

Peer Review Report
on the
Draft Biological Report on the Designation of Marine Critical Habitat
for the Loggerhead Sea Turtle, *Caretta caretta*

Peer Reviewers:

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Blair Witherington, Ph.D., Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Melbourne Beach, FL

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General comments¹

Reviewer 1

Comment: I commend the Critical Habitat Loggerhead Review Team (CHLRT) for their comprehensive review of the published literature. The expansive distribution of loggerhead sea turtles in the marine environment, both due to ontogenetic development and resource partitioning, makes the delineation of critical habitat challenging. However, the draft critical habitat plan in its current form needs further work, predominantly with respect to synthesis. This letter is intended to provide an overview of my assessment of strengths and weaknesses of the draft plan, and detailed edits are provided using the track changes feature in the enclosed document.

My primary concern was that the areas of marine habitat proposed for designation were not listed up front, followed by justification for why those areas were selected. At present, those areas include (1) near-shore coastal waters with 1.6 km of 36 critical nesting beaches identified by the U.S. Fish and Wildlife Service (USFWS); (2) one high density over-wintering area off North Carolina; (3) one high density breeding area off central Florida; (4) two spatially-constricted migratory corridors; and (5) a large swath of ocean where *Sargassum* may be present. Structuring the report around those designations would provide a better flow to the document.

Response: *We do have a list of proposed areas in the Executive Summary and the Table of Contents and List of Tables clearly outlines where a reader can find this information. We purposefully did not focus only on these areas because we wanted to make it clear that we had a systematic process for considering all areas; indeed, we walked through the lifestages and habitat needs for each in order to ensure that we adequately considered all needs of the*

¹ Reviewer numbers are not in the order of the reviewers above.

loggerhead. The resulting critical habitat areas were a result of that systematic process. All that said, we will consider re-structuring our presentation in the proposed rule, which should have less background in any event.

Comment: At present, more detail from the literature [including maps] was included (and repeated nearly verbatim) than is necessary, and areas proposed for designation are first mentioned too late in the document.

Response: *We deleted many redundancies and unnecessary detail in response to this and other comments. However, there were places where we purposefully included redundant information to ensure that each section would be understood without reading the entire document. That said, we did not pare down the verbiage as considerably as the commenter would have liked. We did attempt to pare it down more in the proposed rule.*

Comment: With respect to justifications supporting designation as critical habitat for the five types of areas referenced above, the following paragraphs represent my personal assessment of their selection. Literature citations appear in the report or at the end of this letter if denoted with an asterisk (*).

- 1) Near-shore coastal waters adjacent to the critical regional nesting beaches comprise the vast majority of the areas proposed for designation as critical habitat, and are included to permit hatchling dispersal as well as unobstructed ingress/egress of nesting females. These beaches were quantitatively selected by the USFWS, which gives merit to the selection of the adjacent near-shore coastal waters for critical habitat designation. The CHLRT selected the lesser of two boundary areas (1 vs. 3 nm) evaluated based on the presumption that dispersal of sea turtles increases concurrent with increased distance from shore, which also results in greater deviation in arrival/dispersal bearings. This belief seems reasonable and results in an area that should also, in theory, be easier to monitor and manage; however, the smaller area may not be as beneficial to loggerhead sea turtles as a larger area. **Details of what protection of these critical areas would involve (i.e., seasonal closures, activity restrictions, etc.) were not specified, which limits the ability to properly evaluate the effectiveness of the proposed protected areas.**

Response: *The purpose of this report is not to detail protections that would result from designation, but simply to identify areas critical to the conservation of the species and in which management considerations might come into play. Section VI, Special Management Considerations, does outline activities that might need management as a result of critical habitat designations and, although it doesn't detail protections that might result, it does indicate where NMFS might look more closely during consultations and ask for some seasonal or other restrictions on activities.*

- 2) A large portion of the continental shelf off North Carolina (from Cape Lookout to Cape Hatteras) was selected for designation as critical over-wintering habitat predominantly because nesting females from the Northern and the Peninsular Recovery Units are known to over-winter there (Hawkes et al. 2011, Ceriani et al. 2012). Juvenile loggerheads that seasonally forage in the estuarine waters of North Carolina (McClellan and Read 2007)

through Long Island Sound, New York (Morreale 1999) are also known to over-winter off North Carolina. As such, the proposed designation of this area as critical over-wintering habitat is justified. However, I felt that the analysis of over-wintering was written too strongly from the perspective of this particular (and unique) location, and that some statements were not universally applicable. For instance, the winter aggregation of loggerhead sea turtles at this particular location is attributed to the proximity of the western wall of the Gulf Stream and subsequent thermal refuge (Epperly et al. 1995a). However, most juvenile loggerheads captured off South Carolina spend the winter off South Carolina and north Georgia waters and are more widely dispersed during the winter months than during the summer months (Arendt et al. 2012c). Three separate studies (McClellan and Read 2007, Mansfield et al. 2009, Arendt et al. 2012c) have also shown that roughly one in three juveniles left the continental shelf during winter, further suggesting a greater degree of dispersal during winter than during the summer. Complete seasonal data on adult male loggerhead sea turtles are limited, but Arendt et al. (2012b) report very small summer foraging areas but greater mobility/dispersal during winter in the Gulf of Mexico and off North Carolina.

***Response:** Agreed; the document was revised to account for these other wintering areas and references. However, not all areas that loggerheads inhabit during the winter were identified and discussed in as much detail as North Carolina. The available data reviewed by the CHRT indicated North Carolina was a high use area, with unique characteristics (e.g., Gulf Stream influence, importance to northern foragers) compared to other areas. As such, most of the winter text focused on North Carolina.*

- 3) A single breeding area off central Florida was listed for designation as critical breeding habitat. Seasonal aggregation of adult male loggerheads at this location has been known for several decades (Henwood 1987*; Wibbels et al. 1987*), with mating confirmed more recently (Blanvillain et al. 2008*). Per the draft critical habitat plan, the boundaries of the proposed critical habitat selected were based on distribution of adult males known from satellite telemetry (Arendt et al. 2012a) and aerial surveys (Schroeder and Thompson 1987). Given the historical records and proximity of this breeding aggregation to the second largest loggerhead sea turtle rookery in the world (NMFS and USFWS 2008), its designation as critical breeding habitat seems appropriate.

***Response:** Citations added. No other response needed.*

- 4) Two constricted migratory corridors where the continental shelf narrows appreciably were also proposed for designation as critical habitat. Satellite telemetry data substantiate transit through these areas by both adult male (TEWG 2009, Arendt et al. 2012b) and adult female (Girard et al. 2009*, Hawkes et al. 2011) loggerhead sea turtles during seasonal migrations in excess of 1,200 km. As such, designation of these spatially unique areas as critical habitat seems warranted.

***Response:** Citations added. No other response needed.*

- 5) Lastly, waters which support *Sargassum*, an important developmental habitat for neonate loggerheads (Witherington 2002) was also proposed for protection. In contrast to the aforementioned critical habitat designations, the proposed area for protection under this category is very large (i.e., water depths of 10 m and out to the edge of the US EEZ between 24.6 and 40°N where *Sargassum*) as well as generically described (i.e., where *Sargassum* occurs “in concentrations that support adequate prey abundance and cover, and water temperatures warm enough to support *Sargassum* growth and loggerhead inhabitation”). I concur that *Sargassum* is a critical developmental habitat, but because management actions to protect this critical habitat were not specified, it is not possible to evaluate how effective simply designating these areas as critical habitat will actually be.

