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

CRITICAL AREAS FOR THE CONSERVATION OF THE NORTHWEST ATLANTIC LEATHERBACK TURTLE (*Dermochelys coriacea)*

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By

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(*Dermochelys coriacea)*

Background

Leatherback turtles (*Dermochelys coriacea*) have a circumglobal distribution with nesting sites on tropical sandy beaches and migratory and foraging ranges extending into temperate and sub-polar latitudes. Wallace et al. (2010) defined Regional Management Units (RMU) for sea turtle species, functionally equivalent to the IUCN subpopulations, providing an appropriate demographic unit for the Red List assessment. There are seven leatherback turtle RMUs (hereinafter subpopulations): Northwest Atlantic Ocean, Southeast Atlantic Ocean, Southwest Atlantic Ocean, Northeast Indian Ocean, Southwest Indian Ocean, East Pacific Ocean, and West Pacific Ocean. (Figure No.1)

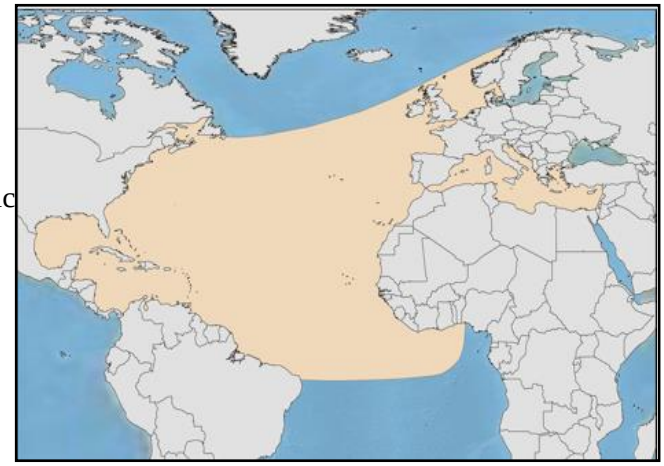

Figure 1: Distribution of the Northwest Atlantic Leatherback RMU (Wallace *et al.* 2010).

The Northwest Atlantic (NWA) Leatherback (*Dermochelys coriacea*) management unit (RMU) or subpopulation extends along the North Atlantic Ocean, from the Wider Caribbean region nesting sites to the feeding grounds from the Equator to northern temperate latitudes (TEWG 2007, Wallace et al. 2010; Eckert et al. 2012).

Their nesting is scattered with 92% of all known nesting beaches supporting relatively small numbers of nests (<100 clutches per year, the equivalent to <20 reproductive females) (Dow et al. 2007, Dow Piniak and Eckert 2011). Eckert and Eckert (2019) updated the Wider Caribbean Region nesting information recording 467 sites from the Florida Peninsula to north Brazil, and from the Gulf of Mexico and Central American coast to the Antilles (Figure Nº 2).

