in the marine turtle illegal trade. First of all, fishermen who extract turtles from the sea and bringing their products to sell in the coast. In this first step, the fishermen sell the products to intermediaries, then marine turtle meat is taken to restaurants and carapaces and penis are transported to artisans and curio sellers.

In the Caribbean region we have a similar scheme of what is found in the Pacific. However, this region has additional factors, such as divers who directly hunt these animals and Wayuu turtle nets located along La Guajira coast. The rest of the domestic consumption, local and regional trade process is similar to the Pacific region.

Finally, we found a new way of marine turtle illegal trade throughout the national's territory. The sale of cock fighting spurs is available on the Internet such as Facebook (Figures 19-23), in which we found five offers without volume specifications. This issue is reaching remote places because these materials are sent by mail and there are no methods to detect them.

Figure 19. Cock fighting spurs offered in Facebook, Colombia, Price was not available.

Figure 20. Cock fighting spurs offered in Facebook, Colombia, 3 USD a pair.

Figure 21. Cock fighting spurs offered in Facebook, Colombia, price 38 USD a box with 12 pairs.

Figure 22. Cock fighting spurs offered in Facebook. Colombia, Price was not available.

Figure 23. Cock fighting spurs offered in Facebook, Colombia, 3.3 USD a pair.

iii. What are the drivers/motivations?

Cultural: on both coasts, marine turtle meat consumption has a negative impact on marine turtle population because local communities have used them as a traditional and cultural practice. Additionally, turtle meat is considered of higher nutritional value compared to other animal proteins. An example of this is found in the Caribbean coast at La Guajira state, where people usually consume this food in early hours of the morning to reduce the effects of alcohol ingestion the night before (traditional beliefs). In the Pacific region we can find these beliefs as well. For instance, marine turtle penis is considered to be an aphrodisiac by local people from Buenaventura.

Economic: selling hawksbill carapace and marine turtle meat brings extra income to local fishermen, handicraft artisans and local divers. This is because the high price that tortoiseshell raw material has in the market. In places like La Guajira, this illegal activity is an important source of income and nutritional value for families living under poverty conditions.

Social: the use of the hawksbill carapaces for handicrafts has a high demand due to the strong physical properties of the material. In the same way, it is believed that cock fighting spurs are more effective than those made with other materials.

iv. What specimens and species are in trade?

The five species of marine turtles illegally traded in Colombia are: green, hawksbill, loggerhead, leatherback, and olive ridley.

v. How are the specimens used (end-products)?

It is important to mention that prices for meat of a given species is not possible to establish because in most cases it has been processed before, arriving to restaurants or marketplaces. Turtle meat dishes have prices that range from 8 to 10 USD. If sold per pound price goes from 2.5 to 5 USD. The price for an entire turtle - depending on the species and size - is estimated between 230 and 500 USD (Table 8).

Table 8. Prices of marine turtle products in Colombia. Prices are established in mean values.

Species	Product	Price	Observation
Olive ridley - Green	Eggs	0.15 USD each one	It is not possible to establish which species is when products are processed, although prices for these two species are similar
	Penis	8 USD an inch 40 USD bottled with alcohol and herbs	
	Meat	3 - 4 USD per pound	
Hawksbill	Whole carapace	20 - 100 USD	The price depends on the size and thickness of the scutes
	Spurs	3 - 4 USD a pair	The price depends on the size and

		35 - 40 USD for a 12 spurs box case	thickness of the scutes
	Penis	8 USD an inch 40 USD bottled with alcohol and herbs	Only recorded in a marketplace of Buenaventura
	Handicrafts (bracelets, rings, combs and diadem)	1.5 to 8 USD	The price depends on the size and thickness of the scutes

c. How is the trade trending?

i. Are overall levels of current trade declining, stable or increasing?

To answer this question, a survey was carried out in local communities to identify the current status of trade but people's willingness to talk was very cautious when not low. Nevertheless, some of them provided useful anecdotal information considered in this report.

Interviewed inhabitants - nine from the Pacific and an equal number from the Caribbean - indicate that illegal trade of marine turtles has decreased in the last 10 years. They argue that natural populations have declined and the trade has decreased as well. In addition, control over security aspects and drug trafficking, reduce the probability of illegal trade in places such as Buenaventura and the main port in the Pacific coast. Although fines imposed to wildlife smuggling and black markets are high and suspects are taken to court, cases do not proceed and turtle trafficking continues to be a clandestine activity in those places with poor Law enforcement in the Caribbean coast of Colombia. In La Guajira state, people recognize a decrease in turtle trade but traditional consumption is still present especially in Wayuu indigenous people. Data collected during this study was not enough to measure the impact of the current dependence on marine turtles by this indigenous group for which they have a cultural value.

In La Guajira, people currently accept the fact that marine turtles are endangered and facing extinction. However, they do not have many protein options to consume nor stable jobs to improve their family income. In this area, a live turtle can be sold for more than 300 USD. Due to the meat consumed and cultural aspects, the most traded species is the green turtle, followed by the hawksbill, which is also highly appreciated for the beauty of its carapace.

ii. Are there any noteworthy trends or shifts in national and regional trade partners?

We note that the demand for cock fighting spurs made of hawksbill has apparently increased on the internet. Countries like Venezuela, Guyana, Suriname and Ecuador are buying these products that come from Colombia. (Personal information from Lemul Cromwell and Hector Barrrios-Garrido, data not published).

2. Conservation impacts

d. What are the conservation impacts associated with the current levels of trade?

In general terms, it seems that hawksbill and green turtles are having negative consequences regarding their conservation status due to the currents levels of trade in the Caribbean region. For example, hawksbill appear to have a great impact for the trade of its carapace, and on the other hand green turtles seem to have an important pressure for its meat. Finally, and based on the surveys, olive ridley looks to have a highly egg consumption in the Pacific region.

i. For each species: How significant is the trade for conservation compared to other threats?

All species of marine turtles are susceptible to changes in the environment, and illegal trade diminishes the ability to prevail over time, however the trade level is different in each species.

Hawksbill: It is the species with the highest level of threat in Colombia. Like other species, it is subject to bycatch, consumption of eggs and meat. However, the pressure on the sale of its carapace is something that only affects this species.

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Green turtle: it is the species with the second highest level of threat in Colombia after hawksbill. It presents threats such as bycatch and egg consumption. However, the pressure on meat consumption in places like Guajira is apparently affecting their natural populations.

Olive ridley: this species is affected by poaching in the nesting process in which eggs consumption is present along the Pacific side. This species is in virtually endanger compared to other species in Colombia.

Leatherback: the main threat to this species is bycatch. Also, in the Caribbean coast its eggs are consumed. Locals suggested that leatherback is no longer targeted for meat consumption. For these reason, we suggest this species is in virtually endanger compared to other species in Colombia.

Loggerhead: although this species is present in the Caribbean coast, its population has reduced, plus the individuals are target of trade as well because its meat. For these reasons, it is not possible to provide an estimate because the data is insufficient for this species.

3. Managements options

e. How can management and conservation be improved at the national and regional level?

Near to Tolu, in the South West side of the "Corales del Rosario" and San Bernardo National Park there are local communities who live from fishing and tourism (Santa Cruz Island). They are also involved in a "conservation program", carried out by a local hotel, where owners exchange animals for equal weight of chicken to those people that handed them out a live turtle which are released after tagged. Not much information was provided by the person in charge of the hotel by the time it was visited. This program focuses on hawksbills and not green turtles, which are also present in the area. This is an incentive that encourages people to continue hunting the greens for its meat. To avoid police controls turtle meat is landed after slaughtering the animal offshore. The same case is observed in the Pacific, where fishermen process the turtles in the sea before coming ashore to sell their meat (Figure 24).

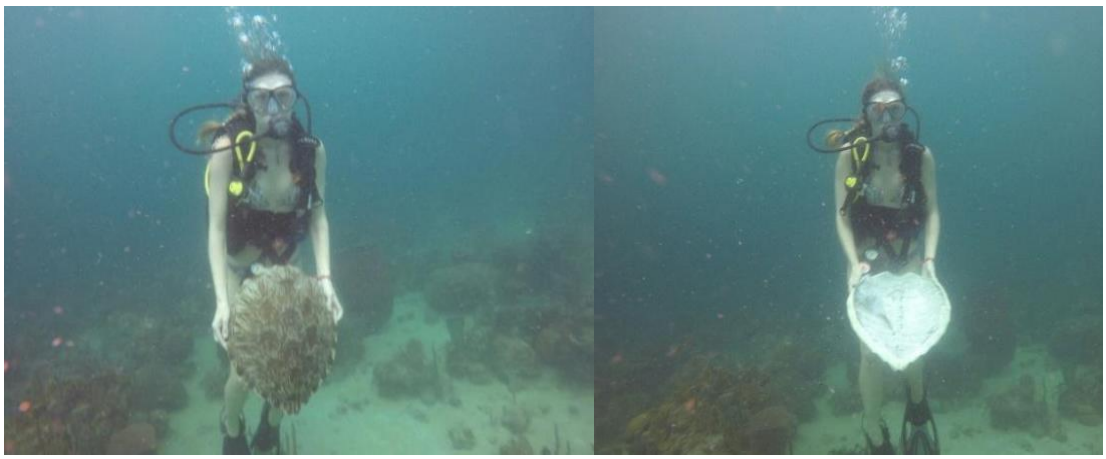

Figure 24. Green turtle carapace found apparently slaughtered, Colombian Caribbean.

I. What are evident shortcomings in current management and conservation policies that are enabling illegal/uncontrolled trade?

In Colombia poor Law enforcement is the major cause for enabling current wildlife trade as the case with marine turtles. Current capacity of police and environmental authorities to eradicate this illegal activity is low. This is mainly because of two factors:1) lack of training on environmental issues and anti-poaching techniques by Law enforcement and environmental authorities in the main sites where marine turtles are traded, and 2) Surveillance and equipment to conduct them are minimal in the coastal and marine areas of the places mentioned in this report.

i. What are evident successes in currents management systems from which lessons can be learnt?

Recently in April 2018, 250 hawksbill handicraft items were seized by the environmental and ecological police in Cartagena (Figure 25). The price of the confiscated merchandise was estimated at 1,500 US. This Law enforcement activity was part of the hands-on training sessions imparted by WWF to police and environmental authorities at the city of Cartagena. Over 50 police officers were trained to tackle marine turtle trafficking, specifically in the recognition of handicrafts made of hawksbills carapace.

Figure 25. Seizure of handicrafts made of hawksbill carapace in the city of Cartagena, Colombian Caribbean.

ii. How can current management and conservation practices can be improved at national and regional levels?

To really halt illegal wildlife trade in Colombia political will is required. Without governmental backing there is no possibility for any conservation initiative to halt marine turtle illegal trade. That seems to be the case in Colombia.

At the national level, the Ministry of Environment has failed to properly implement the National Terrestrial and Marine Turtle Conservation Program (MMA, 2002). It is urgent to develop this policy besides a public campaign to update particularly local communities on the plight of marine turtles and the importance of conserving them. The protection of these endangered species must be encouraged through economic and social incentives that benefit local people in the form of conservation agreements. It is imperative to reduce poverty while improving livelihoods of communities that directly depends of marine turtles and their critical habitats.

At the state level, regional environmental authorities in Colombia must work following national guidelines fostering community-based conservation endeavors. Governance needs to be enhanced and communities empowered locally for responsible environmental management providing enough tools and means to combat current illegal trade jeopardizing people´s livelihood and destroying natural resources on which they rely today and their descendants will do so tomorrow.

The private sector needs to be involved as well. The work begins with the extractive sector, whether fishing boats, directed fishing, bycatch or divers. In this task, commitments should be implemented for the protection and

conservation of marine turtles. These actions must be directed towards other biological resources and activities that are sustainable. On the same way, environmental authorities need to accompany these activities with the implementation of Laws through control and surveillance, which is covered by section *328. Illicit use of the renewable natural resources of the Law Law 599 OF 2000.*

The second level of this management approach should focus on intermediaries, who are responsible for marketing the meat, eggs, penis and carapaces. If this sector is involved in the conservation plan to develop, it will be much easier to tackle the business chain reducing the demand and supply of marine turtle illegal products. Thus, traffickers will not have a market to sell their products, and consumers at the end of the chain end (tourists or local inhabitants) would not demand available products.

Finally, there is urgent to involve those that consume marine turtle products in Colombia and abroad. Consumption might be reduced if people is well informed about the critical situation on which marine turtles are nowadays and the legal consequences of breaking national and international legislation that protect them.

Areas where immediate mitigate efforts may be needed

f. What mitigation action is needed and where is it most urgent?

i. What areas (geographical and operational) are in need of immediate mitigation efforts?

In the Pacific coast of Colombia, a strategic plan must be implemented as soon as possible to reduce turtle meat consumption. Buenaventura has a huge number of national and foreign visitors, due to tourism and important commerce business that takes place in the more important Colombian port in the Pacific coast. Current scenario without systematic controls facilitate the demand and offer on marine turtle products openly or underground.

In the Caribbean region, bigger efforts must be implemented to reduce the demand for hawksbills carapace made items in the city of Cartagena. This is the major Colombian destiny which experience an increasing number of the

four million domestic and foreign visitors that arrived last year by sea, air and land.

In La Guajira state Law enforcement under cultural and poverty considerations need to be applied in order to deactivate current marine turtle illegal trade. If this happened, most of the marine turtle illegal traffic in the Colombian Caribbean will be significantly reduced.

ii. What are those efforts?

These efforts consist of more inclusive and participatory public policies for local communities to raise their voice and express their needs which might result in more sustainable and responsible sources of income to reduce poaching, consumption and illegal trade of marine turtles in Colombian Pacific and Caribbean coasts.

At the same way, the environmental authorities must be more rigorous in the implementation of control and surveillance activities. In addition, prevention plans for marine turtle consumption should be implemented with the objective that tourists and locals do not contribute to this illegal activity.

iii. What immediate, short and long term needs should be highlighted to parties, management bodies and other relevant bodies and stakeholders?

At this time, NGOs working in environmental and biodiversity conservation in Colombia such as WWF, are contributing raising information on marine turtle illegal trade useful for authorities to combat this menace. This is an important factor because it allows civil society to help the government in applying legislation while developing research management alternatives in those places where protection is high priority. Environmental authorities must undertake better and cost-effective surveillance plans to stop as soon as possible these illegal activities taking place in Colombia.

In the long-run, NGOs, National Parks and the Ministry of the Environment should develop and apply strategic and coordinated plans involving multiple stakeholders for whom wildlife has an economic, ecological and cultural value. Community-based conservation has a key role to play to change illegal practices involving marine turtles. New profitable, sustainable and responsible activities such as ecotourism, the provision of biodiversity goods and the

compensation for ecosystem services need to be strengthened where currently implemented or develop where in order to secure marine turtle future in Colombia.

Important findings

Data gathered during this study and information obtained from colleagues and web sites highlight the following aspects:

- In the Pacific region the traffic associated with marine turtles is more oriented to eat turtle meat and uses associated to aphrodisiac properties
- In the Caribbean, especially in Cartagena (Bolivar state) and surroundings towns the main reason for trafficking marine turtle is to obtain hawksbill´s carapace in order to elaborate cock fighting spurs. If the hawksbill carapace is not thick enough, it is used to make handicrafts. Those products are exported to main cities in the Colombian Caribbean such as Santa Marta (Magdalena state) and other inland cities.
- In La Guajira state there is a strong marine turtle meat market, which is enhanced by poverty and cultural traditions. The species most affected is the green turtle, which is chased for the soft taste of its meat.
- From a national perspective, the main illegal trade arising threat is the demand for cock fighting spurs made of hawksbill scutes. It is important to keep in mind that besides this problem this species as well as other marine turtles in Colombia is pursued for its meat.

Panama

The marine turtles represent a valuable resource of marine biodiversity for Panama. The recognition of the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) in 1996 and later ratified by Law 8, formalized the country´s compromise towards conservation and protection of marine turtles in particular in recent decades. Panama has shown progress on the protection of nesting sites, especially those already impacted by human

activities, training, environmental education and local awareness about the importance of conservation and proper management. At different levels the government has promoted synergies among regional and international organisms in favor of marine turtles (MiAmbiente, 2017).

This chapter summarizes the results of the surveys conducted to date along different sites of the country in the Pacific and Caribbean regions. Traveling by car or boat to several locations these surveys involved the identification of key areas for trade, meeting several people including government officials, NGO activists, ethnic groups leaders, fishermen, divers, rangers and tour operators, and identifying the paths of the trade with the more detailed description possible.

1. Status, scope and trends

a. In what areas does trade exist?

Based on field work and literature review, the areas under more pressure are in the Caribbean region of the country (Meylan et al., 2013, STRI NEWS August 02, 2013). These areas are the two main archipelagos: Bocas del Toro state, the Kuna Yala Comarca, and part of the Ngäbe Bugle Comarca. The results suggest that marine turtles seem to be under higher pressure due to the illegal trade of their products. On the other hand, along the Pacific coast trade focuses on beaches in Veraguas state, Los Santos state, and Panama Oeste state with less intensity in Chiriqui state.

I. What are the source, transit and destinations countries/locations involved in the trade?

Bocas del Toro state, the Kuna Yala Comarca and the Ngäbe Bugle Comarca act as source of marine turtle products (i.e. meat, carapace, eggs) that are locally consumed or traded towards main City centers in the country: Isla Colon, Changuinola, Chiriqui Grande, David City, Santiago City, Las Tablas City, Panama City, and Santa Isabel port in Colon state. This traffic does not preclude the selling of products, mainly hawksbill carapaces outside the country to Colombia (Cartagena and Turbo). Interestingly, based on the response of 26 interviewers, there seems to be an abroad manufacturing of raw hawksbill carapaces that are sold to Colombian ships or cross the Costa

Rican border reaching Mexico and are processed on those countries and re-sold back into Panama as valuable cock fighting spurs.

A general map showing the major trade locations (Figure 26) and specific details source, transit and destination of major main turtle illegal trade are mentioned in the Table 9.