Response: *Because Sargassum habitat is so important to loggerheads, we want it to be considered in consultations on Federal activities that might affect it. We do not anticipate that many, if any, Federal activities would affect Sargassum but recognize that we can't anticipate all eventualities and, as such, feel it's necessary to highlight it as important habitat. For instance, at one point a Sargassum fishery occurred and a Fishery Management Plan was developed. If this were to happen again, the effects on Sargassum loggerhead critical habitat would be considered via a consultation on the Federal action.*

In summary, the identification of critical habitats for loggerhead sea turtles in the Northwest Atlantic Ocean is advisable; however, because of the inherent limitations of designating critical habitat, this report should be concisely written. If possible, I highly recommend consolidating the details which at present appear (and re-appear) across 75 pages in Sections III through VI to a single section spanning ~20 pages. I used the track changes tool to provide a line-by-line review the draft critical habitat plan to assist with further edits.

Response: *As stated in response to your first comment, we deleted many redundancies and unnecessary detail in response to this comment; however, we did not take the time to pare down the verbiage as considerably as the commenter would have liked. We will attempt to pare it down more in the proposed rule.*

Comment: In addition, the editor should pay particular attention to the consistent use of italics for “et al.” and a single versus double “p” for designating single page references.

Response: *These changes were made. Thank you.*

Comment: Graphics should be original and not reproductions from published literature and the use of scanned images (which may be copyright protected) should absolutely be avoided.

Response: *Partly in response to this comment, we had two original maps made in house, and ensured that we had permission – and stated such in the document – to use any others. The maps included from some published literature were not able to be recreated with data available to us but they were important to the discussion (e.g., Sargassum distribution from satellite imagery). The TEWG maps were from a NMFS publication, so we didn't need permission to use those.*

Comment: A graphic providing an overview of the spatial extent of sampling surveys or locations (with sample sizes) where loggerheads were outfitted with satellite transmitters would be very useful, particularly since site fidelity likely influences observed distribution patterns. The use of such a graphic would also permit visualization of landmarks referenced in the text.

Response: *We agree that this would be useful but we didn't have the data available. We do cite and use the figures from the TEWG report and note that "Satellite telemetry data contributors and methodology can be found at TEWG (2009, pp. 24-30)..." Besides noting the source of the data (to the extent we know and what is already included in TEWG), we do not have the level of detail necessary to prepare such a figure currently available to us.*

Comment: The bulleted list of areas of known importance provided on p. 86 should be developed as a table of known study locations and include information on temporal coverage.

Response: *We understand and did discuss making this a table but, because it was not an exhaustive list, decided to simply list these known foraging sites.*

Comment: During this review, all report sections excluding the References section were evaluated in their entirety. However, because of the high frequency of errors detected in the first five pages of the References section (i.e., 12 of the first 49 references listed did not appear in the text), I did not continue to review this section any further. As such, I highly encourage cross-checking the References section with all text in the draft, to ensure that full citations appear for all references indicated in the text, and also that citations only appear for literature referenced in the text.

Response: *We have carefully cross-checked the references section. Thank you.*

Reviewer 2

Comment: I have a few minor comments throughout but for the most part I am very impressed at this valuable compendium of information and the logic leading to the recommendations. I find it thorough, up-to-date, and convincing. Kudos to the authors.

Response: *Thank you. We have addressed specific comments below.*

Reviewer 3

Comment: In general, I found this document a bit disjointed. There was a considerable amount of overlap/redundancy. I wasn't sure whether this was due to required formatting, so I didn't do more than note sections that could possibly be edited to reduce the level of redundancy.

Response: *We deleted many redundancies and unnecessary detail in response to this and other comments. However, there were places where we purposefully included redundant information to ensure that each section would be understood without reading the entire document. That said,*

we did not pare down the verbiage as considerably as the commenter would have liked, but did attempt to pare it down more in the proposed rule.

Comment: I recommend that there be greater consistency in the presentation of the data for the Pacific vs. the Atlantic. (see my comments). Both basins appeared to take very different approaches. The Pacific section I felt was stronger in some ways and used data that were ignored in the Atlantic section (e.g., bycatch, strandings, oceanographic habitat characteristics).

Response: *Strandings and fishery bycatch estimates were used in the Pacific as a means to identify whether the turtles are even present in those areas. It served a specific purpose that is not necessary for the Atlantic because the presence of the turtles in the areas we are considering is not in question. In the Atlantic, fishery bycatch correlates and oceanographic habitat characteristics are included when available and illuminating. With regard to oceanographic habitat characteristics specifically, we focused on such features for the Central North Pacific because that is an open-ocean area surrounding the islands. There is little open-ocean habitat in the Atlantic EEZ.*

Comment: The categorization of the different life stages was rather confusing throughout the document, particularly when referring to juveniles. Please see my specific comments in the attached draft. The life stages are somewhat redefined based on NMFS and USFWS 2008(?); however, for the Atlantic section, the TEWG 2009 is heavily cited or copied—this document defines the different age classes differently. Attention should be made to make sure that there are not crossed definitions or misrepresentation of the different age classes discussed. In the Pacific section, the term pelagic juvenile crops up, but it is not used in the Atlantic section. Consistency is needed.

Response: *So noted. While we still use the recovery plan (NMFS and USFWS 2008) and TEWG terminology in different sections, we did a check to ensure we did not misrepresent data or analyses for the different age classes. With regard to the term pelagic juveniles, there may have been some confusion because we previously discussed juveniles in their oceanic and neritic stages. We changed the term pelagic juvenile to oceanic juvenile. Likewise, we changed most references to pelagic habitat to oceanic to be consistent.*

Comment: Finally, the literature cited in this document does not represent the best available information/data out there. Where I could, I suggest better or additional or missing citations. While the TEWG provides a good foundation for spatial data of loggerheads in the Atlantic, those data only run through 2007-2008. There are newer papers available. I apologize that I didn't have time to provide you with a full list of citations, but I am happy to do this at a later time if the group has difficulty hunting any of the references down.

Response: *We updated many citations using your suggestions, those of other peer reviewers and on our own. Because the TEWG report represents the most comprehensive accumulation of available loggerhead distribution data through 2007/2008, and it was used as a primary data source for this document, we re-stated much of the information in the Biological Report and supplemented it with more recent data.*

Reviewer 4

Comment: It is an excellent report, and I applaud both the effort and the result. However, I see some defensible additions to the Areas Recommended for Critical Habitat Designation.

Neritic foraging habitat additions:

If candidate habitats are those occupied areas that “may require special management considerations or protection,” it seems that many neritic foraging areas would qualify. In the draft report, only nearshore reproductive habitat, winter habitat, breeding habitat, and migratory habitat are recommended as neritic CH.

Neritic foraging habitat as CH is problematic, but leaving it out may not be necessary. The omission is understandable because, as the report explains, “...the foraging grounds for loggerheads are essentially the entire continental shelf.” Thus, an all or none decision was made by the Critical Habitat Review Team. Although I agree that the entire continental shelf is an impractical area for CH consideration, I propose that some shelf foraging areas stand out.

