REPORT

REGIONAL WORKSHOP ON THE HAWKSBILL TURTLE IN THE WIDER CARIBBEAN AND WESTERN ATLANTIC

DEVELOPING A REGIONAL COOPERATION FRAMEWORK FOR THE CONSERVATION OF THE HAWKSBILL TURTLE *Eretmochelys imbricata* IN THE WIDER CARIBBEAN AND WESTERN ATLANTIC

PUERTO MORELOS, QUINTANA ROO, MEXICO

September 23 – 25, 2009

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Mexico:	Ana Rebeca Barragán (DEPC-CONANP)
	Aída Peña (UCAI – SEMARNAT)
	Antonieta Ricoy (UCAI – SEMARNAT)

On-site Logistic support:

CONANP:	Christiane Aguilar Girón
	Alejandro Pliego
	Marisela Garduño
Kutzari AC	Patricia Solis

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[1] IAC (Inter-American Convention for the Protection and Conservation of Sea Turtles), CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), Convention for the Protection and Development of the Marine Environment of the Wider Caribbean region (Cartagena Convention) and SPAW (Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region), CONANP (Consejo Nacional de Áreas Protegidas – Government of the United States of México), SEMARNAT (Secretaria de Medio Ambiente y Recursos Naturales – Government of the United States of México) and WWF (World Wildlife Fund).

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Executive Summary

At its 14th meeting, the Conference of Parties to CITES adopted a decision providing support to the IAC and the Cartagena Convention with its SPAW protocol to conduct a meeting focused on hawksbill turtles in the WC/WA Region. The purpose was to promote collaboration, planning and information sharing within the region and to cooperate with other organizations and multilateral agreements. These organizations were also requested to report on the results of the regional meeting and information regarding progress on implementation of management plans.

The Regional Workshop on the Hawksbill Turtle in the Wider Caribbean and Western Atlantic convened from September 23-25, 2009 in Puerto Morelos, Quintana Roo, México. All abbreviations given throughout this summary are explained within the document in footnote 1. The meeting was attended by 57 participants, including representatives from 21 Range States and Territories, the *Pro Tempore* Secretary and members of the IAC, representatives of CITES parties, representatives of SPAW protocol, 12 invited experts, and five observers from NGOs. These attendees and their contact information can be found in Appendix 3: List of Participants.

The hawksbill turtle remains listed on the IUCN *Red List of Threatened Species* and is considered an endangered migratory species as well. Hawksbills nest in 40 of the 42 countries and territories of the Wider Caribbean Region plus Brazil. Foraging occurs throughout most of the region but precise locations are poorly defined, and large nesting colonies are extremely rare. Hawksbill population trends for the region are difficult to evaluate, mainly because of the dispersed available data and only recent existence of most monitoring projects.

The threats to which hawksbills are exposed can be grouped in two groups: primary (widespread and well-known) and secondary (localized or of unknown effects). Direct take is one of the most severe threats with the most significant capture for the purpose of consuming meat and/ or later selling shells, eggs, or oil as commercial goods. The region is faced with limited resources, no monitoring mechanisms in place, and little importance given to infractions of laws protecting hawksbills. Incidental catch and entanglement in discarded gear is also an important factor, but information is often incomplete. Difficulties in adopting and effectively practicing sea turtle protection measures have been widespread throughout. Some trends have been discovered in fishing gear such as the considerable increase in mortality from gillnets and bottom trawlers as compared to longlines. Coastal development is another primary threat that includes the construction, lighting, noise, and human interference. Contamination and the loss of biodiversity are characteristic of this threat. Up to 20% of historical nesting sites have been completely lost and 50% of the rest have been severely impacted. Secondary threats include pollution from debris which can lead to physical barriers and a loss of habitat, chemicals that cause nitrification of the environment or that contaminate such as detergent, synthetic compounds, and petroleum, and noise. Other threats are depredation by domestic and other animals, disease such as fibropapillomatosis, beach erosion, and global warming.

The workshop was divided into two sections: diagnosis of the hawksbill turtle in WC/WA Region and a working group's session. One group performed a Viability analysis of hawksbill turtle populations in the WC/WA Region, in which the participants established which key attributes should be maintained to ensure the integrity and health of the hawksbill turtle in the long term. Three categories – size, condition, and landscape context – were used for evaluation. The remaining participants were split into five working groups: direct take, gillnet bycatch and

entanglement, habitat deterioration (infrastructure, lights, and vegetation removal), habitat deterioration (non-natural depredation and pollution), and threats related to inadequate policies or climate change. Each working group conducted a more detailed analysis of threats using the Conservation Action Planning (CAP) methodology, in order to develop strategies and actions for the conservation of ecosystems or populations of interest. The groups identified and ranked stresses and sources of stress according to their severity and scope.

The viability analysis found an overall ranking of *Fair* for the Hawksbill turtle meaning that the target for conservation had one or more key ecological attributes outside the acceptable variation range, but which could still be restored. The group commented that there were gaps in our knowledge and that standardized monitoring protocols must be developed for key parameters in order to monitor population trends and status. According to the stresses analysis, the participants regarded the *mortality of adult turtles at sea* and the *reduced "fitness" of nesting females* as critical factors for the survival of the populations. Others ranged from *Low* to *High* stress. They also identified 40 sources of threat with 10 priority ones: turtle fishing, other fisheries, gill net, lost fishing gear, beach infrastructure, lights, non-native mammals, oil spills and response, lack of community collaboration or incentives for conservation, and change in open ocean conditions. From these sources, which were grouped by the five working groups, 15 objectives for a regional conservation program for the hawksbill turtle were established with numerous strategies and action steps.

It was evident that some important issues could and should be immediately addressed in order to provide prompt and effective conservation actions. Four project profiles for the WC/WA Region were developed to be submitted for funding: reduction of hawksbill bycatch, reduction of direct take and commerce activities, identification of hawksbill distinct nesting population units, and harmonization of conservation laws, regulations, and policies. Finally, two action items were suggested in plenary discussion: a joint IAC-CITES-SPAW regional proposal for the Global Environmental Fund and a proposal through the SPAW Secretariat to the Integrated Coastal Zone Management.

Appendices are listed in the Table of Contents. Appendix 2 contains summaries of the nine introductory presentations that were made to share expertise knowledge among all participants. (Overview of the biology of the hawksbill turtle in the WC/WA; Current status of the hawksbill turtle in the WC/WA: population sizes and trends; Case Study: current status of the hawksbill turtle in the Mexican Caribbean; An overview of regional threats: state & trends; Comparative observations on trade in hawksbill products in the Dominican Republic; Regional Agreements for the Conservation of Sea Turtles in the WC/WA Region; Results of the CITES Dialogue Meetings; Map and overview of current strategies, projects, actions and actors taking place in the region the conservation of the hawksbill; Lessons learned from the international regulatory framework on the conservation of sea turtles).

Introduction

The Regional Workshop on the Hawksbill Turtle in the Wider Caribbean and Western Atlantic convened from September 23-25, 2009 in Puerto Morelos, Quintana Roo, México.

The workshop objectives were to evaluate the current status of the hawksbill turtle (*Eretmochelys imbricata*) in the Wider Caribbean and Western Atlantic Region[2], taking special note of concern surrounding recent declines in nesting populations in México and whether these changes were a sign of what may be happening to other hawksbill populations in the broader region. It also sought to address threats to populations (including capture, overharvesting and illegal trade) and habitats, to prepare a draft regional conservation strategy, to identify gaps and priorities, and to encourage regional collaboration among governments.

Background

In order to address concerns in the region regarding legal take and international trade in hawksbills CITES held two regional dialogue meetings. The first dialogue meeting on hawksbill turtles was held in Mexico in May 2001 and the second one in the Cayman Islands in May 2002.

In November of 2004, concerns were raised during the 7th Regional Workshop on Sea Turtle Conservation Programs in the Yucatan Peninsula about the decline in hawksbill turtle nesting in Yucatan, México. In response, a working group of specialists and environmental authorities gathered in March of 2005, to analyze regional nesting trends for this species. The results were published in the Proceedings of the Workshop "Towards IAC's COP3: Diagnosis of the Status of the Hawksbill Turtle (*Eretmochelys imbricata*) in the Yucatan Peninsula and Strategic Actions" (Abreu *et al*., 2005). In September of 2007, Mexican specialists met for the Preliminary Meeting for the Diagnosis of the Hawksbill Turtle in the Gulf of México and Caribbean, where they integrated historical data of hawksbill nesting in the region and prioritized problems and threats. A follow-up meeting produced a document entitled "Results of the Working Group Meeting for the Hawksbill Turtle in the Mexican Atlantic", which compiled and updated in an interdisciplinary context a large part of the information about the species and its habitat in México (Guzmán *et al.*, 2008).

Mexico raised these concerns at the Second Conference of the Parties of the IAC and in September of 2006, the Third IAC Conference of the Parties adopted Resolution COP3/2006/R1 Conservation of the Hawksbill Turtle (http://www.iacseaturtle.org/English/download/COP3-2006-R1%20Hawksbill%20Res.pdf). This resolution urged the Parties to promote synergies between the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Protocol Concerning Specially Protected Areas and Wildlife (SPAW), the

[2] For the purposes of this workshop, the Wider Caribbean and Western Atlantic (WC/WA) region embraces the 28 range States of the UNEP Regional Seas Programme in the Caribbean Sea (http://www.unep.org/regionalseas/programmes/unpro/caribbean/default.asp), plus Bermuda to the north and Brazil to the south.

Convention on Migratory Species (CMS), the Western Hemisphere Migratory Species Initiative (WHMSI), the Food and Agriculture Organization (FAO), other pertinent treaties and international organizations, and regional fisheries bodies in order to facilitate regional dialogue on management and conservation of the hawksbill turtle and its habitats. The resolution also promoted the organization of a workshop with recognized experts to evaluate the current condition of hawksbill populations in the Greater Caribbean and Western Atlantic, and to present the best available methods of research and conservation for the species in its marine habitats.

At its 14th meeting, the Conference of Parties to CITES (CoP14, The Hague, 2007) adopted Decision 14.86, which instructed the CITES Secretariat to provide support to, and collaborate with, the IAC and the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) with its SPAW Protocol, in raising funds to conduct, before the 15th meeting of the Conference of the Parties to CITES, a meeting focused on hawksbill turtles in the Wider Caribbean and Western Atlantic Region. The purpose of the meeting was to promote collaboration, planning and information sharing within the region and to collaborate with other organizations and multilateral agreements that have a mandate concerning the conservation, management and sustainable use of this species. The Decision requested these organizations to include issues related to illegal trade in hawksbill turtles in the regional meeting's agenda and to assure the participation of the CITES Secretariat in the regional meeting as an observer, as well as the participation of CITES Parties of the Wider Caribbean Region. The Decision also requested these organizations to report on the results of the regional meeting, and if available, information on progress made regarding the implementation of the national management plans of the Parties of the Wider Caribbean Region, and to submit this report at the 15th meeting of the Conference of Parties to CITES (CoP15).

In addition, a Memorandum of Cooperation was signed on September 28 of 2006 between the SPAW Protocol and the IAC, which requested both Secretariats to collaborate in coping with the decline in the abundance of the hawksbill turtle in Mexico.

The Secretariats of the IAC, SPAW, and CITES, the Government of México represented by the Secretary of the Environment and Natural Resources, and the World Wildlife Fund (WWF) provided the necessary finances for the meeting.

Summary of the Status of the Hawksbill Turtle in the Wider Caribbean and Western Atlantic (WC/WA) Region

The hawksbill turtle remains listed as Critically Endangered on the International Union for Conservation of Nature (IUCN) *Red List of Threatened Species*, following the most recent assessment documenting an 84% to 87% decline in the number of females nesting annually over the last three hawksbill generations (Mortimer and Donnelly, 2008b). The hawksbill is also included in Appendix I of the Convention on Migratory Species (CMS) as an endangered migratory species and in Appendix II, which calls for concerted action to support its conservation through international agreements. Appendix II is partially made up of the SPAW Protocol of the Cartagena Convention, which refers to species under total protection. Similarly, the species is included in Appendix I of CITES, which greatly restricts its international trade.

The status of hawksbill populations in the Wider Caribbean and Western Atlantic (WC/WA) Region has been the subject of numerous analyses since the 1980s. Early population calculations estimated a maximum of 4,975 nesting females in this region (Meylan, 1989). The 1996 population assessment for the IUCN Red List concluded that the hawksbill fulfilled the criteria for a Critically Endangered species, given that the majority of the populations showed marked rates of declines, were reduced, or were remnants of previously healthy populations (Meylan, 1999). Only the populations around the Yucatan Peninsula, in Mexico, were identified as having more than 1000 nesting females per year.

Dow *et al.* (2007) determined that hawksbills nest in 40 of the 42 countries and territories of the Wider Caribbean Region plus Brazil, that foraging occurs throughout most of the region but precise locations are poorly defined, and that large nesting colonies are extremely rare. Of 817 known hawksbill nesting grounds (Figure 1), only three sites reported more than 1,000 nesting tracks per year (Mona Island in Puerto Rico, the West coast of Barbados and Punta Xen, Mexico and only 36 sites (Figure 2) receive more than 100 nesting crawls per year.

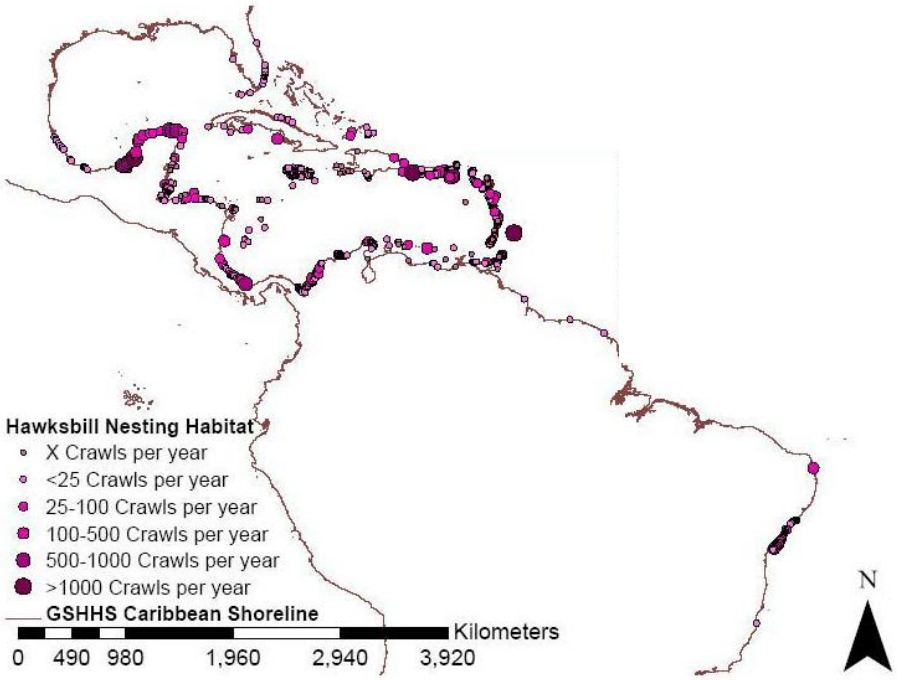

Figure 1. Hawksbill nesting sites in the Caribbean and Western Atlantic Region. (n=817). Source: Dow *et al.* (2007). http://seamap.env.duke.edu/prod/services/widecast/references/Dow_et_al_2007.pdf

