INTER-AMERICAN CONVENTION FOR THE PROTECTION AND CONSERVATION OF SEA TURTLES

NORTHWEST ATLANTIC LEATHERBACK TURTLES (*DERMOCHELYS CORIACEA*): A SUMMARY OF CURRENT CONSERVATION STATUS, CHALLENGES, AND OPPORTUNITIES

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This document was presented at the 17th meeting of the Scientific Committee within the framework of the implementation of Resolution CIT-COP9-2019-R2 on the Conservation of the Northwest Atlantic Leatherback. The document was adopted for the use of the Scientific Committee and other collaborators in outreach activities regarding the conservation status of the NWA Leatherback (*Dermochelys coriacea)* population.

Northwest Atlantic Leatherback Turtles (*Dermochelys coriacea*): A Summary of Current Conservation Status, Challenges, and Opportunities

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The conservation crisis facing the Northwest Atlantic leatherback demands collective action through international forums. Unilateral conservation action on behalf of a migratory marine species is wholly inadequate to the important task at hand. This is a call for all Parties to the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) to implement conscientiously the commitments agreed upon in CIT-COP9-2019-R2 Resolution on the NWA leatherback, and for the range states of the species, Canada, Guyana, French Guiana, Trinidad & Tobago, and Suriname to consider joining the IAC to unite efforts to effectively address the species conservation challenges.

1. Background

The leatherback sea turtle is the world's largest reptile, swimming the world's oceans since the time of the dinosaurs, at least 100 million years ago (Dutton et al. 1999). The species has a circumglobal distribution with nesting sites on tropical sandy beaches and migratory and foraging ranges that extend into temperate and sub-polar latitudes (Figure 1) (Eckert et al. 2012; Wallace et al. 2010). According to Wallace et al. (2010), there are seven Regional Management Units, or subpopulations, of leatherback sea turtles: Northwest Atlantic Ocean, Southeast Atlantic Ocean, Southwest Atlantic Ocean, Northeast Indian Ocean, Southwest Indian Ocean, East Pacific Ocean, and West Pacific Ocean.

The nesting sites of the Northwest Atlantic (NWA) leatherback subpopulation are concentrated in the southern latitudes of the Wider Caribbean. Only six colonies remain with more than 1,000 nesting crawls (successful and unsuccessful combined) per year; these are located in French Guiana, Panamá, and Trinidad. Twelve sites reporting 500-1,000 crawls per year are more broadly distributed in Colombia, Costa Rica, Dominican Republic, French Guiana, Grenada, Panamá, Puerto Rico, Suriname, Trinidad, and the USA (Florida) (Eckert and Eckert 2019). More than half (63 percent) of all nesting beaches support very small colonies with fewer than 25 crawls per year (Eckert and Eckert 2019), a number not dissimilar from the 63 percent reported a decade earlier by Dow Piniak & Eckert (2011).

Figure 1: *The distribution of the Northwest Atlantic subpopulation. Source: Wallace et al. 2010.*

The NWA leatherbacks forage widely in the inshore and offshore waters of temperate and sub-polar Atlantic (James, Ottensmeyer & Myers 2005; James et al. 2006; Dodge et al. 2014). The turtles move into the more northern areas as the summer season progresses and the ambient water temperature increases (James et al. 2006). While in the high latitudes, the turtles feed on large species of scyphomedusae; their distribution in Canadian waters mirrors that of their gelatinous prey (James et al. 2006). The abundance of prey makes Canada a critical high-latitude habitat for this species (Eckert 2006; James et al. 2006).

As adult leatherbacks migrate between their nesting sites and foraging grounds, they disperse widely across the ocean (James, Ottensmeyer & Myers 2005; Stewart et al. 2013). Nevertheless, genetic analysis has shown that leatherbacks that forage in Canadian waters demonstrate fidelity to these forage areas and originate predominantly from nesting colonies in Trinidad and French Guiana (Stewart et al. 2013).

2. Conservation Status and Threats

The NWA Leatherback Working Group (2018) describes the most recent regional assessment of population trends. It was done after concerns regarding decreasing annual counts of nests and nesting females became evident through community-based monitoring throughout the Wider Caribbean Region.

The Working Group collected data from a multitude of sources (40 partners in 17 countries), through which they were able to analyse a long term trend (1990-2017), an intermediate trend (1998-2017), and a more recent trend (2008-2017) (Northwest Atlantic Leatherback Working Group 2018). Based on these inputs, the NWA subpopulation shows a significant negative trend in nest counts for both long-term and recent timelines (Figure 2).

In response to the NWA Working Group (2018), the IUCN re-classified the NWA leatherback subpopulation as **Endangered** (IUCN 2019). This category means that this subpopulation is at a "very high risk of extinction in the wild in the immediate future" (IUCN n.d.). The Atlantic leatherback is listed as **Endangered** under the Canadian *Species at Risk Act,* **Endangered** under the U.S. Endangered Species Act, and an **Environmentally Sensitive Species** under the *Environmental Management Act, 2000* in Trinidad and Tobago.