The best example of such a candidate foraging habitat is offshore hard bottom. There is support for hard bottom as loggerhead foraging habitat, although we currently have no habitat description specific to loggerheads. I propose the general definition used for Essential Fish Habitat: “exposed areas of rock or consolidated sediments, distinguished from surrounding unconsolidated sediments, which may or may not be characterized by a thin veneer of live or dead biota, generally located in the ocean rather than in the estuarine system.”

Some justification for singling out hard bottom as loggerhead CH is that 1) the habitat has a spatial definition, 2) the habitat is susceptible to threats from line fisheries and trawls, and 3) there is a highly correlated relationship between spatiotemporal distributions of threats and occupied habitat (there are fisheries that target offshore hard bottom).

Response: *The CHRT struggled with the identification of foraging areas as critical habitat. We appreciate this suggestion and gave it serious thought. We discussed evaluating foraging habitat by substrate type, including hard bottom. A couple of things were problematic: 1) Loggerheads forage on a wide variety of substrates, although we recognize that hard bottom is one accepted type of substrate that is widely used; and 2) even if we chose this one substrate as a guide to identifying foraging areas, there are no quantitative studies that would help identify the required “critical” concentrations of foraging substrate and, being so patchy, it would be problematic to map it. In the end, we decided to include the list of areas we provided and ask for comments during the public comment period.*

Winter habitat additions:

Brumation habitat may be difficult to detect using aerial surveys and satellite telemetry. Because turtles overwintering in bottom sediments surface infrequently, PTT transmissions and availability for aerial sightings are likely to underestimate abundance. However, the Canaveral ship channel (Florida) is well represented by other evidence, which suggests that it is important winter habitat (Ogren, L. & McVea, C. J. 1995 Apparent hibernation by sea turtles in North American Waters. Biology and conservation of sea turtles (ed. K. A. Bjorndal). t pp. 127–132, Washington: Smithsonian Institution Press).

***Response:** The winter habitat text was modified to provide a few more general references to loggerhead winter distribution and habitat. We do agree that Canaveral ship channel is an area with concentrated loggerhead sightings during the winter. References to that area were included. However, in considering the available data, the CHRT determined a difference between areas off Florida and North Carolina, namely the availability of hospitable habitat in the surrounding area in Florida and the importance of the North Carolina habitat to northern foragers. The winter habitat off North Carolina was chosen because of its uniqueness in that it represented a special location where some loggerheads utilize a different behavioral strategy, i.e., staying at the northern limit where the temperature can be tolerated and they can remain close to summer foraging grounds vs. migrating long distances to warmer waters.*

Specific Comments²

Executive Summary – Table 1

Nearshore Reproductive

Comment: Is this 1 nautical mile? [PCEs, page 10]

Response: No, if it were nautical mile it would be 1.8 km

Comment: What about natural disturbances? [PCEs, page 10]

Response: Whoops. This is not a PCE; we took it out of the main body but forgot to delete it here.

Winter

Comment: The literature supports the “western” edge of the Gulf Stream [PBF of winter habitat, page 10]

Response: Added “western”

Comment: I’ll recheck in the text, but this seems arbitrary. Why not the shelf-based 200m isobath that is used in the document to delineate neritic waters? [Water depth at winter habitat, page 10]

² Note all pages referred to here are for the 12/19/12 version of the Biological Report

Response: Kept as is, hopefully text provided necessary clarification.

Constricted Migratory

Comment: Constricted migratory corridors? What about early post-hatchling/neonate dispersal in the Gulf Stream (e.g., Mansfield and Putman in press) where land is not one of the limiting factors (rather, ocean current boundaries)? [Constricted migratory corridors classified as a type of habitat, page 10]

Response: The point is that these are areas where the ability for all age classes to pass through is limited to a narrower corridor than in other areas, yet for various reasons including reaching feeding grounds and breeding, it's important for the turtles to be able to pass through. Because they're narrower corridors, the team decided that it was necessary to ensure that passage through and use of those corridors weren't limited further through Federal activities. The reason land is a limiting factor is that it constricts the passage on one side.

Further, the Gulf Stream is not a migratory corridor in the sense we are considering here. It is a hatchling dispersal feature, but it is much larger, more variable (in size and location), and the turtle use of it is much more passive, than the limited, discrete migratory corridors that we are discussing here. We added more discussion of the Gulf Stream in the oceanic habitat section.

Sargassum

Comment: Biomass? [Referring to Sargassum in terms of concentration rather than biomass as a primary constitute element, page 11]

Response: Sticking with concentration. Concentration is more appropriate because we're discussing Sargassum as a habitat and looking at concentration and area covered, not purely biomass (which could be dispersed and not sufficiently concentrated to provide cover and other uses for hatchlings).

List of Abbreviations and Acronyms

Comment: Capitalized all measurements. [page 12]

Response: Checked GPO style manual – only proper nouns need capitalization.

1.D.1. Northwest Atlantic Ocean DPS

Comment: Reference needed here. [3rd para, 2nd sentence, page 18]

Response: Added

II.A. Species Description

Comment: The more recent TEQG 2009 states 82 cm SCL as the minimum size of maturity, with 90 cm SCL representing the mean, I believe—see TEWG 2009 Table 1 that references NMFS SEFSC 2001 and Snover 2002. [Mean straight carapace length (SCL) of nesting females in the southeastern United States, page 20]

Response: Put the more updated average from NMFS SEFSC 2001. They didn't have a minimum and it wasn't crucial for the purpose of the report, so left it at that.

Table 2. Life Stage and Ecosystem and associated Habitat [page 22]

Comment: Note that care should be taken when using the definitions found in NMFS and USFWS 2008. Later in this document, there is heavy use/sourcing from the TEWG 2009 where different definitions of juvenile stages are used.

Response: So noted. We made an attempt to crosswalk and make clear.

Comment: Suggested word change b/c I'm not sure what the distinction is...are you indicating that hatchlings that didn't originate from a given shoreline might appear on that shoreline? Or are you referring to shoreline as the boundary between the sea and the land? [Changed "Nesting beaches and shorelines" to "Nesting beaches to shorelines"]

Response: Thanks for word change – it accurately reflects what we meant.

Comment: Is this a standard or accepted life stage?? [Hatchling swim frenzy]

Response: Perhaps not. It was borrowed from the Loggerhead Recovery Plan. In response to the comment, we changed the presentation here to refer to the hatchling stage twice, once with "on beach" in parentheses and once with "swim frenzy" to differentiate between portions of the hatchling stage when they're using different habitat.

Comment: This includes the "hatchling swim frenzy" period, too...confusing. Is it necessary to reinvent terms and life stages? There are a number of models available, particularly those in recent editions of the Biology of Sea Turtles and the Loggerhead book (by Witherington and Bolton eds. E.g., Bolton 2003...). [Post Hatchling Transition]

Response: See response above.

Comment: Note that the most recent literature available (see Mansfield and Putman in press for a review) suggest that there is *plasticity* in habitat selection among "neritic" juveniles and "neritic" adults. This table includes this plasticity possibility, but it is misleading in that each row is not a discrete stage... [Ecosystem of Juveniles]

Response: We were attempting to partition habitat use by life stages to ensure that we are considering all habitat necessary for each life stage as we identify critical habitat. Each row is not a discrete life stage specifically because of the plasticity, i.e., we need to show that both life stages use both. We could have had one row per life stage and two habitat types for each but we wanted to focus on each discrete habitat need of the species, so chose not to combine habitats.