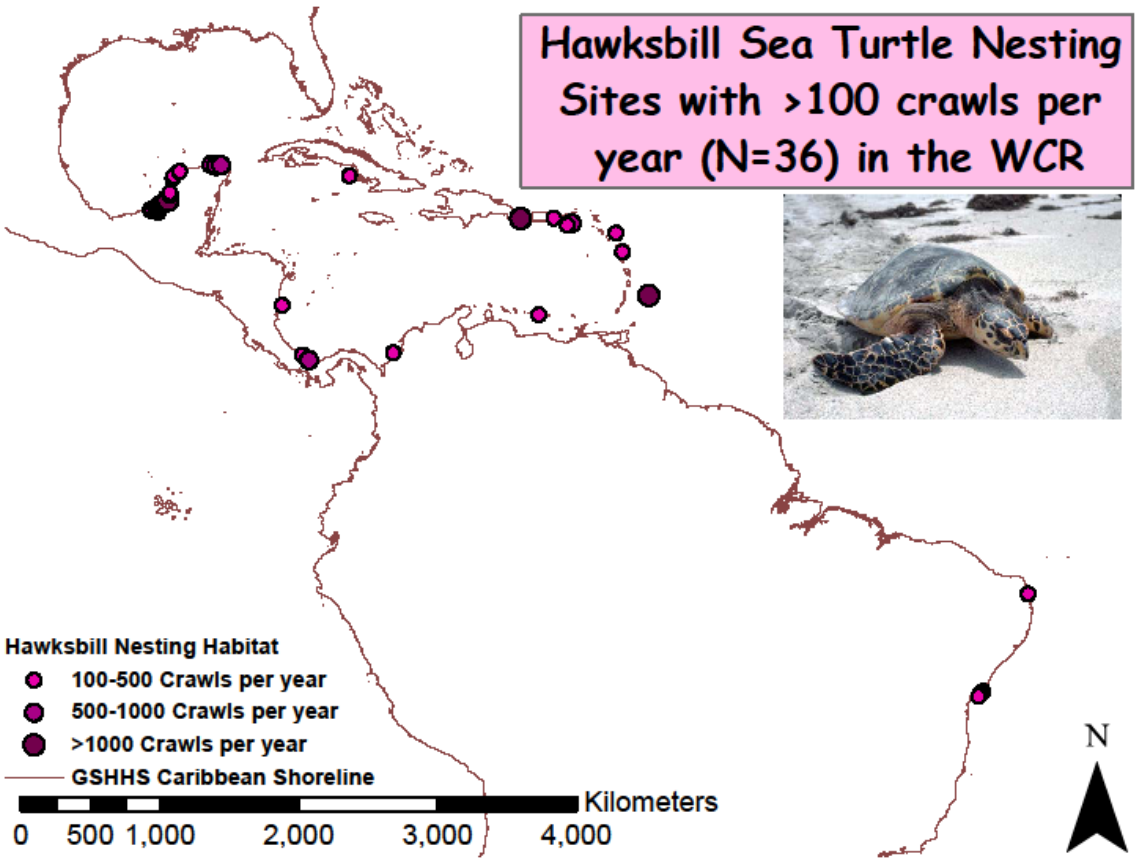

Figure 2. Hawksbill nesting sites in the Caribbean and Western Atlantic Region that receive more than 100 nesting crawls (successful and unsuccessful combined) each year. Source: Dow *et al.* (2007), http://seamap.env.duke.edu/prod/services/widecast/references/Dow_et_al_2007.pdf.

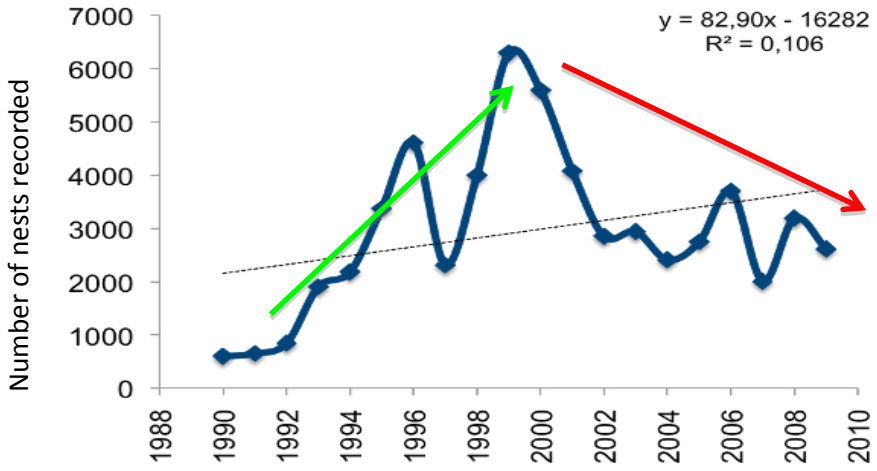

Figure 3. Historical trend of hawksbill turtle nestings for the Yucatan Peninsula. Source: Vicente Guzmán, CONANP, unpublished data.

Regional hawksbill population trends are difficult to evaluate, mainly because available data is dispersed and there is only a recent existence of most monitoring projects (see Chacón and Eckert in Appendix 2: Introductory presentations). Among the oldest and most consistent monitoring programs in the region is the one in the Yucatan Peninsula, and until recently, the Mexican Atlantic population was considered to be the largest in the WC/WA Region. In fact prior to 2000, two out of every five nests recorded in the region were laid by hawksbill turtles on Mexican beaches. After that year, contrasting with the rest of the region, a drastic decline was recorded for the Yucatan nesting ground, which reached 35% of the nesting numbers observed in 1999. Several causes have been suggested, but none have been proven (Fig. 3; Guzmán *et al*., 2008).

Threats for the Hawksbill Turtle in the Region

The threats to which hawksbills are exposed can be grouped in two groups, according to the presentation of regional threats given by Cathi Campbell (Appendix 2):

1) Primary threats: those widespread, well-known and equal in importance throughout the region

2) Secondary threats: localized or of unknown effects in the region

1. Primary Threats:

Direct take and trade of products

Direct take is one of the most severe threats because it destroys organisms that often have a great value for maintaining the population, whether because they are breeders or because they represent an important genetic stock. The most significant capture is done intentionally for the purpose of consuming meat and/ or later selling shells or other products. Ordóñez *et al*. (2005) concludes that capture for consumption is one of the main reasons for the killing of hawksbill turtles in the areas around Bastimentos, Zapatillas Cays, Valiente Peninsula and Escudo de Veragüas in Bocas del Toro in Panama.

Villate (2008) stated that out of the 481 sea turtles recorded between May and August of 2002 in La Guajira markets in Colombia, 181, or more than one-third, were hawksbill turtles, providing another glimpse at the magnitude of this fishery. Products such as shell or oil extracted from the sea turtle are additional commercial goods.

Egg collection is also an important factor harming the reproductive potential of the populations. Initially, it was done to satisfy protein requirements, but with improved means of transportation and refrigeration, egg consumption has become more intense since the eggs have become a commercial item that is exchanged for money or other goods. Guzmán *et al.* (2008) determined that the loss of nests to direct take may be an important factor threatening the health of the populations in certain years and at specific sites. Furthermore, the authors mention that, in Campeche, a loss of 10% represents hundreds of nests, an amount that would exceed the total

annual nesting for many sites in the WC/WA Region. They also point out that between 1992 and 2007 in the state of Campeche, 49.5% of the nests were registered as being poached, 31.6% were depredated, and the remaining minority of nests incubated safely on the beach.

Hawksbill scutes are as prized as ivory, rhinoceros horn, gold and some precious stones. The magnitude and long history of the global market for hawksbill shell has strongly influenced the survivorship of the species (e.g., Carr, 1972; Mack *et al.*, 1982; Groombridge y Luxmoore, 1989; Meylan, 1989; Eckert, 1995; Mortimore and Donnelly, 2008a,b).

The global ban on international trade of sea turtles has gradually taken effect, to the extent that nations that are strong importers and exporters comply with CITES provisions. However, legal trade in hawksbill turtle shell between signatory nations of the Convention did not cease until the end of 1992. According to Mortimer and Donnelly (2008b), the volume of international trade has significantly declined over the last 10-15 years; however, studies prove that domestic trade and illegal international traffic continue to exert pressure on the world's decimated populations of this species. In Central America and the Caribbean, illegal domestic exploitation and illegal international trafficking of hawksbill products persists (Fleming 2001; Chacón 2002a; TRAFFIC, 2002; Bräutigan and Eckert 2006; Reuter and Allan 2006; Mota and León 2006; Barrios and Montiel, 2008).

Significant progress in some jurisdictions, such as a noticeable decrease in trade on some Caribbean islands in contrast to a constant, extensive and sparsely documented use of hawksbills in American nations, especially in Central America, shows disperse exploitation in the region. Much of this occurs because of breaches or inconsistencies in the legal framework, as well as a separation from the specie's biological characteristics when creating the laws. A description of the regional situation regarding trade includes countries that have limited resources, no monitoring mechanisms in place, and little importance is given to breaking the laws that protect hawksbills (Bräutigan and Eckert, 2006).

Incidental catch and entanglement in discarded gear

No comprehensive database exists with information on incidental capture of hawksbills in fishing activities carried out in the WC&WA Region. The information available is often disperse, incomplete, short-term and too specific, and seldom comes from governmental entities.

Incidental catch has been indicated as an important factor in the decline of many sea turtle populations (Lewison *et al.*, 2004 a and b). So far the most important and complete assessments have been done specifically on pelagic longline fisheries, and as a result of these studies, it has been proposed to change the hook type from "J" to circular (Lewison and Crowder, 2007; Read, 2007; Moore *et al.*, 2009). Published information points to the difficulties faced by fisheries administrative bodies in adopting sea turtle protection measures through management policies and making them effective in practice. Moreover, it is difficult to manage multi-species fisheries to protect a specific taxon.

Moore *et al.* (2009) reports that a minimum of 60 hawksbill turtles were captured per year in longline fisheries in the Atlantic and Gulf of Mexico from 1992 to 2006, although records were only found for 1992, 1997, 1998 and 2006. This can have a major impact on some populations with only a few members. No latitudinal trends were found, but trends were shown for pelagic

longlines when comparing ocean basins, although without specific reference to hawksbills (Lewison *et al.*, 2004a). It is clear, however, that hawksbills do appear to be reported as being one of the species captured, especially in fisheries associated with reef and coastal zones. According to their observations, Lewison and Crowder (2007) determined that mortality from gillnets and bottom trawlers is considerable when compared to that produced by longlines.

Through interviews and net sampling, Aucoin and León (2008) determined that the capture per unit effort of hawksbills in Dominican waters was on the magnitude of 0.03 turtles per hour (SD= 0.04) and incidental capture was approximately 1 individual per day.

In Jamaican waters, Bjorkland *et al.* (2008) found that of 127 fishermen interviewed, about 27% reported incidentally capturing turtles using trawls, traps and gillnets. Fishing traps and gillnets were the main gear identified in this capture although it may also represent the widespread use of this gear in Jamaican waters. The authors recognize that hawksbill specimens between 3-20 kg. are caught in fishing traps while larger animals are more frequently trapped in gillnets.

Mortimer and Donnelly (2008b) identified gillnets and fishing traps as the most important fishing gear involving the incidental catch of hawksbills. Meylan and Redlow (2008) reported incidental catch in the Florida Keys as an important threat, and Blumenthal *et al.* (in print) determined that 17% of hawksbill mortality in the Cayman Islands is due to incidental catch.

Lagueux and Campbell (2005) found a direct relationship between hawksbills and fisheries operations in sea turtle strandings, particularly among trawls used to capture shrimp in the coastal waters off the Caribbean coast of Nicaragua. They also mentioned impacts caused by the operation of spiny lobster fisheries as well as impacts from gillnets. The authors expressed their concern for the correct use of TEDs (Turtle Excluder Devices).

Kerr-Bjorkland (2009) determined that hawksbills make up a significant part of incidental catch in Mexico's longline fleet operating in the Gulf of Mexico as well as in Venezuela's longline fishery operating in the central and south Caribbean. No incidental catch was recorded in the US pelagic longline fisheries from 2002-2007. This information concurs with other authors who assert that incidental catch is greatest in gillnets. Guzmán and García (2007) determined that incidental catch of hawksbills in Campeche is concentrated in fisheries operating entangling nets capturing bass, rays and other species, mostly because it is a widespread economic activity, though there is little capture per unit of net. The nets used for capturing rays have the greatest incidence per cast. Meanwhile studies done by Cuevas (2007) recorded incidental catch of hawksbills in the Yucatan totaling 41% of all sea turtles captured. Fishermen consumed up to 55% of all hawksbills caught.

From an ecological point of view, impacts to the food chain caused by fishing gear dedicated to extracting organisms from the different trophic levels should be taken into consideration since it affects the entire structure of the ecosystem. Lewison *et al.* (2004b) believes that all effects from the cascade of changes to the food chain should be taken into consideration.

Dow *et al* (2007) compiled the responses to a standardized survey applied to local experts in the Wider Caribbean Region, which stated that 91% of the nations and territories in the region report entanglement with discarded fishing gear as a threat to sea turtles – 26% of them describe this threat as "frequent".

Coastal development

Coastal development includes the construction of structures that alter the morphology of the coastal zone, which promotes the installation of lighting, increased noise level and the arrival of visitors. Contamination and the loss of biodiversity are characteristic of this threat. The majority of the coastal zones in the Caribbean have been turned into tourism areas with high urban development.

Choi and Eckert (2009) associate coastal development, especially beach front development, with light pollution, erosion, sand mining, obstacles and traffic on the beach, depredation, marine debris, run-off, indiscriminate anchoring, fishing with poisons, contamination, and oil spills, among others.

In a comprehensive review of the Caribbean, McClenachan *et al.* (2006) determined that up to 20% of historical nesting sites have been completely lost and 50% of the rest have been severely impacted to such an extent that it threatens the species with ecological extinction.

Harewood and Horrocks (2008) found negative effects on the size of hatchlings from clutches on developed beaches, as well as their ability to crawl towards the sea and orientate themselves once they reach the water because they spent more time on the beach or because they were attracted to lights along the coast. These hawksbill hatchlings showed higher mortality rates.

One of the variables associated with coastal development is land use change, specifically the transformation of native forests to pastures, gardens, exotic plantations and in the most extreme cases, construction. Kamel and Mrosovsky (2006a) discovered that on Guadalupe Island, nesting areas that were exposed to deforestation experienced higher temperatures, to such a degree that areas covered by forest were important in the production of male hawksbills. Furthermore, these authors indicated possible impacts as a result of changing patches of native forest to coconut plantations, mainly because this turtle species uses the sand below the vegetation or along the border of the vegetation as her nesting site (Kamel and Mrosovsky 2006b). According to Guzmán *et al.* (1993), as cited by Guzmán and Ortiz (2007), when vegetative cover was available on the coast, 63% of the hawksbills preferred to nest under the shade and fewer preferred outside of the shaded area.

Bolongaro *et al.* (2007) documented the loss of hawksbill nesting habitat along the coasts of Campeche due to the construction of breakwaters, seawalls and tetrapods, which significantly alter nesting distribution for hawksbills in Isla Aguada, México. One of the main problems is beach erosion caused specifically by the effects of human activities such as a change in current patterns caused by infrastructure, building dams, and deposition of sediments on the marine bed, among others.

Campbell *et al.* (2007) described the growing human occupation of Pearl Cays, Nicaragua, and, more specifically, the alteration of the coastline by building infrastructure that endangers this important nesting site. They reported impacts such as loss of coastal vegetation, sand mining, covering surfaces with cement, digging water wells, alteration of the morphology of the coastline, obstructions in the nesting area, and compacted sand due to excessive transit.