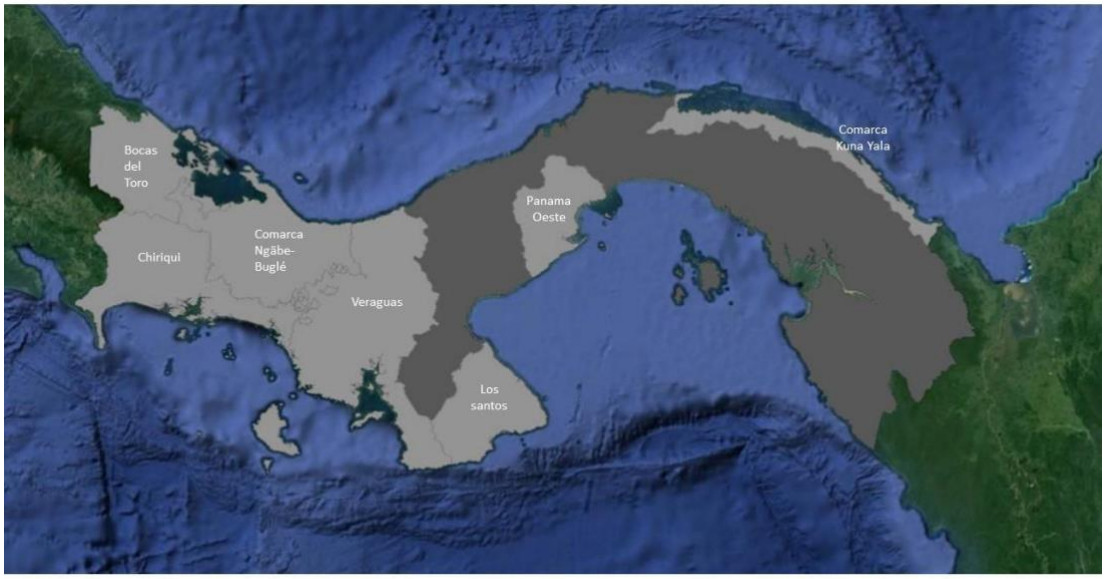

Figure 26. Map of Panama including Pacific and Caribbean coastal states and comarcas involved in illegal trafficking.

Table 9. Details about source, transit and destination of major main turtle illegal trade.

Location	**Source**	**Observations**	**Final destination**
Caribbean / Bocas del Toro state	Larga beach, Bluff beach, Zapatillas Cays, Punta Vieja, Polo beach, Cayo de Agua, Carenero beach	Fishermen mainly from Bastimentos Island go to catch nesting females and eggs of mainly green and also hawksbill marine turtles. Sometimes	The eggs and meat are sold in Isla Colon. Some people from Panama City come to buy prepared dishes in the local restaurants of Isla Colon. There is a possibility that some hawksbill carapaces cross the

		they also use harpoons to catch green turtle males on the sea.	border with Costa Rica towards Mexico
	Playa Soropta	People kill nesting females of *D. coriacea* and also collect eggs. Eggs of green turtles and eggs of hawksbill are collected too.	The eggs and meat of leatherbacks are offered in restaurants in Changuinola city. Eggs of green and hawksbill marine turtles are also offered in Changuinola city.
	Open sea 5 miles away from Zapatillas Cays	Fishermen mainly from Bastimentos and Almirante go there to catch green turtles during their migration period using harpoons and artisanal fishing nets	For local consumption in Bastimentos and Isla Colon (offered in restaurants located at Istmito and in front of Hotel Bocas del Toro)
Caribbean / Ngäbe Bugle Comarca	Roja Beach, Punta Escondida, Punta Nispero, Quebrada Nasa, Cayo Paloma, Bahia Azul, Tobobe,	These are communities that use marine turtles extensively as	The communities use marine turtles mainly for local consumption, although in a minor

	Kusapin, Chiriqui beach, Escudo de Veraguas Island	part of their diet. They consume green, hawksbill and leatherback marine turtles, making use of meat, eggs and carapace (in the case of hawksbills)	scale some professionals and traders visiting the town of Kusapin buy turtle meat. These marine turtles are also traded in Chiriquí Grande and Almirante
	El Banco, located away from Escudo de Veraguas Island	Fisherman from the communities go there to catch green turtles during their migration period using artisanal fishing nets	The communities use marine turtles mainly for local consumption
Pacific / Chiriqui state	La Barqueta Agricola Wildlife Refuge	Local residents collect eggs and fins from olive ridley	A part of these products are consumed locally and eggs are sold in David City.
Pacific / Los Santos state	Cambutal beach, La Cuchilla beach, Horcones beach, Guanico Abajo, Isla	Local residents collect eggs and sometimes fins of olive ridley	Eggs are sold in Tonosi, Las Tablas bus terminal and in the town of Pedasi

	Cañas Wildlife Refuge		
	Mensabe Port	Fishermen come to the port with marine turtle meat (the specific species is unknown)	Probably this meat is consumed locally.
Pacific / Panama Oeste state	Punta Chame, Veracruz	Local residents collect eggs, meat and also prepare turtle oil of olive ridley	Part of these is for local consumption and part is sold in Panama City.
Pacific / Veraguas state	Cascajilloso, Playita, Morrillo, Malena beach, and Mata Oscura beaches	Local residents collect mainly eggs of olive ridley and sporadically hawksbill.	Eggs are mainly sold in Arenas town and Mariato. Cock fighting spurs make of hawksbill carapaces are also found in agricultural stores in Santiago City and Mariato town
Caribbean / Kuna Yala Comarca	Carti Sugdub, Isla Tigre, Corazon de Jesus, Ticantiqui, Rio Azucar, Nargana	Fishermen and lobster´s divers go to the nearby coral reefs and catch mainly	In the case of hawksbill the meat, fins, plastron and eggs are consumed locally and the carapace is sold to

		hawksbill and make use of meat, carapace, fins, eggs and plastron and sporadically green turtles to make use of the meat.	boats coming from Santa Isabel port in Colon state and from Cartagena and Turbo in Colombia. These boats bring goods to supply communities in Kuna Yala and as a side activity they buy hawksbill carapace. In the case of green turtles the meat is consumed locally.

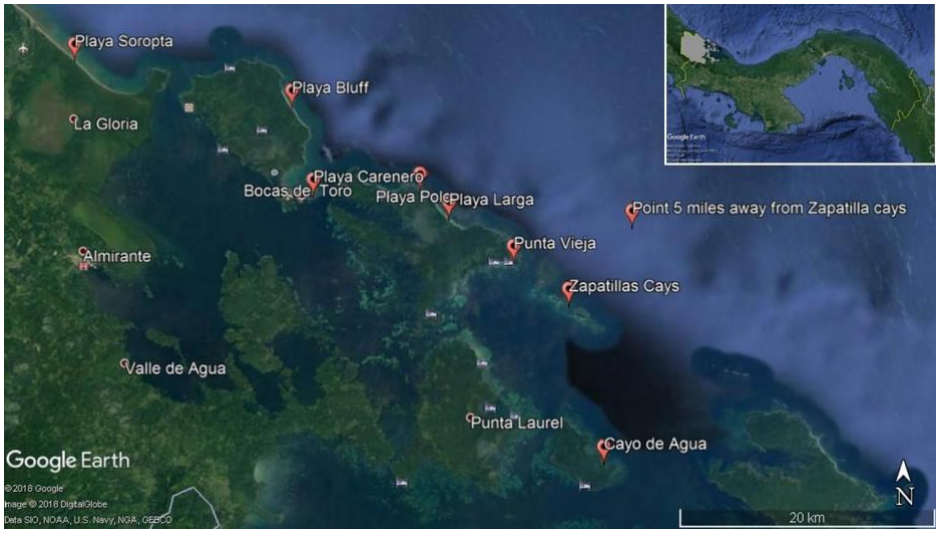

Figure 27. Source of marine turtle illegal trade in Bocas del Toro state, Panamanian Caribbean.

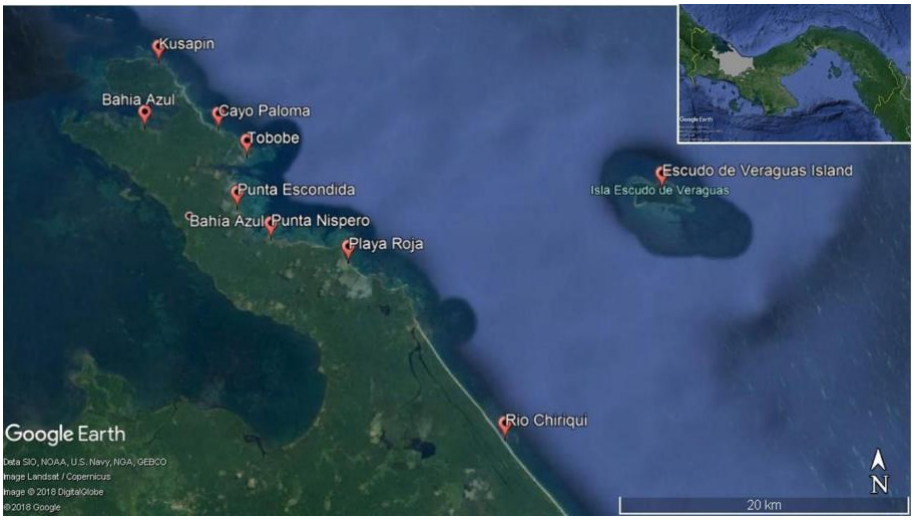

Figure 28. Source of marine turtle illegal trade in Ngäbe Bugle Comarca, Panamanian Caribbean.

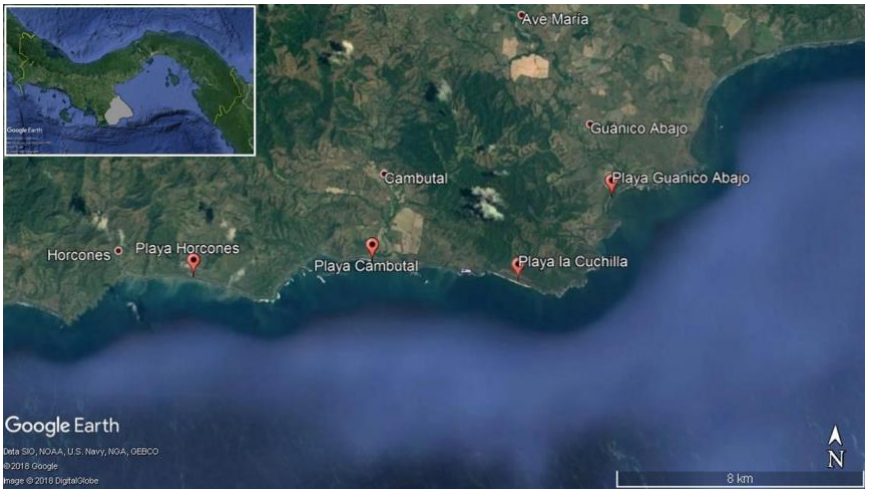

Figure 29. Source of marine turtle illegal trade in Los Santos state (part 1), Panamanian Pacific.

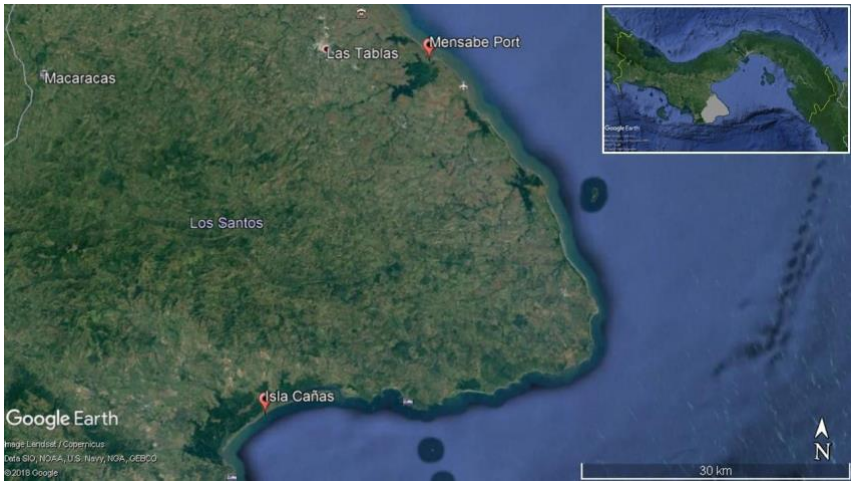

Figure 30. Source of marine turtle illegal trade in Los Santos state (part 2), Panamanian Pacific.

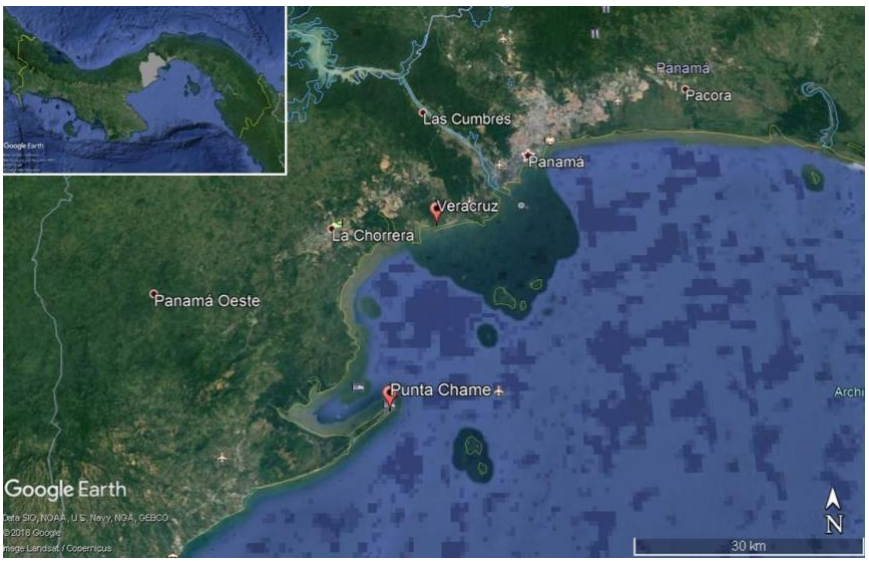

Figure 31. Source of marine turtle illegal trade in Panama Oeste state, Panamanian Pacific.

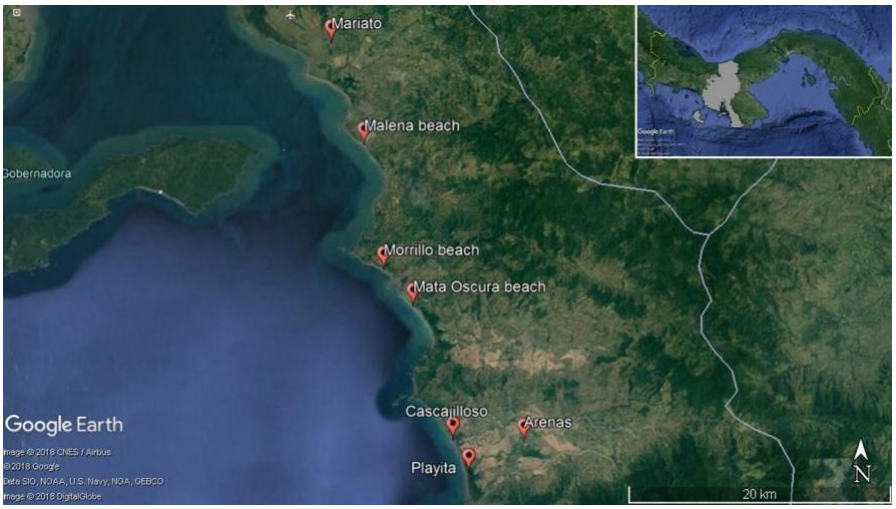

Figure32. Source of marine turtle illegal trade in Veraguas state, Panamanian Pacific.

Figure 33. Source of marine turtle illegal trade in Kuna Yala Comarca, Panamanian Caribbean.

b. How much trade is there?

i. How many specimens (what species) are estimated to be trades in the country assessed?

According to the Diagnostic of the Situation of Marine Turtles in Panama and the National Action Plan for their Conservation (MiAmbiente, 2017), from the five species known to exist in the country, four were identified to be involved in some kind of trade: leatherback, green, hawksbill and olive ridley. The features of the trade depend on two aspects: the species and the location assessed. Based on the responses of 26 interviewed people during the surveys it seems that the main trade in the Caribbean region of the country is based upon hawksbill followed by green turtles (Figure 34), meanwhile in the Pacific region the trade focuses mainly on olive ridley (Figure 35).

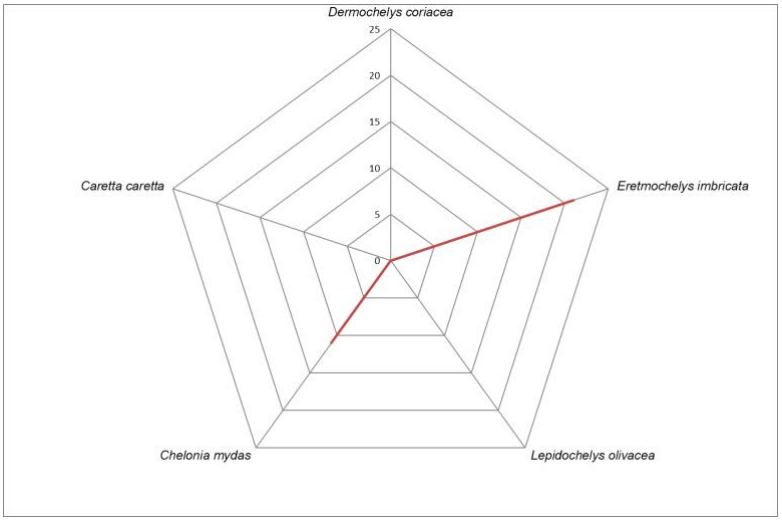

Figure 34. Radar diagram representing the frequency of response of the interviewers about the marine turtle species involved in illegal trade in the Panamanian Caribbean.