Comment: Adults and larger juveniles that occur in the oceanic zone are not necessarily restricted to the ocean's surface waters...larger juveniles may dive up to 100m+ and adults have been tracked to depth as well... [Oceanic habitat of adults]

Response: Thanks for catching. We added the word "predominantly" to note that they do not use surface waters exclusively.

Comment: And breeding habitat—this shows up elsewhere many times and likely should be mentioned here as well. [Breeding included under the neritic habitat of adults]

Response: You are correct. Added.

II.B.1. Terrestrial -- Nesting Female, Egg, and Hatchling

Comment: Suggest changing this reference to Tucker, A.D. 2010. Nest site fidelity and clutch frequency of loggerhead turtles are better elucidated by satellite telemetry than by nocturnal tagging efforts: Implications for stock estimation. *Journal of Experimental Marine Biology and Ecology* 383(1):48–55. Also, the abstract for that publication lists 2 to 8 clutches per season with a modal value of 5. [Had cited Tucker 2008, pers. comm., para 2, page 23]

Response: Done.

Comment: Is this the source literature? What about Snover *et al.* 2010? Or another recent Snover paper (I'll see if I can find it)...Need to look. [Citation of recovery plan, para 2, page 23]

Response: Text revised to reference source literature and account for variability in AFR.

Comment: AFR estimates range widely among references...the 2009 Global Status Review by Conant *et al.* assumed 30 years...Scott *et al.* (2011) reported it to be as late as 45 years, and in the Eastern Atlantic (Eder *et al.* 2012) it has been reported as early as 18 years. [para 2, page 23]

Scott, R., R. March, G.C. Hays. 2011. Life in the really slow lane: loggerhead sea turtles mature late relative to other reptiles. *Functional Ecology* 26(1):227–235.

Eder, E., A. Ceballos, S. Martins, H.Pérez-García, I. Marín, A. Marco, L. Cardona. 2012. Foraging dichotomy in loggerhead sea turtles *Caretta caretta* off northwestern Africa. *Marine Ecology Progress Series* 470:113–122.

Response: For this particular statement (and because AFR can vary by area), we wanted to only include data on the relevant DPSs. As such, Eder was not included. Other citations added to be more inclusive of the available literature and range of AFR.

II.B.2. Neritic -- Hatchling Swim Frenzy and Post-Hatchling Transition

Comment: A reference is needed here. [Referring to sentence, “As post-hatchlings, loggerheads are found at or near the ocean surface in neritic waters along the continental shelf.” page 25]

Response: It is part of the Witherington citation. Changed to make that clear.

II.B.3. Oceanic – Post-Hatchling Transition, Juvenile, and Adult

Comment: What about oceanographic features?? Or is this found later in the document?
[Comment made on title of section, page 25]

Response: Added in some text about the importance of current systems. Also later in document.

Comment: Witherington, B, S Hirama, and R Hardy. 2012. Young sea turtles of the *Sargassum*-dominated, surface-pelagic drift community: habitat use, population density, and threats. *Marine Ecology Progress Series* 463:1–22 [Had cited information on active and passive movements and location in water column as a pers. comm., para 2, last sentence, page 25]

Response: Added citation.

Comment: There are more recent papers modeling and discussing the dispersal and movements of oceanic stage juveniles. See Mansfield and Putman in press for a review. See also: Putman , Bane and Lohmann 2010 (*Proc of the Royal Soc B* 277: 3631-3637); Putman *et al.* 2012 (*Mar Bio* 159:2117-2126) [para 2, last sentence, page 25]

Response: Added Witherington citation (2012) and additional text on juvenile dispersal.

Comment: - Snover *et al.* 2010 is more recent and indicates that the size of recruitment to neritic habitat starts about 45 cm SCL. Snover added to ref cited. [3rd para, sentence beginning, “In the North Pacific...” page 25]

Response: Added Snover reference on size in addition to reference to years.

Comment: In Table 1 of the 2009 Global Status Review, Conant *et al.* estimate 27 years spent in oceanic phase for North Pacific juveniles vs. 10 years for North Atlantic. [3rd para, sentence beginning, “In the North Pacific...” page 26]

Response: Addressed and comment incorporated.

Comment: Also recently documented in Eastern Atlantic using isotopes and skelotochronology by Eder *et al.* (2012) – reference already provided. [Referring to adults moving between neritic and oceanic zones, page 26]

Response: Added.

Comment: Also: Hawkes *et al.* 2006, Reich *et al.* 2010 [Referring to adults moving between neritic and oceanic zones, page 26]

Response: Citations added.

Comment: Final results should be found in Reich *et al.* 2010! [Referred to preliminary results in Reich *et al.* 2007, page 26]

Response: Reich citation updated to 2010 paper. Additional recent information (e.g., Pajuelo *et al.* 2012) also provided.

Comment: This assertion published in Reich *et al.* (2010) was recently changed by Pajuelo *et al.* (2012) to indicate differential neritic habitats vs. oceanic-neritic given similarity in deltaC and deltaN value distributions. [page 26]

Pajuelo, M., K.A. Bjorndal, K.J. Reich, H.B. Vander Zanden, L.A. Hawkes, and A.B. Bolten. 2012. Assignment of nesting loggerhead turtles to their foraging areas in the Northwest Atlantic using stable isotopes. *Ecosphere* 3(10):1–18.

Response: Pajuelo citation added, and text clarified accordingly.

II.B.4. Neritic -- Juvenile and Adult

Comment: Not just periodically! Mansfield *et al.* 2009 tracked turtles from the neritic zone to the oceanic zone where the turtles remained for long periods—in one case over 3.5 years. Given the available literature, the most recent data indicate that neritic juveniles in the NW Atlantic are not necessarily tied to the neritic zone once they return there after an oceanic period. ¼ to 1/3 of the juveniles tracked by Mansfield *et al.* 2009 and McClellan and Read 2007 returned to an oceanic habitat. The citations listed in the next comment all support this plasticity of habitat use/selection. We review this in Mansfield and Putman in press. [In response to statement, “Some juveniles may periodically move between neritic and oceanic zones.” page 27]

Response: Deleted periodically. Text revised and relevant citations added.

Comment: Please also cite: Keinath 1993, Laurent *et al.* 1998, Witzell 1999, Mansfield *et al.* 2009, Arendt *et al.* 2012 (*Mar bio* 159:127-139) [In response to statement, “Some juveniles may periodically move between neritic and oceanic zones.” page 27]

Response: As noted above, relevant citations added. Those that were not added were reviewed and deemed not supportive of this particular statement.

III. Identification and Description of Geographical Area Occupied by the Northwest Atlantic Ocean DPS and North Pacific DPS

Comment: The term ‘preferred’ is tricky. Given the available data and literature, I recommend deleting this term. [Regarding water temperature for habitat range, para 2, page 30]

Response: Deleted.

III.A.2.b. Neritic Juvenile and Adult Habitat

Comment: Lutcavage and Musick 1985(86?), Mansfield 2006... [In response to note to add citations (inadvertently left in draft), page 32]

Response: Added

Comment: I'm not sure what citations you were planning on including, but I would recommend at least the following three references:

Arendt *et al.* 2012f – p. 474 (Table 1) documents recapture in same survey area up to 9 years later (2002 to 2009)

Ehrhart *et al.* 2007 – p. 419 makes reference to 241 recapture events for loggerheads that were recaptured “one or more times” between 1982 and 2006.

