Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

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The Sea Turtle Conservancy (STC) respectfully submits these comments on *Technical and Legal Analysis in Support of the Petition to Designate the Northwest Atlantic Leatherback Subpopulation of Sea Turtles as a Distinct Population Segment (DPS) and List the DPS as Threatened under the Endangered Species Act* submitted by petitioner Blue Water Fisherman's Association. We agree that the population is discrete and significant to its species and meets the requirements of listing as a DPS and concur with the petition's justification of this designation. However, unlike the petitioner, we conclude that the proposed DPS should to be listed as Endangered. The premise of the petition is that this population is increasing and major threats to its existence have largely abated. However, much of the data on which the petition it is based are more than a decade old. Recent evidence from numerous well-monitored beaches studied over the long-term, as well as preliminary shorter term evidence from other well-monitored sites, and increasing natural and anthropogenic threats to the species in marine and terrestrial habitats lead us to conclude that the population is not increasing and could be declining on a region-wide scale. For these reasons, STC believes that the designation of this proposed DPS as Threatened or Recovered is not warranted and urge NMFS to designate it as Endangered.

Region-Wide Leatherback Nesting Declines Are Occurring on Well-Monitored Nesting Beaches

Like other species of sea turtles, fluctuations in leatherback nesting occur from year to year; the status of a nesting assemblage only can be determined after some years of consistent data collection. Caution needs to be taken in assessing nesting trends and determining whether a population is stable, increasing or declining. Consistency of effort and long-term nesting data collection provide the critical information needed to determine nesting trends and possible population changes. Nevertheless, short term changes of several years also have value and should not be ignored as they may presage future trends.

In the Northwest Atlantic, leatherback nesting declines have been demonstrated on beaches in Central America as well as in the insular Caribbean. Several longer-term surveys in Central America undertaken by STC are telling: along the Caribbean coast of Costa Rica, leatherback nesting has declined at two historic sites, Tortuguero and Gandoca. In Tortuguero, where STC has been monitoring leatherback nesting since 1995, nesting has declined drastically from over 1600 nests in 1995 to fewer than 100 nests in 2017 (Figure 1). While overall leatherback nesting has declined in Costa Rica, nesting has been stable at Pacuare Nature Reserve, where an average 809 nests are laid annually (Rivas, Fernandez & Marco 2015). Since 2005, STC has been monitoring nesting at Chiriquí Beach, Panama. With between 3000 and 6500 nests per season, Chiriqui Beach is the second largest leatherback rookery in the North Atlantic.

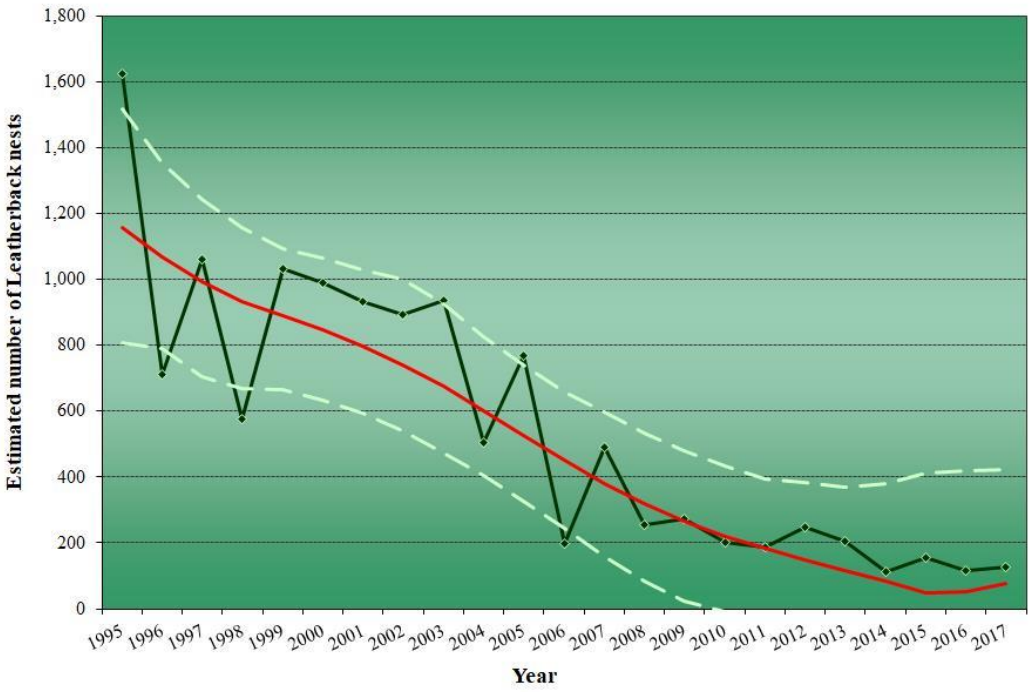

Figure 1. Leatherback nesting trend at Tortuguero, Costa Rica from 1995 to 2017.