A combination of persistent environmental and anthropogenic drivers is responsible for the observed declines. One of the key threats facing the NWA leatherback is interaction with fishing gear (Northwest Atlantic Leatherback Working Group 2018). Bycatch on high-seas pelagic longlines has been well documented (e.g., Fossette et al. 2014; Stewart et al. 2016); entanglement in fixed fishing gear, such as pot and trap nets, is a regular occurrence in leatherbacks' foraging grounds (James, Ottensmeyer & Myers 2005; Hamelin et al. 2016); and offshore major nesting beaches in Trinidad, bycatch numbers in artisanal gillnet fisheries are as high as 3,000 per year (Eckert & Eckert 2005; Lee Lum 2006). These interactions are worrisome because they affect mature individuals that are particularly valuable to this long-lived subpopulation.

Beach erosion is also contributing to the observed declines in nesting females. In the Wider Caribbean Region, leatherback nesting sites tend to be high energy beaches where changes in sand accretion and erosion are common (Northwest Atlantic Leatherback Working Group 2018). At major nesting beaches in the Guianas, however, sandy nesting habitat has shrunk significantly in the face of persistent erosion, contributing to declines in nesting numbers. A concomitant increase in nesting females has not been noted on other beaches in the region (Northwest Atlantic Leatherback Working Group 2018).

Natural cycles of erosion aside, anthropogenic coastal development (e.g., roadways, marinas, hotels) and seawalls (e.g., armour stone) can also drastically impact available nesting habitat, and so the Northwest Atlantic Leatherback Working Group (2018) advocates for due diligence from managers who issue permits for future coastal development to consider the impacts of such development on the nesting habitat of leatherbacks and other sea turtle species (see also Bräutigam & Eckert 2006).

Furthermore, modern climate change has a wide-range of direct and indirect negative consequences for all sea turtles, including leatherbacks: Rising temperatures can impact nesting leatherbacks by increasing incubation temperature, leading to decreased hatching success (Rafferty et al. 2017) and embryo feminization (as Monsinjon et al. 2019 has shown for loggerhead sea turtles); sea level rise brought on by climate change can limit turtle nesting habitat (Fish et al. 2008; Doney et al. 2014); ocean acidification can lead to the release of harmful compounds from ocean sediments that can impact turtle (and other long-lived species) health (e.g., Hexavalent chromium [Cr(VI)], Speer et al. 2018); climate change is linked to increased rates of disease in many species, including turtles (Doney et al. 2014); and, increase in inter-nesting intervals and decrease in clutch frequency can be attributed to changes in the oceanographic conditions that affect prey availability (Doney et al. 2014).