2. Secondary threats:

Pollution

a) Debris

Debris may arise from the immediate environments, such as communities surrounding coral reefs, but it may also come from the upper watershed. This is the case for logs and debris that are transported by rivers to the ocean via ocean currents and later end up deposited on the beach by rising tides and waves. This causes a loss of nesting habitat because these materials occasionally become large physical barriers to nesting (Chacón, 2004).

b) Chemicals

Liquid waste may be divided into two categories: those that cause nitrification of the environment such as waste found in sewage water and those that contaminate, like detergents and bleaching agents typically found in run-off waters, as well as synthetic chemicals used in agriculture (Choi and Eckert, 2009).

Nitrification of the environment where hawksbills live and feed is a serious problem because the nitrogenous components can promote the growth of algae. Algal blooms can lead to the suffocation of sponges and corals, causing a drop in biodiversity and changes in the structure and function of a coral ecosystem (Burke and Maidens, 2005).

Oil spills are another severe problem for this species as well as for different marine habitats. Effects on animal physiology and ecosystem functions are some of the impacts of this threat. Meylan and Redlow (2008) highlight this impact as one that affects hawksbill turtles in the waters off Florida.

Milton *et al.* (2003) determined that sea turtles are highly sensitive to chemical impacts from petroleum. Some areas where gas and petroleum exploration, transportation and processing are carried out overlap with important sea turtle habitats. Sea turtles are vulnerable to the effects of petroleum throughout all of their developmental stages from eggs and hatchlings to juvenile and adults in coastal waters. Petroleum effects sea turtles by increasing egg mortality, causes defects during their development, and direct mortality of specimens contaminated with oil due to negative effects to their skin, blood, digestive and immune systems, and salt glands.

c) Noise contamination

Available data show that sea turtles are most sensible to frequencies in ranges of 250–300 Hz and 500–700 Hz. Sensitivity deteriorates as the turtle moves farther away from this range, although some sensitivity exists at frequencies as low as 60 Hz and, probably as low as 30 Hz (Moulton and Richardson, 2008).

The frequency at which turtles hear best overlaps with that of a compressed air gun, which are often used in seismic studies for petroleum exploration. Most of the air pistols used in these studies operate at low frequencies between 10-120 Hz. However, the pulses contain very little energy between 500-1000 Hz. The wave emitted is characterized by the projection of a broad wave that later flattens, followed by waves caused from the oscillation of the air bubble emitted.

Depredation by domestic and other animals

This threat occurs when coastal communities or cities fail to control domestic animals and allow them to seek food on their own, behaving like wild animals and depredating nests as well as turtles. According to Ordoñez *et al.* (2005) this is a major cause of mortality in Bocas del Toro, Panama.

Leighton *et al.* (2008) reported significant depredation of hawksbill nests by the mongoose (*Herpestes javanicus*) an exotic species widely distributed throughout the Caribbean. Zeppelini *et al.* (2007) found that hawksbill hatchlings in northeastern Brazil were depredated by the brown rat (*Rattus novergicus*). Hancock (2008) reported depredation of hawksbill nests by raccoons (*Procyon lotor*), coatis (*Nasua narica*) and skunks (*Conepatus semistriatus*).

Disease

The most serious and debilitating disease is fibropapillomatosis, which decreases the turtle's physiological abilities until it dies. The disease was initially described in the family Cheloniidae, specifically in the green turtle (*Chelonia mydas)*, but has also been found in *Caretta caretta*, *Lepidochelys olivacea*, *Eretmochelys imbricata* and *Natator depressus* (Herbst, 1994).

In 1996, Brazil performed microscopic examinations on two female hawksbill turtles that had been maintained in captivity and confirmed the first cases of fibropapillomatosis (Amato and Moraes, 2000).

The main paths of bacterial infection in marine chelonids occur as a result of external injuries (Dobbs, 2001) that end up affecting skin tissue. These alterations eventually cause cutaneous abscesses and dermatitis (Glazebrook and Campbell, 1990).

According to Calvache and Gómez (2006) some of the diseases present in *E. imbricata* also include:

- Shell Rot disease or "Ulcerative Shell Disease (USD)"
- Septicemic cutaneous ulcerative disease (SCUD
- Ulcerative dermal necrosis
- Papillary Dermatitis (PD)
- Cutaneous abscesses

Other diseases found by Calvache and Gómez (2006) are associated with missing dietary elements and parasites.

Erosion

The use of sand as material for construction, reparation, and raw material for concrete causes coastal erosion. When sand is removed, the currents create alterations in the coastal dynamic, eroding large parts of the beach and eggs. Sediment plumes from the rivers deposited on the marine bottoms can change current patterns and lead to coastal erosion that affects nesting. Márquez (2007) documented a net loss of 160 m of beach at Isla Aguada and Chenkan in Mexico, a loss of 5.3 m per year over three decades.

Global warming

There has been a recent increase in research focusing on the effects of this global phenomenon on sea turtles. The average temperature of the Earth has risen 0.6 °C to 0.8 °C in the last 100 years and the average global sea level has risen about 18 cm (IPCC, 2001). The magnitude of the impact of these changes has yet to be determined, but we do know that they can alter the circulation patterns of surface currents and ocean bloom events, the location and intensity of extreme climatic events and the chemical processes of the ocean associated with elevated levels of dissolved carbon dioxide.

These conditions affect the coral reefs, one of the most important habitats for hawksbills, by bleaching the corals. In other words, it causes a loss of the coral's natural color (often green and brown tones) caused by the removal of symbiotic algae (zooxanthelas), leaving the coral with the appearance of being very pale to bright white. Coral bleaching may be a response to different stress factors including changes in salinity, excessive light, and the presence of toxins and microbial infections; nonetheless, the increase in sea surface temperatures (SST) is the most common cause of bleaching over extensive areas (Burke and Maidens, 2005). These authors also point out that the conditions in which these reefs have lived in the Caribbean for millennia are rapidly changing. Global climate change models predict that for the year 2070, the air temperature in the Caribbean will rise between 2 °C and 4 ºC, with the greatest changes occurring in the northern Caribbean and around continental borders. Because current levels of sea surface temperature (SST) are already close to the upper temperature threshold for the survival of corals, it is projected that for the year 2020, coral bleaching will become an annual event in the Caribbean. Other impacts include damages caused by hurricanes and storms (which are becoming more frequent), rising sea levels, reduction of potential calcification (increased acidity of water), and the propagation and intensity of disease.

The phenomenon of global warming, along with an increased alteration of coastal vegetation and a loss of shade over the last few decades, has contributed to increasing temperatures of the sand (Kamel and Mrosovsky 2006a) which may result in the feminization of hawksbill populations. Hawkes *et al.* (2007) determined sand temperatures increased when the location of the beach provided greater temperatures, which would negatively favor mortal thresholds, weakening eggs and hatchlings and transforming beaches that were once good for hatchling production into sites with low hatching success (Limpus 2006). Furthermore, this author states that temperature variations would be a selective pressure on sea turtle nesting, since temperatures on white sand nesting beaches are lower than on black sand nesting beaches and beaches in temperate zones are cooler than tropical zones. Additionally, beaches in general are cooler in winter than summer.

Another aspect of climate change that may affect hawksbills and their habitats is an unpredictable climate, including changes in rainfall and summer climate patterns. These changes may include an increase in rain intensity and summers, from flooding with a disproportionate increase in ground water levels to summers reporting extreme temperatures. The presence of natural phenomena like hurricanes and storms affect the structure and function of vital ecosystems such as coral reefs and mangroves.

Specific and regional initiatives are currently being done to study the response of hawksbills to this global impact and to propose management actions (for example ACT, Adaptation to Climate Change for Marine Turtles, http://www.panda.org/lac/marineturtles/act). In 2007, this initiative

held an expert workshop to evaluate the effects of climate change on beaches and nesting, the ecology of feeding grounds, oceanography and dispersion, sex ratios, and population dynamics as well as their adaptation, strategies and management – everything related to hawksbill turtles as an indicator species (WWF, 2007). Fish *et al.* (2008) presented models and projections of rising sea levels on beaches in Barbados in order to analyze their affects on sea turtles and concluded that moving coastal infrastructure inland by 90 m or more would stop further beach loss. This suggestion was also recommended by Choi and Eckert (2009) to be considered when developing the coastline.

The combined effect of these and other threats acting over many generations, has prompted some scientists to describe the species as so severely reduced from historical levels as to be considered "virtually extinct" from the standpoint of its role in Caribbean marine ecosystems (Bjorndal and Jackson, 2008).

Workshop Development

Prior to the workshop, the participants were provided with the document "Update on the status of the hawksbill turtle (*Eretmochelys imbricata*) in the Caribbean and Western Atlantic", prepared by Didiher Chacón as a reference document, along with other relevant literature in preparation for discussion.

The meeting was attended by 57 participants, including representatives from 21 Range States and Territories, the *Pro Tempore* Secretary and members of the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), representatives of CITES parties, representatives of the Specially Protected Areas and Wildlife (SPAW) Protocol of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, 12 invited experts, and five observers from non-governmental organizations (Appendix 3: List of Participants).

The workshop was divided in two sections:

1) **Diagnosis of the hawksbill turtle in the Wider Caribbean and Western Atlantic** - Experts in hawksbill biology and conservation in the region presented an overview of several aspects of the current state of knowledge, management and conservation actions as an introduction for the discussion (Appendix 1: Workshop Agenda; Appendix 2: Introductory Presentations)

2) **Working Group's Session**.

One group performed a Viability analysis of hawksbill turtle populations in the Wider Caribbean and Western Atlantic (WC/WA), in which the participants established which key attributes, including ecological processes, should be maintained to ensure the integrity and health (viability) of the hawksbill turtle in the long term (Appendix 4). They used three categories for evaluation of the ecological integrity:

1. ***Size*** - Abundance of the species
2. ***Condition*** - Composition, structure and biotic interactions

3. ***Landscape context*** - Ecological processes on a landscape scale and connectivity (migration)

This group ranked these attributes as *very good*, *good*, *fair* or *poor*.

The rest of the participants were split in 5 working groups, based on a general assessment of global threats faced by the hawksbill turtle in the region and agreed in Plenary discussion:

- Group 1: Direct take: targeted fisheries, opportunistic fisheries. Chair: René Márquez
- Group 2: Gillnet bycatch and entanglement in lost gear. Chair: Cynthia Lagueux
- Group 3: Habitat deterioration: infrastructure, lights, vegetation removal. Chair: Carlos Diez
- Group 4: Habitat deterioration: pollution and non-natural depredation. Chair: Robert van Dam
- Group 5: Threats related to inadequate regional policies and climate change. Chair: Eduardo Cuevas

During discussion in Plenary, the group also defined different lifecycle stages (eggs, hatchlings, juveniles, adults at sea, nesting females) as the key ecological attributes for the hawksbill turtle. For each key ecological attribute, mortality and reduced fitness were defined as stresses. In this context, "fitness" was defined as the probability of individuals from each lifecycle stage to reach the next stage (eggs to hatchlings, hatchlings to juveniles, etc.).

Each working group conducted a more detailed analysis of threats for the hawksbill turtle in the region, using the Conservation Action Planning (CAP) methodology, which takes documental information, statistics and anecdotal knowledge of groups and organizes it in a systematic and orderly way, in order to develop strategies and actions for the conservation of ecosystems or populations of interest.

The groups identified and ranked stresses and sources of stress for the species, according to their *severity* (the level of damage that can be expected for the subject of conservation over the next 10 years under the current circumstances) and *scope* (the geographic range of pressure over the conservation subject that can be expected over the next 10 years under current circumstances). For the top ranked threats, each group performed an analysis of situation, in which for each threat the participants identified direct actors, actions by which the pressure is produced, and the motivations of actors.

Results

According to the available information on the hawksbill turtle populations in the WC/WA Region, the viability analysis yielded the following evaluation of the ecological integrity for the species:

Conservation Targets		Landscape Context	Condition	Size	Viability Rank
Current Rating					
1	Hawksbill turtle in the WC/WA Region	Fair	Poor	Fair	**Fair**
Project Biodiversity Health Rank					**Fair**

This viability rank means that the target for conservation (the hawksbill turtle in the WC/WA Region) has one or more key ecological attributes outside the acceptable variation range, but which can still be restored, according to the available scientific information (Appendix 4).

During the discussion of viability, the group commented that there were gaps in our knowledge important for the evaluation of the ecological integrity of hawksbill populations and that standardized monitoring protocols must be developed for key parameters in order to monitor population trends and status.

The results of the ranking of stresses for each threat are shown in the table below. According to this analysis, the participants regarded the **mortality of adult turtles at sea** and the **reduced "fitness" of nesting females** as critical factors for the survival of the populations.

Stresses		Stress Rank
1	Mortality of eggs	Medium
2	Mortality of hatchlings	Medium
3	Mortality of juveniles	Medium
4	Mortality of adults at sea	**Very High**
5	Mortality of nesting females	**High**
6	Reduced "fitness" of eggs	Medium
7	Reduced "fitness" of hatchlings	Low
8	Reduced "fitness" of juveniles	Medium
9	Reduced "fitness" of adults at sea	Medium
10	Reduced "fitness" of nesting females	**Very High**

During the threat analysis based on the simple analysis of the CAP tool, the participants identified 40 sources of threats, with 10 priority ones:

THREATS	SOURCE OF THREAT	RANKING
Direct take: targeted fisheries, opportunistic fisheries *(Group 1)*	(1) Turtle fishing	Medium
	(2) Other fisheries (opportunistic and combined take)	Medium
Gillnet bycatch and entanglement in lost gear *(Group 2)*	(3) Gill Net	**High**
	(4) Lost fishing gear	**High**
Habitat deterioration: infrastructure, lights, vegetation removal (*Group 3)*	(5) Beach Infrastructure	**High**
	(6) Lights	Medium
Habitat deterioration: pollution and non-natural predation (*Group 4)*	(7) Non-native mammals (raccoons, dogs, cats, mongoose, pigs)	**High**
	(8) Oil spills and response	**High**
Threats related to inadequate regional policies and climate change *(Group 5)*	(9A) Lack of community collaboration (9B) No incentives for conservation	**Very High**
	(10) Change in open ocean conditions (temperature, currents, etc)	**Very High**

Although there was not complete consensus on the prioritization process, these top sources of threat were analyzed per group to produce a list of 15 objectives for a regional conservation program for the hawksbill turtle, which includes strategies and action steps intended to enhance viability of populations and minimizing the effects of threats.

OBJECTIVES AND STRATEGIES SUGGESTED IN THE WORKING GROUPS

I. Direct take: Targeted Fisheries, Opportunistic Fisheries

Objective 1: By the year 2014, reduce by 50% the direct take of hawksbill turtles in the WC/WA Region.