Braun-McNeill *et al.* (2008) –p. 275 reports 54 of 160 recapture events as involving multiple recaptures and a maximum recapture interval of 7 years. [In response to note to add citations (inadvertently left in draft), para 1, page 32]

Response: Top three citations added.

Comment: Also cite: Coles 2000, Byles 1988...citations are needed here. [Regarding sea turtle migrations and distribution being correlated to environmental conditions, para 1, page 32]

Response: Added Coles but not Byles, we we deemed not as applicable to particular statement.

Comment: This sounds too familiar—please check to make sure, but I believe that Mansfield *et al.* 2009 should be cited here...or Mansfield and Putman in press... [In response to statement that these changes may be predictable and cyclical, para 1, page 32]

Response: Added Mansfield et al 2009.

Comment: Same with the Chesapeake Bay: Lutcavage and Musick 1985, Byles 1988(?), Mansfield 2006... [In response to statement (2nd sentence of 2nd para) that “Areas such as Pamlico Sound... regularly used by juvenile loggerheads are only rarely frequented by adults”, para 2, page 32]

Response: Addressed Chesapeake Bay below. Based upon the available data, adults don't seem to be rare visitors to Chesapeake Bay like in the other areas mentioned here. Agree that juveniles are indeed more frequent.

Comment: The estimate for adults in the Ches Bay is from 5-7% vs. juveniles. The number of adults using the Ches Bay is quite low relative to juveniles. [para 2, page 32]

Response: Agreed that the juveniles are more frequently encountered, but this sentence is stated in the recovery plan with Musick, pers comm citation. Given the papers cited, I wouldn't say that adults are rare (as in other sentence).

Comment: There are a number of citations that can be used instead of a pers. comm. Lutcavage and Musick 1985, Byles 1988, Keinath 1993, Coles dissertation (VIMS), Mansfield 2006, Mansfield *et al.* 2009... [In response to Musick pers comm , para 2, page 32]

Response: Agreed. Citations added and text revised accordingly.

Comment: A better citation might be Schroeder *et al.* 1998, p. 266; Witherington *et al.* 2006, as above [In response to statement about nesting females in the Florida Bay, para 2, page 32]

Response: Deleted this sentence and then added a bit of text to previous sentence since it all comes from the same sources.

Comment: As a primary data source for what? This document? The data presented in the TEWG represented available data through ~2007 or 2008. This BO needs to incorporate some of the newer papers/literature. [Regarding statement that TEWG 2009 used as primary data source, top of page 33]

Response: Noted and addressed.

Comment: Perhaps it would also be good to indicate that much of the data used by the TEWG report has subsequently also been published? In particular, Mansfield *et al.* (2009), Girard *et al.* (2009), Hawkes *et al.* (2011), Arendt *et al.* (2012a-c). [page 38, 2nd para on pg]

Girard, C., A.D. Tucker, and B. Calmettes. 2009. Post-nesting migrations of loggerhead sea turtles in the Gulf of Mexico: dispersal in highly dynamic conditions. *Marine Biology* 156(9): 1827–1839.

Response: Added.

Comment: Because of site fidelity, this geographic distribution to a large extent reflect where the juveniles were captured and sat-tagged; 35 off SC (Arendt *et al.* 2012c), 36 off NC (all but one by McClellan and Read 2007), 35 off VA to NY (Morreale 1999; Mansfield *et al.* 2009) [Regarding discussion of Figures 5A-D, page 39]

Response: Agree. Didn't change anything in report.

Comment: Mike Arendt has published this work—those papers should be cited. All 2012 in *Marine Biology*, I believe. [Regarding small number of males that moved beyond the continental shelf; had cited Arendt, unpublished data, page 40]

Response: Arendt citation put in by Arendt so this is done.

Comment: These data should also be published now (Hawks *et al.* paper??). I understand the need to use the TEWG as a data source; however, that document no longer represents the best available information—there have been a number of publications since that document was produced. This entire section should be updated accordingly. [Regarding Griffin *et al.* 2012 unpublished data (last sentence in 2nd paragraph on page), page 41]

Response: We used the TEWG as a start and added papers and information published since then as appropriate. For instance, Ceriani contains new information and it does elaborate upon the pattern in the TEWG data, and we noted that below.

Comment: This should be in Chapter 3 [Regarding Mansfield 2006, page 42]

Response: Thanks.

Comment: Following-up on comments above, the reason that this total is 99 instead of 104 appears to be because only 29 of 33 animals listed in Table 8 of the 2009 TEWG report are listed here. [Regarding caption for Figure 8A-C, page 43]

Response: Thanks.

III.A.2.b.(i). Foraging Habitat

Comment: This includes estuaries and inland sounds, right? [Regarding statement that foraging loggerheads use entire continental shelf, page 44]

Response: Yes, clarification provided.

Comment: This sentence feels incomplete (i.e., diet shifts in individuals?) or it is simply out of place as it's repeating statements made before mention of leatherback and green sea turtles. [top of page 45]

Response: Text rearranged and revised to clarify intent of statement.

Comment: See also Mansfield *et al.* 2009 where environmental parameters were also characterized for both neritic and oceanic habitats occupied by larger juveniles. [1st full para, page 45]

Response: Text added.

III.A.2.b.(ii) Winter Habitat

Comment: Please cite older lit here. Including, but not limited to: Byles 1988, Lutcavage and Musick 1985(??), Keinath 1993, Coles 1999 dissertation, Mansfield 2006, Mansfield *et al.* 2009, etc. All of these precede the Hawkes paper and most suggest the same seasonal movements. [1st sentence of 1st para, page 46]

Response: Several relevant papers added.

Comment: There is a seasonal longitudinal migration that occurs, though, due to suboptimal waters that stretch from the coast to about 40km offshore during the winter. [Migration movements in terms of location and water temperature, 1st para, page 46]

Response: Edit added, and winter patterns in other areas added later.

Comment: This run-on sentence should be broken up. [page 46]

Response: Revised.

Comment: Check Mansfield 2006. [Home range, top of page 49]

Response: Mansfield 2006 (e.g., site fidelity and tracking sections) was reviewed and considered. This reference and Mansfield *et al.* 2009 were added to various parts of this section as appropriate. This particular text is focused on NC home range values (esp in winter), so the Mansfield citations were not added here.

Comment: I could not find this reference in the bibliography. [Parker *et al.* 1983, page 49]

Response: Added.

Comment: Mansfield et al 2009 and Mike Arendt's recent papers also showed this, as did an aerial paper by Epperly *et al.* 1995a. [Location of seasonal migratory turtles in winter, 1st para, page 51]

Response: Additional citations added in this section. Pattern of turtles moving into oceanic environments by Mansfield and Arendt noted earlier.

Comment: This is a long and run-on sentence; suggest breaking it into two thoughts dealing with depth and temperature separately. [Sentence starting "This pattern of loggerheads...page 51]

Response: Not using Read paper so deleted run on part.

Comment: Please provide a citation in the foot note to document source of definition for brumation. [page 51]

Response: Done (citation moved to earlier however).

Comment: I think that Byles 1988 and Keinath 1993 also refer to brumation in their dissertations. They should be cited. [page 51]

Response: Byles discusses brumation but does not provide any evidence for brumation in VA or NC (just notes incidents in Canaveral/FL). Keinath doesn't seem to mention brumation

Comment: Mansfield 2006 suggests the same for the spring months. Chapters 2 and 4. [Regarding dive durations for loggerheads, page 51]

Response: Mansfield 2006 chapters 2/4 reviewed, but references to the necessary winter dive or surfacing data were not noted.