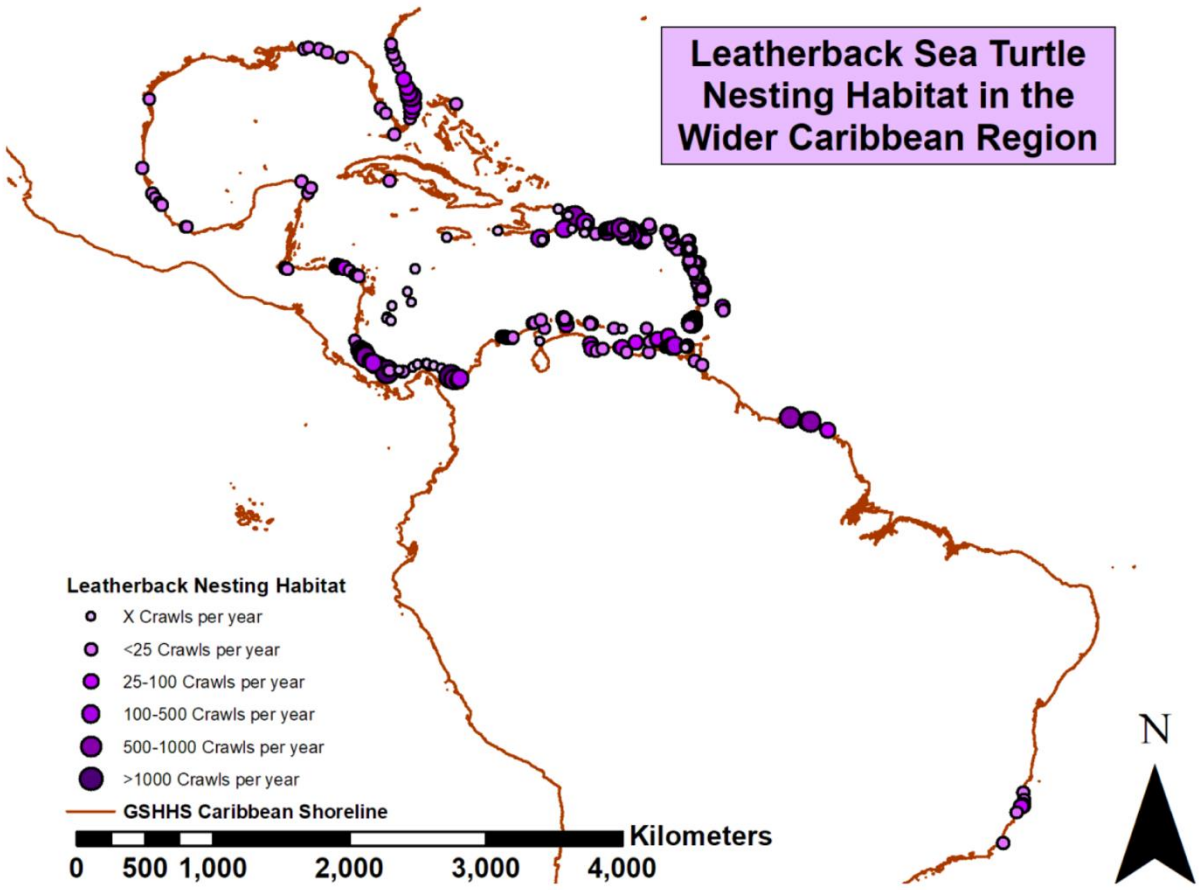

Figure Nº 2: Northwest Atlantic Leatherback *D. coriacea* nesting distribution (source: Eckert and Eckert 2019).

Last decade assessments on the NWA Leatherback status, concluded that this management unit was abundant with a steady and even increasing trend, except for those in Costa Rica already showing a population decrease (Troeng, Chacon and Dick 2004; TEWG 2007; Tiwari et al. 2013). TWEG (2007) compiled data on various demographic parameters and abundance metrics, to estimate the size and trend of the adult population and concluded that for 2004-2005 there were between 28.000 - 46.000 nests and between 4.800-11.000 nesting females, and an increasing trend throughout the region (TEWG 2007).

Hence, leatherback turtles provide the most troubling story, having appeared to be rebounding (TEWG 2007) until recent field observations of declining trends led to a quantitative regional assessment concluding that "Abundance-weighted trends were negative in all temporal scenarios and became more negative as the time series shortened." The most striking is the approximately 99% decline in Awala-Yalimapo, French Guiana (once ranked among the largest leatherback colonies in the world) within the most recent generation of leatherback turtles (Northwest Atlantic Leatherback Working Group 2018).

According to the Northwest Atlantic Leatherback Working Group (2018), regional trends of NWA leatherback (*D. coriacea*) annual counts of nests have decreased significantly at the site level and regional scales, over the long-term (1990-2017) and more recent periods (2008-2017), with decreases of over 90% in Awala-Yalimapo (French Guiana) and in Suriname since the 1990s. Only six colonies

with more than 1000 nesting crawls per year remain, and these are grouped in the southern latitudes (French Guiana, Panama, Trinidad). Twelve sites reporting 500-1,000 crawls per year are more broadly distributed in Colombia, Costa Rica, Dominican Republic, French Guiana, Grenada, Panama, Puerto Rico, Suriname, Trinidad, and the USA (Florida) (Eckert and Eckert 2019). More than half, (63 %) of all known nesting beaches support small colonies with fewer than 25 crawls per year; 12% supports an unknown abundance of crawls (Eckert and Eckert 2019).