- *Strategy 1: To enforce the laws regarding effective protection to the hawksbill turtle in the region and fisheries, at both the national and international levels.*

  Actions for strategy 1:
  - Strengthen the application and compliance with national and international laws.
  - Strengthen the capacity of authorities to enforce the law.
  - Promote the adhesion of countries to international treaties that protect and conserve sea turtles.
  - Strengthen monitoring, control and enforcement systems, including participatory monitoring
  - Strengthen coordination between local, national and international authorities, together with the civil society.
  - Inform all sectors involved on the importance of law enforcement

- *Strategy 2: Strengthening of a legal structure for the effective protection of the hawksbill turtle in the region.*

  Actions for strategy 2:
  - Review and, when necessary, amend laws relating to hawksbill turtles and fisheries
  - Regulate specific fisheries that impact hawksbill turtle populations

- Review and, when necessary, increase fines, sanctions and penalties for incompliance with laws relating to hawksbill turtles

- *Strategy 3: Create awareness of the status, threats and conservation of the hawksbill turtle in the region.*
  Actions for strategy 3:
  - Promote environmental education and publicity on biology, current status, threats and conservation of hawksbill turtles at all levels of the society
  - Involve communities in conservation programs
  - Create an understanding that hawksbill turtles are a part of the regional patrimony

- *Strategy 4: Significant reduction of the directed and opportunistic fisheries of the hawksbill turtle.*
  Actions for strategy 4:
  - Implement sustainable management of fisheries so that non target species and ecosystems are not affected
  - Diversify economic resources for fishermen that capture hawksbills
  - Propose subsistence alternatives for fishermen and communities
  - Promote the use of selective fishing gear

II. Gillnet Bycatch and Entanglement in Lost Gear

Objective 1: Over the course of 3 years, reduce by 25% the bycatch of hawksbills in WC/WA gillnets

- *Strategy 1: Reduce interaction between hawksbills and gillnet fisheries.*
- *Strategy 2: Increase public awareness of the bycatch issue.*
- *Strategy 3: Create market reforms.*
- *Strategy 4: Improve care and rehabilitation.*

Objective 2: Over the course of 3 years, reduce by 50% the volume of lost fishing gear found in coastal (marine) habitat throughout the WC/WA Region

- *Strategy 1: Adopt a national policy regarding lost fishing gear.*
- *Strategy 2: Build capacity for ocean clean-up.*
- *Strategy 3: Increase public awareness of the lost gear issue.*

III. Habitat Deterioration: Infrastructure, Lights and Vegetation Removal

Objective 1: 70% of stakeholders in the WC/WA Region have an improved awareness of the threat to hawksbill posed by infrastructure and lights over the next 10 years.

- *Strategy 1: Design targeted awareness programs for stakeholders.*

Objective 2: Change by year 2019 the use of regular lights to "turtle-friendly" lights on 70% of development near or at turtle nesting beaches in the WC/WA Region through the use of incentive measures.

- *Strategy 1: Develop a program for light system substitution for buildings that impact hawksbill turtle nesting beaches in the WC/WA Region.*

Objective 3: By year 2014, decrease the impact of coastal development over key sea turtle nesting habitat of the Wider Caribbean Region

- *Strategy 1: Establish guidelines for harmonizing development standards in the coastal environment of the WC/WA Region within five years, including measures for coastal realignment and setbacks.*

IV. Habitat Deterioration: Pollution and Non-Natural Predation

Objective 1: Reduce solid waste trash on critical hawksbill nesting beaches by 25 % within 5 years to improve fitness, reproductive success and habitat condition.

- *Strategy 1: Develop regional policy that encourages proper disposal and recycling through incentives, education and enforcement.*

Objective 2: Protect critical hawksbill's habitat (nesting and foraging) by reducing impact from oil and chemical spills in the WC/WA Region over the next 10 years

- *Strategy 1: Compile updated information for the last 10 years on impact of oil and chemical spill incidents in the WC/WA Region.*
- *Strategy 2: Establish a regional strategy for the reduction of impacts from oil and chemical spills on critical hawksbill habitat*
- *Strategy 3: Implement the designation of the Wider Caribbean Region as a 'special area' for navigation as identified by Annexes I and II of the MARPOL Convention.*

Objective 3: By 2014, protect hawksbill nesting beaches and improve hatch success by controlling non-native predators.

- *Strategy 1: Research information on nest predation on hawksbill beaches and review existing laws and policies regarding non native predators in the region.*
- *Strategy 2: Develop a regional strategy for the control of non native predator populations in the region.*

V. Threats Related to Inadequate Regional Policies and Climate Change

Objective 1: By 2012, have an ongoing process for the harmonization of conservation and protection efforts for the hawksbill turtle in the WC/WA Region.

- *Strategy 1: Implement outreach strategies in order to fill the gaps related to laws and regulations of existing management policies for the hawksbill turtle in all WC/WA countries.*
- *Strategy 2: Regional harmonization of turtle conservation policies, including addressing the key strategies to address the main threats, through a Regional Marine Turtle Conservation Program.*

Objective 2: By 2014, have a regional strategy for increased community incentives for conservation.

- *Strategy 1: IAC recognition of communities that conserve their turtles through grants for health & education.*
- *Strategy 2: Lobby for the allocation of government funds for the conservation of turtles.*
- *Strategy 3: Education of policy-makers and key stakeholders by NGOs*

Objective 3: By 2020, national climate change adaptation plans are under implementation in all hawksbill range countries of the WC/WA Region.

- *Strategy 1: By 2015, diagnosis of potential nesting sites for hawksbills under future climatic conditions for the WC/WA Region.*
- *Strategy 2: Structuring of national climate change adaptations plans for each country in the region.*

Objective 4: By 2020, 20% of identified climate-resilient reef patches/areas at key regional hawksbill foraging grounds are protected in MPA networks.

- *Strategy 1: Identification and protection of climate-resilient patches of coral and sponges at key hawksbill foraging grounds.*

Objective 5: By 2020, each of the key regional hawksbill foraging grounds has a management and conservation plan, including mitigation of non-climate stressors.

- *Strategy 1: Revision or creation of management plans for key regional hawksbill foraging areas, to include mitigation measures for non-climate stressors.*

Objective 6: By 2020, an adequate sex ratio is produced in each genetic stock in the Wider Caribbean Region to ensure population viability and recovery.

- *Strategy 1: Establish a regional management strategy for the conservation of key nesting habitat in conditions suitable for the production of natural sex ratios for hawksbill populations.*

Objective 7: By 2020, Research community understands the impacts of changes in open ocean conditions on the population viability of hawksbills.

- *Strategy 1: Research institutions coordinate efforts to understand the relative contribution of impacts of open ocean conditions on hawksbill populations in the WC/WA Region.*

Two highlights of the group discussions were the regional policies regarding the conservation of the hawksbill and the trade of the hawksbill products in the region.

Different hawksbill turtle management policies in the WC/WA Region should be reviewed to assess their conservation impacts and relative benefits for hawksbill turtle populations. Emphasis was made on the importance of the harmonization of conservation actions for the hawksbill turtle in the region.

Regional trade on hawksbill products and subproducts was regarded as one of the important motivations for direct take (both intentional and opportunistic) which is among the top 10 sources of threat detected. It was discussed within Group 1 that the elimination of trade as a motivation would cause a significant reduction of the directed and opportunistic fisheries of the species.

During general discussion it was noted that trade was an important issue to be addressed in the region and that monitoring of harvest and trade (legal and illegal, domestic and international) and their impacts on hawksbill populations should be improved, taking into consideration that widespread illegal and legal domestic consumption and trade still exists in the region. The

representative from Nicaragua commented that illegal trade was still a problem in the Caribbean of Nicaragua since there was no lack of laws and regulations, but rather lack of monitoring control and surveillance of trade activities, and that this was an ongoing practice that it is necessary to address as soon as possible. The participants from Dominican Republic recognized that the recent regulations for trade in the country were due to the political will of the present environment authorities who decided to put a stop on this trade and to take action.

During the threat analysis and discussion, it was evident that some important issues could and should be immediately addressed in order to provide prompt and effective conservation actions. The Steering Committee decided to ask some participants to work on 4 project profiles to be submitted for funding (Appendix 6. Summary of each project profile):

1) Reduction of by-catch of hawksbills throughout the WC/WA Region
2) Reduction of direct take of hawksbill turtles and the trade of their products in the WC/WA Region
3) Identification of hawksbill distinct nesting population units in the WC/WA Region
4) Harmonization of laws, regulations, and policies for the conservation of hawksbill turtles *Eretmochelys imbricata* in the wider Caribbean.

Recommendations

Two actions items were suggested in Plenary discussion:

- To prepare a joint IAC-CITES-SPAW regional proposal for the Global Environmental Fund (GEF) by June 2010, considering some of the actions identified during this workshop, emphasizing habitat protection and climate change as the common axis.
- SPAW Secretariat could promote a proposal within the Integrated Coastal Zone Management (ICZM) Program.

The objectives, strategies, actions and indicators obtained during the workshop will be further refined based on subsequent review by the participants and consultation within the Steering Committee. This document will be presented to the COPs of the International Conventions involved in the organization of the workshop (IAC, CITES, SPAW), and will serve to guide the regional conservation actions for the recovery of the Caribbean hawksbill turtle.

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APPENDIX 1: Workshop Agenda

Tuesday, ***September 22***

16:00	Registration of Participants – Salon Mallorca

Wednesday, ***September 23***

Opening Ceremony – Salón Mallorca		
09:00 – 09:20	Welcoming words	Gregorio Sánchez Martínez Municipality President
	Regional Context of the Workshop: Objectives, purpose and scope	Verónica Cáceres – IAC
	Opening Message	Alfredo Arellano – CONANP
PRESIDIUM Verónica Cáceres. IAC *Pro Tempore* Secretary Robert Boljesic. Senior Scientific Officer CITES Alessandra Vanzella. Secretary SPAW Protocol Gregorio Sánchez. Municipality President H. Aytto. Benito Juárez. Quintana Roo Javier Díaz Carvajal Secretary of Urban Development and Environment, Government Q. Roo Alfredo Arellano Regional Director for Yucatán Peninsula and Mexican Caribbean. CONANP Laura Sarti Technical Coordinator of the National Sea Turtle Conservation Program. Mexico CONANP. Gabriela Lima Laurent. Delegate of SEMARNAT in Quintana Roo.		

9:20 – 9:40	General Information, Acknowledgements.	
PRESENTATIONS SESSION: Current State of Knowledge		
9:40 – 10:05	Overview of the Biology of the Hawksbill turtle in the Wider Caribbean and Western Atlantic.	Robert Van Dam
10:05 – 10:30	Current status of the hawksbill turtle in the Wider Caribbean and Western Atlantic: population sizes and trends.	Didiher Chacon
10:30 – 10:55	Case Study: Current Status of the hawksbill turtle in the Mexican Caribbean.	Vicente Guzmán
10:55 – 11:10	*Break*	
Current factors causing loss or decline		
11:10– 11:35	An overview of regional threats: state & trends	Cathi Campbell
11:35 – 12:00	Comparative observations on the hawksbill product trade in Dominican Republic.	Paola Mosig
Current Management & Conservation Action		
12:00 – 12:25	Overview of regional conventions related to hawksbill turtle conservation: SPAW and IAC	Alessandra Vanzella
12:25 – 12:50	Results of the CITES Dialogue Meetings.	Robert Boljesic
12:50 – 13:15	Map and overview of current strategies, projects, actions, and actors taking place in the region for the conservation of the Hawksbill	Karen Eckert
13:15 – 13:40	Lessons Learned from international regulatory framework on the conservation of sea turtles	Jack Frazier
13:40 – 14:40	**Lunch**	

Designing the Cooperation Framework		
14:40 – 15:10	Plenary 1) Explaining the methodology, terminology and process: a) Consensus of goals of the Cooperation Framework : goal clarification items b) Defining the objectives c) Criteria for actions of the Cooperation Framework d) Explaining the working matrix and its parameters	Nestor Windevoxhel
Defining the why: **A list of priority threats to the Hawksbill turtle and its habitat**		
15:10 - 18:00	Break out groups: Identification and prioritization of threats: Threats to habitat & Threats to populations Habitat (deterioration or change in quality) 1. Threats to habitat in the Water Column 2. Threats to habitat substrate (e.g., coral reef) 3. Threats to nesting habitat Populations (extraction) 4. Incidental bycatch 5. Targeted fishing 6. Poaching	
	Each break out session group will: 1. Identify specific threats related to theme 2. Assess and qualify the impact (on the distribution range, biological cycle, abundance and reproductive success; according to the following values: high, medium and low) 3. Define the scale of impact of the threat (local, national or regional) 4. Determine the trend of the threat (increasing, decreasing or stable)	
18:00-18:30	Rapporteurs will meet to compile a priority list of threats	Breakout session rapporteurs, Chairs.
18:30	End of Day	
20:00	**Welcoming Cocktail event** *Terraza Tequila*	

Thursday, ***September 24***

8:30 – 8:50	Socialize and adopt the list of priority threats	Plenary
Defining the what: **Identify cooperative actions to prevent/reduce/eliminate priority threats**		
8:50-13:00	Break out groups: Identification of cooperative actions: 1. Research, monitoring, evaluation and reporting 2. Illegal Use and Enforcement 3. Innovative enabling approaches (new technologies and practices, market and economic incentives) 4. Increasing awareness (education and outreach)	

	Each break out group will: • Discuss their assigned theme for the region • Identify voids, deficiencies, successes, strengths. • Identify principal stakeholders • Develop Actions for each theme (actions on prevention, control and mitigation for threats, actions for filling research and management gaps and possible proposals for scientific research) Actions to be identified need to meet the following: • Be oriented towards specific results • Be measurable • Have clear deliverables • Have a defined time frame • Of significant impact	
13:00 – 14:00	**Lunch**	
14:00 – 17:30	**Setting priorities:** The working groups will prioritize among the resulting actions of previous session. Criteria to set priorities: • Urgency of the action • Explicit regional priority • Possibility to take advantage of unique opportunities • Feasibility: Ensure concrete action, and Produce results within a time set	
17:30 – 18:00	Plenary Session: Summary presentation of Priorities, Session wrap-up	Group Chairs
18:00	End of Day	

Friday, ***September 25***

8:30 – 8:45	Revision of previous day work, questions	Nestor W.
8:45 – 13:00	**Defining time and key actors.** The working groups will define how the actions will be carried out according to the priorities set on the previous session. Each group will produce a time table with short, medium and long term actions.	
13:00 – 14:00	**Lunch**	
14:00 – 16:00	Continuation of time frame assignment by the working groups	
16:00 – 17:00	Working groups final presentations, discussion of results, wrap-up and next steps	
17:00 – 17:15	*Coffee Break*	
17:15 – 17:45	Presentation of structure and funding for a Regional Program for Hawksbill Turtle Conservation	
17:45 – 18:00	Final comments, agreements and conclusions. Closing Ceremony.	
18:30	**Farewell dinner**	

APPENDIX 2: Summaries of the Introductory Presentations

Overview of the biology of the hawksbill turtle in the Wider Caribbean and Western Atlantic
(Robert van Dam – Chelonia, Inc.)

There are 7 species of sea turtles in the world. In the Caribbean region 4 species are common and 2 (*Lepidochelys sp.*) are less commonly sighted. In the case of the hawksbill turtle (*Eretmochelys imbricata*), its presence is associated with coral reefs and hard bottoms. This species is characterized by thick scutes on the carapace and a mandible shaped like a beak. This presentation emphasized the life cycle of the hawksbill turtle, beginning with the birth of hatchlings on sandy beaches with vegetation. The hatchlings orient themselves to the water using visual cues, during which they are very exposed to predators like birds and crabs. The size of the hatchlings at birth is approximately 4 cm (carapace length) and weighs about 16 g. During their life cycle, a phase named the "lost years" exists that lasts about 1 to 2 years, until they reach about 20 to 30 cm in carapace length. During this period their diet is based on crustaceans and other small organisms.

The benthic phase starts when they have reached a carapace length of more than 20 cm. While in this stage, the turtles spend 96 to 98% of their time submerged, in aggregations of juveniles typically made up of individuals from various places of origin. They are found to show a variable sex ratio of 1:1 – 1:2.7 male:female. Their diet in the Caribbean consists mainly of sponges and other invertebrates, demonstrating a very limited home range for as long as the available food is adequate. The density of aggregations and body growth rates are highly variable, depending mainly food availability.