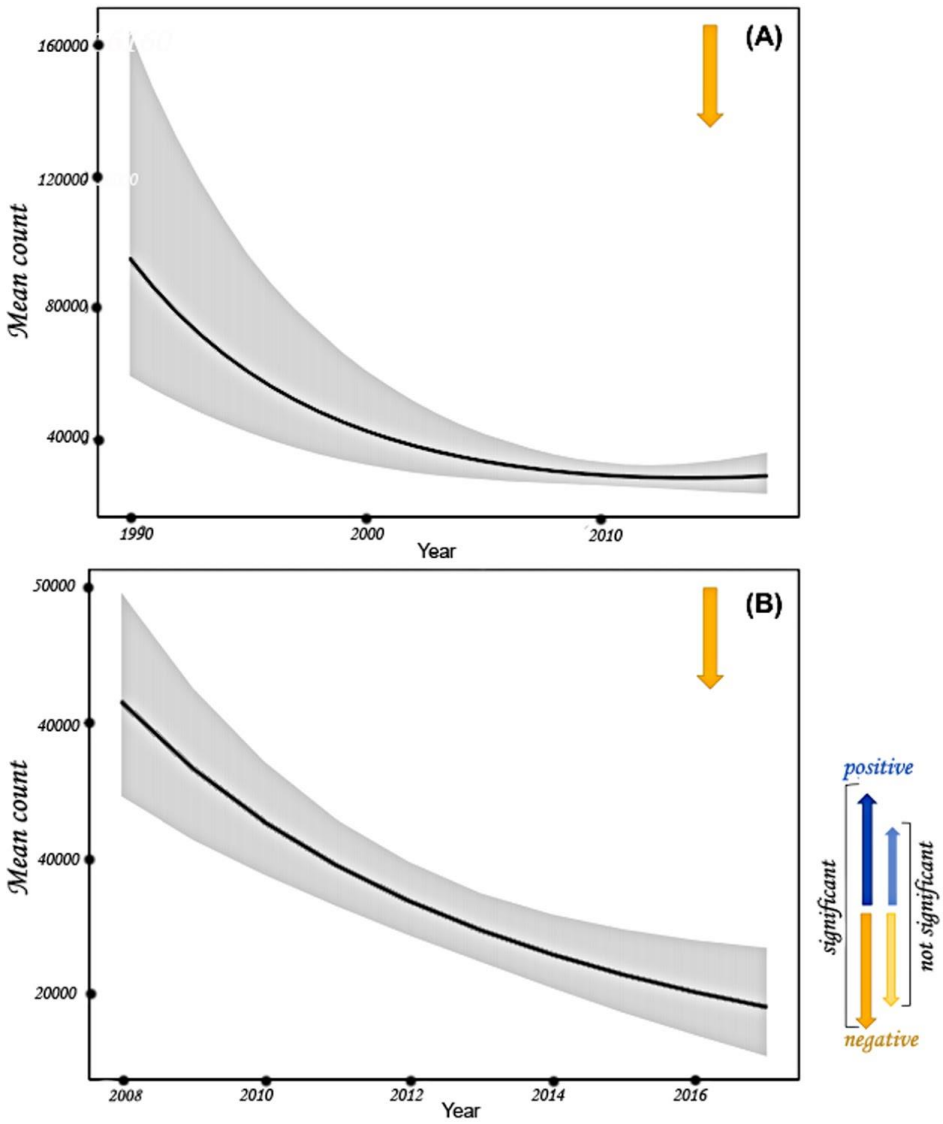

Figure 2: *Regional-level trends (annual geometric change in nest counts) for (A) 1990-2017 and (B) 2008-2017. Line is geometric annual mean trend (weighted by relative site-level abundance) and shaded area in 95 percent credible intervals. Source: Northwest Atlantic Leatherback Working Group 2018.*

3. Conservation Challenges and Opportunities

The life history of the NWA leatherback sea turtle poses several conservation challenges. This highly migratory species crosses multiple national and international boundaries in its lifetime, dispersing widely across the Atlantic Ocean. This makes it difficult to adopt area-based protection measures when the turtles are migrating or foraging. At the same time, nesting is concentrated in a few locations. This makes the subpopulation sensitive to fishing pressure in these areas, as well as changes in habitat suitability and the existential threat of climate change. International cooperation is essential to overcome these issues (Bräutigam & Eckert 2006; Dow Piniak and Eckert 2011; Eckert et al., 2012; Northwest Atlantic Leatherback Working Group 2018).

The Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) is the world's only treaty dedicated to sea turtles. The objectives of the IAC are the protection, conservation, and recovery of the populations of sea turtles and their habitats, on the basis of the best available scientific information and taking into consideration the environmental, socio-economic, and cultural characteristics of its Parties. In 2019, the IAC 9th Conference of Parties, addressing the technical advice from the Northwest Atlantic Leatherback Working Group in the document "Northwest Atlantic Leatherback Turtle Status Assessment" and the Recommendations from the IAC Scientific Committee adopted a Resolution on the Conservation of the Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*) (CIT-COP9-2019-R2) instructing the Secretariat *Pro Tempore* and Parties to reach out to countries that are critical to the survival of the species but that are not yet parties to the convention. These countries – which host some of the largest remaining nesting colonies in the world – are Guyana, French Guiana, Trinidad & Tobago, and Suriname. Canada, which provides uniquely important foraging habitat and migratory passage to these same turtles, is also not yet a party to this important treaty. To realize holistic and comprehensive conservation solutions, it is highly advisable that each of these countries join the IAC as soon as practicable.

Other priority actions identified in the IAC Resolution include strengthening fishery observer programs, implementing "Guidelines to Reduce Sea Turtle Mortality in Fishing Operations" of the United Nations Food and Agriculture Organization (FAO), and increasing enforcement of laws and regulations relevant to the NWA leatherback (CIT-COP9-2019-R2). These commitments form a strong foundation for Parties to work together to stabilize and reverse the declines of the NWA leatherback.

Using the IAC legal framework to cooperate and coordinate activities has several advantages. Information, knowledge, and experience exchange between all countries within the NWA leatherback's range provide important learning opportunities for everyone involved. IAC Parties have received technical support to develop their national sea turtle conservation plans, training on best practices to reduce sea turtle mortality in fishing gears, workshops to monitor nesting beaches, and nests handling, among others. Also, becoming part of the IAC has meant the installation of the discussion on sea turtles in the governmental agenda of the Parties, contributing to the implementation of a top-down conservation approach, mobilizing the governments' participation, and allowing that topics that are not generally discussed, such as sea turtle biology, are addressed at the governmental level.

Since the IAC is a binding treaty, it also serves as a forum for countries to review each other's efforts and, when needed, to hold each other accountable for the performance of their respective commitments. Finally, given that the large majority of Wider Caribbean Region range states already protect the leatherback (Eckert & Eckert 2019), joining the IAC, which is complementary to other Conventions, helps countries strengthen the implementation of their domestic policies, and comply with international commitments under other treaties already signed by the Parties.

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