Conservation Status and Threats

NWA Atlantic leatherback turtle's conservation is challenging given the broad spatial distribution, encompassing much of the Atlantic basin, including terrestrial, coastal, and pelagic habitats throughout various life stages, and because they travel across numerous political borders. As a result, effective management measures must be enacted at multiple international and local levels, including fisheries bycatch reduction, protection of nesting habitats, protection of in-water habitats, and reduction of intentional captures.

TEWG (2007) recognized that the greatest threats to the NWA species are at two levels; the first one and direct to its survival, is eggs extraction for consumption or trade, legal or illegal directed hunting, predation by introduced species, and the loss of nesting habitat either due to coastal development or to the effects of climate change. The second category is in their inter-nesting and migration habitats, including direct catches, bycatch, and collision with boats. Also, Dow et al. (2007) established that the greatest threats in beaches were erosion, loss of clutches due to abiotic factors, artificial light, and egg collection; while in-water are pollution, bycatch, entanglement, and hunting.

Oravetz (2000) showed that the main sources of sea turtle mortality by fishing gears around the world are: trawls, pelagic and bottom longlines, gillnets and trap nets, entanglement with buoy ropes and traps, as well as commercial and sport fishing lines and hooks.

Boulon (2000), Gibson and Smith (2000), Mortimer (2000), and Witherington (2000) list direct and indirect causes of mortality, and some threat reduction proposals were presented by Marcovaldi and Thomé (2000).

Based on the aforementioned analyzes and mainly on the work of the Northwest Atlantic Leatherback Working Group (2018), it is concluded that the regional trends of leatherback (*D. coriacea*) annual counts of nests have decreased significantly at a site level and regional scales, during long-term (1990-2017) and the most recent (2008-2017) timelines, with the decrease of more than 90% in Awala-Yalimapo (French Guiana) and Suriname since the 1990s (Figure Nº 3).