The habitat for adults is characterized by hard bottoms, between 20 and 80 m of depth. Adults are mainly spongivorous, and typically form aggregations of individuals from different places. The sex ratio is unknown. The main predator at this stage is the tiger shark (*Galeocerdo cuvier*). The adults perform periodic migrations to reproductive areas, with intervals for males of 1 to 2 years, and for females of 2 to 4 years. There is a high degree of natal phylopatry, and mating occurs close to the nesting area. They remain in the reproductive area from 4 to 6 months, and in some locations during the entire year.

Nesting is nocturnal. The turtles construct 4 to 5 nests in a season, with intervals of about 15 days. Each nest contains about 150 eggs, with an approximate weight of 28 g each. Nests are typically built under the vegetation or in dunes. Sex determination of the embryo is produced by the effect of temperature during the middle third of the incubation period; the pivotal temperature is between 29.2 and 29.6° C. Hatching occurs after 50 – 70 days, depending on the incubation temperature. Hatching success is about 70 – 85%. Each female may produce 500 – 600 hatchlings per season; however, beach erosion and nest depredation are the main causes for natural loss of clutches.

Current status of the hawksbill turtle in the Wider Caribbean and Western Atlantic: population sizes and trends
(Didiher Chacón – WIDECAST Costa Rica)

This presentation highlighted the reference document prepared for the meeting on the updated status on the population sizes and trends of the hawksbill turtle in the region. In general terms, the available data are disperse, and most data sets comprise a relatively few number of years. In some instances there was information only for "index beaches" and/or mixed with other sea turtle species (this is particularly true of fisheries databases). The diagnosis considered observations with different degrees of precision (beach, nests and females). It did not consider males or other stages of the life cycle.

A recent atlas (Dow *et al*., 2007) documented 817 known nesting sites in the Wider Caribbean Region including Brazil, and showed that 85% of these sites receive less than 25 nesting tracks per year. Only 3 sites recorded over 1,000 nesting tracks per year.

Regarding the current population trend, based on existing historical information, the presentation showed that the hawksbill turtle is Critically Endangered (cf. IUCN Red List), with a reduction of over 80% in the last three hawksbill turtle generations, a decrease in the distribution area, and a reduction in habitat quality. Impetus for the significant population decline has been traced to overexploitation of eggs, meat, and carapace, loss of habitat, and incidental capture and mortality.

More than 50% of known nesting sites reported less than 5 nesting females per year (Dow *et al.*, 2007); in very few sites positive trends were reported (only in Mona Island, Antigua, Barbados, Buck Island in the USVI, and Cuba), with signs of recovery after many years of protection activities. Negative trends were reported for Nicaragua, Costa Rica and Panamá, with a sharp decline reported for the Yucatán Peninsula in México. There were unknown trends for several locations, sometimes with very old records.

Case Study: current status of the hawksbill turtle in the Mexican Caribbean
(Vicente Guzmán – CONANP)

The presentation highlighted the levels of exploitation of the hawksbill turtle in Mexico prior to 1970, which hinted on the presence of several thousands of individuals in that region. The population was not able to recover from the heavy exploitation and was on the brink of extinction in the early 1970s. For this reason, the Mexican Federal Government established a permanent and long-term conservation program for the hawksbill turtle as part of the National Sea Turtle Conservation Program.

As an historical account, it was mentioned that conservation work for the hawksbill in the Yucatan Peninsula started in 1963, and in 1971-1972, a ban for the exploitation of this species in the Gulf of Mexico was decreed. In 1990, Mexico set a total and permanent ban for the exploitation of sea turtles, which in conjunction with protection actions on the beaches, helped to have an increment of several hundred thousands of recorded nestings. However in 2000, the number of hawksbill nestings in the Peninsula declined again. In fact in 2007, the number of recorded nests was only 33% of the historic peak in 1999.

Mexico presented this problem in the IAC's COP in 2004 for the first time. CONANP promoted a first meeting of hawksbill specialists in Telchac, Yucatan in 2005, where the most urgent issues for this population were defined, such as incidental and direct take, unknown feeding areas, impacts from seismic surveys, degradation and loss of nesting habitat, and inadequate conservation techniques. The Hawksbill Turtle Working Group (HTWG) met in 2007 to update the nesting trends, analyzed possible hypothesis for the decline, and identified voids of information. A follow-up meeting addressed the issues of current phenomena with future impact (anthropogenic and environmental), evaluation of environmental influence over population dynamics, and historical factors that contributed historically to the decline of the populations in the region of the Yucatan Peninsula.

The results mentioned the contribution of fisheries to the population decline, with an average annual capture of hawksbills in the Yucatan Peninsula of about 1,000 individuals per year from 1953 to 1983. In those days the population was estimated to be about 25,000 individuals. The incidental capture by the shrimp trawl fleet is unknown, but it was estimated to be high until the late 1980s. The snook and croaker fish nets had the highest impact because of their time and location of use and because they capture juvenile turtles of 22 to 53 cm carapace length. There were important voids on the information about fishing efforts, impact of different fishing gear and areas of greater interactions.

Currently, illegal capture occured mainly in Isla Arena (Campeche), Celestún, and Ría Lagartos (Yucatán). Adult tagged hawksbills have been recaptured in Nicaragua, Panamá, and Barbados, and tagged juveniles have been recaptured in Cuba.

We have more information about several threats identified in the region. Diverse threats and conditions act in conjunction and in a multifactor way to affect the population. Each population responds differently, depending on temporal specific impacts.

An overview of regional threats: state & trends
(Cathi Campbell – Wildlife Conservation Society)

The presentation addressed specific threats that hawksbill turtles face at the regional level. Threats can be classified in two groups: Primary threats, which are widespread and of equal importance on a regional level, and Secondary threats, which may be localized or of lower importance in some areas. Examples of primary threats are exploitation for meat, eggs and shell, incidental capture, entanglement in marine debris, and loss or degradation of habitat. Secondary threats are pollution, depredation, lack of awareness or political will, and insufficient staff or lack of funding for enforcement.

About 30% of nations or territories in the Caribbean allow some take of sea turtles, including hawksbills. In many cases there is no monitoring of the resource or management of allowed take. Illegal trade of hawksbill products is widespread in the region.

Sources of entanglement in marine debris can be gill net fisheries, lobster net fishing, lobster diving, entanglement nets, trawl, pot, or longline fisheries; and they can result in mortality from capture or provide an opportunistic take of live turtles. Important areas of concern are Barbados, Cuba, Dominican Republic, Mexico and Puerto Rico.

Habitat loss or degradation comes from coastal development, sand mining, beach armoring, debris from fishing vessels, oil and gas platforms and cruise ships, vegetation removal, poor waste management, or extreme natural events like hurricanes or floods. Prevalence of these factors vary widely across the Caribbean region and cause changes in incubation conditions, entrapment of individuals, obstacles at beach access for females, or beach erosion. Reefs threatened by changing environmental conditions can cause a reduction in the availability of food, and environmental stressors by pollution can suppress the immune system.

On the social side, many communities in the region were unaware of the actions needed to conserve or recover natural resources, or have no incentive to take the necessary actions. In many localities, turtle conservation is not a priority for organizations, causing insufficient staff or lack of funding for enforcement.

In conclusion, there were constant pressures from a variety of sources on regional hawksbill populations, but key issues were direct take, incidental capture, and habitat loss. As a result, some larger populations were under pressure, while many smaller ones were continuing to decline. We need to understand the scope of habitat used by each population to understand magnitude of threat to each, and we need to better identify and quantify the sources, particularly at important feeding and nesting sites, with surveys and monitoring procedures.

If legal take continues it should be based on scientific data that demonstrates that take is sustainable. We need to identify and implement alternatives for artisans to eliminate hawksbill shell trade, and improve enforcement of existing laws.

Comparative observations on trade in hawksbill products in the Dominican Republic
(Paola Mosig – TRAFFIC)

The presentation showed the comparative results of the surveys on the trade of hawksbill products carried out in the Dominican Republic first in 2006 and later in 2009. It was pointed out that the results of these kinds of surveys can be a useful tool for the design of strategies, implementation of actions, and systematization of information to direct efforts against the illegal commerce of turtle shell.

Direct exploitation of sea turtles in the Great Caribbean area has had a considerable impact on many populations. Large-scale capture and trade started in the 1950's, with the United States, Europe and Japan as the main international markets until several international regulations restricted the legal trade in those areas.

In the particular case of the Dominican Republic, the hawksbill turtle has been one of the most appreciated species by the local fishers due to the use of its shell in the national handcraft industry. This country is a signatory of CITES since 1987 and the first ban on the exploitation of hawksbill turtles was decreed from 4989 to 1991. Since 1996, national regulations prohibit the capture and commerce of this species.

In 2006, from 414 commercial establishments evaluated, there were hawksbill turtle shell products for sale in 249 of them, with an estimated total offer of 50,000 shell items.

Recently, the Dominican Republic authorities implemented actions to enforce the national and international legislation, by confiscating hawksbill turtle shell objects in key distribution sites. In

2009, more than 99% of the items found in 2006 were taken away from sale locations or confiscated after these government actions. The comparative observations carried out in the tourist and commercial areas reflect a positive response to the government's actions towards the reduction of the illegal trade that affect the hawksbill. At the same time, the use of alternative materials like cow horn or bone to make handcrafts has been increasing, and these are being sold in stores and locations that previously use to sell hawksbill turtle shell items. TRAFFIC continues to provide orientation to tourists and local citizens, through outreach, education and awareness campaigns.

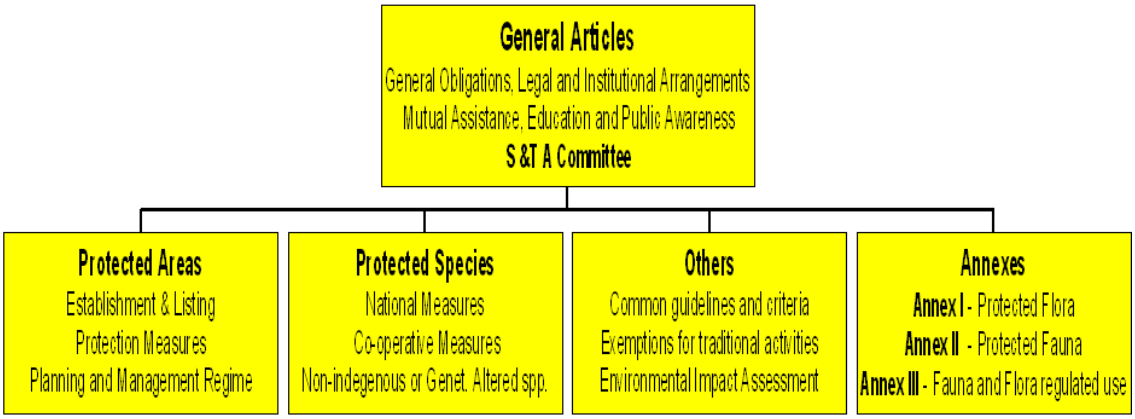
Regional Agreements for the Conservation of Sea Turtles in the Wider Caribbean and Western Atlantic Region
(Alessandra Vanzella-Khouri – SPAW Programme Officer)

Convention for the Protection and Development of the Marine Environment of the WCR (Cartagena Convention) - Entered into force in 1986, it's the only legally binding, region-wide environmental agreement for the Wider Caribbean Region. It has 23 Parties of 28 possible from WCR. The Contracting Parties shall take all appropriate measures to prevent, reduce and control:

- Pollution from Ships
- Pollution from Dumping
- Pollution from Land-Based Sources
- Pollution from Sea Bed Activities
- Air Pollution
- Pollution in Specially Protected Areas

Specially Protected Areas and Wildlife Protocol (SPAW) - Its objectives are to protect, preserve and manage sensitive areas, to protect and preserve threatened and endangered species of flora and fauna (Annex I and II) and to protect species of regional concern to prevent becoming threatened or endangered (Annex III), through assessments, better management practices, cooperative programmes, development and implementation of guidelines, capacity building and regional cooperation.

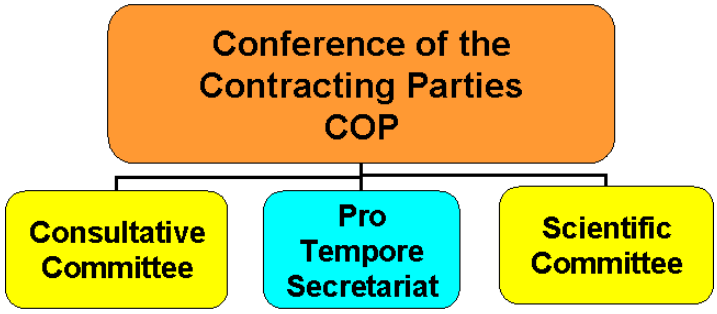
In 1990, the Protocol was adopted and signed by 16 governments. Three Annexes (lists of species) and two levels of protection were defined in 1991; listing includes entire groups of species (e.g. corals, mangroves, sea turtles, groups of marine mammals). The Protocol entered into force in 2000 and it currently has 13 Parties.



Under the SPAW Protocol protection measures, Parties identify and protect threatened and endangered species under their national jurisdiction. They also take measures to prevent species to become threatened or endangered, regulate or prohibit, where appropriate, the taking, possession, killing etc. and coordinate with other Parties on protection and recovery of migratory species.

Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) - It is an intergovernmental treaty which provides the legal framework for countries in the Americas to take actions in benefit of sea turtles. Addresses the need to implement measures harmonized among nations, coordinate multilateral conservation and protection actions, and oversee the implementation of a regional agenda that will lead to the recovery of these species. It entered into force in May 2001 and currently has 13 Contracting Parties.

The objective of the Convention is to promote the protection, conservation and recovery of the populations of sea turtles and those habitats on which they depend, on the basis of the best available data and taking into consideration the environmental, socioeconomic and cultural characteristics of the Parties. These actions should cover both nesting beaches and the Parties' territorial waters. The Parties commit to protect and conserve populations of sea turtles and their habitats, reducing incidental capture, injury and mortality of sea turtles associated with commercial fishing activities, to prohibit intentional and domestic capture and international trade in sea turtles, their eggs, parts and products and to foster international cooperation for research and management of sea turtles. The only exception to the prohibition of capture is the use of turtles to satisfy the economic subsistence needs of traditional communities.



Results of the CITES Dialogue Meetings
(Robert Boljesic – CITES Secretariat Scientific Officer)
He was unable to present and sent the following abstract.

Hawksbill turtle (*Eretmochelys imbricata*) is listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Listing in Appendix I of CITES means that any live or dead animal and any readily recognizable part or derivative thereof is not to be used for primarily commercial purposes.

At the 10th and 11th meetings of the Conference of the Parties (CoP10, Harare, June 1997, and CoP11, Gigiri, April 2000), Cuba put forward proposals to transfer from Appendix I to Appendix II certain parts of the Caribbean population of hawksbill turtles inhabiting Cuban waters (see: CoP 10 Prop. 60 and CoP 11 Props. 40 & 41). Since consensus on resuming limited international trade could not be reached, these proposals were rejected. The CITES Secretariat was asked to convene a technical workshop of Caribbean hawksbill turtle range States and territories to be held within 12 months after CoP11 to strengthen regional cooperation on the issue. Other Parties also contacted the Secretariat, supporting the idea of a range State regional meeting, but suggesting different procedures and objectives.

After considering all suggestions, the Secretariat proposed that two Wider Caribbean Hawksbill Turtle Range State dialogue meetings (similar to the very successful African Elephant dialogues) be held before CoP12, to discuss and, if possible, reach consensus on possible utilization of this species under CITES regulation.