Comment: This is a limited perspective on strategies. I don't think you can justify the Gulf Stream avoidance statement in (i). Another benefit for associating with this Gulf Stream frontal area is an increase in available food/productivity—if bottom waters near shore are too cold to inhabit, then why not move offshore to an area known to be more productive?? [page 51]

Response: Text revised.

Comment: Should anyone be cited here? [Statement that loggerheads may be exhibiting two strategies, page 51]

Response: It was intending to be a general statement based upon summary knowledge as well as the available literature, but relevant references added.

Comment: Why? Yet Keinath 1993, McClellan and Read 2007 and Mansfield et al 2009 all document a large proportion of turtles heading into the north Atlantic. What evidence suggests the turtles are actively avoiding the Gulf Stream?? [Actively avoiding gulf stream, page 51]

Response: Good point of clarification. Epperly *et al.* 1995 do suggest that the pattern off Hatteras (as noted in our text) could be the same as discussed off FL. We are presenting what Epperly states as it is a possible scenario for the concentration in southern NC. However, there is no empirical evidence showing avoidance. While juveniles have been tracked to enter oceanic environment at this point, many do not. Added text to help clarify possibilities.

Comment: But the turtles in this region are likely of mixed stocks! The best avail. Information indicates that southern stocks may also have important habitat here, esp. among the juveniles. So, this is not limited to the Northern Recovery Unit. See Norrgard 1996, Bass *et al.* 2004, Encalada *et al.* 1998, Bowen *et al.* 2004, Rankin-Baransky *et al.* 2001...(summarized by Mansfield *et al.* 2009, and mentioned in the TEWG 2009). [Important winter concentration area especially for Northern Recovery Unit, 1st sentence of 1st full para, page 52]

Response: Text was not referring to only NRU, but any stock that inhabits the area off NC in the winter (noted as NRU and other RU). Seems that area is most frequently used by those turtles coming down from northern foraging areas (e.g., turtles foraging off FL don't appear to come up to NC to winter). Revised to ensure it's clear it's referring to all turtles that may be in that area, coming from the north. But regardless of what stock is using this area, we still see concentrated use.

Comment: See also Mansfield *et al.* 2009, Mansfield 2006, Epperly *et al.* 1995 (?). [Avoiding cold winter temperatures and reducing energetic costs to maintain position in the Gulf Stream, last sentence of 1st full para, page 52]

Response: Citations added.

III.A.2.b. (iv). Constricted Migratory Habitat

Comment: What about posthatchling/neonate use of the Gulf Stream as transport?? There are plenty of citations to support this...new tracking data (Mansfield *et al.* in review—or Mansfield pers. comm if needed) support in-water observations (Carr papers, Witherington papers) and dispersal models (Putman and Lohman papers...Is there a reason why this early dispersal information and tie to the Gulf Stream is not included? [Pertains to entire section, page 54]

Response: While it is true that hatchlings utilize the Gulf Stream and Florida Current for dispersal, that was not the intent of our identifying the particular corridors that we did. We added language to specify that these corridors are used by juveniles and adults and are specific, narrow, limited migratory routes that could potentially be obstructed (unlike the Gulf Stream and Florida Current system that is an enormous oceanographic feature). We also added text in our "Oceanic" section regarding the importance of the major currents such as the Gulf Stream and Florida Current, but it's not the same as migratory habitat.

Comment: This section is somewhat redundant but provides a better summary of the seasonal movements than the earlier sections of this document (where I list many of these citations that are missing in the earlier section of this BO). [Specific migratory corridor in North Carolina, page 55]

Response: May be somewhat redundant but we wanted to note the documentation for each section.

Comment: Mansfield *et al.* 2009, Mansfield 2006, Keinath 1993, Byles 1988. [Specific migratory corridor in North Carolina, 1st para, page 55]

Response: Added

Comment: Also: Norrgard 1996, see list of citations in earlier section/comments. Again, this is redundant information but provides a much better representation of the available literature than the earlier section of this BO. [2nd sentence of 2nd para on page 55]

Response: Leaving as is. These are the standard genetic references we used in BiOps.

Comment: Citations should be provided for this section—see lists of citations mentioned in this review. Greater representation of the available lit/data is needed throughout this document. [bottom of page 55, starting with “This narrow corridor...”]

Response: Added.

Comment: This contradicts what the authors are suggesting earlier in this BO regarding turtles avoiding Gulf Stream transport. [1st para on page 56, starting with “The influence of the fast moving Gulf Stream.....”]

Response: Not sure that there is a discrepancy. The earlier suggestions of Gulf Stream avoidance were in reference to neritic adults and juveniles, and the earlier text was revised to specify this.

Comment: Yes, but there is a large proportion of turtles that exhibited plasticity of habitat use and moved offshore, using the Gulf Stream. Another point to consider in evaluating the Gulf Stream’s relative importance as a constrained migratory route. [Last sentence of 1st para, page 56]

Response: We agree there is a notable portion that have been tracked moving offshore at this point, but still the majority of tracks are within this corridor (during a large proportion of the year).

Comment: See also Mansfield 2006, chapter 3 [Hawkes et al 2011, middle of 2nd para, page 56]

Response: Added to sentence below about other post nesting tracking studies.

Comment: Can’t find in bibliography. [Meylan et al 1983, top of page 57]

Response: Added.

Comment: Mansfield 2006, and *et al.* 2009 showed some adults and juveniles that used this route into the Gulf of Mexico during fall migrations. [Specific migratory corridor in Southern Florida, page 57]

Response: Sentence added above related to this.

III.A.3. Sargassum

Comment: One problem in this BO is the loose terminology associated with juvenile...oceanic juvenile, neritic juvenile, etc. A better structure is needed. Early juveniles could mean post hatchling, neonate, etc. [1st full para, page 58]

Response: Early juvenile is what Witherington states in his paper – and he distinguishes between post-hatchlings and early juveniles, so they’re clearly distinct. We don’t refer to early juveniles elsewhere but simply to the hatchling, post-hatchling transition stage, juveniles and adults. In this context, if someone refers to an early juvenile, it seems clear that he’s referring to young juveniles.

Comment: But didn't this study target their sampling within Sargassum habitat? Those data may be somewhat spatially biased since non-Sargassum habitat was not heavily sampled. They do indicate that oceanic stage turtles associated in Sargassum habitat. [Middle of 1st full para, page 58, starting "Witherington et al 2012..."]

Response: Good comment. Witherington et al 2012 (p. 4) did conduct searches within drift (Sargassum) material and non-drift material during travel offshore and in between patches of Sargassum. The time spent in non-drift material was less than drift material but turtles were also observed within these "non-target" areas, albeit with less frequency (p. 11). The statement applies to transects through floating material and non target areas; the behavior and association with floating objects was similar. So while there may have been a bias in sampling effort this statement applies to all areas searched.

Comment: Of Sargassum biomass [Gower and King mapped the distribution and movement of pelagic Sargassum..., page 59]

Response: See earlier comment – because we were identifying habitat, it's more than just biomass, but certain concentrations and distribution.

Comment: Sargassum biomass [Caption for Figure 13, page 61]

Response: This was the figure header in the paper which we received permission to use. Also, see comment on previous page on use of biomass with Sargassum.