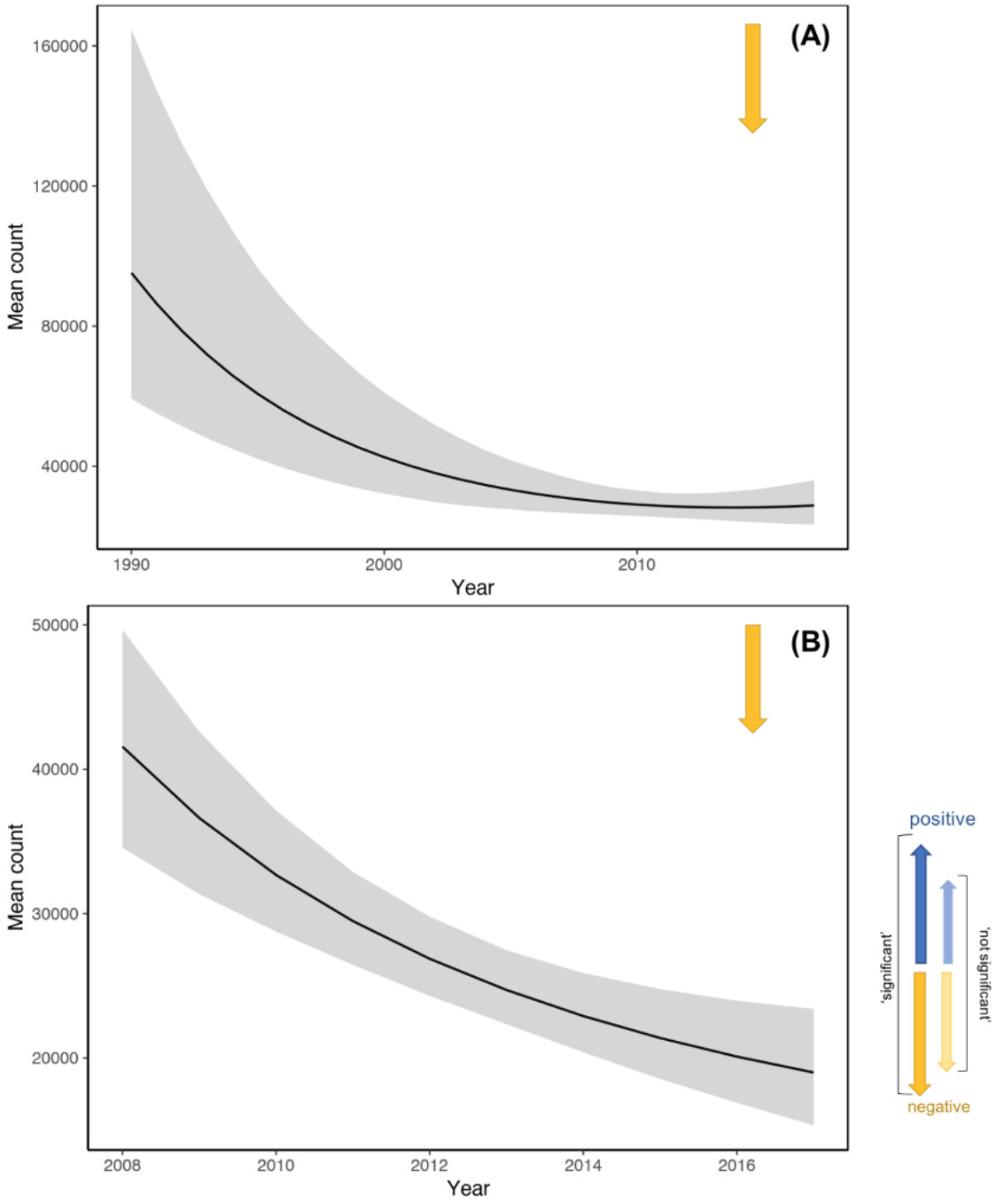

Figure Nº 3: Regional-level trends (annual geometric mean change in nest counts) for (A) 1990-2017 and (B) 2008-2017 (results for the intermediate scenario not shown). The line is the geometric annual mean trend (weighted by relative site-level abundance) and the shaded area is 95% Credible Intervals. Blue up arrows = positive trends, yellow down arrows = negative trends; large arrows = 'significant' trends; small arrows = 'non-significant' trends. Source: Northwest Atlantic Leatherback Working Group (2018).

Critical Areas in their life cycle:

Undoubtedly, critical stages of this species life cycle are linked to areas in the Atlantic and the Caribbean; these phases include feeding, migration, reproduction, and nesting. Several studies such as those by TEWG (2007), Dutton et al. (2013), Stewart et al. (2016), Bond & James (2017), Northwest Atlantic Leatherback Working Group (2018), and Eckert and Eckert (2019); have compiled critical information that allows establishing a characterization of the Northwest Atlantic leatherback critical areas:

1. **Nesting areas**: From the continental Caribbean in southern Nicaragua through Costa Rica, Panama, and the Gulf of Uraba in Colombia. Venezuela north coast, Trinidad and Tobago beaches, as well as several of the Lesser and Greater Antilles (especially Puerto Rico, the Dominican Republic, and the Virgin Islands). The Florida Peninsula Atlantic Coast is also included (Figure Nº 4). Also see Bond & James (2017).

Figure Nº 4: Northwest Atlantic Leatherback main nesting areas

2. **Foraging grounds**; includes the Gulf of Mexico inner waters in front of Florida and Louisiana, the whole USA east coast, and part of Canada´s east coast. (Figure Nº 5)

Figure Nº 5: Northwest Atlantic Leatherback main foraging grounds

3. **Migration areas:** There are two well defined two-way migration corridors (Annexes 1-3), where the first corresponds to the external waters of the Caribbean from eastern Canada to South America´s north coast (Trinidad and Tobago, the Guianas, Suriname, Venezuela), and the waters off Venezuela and Colombia towards the Central American isthmus. This same corridor is used as a post-nesting way back (Figure Nº 6). A second corridor goes from the Caribbean waters off Central America, passing through Yucatan´s strait to the inner Gulf of Mexico, coinciding with a foraging area in the Gulf.