CITES dialogue meetings are held in a 'neutral' venue and the hosting country provides the neutral chairmanship. At the meetings Vice Chairmen are elected, who work with the Chairman, the Secretariat and the International Union for Conservation of Nature (IUCN) in order to prepare a final communiqué. However, it has to be emphasized that the CITES dialogue meetings are organized by the range States and in that context, the Secretariat and IUCN, its partner in this programme, are there to assist and facilitate the process. The Secretariat proposes a draft agenda, and gathers input from the range States. Once the agenda is agreed, the Secretariat coordinates the preparation of discussion documents on the various agenda topics.

The first meeting of the Wider Caribbean Hawksbill Turtle Range State Dialogue was convened from 15 to 17 May 2001 in Mexico City. This meeting was attended by 35 range States and Territories (see: http://www.cites.org/eng/prog/HBT/dialogue1/participants.shtml) and focused on issues relating to the conservation of and trade in hawksbill turtles in the wider Caribbean region. The meeting was convened in response to a consensus amongst the range States to provide an opportunity to make progress towards strengthening dialogue and co-operation in the region on issues of common concern. Japan, the Netherlands, the United Kingdom, the United States of America and the World Wildlife Fund (WWF) provided the necessary finances.

The meeting reviewed the conservation status of hawksbill turtles, the biological aspects of populations, status of trade in hawksbill turtle products, multilateral agreements for conservation and the role of ranching and captive breeding of hawksbill turtles. Countries reported on national legislation, recovery plans, conservation programs and problems encountered.

It was agreed at the meeting that:

- critical knowledge gaps should be identified and standardized monitoring protocols developed for key parameters to monitor population trends and status;
- monitoring of harvest and trade (legal and illegal, domestic and international) and their impacts on hawksbill populations should be improved in the Wider Caribbean Region taking into consideration a prohibition on international trade but widespread illegal and legal domestic consumption and trade;
- different hawksbill turtle management policies in the Wider Caribbean should be reviewed to assess their conservation impacts and relative benefits for hawksbill turtle populations; and
- an effective hawksbill turtle conservation strategy and management plans should be established at regional level taking into account the full range of national conservation objectives and development needs in the Wider Caribbean.

After the first dialogue meeting, three teleconferences of the hawksbill turtle sub-group were held on 24 August 2001, 24 October 2001 and 9 April 2002 with the participation of: Barbados, Bermuda, Cuba, Costa Rica, Mexico, Puerto Rico, the United States of America, IUCN, TRAFFIC North America, the United Nations Environment Program - World Conservation Monitoring Centre (UNEP – WCMC) and the CITES Secretariat. The sub-group considered development of standardized 'status monitoring' and 'trade/use monitoring' protocols, new index sites for long-term 'status monitoring', submission of information to IUCN on the biology/status of the species, the role of the clearinghouse mechanism and funding needs and priorities. The outcome of these meetings is available at: http://www.cites.org/eng/prog/HBT/subgroup/0108.shtml .

The second meeting of the Wider Caribbean Hawksbill Turtle Range State Dialogue was convened from 21 to 23 May 2002 in Cayman Islands, United Kingdom. This meeting was attended by 29 States and Territories (see: http://www.cites.org/eng/prog/HBT/dialogue2/List_of_Particip.pdf). At the meeting discussions continued concerning the conservation of and trade in hawksbill turtles in the Wider Caribbean Region that began one year earlier in Mexico City. The aim of the meeting was to allow participants to review progress towards the development and implementation of an effective hawksbill turtle conservation strategy at a regional level, taking into account the full range of national conservation objectives and development needs in the wider Caribbean. The European Commission, Japan, the United Kingdom, the Netherlands, the United States of America and the World Wildlife Fund provided the necessary finances.

Discussions focused on the main elements of a regional conservation strategy. A draft resolution was prepared for submission to the 12th meeting of the Conference of the Parties, outlining the principle elements of such a strategy, including:

- promoting the recovery of depleted populations and maintaining stable, recovered populations of hawksbill turtles in the region;
- promoting and strengthening existing measures, such as national programmes and those under the Caribbean Environment Programme;

- monitoring and reducing illegal harvest and trade;
- ensuring sufficient resources for implementing the strategy, including capacity building;
- improving communication and information sharing in the region, including public awareness;
- improving research and monitoring; and
- ensuring active participation of all countries in the region.

Working groups also discussed issues related to the development of standardized monitoring protocols for population trends and for legal and illegal use of and trade in specimens. Delegates highlighted the importance of improved communication and sharing of information to ensure improved collaboration and commitment to the conservation of the species in the region. They expressed their appreciation for the benefits of the Dialogue and agreed that future meetings would be important to maintain the commitment to and understanding of issues related to hawksbill conservation in the region.

As a result of dialogue process, a draft resolution and a number of decisions were proposed at the 12th meeting of the Conference of the Parties (Santiago de Chile, November 2002) (see Annexes 2 to 4 of CoP12 Doc. 20.2.) P12 adopted Decisions 12.44 to 12.46 (see: http://www.cites.org/eng/dec/valid12/12-44_46.shtml) directed to Parties which are States in or have territories in the Wider Caribbean Region to further develop and implement a collaborative regional conservation strategy and national management plans, adopt and implement standard protocols for the monitoring to implement measures to reduce illegal catch and illegal trade and to report on progress at the 13th meeting of the Conference of the Parties. CoP12 directed the Secretariat to, subject to funding[3], arrange at least one meeting of the wider Caribbean region before the CoP13. The Conference also encouraged Parties, intergovernmental organizations, international aid agencies and non-governmental organizations to provide funds to enable the implementation of the Caribbean regional hawksbill strategy and to support the regional dialogue process. envisage

At the 13th meeting of the Conference of the Parties (Bangkok, November 2004), the CITES Secretariat reported (see: CoP13 Doc. 34) that it received no information from Parties, intergovernmental organizations, international aid agencies or non-governmental organizations with regard to Decisions 12.44 and 12.45. In view of the apparent lack of interest in a Caribbean regional meeting on this subject, the Secretariat suggested that the matter be taken up within its regular bilateral discussions with other Multilateral Environmental Agreements and intergovernmental organizations active in the region or on the conservation and sustainable use of the species.

The CoP13 adopted Decisions 13.38 to 13.41 (see: http://www.cites.org/eng/dec/valid13/13-38_41.shtml) that extended the Decisions adopted at CoP12. The Conference further directed

[3] *The Secretariat sought the required funding but was unsuccessful in raising sufficient funds to hold the meetings envisaged. The only donor that offered financial contribution was the United Kingdom of Great Britain and Northern Ireland, to which the Secretariat is very grateful.

the Secretariat to, subject to funding[1] and before the CoP14, arrange at least one meeting of the Wider Caribbean Region on the hawksbill turtle in order to facilitate regional collaboration, planning and information exchange, as well as collaboration with other bodies and multilateral agreements with a mandate concerning the conservation and management of this species in the Wider Caribbean Region. The CoP 13 also directed the Secretariat to collate reports received from States and territories in the Wider Caribbean Region on progress made in the implementation of the regional conservation strategy and national management plans and present a written summary at the CoP14.

At the 14th meeting of the Conference of the Parties (the Hague, June 2007), the Secretariat presented a document CoP14 Doc. 58 on hawksbill turtle. The information received from the Parties was summarized in document CoP14 Inf. 4. From the submissions received in response to Decision 13.38, the Secretariat reported that States and territories have not been able to realize the regional conservation strategy for hawksbill turtles in the Wider Caribbean Region. Whilst no overall strategy appears to exist, there are nevertheless a number of national and bilateral programs focused on different aspects of the conservation and sustainable use of hawksbill turtles.

The CoP14 adopted the Decisions 14.86 and 14.87 (see: http://www.cites.org/eng/dec/valid14/14_86-87.shtml) directed to the Secretariat to provide support to, and collaborate with, the Inter-American Convention for the Protection and Conservation of Sea Turtles and the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) and its Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol), in raising funds to convene, before the CoP15, a meeting on hawksbill turtles for the Wider Caribbean Region with the purpose of promoting collaboration, planning and information sharing within the region, and to cooperate with other organizations and multilateral agreements that have a mandate concerning the conservation, management and sustainable use of this species in the Wider Caribbean Region.

CoP14 also requested the above mentioned organizations to include issues related to illegal trade in hawksbill turtles in the regional meeting's agenda and to enable the participation of the CITES Secretariat in the meeting as an observer, as well as the participation of CITES Parties of the Wider Caribbean Region. The CoP14 directed the Secretariat to request these organizations to submit the report at the CoP15, including the results of the regional meeting, as well as, if available, information about the progress made regarding the implementation of the national management plans of the Parties of the Wider Caribbean Region.

Relevant documents of the Conference of the Parties to CITES and more detailed information on Wider Caribbean Hawksbill Turtle Range State Dialogue meetings are available at: http://www.cites.org/eng/cop/index.shtml and http://www.cites.org/eng/prog/hbt.shtml .

Map and overview of current strategies, projects, actions and actors taking place in the region the conservation of the hawksbill
(Karen Eckert – WIDECAST)

The author presented an overview of the information on hawksbill turtle biology and conservation compiled in the Dow *et al.* (2007) atlas, the most comprehensive spatial database of nesting habitat for any region in the with 1,311 nesting beaches (all species) geo-located and characterized by more than 120 Data Providers in 43 nations and territories.

Large hawksbill nesting colonies are very rare in the region. Three sites (Mona Island, Puerto Rico; West coast of Barbados; Punta Xen, Mexico), < 0.4% of the region's 817 known hawksbill nesting grounds, receive more than 1,000 nesting crawls per year, and only 4.4% receive more than 100 nesting crawls per year (the equivalent of 15-20 reproductive active females) (see Fig. 2. in "Status of the Hawksbill Sea Turtle in the Wider Caribbean and Western Atlantic Region "). Hawksbills are also the least known species in the Wider Caribbean Region, with 33% of all known nesting beaches associated with unknown crawl abundances (most of these are believed to be minor nesting sites). The study also concluded that some countries have never been fully surveyed, that population monitoring is incomplete regionally, and that foraging grounds are very poorly known.

Current management strategies in the region generally focus on increasing population size by implementing the specific mandates of national law, a national recovery plan, and/or an international agreement. Such strategies typically embrace a suite of research, conservation, education/ outreach, and policy initiatives designed to:

- document population abundance, distribution, and trends
- identify and fill essential information gaps
- mitigate threats (direct, indirect)
- promote public awareness of the species' plight

Species recovery planning processes articulate and prioritize actions that fulfill strategic management goals. Such processes also facilitate dialogue, promote consensus on priority actions and foster commitment to implementation. More than 50% of range States have developed sea turtle recovery plans and use them to prioritize conservation actions.

More than 70% of Wider Caribbean Region (including Bermuda and Brazil) range States fully protect their Hawksbills – Cuba and The Bahamas being the latest to close their fisheries. Five nations have technical exemptions (not currently invoked) for traditional or subsistence uses. Only the Cayman Islands (which, uniquely, requires a maximum vs a minimum size limit on animals caught) and other British Overseas Territories (exempting Bermuda, which offers full protection), Haiti, and a few Eastern Caribbean nations still have legal sea turtle fisheries.

For Caribbean hawksbill turtles, implementation efforts have included significant human and financial investments in, among others:

- surveys of habitat use (nesting, foraging)
- population monitoring (nesting, foraging)
- basic research (e.g. home range, diet, reproductive success)
- threat mitigation (e.g. egg relocation, anti-poaching, bycatch reduction)
- attention to CZM issues (e.g. beachfront lighting, sand mining, access)

- habitat maintenance (e.g. beach clean-ups)
- designation of protected areas
- distribution of education materials
- participation in international meetings

Regarding population monitoring, and specifically of the annual nesting effort, 95% of known hawksbill turtle nesting beaches with over 100 crawls per year are patrolled at a minimum of twice per week (exceptions: Los Roques, VZ; Isla Fuerte, CO); 65% are monitored nightly.

The important actors performing all these actions in the region are NGOs/CBOs (WIDECAST, WWF, TNC, WCS, IUCN/MTSG, etc., as well as hundreds of community-based organizations in dozens of countries), Governments (Fisheries, Forestry, Tourism, Education, Police), and Universities (e.g., University of the West Indies), and all with important support from intergovernmental bodies (CEP/SPAW, IAC, CITES), the private industry (Tourism, Fisheries, Diving) and/ or national and regional donors (foundations, governments, NGOs, zoos/ aquaria, inter-governmental bodies, and industry-sponsored conservation funds).

Recommendations for a Regional Conservation Strategy include:

1. Each Range State should have a national recovery/management plan conceived through stakeholder led processes and finalized in a standardized format
2. Each Range State should conduct a baseline survey during peak hawksbill turtle season to identify habitats
3. Range States should collaborate in the design and implementation of a regional network of Index Monitoring Sites (minimum: all beaches with > 100 crawls per year)
4. Range States should implement standardized data collection, record keeping, and transparent reporting
5. Range States should support implementation of systematic surveys to identify foraging areas and migratory corridors
6. There should be wider distribution of technical materials (guidelines and criteria), including relevant translations (especially French)

Lessons learned from the international regulatory framework on the conservation of sea turtles
(Jack Frazier – Conservation and Research Center, Smithsonian Institution / IAC Scientific Committee).

The presentation referred to the international treaties related to sea turtle conservation, particularly about the life history and economic aspects of the hawksbill turtle. The hawksbill has a wide distribution and migration routes throughout the Caribbean, because of which an individual can live in territorial waters and Exclusive Economic Zones of several countries. This makes the species a shared resource.

Hawksbills have been exploited over millennia, and specifically in the Wider Caribbean populations were heavily exploited, placing the species in a Critically Endangered status.

Nevertheless, societies have valued the hawksbill turtle and consider that it warrants special conservation attention, specially an urgent attention from all the countries, with international treaties that promote cooperation among the countries for the species protection and conservation.

The existing international instruments specific to marine turtles are:

- TIHPA - Turtle Islands Heritage Protected Area (Malaysia & Philippines)
- Tripartite - Cooperative Agreement for the Conservation of Sea Turtles of the Caribbean Coast of Costa Rica, Nicaragua and Panama
- Abidjan MOU - Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa
- IAC - Inter-American Convention for the Protection and Conservation of Sea Turtles
- IOSEA - Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of the Indian Ocean and South-East Asia
- LIMA - Convention for the Protection of the Marine Environment and Coastal Zones of the South East Pacific: Programa Regional para la Conservación de las Tortugas Marinas en el Pacífico Sudeste.

The presentation showed an analysis of these international instruments, mentioning their difficulties, challenges, advantages and steps to be followed in the future according with sea turtle conservation priorities:

Summary of instruments	TIHPA	Tripartite	Abidjan MOU	IAC	IOSEA MOU	Lima: Prog. M.T.
Date in effect						
Nº of States						
States possible						
Secretariat						
Financial support						
Plenary meetings						
Sci/Advisory Committee						
Committee meetings						
Formal alliances						
NGO participation						
Products						

	REMARKABLE
	ACCEPTABLE
	NEEDS ATTENTION
	PROBLEMATIC

Regarding the IAC, the lessons to be learned for Focal Points, Secretariat, Committees, NGOs, etc. are:

- Be prepared before COPs
- Be informed about the IAC (text, objectives, resolutions, priorities, pending tasks, etc.)
- Follow-up after COP
- Commitment to inter-sessions work
- Communications – extremely important
- Promote & defend national VALUE for turtle conservation
- LEADERSHIP of Secretariat – ESSENTIAL
- Focus on REGIONAL NEEDS and not personal/institutional priorities

Tasks and challenges for the future:

- Human activities that impact marine turtles are what need to be managed, not sea turtles as a resource
- Hawksbill turtles are a shared resource, which means the need of collaboration, specifically international
- Such collaboration involves dealing with sovereign states, inter-governmental organizations, multilateral organizations and many other actors.