Comment: This study showed the highest density of post-hatchling loggerheads at the Atlantic Gulf Stream front off Florida, which is a major convergence. In the Gulf of Mexico, little effort and captures were made at major convergences. [2nd full para, page 62, Witherington et al 2012]

Response: Text edited accordingly.

III.A.4. Oceanic

Comment: Changed this to "drift" [1st para, 1st sentence]

Response: We changed Mike's suggestion of the word "drift" back to how it was originally written as there is some evidence that the young turtles are not just passively drifting.

Comment: Or the published paper: Mansfield *et al.* 2009. [Cited Mansfield 2006 in 1st para 4th sentence]

Response: Changed to Mansfield et al. 2009.

Comment: Please see comments earlier in this BO listing citations related to adults heading back offshore. See also: Mansfield and Putman in press for a review. [Last sentence of 1st para]

Response: A number of citations were added in the earlier section (e.g., Hatase *et al.* 2002; Hawkes *et al.* 2006; Eder *et al.* 2012). However, those studies were not in the NWA, and here we wanted to limit the citations to the relevant DPS. Only Reich and Girard added here.

Comment: What about information regarding the inwater habitat use in the oceanic areas? SST, SSH, NPP, etc?? There are data available for the Atlantic. See: Mansfield *et al.* 2009, McCarthy *et al.* 2010... [last sentence in section, page 64]

Response: Additional information added

III.B.2.a. Central North Pacific (North Pacific DPS)

Comment: Please be consistent when discussing the offshore habitat in this document. Pelagic vs. Oceanic...it should be discussed with the same language throughout the document regardless of ocean basin. [bottom of 1st para, page 65]

Response: All ‘pelagic’ references changed to ‘oceanic’ in the Pacific section.

Comment: A similar table should be provided for the Atlantic section. Data/literature are available. [Table 3, page 66]

Response: Added relevant data in specific Atlantic sections where it’s available, but didn’t present in a table due to the large diversity of habitat types within U.S. EEZ, and therefore potential critical habitat, in the Atlantic.

Comment: This [original] map looks odd in the Western Pacific, it is not my creation but uses data I supplied obviously. I suspect an overlay issue of some type. I pasted a version below using data I have with the software Generic Mapping Tools, and it looks a bit different. I have faith in the analysis but this figure needs a fix. [Figure 15, page 67]

Response: Map replaced and new caption added for figure.

III.B.2.b. Eastern Pacific/U.S. West Coast (North Pacific DPS)

Comment: Have loggerheads of any size been encountered in the North Pacific garbage patch? Given the value of Sargassum in the Atlantic it seems like a logical place for young turtles to converge and hang out in the Pacific, despite distance from nesting beaches. I am not aware of any such findings, but has anyone looked? Additionally, drift Sargassum does occur in the Pacific but not nearly at the same scale. Have flotsam associations been explored in the Pacific? [Comment at beginning of section, page 68]

Response: We found no references with respect to the N. Pacific garbage patch and association with young loggerheads, just general references that sea turtles and sea birds likely ingest a lot of the plastic, mistaking it for food. Most of the debris has broken into pieces less than 5 mm, so probably cannot be compared to *Sargassum*. In addition, most of the area is outside of the U.S. EEZ and I would not consider it an oceanographic/physical feature, but some may differ with that – I know of no critical habitat that would compare with this.

Comment: If strandings data are included for the Pacific, why were they not included for the Atlantic where a much larger dataset is available?? This is especially pertinent for seasonal stranding patterns around and just north of Cape Hatteras, an area this BO singles out as being an important migratory area...in VA in the spring 100's of juvenile strandings occur in the lower Chesapeake Bay during a 2-3 week period. Many VIMS dissertations and masters theses document this pattern. Mansfield *et al.* 2009 mentions it in the introduction. [Regarding, "Of 32 documented strandings...", top of page 69]

Response: Strandings were a focus for the Pacific write up as a way to discuss whether the turtles are even present in those areas. It served a specific purpose that is not necessary for the Atlantic because the presence of the turtles in the areas we are considering is not in question.

Comment: There is a large disconnect in the choice of data presented between the Pacific and Atlantic sections. Why are no observer/bycatch data presented in the Atlantic section?? [Loggerhead observed taken by the California drift gillnet fishery, top of page 70]

Response: This level of detail is not necessary in the Atlantic. Fishery bycatch estimates were considered for environmental correlates and distributional patterns. In the Pacific section it is used as a way to indicate presence of the animals. We have other information already making that point in the Atlantic.

Comment: I would suggest adding Point Sur. [Figure 18]

Response: Point Sur is north of Point Conception (off this map), and is not really referenced with the data so I would rather not remake the map and include it since the point is to focus on all points south of Pt. Conception.

IV.B.1.b. Winter Habitat (Northwest Atlantic Ocean DPS)

Comment: This should likely be 2007, not 2005. Also, please provide a better representation of the available literature here. [Referring to citation McClellan and Read 2005 under PCEs, page 77]

Response: The temperature ranges were based upon winter data specifically for NC. The papers/data cited provided that specific range. This citation list is not for all studies providing the distributional range for loggerheads (as it would likely be >10C), but only the winter concentration area off NC. McClellan and Read 2005 was a symposium poster, but we're changing it to McClellan unpublished data, where cited. All that said, citations were taken out of PCEs.

Comment: Should this be 200 given that the oceanic habitat starts depth? [Referring to PCE of water depths between 20 and 100 m, page 77]

Response: The depth range was chosen based upon satellite tracks in that area (see winter section above for data). Available data from the winter in this area indicates that loggerheads inhabit depth ranges within 20-100 m, with most turtles staying in this range. While distribution is likely largely based upon SST, this depth range provides flexibility in this movement especially as SSTs are colder closer to shore.

Comment: What is the justification for this 100 m determination? [Referring to PCE of water depths between 20 and 100 m, page 77]

Response: See response above.

IV.B.1.c. Sargassum (Northwest Atlantic Ocean DPS)

Comment: I realize that this is the dominant structure in this microhabitat but aren't there a variety of floating material here besides just pieces of Sargassum? [Comment at beginning of section, page 78]

Response: Yes. For example, Witherington *et al.* 2012 (p. 8) searched consolidated patches of floating material and found Sargassum dominated the area but woody material, seagrass, and synthetic debris were present. We tried to account for that as the PBF includes “where surface waters form accumulations of floating material, especially Sargassum.” That said, given the dominant nature of Sargassum in this habitat and the association of young loggerheads to this particular feature, we focused on Sargassum as the habitat to protect. Text was added to Sargassum section to account for other types of floating material in these areas.

IV.B.1.d. Oceanic (Northwest Atlantic Ocean DPS)

Comment: As mentioned before, what about the Gulf Stream, esp. related to early posthatchling/neonate dispersal?? The Pacific section provides plenty of ocean circulation information. Why was this omitted from the Atlantic section?

Response: Gulf Stream and Florida Loop Current info has been added to the Oceanic discussion. However, we are not including those oceanographic features as critical habitat.