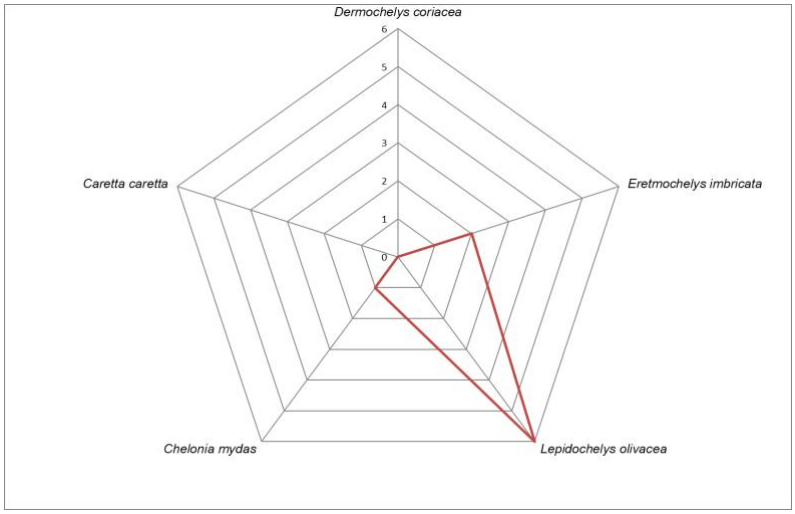

Figure 35. Radar diagram representing the frequency of response of the interviewers about the marine turtle species involved in illegal trade in the Panamanian Pacific.

There are not conclusive figures about the number of the actual trade, since the authorities did not manage a database and figures coming from NGOs and community-based groups diverge. However, the following Table summarizes the information collected along the country during different visits and interviews (Table 10).

Table 10. Amount of marine turtle specimen products traded in Panama.

Source	**Species**	**Amount of product traded**	**Observations**
Pacific / La Barqueta Agricola Wildlife Refuge	Olive ridley	4 to 5 are captured during high nesting season every year	This activity is developed by one local resident
Caribbean / Open sea 5 miles away from Zapatillas Cays	Green turtle	1000 turtles captured during one nesting season (from July to September), sometimes up to 7 per day per hunter	
Caribbean / Bluff beach, Chiriqui beach, Roja beach, Isla Escudo de Veraguas Island, Zapatilla Cays, Larga beach, Punta Vieja and Polo beach	Hawksbill	During 2017 a total of 29 individuals were killed at these sites	
Caribbean / Kusapin	Green turtle	During every high season as many as 15 turtles are killed	

Caribbean / Soropta beach	Leatherback	Between 2007 and 2018 there are records of 12 killed turtles	
Pacific / Cambutal beach	Olive ridley	Between 2016 and 2017 a total of 187 nests looted and 3047 eggs confiscated. Between 2017 and 2018 a total of 130 nests looted and 3013 eggs confiscated.	
Pacific / Cascajilloso beach	Olive ridley	During every season around 30 – 40% of nests are looted	
Pacific / Isla Cañas Wildlife Refuge	Olive ridley	During a given year around one hundred thousand to two hundred thousand eggs are collected illegally	
Pacific / Punta Chame	Olive ridley	During 2015 eight turtles were killed and during 2017, three turtles were mutilated.	

Caribbean / Carti Sugdub, Isla Tigre, Nargana, Corazon de Jesus, Ticantiqui, Rio Azucar	Hawksbill	One person can catch between 3 to 6 turtles per month	Data from local interviews to fishermen and lobster´s divers

ii. How does the level extrapolate to regional scale?

One interesting feature of the trade of green turtles is that the species is captured off the coast in Bocas del Toro and Ngäbe Bugle Comarca during their migration path from Colombia to Costa Rica. This event occurs between June and July and sailors travel to open waters capturing the turtles during their mating or when they go to the surface for breathing. This activity has an imminent impact on the recruitment of the species and extrapolates to the other countries involved.

The use of hawksbill´s carapace seems to extend beyond borders when in Kuna Yala Comarca this product is sold to Colombia for further processing. Based on information provided by government officials from the National Authority of Aquatic Resources of Panama (ARAP), some of the hawksbill carapaces from Bocas del Toro state cross the border with Costa Rica further north to Mexico imposing a more complex scheme in the dimension of regional trade.

iii. Can the countries on the region be ranked to the relative size of the trade?

One informant indicates that Panama is considered as the number one producer of ornaments based on hawksbill carapace.

c. What are the features and the characteristics of the trade?

i. How can the trade be characterized?

In general terms the trade can be distinguished by two kinds of patterns according to the final destination of the product: 1) there is an in country domestic use of the product by rural communities that: depend on these products for subsistence or they commercialize it internally. 2) another feature is an export scheme of the product out of the local communities which has a

final destination in the national markets of more populated cities or ends up out of the country. To better visualize these patterns the following figures represent the paths of specific marine turtle products traded in Panama.

Bocas del Toro state and Kuna Yala Comarca are the two main sites in the Caribbean side of the country where hawksbills are captured (Figure 36). In particular local fishermen and lobster divers captured the turtles during their travels to capture fish and lobsters. In Kuna Yala in particular, lobster´s divers use fishing nets and an artisanal tool made of a metal wire tied to a stick to capture the Hawksbill during their immersions. The turtle meat and eggs are used locally and the carapace is sold to traders from Colon province (Santa Isabel port) and Colombia in the case of Kuna Yala, and probably delivered back to other cities in the country. In the case of Bocas del Toro one path takes the raw carapace to Almirante and Chiriqui Grande and other path takes them probably to Costa Rica reaching Mexico. In particular cock fighting spurs are sold in Santiago and Mariato. In Santiago there is one person dedicated to the post processing of hawksbill carapace to produce spurs and in Montijo town there are two men dedicated to this activity. Potentially these spurs are also offered in Santa Fe district north of Veraguas province where the cock fighting activity is frequent.

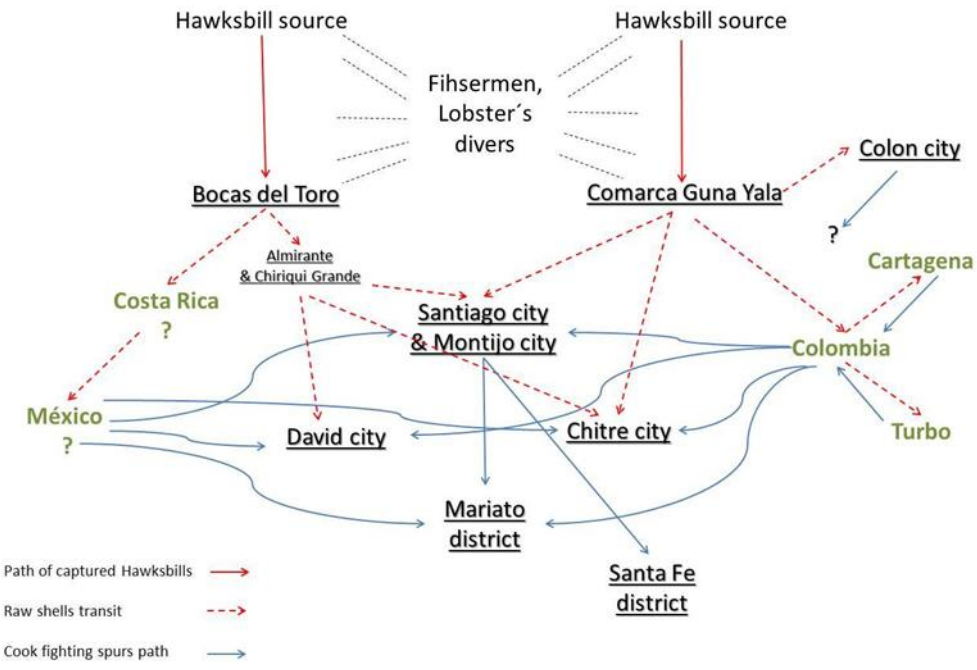

Figure 36. Schematic representation of the trading path of hawksbill carapaces in Panama.

The three main sites where green turtles are captured are Bocas del Toro state, Kuna Yala and Ngäbe Bugle Comarca. Local fishermen and divers bring the meat and eggs to be consumed locally (Figure 37).

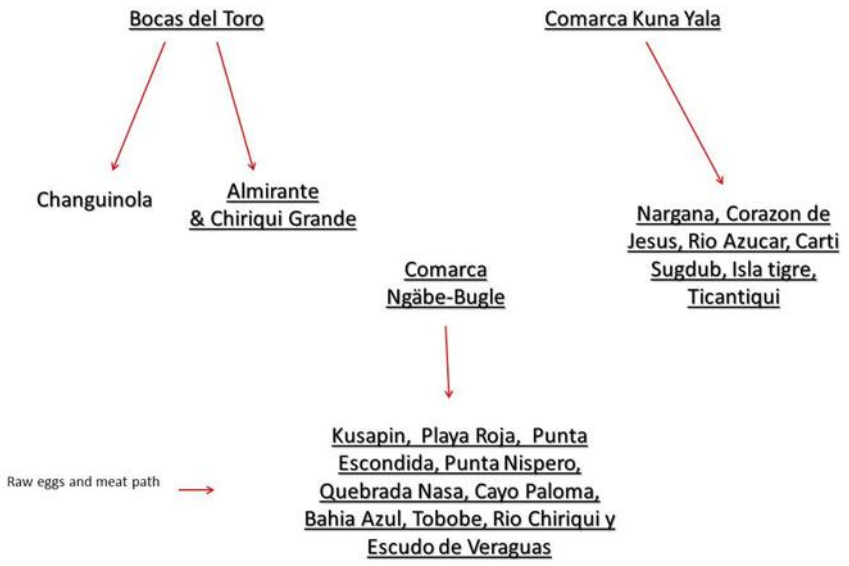

Figure 37. Schematic representation of the trading path of green turtle meat and eggs in the Panamanian Caribbean.

Local people collect eggs along different nesting sites in the Pacific region. Parts of these eggs are consumed locally and part are processed and sold to other urban centers and main cities in bars and public events (Figure 38).

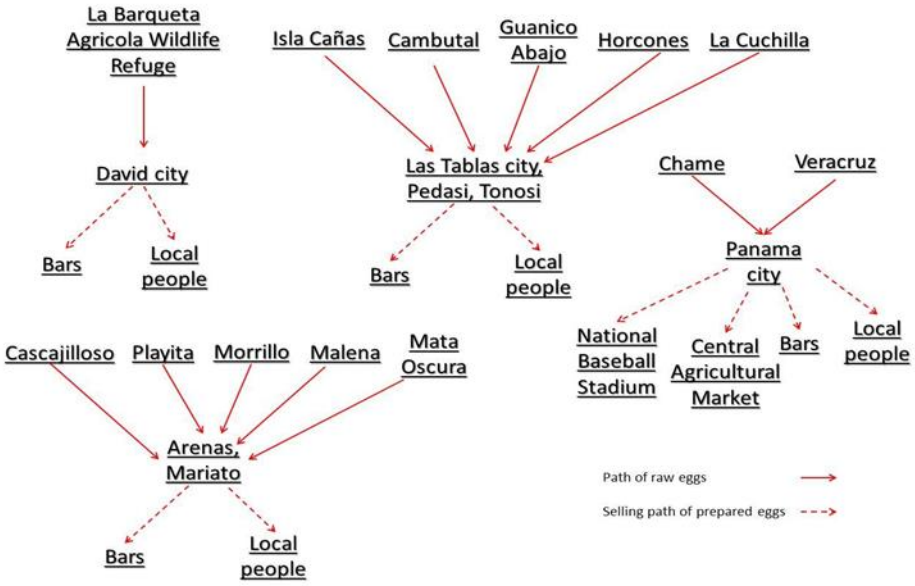

Figure 38. Schematic representation of the trading path of olive ridley eggs in Panamanian Pacific.

After searching for information on illegal trade in local newspapers on the web, we found the following records of turtle eggs confiscated in the Pacific side (Table 11). Most of the cases happened between August and November, which corresponds to the peak of the nesting season for olive ridley in the Pacific region.

Table 11. Cases of turtle eggs confiscated by government authorities in the Pacific region of the country.

Year/Month	**Amount of eggs confiscated**	**Comments**
2012/July	1500	Los Santos state
2013/September	637	Cocle state
2015/October	843	Los Santos state
2015/November	3460	Los Santos state
2016/August	7319 (olive ridley) 49 (green turtle)	Los Santos state
2016/October	9117	Los Santos state
2016/November	1400	Los Santos state
2018/September	13500	Los Santos state

According to records of a database of ARAP, between 2011 and 2013 there were cases of crimes committed by local people in the Pacific region (Los Santos state), see Table 12.

Table 12. Crimes for possession or commercialization of marine turtles products.

Description of crime	**Year**	**Amount of fine (USD)**
Commercialization of turtle meat	2011	100.00
Possession of turtle eggs and other marine turtle products	2011	100.00
Commercialization of turtle eggs	2012	2,000.00
Possession of turtle	2012	1,000.00

eggs and other marine turtle products		
Commercialization of marine turtle products (repeat offender)	2013	4,000.00

Source: National Authority for the Aquatic Resources of Panama.

Leatherbacks are mainly captured at Soropta beach and their meat and eggs are traded to Changuinola City, where they are offered in restaurants and local bars. Some foreign visitors come to the City looking for these dishes considered as delicatessens (Figure 39).

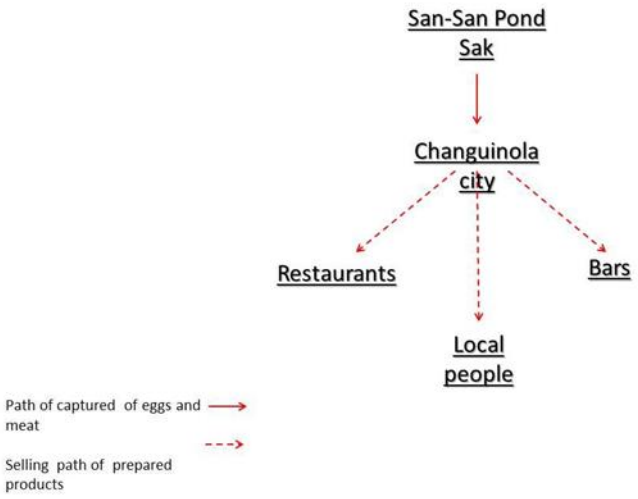

Figure 39. Schematic representation of the trading path of leatherback meat and eggs in Panamanian Pacific.

ii. Who is involved in the trade?

In the Caribbean region of the country, in the area of Bocas del Toro state and Ngäbe Bugle Comarca the local fishermen take part in the trade of hawksbill and green turtles. The local fishermen in KunaYala and divers capture hawksbill and green turtles for local consumption; the hawksbill raw carapace is sold to local fish traders and to boats that supply goods coming from Colon (Santa Isabel Port) and Colombia (Cartagena and Turbo). In the case of Comarca Ngäbe Bugle, local fishermen captured green turtles mainly for local consumption. In some cases, foreign professionals that come to Kusapin town

to work, consumed this meat. A Major source of cock fighting spurs are distributed along the country, especially in the Caribbean areas (see Seminoff & Schumacher, 2016).

In the Pacific side marine turtle eggs are widely consumed by local people. One part of the egg is traded in bars, street avenues and public events in the countryside. It was known that cock fighting spurs are offered undercover in agricultural stores in Mariato (e.g. Melo store and El Bramador store) and openly in Santiago City (El Bramador store).

The national authorities (e.g. Local Municipality, National Security Bodies, MiAmbiente, ARAP) are the bodies authorized by Law to implement and put into practice the marine turtle conservation regulations.

iii. What are the drivers/motivations?

Cultural: in the case of Ngäbe Bugle and Kuna Yala Comarcas for the aboriginal people the consumption of marine turtle meat and eggs is part their diet as an ancestral heritage. In the Ngäbe Bugle Comarca the Law 10 that creates the Comarca declares marine turtle hunting as an act of basic subsistence.

Economic: the selling of hawksbill carapaces brings extra income to the local fishermen and divers since this is not their main way of living. For example, in Kuna Yala some fishermen declared that they were able to build up their houses thanks to the trade of hawksbill carapaces around 30 years ago.

Social: in the world of cock fighting gambling, having high quality spurs is guarantee of success. It is known that hawksbill spurs perform better during the cock fights. In addition, the consumption of eggs and smoked male penis (from hawksbill) are still considered aphrodisiac by many men. The turtle oil is also used as a strong local remedy to cure respiratory problems and enhance the immune system. The hawksbill eggs are considered to aid with heart problems as well.

iv. What specimens and species are in trade?

As mentioned before the four species involved in the traffic are: leatherbacks, hawksbills, olive ridley and green turtles.

v. How the specimens are used (end-products)?

All the turtle parts are used, but with differences depending on the specific species. Prices are also variable but with some consistency in the case of turtle eggs (Table 13).

Hawksbill: meat, eggs, carapace, plastron and penis. The final products involve the preparation of meat in local dishes and cooked eggs. The carapace is processed to produce jewelry (earrings, combs, bracelets, etc.) and cock fighting spurs (Figure 40). Smoked marine turtle penis is also used as aphrodisiac and the plastron is smoked and later prepared in soup.

Figure 40. Evidence of cock fighting spurs in Arenas, Panamanian Pacific.

Green turtle: meat, eggs. The eggs are cooked, and the meat is prepared in local dishes. There is a dish which is made of a mixture of turtle eggs and flour.

Olive ridley: eggs, turtle oil. Eggs are cooked or prepared with onion and lemon; turtle oil is extracted to produce medicinal remedies.

Leatherback: meat and eggs. The meat is prepared for local dishes and the eggs cooked or prepared for final consumption.

The prices of some of end products are shown in Table 13:

Table 13. Prices of different end products of marine turtles in Panama. Values are mean (minimum-maximum) values.