While not as dramatic as the decline documented in Tortuguero, the overall nesting trend at Chiriquí Beach is one of decline (Figure 2).

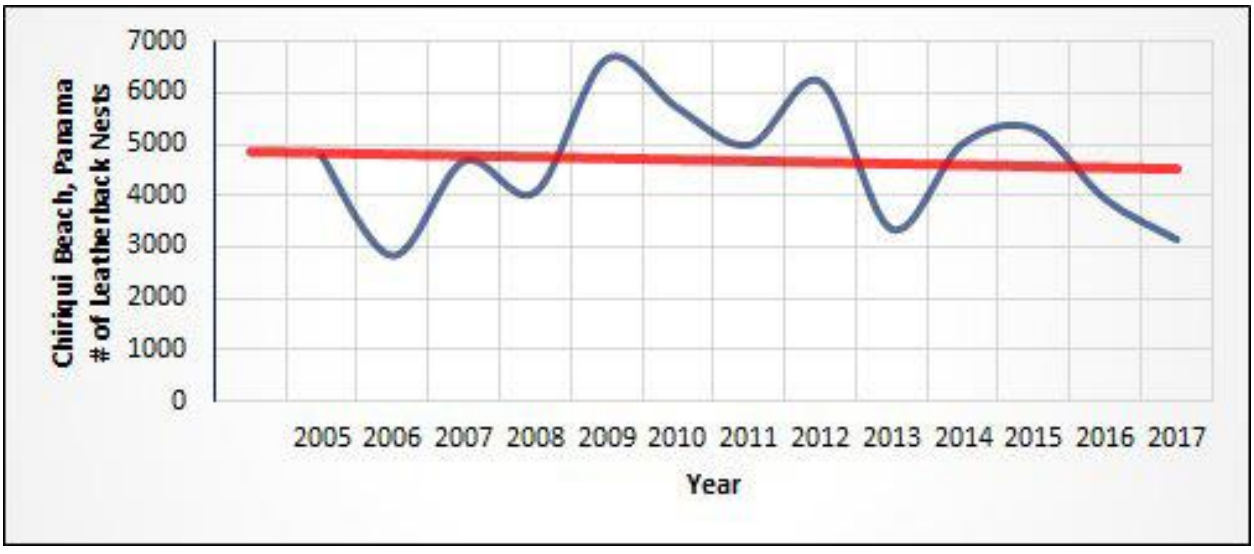

Figure 2. Leatherback nesting trend at Chiriquí Beach, Panama from 2005 to 2017.

In recent years, nesting populations at Sandy Point National Wildlife Refuge, St. Croix, USVI; Florida, USA; and the Culebra Archipelago, Puerto Rico have declined. In addition, several of the largest nesting

beaches in Puerto Rico have declined over the past few years, while only a few of the smaller beaches have shown a slight increase or are stable, suggesting an overall decline in the Puerto Rican nesting population. Nesting declines have also been reported in Trinidad and Tobago (Eckert 2013). These region-wide declines on numerous protected and consistently monitored beaches is baffling and cause for concern. It appears that whatever the cause(s), these declines are happening on a region-wide basis.

Some leatherbacks nest on multiple beaches within a region, but these movements do not account for the declines which have been observed on some beaches. With a handful of recorded individuals showing low nesting site fidelity, or the rare occasion of movement between close proximity nesting beaches (Horrocks et al. 2016; Dutton et al. 2013), the importance of trends at all nesting beaches is an important consideration, especially the nesting trends at the larger nesting sites. Some movement of individuals is not necessarily associated with low site fidelity, but the movement and shifting of sands and a suitable nesting beach. The largest rookery in the North Atlantic is in the Guianas (Guyana, Suriname and French Guiana) (Fossette et al. 2008; Turtle Expert Working Group (TEWG) 2007). This area experiences annual shifts in sand resulting in the movement of suitable nesting beaches (Fossette et al. 2008). The appearance of low site fidelity in this area is more likely due to leatherback turtles following the shifting nesting beaches rather than not selecting the turtle's natal beach.