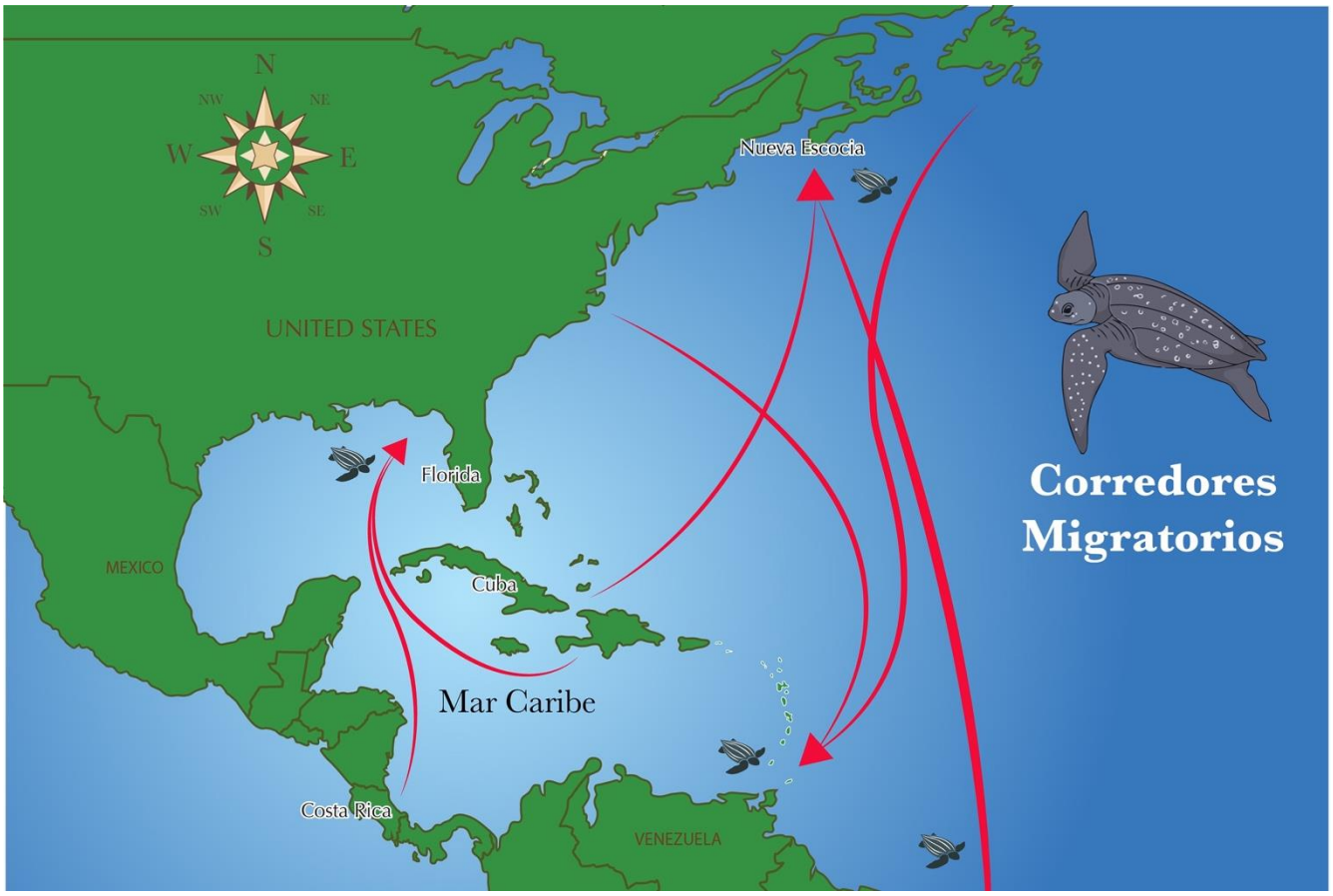

Figure Nº 6: Northwest Atlantic Leatherback main nesting and post-nesting migratory routes

Conservation Solutions

The Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) provides the countries with solid foundations to work on actions towards this species recovery. Given the leatherback critical situation, regional efforts could be strengthened by working together with the Parties, as well as with national and international organizations involved in its conservation.

Several regional efforts over the past decades have pointed to the critical areas to focus resources and efforts that could change the current population trend. As a result, several viable actions have been identified to implement on nesting beaches, key marine areas, and policy/governance to address threats and promote their recovery. In particular, the Action Plan is being developed based on three goals:

1) Protect nesting beaches and increase hatchlings production
2) Reduce mortality in bycatch in fisheries
3) Use international political instruments for regional conservation, especially in critical areas where vital life cycle processes occur, such as migratory corridors, foraging grounds, inter-nesting aggregation areas, and nesting areas; and seek for the integration of key countries for this species, such as some Caribbean nations (e.g. Trinidad, Grenada, etc.) and Canada.