Species	**Product**	**Price (USD)**	**Observation**
Hawksbill	Meat	2.23 per pound (1 – 5)	
	Eggs	0.10 per unit	This price is in Kuna Yala where the consumption is low
	Whole carapace	14.63 (10 – 25)	The price depends if the buyer is national or Colombian
	Whole turtle	110 (50 - 180)	The price depends if the buyer is national or Colombian
	Spurs	15- 12 a pair, 300 - 250 a 24 spurs´ case, 150 - 170 a 12 spurs´ case	The most expensive spurs come from Colombia and Mexico
	Smoked penis	5.00 per unit	This is sold to Colombian fishermen
Green turtle	Meat	2.45 (0.50 - 4.00)	The lowest prices is in Comarca Ngäbe Bugle, the highest price is in Bocas del Toro
	Eggs	0.07 (0.05 - 0.10) per tortilla	This is a kind of tortilla made of a mixture of turtle egg and flour in Kuna Yala
Olive ridley	Eggs	0.44 (0.25 - 0.50) per unit, 3.00 a dozen	All data comes from the Pacific side

Leatherback	Meat	2.00 per pound	This is in Changuinola
	Eggs	0.62 (0.50 – 0.75)	This is in Changuinola

d. How is the trade trending?

i. Are overall levels of current trade declining, stable or increasing?

In the Pacific region there are conservation projects in different beaches: e.g. La Barqueta Agricola Wildlife Refuge, Mata Oscura, Malena, Morrillo, Arenas, Isla Cañas, Cambutal, La Cuchilla, Punta Chame, and La Marinera which have help to reduce the pressure of illegal trade. These projects are ruled by national NGOs, community based groups, and the Ministry of the Environment. Because of these projects, they are conducting more patrolling and surveillance of rangers of the Ministry of Environment and police bodies. This may explain the higher frequency of people choosing a declining response of the trade in this side of the country (Figure 41).

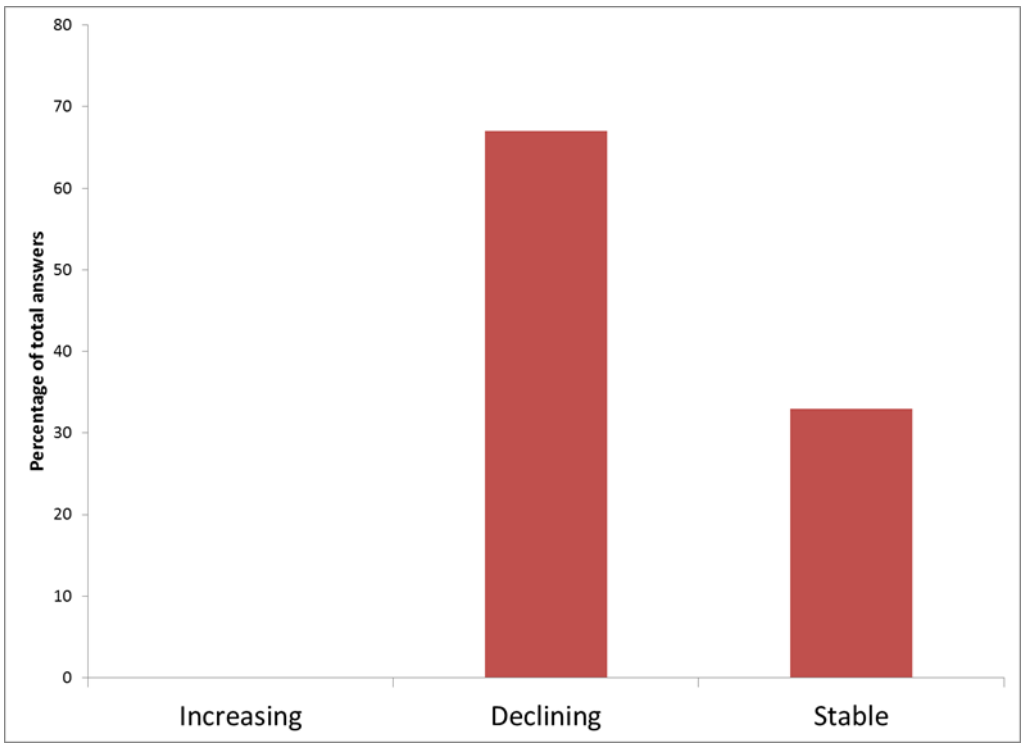

Figure 41. Percentages of answers of the interviewers (government officials, NGO activists, park rangers and tour operators) in the Panamanian Pacific.

There are two scenarios in the Caribbean region: the first in Bocas del Toro since, 15 years ago there have been conservation projects including environmental education on the topic of marine turtles, which have allowed the marine turtle populations to recover, in particular hawksbills. For example, Marine turtle Conservancy has conservation projects including leatherback and hawksbills in several beaches. Between 2000 and 2004 through the PROARCA-Costas project there were several environmental education workshops in different communities in Bocas del Toro and Ngäbe Bugle Comarca, promoting the conservation of the sea and marine turtles. In addition, in Bocas del Toro exists the Bastimentos National Marine Park and in the Ngäbe Bugle Comarca there is the Paisaje Protegido Escudo de Veraguas, these two protected areas hold important nesting beaches for species like hawksbill and leatherback*;* these areas are being patrolled by rangers from MiAmbiente which brings a certain level of protection.

The second scenario is in Kuna Yala Comarca, where due to the overexploitation in previous years, now the marine turtles as resource have been reduced, especially hawksbill. The general perception is that there is a decline of marine turtles and therefore a reduced trade (Figure 42). This perception may be biased because the local fishermen and divers think that there are no actual restrictions to catch marine turtles; a previous ban imposed by the local authorities expired in 2011 and the level of monitoring and patrolling by MiAmbiente is not fully implemented, which make difficult to the control of the illegal trade. This is a matter of scale because the actual levels of trade may still be higher for the level of the resource available.

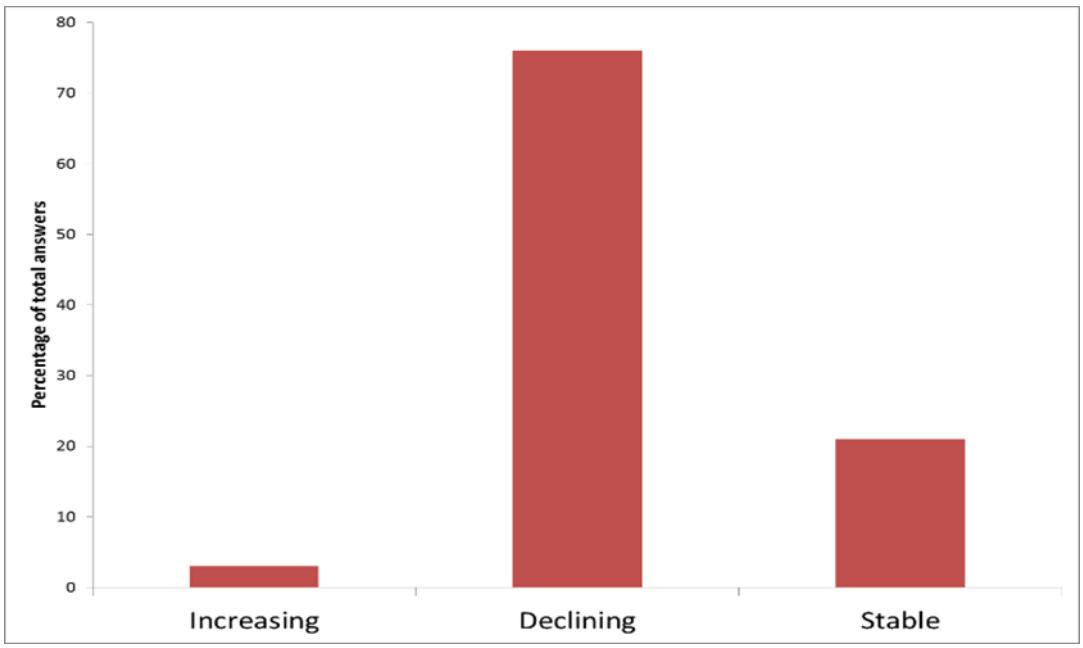

Figure 42. Percentage of the interviewers (government officials, NGO activists, ethnic groups leaders, fishermen, divers, rangers and tour operators) in Panamanian Caribbean.

ii. Are there any noteworthy trends or shifts in national and regional trade partners?

Based on the review of the Action Plan for the recovery of marine turtles of the Caribbean of Panama (Ruiz et al., 2007), the National Action Plan for the Conservation of Marine Turtles in Panama (MiAmbiente, 2017), and the interviews conducted during this study it seems that the trade still remains an important threat to marine turtles; in general the overall trends on the trade still are the same than 10 years ago.

However, we noted that there is a recent consumption of leatherback meat and eggs in the area of Changuinola, because the local people have acquired new methods for cooking the meat of this species.

2. Conservation impacts

e. What are the conservation impacts associated with the current levels of trade?

According to the results of the interviews, trade of marine turtles' products in the Caribbean region is linked to the hawksbill carapace trade. One important demand is related to the production of cock fighting spurs that comes from the Caribbean region and are used along the country (Seminoff & Schumacher,

2016). This trade includes not only adult individuals but also juveniles which compromise the survival of the species. In the Pacific region, the results of the interviews indicate that trade of olive ridley continues in this region (MiAmbiente, 2017), enhances the threats to this species.

Climatic change is the main threat affecting all the marine turtle species in the world. This phenomenon may have effects on the sex ratio of the hatchlings; change the ocean chemistry, and causing coral bleaching which in turn may affect the food sources available for turtles. The increase of the sea level jeopardizes the quality of beaches for nesting success of females.

The actual trade exacerbates this and other threats putting at risk the survival of these species for the future.

i. For each species: How significant is the trade for conservation compared to other threats?

Hawksbill: trade of carapace is the main threat for this species, and its impact is stronger in the Caribbean populations. This trade affects juveniles and adult specimens equally. This plus the eggs and meat trade compromise the survival of future generations.

Green turtle: this species is the most hunted because the taste of its meat is highly appreciated. Because of the features of the hunting in which copulating males and females are targeted, the volume (1000 adults individuals between July and September) of this trade compromises the gestation of a new generation of specimens.

Olive ridley: this species is greatly affected by the nest looting and the later eggs consumption along the Pacific side. This trade imposes and extra conservation threat to the species because of the actual nest predation caused by coyotes (*Canis latrans*).

Leatherback: along the years one of the main threats to this species is the bycatch in fishing nets. In addition, the trend in consumption of meat and eggs in the Caribbean side represents a new threat for this species.

3. Managements options

f. How can management and conservation be improved at the national and regional level?

Recently the National Action Plan for the Conservation of Marine Turtles in Panama (MiAmbiente, 2017) has been approved, which establishes key management and conservation actions that need to be implemented. At national level the financial support and decision-making process must be strengthened allowing for the real implementation of the Plan. The new Ministry of Environment has created a National Directorate of coasts and the seas, this new body must be strengthened with more trained personal and efficient equipment, especially in areas like Ngäbe Bugle Comarca, Bocas del Toro state, Kuna Yala Comarca and Los Santos state.

At national and regional level, there is a need to develop a database of illegal trade. This database as a compulsory request by CITES for example, could be filled with data coming from different national bodies using the current National Network for Marine Turtles which encompass all the NGOs and local grassroot groups in the country developing activities related to research, conservation and education.

i. What are evident shortcomings in current management and conservation policies that are enabling illegal/uncontrolled trade?

Education: lack of programs tending to deliver basic knowledge about ecology and conservation needs of marine turtles in sensitive areas. There is an urgent need for the continuity of those programs focusing to the conservation of marine turtles previously implemented in the Caribbean and Pacific side in sensitive areas.

Surveillance: areas with high trade lack of proper protection and patrolling of responsible authorities. The responsible personnel lacks adequate equipment to implement surveillance activities at sea and land. The amount of people assigned to develop surveillance activities is not assigned based on the priority of the area and sometimes is lacking.

Capacity building: there is a weak knowledge of the legal framework attaining marine turtle conservation in the country among the responsible authorities

(MiAmbiente technical personal, National Security Bodies, ARAP technical personal).

Legal framework: local communities lack knowledge about the national regulations protecting marine turtles; this reverts in the unaware transgression of these regulations. There are inconsistencies between the Laws and decrees issued by indigenous authorities and the national legal frameworks that adopt the international conventions that protect the marine turtles. For example, the Ngäbe Bugle Comarca under its creation Law number 10, states that marine turtle hunting is considered as way of subsistence which allows for hunting inside its territory but without any supervision. On the other hand, in Kuna Yala Comarca, the local fishermen and divers are unaware of regulations on marine turtle trade, for them such regulations are compulsory only when the General Congress (the maximum authority body) issues them.

ii. What are evident successes in current management systems from which lessons can be learnt?

Bocas del Toro state: The Sea Turtle Conservancy (STC) has been able to develop a long term monitoring and environmental education program in different locations and communities (e.g. Bluff beach, and Zapatilla Cays, Chiriqui beach). This has been recognized by local communities along the province which means that long term programs guarantee more positive impact among the communities.

The Asociacion de Amigos y Vecinos de la Costa y la Naturaleza (AAMVECONA) group during 18 years have been working in the area of San-San Pond Sak wetland, encompassing eco-touristic activities with conservation of wildlife including marine turtles. One important feature is that the beach they protect is a nesting site for leatherback.

Kuna Yala Comarca: The Kuna General Congress approved a ban on capture of marine turtles hunting for 5 years (Resolution No. 8/12/2006) protecting: hawksbill, green, leatherback and loggerhead marine turtles. The ban expired in 2011 but the fact that all the communities along the Comarca attached to this ban implies that futures regulations coming from the Kuna General Congress will be strictly followed by local residents.

Pacific region: the existence of marine turtle nurseries along key nesting beaches has contributed to reducing the trade in these areas. The existence of monitoring programs helps to reduce the trade due to the continued surveillance of authorities jointly with local volunteers.

iii. How can current management and conservation practices be improved at national and regional levels?

Scientific oriented conservation is urgently needed, moreover in areas with populations considered as critically endangered (hawksbill Kuna Yala Comarca and leatherback along the coast of Azuero Peninsula). This may improve the effect of the actual efforts and would make a more efficient use of money.

Conservation actions can be improved by involving the private sector calling for Social Responsibility. A successful example is the liaison between the NGO Tortuguias and the Banistmo bank which supports the conservation project at Cambutal beach. This approach could be used in La Barqueta Agricola Wildlife Refuge, where many hotels and restaurants are making use of the general seaside view but without supporting the ongoing conservation of the protected area.

A training pack scheme for those MiAmbiente rangers working at important nesting or foraging sites in the country. This could help the local actions and enhance environmental education, surveillance and monitoring activities in areas considered as hot spots.

2. Areas where immediate mitigate efforts may be needed

a. What mitigation action is needed and where is it most urgent?

1. To develop a nationwide awareness campaign, enhancing the importance of marine turtles as a heritage and the regulations on trade.

2. To work with the Kuna Yala General Congress to promote the application of marine turtle bans especially for hawksbill during its nesting season.

3. To create a new protected area in the Ngäbe Bugle Comarca, including the coral reef near Tobobe, Roja Beach, and Punta Nispero.

4. To develop an Action Plan to increase the surveillance of sensitive areas during the migration period of green turtles, especially in Bocas del Toro and Ngäbe Bugle Comarca. This Plan needs to create synergy among the National Security Bodies, the Ministry of Environment, and local authorities.

5. To implement a long term environmental education program for primary and secondary schools in Bocas del Toro, Ngäbe Bugle Comarca and Kuna Yala Comarca. This program needs to involve the local stakeholders, local groups, NGOs and responsible authorities.

i. What areas (geographical and operational) are in need of immediate mitigation efforts? What are those efforts?

Bluff beach in Bocas del Toro state. It is of utmost importance to concretize the declaration of Playa Bluff as a protected area, in order to finalize a long term process achieving a higher level of protection of this area.

Playa Ibiari in Ngäbe Bugle Comarca. This nesting beach requires a study that may support its declaration as a protected area important for nesting turtles. To do so, local authorities must be involved during the process, because they also allow for permits of sand extraction in this beach.

Eco-tourism in Ngäbe Bugle Comarca. An eco-tourism project targeting underprivileged communities along the coast of Ngäbe Bugle Comarca would be an alternative to generate local income and reduce the pressure on the marine turtles. This needs to be addressed by the Tourism Authority of Panama, the Ministry of the Environment and the local authorities.

Fishing project in Kuna Yala Comarca. A novel project for fishermen is needed to improve their fishing gears, allowing them to develop fishing activities at open sea and with better yields, reducing the need for targeting marine turtle during their daily activities.

Checkpoints. To establish check points jointly with MiAmbiente officials and National Security Bodies in sites considered as hot spots (e.g. Almirante, Chiriqui Grande, Tonosi, Chame).

Training. Training of prosecuting attorneys in environmental Laws with special attention to marine turtle regulations.

La Barqueta Agricola Wildlife Refuge in Chiriqui state. This is needed in order to control illegal traders.

Personal. To increase the amount of trained personal from MiAmbiente in Isla Cañas Wildlife Refuge.

ii. What immediate, short and long term needs should be highlighted to parties, management bodies and other relevant bodies and stakeholders?

To make the environmental issue a priority in the national plans and politics at the highest decision level. This feature will have an impact on the actual economic development model.

To prioritize the declaration of new protected areas in key sites to strength the conservation of foraging sites and nesting beaches along the country.

To increase the amount of trained personal for surveillance inside and outside the protected areas in key sites considered as hot spots.

To implement the actions established in the National Action Plan for the Conservation of Marine Turtles in Panama (MiAmbiente, 2017).

To reactivate the Costa Rica – Panama Sixaola Binational commission to ensure enforcement of transit and trade control and surveillance across the border at Sixaola River. This action also must be enforced at Guabito checkpoint.

Additional information

As additional information, an online search was conducted to determine if there were marine turtle products being commercialized on the internet (Figure 43).