The Petition May Overestimate the Size of the Northwest Atlantic Leatherback Population

Based on nesting numbers in 2004 or 2005, the TEWG (2007) estimated between 28,000 and 46,000 nests for Northwestern Atlantic beaches, representing between 17,000 and 52,000 adults. With recent declines at many nesting beaches, STC concludes that the petition's estimate of approximately 44,000 adult individuals is overly optimistic.

Overestimates of population size happen in several ways. It is very possible that the nest frequency value used to estimate the adult population was underestimated, resulting in overestimates of the actual number of nesting leatherbacks. For example, Tucker (2010) found that nocturnal tagging efforts underestimated the mean number of nests deposited by an individual loggerhead by more than 50%, suggesting the overall population estimate for loggerhead turtles may have been overestimated by over 30%. A similar underestimate of the mean number of clutches per year deposited by leatherback turtles also may be occurring, especially with annual beach monitoring efforts varying due to inconsistent funding and beach accessibility on some of the most important leatherback nesting beaches in the North Atlantic (Fossette et al. 2008). Nest frequency, and thus population density, for smaller, well monitored beaches may be more accurate (TEWG 2007). Additional research using satellite telemetry is needed to evaluate current leatherback clutch frequency estimates at the larger rookeries, including the region's largest rookery in the Guianas.

The size and status of nesting populations in the Guianas are uncertain because nesting data are not up-to-date nor comprehensive; population trends have not been analyzed for more than decade. These beaches and the turtles which use them are subject to multiple threats, including beach erosion and movement, harvest for food, egg poaching (nearly 100% on some beaches), nest predation (native and

invasive species), and capture in nearshore and offshore fisheries (Fossette et al. 2008). The estimated size of this population and its associated nesting trend are critical to evaluating the overall status of leatherbacks in the Northwest Atlantic, but data on which to base these evaluations do not exist.

The petition's optimism about population size, this time specifically related to nesting beaches, also is reflected in the distribution of nesting locations as presented in Fig. B.1 on page 11 of the petition. The map does not represent only long term, viable nesting sites. According to the source of the map (Dow Piniak & Eckert 2011) many of the largest leatherback rookeries can be found in the Wider Caribbean, but only 10 of these sites have more than 1,000 crawls, not nests, per year, with four more sites having between 500 and 1,000 crawls. The majority (58%) of sites on the map represent nesting beaches with less than 25 crawls per year and 21% have an unknown number of crawls (Dow Piniak & Eckert 2011). The map shows 470 nesting sites, but contributions to the overall leatherback population are unknown for 371 (69%) of these sites.

Lastly, the petition's inclusion of future regional population estimates is fraught with difficulty. The exercise of estimating population size into the future was undertaken for the World Conservation Union (IUCN) on data available in or before 2010 (Tiwari et al. 2013). Eight years later, the situation on many beaches has already changed from increasing to stable or declining populations. As warmer temperatures adversely and rapidly modify marine and coastal environments, projected estimates of sea turtle population size a generation or more into the future should be viewed with skepticism.

Northwest Atlantic Leatherback Nesting & Hatching Success Is Low and May Be Declining

In addition to declining numbers on important beaches and possible instability on the most critical beaches in the Guianas, overall leatherback nesting and hatching success in the Northwest Atlantic may be lower than average for the species, even at sites that have stable or increasing nesting. Globally, leatherback hatching success is generally ~50% (Perrault et al. 2012). The nest success rate is between 5 and 35% in the largest Atlantic rookery in the Guianas, with hatching success rates between 10.6 and 56.0% (Fossette et al. 2008). Evidence that already low rates are declining further on some beaches comes from the Sandy Point National Wildlife Refuge, St. Croix, USVI where overall mean hatching success and emergence have declined significantly between 1990 and 2010 (Garner et al. 2017). At Tortuguero, Costa Rica, in 2015 the mean hatching success for leatherbacks was 8.9% and hatchling emerging success was 8.2% (unpublished STC data). In Panama, hatchling emergence at Chiriquí Beach is 55.6% but only 11.4% at Soropta, the second highest nesting site in the Bocas del Toro, Panama region during the 2016 nesting season (unpublished STC data). As noted in the section on climate change below, warmer temperatures on nesting beaches are likely responsible for these declining success rates.