APPENDIX 3: Working Groups

Group 1: Direct Take: Targeted Fisheries, Opportunistic Fisheries

Chair: René Márquez

Paola Mosig, Juan Carlos Cantú, José Fco. Saballo, Cristina Ordóñez, Cathi Campbell, Diana Gómez, Cecilia Hernández

Group 2: Gillnet Bycatch and Entanglement in Lost Gear

Chair: Cynthia Lagueux

Karen Eckert, Jorge Zuzunaga, Nelson Andrade, Rhema Kerr-Bjorkland, Isaías Majil, José Martínez Mencos, Mark Outerbridge, Begoña Mora

Group 3: Habitat Deterioration: Infrastructure, Lights and Vegetation Removal

Chair: Carlos Diez

Julia Horrocks, Paul Hoetjes, Tricia Lovell, Mervin Hastings, Wesley Clerveaux, Stephen Poon

Group 4: Habitat Deterioration: Pollution and Non-Natural Predation

Chair: Robert van Dam

Zandy Hillis-Starr, Yolanda León, Rozenn Le Scao, Alessandra Vanzella

Group 5: Threats Related to Inadequate Regional Policies and Climate Change

Chair: Eduardo Cuevas

Carlos Drews, Jack Frazier, Earl Possardt, Veronica Cáceres, Maria Isabel Nava, Janice Blumenthal, Andrea Donaldson, Karen Joseph, Rebecca Regnery

Viability Analysis Group:

Chair: Didiher Chacón

Laura Sarti, Alberto Abreu, Jim Richardson, Vicente Guzmán, Gustave Lopez

APPENDIX 4: Directory of Participants

Country Representatives				
Country	**Name**	**Institution**	**Telephone**	**E-mail**
Antigua & Barbuda	Tricia Lovell	Senior Fisheries Officer, WIDECAST National Coordinator	Tel/Fax: 268 462-1372	fisheriesantigua@gmail.com, tricial@lycos.com
Barbados	Julia Horrocks	Professor, Faculty of Pure and Applied Sciences, Dept. of Biological and Chemical Sciences, University of the West Indies; WIDECAST National Coordinator	Tel: 1-246-438-7761 Fax: 1-246-438-7767	heritage@barbados.gov.bb, julia.horrocks@cavehill.uwi.edu
Belize	Isaias Majil	MPA Coordinator, Fisheries Department	Tel: 224-4552 fax: 223-2983	Isaiasmajil@yahoo.com, isaias.majil@gmail.com
Bermuda	Mark Outerbridge	Bermuda Turtle Project Coordinator, Bermuda Zoological Society; WIDECAST National Coordinator	Tel: 441-293-2727 ext 139 Fax: 441-293-6451	mouterbridge@gov.bm
Brazil	Gustave Lopez	Regional Coordinator, Bahia, Projeto Tamar, Fundacion Pro-Tamar	Tel: (+55 71) 3676-1045 Fax: (+55 71) 3676-1067	guslopez@tamar.org.br
Cayman Islands	Janice Blumenthal	Department of Environment	Tel: 345-949-8469 Fax: 345-949-4020	Janice.Blumenthal@gov.ky or Janice.Blumenthal@gmail.com
Colombia	Diana Gómez López	Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andréis (INVEMAR)	Tel: (+57) 54380808 Ext.: 250 Fax: (+57) 54233280	disag2@yahoo.com.mx, digomez@invemar.org.co
Costa Rica	José Francisco Saballo López	Área de conservación la amistad Caribe, MINAET	Tel: (506) 2756 6014 Fax: (506) 2756 6014	gumbe312hotmail.com
Dominican Republic	Cecilia Hernández Peña	Encargada Depto. Regulaciones y Controles de la Dirección de Biodiversidad y Vida Silvestre, Subsecretaria de Áreas Protegidas y Biodiversidad, Secretaria de Estado de Medio Ambiente y Recursos Naturales	Tel: (809) 472-4204 Exts. 296 Y 23 (809) 472-4354 (directo)	ceciliah50@hotmail.com, cecilia.hernandez@medioambiente.gob.do
France (Martinique)	Rozenn Le Scao	National Wildlife and Hunting Agency; WIDECAST National Coordinator	Tel: + 33 (0) (596) 696 234 235	Rozenn.LE-SCAO@developpement-durable.gouv.fr

Guatemala	Jose Martinez Mencos	Jefe de la Sección de Recursos Hidrobiológicos Consejo Nacional de Áreas Protegidas	Tel: (502) 5301-1292 Fax: (502) 2251-8588	josemartinezmencos@yahoo.com jmartinez@conap.gob.gt
Guyana	Dominique Saheed	Senior Environmental Officer	(592) 225-7232/6 (592) 619-2168	dominiquesaheed@yahoo.com dominiquesaheed27@gmail.com
Jamaica	Andrea Donaldson	National Environment and Planning Agency; WIDECAST National Coordinator	(876)754-7540 ext. 2227 Fax: 512-9191	adonaldson@nepa.gov.jm
Mexico	Vicente Guzmán Hernández	Líder de Proyecto Carey, Comisión Nacional de Áreas Naturales Protegidas; WIDECAST National Coordinator	Tel: (938) 38 2 62 70 Fax: 38 2 88 13	vguzman@conanp.gob.mx, vgh81@hotmail.com
Netherlands Antilles	Maria Isabel Nava	Sea Turtle Conservation Bonaire (STCB), WIDECAST National Coordinator	Tel: 599 / 717225 – 599 /7800433 Fax: 7172225	STCB@bonaireturtles.org navamabel@hotmail.com
Nicaragua	Karen Joseph	Delegada Regional Instituto Nicaraguense de Pesca INPESCA	Tel: 505 25722344	karenmjs@yahoo.com
St. Lucia	Nelson Thomas	Department of Fisheries	Tel: (758) 468-4135 or 468-4140 Fax: (758) 452-3853	deptfish@slumaffe.org
Trinidad & Tobago	Stephen Poon	Forester, Wildlife Section, Forestry Division; WIDECAST National Coordinator	Tel: 1 868 2914832 Fax: 1 868 645 4288	poon_st@hotmail.com
Turks & Caicos Islands	Wesley Clerveaux	Director, Department of Environment & Coastal Resources	Tel: (649)-941-5122 Fax: (649)-946-4793	wvclerveaux@gov.tc
United Kingdom British Virgin Islands	Mervin Hastings	Sr. Marine Biologist, Ministry of Natural Resources & Labour-Conservation & Fisheries Department; WIDECAST National Coordinator	Tel: 1 (284) 468 9678 Fax: 1 (284) 494 2670	mhastings@gov.vg, mervin_hastings@hotmail.com
United States of America	Earl Possardt	US Fish and Wildlife Service	703 358 2277	Earl_Possardt@fws.gov

Venezuela	Begoña Mora Celis	Jefe de División en la Dirección de Fauna. Ministerio del Poder Popular para el Ambiente, Oficina Nacional de Diversidad Biológica	Tel : 58212 408 2123, 4082124 Fax : 58212 408 2109	moraceli@gmail.com, bmora@minamb.gob.ve
Invited Experts				
	Didiher Chacón	Coordinador Programa para America Latina WIDECAST	Tel : (506) 2261-3814 Fax : (506) 2260-5789	dchacon@widecast.org
	Robert van Dam	Chelonia Inc	599 786-9909	rpvandam@yahoo.com
	Paola Mosig Reid	Oficial de Programa TRAFFIC Norteamérica/ WWF México	Tel: 52 (55) 52 86-56 31 ext. 232 Fax: 52 (55) 52 86 56 37	pmosig@wwfmex.org
	Carlos Drews	WWF		cdrews@wwfca.org
	Karen Eckert	WIDECAST: Wider Caribbean Sea Turtle Conservation Network	Tel: 1 (314) 954-8571	keckert@widecast.org
	Cynthia Lagueux	Wildlife Conservation Society; WIDECAST National Coordinator		clagueux@wcs.org
	James Richardson	Odum School of Ecology, University of Georgia	Tel: (706) 542-6036 or 706-410-4025 (cell) Fax: (706) 542-4819	jamesir@uga.edu
	Yolanda León	Universidad INTEC y Grupo Jaragua, Santo Domingo, Rep Dominicana	Tel: (809) 567-9271 x426 Fax: (809) 549-3180	ymleon@intec.edu.do
	Cristina Ordoñez	Caribbean Conservation Corporation	Tel: (507) 66715794 Fax: (507) 7579962	cristinao@cccturtle.org crisespino@yahoo.com
	Carlos Diez	Coordinador Nacional del Programa Tortugas Marinas de Puerto Rico, Dept. de Recursos Naturales y Ambientales de Puerto Rico; WIDECAST National Coordinator	Tel: (787) 453-6484	cediez@caribe.net
	Zandy Hillis-Starr	U.S. National Park Service, Buck Island Sea Turtle Research Program	Tel: (340) 773-1460 x 235 Fax: (340) 719-1791	zandy_hillis-starr@nps.gov
Facilitator				
	Nestor Windenvoxel			nwindevoxhel@gmail.com
Steering / Organizing Committee				

	Laura Sarti	Coordinadora Técnica del Programa Nacional para la conservación de Tortugas Marinas CONANP	Tel: 54 49 70 71. 54 49 70 00 ext. 17 163	lsarti@conanp.gob.mx
	Ana Barragán	Especies prioritarias para la conservación CONANP	Tel : 55 54 49 7071 red 17071	abarragan@conanp.gob.mx
	Aida Peña	SEMARNAT		aida.pj@smarnat.gob.mx
	Antonieta Ricoy	SEMARNAT		maria.ricoy@semarnat.gob.mx
	Veronica Caceres	CIT		secretario@iacseaturtle.org
	Belinda Dick	CIT		contact@iacseaturtle.org
	Earl Possardt	(US Representative see above)		
	Alessandra Vanzella	SPAW		avk@cep.unep.org
	Paul Hoetjes	MINA Curacao; WIDECAST National Coordinator		paul@mina.vomil.an
	Jorge Zuzunaga			jzuzunaga@produce.gob.pe
Translator				
	Leticia Saenz			
IAC Committee Members				
Scientific Committee	Jack Frazier	Researcher, Conservation and Research Center, Smithsonian Institution	Tel: (540) 635 6564 Fax: 540 635 6551	kurma@shentel.net
Consultative Committee	Alberto Abreu	Instituto de Ciencias del Mar y Limnología, UNAM	*Tel: (+52 669) 985 2848 Fax: (+52 669) 982 6133*	Alberto.abreu@ola.icmyl.unam.mx
Scientific Committee	Rene Marquez			lkempii@prodigy.net.mx
Other participants				
	Juan Carlos Cantú	Defenders of Wildlife	Tel: (52 55) 5596-2108 Fax: (52 55) 5245-8300	jccantu@defenders.org
	Rebecca Regnery	Humane Society International	Tel: (301) 258-3105 Fax: (301) 258-3082	rregnery@hsi.org
	Rhema Kerr Bjorkland	Duke University Center for Marine Conservation	Tel: (252) 504-7692 Fax: (252) 504- 7648	rhema.bjorkland@duke.edu

	Eduardo Cuevas	PRONATURA		ecuevas@pronatura-ppy.org.mx
	Nelson Andrade	SPAW		
	Eduardo Fuentes	SEMARNAT Q. Roo	Tel:019838350204	eduardo.fuentes@qr.semarnat.gob.mx
	Petra Montoya	Ecologia Cancun		petramontoya@hotmail.com
	Lorena Flores	Ecologia Cancun Coord. Tortugas marinas		lorrs_7a@live.com.mx
	Cathi Campbell	Wildlife Conservation Society	352 376-6394	Ccampbell59@gmail.com

APPENDIX 5: Criteria for Analysis Used During the Regional Hawksbill Workshop

The Conservation Action Planning (CAP) method allows us to take documental information, statistics and anecdotal knowledge of groups and organize it in a systematic and orderly way, in order to develop strategies and actions for the conservation of ecosystems or populations of interest.

Since it's uncommon to have all the needed elements from a system or all the information for a particular species, the method orders and prioritizes the best available information, so it is essential that the participants have the best possible knowledge and bring to the process publications and data that help to define the criteria and for them to be open to share their knowledge.

The key word that describes the CAP is prioritizing; the participants must establish grades with criteria that allow prioritizing what is important or less important based on existing knowledge. This provides an objective analysis that combines an ordered working system, based on population ecology, scientific knowledge and field data provided by the participants in the process.

The ultimate goal of the process is to establish actions and needs to achieve:

1. An increment or improvement of those conditions that allow maintaining the viability of the identified conservation elements, in our case, the hawksbill turtle.
2. The elimination or reduction of the sources of threats, and to lower their negative impact on the hawksbill turtle.
3. The establishment of capacities and conditions necessary to achieve the previous points.
4. To evaluate in an objective way the progress or delays on the previous points.

ANALYSIS OF VIABILITY (ECOLOGICAL INTEGRITY) OF THE CONSERVATION TARGETS

The viability analysis allows us to determine the status of the ecosystem or population that we need to conserve.

- Which Key attributes, including ecological processes, should be maintained to ensure the integrity and health (viability) of the subjects on the long term?
- Within which ranges should we keep those key attributes?

Three categories for the evaluation of the ecological integrity of the conservation target (in our case, the hawksbill turtle):

1. **Size** - Area of an ecosystem or abundance of the species
2. **Condition** - Composition, structure and biotic interactions

3. **Landscape context** - Ecological processes on a landscape scale and connectivity (migration)

Participants must qualify these aspects as: Very good, Good, Fair, or Poor.

Very Good	Preferred state - all the key attributes are within desired and preferred ranges.
Good	Acceptable state - all the key attributes are within their acceptable variation ranges (minimum integrity thresholds).
Fair	Restorable state - one or more key attributes are outside the acceptable variation range, but can be restored.
Poor	Non-restorable state - one or more key attributes can't be restored.

The categories relevant for the hawksbill turtle are:

1. SIZE
    a. Abundance
2. CONDITION
    a. Structure
        i. Age structure
    b. Biotic interactions
        i. Reproduction, competition, predation
3. LANDSCAPE CONTEXT
    a. Connectivity
        i. Access to habitat of food resources
        ii. Ability to disperse, migrate or colonize
        iii. Possible barriers to migration

In order to measure if the viability changes along the implementation of the strategies, we need to establish standard measuring criteria in the form of viability indicators.

WHAT IS A VIABILITY INDICATOR?

Indicators are measurable and inform us about the state of a key attribute and of the status of biodiversity or the conservation subject.

An indicator must be:

- **Sensitive to changes** in the status of the key attribute
- **Biologically pertinent**, and directly related to the status of the key attribute

- **Measurable** with minimum error and standard methods
- **Cost-efficient**, providing maximum information with minimum time, personnel and money.

It is important to identify at least one indicator per key attribute.

ANALYSIS OF THREATS TO THE CONSERVATION TARGET

In our case, threats to conservation of the hawksbill turtle are composed by a combination of pressures (stresses) and sources of stress. The method allows establishing and qualifying each of these independently, but the CAP system performs a joint analysis of them.

1. **Stresses** - the damage or degradation of key attributes that the conservation target is suffering, which originate a reduction of viability.

2. **Sources of stress**. – those things that are causing the damage to the conservation target, like the use of land, water and natural resources in a way incompatible with conservation.

STRESSES

1. Identify the main stresses for the conservation subjects
    a. Potential damage to ecological attributes over the next 10 years
2. "Grading" the stresses by:
    a. Severity of damage
    b. Scope of damage

They will be graded as: Very High, High, Medium and Low. The limits or the categories can be obtained from real data if available; if there are no specific data, the participants can establish indicative ranges that can be qualitative or quantitative depending on the available information.