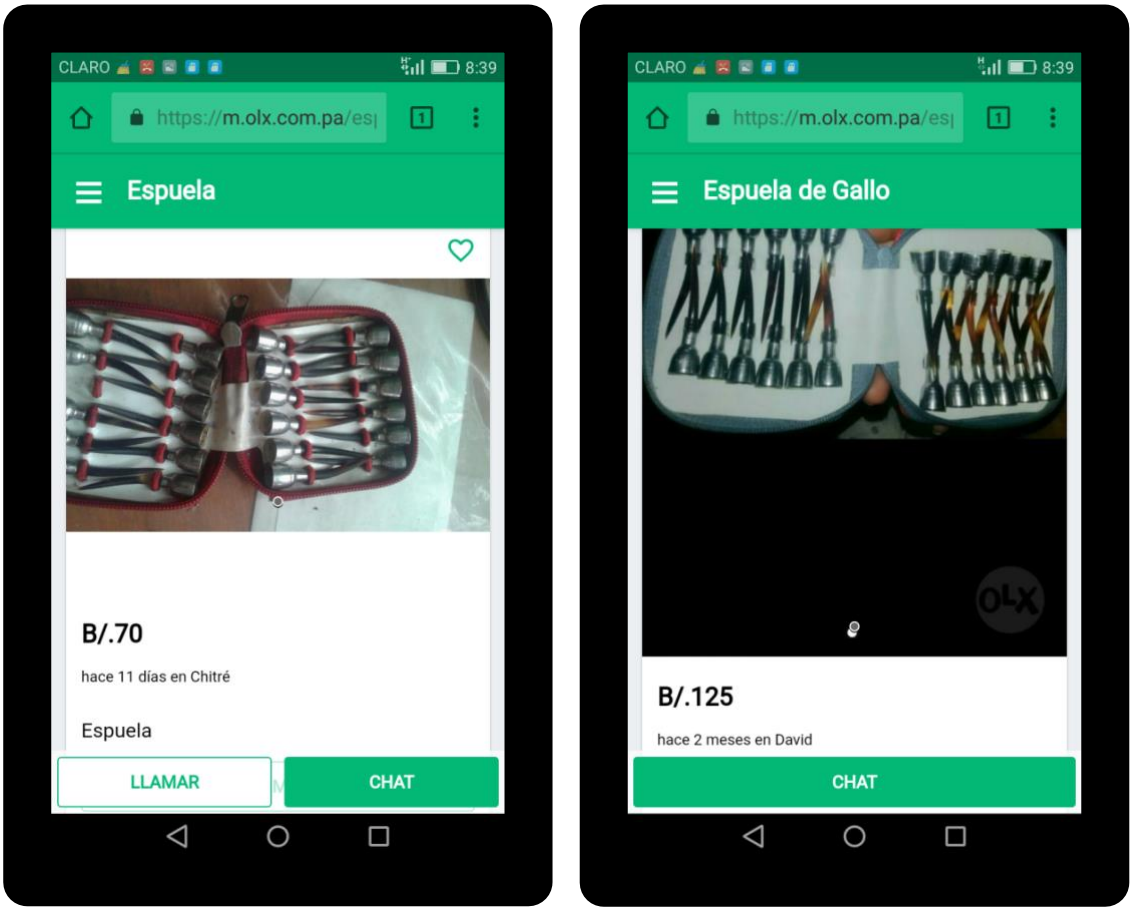

Figure 43. Cock fighting spur cases (24 units) offered at OLX Panama website, prices range between 70 USD and 125 USD, these offers came from two cities in Panamanian Pacific (i.e. Chitre and David).

Nicaragua

1. Status, scope and trends

b. In what areas does trade exist?

Five of the seven existing species of marine turtles are distributed along the coasts of Nicaragua enriching the country's marine biodiversity. Along the Pacific coast, important nesting sites are located, in the north of the country, in Estero Padre Ramos and Estero Aserradores, nesting hawksbill turtle (*E. imbricata*); to the south on Juan Venado Island there are nesting of leatherback turtle (*D. coriacea*); to the center, Playa Salamina, nesting place of the leatherback turtle and Veracruz beach, place of spawning of green turtle (*C. mydas*) and olive ridley (*L. olivacea*); and more to the south of the coast there are two Wildlife Refuges, Chacocente in whose sands, nest olive ridley turtles, green turtle and leatherback and the Refugio La Flor, near the border with

Costa Rica, where the olive ridley, hawksbill and in less proportion green turtle nest (Urteaga, Diaz, & Mota, 2005).

To the south of the Caribbean coast, near the mouth of the San Juan River there is an extensive beach called El Cocal, where leatherback turtle nests; to the North in the area of Punta Gorda is the nesting beach of loggerhead and to the center in the Pearl Cays are nesting of hawksbill turtle (Nietschman, 1977). In the Caribbean, the leatherback turtle and loggerhead are less common, while green turtle and hawksbill turtle are more abundant and have been part of the culture and commercial trades in the Caribbean region local market. There are located two important turtles in the Nicaraguan Caribbean Sea, aggregation sites are the one around Miskitos cay, at the north, and the other one located at the Pearl cays (Garland & Carthy, 2010). Also two important nest sites are located in Punta Gorda community and in the Pearl cays sand banks (Figure 44).

Figure 44. Nicaragua marine turtles nesting beaches.

The largest remaining green turtle rookery in the Atlantic basin, and one of the two largest in the world, is the population that nests in Tortuguero, Costa Rica (Garland & Carthy, 2010). The primary foraging habitats for this rookery are

located in the extensive coastal shelf along Nicaragua's Caribbean coast, which is also the location of one of the largest, legal commercial marine turtle fisheries in the Americas (Garland & Carthy, 2010).

Four species forage and nest along the Caribbean coast of Nicaragua (green, hawksbill, loggerhead and leatherback) (Brautigam et al., 2006). Marine turtles and their eggs have been poached for hundreds of years by indigenous ethnic groups in a corridor that has been said to be the largest turtle grouping site and foraging in the Atlantic (Carr et al., 1978). The levels of consumption of turtle meat are kept apparently stable through resolutions of the Caribbean Regional Governments, but the little personnel in charge, does not have the sufficient capacity to maintain the control of the catches that are made during the open seasons. Surveys conducted by WWF in 2018 for this investigation, recorded data of the current consumption of green turtle meat and the sustained trade of hawksbill handicrafts in the main population centers of the Nicaraguan Caribbean coast.

On the Caribbean coast of Nicaragua there are two port cities where the turtle market is concentrated, Bilwi in the north and Bluefields in the south (Lagueux et al., 2014).

Garland & Carthy (2010) notes that although turtle meat it is considered one of the cheapest available meats, harvesting and selling turtles is also the quickest and easiest legal way for fishermen to generate income and feed their families. They point in addition to local sales, turtle meat to be occasionally transported to other towns and inland markets for sale to individuals and restaurants. In both Bilwi and Bluefields cities, the prices of a turtle is between 50 - 70 pounds ranging from 47 - 114 USD. The price of green turtle meat is 1.30 USD a pound, and a pair of turtle fins oscillate in 2.50 to 4.75 USD. Sellers report a monthly income from this activity of 220 - 570 USD (Figure 45).

Figure 45. Sale of green turtle meat at the Bilwi market, Nicaraguan Caribbean coast.

In Bilwi hawksbill rings are sold at 1.20 USD while thick bracelets cost 6.30 USD. Obtained revenue by a vendor ranges from 310 - 380 USD per month. Famous eldest artisans do not work hawksbill material as they used to do in the past because pieces like necklaces can no longer be easily sold. Now they make crafts combining PVC and plastics of striking colors as fashion demands today, adding insertions of hawksbill and gold to their creations (Figure 46).

Figure 46. Hawksbill sale in Bilwi, Nicaraguan Caribbean coast.

In Bluefields there is a store where hawksbills pieces with gold embedded are still sold from 5.70 - 25.00 USD (Figure 47). It is known that stored raw hawksbill material is being sold at 12.70 USD a pound in Bluefields and Corn

Island. This raw material is transported to Pearl cays where final price is obtained before it is shipped to San Andres Island, Colombia.

Figure 47. Hawksbill sale in Bluefields, Nicaraguan Caribbean coast.

In a visit to the Managua international airport it was observed that among the souvenirs offered to the tourists there were hawksbill items (Figure 48).

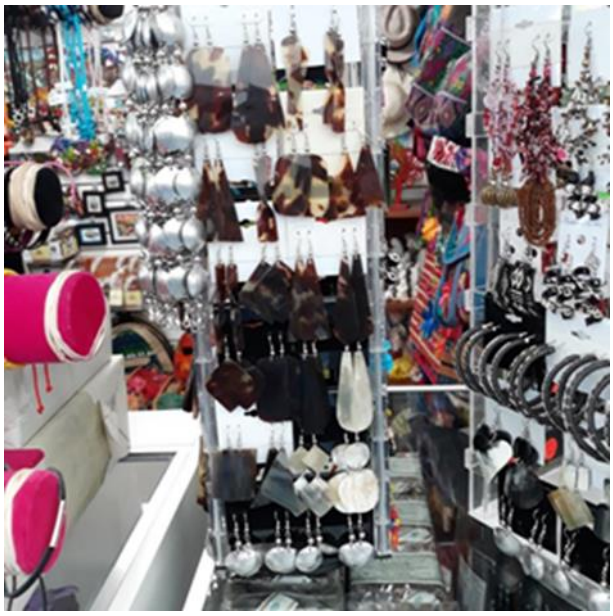

Figure 48. Hawksbill sale in International airport of Managua, Nicaragua.

In Roberto Huembes market, the largest handicraft retailer in Managua, it is common to find shelves with various tortoiseshell items displayed, from simple rings to bracelets earrings and headbands (Figure 49).

Figure 49. Hawksbill articles in Roberto Huembes Market, Managua, Nicaragua.

In the Pacific coast of country olive ridley carapaces are openly sold at a price that ranges from 10 to 20 USD depending on seasonal demand.

A survey was prepared to apply to citizens related in some manner with the turtle commercial chain. Interviews were held with fishermen, merchants, tortoiseshell artisans, tour operators and government officials. The more important markets for turtle sale and trade as well as street sales where final products are offered were visited during this study. Surveys were conducted at nine fishing communities of the Pacific to interview leaders of fishing groups who provided first-hand information, this places were: Padre Ramos, Aserradores, Corinto, El Transito, Masachapa, Chacocente, Pie de Gigante, San Juan del Sur y La Flor.

In the Caribbean coast the City of Bilwi, which is the commercial center of the Miskito community that still captures marine turtles for exploitation, consumption and trade (Lagueux et al., 2014) was visited. Surveys were also conducted in the City of Bluefields and Corn Island where the multiethnic population continues strong with the consumption of meat. Forty artisans, fishermen and small entrepreneurs were selected to answer this survey and local inspectors were visited to gather data from governmental local source. Interviewed people described the current situation of turtle trade. 44% of the people who responded the survey are full-time fishermen, most of them are originally from the Pacific coast communities.

Of all respondents 13% are artisans who work and sell hawksbill items in Bilwi and Corn Island; 8% are meat retailers based in Bluefields and Bilwi; another 8% are tour operators of recreational fishing trips and sightings of marine mammals; 5% of the Caribbean's sporadic merchants, the remaining 25% are made up of rangers protecting nesting beaches, jewelers and government officials of Bilwi and Corn Island municipalities (Figure 50 and 51).

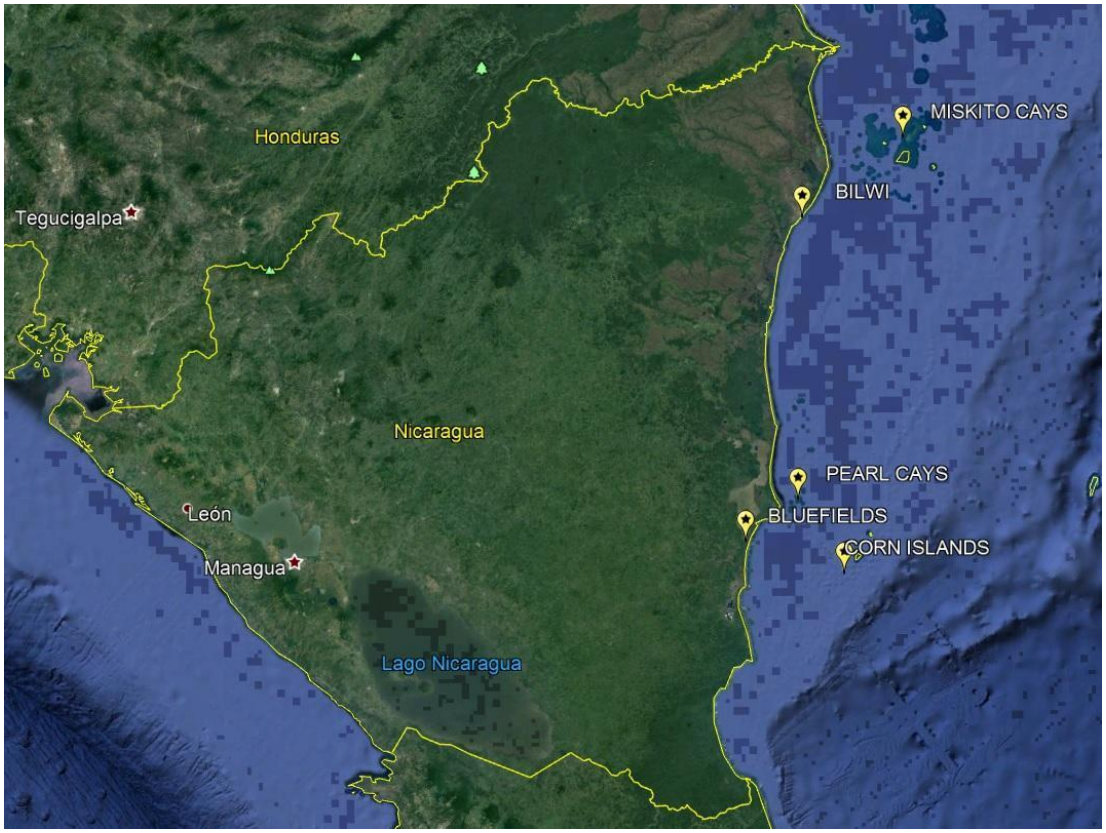

Figure 50. Location of the cities Bilwi, Bluefields and Corn Islands, Nicaraguan Caribbean.

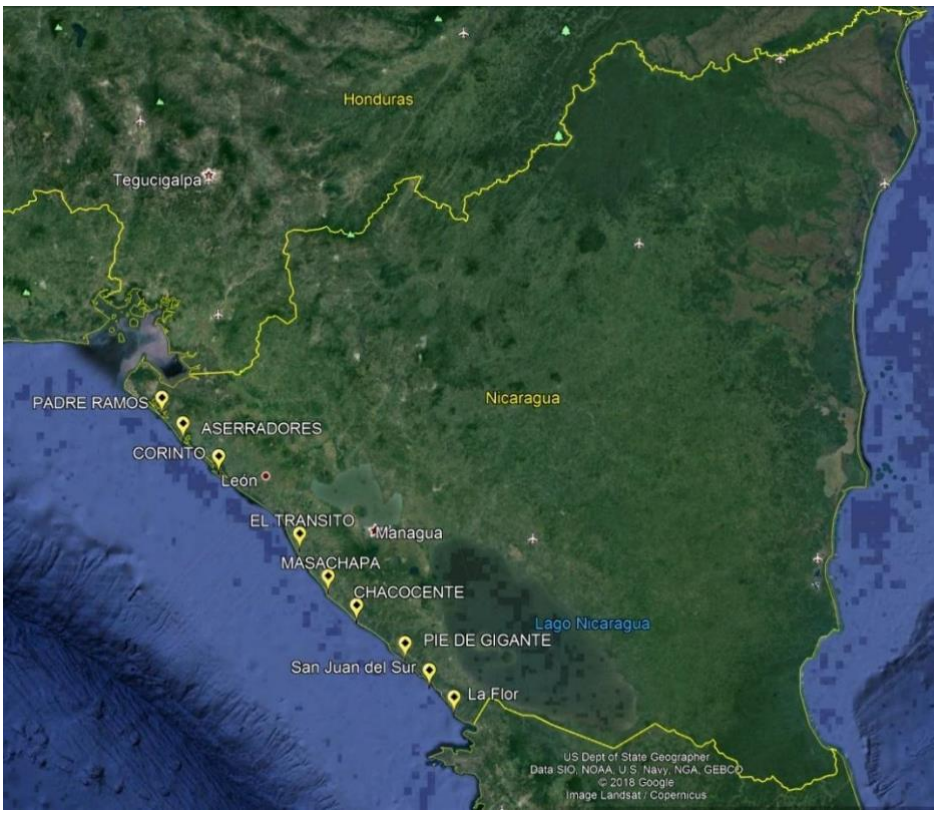

Figure 51. Location of cities and fishing communities visited in the Nicaraguan Pacific coast.

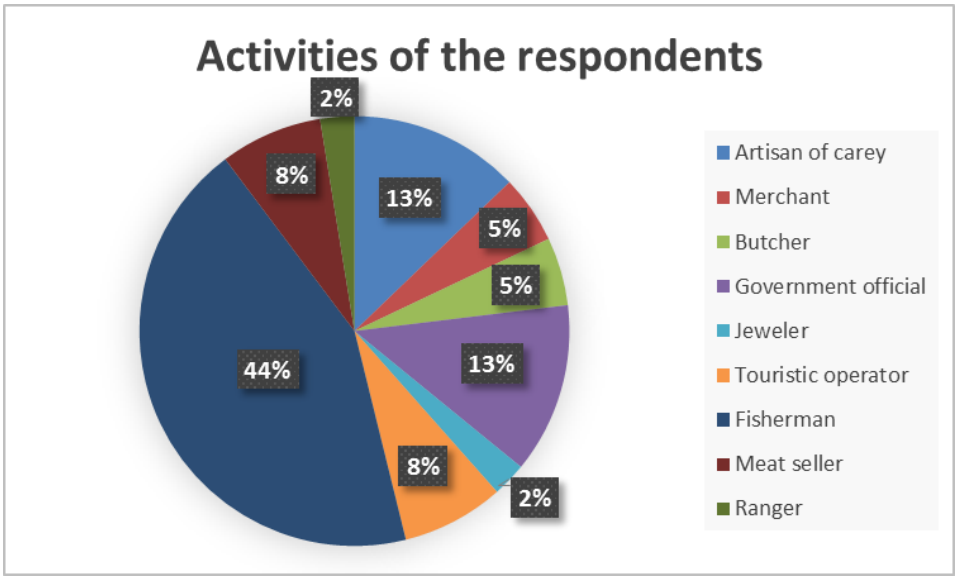

Figure 52. Activities performed by the interviewees in Nicaragua.