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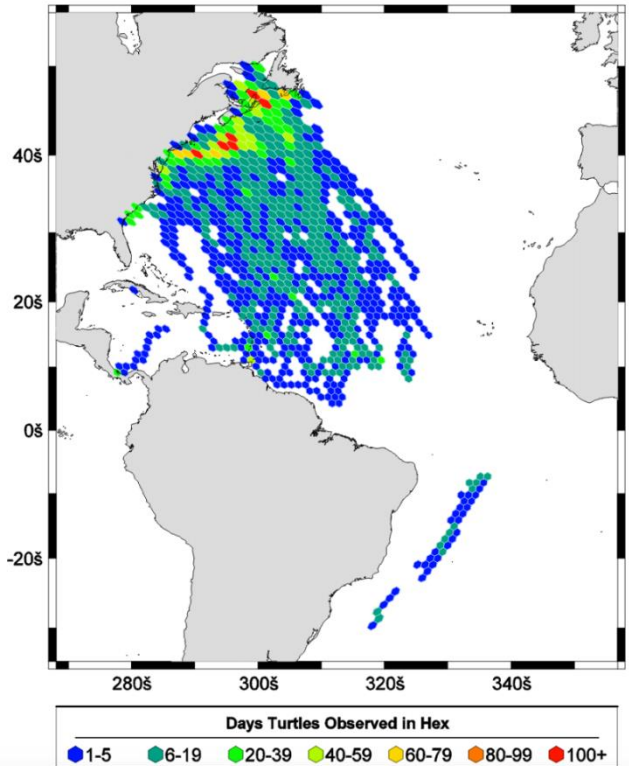
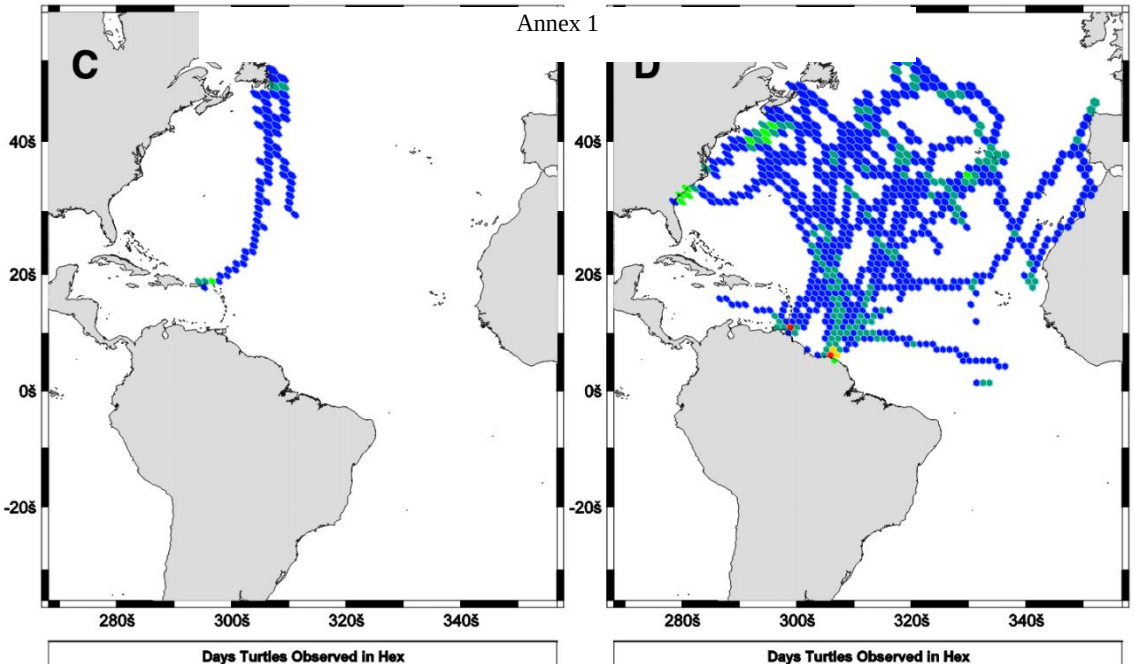
Annexes