SEVERITY is the level of damage that can be expected for the subject of conservation over the next 10 years under the current circumstances.

Very High	It is likely that the stress destroys or eliminates the conservation target in all or a portion of its distribution range.
High	It is likely that the stress seriously deteriorates the conservation target in a portion of its distribution range.
Medium	It is likely that the stress deteriorates moderately the conservation target in a portion of its distribution range.
Low	It is likely that the stress slightly deteriorates the conservation target in a portion of its distribution range.

SCOPE is the geographic range of the stress on the conservation target that can be expected over the next 10 years under current circumstances

Very High	It is likely that the stress is very widely distributed and affects all the locations of the conservation target in the region (more than 75%).
High	It is likely that the stress has an ample distribution and affects many of the locations of the conservation target in the region (50 – 75%).
Medium	It is likely that the stress has a local distribution and affects some of the locations of the conservation target in the region (25 – 50%).
Low	It is likely that the stress has a very limited distribution and affects few of the locations of the conservation target in the region (less than 25%).

SOURCES OF STRESS:

They correspond to the use of natural resources incompatible with conservation that originate the stresses. For this methodology we exclude those sources of natural origin, over which we can't have strategies or actions to control or mitigate.

1. Identify the sources of each stress
    a. Identify the closest source
    b. Identify the source in a precise manner
    c. Each source may require a different strategy
2. "Grade" the sources:
    a. Degree of contribution to the stress
    b. Irreversibility of the stress
    c. Very High, High, Medium, Low

CONTRIBUTION is the proportional participation of the source to the stress, which can be expected over the next 10 years.

Very High	The source has a very large contribution to that particular stress (the main or one of the main causes).
High	The source has a large contribution to the particular stress
Medium	The source has a moderate contribution to the particular stress
Low	The source has a small or no contribution to the particular stress

IRREVERSIBILITY is the impossibility to revert the effects of the source of stress

Very High	The source produces a stress that is not reversible (e.g. a mangrove

destroyed by urban development)

High The source produces a stress that is reversible, but not socially or economically feasible (e.g. a wetland turned into agriculture area)

Medium The source produces a stress that is reversible with a reasonable commitment of financial or human resources (e.g. building tunnels under highways that cross a wetland)

Low The source produces a stress that is easily reversible at a relative low cost (e.g. dirt roads crossing a wetland).

ANALYSIS OF SITUATION AND DEFINITION OF STRATEGIES

During this procedure we will work with flashcards and will set in a way very similar to a problem tree the situation of the sources of pressure that ranked the highest.

For each source of pressure we will establish:

1. Who is the cause
2. Actions by which the stress is produced
3. Motivations of actions
4. Indirect actors
5. Motivations of indirect actors

Once we create this "situation tree", on top of it we will write the strategies that will allow to eliminate the conditions or motivations for stress, reduce the corresponding actions and breaking the cycle that leads to the threats for the hawksbill turtle.

Once the strategies are set we will review the group results to evaluate potential duplications and then we can rank them to detect the most important.

Each strategy can be prioritized according to its contribution to the conservation objectives.

CONTRIBUTION TO STRATEGIC OBJECTIVE: the degree in which the strategy, if successfully implemented, will lead to the accomplishment of the objective.

Very High The strategy by itself can allow to reach one or more objectives

High The strategy will contribute substantially to the fulfillment of the objectives but is not enough by itself

Medium The strategy has an important contribution to the fulfillment of one or more objectives

Low The strategy has a small contribution to the fulfillment of one or more objectives

APPENDIX 6: Summary of Project Profiles

REDUCTION OF BY-CATCH OF HAWKSBILLS THROUGHOUT THE WIDER CARIBBEAN REGION

Statement of Need and Justification

Incidental capture or bycatch in fisheries is a proven threat to sea turtle populations globally (Lewison *et al.*, 2004). Sea turtles are vulnerable to such additive sources of mortality because of their life-history characteristics (long-lived, late maturing animals), and all species have been documented as non-target catch in fisheries (Casale *et al.*, 2007) While industrial bycatch is relatively well studied, there is a paucity of data for tropical artisanal fisheries. This lack of data and quantified assessments hampers collaboration with regional fisheries management organizations and coastal communities, who often require convincing of the extent, urgency and scope of the bycatch and have justifiable concerns regarding the impact of bycatch mitigation on fisher livelihoods and coastal communities

The Wider Caribbean Region (WCR) has globally significant hawksbill (*Eretmochelys imbricata*) populations. The species has had tremendous social, economic and cultural value to the region, but has undergone significant declines and has been classified as Critically Endangered, with WCR populations severely reduced in 26 of 29 nations (Mortimer and Donnelly, 2007). The hawksbill turtle has been the focus of decades of intense regional and global conservation activity, yet many populations continue to decline. Bycatch in fisheries has not received significant attention on a regional level and may be the key to turning the tide for the WCR populations. Thus, given the lack efforts to reduce mortality from by-catch and its potential significant impact on hawksbills in the region, it is imperative to take immediate action to assess and mitigate this phenomenon.

Project Objectives

1) Develop collaboration between regional fisheries entities (RFMO) and regional sea turtle conservation bodies by December 2010 to expedite by-catch reduction.
2) Over the course of 5 years, reduce hawksbill by-catch in coastal fisheries in the WCR by 25%.

Project Activities

Objective 1

a) Identify appropriate actors for regional bycatch reduction team comprising fisheries entities (RFMO) and regional sea turtle conservation bodies.
b) Convene actors and develop working group agreement, goals, and plan of action.
c) Disseminate information to stakeholders (e.g.- fisheries, government bodies, and the conservation community).
d) Group provides oversight of and facilitates implementation of Objective 2.

Objective 2

a) Develop a sampling framework for monitoring index fisheries.
b) Develop models to predict hawksbill occurrence.
c) Define the extent and intensity of coastal fisheries.
d) Combine results from b & c and use to predict by-catch risk and target areas for implementation of by-catch reduction measures.
e) Build capacity (government, non-government) for monitoring and reporting coastal by-catch of marine turtles by species.
f) Implement monitoring program.

REDUCTION OF DIRECT TAKE OF HAWKSBILL TURTLES AND THEIR PRODUCTS IN THE WIDER CARIBBEAN

Statement of need and justification

Hawksbill turtle populations throughout the Wider Caribbean Region are impacted by direct take for their eggs, and for juvenile and adult animals. The use of hawksbills and their products generate income from the sale of meat, eggs, and shell, provide a source of protein, and meet cultural and traditional demands. Although hawksbill turtles are not completely protected in only 14 territories throughout the Wider Caribbean Region, many more allow the take of hawksbills and their eggs by not enforcing existing laws. Thirty-nine of 43 Wider Caribbean countries report a national trade in hawksbills and their products and 26 of 43 countries report some level of illegal international trade (Dow *et al.*, 2007). Although the total take of eggs and numbers of animals is unknown, apparently the threat is sufficiently high to be negatively affecting population recovery throughout the region.

Project goal and objectives

Goal

Contribute to the recovery of Caribbean hawksbill populations through the reduction of direct take of hawksbill eggs and animals at selected sites of concern.

Objectives

1. Determine levels of direct take of eggs, juveniles, adults/nesting females in areas of concern (i.e., rookeries with > 100 crawls per year and foraging areas with > 300 animals).

2. Reduce take of eggs to < 10% per rookery and eliminate take of nesting females, identified in Objective 1, with more than 100 crawls per year over three years.

3. Reduce direct take of foraging animals, identified in Objective 1, by 50% over five years.

Project activities

Objective 1:

a) Conduct literature search (WIDECAST documents, national country reports, publications, etc.) to identify rookeries with egg take >10% of annual nesting and/ or take of females, or take of foraging animals, at sites described above.
b) Survey national contact points (e.g. - NGO's, fishery departments, and WIDECAST representatives) to verify, confirm, and update estimated levels of direct take of eggs and nesting females in areas of concern.
c) Select areas of concern in which interventions will be directed.

Objective 2:

a) Determine current annual rate of take for eggs and/or nesting females.
b) Identify who and why eggs and nesting females are taken.
c) Conduct awareness and educational campaign directed at people who take eggs and/or nesting females.
d) Where necessary, implement program(s) (alternative sources of income?) to address "need" to take eggs and nesting females.
e) Increase nocturnal surveillance (employment of local inhabitants) of nesting beaches to protect nests and nesting females.
f) Determine annual rate of take for eggs and/or nesting females per year for five years.
g) Each year, evaluate results of previous nesting season and adapt interventions as needed.
h) Improve enforcement of existing laws & regulations where they exist but not enforced.
i) Decrease by 25% the number of Caribbean territories that do not provide complete protection for hawksbill turtles.
j) Decrease the sale of hawksbill products within and between nations.

Objective 3:

a) Determine current annual rate of take for animals.
b) Identify who and why foraging animals are taken.
c) Conduct awareness and educational campaign directed at people who take foraging animals.
d) Where necessary, implement program(s) (alternative sources of income?) to address the "need" to take foraging animals.
e) Increase nocturnal surveillance (employment of local inhabitants) of nesting beaches to reduce take of eggs and nesting females.
f) Determine annual rate of take for foraging animals per year for five years.
g) Each year, evaluate results and adapt interventions as needed.
h) Improve enforcement of existing laws & regulations where they exist but not enforced.

i) Decrease by 25% the number of Caribbean territories that do not provide complete protection for hawksbill turtles.
j) Decrease the sale of hawksbill products within and between nations.

IDENTIFICATION OF HAWKSBILL DISTINCT NESTING POPULATION UNITS IN THE WIDER CARIBBEAN REGION

Statement of need and justification

Due to the phylopatric nature of sea turtles, individual populations behave as independent breeding units, with unique genetic signatures that allow their identification with "genetic markers". A catalogue of the genetic composition of each individual population unit is essential to understand the way each one moves across the region as it develops and to what extent each unit is represented at foraging sites. Both of these are crucial elements in designing adequate management strategies for a migratory species.

In spite of many advances in the genetic methodology and many regional and national genetic surveys on hawksbill populations in the Caribbean, rookeries remain within the geographic range that have not been evaluated. This hinders comprehensive analyses of stock composition at convergent marine aggregations and thus limits our understanding and management capacity for the species at a regional level. Although genetic work has been done on hawksbill populations over the last decade and a half, there is still a need to complete the geographic coverage and assure all of the major rookeries have been sampled. There have also been improvements on the methods of characterizing genetic variants that have not been applied in some of the previously evaluated populations. This project intends to build upon existing genetic information that has allowed the identification of breeding units in some of the major populations in the Wider Caribbean Region, but given that molecular markers still appear that have not been reported in any of the sampled rookeries, it is clear that rookeries remain with no genetic surveys or that surveyed rookeries need to be analyzed more thoroughly. Furthermore, with the recent finding of significant genetic differentiation between the two Barbados coasts, there is a growing realization that common assumptions of complete coverage of national populations by only sampling a single rookery may not be accurate. Thus in the proposal, we also urge that complete national coverage is implemented over a number of seasons.

This project will identify remaining populations that either have not been sampled, or those with a poor coverage or with outdated methods, to be analyzed with standardized protocols. Completing this project will allow us to generate a comprehensive Atlas of genetic profiles for hawksbill populations in the Wider Caribbean Region, an essential tool for the accurate evaluation of stock composition in foraging sites, something that until now is only partially available.

Project goal and objectives

To genetically characterize the entire set of hawksbill populations in the Greater Caribbean

Objectives:

1) Identify a set of collaborating genetic laboratories to carry out the project.

2) Initiate and/or support sample collections in areas with little or no on-going surveys.
3) Identify populations that have not been sampled or have been only partially surveyed.
4) Determine the mtDNA control region haplotype composition of each hawksbill rookery.
5) Identify the geographic boundaries for the individual populations on the basis analyses from #4

Project activities

1) Identify the participating laboratories in order to have a fair regional representation and that each has previous work in the subject (preliminary list: Mexico, Cuba, Puerto Rico, Barbados, Venezuela, Colombia, USA-Florida)
2) Meeting of participants to identify and agree on protocols for both field work and laboratory analyses (Standardize methodology amongst participating laboratories)
3) Identify sites that need sampling and partners in the field
4) Facilitate CITES blanket permitting for exporting samples to participating laboratories
5) Collect samples from identified rookeries, preserve and send to the participating laboratories
6) Determine the genetic profile for each rookery using standard methods for amplification of mtDNA control region by PCR and DNA sequencing
7) Meeting of participants to compile and interpret the results to complete the Atlas of the genetic profiles of hawksbill populations in the Wider Caribbean

HARMONIZATION OF LAWS, REGULATIONS AND POLICIES FOR THE CONSERVATION OF HAWKSBILLS IN THE WIDER CARIBBEAN.

Statement of need and justification

International collaboration is needed in order to better address conservation of the population of Hawksbill turtles in the Wider Caribbean Region. This is a challenge since we are dealing with many nations with different legal frameworks in regards to sea turtle conservation that include laws and regulations or bylaws that might be effective and strong in one country but that could be non-existent, or very weak, in others. Also some of these laws might not have a specific regulation in regards to hawksbill conservation. Therefore the efforts to protect the species are not uniform in the region, revealing a need to harmonize the legal framework under which hawksbill turtle populations can be protected in a regional context. Encouraging countries to work together, such as by joining International Conventions like the IAC, in the protection of the species is an effective action, but also having a clear idea as to what is needed for each country to orient their laws and conservation programs towards a regional regulatory framework for hawksbill turtle conservation. This project will provide countries with a proposal of a harmonized regulation for regional conservation of hawksbill in the Wider Caribbean Region.

Project goal and objectives

Harmonization of efforts in conservation and protection of hawksbill turtles (*Eretmochelys imbricata*) at a regional level by creating a proposal for a regional regulation that can be included in the laws that protect sea turtles in the Wider Caribbean Region.

Project activities

1) Review the legal framework for all the countries where hawksbill turtles are found in order to produce a diagnosis of similarities, gaps, and discrepancies in their laws and regulations. This diagnostic should also identify what countries need more assistance with harmonizing regulations in order to bring them closer to what the majority of countries in the region are doing in terms of conservation efforts.
2) A regional or sub regional proposal of bylaws for the conservation of hawksbill turtles in the Wider Caribbean and Western Atlantic will be elaborated based on the results of the framework revision.
3) The IAC Secretariat will do outreach with party and non-party countries that have been identified to have weaknesses and gaps in their laws and regulations, as well as in their management programs, in order to encourage them to adopt regulations of their laws addressed to hawksbill conservation at a regional level and thus bring them closer to what other countries are doing in terms of conservation. This is part of a regional harmonization process.
4) With the regional regulation proposal to the laws for hawksbill conservation the IAC Secretariat will organize a meeting to submit this proposal to review by the legal representatives and technical representative of each government in order to make changes and adjustments to the document that can be in agreement with all the participant countries.
5) Once the document is validated by the legal and technical representative of each country it can be presented to IAC COP and through a cooperation agreement this can be presented to other international conventions that their party countries are those of the Wider Caribbean and Western Atlantic like SPAW protocol in order to discuss how to harmonize their policies at a regional level.
6) The IAC secretariat will perform outreach to other non-party countries that have been identified to have conditions or habitats important to the hawksbill population in terms of foraging grounds and nesting beaches or that have problems with illegal trade. The goal is to make them aware that international collaboration is needed to have effective conservation efforts, and that joining the IAC can contribute positively to the protection and conservation of this species at a regional level.

APPENDIX 7: Images from the Event