Of the 40 interviewed (Figure 52), 61% of the respondents recognized three species of marine turtles, another 25% only recognizes two species and 7% recognize four species. In the Pacific the olive ridley turtle and leatherback are the more common according to local inhabitants. In the Caribbean green and hawksbills are the more easily identified by people when asked about species in the area.

When enquired about the knowledge of the current regulations on turtles, 50% said they do not know the Laws that protect marine turtles; the other 50% indicated that they know the Law of Environment, the regulations on bans and the restriction on the consumption of eggs.

Regarding the knowledge of the government institution in charge of enforcing the regulations of the Law of Environment, 53% acknowledged the Ministry of the Environment and Natural Resources (MARENA), while 18% totally ignore which is the institution that regulates the matters of fauna, another 13% erroneously assume that the Naval Force is in charge of regulation.

In Nicaragua there are many organizations that work on environmental issues, 37% of the people recognized Fauna & Flora International as the NGO dealing with marine turtle issues and other organizations in the Pacific account for 8% like Paso “Pacifico” which also works in the Pacific coast; 10% recognized Wildlife Conservation Society in the Caribbean, and 34% of the respondents do not know about environmental organizations.

In the Caribbean Coast, where the catch and use of marine turtles is allowed, 62% of the interviewed people say that they do it only for domestic consumption, another 32% use to sell the meat, viscera for bait fish and the carapaces for decoration.

Regarding the rate of turtle consumption, it is estimated that an average of 450 turtles per month are landed in communities along the Caribbean Coast for local consumption. The most demanded species by local population is the green turtle, arguing that hawksbill meat is not very tasty.

1. **Status, scope and trends**

   i. **What are the source, transit and destinations countries/locations involved in the trade?**

In addition to information presented in previous above section, places for major trade are mentioned in Table 14.

Table 14. Details about source, transit and destination of major marine turtle trade.

Location	Source	Observation	Final destination
State of Chinandega, municipality of El Viejo. Pacific.	Communities of Aserradores, Jiquilillo and Padre Ramos.	They are areas of gathering and spawning of hawksbill turtles and transit of olive ridley. The community does not direct efforts to capture turtles; They do not process the hawksbills, but they consume their eggs	Hawksbill eggs are consumed locally and part of its collection is sent to trade in other nearby cities.
State of Chinandega. Municipality of Corinto. Pacific.	Community of Corinto.	The fishermen incidentally catch olive ridley turtles, leatherback turtles and green turtles in gill nets, commercializing their meat locally.	Nest eggs found along the coast are marketed to Leon and Managua.
León state. Pacific.	El Transito	People collect eggs of olive ridley for consumption and trade.	Olive ridley eggs and fin meat are sold in the City of León and to the capital Managua.
Managua Municipality of San Rafael del Sur. Pacific.	Masachapa	The fishermen land the turtles drowned in their nets for commercialization of the meat and shell. There is no egg trade.	The meat and fins are sold in Managua in places whose owners are originally from the Caribbean

			coast. Carapaces are prepared on request
State of Rivas. Municipality of San Juan del Sur. Pacific.	San Juan del Sur	Local people collect eggs from solitary olive ridley and some carapaces that they commercialize in Granada and Managua.	The demand for eggs and handicrafts of tortoises in the local tourist trade is not attractive, because in this port tourists arrive on board cruise ships and many reject this type of product.
Autonomous Region of the North Caribbean Coast.	Bilwi.	Local Government regulations allow the capture and monthly commercialization of up to 450 green turtles. The hawksbill turtles are not coveted. The communities that mainly supply the market are: Krukira, Awastara, Daukra, Pahara.	Autonomous Region of the North Caribbean Coast.
		The local government authorizes each year the capture and monthly commercialization of some 360 green turtles	Almost all the meat is marketed locally, the rest is transported to the Pacific to

Autonomous Region of the South Caribbean Coast.	Bluefields.	from 10 neighboring communities. In the Perlas cays and nearby beaches, the hawksbill is captured to obtain their carapace scutes.	coastal food businesses. Tortoiseshell plates are sold partly in Bluefields and the rest is sent to Managua and neighboring countries.
	Corn Island.	The consumption of green turtle meat is part of the local custom, about 50 turtles are landed monthly. The hawksbill is not desired, nor is there any habit of consuming eggs.	The green turtle is consumed locally, the hawksbill shell, a part of it is sent to Bluefields and from there to Managua, another part is taken to Pearl Cays to market with boats of San Andrés

In 2005 the Ministry of Environment decreed the protection of green turtles throughout the year. However, the Autonomous Governments of the North (RAAN) and the South (RAAS), rejected the regulations and established the period of protection from August to February, but in reality, turtles are fished all year round for "subsistence" purposes. Thus, the contradictions and inconsistencies in national and regional Laws remain, and enforcement is all but nonexistent (Lagueux et al., 2014). In this regard, the reforms to Law 489 published in 2012 in its section 4 says: Sec. 4.: *In the exploitation of the hydro-biological resources of the Caribbean Sea, they must recognize the rights*

established for the Autonomous Regions in the Political Constitution, the Statute of Autonomy of the Caribbean Coast Regions and other current regulations.

b. How much trade is there?

Of the five species present on the coasts of Nicaragua, the pressure of consumption and trade lies mostly on two of them: olive ridley and green turtles. During the realization is this study, it was found that in the community of Masachapa, on the Pacific coast, fishermen receive requests of turtle meat to supply particular needs of Caribbean ethnic groups who live on the Pacific coast of the country.

i. How many specimens (what species) are estimated to be trade in the country assessed?

The Resolution of the North Regional Government (**RAAN**) for the period 2016-2017, determined that the annual quota for green turtle hunt would be 2,500 specimens with minimum sizes of 65 and 73 for females and males respectively. The communities that directly capture turtles are: Awastara, Daukra, Krukira, Pahara, Walpasixa and Sandy Bay. (Communication from the Natural Resources Commission of the Autonomous Regional Council).

In the case of the South Regional Government (**RAAS**) for the period 2015-2018, determined that the annual quota of capturing would be 2,541 specimens with minimum sizes of 65 and 72 for females and males respectively; the communities that are being supplied are: Awas, Haulover, Kahkabila, Laguna de Perlas, Raitipura, Barra de Río Grande, Sandy Bay Sirpi, Set Net Point and Tasbapauni (Resolution of the Board of Directors of the Autonomous Regional Council of the South Caribbean Coast No. 863-10-09-2015).

However, Garland (2010) points out that regional regulations were created to limit harvest numbers in indigenous communities in the RAAS and the RAAN, yet the quotas frequently change without explanation and are not strictly enforced in most coastal communities. In late 2008 and early 2009, harvest limits were set at 5,000 turtles/year in the RAAN and 3,100 turtles/year in the RAAS, with a 3-month closed season along the entire Caribbean coast.

According to Lagueux et al. (2014), between 2002 and 2011 a total of 40,370 green turtles were captured in the RAAN at an average of 336 per month, while in the RAAS 27,080 turtles were captured in the same period of time, an average of 226 monthly. Despite legislation, the autonomous government of the Caribbean coastal regions of Nicaragua, together with understaffed, time constraints and a lack of enforcement make the implementation and control of Laws challenging (Garland & Carthy, 2010). Probably a large part of the capture of green turtles actually correspond to hawksbill turtles, a situation facilitated by the lack of control in the records of authorities, to which there is no access.

The results of surveys in fishing communities (Aserradores, Jiquilillo, Padre Ramos, Corinto Port, El Transito and Masachapa) suggest that in many areas there is an informal or formal (but illegal) market for marine turtle products, in particular hawksbill articles, often hawksbill eggs are consumed locally and a small proportion of them are traded in local markets. In coastal areas, eggs are the only marine turtle product consumed. On the other hand, an established market of olive ridley meat is present for local consumption. People surveyed in the Pacific coast state that they know four species of turtles, the one that most falls in their nets is the olive ridley and the ones that are least found are green and leatherback turtle (Figure 53).

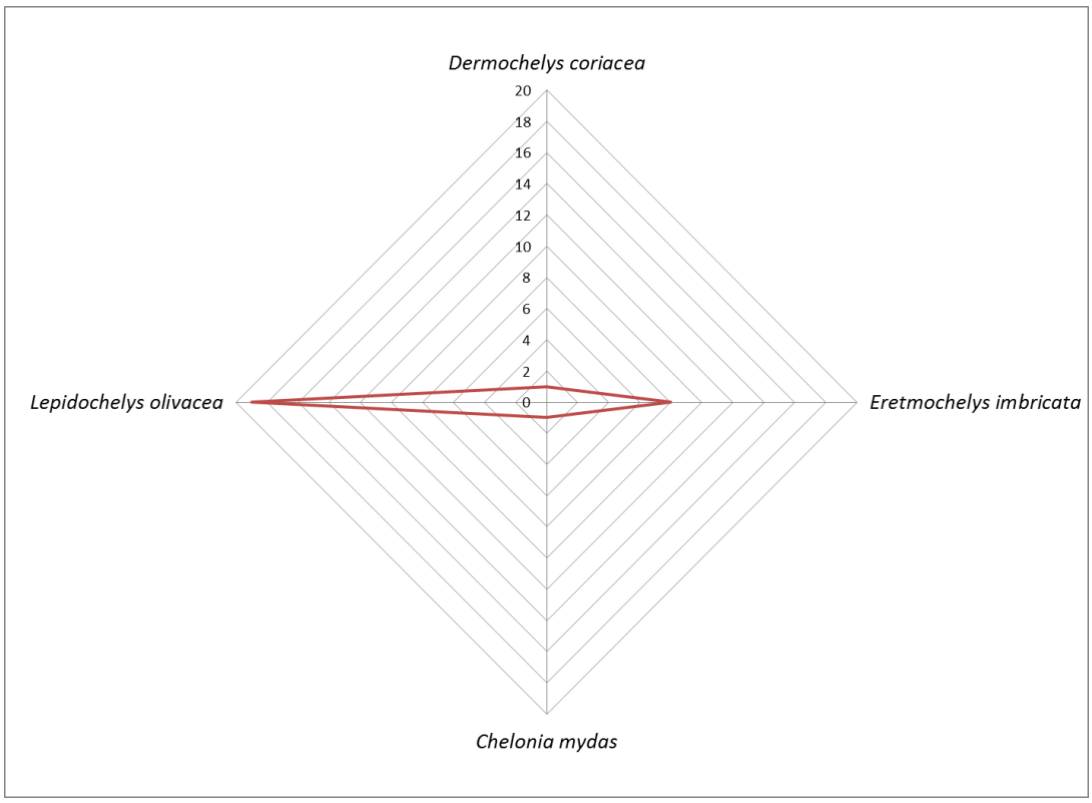

Figure 53. Most common turtles observed and commercialized in the Nicaraguan Pacific, according to surveys in fishing communities.

Similarly, on the Caribbean coast respondents mentioned that the most common turtles in trade are green and hawksbills, the least common are leatherback and loggerhead (Figure 54).

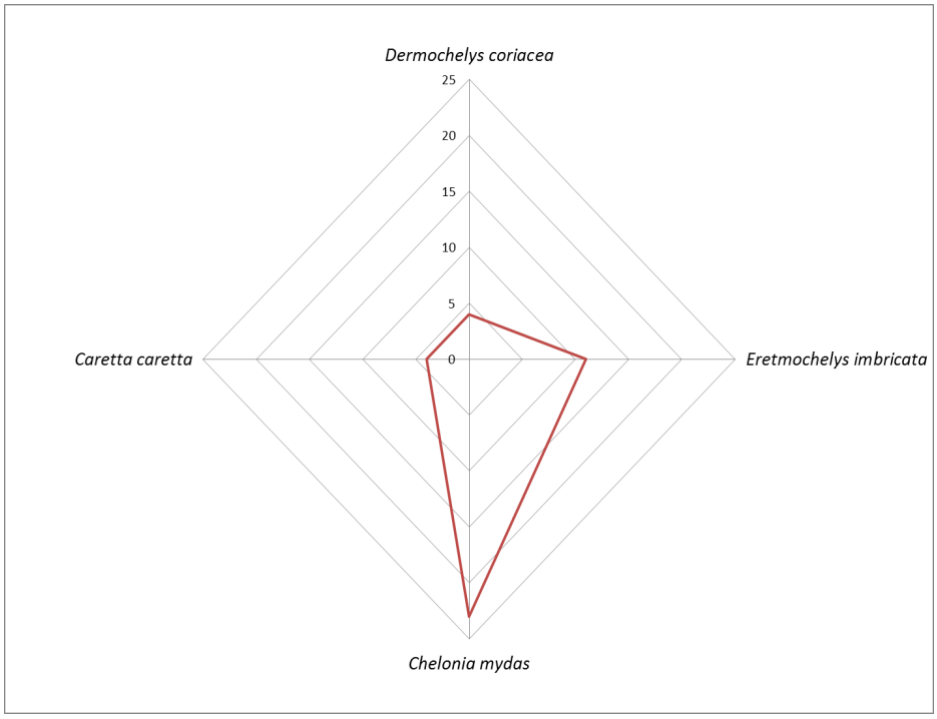

Figure 54. Most common turtles observed and commercialized in the Nicaraguan Caribbean, based on survey conducted to 40 interviewees.

According to Harrison et al. (2017), across Nicaragua, most people know that it is illegal to kill marine turtles. However, in the Pacific coast people stated that they understood that it was partially legal along the year, apparently confusing the legal green turtle fishery with hawksbill trade. Some of them also spoke of "Special permissions extended by the government" for artisans on the Caribbean coast to work the tortoise shell. In the Caribbean, sellers believe that the sale of raw materials is illegal, but the sale of finished products is legal.

ii. How does the level extrapolate to regional scale?

The largest population of green turtles in the Caribbean area are born in the area of Tortuguero in Costa Rica, migrating to the feeding grounds that are off the coast of Nicaragua that range from the Perlas Cays to Warrior Cays to the south of the port of Bilwi. In those places turtles spend great part of their life before continuing their trip towards the cays of Florida and the open waters of the Atlantic. In their return, marine turtles in adult phase are caught by the Miskito Indigenous, which have practiced this hunting for several centuries. Finally, this practice continues in order to satisfy their own needs for trade along the coast of Nicaragua and neighboring countries of Central America.

iii. Can the countries in the region be ranked to the relative size of the trade?

Trade of marine turtles in Nicaragua focuses more on the Caribbean area, where the pressure of consumption and exploitation is constant because is supported by the legislation of ethnic groups in this region. Inhabitants of the Caribbean coast recognize that hawksbill products are the most demanded by neighboring countries (due to low domestic demand and high prices in other countries), so there are traders dedicated to moving carapaces scutes from Bilwi and Bluefields to Managua and from there to abroad.

c. What are the features and the characteristics of the trade?

i. How can the trade be characterized?

The marine turtle eggs commercialized in Nicaragua are mainly collected from the Pacific coast and illegally marketed in markets and establishments such as restaurants, and there are people who move them to El Salvador and Honduras. Even though illegal trade happens in the Caribbean coast, at

locations such as Perlas cays and Playa Cocal, the volume of eggs traded her is less, and these are mostly collected for home self-consumption. So far, its protection has incremented because the management effort (Abarca et al., 2012).

According to what has been observed and the data collected in recent and current surveys, the hawksbills obtained in different places on the Caribbean coast are sold abroad preferably in rough or unworked plates. A part of the hawksbill scutes are left in the hands of the local artisans of Bilwi, Bluefields and Managua for the elaboration of pieces of personal adornment as shown in Figures 45 to 48.

ii. Who is involved in the trade?

Harrison et al. (2017) notes that a merchant arrives in the cities of the Pacific directly from Puerto Cabezas (Bilwi), on the Caribbean coast every 2 months, bringing approximately 30 pounds of merchandise (such as earrings, bracelets, and other small items of jewelry) what amounts to an annual market of almost 200 pounds of hawksbill products, solely in the City of León. In addition, several Pacific coast vendors mentioned that there was a market to export products to El Salvador and Costa Rica. In the year 2017, in the shops of Managua and Masaya, 2,700 and 2,800 hawksbill articles were recorded respectively, which were valued at an estimated of USD 18,000. (Harrison et al., 2017).

Most of the hawksbill plates come from the Caribbean coast is distributed in craft markets, airports and tourist sites. In previous studies conducted by independent organizations, (Abarca et al., 2012), it has been established that there is export of finished goods to El Salvador, Honduras, Costa Rica and Colombia, through trade with the San Andres Island.

iii. What are the drivers/motivations?

Cultural: Marine turtles and their eggs have been exploited by indigenous and ethnic coastal inhabitants, and foreign fleets (Lagueux, 2014). The Miskitos have based part of their culture around the capture and exploitation of turtles for more than 500 years, fulfilling social rules of distributing. Dividing and

sharing meat with the families in their community is something that is disappearing little by little caused by the current trade.

Economic: The Miskito communities do not enjoy some of the basic services, they are high poverty zones. So they have to access cash to acquire goods and services through the sale of fish, turtle meat and the hawksbill plate's trade.

Social: The acquisition of goods such as a maritime engines or fiberglass boats, with these items they can fishing independently and throw more nets into the water to procure more captures and, therefore more income and a better way of life.

iv. What specimens and species are in trade?