Significant Natural and Anthropogenic Threats to Northwest Atlantic Leatherbacks Are Increasing

Leatherbacks are fully protected on paper in all but five Wider Caribbean countries (Horrocks et al 2016), but protection is often not implemented fully. Bycatch injury and mortality occur in national and

international waters, and egg poaching still occurs at many nesting beaches. Ingestion of marine debris, beach armoring and modification for tourism, and oil and gas exploration pose additional threats. Threats to leatherbacks in the Guianas also include beach erosion and movement, harvest for food, egg poaching (nearly 100% on some beaches), nest predation (native and invasive species), and fisheries bycatch (8 to 18% of nesting females show injuries or scars related to bycatch interaction) (Fossette et al. 2008). Between 2005 and 2012, STC has deployed 20 satellite transmitters on nesting females in the Guianas. Ten percent of these animals were captured by fisheries. One female was caught by a local fisherman and a second was taken in the international waters of the North Atlantic (unpublished STC data).

Climate change is a very significant issue for sea turtle conservation. On beaches, warmer temperatures alter the sex ratio of sea turtle nests (Jensen et al. 2018) and possibly decrease nest success, especially on black sand beaches. As mentioned earlier, the hatchling emergence rate at Soropta Beach, a black sand beach, was significantly lower than at Chiriquí Beach, a nearby tan-colored beach. Climate change may not be the only cause of low hatchling emergence as well as the skewing of sex ratios in developing clutches to produce more females, but it is a very important factor. A study at Sandy Point National Wildlife Refuge recorded increased mortality of leatherback eggs at late stage embryo development associated with decreased precipitation and increased temperature (Garner, MacKenzie & Gatlin 2017). These effects can be expected to increase with higher temperatures. Climate change also is expected to result in more severe storms, surge events and beach erosion, all of which will negatively affect nesting and hatching success for all species of sea turtles. Changes are also occurring in marine habitats as waters warm. At leatherback foraging sites, Neeman et al. (2015) observed delays in nesting associated with increased sea surface temperatures. Nesting delays could have cascading effects on leatherbacks and nesting habitats. Warmer water temperatures already allow leatherbacks to expand their North Atlantic range into higher latitudes, where, in all likelihood, they will face additional interactions with fisheries.

Leatherbacks are especially vulnerable to bycatch in longlines and gill nets. Fossette et al. (2014) identified four areas of leatherback susceptibility to bycatch interactions in the North Atlantic (Fig 3) where longlines are the predominant gear. These areas are located in international waters of the central northern Atlantic, the east coast of the United States, around the Canary Islands, and in the Cape Verde basin. High susceptibility areas are represented by multiple national exclusive economic zones and international waters requiring multi-national cooperation among Regional Fisheries Management Organizations (RFMOs) to work towards reducing leatherback bycatch in the North Atlantic. Under ESA regulations, U.S. fishermen have taken the lead in developing and using methodology and gear to reduce longline capture, injury and mortality. Nevertheless, despite recognition of the problem and proven mitigation measures, the RFMOs have failed to address leatherback interactions in longline fisheries. The need to reduce gill net bycatch in more localized settings also remains problematic because small-scale fisheries are extensive and difficult to regulate. As a result, bycatch remains a significant threat to the species.