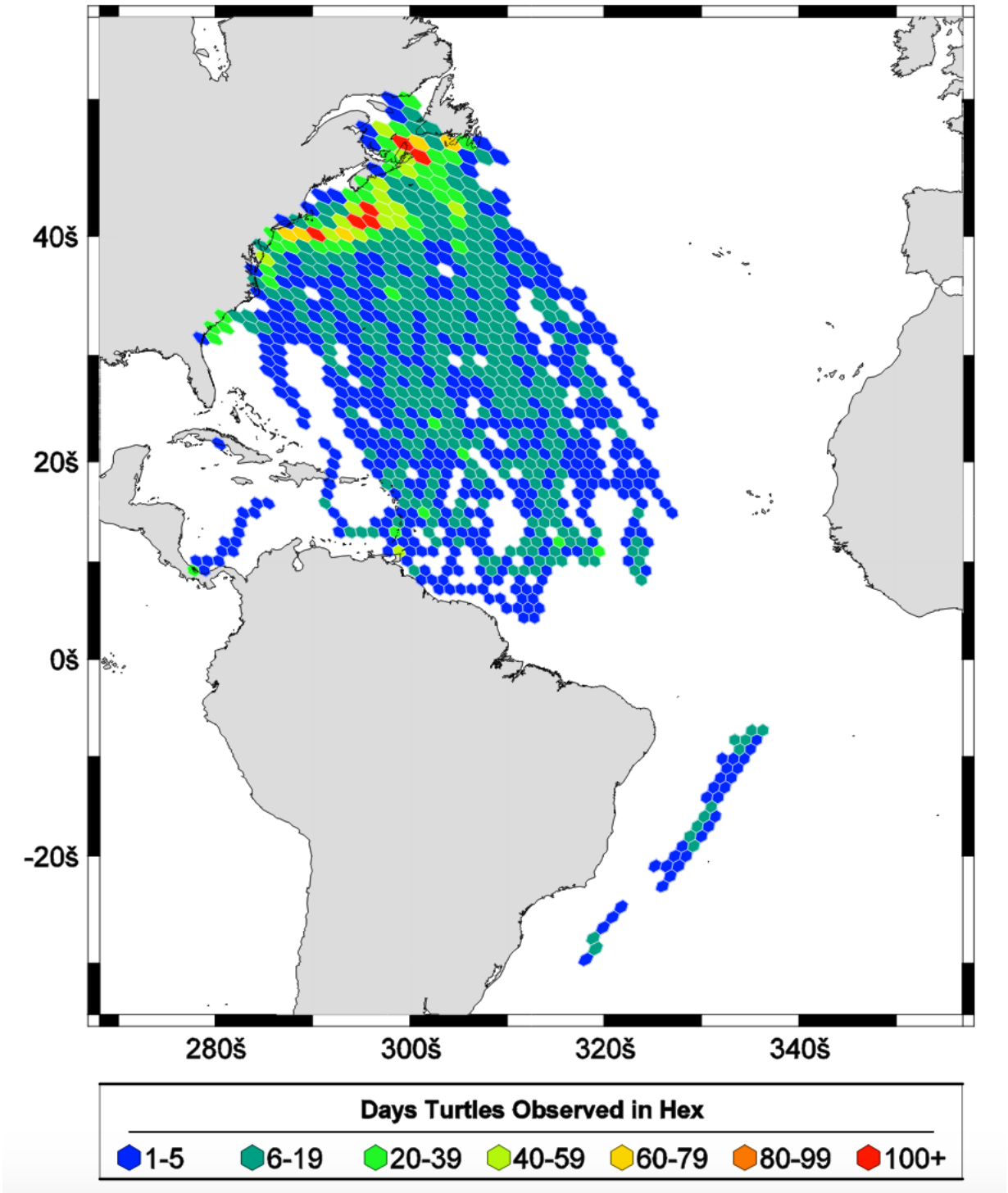
Maps showing migratory routes from foraging to nesting zones and vice versa, based on satellite tracking. (TEWG 2007).



Annex 1



Annex 2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Days Turtles Observed in Hex
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Annex 3