The Fisheries and Aquaculture Law of 2004 allows the capture of marine turtles for domestic consumption use by fisherman and their families, however, it does not distinguish between species of marine turtles, allowing the use of all species for domestic consumption purposes. The capture or killing of any marine turtles other than for subsistence use is prohibited (as is the sale of turtle meat beyond communities). This fishing is only allowed on the Atlantic coast of the country and fishermen must comply with closing seasons and regulations, if not they are risking to face penalties. (Garland & Carthy, 2010), however, three species of marine turtles are commercialized in Nicaragua: green and hawksbill in the Caribbean, and olive ridley in Pacific. On turtle captures, 62% of the people surveyed (of a total of 40) said it is destined for the direct consumption of the populations of the Caribbean coast, 30% enters the trade of parts and 3% is used for decoration, in particular the carapace which is mainly used for decoration. In the Pacific the turtle most used for internal trade is the olive ridley, while in the Caribbean the pressure falls on the green turtle followed by hawksbill. 67% of the fisher and merchant respondents indicated that they capture a greater number of adult specimens. In conclusion 80% of sales are made to nationals, while 20% is placed in the tourist market.

v. How are the specimens used (end-products)?

The green turtle is the most in demand by the Miskito people to consume their meat. The price can range between 47 and 114 USD before being sacrificed. The price of meat per pound ranges between 1 and 1.30 USD. Hawksbill handicraft products can be sold from 1.20 to 35.00 USD (Table 15).

Table 15. Minimum and maximum prices of turtle parts and tortoiseshell pieces.

Product	Minimum USD	Maximum USD
Whole green turtle (average 60 pounds)	47.00	114.00
Pound of meat. Green turtle.	1.00	1.30
Fin pairs. Green and olive ridley turtle	2.50	4.75
Monthly income by sales	220.00	570.00
Rings and bracelets from hawksbill turtle.	1.20	6.30
Rings and bracelets inlaid with gold. Hawksbill.	5.70	35.00
Raw plates (pound) hawksbill turtle	12.00	13.00
Profit of artisans per month*	320.00	400.00
Income from sales of jewelers	390.00	630.00

* The profit margin was obtained with a direct question in the survey

d. How is the trade trending?

i. Are overall levels of current trade declining, stable or increasing?

When inquiring about the perception of the status of the population of marine turtles, 76% of the people surveyed said that the population of turtles is declining and they point out among the probable causes: the commercialization of the eggs, the death caused by incidental fishing by shrimp boats, pollution in the sea, human encroachment of nesting beaches, the lack of regulation and the commercialization of the meat without a real need of alimentary satisfaction only of commerce. Those who negotiate with

hawksbills said that today it is more difficult to find availability of tortoiseshell plates in the local market.

According to the findings in this study, awareness amongst community members about regulations applying to marine turtles differs according to the area considered. The coastal communities indicate that the turtle population has diminished, and the main causes are the inadequate regulation for its protection, population unawareness, turtle meet is an unnecessary trade, sea conditions variations, and turtle mortality impact because of its commercialization, In the future it is expected that the consumption of turtle meat will decrease since the young population does not demand it. Green turtle meat consumption and trade in communities along the Caribbean coast, from Cabo Gracias a Dios (Honduras border) to San Juan river (Costa Rica border), will continue being an alternative for ethnic groups meanwhile no good road communication with the region exist, because some products for home consumption do not reach to the communities. This would allow them to break with dependence on this resource.

ii. Are there any noteworthy trends or shifts in national and regional trade partners?

The demand for hawksbill products from neighboring countries seems to have been increasing over the years, so that a large part of hawksbill plates are sold to Central America, Panama and Colombia, while in the national market, the demand is decreasing due to the preference of plastic articles or other simple and rustic materials.

2. Conservation impacts

e. What are the conservation impacts associated with the current levels of trade?

In the Pacific, there has been an increase in the demand for eggs, which implies fewer births on nesting beaches. The increase of uncontrolled tourism on nesting beaches increases nest losses. Another factor is the birth of new sectors demanding meat consumption, usually migrant populations from other areas of the country that bring the habit of consumption of turtle meat.

The level of trade in the Caribbean as a result of sustained hunting of turtles, can lead decline the adult population, also driven by the pressure of capturing to trade in meat and to obtain tortoiseshell scutes. Another factor is the expansion of trade in meat to new markets among the population of the Pacific coast.

i. For each species: How significant is the trade for conservation compared to other threats?

For the hawksbill turtle, the risk of disappearance increases in the Eastern Pacific, where the population is becoming less numerous (Seminoff and Wallace, 2012) the nesting sites are permanently threatened by anthropogenic changes in the environment also by natural predators; climate change conditions (Seminoff and Wallace, 2012). In the Caribbean, the situation is similar since the number of nesting turtles in the Pearl Cays are permanently threatened by the activities of trade and use of their scutes, which puts the number of nesting females at risk.

For the green turtle of the Caribbean, the current level of consumption and its authorized increase of this each year by the coastal towns, supposes a drastic annual decrease in the availability of females in the future.

ii. For each species: what are the perceived current/potential conservation impacts of current trade levels?

The current conservation targets that are considered for turtle species can be seen in Table 16, with this criteria:

1. Level of protection that each species has in the country.

2. The impact caused by the granting of permits for the capture of turtles on the Caribbean coast.

3. The level of demand for domestic trade and international trade.

4. The incipient demand for turtle meat in fishing communities of the Pacific coast.

Table 16. Conservation impacts of trade.*

Species	Trade impact over other threats	Conservation impacts of trade (Pacific)	Conservation impacts of trade (Caribbean)
Loggerhead	Low	n/a	n/a
Green turtle	Very high	n/a	Decline of the adult population. Capture for meat trade. Expansion of the meat trade to new markets towards the Pacific area.
Leatherback	Low	n/a	n/a
Hawksbill	Very high	Increase in the demand for eggs and tortoise shell plates.	Capture of the preferred population of adults to obtain plates. Supply of raw material to local artisans and intermediaries. Supply of the hawksbill market in neighboring countries.
Olive ridley	High	Increase in the demand for eggs. Less amount of nesting. Uncontrolled tourism on nesting beaches. New population sectors add to consumption	n/a

		demand for meat turtle.	

3. Managements options

a. How can management and conservation be improved at the national and regional level?

A conservation model has been developed in the community of Padre Ramos, where the community members who were once poacher, currently dedicate part of their time to patrol the beaches looking for the nesting of hawksbill turtles to transfer them to the local nursery and they wait that the largest number of them hatch successfully, because to that extent they will receive a stimulus that encourages them to continue collaborating in the conservation of the species. With the support of local organizations and participation of people from the local community, national and international tourism is promoted to publicize the way in which management is carried out. Visitors are also invited to participate as collaborators in patrolling and collecting nests for their protection.

i. What are evident shortcomings in current management and conservation policies that are enabling illegal/uncontrolled trade?

In the first place, lack of personnel for effective fulfillment of the Law together with a lack of knowledge of the prohibition of the trade of hawksbills on the part of nationals and foreigners on the regulation of the permanent ban on the consumption of eggs. This is in addition to the low awareness of the population and limited knowledge of the current status of marine turtle populations as a consequence of the impact of bycatch.

A low control in border and airport customs points and a deficiency in the knowledge on the issue of hawksbill in the government institutions.

The impact created by the environmental degradation of the main aggregation sites of turtles in the sea and coasts.

The current level of turtle captured that is produced by artisanal fishing fleet is not known.

ii. What are evident successes in currents management systems from which lessons can be learned?

The National Police carries out operations on the roads to detect the trafficking of turtle eggs in the nesting seasons in the Wildlife Refuges, due to limitations on the access to official information, it is not possible to offer the numbers of operatives and the quantities of eggs seized in the Pacific from green and hawksbill turtles in the Caribbean.

iii. How can current management and conservation practices be improved at national and regional levels?

<u>At the national level</u>:

Carry out sensitization activities of the population on protection measures for marine turtles with the participation of the Ministry of Education, Schools, Ministry of the Environment and Local NGO´s present in the area.

By collaborating in the strengthening of the technical capabilities of the Ministry of Environment staff on the origins, causes and impact of the illegal trade in marine turtle byproducts. Dissemination on the prohibition of hawksbill trade amongst the national population and foreigners who visit the country. Encourage and support the local CITES office, in monitoring the hawksbill and turtle eggs trade, establishing checkpoints on the roads and around the nesting beaches, and increasing marine patrols. Promote, maintain and update awareness campaigns aimed at the general population to raise awareness about "not to trade of parts" and support the conservation of turtles.

By promoting with universities research on the level of impact of bycatch on different species of marine turtles, fully identifying the different sources of hawksbill in the Caribbean, which feed the local and foreign market (Fauna & Flora International, 2018).

By promoting environmental education campaigns throughout the country with the participation of government entities.

Raising awareness of the current status of the habitat in the nesting and foraging areas of marine turtles in the Pacific and Caribbean coast of Nicaragua.

By requesting the Inpesca and the Naval Force to regularly verify the installation of the TEDs in the networks of the shrimp boats operating in the Caribbean.

By collaborating with the town hall, Marena, Inpesca and Naval Force collaborate in the follow-up of the chain of trade of parts of turtles to curb illegal trade.

At regional level.

By unifying the criteria and monitoring standards for the control of the traffic of turtle parts between the offices in charge of the environment and the customs of the different countries.

By placing banners in the areas of entrance of airports and borders with messages of not acquiring pieces and or parts of turtles.

By generating standardized custom control mechanisms in the different countries to halt hawksbill trade more drastically, unifying awareness messages that promote or discourage the trade of parts.

Through the compiling of researches carried out in the Caribbean and in the OPO on the theme of the hawksbill turtle to unify the research criteria.

By identifying the routes of entry of products and seek compliance with the Law.

Through the invitation of the signatory countries to ratify the IAC Convention and encourage their participation in the decision-making forums on protection measures.

By supporting the creation of additional protection measures for foraging areas and nesting beaches with the commitment of governments. Request that the National Marine Fisheries Service verify compliance with the norm of placement of TEDs in shrimp boats.

DISCUSSION AND ESTABLISHMENT OF IMMEDIATE MITIGATION AREAS

Caribbean region

Based on the results obtained in this project (surveys/interviews, field trips and reviews of scientific literature), the Caribbean region represents a greater international illegal traffic in terms of reported species, volume of trafficked products, hotspots for marine turtle illegal trade and high ethnic and cultural diversity.

Regarding the species reported, it is important to mention that the domestic consumption of the green turtle is greater compared to the other species present in the Caribbean region, which focuses on the consumption of meat and eggs.

Regarding the hawksbill turtle, it is likely that its local consumption is lower compared to the green turtle, however the exploitation focuses on the trade of its carapace, which exceeds national borders and becomes illegal international trade in the region (Figure 54). However, hawksbill meat and eggs are also used for domestic consumption. Finally, the meat and eggs of the leatherback and loggerhead species are consumed locally in a lesser proportion with respect to green and hawksbill turtles.

In the case of Panama, hawksbills, greens and leatherbacks are under some level of illegal trade but its intensity varies. Green turtles are trafficked by thousands every year mainly in Bocas del Toro state and Ngäbe Bugle Comarca for local meat consumption (see Table 10) affecting adult mating individuals during its migration path from Tortuguero in Costa Rica; hawksbills are intensively captured for their carapace to produce among others, cock fighting spurs. This valuable product features an intricated path finally reaching not only the local market but the international market as well (Figure 35). This imposes a need for international cooperation on the issue. Leatherbacks are less trafficked by locals, this probably is due to the less appreciation of their meat and the difficulty to collect their eggs because they are laying deeply compared to other species.

According to the volume of animals and products trafficked, in Colombia there are two areas of special interest: on the one hand is Cartagena, a City that has a recognized hawksbill market and on the other hand, there is the state of La Guajira, a region with geographic importance due to traditional local consumption by the Wayuu ethnic group and other local inhabitants (Figures 12 and 13). During this study three sites were identified in the Caribbean where local consumption appears to occur and the trafficking of turtles: the Bocas del Toro state archipelago, part of the coast of the Ngäbe Bugle Comarca and the archipelago of the Kuna Yala Comarca, the last two inhabited by ethnic groups. In both, local consumption of hawksbill and green species is known as a cultural aspect in some cases considered as subsistence. This continuous consumption of hawksbills and green turtles have been previously reported by Meylan et al. (2013) and Meylan & Donnelly (1999). The sustainability of this consumption however, that according to our surveys may reach thousands of adult individuals in the case of green turtles alone (see Table 10), can be compromised due to the extra trade of hawksbills adult and juveniles and green products outside the communities to external traders. On the Caribbean coast of Nicaragua, the largest volume of hawksbill products originates in the area between the Miskito and Perlas cays. This activity is carried out exclusively by the Miskito Indians, as an important part of their ancestral traditions and uses. Green and hawksbill captured in this area are taken to the cities of Bilwi and Bluefields, to supply local demand for meat and derivatives. A good part of these are destined for domestic consumption in different cities of the country. Subsequently, hawksbill products cross international borders.

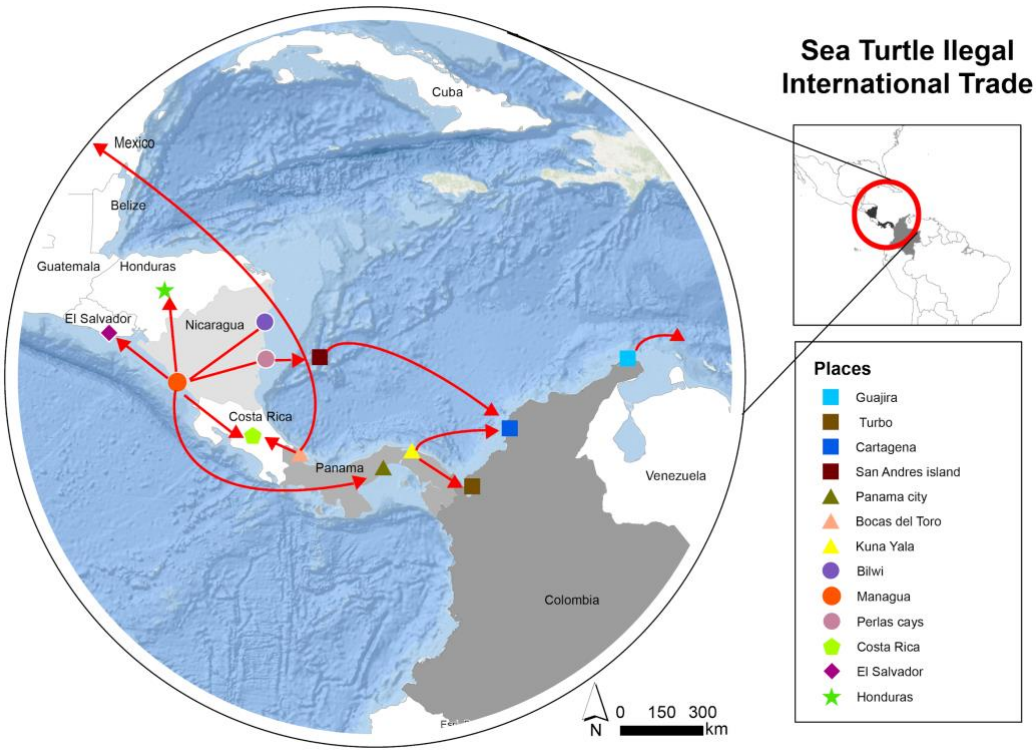

Figure 55. Illegal international trade routes for hawksbill turtle specimens, based on data obtained during this study.

Pacific region

In the Pacific region, the situation is different in terms of local consumption and illegal international trafficking of marine turtle products.

Regarding to the species and its abundance, the most consumed in this region because of its meat and eggs is olive ridley. Green and hawksbills are locally consumed but at a smaller scale. In the City of Buenaventura, Colombia (Valle del Cauca state) and in the state of Choco (Pacific coast) there is a local consumption of meat and eggs of traditional and cultural character, in some cases associated with aphrodisiac beliefs.

In the Pacific coast of Panama, the local consumption of eggs is based on olive ridley species, whose surplus is commercialized in the markets of the cities of David, Santiago, Las Tablas, Tonosí, Pedasí, Arenas, Mariato and Panama City. To a lesser extent, the green turtle eggs that are not locally consumed are eventually commercialized. Figures obtained during this study indicate that olive ridley eggs are trafficked by thousands every year at main nesting beaches (e.g. Cambutal beach, see Table 10). These findings add more

information and complements the facts described in the Diagnostic of the Situation of Marine Turtles in Panama (Miambiente, 2017), indicating this is an ongoing problem not fully addressed. In Nicaragua, the consumption of turtle eggs is a widespread custom in cities with coasts in the Pacific, the activity of people who devote themselves to the looting of nests. The eggs of all the species that nests are collected, but in particular the olive ridley turtle. The demand for other products, so far is not significant, however, the fishermen of the community of Masachapa are responsible for the turtles by foreigners who already have the habit of consumption.

Online resources

Our results obtained suggest that marine turtle illegal traffic is present in the region. In this research others NGO provided resources and information in this aspect. For example, Brad Nahill (www.seeturtles.org) with his campaign Too Rare to Wear and Didiher Chacón (Latin American marine turtles LAST-Widecast ally www.costaricanseaturtles.org) have shut down specific web links in social media such as Facebook, Ebay, Instagram among others. Most of this traffic is focused to hawksbill products, mainly in the offer of cockfighting spurs, which is a cultural tradition in places like Colombia, Panama and Nicaragua. Our data reflect the dynamics mentioned above, in which hawksbill spurs (Figures: 19, 20, 21, 22, 23 and 39) have a high demand in the region, not only in the study area but also in other countries such as Venezuela, Suriname, Ecuador, Chile and Mexico.

Considerations for future actions

In the case of Nicaragua, during the realization of this investigation and talking with fishermen and representatives of local NGOs on the Caribbean coast, three routes of origin of hawksbill products were identified: in the Tasbapauni area off the Perlas cays, where the hawksbill is commercialized with the vessels that travel to Colombia. From the two main population centers of Bilwi and Bluefields, the product is transferred to the capital Managua, and later

through sites that lack control at the borders to neighboring countries such as El Salvador, Honduras, Costa Rica and Panama.