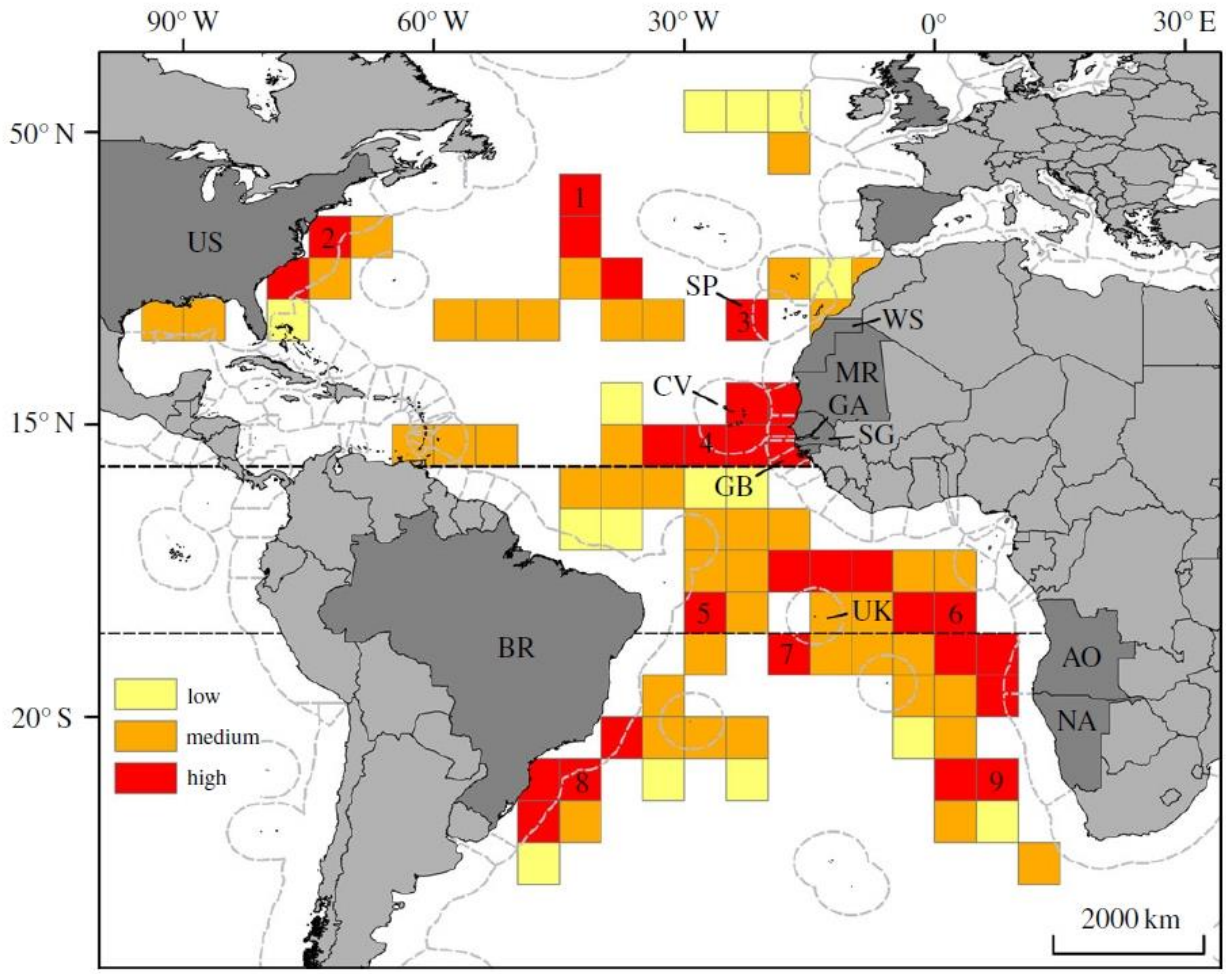

Figure 3. Long-term susceptibility of leatherback turtle to bycatch in longline fisheries. This map shows where high-fishing-pressure areas overlapped with leatherback habitat use, between 1995 and 2010, in the Atlantic Ocean (Fossette et al. 2014).

STC Disagrees with Conclusions in the Petition's Evaluation of ESA section 4 (a)

Pursuant to Section 4 of the ESA, NMFS and the U.S. Fish and Wildlife Service (FWS) are required to evaluate the conservation status of a DPS as Endangered, Threatened or Recovered. The petition provides an extensive review of the five factors on which NMFS and the FWS will base their listing decision, but STC disagrees with many of its conclusions. The petition states that, "threats mostly appear to be abating due to a near cessation of harvest, decreased fishing effort and government conservation efforts although some troublesome areas still exist" (Petition at p. 48). Our earlier comments on threats belie this statement. Furthermore, the petition downplays the significance of climate change which may be the most significant threat to the long-term survival of the DPS, suggesting for example, that the long-term effects of warmer temperatures on sex ratios can be mitigated at a time when embryonic death on warmer beaches is already occurring. Although the petition's review of international

instruments is comprehensive, many of these instruments are ineffective or poorly enforced. Lastly, the petition states the population is increasing when there is ample evidence to suggest that it is not.

Conclusion

As a unique and significant subpopulation of leatherbacks, Northwest Atlantic leatherbacks meet ESA criteria to be designated as a Distinct Population Segment. Numerous and in some cases increasing natural and anthropogenic threats to this proposed DPS pose significant risks to its future. Recent nesting data indicate that important segments of the proposed DPS may be declining and include possible extirpation at multiple nesting sites in the Northwest Atlantic. Not one of the eight U.S. Recovery Plan objectives for Atlantic Leatherbacks and priority one tasks has been completed. Moreover, current protections in the region are not fully implemented or enforced. We believe that the precautionary approach is warranted and urge NMFS to designate the proposed DPS as Endangered.

In closing, we also would like to associate ourselves with the excellent and more detailed remarks on legal issues submitted separately by Earthjustice.

Thank you for considering our comments.

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