Due the legislation of the Caribbean governments of Nicaragua allows the capture of green turtle for consumption of the Miskito communities, in the activities of capture of the green turtle they are involved nonspecific amounts of hawksbill turtles, which are sacrificed to obtain their tortoiseshell plates to sell them to the merchants. The domestic price of the country is low for this raw material, so that hunters choose to sell the goods to those who traffic the product internationally, via Pearls cays to San Andrés or to intermediaries who carry the tortoiseshell plates to Managua and from that place to the borders with neighbor countries.

The strict control of the border authorities in combination with the police is essential to stop the flow of smuggled hawksbill and hawksbill products from the country to neighboring countries.

In the Caribbean of Panama, international illegal trade of marine turtle focuses on the capture of hawksbill turtles. Individuals are hunted with harpoons and nets in the Bocas del Toro area (Meylan et al., 2013) and trafficked mainly to the border with Costa Rica, probably through the Sixaola border post, from where some of these products appear to be transported to Mexico (ARAP official personal communication). In the case of the Kuna Yala Comarca, hawksbill turtles are captured mainly to obtain their carapaces and meat (MiAmbiente, 2017), which are then taken by sea to the Colombian border to the cities of Turbo and Cartagena.

In this illegal trade local fishermen are mainly the participants and lobster divers (in the case of Bocas del Toro state and Kuna Yala Comarca), and trading boats coming from Colon state and Colombia (in the case of Kuna Yala Comarca) which buy meat and carapace of hawksbills. These can be considered the starting points/sources of the illegal trade, however, the inefficient patrolling and proper Law enforcement by local authorities add to this problem. The motivations behind this illegal trade are complex because in part they are linked to the cultural traditions of ethnic groups that value the local consumption of meat and eggs as part of their livelihoods. According to several interviewers in the Caribbean region this situation is not fully shared

by the new generations to which the marine turtles conservation is becoming more and more important. Therefore, any conservation initiative must include not only the full participation of young people along all the steps of the project, but also economic alternatives to the fishermen that get extra income from illegal trade.

One particular aspect is the local consumption of olive ridley eggs in the Pacific region. This problem is more acute at important nesting beaches that lack proper patrolling (e.g. Isla Cañas Wildlife Refuge, Cambutal beach) and again exacerbated by the lack of adequate Law enforcement. The implementation of permanent checkpoints with trained personnel and more support for the actual and new *in-situ* nurseries would be the solution that may ameliorate this situation.

It is also relevant to consider the complexity of the problem, and the need to address the shortcomings of conservation and management in a holistic framework. Previous initiatives have proven effective when they are intensive and developed in the long term (e.g. PROMAR, Sea Turtle Conservancy projects, Malena beach nursery conservation project) but they need to be inserted into a broad nationwide initiative involving: education, capacity building, legal framework and surveillance. To these a new international cooperation action has to be added based on the actual illegal trade identified during this study.

In Colombia, four areas are part of the international illegal marine turtle trafficking scheme. In the city of Cartagena, hawksbill products that come from both Panama and Nicaragua are received through the archipelago of San Andrés. On the other hand, products from the Kuna Yala Comarca in Panama arrive to the City of Turbo in the Caribbean. Finally, in the state of La Guajira, the northeastern corner of the Colombian Caribbean, hawksbill products are taken to Venezuela and Suriname.

Priority areas

The results of this study indicate that the greatest international illegal trade pressure and local consumption of marine turtle products takes place in the Greater Caribbean region.

In Colombia there are two areas in need of immediate mitigation located in the Caribbean: the city of Cartagena and the state of La Guajira. In Cartagena, the first report of marine turtle trafficking between 2008 and 2012 quantified 2,593 hawksbill products valued at 20,990 USD (Harrison et al., 2017). During 2017 and 2018 seizures of hawksbill products were registered by the police in the same City (Figures 24). However, the merchants and artisans of the City have begun to sell their products clandestinely to tourists (Figure 5).

Cartagena is of special interest for both artisans and for hawksbill traders, this is because it is one of the main cities in the Colombian Caribbean and the region, due to the high flow of tourists. Official information reports a total of 434,600 tourists from foreign flights, 2,027,415 tourists on domestic flights and 338,172 cruise passengers during 2017 (Corpoturismo-Cartagena). This data highlights Cartagena as the City with the most tourism in Colombia. For these reasons, it is considered that Cartagena is a key point in the fight against illegal international trade of hawksbill turtles, because it is the main destination of trafficked material in the Wider Caribbean Region.

In La Guajira state, Colombia, there is a high local consumption of turtle meat, as mentioned above. This activity has been reported since 1988 (Rueda-Almonacid et al., 1992), a period of time in which up to 400 turtles/month were captured in the rainy season (May-November). These catches were focused on green turtles and hawksbills because of their commercial value. However, local inhabitants also captured leatherback and loggerhead individuals (Rueda-Almonacid et al., 1992). More recent studies in La Guajira peninsula, a geographic area that includes the territories of Colombia mainly and to a lesser extent to Venezuela, have determined that the consumption of marine turtles is still present in the area and its main consumers are indigenous from the Wayuu ethnic group (Barrios-Garrido, 2018). Some studies carried out in the area suggest that marine turtle populations have been reduced over the years, and the cause associated with this phenomenon includes consumption of turtle meat by the Wayuu and other inhabitants of the region (Martínez, 2011). These reports are consistent with the databases and findings reported in this study, in which, the state of La Guajira has reported more cases of crimes related to marine turtles than the rest of the states in Colombia (Figures 17 and 18). For these reasons, it is considered that La Guajira state must be

a key place for the conservation of marine turtles, preventing local consumption and illegal international trade in the Caribbean region.

In the case of Panama, although the data on local sales of hawksbill products in commercial establishments could be underestimated (Harrison et al., 2017). Based on the information gathered in this project, it is likely that the illegal International trade play a major role. This trade originates in Bocas del Toro state and Kuna Yala Comarca to other countries in North, Central and South America (Tables 10 & 13) involving hawksbill carapace products (jewelry and cock fighting spurs). These two sites have been recognized as natural foraging, migratory and reproductive areas for hawksbills in the Caribbean region of the country (Chacon, 2002). Although this trade focuses mainly on hawksbill carapaces, a trend that has historic features in Panama (see Palmer, 1986; Miliken & Tokunaga, 1987; Donnelly & Mortimer, 2008), the illegal traffic of meat is also important. These features have been mentioned in previous studies (Meylan et al., 2013; Meylan & Donnelly, 1999; Chacon, 2002), indicating a problem that still occurs in the area. Therefore, it is necessary to carry out actions that lead to effective protection at the nesting sites and reduce the intentional capture (Vélez-Suazo et al., 2017).

In Nicaragua, it is considered that the community of Laguna de Perlas and the City of Bluefields may be the priority mitigation areas to reduce illegal international trade of hawksbill. From Bluefields the product is finally transferred to Managua. The trade in turtles is constant due to the habits of consumption and the permanent hunting of green turtles, which influences the hawksbill catches to be sold in local markets. Awareness measures aimed at local authorities and marketers are necessary to prevent the growth of this market and its movement to other cities and neighboring countries. Activities to raise awareness should remain a priority to strengthen and improve positive attitudes towards the conservation of natural resources and increase collaboration with conservation efforts (Lagueux et al., 2014).

These results obtained from Colombia, Panama and Nicaragua are supported by previous studies in the region (Barrios-Garrido, 2018; Harrison et al., 2017; Martinez, 2011; Meylan & Donnelly, 1999; Meylan et al., 2013; Rueda-Almonacid et al., 1992; Vélez-Suazo et al., 2017), in which marine turtle illegal trade and local consumption has been reported.

Public awareness and Law enforcement

One of the strategies to mitigate the illegal international traffic of marine turtles is the implementation of educational and media campaigns that work on three levels. The first is based on communities that extract marine turtles from their natural habitats. The second are merchants, curio sellers and artisans, who are responsible for exhibiting and selling marine turtle products. The third is the buyer of the product, which can be integrated by local consumers and/or tourists. However, for these strategies to be effective, they must be accompanied by training to the environmental authorities in charge of Law enforcement.

Trainings and workshops related to environmental Laws and policies are very important. This will allow governmental authorities to implement legal mechanisms that protect marine turtles in: Colombia, Panama and Nicaragua. A concrete case of the evidence of success of these processes was presented in Cartagena between 2017 and 2018. During this period of time, WWF started a campaign in this City to stop hawksbill traffic; during this process, local police officers received technical and theoretical training about this crime against wildlife. As a result of this effort, the seizures of hawksbill products increased significantly (Figure 24).

Another example is the environmental education program developed in Panama between 2000 and 2004 through the PROARCA-COSTAS project, in different communities of Bocas del Toro and the Ngäbe Bugle Comarca where aspects of ocean conservation and marine turtles were promoted.

In the year of 2006 the foundation Yauk Sabguedmala (marine turtle conservationists) supported by the San Blas Sailing company, developed environmental education activities regarding marine turtle conservation and turtle eggs relocation in protected hatcheries along Kuna Yala Comarca (MiAmbiente, 2017). This kind of joint venture involving local grassroot groups and private entrepreneurs must be highlighted and its successes replicated along the Comarca and beyond.

In Nicaragua, it is necessary to increase the efforts to promote and update ongoing awareness campaigns on marine turtle conservation in key communities such as: Tasbapauni, Set Net Point and Laguna de Perlas, because these communities are the main responsible in the capture and illegal international trade of marine turtles.

Community engagement

Direct work with local communities throughout the region is necessary to reduce the factors that compromise conservation of marine turtles in the region. This entails the search for alternatives that facilitate the reduction of illegal international trade activities and traditional local consumption. In this way, income and other resources will guarantee an active participation of local communities in the conservation of marine turtles. For example: community projects that improve diet through local agricultural production, responsible fishing that includes the improvement of fishing gear, resource management, identification of sustainable alternatives related with ecotourism and local management of protected marine turtle hatcheries.

In the Caribbean region of Panama in Kuna Yala Comarca, the need to support current divers and fishermen with fishing gear that allows them to be more efficient in capturing has been identified. In the case of the Ngäbe Bugle Comarca, it is necessary to implement sustainable production activities to improve the diet and at the same time identify potential ecotourism projects in priority areas.

In the Pacific region of Panama, the active participation of the communities is required in ordering processes of the coastal zone, support to the current marine turtle hatcheries (for example: Malena beach, Mata Oscura and Punta Chame) and the implementation of new breeding sites (MiAmbiente, 2017), as well as support for ecotourism activities (for example: Chiriquí beach project in the Ngäbe Bugle Comarca, San-San beach in Bocas del Toro state, Armila Beach in the Kuna Yala Comarca). Similarly, in Colombia, ecotourism projects related to the leatherback season have been carried out in Acandí (Chocó region - Caribbean coast) and in Bahía Solano (Chocó region - Pacific coast) where olive ridley nests regularly between July and December.

Currently in the Pacific of Nicaragua there are organizations that are working very hard in the development of programs to protect sea turtles, the hawksbill turtle is successfully protected in key sites in the north of the country through initiatives that involve the community in the actions of protection through the "Carey committee", created to establish joint management rules, between the state, the community and the environmental support organization.

The case of the Nicaraguan Caribbean is more complex. On the one hand local governments allow the hunting of marine turtles for a determined number each year however, the control of the authorities over the quantities of captures and marketing is deficient. The absence of environmental organizations are also added, they are responsible for the education and awareness of the communities to alert the current status of sea turtles and at the same time support local governments in the statistical control systems to guarantee the compliance with catch regulations.

Research- and conservation-based management

Research in the region is the basis for decision making that helps to reduce the negative impacts on marine turtle populations. Among the information needed to know are: establishment of baseline information on critical habitats, estimation of the state of conservation of current populations, knowledge of the origin and level of impact of anthropogenic actions and adaptation to climate change (Chacon, 2008).

In terms of conservation and management, effective protection and monitoring of nesting beaches, feeding zones and knowledge of migratory routes and regional connectivity (Vélez-Suazo et al., 2017) is useful to enhance current CITES database on international illegal trade of marine turtle products. This information will also help to update national wildlife crime statistics in assessed countries.

As a special case, in Nicaragua, the Perlas cays consist of 18 cays bordered by mangroves (*Rhizophora mangle*) and coconut palms, located between 12 and 24 km off the community of Set Net Point. Literature reveals that "in the nineties the reefs in the Perlas cays were healthy and growing, but in the

following years, for indeterminate reasons, these have been destroyed" (Weijerman & Ubeda, 1999); as well as the diversity and abundance of resident species (Ryan, 1992; PAANIC, 1993). Recently it has been reported the deforestation of the mangrove that protects the cays. This can have negative consequences affecting important hawksbill nesting sites, such as the Vincent and Maroon Cays (personal communication - Karen Joseph. Field Coordinator WCS Pearl Lagoon, Bluefields). The causes and consequences of these affectations require investigations that determine the necessary measures to guarantee the conservation of these keys in the future.

CONCLUSIONS

The present study shows the actual aspects related to the legal and illegal trade of marine turtles in Nicaragua, Panama and Colombia. The results suggest that the illegal trade is still a problem along the region, and this situation seems to be more relevant in the Great Caribbean region. In general, it seems that local ethnic groups play an important role in the local use of marine turtle products and in some cases are also involved in international illegal trade of some of these products. Today more legal instruments and national and international regulations are in place but these regulations still need to be handle and put in practice by the National security bodies and environmental authorities. Since the illegal trade involve not only national consumers but also reaches the international market, there must be an international cooperation scheme to address the issues that are commonplace. On this regards we may conclude as result of this study:

- The need to develop a standardized regional illegal trafficking database, allowing more precise data sharing and analysis of the volume and value of the illegal trade.
- The Caribbean region is the area more affected by illegal trade of marine turtle products. An urgent effort is required to monitor, control and ameliorate this problem that has an international dimensions.
- A regional and nationwide awareness campaign need to be implemented, related to the ecology, conservation and legal aspects of

marine turtles in the area. This campaign must involve three levels (as mentioned above in discussion section), targeting all the stakeholders involved.

- In deep training program involving all the important security and Law enforcement bodies in the region, must be urgently implemented. The establishment of an outlook content for the program and a detailed training scheme must be also developed involving local NGOs and authorities in each country.
- At each country national strategies for Conservation of Marine Turtles must be developed, especially for the regions involved in illegal trade. These strategies may encompass the enforcement of local marine turtle conservation networks to promote capacity building and local empowerment.

RECOMENDATIONS

As final recommendations we suggest some key actions that may help to reduce and mitigate the illegal trade along the Pacific and Caribbean regions of the three countries part of this study. The follow recommendations are the result of deeper discussions and analysis of this study and are intended as guidelines for further development and application according to the situation in each country.

In the case of Panama, the illegal trade in the Caribbean region has cultural implications dating back from many generations, specially the local meat consumption and products of hawksbill turtle. In the Pacific region still the egg consumption is a major problem because local people get extra income from selling them and cock fighting gambling is still a profitable activity. Therefore based on the results of this study we recommend:

- For the Caribbean region it is necessary to increase the surveillance during the migration of green turtles of the National Security Bodies in sites considered as hotspots like for example: Kuna Yala Comarca, Bocas del Toro state (offshore Zapatilla cays), and Ngäbe Bugle Comarca (at open sea).

- In the Pacific region of the country it is necessary to support the establishment of beach patrolling programs and ex-situ nurseries to ameliorate the impact of illegal egg collectors and natural threats.
- In the case of Kuna Yala it is necessary to implement a continue environmental education program, involving local fishermen, but at the same time an alternative project to support the local fishermen so they can improve their fishing practices with appropriate equipment, getting better yields and therefore reduce marine turtle hunt as an income source.
- In Ngäbe Bugle Comarca it is utmost important to declare new protected areas to guarantee the protection of foraging and nesting sites of marine turtles, in particular Ibiari beach and the coral reef near Tobobe, Roja Beach, and Punta Nispero.
- In the Pacific region, especially in Los Santos state where more illegal egg trafficking exists, the local security bodies need to increase the surveillance and application of the Law to ameliorate this problem in the area.

In the case of Colombia, in the Pacific region we have consumption of meat, eggs and other products such as turtle penis. On the other hand, in the Caribbean region, we have more consumption of turtle meat and apparently a big market of hawksbill products such as handicrafts and cook fighting spurs. For these reason, we recommend:

- Engage fishing communities, curio sellers and local restaurants to implement sustainable activities that might improve livelihoods. For example, in La Guajira state where the poverty is almost the double than registered in Colombia we observed more marine turtle meat consumption than in the rest of the country. For this reason, we must include all stakeholders from the very beginning in future marine turtle conservation projects considering poverty reduction.
- Work with the environmental authorities to improve the control and vigilance of these activities in places that register marine turtle illegal trade

- Work in public awareness to reduce demand on this products, especially in places such as Cartagena, where local's authorities have obtained important results against marine turtle illegal traffic

On the Caribbean coast of Nicaragua:

- Training for institutional staff and other key stakeholders on regulations and conservation of marine turtles and their habitats. Work to comply with Laws and regulations, for this, update and apply regulations, accompanied by national campaigns for its dissemination, knowledge and application. Promote initiatives for the establishment of protected areas and special coastal marine management zones.
- Regarding the area of Pearl Cays in the Caribbean, this involves the realization of agreements with municipal mayors and regional governments of the Caribbean to promote joint initiatives between government offices and environmental organizations that collaborate in the care and monitoring of marine turtle populations. It is possible that the efforts of these initiatives have a high cost because they involve the training of many personnel involved and the printing of study material. It must be taken into account that the National Police, the Army and the Naval Force are institutions that due to the nature of their mission should be included in the training and awareness programs for the correct application of the Law.
- It would be appropriate for the Ministry of Environment and Natural Resources, in close coordination with the Fisheries and Aquaculture Institute, supported by the facilities offered by local municipalities and non-governmental organizations that collaborate in the protection of marine fauna. Coordinate efforts with Naval Force to develop protection plans and also to carry out operations to comply with the regulations related to the protection of protected areas with more attention over the hydro-biological resources. Provide special attention to the care of the area adjacent to the Perlas Cays, King cays and Guerreros Cays, because all this area are sites of feeding of marine turtles and at the same time fishing spots in which, along with the green turtle, hawksbill turtles are also being captured.

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