V.A.2.a. Nearshore Reproductive Habitat (Northwest Atlantic Ocean DPS)

Comment: The Mansfield 2006 dissertation would likely be a better citation (chapter 3) [4th para of section, referring to sentence starting, “Numerous other studies have documented similar longshore movement...”, page 83]

Response: Added Mansfield 2006

Comment: Standard mile or nautical mile?? Why was this chosen? It seems arbitrary—what is the justification for this? Is there an established precedence for it? [5th para of section, “NMFS decided to use a distance of...”, page 83]

Response: We are using standard miles (1.6 km as stated in the text). The explanation of why 1 mile is in the text. And explanation was added earlier that there is no habitat-based delineation for the seaward extent of this habitat type. Unfortunately any line chosen for “nearshore reproductive habitat” will be based as much on convenience and area of highest concern as by any particular habitat line.

Comment: Citations are needed throughout this section/paragraph. [5th para of section, page 83]
Response: Added.

Comment: If by “fitness” you are referring to reproductive fitness several decades later, I’d say that is quite a stretch. Also, lactate levels during the anerobic crawl and swim frenzy have been documented by Dial (1987) who reported that the greatest lactate level occurred during the hatchling frenzy, but subsided after 10 minutes of anerobic swimming. Thus, it is reasonable to suggest that disorientation that results in excessively high lactate levels during the hatchling frenzy should reduce survival. [5th para of section, sentence starting “Disorientation and prolonging...”, page 83]]

Dial, B.E. 1987. Energetics and performance during nest emergence and the hatchling frenzy in loggerhead sea turtles (*Caretta caretta*). *Herpetologica* 43(3):307–315.

Response: Used wording from Dial paper re: reduced fitness, so left it in. Added text and reference.

Comment: Citation?? [5th para, sentence starting “As they go further from shore...”, page 83]

Response: It’s a statement made from logic and physics, not any particular study.

Comment: Suggest removing this portion of the sentence as logic, because any distance can be clearly mapped. [5th para, last sentence, referring to “for a clearly mapped line”, page 83]

Response: Done.

V.A.2.b Foraging Habitat (Northwest Atlantic Ocean DPS)

Comment: What about human pressures on prey resources (e.g., blue crab or horseshoe crab fisheries, whelk fisheries,...)? [Consideration 2, areas containing high prey availability, page 84]

Response: Those type of impacts are addressed in special management considerations. However, because no foraging habitat is proposed for designation, these types of impacts were not addressed.

Comment: Re-arranged to present these types of data sets in the order that they are discussed below. [2nd para, Moved satellite telemetry studies to be before in-water studies, page 84]

Response: Thanks.

Comment: See also Keinath 1993, Byles 1988, Mansfield 2006.....Plus recent AMAPPS report. [2nd para, Virginia Aquarium, unpublished data, page 84]

Response: Byles was considered but didn’t have the level of spatial detail to help identify concentration patterns (besides entire VA Chesapeake Bay). Mansfield was more recent and provided a bit more scale (as did Keinath) so were included here. AMAPPS effort is presented in NMFS 2011 and NMFS 2012, both included already.

Comment: Commenter inserted “tagged on beaches in those areas” [3rd para, 3rd sentence, bottom of page 84]

Response: The above studies include turtles tagged on nesting beaches as well as a fe from foraging grounds, so did not keep this edit.

Comment: Murray, K.T. 2011. Interactions between sea turtles and dredge gear in the U.S. sea scallop (*Placopecten magellanicus*) fishery, 2001–2008. *Fisheries Research* 107:137–146. [5th para, [Middle of page 85]

Response: Thanks.

Comment: Citation for this reference is not provided. [Murray 2009, middle of page 85]

Response: Added to Literature Cited.

Comment: See also Keinath 1993, Byles 1988, Mansfield 2006.....Plus recent AMAPPS report [“While loggerheads forage in warm waters...”, page 85]

Response: Not needed here, as they are included elsewhere.

Comment: I am surprised. Virginia Marine Resources Commission and the Virginia Institute of Marine Science (as an example) has many data sets regarding blue crab, horseshoe crab, whelk landings and harvest data. There are also known diet studies that can be coupled with these data (e.g., work by Erin Seney—Seney and Musick 2007). [same sentence as above but referring to the 2nd part, “the CHRT found no information on specific prey density...”]

Response: We did obtain blue crab harvest data from VMRC for 2010-2011. Once we saw what they have available – crab pot trips by month and location – we did not pursue having them pull horseshoe crab data. While we could obtain more fishery data (and in other states), we didn’t know the level of prey density or quality that loggerheads need in a particular foraging area to make it “critical.” There are no published studies that we know of on this. As such, looking at fishery harvest data for every known foraging location was deemed unnecessary.

Comment: There are many citations that have been omitted here. Byles 1988, Bellmund 1987, Keinath 1993, Coles 1999, Coles 2000, Seney and Musick 2007, etc..... [2nd bullet (Chesapeake Bay), list of foraging areas, page 86]

Response: Added.

Comment: Why not just call this the Northern OBX of NC and then list the geographic description? [3rd bullet, list of foraging areas]

Response: Made change.

Comment: Note: these two surveys were conducted in the shipping channel seaward of the harbor entrance jetties. I strongly recommend this category be changed something like “Shipping channels in the southeast U.S.” [5th bullet, list of foraging areas]

In 1992-93, the USACOE (Dickerson *et al.* 1995) conducted similar surveys in six channels in the southeast US (Canaveral, FL; Fernandina, FL; Brunswick, GA; Savannah, GA; Charleston, SC; Moorehead City, NC) and loggerheads were observed to seasonally aggregate in all channels except Moorehead City. A considerable amount of unpublished data also exists for trawl capture and relocation efforts in these channels prior to dredging, and Chris Slay (cslay@att.net) would be a great reference to document those data.

Dickerson, D.D., K.J. Reine, D.A. Nelson and C.E. Dickerson, Jr. 1995. Assessment of sea turtle abundance in six South Atlantic U.S. Channels. Miscellaneous Paper EL-95-5, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Response: Agree. Added information.

Comment: This is only the FL-centric version of the hot spots that were identified by Arendt *et al.* (2012d), which occurred off nFL, GA, and SC. If you don't want to list all of the hot spots (which sometimes occur adjacent to cold spots), you could just indicate the nearshore coastal waters surveyed by a regional trawl survey funded by NMFS since 2000 (Arendt *et al.* 2012d,f). [6th bullet, list of foraging areas]

Response: We agree that other hotspots were not included and recognize it was not appropriate to only reference some. This information, which shows the widespread nature of loggerhead foraging, is referenced elsewhere in the document, so we chose to delete it here.

V.A.2.c. Winter Habitat (Northwest Atlantic Ocean DPS)

Comment: I strongly disagree with that statement, at least as it pertains to juvenile loggerhead sea turtles satellite-tagged off SC. See Figure 1 of Arendt *et al.* 2012c; the winter MCP area was more than 2x as large as the spring-autumn MCP area and unlike spring-autumn, loggerheads spent very little time in hot spot areas. [1st para in section, 2nd sentence starting, "Loggerhead distribution in temperate areas..., page 86"]

Response: This text was aimed at NC distribution, but the comment is appropriate and text was modified to be more general. The specific sentence was deleted.

Comment: 2007. Also Keinath 1993, and others. [1st para of section, referring to McClellan and Read 2005, top of page 87]

Response: Relevant text was deleted so no longer applicable.

Comment: See also Mansfield 2006 [last para, page 87, citation for sentence beginning, "High use areas were considered to be areas..." McClellan and Read 2005]

Response: Text included but moved to foraging habitat.

Comment: As this language is nearly verbatim to what appears on pp. 84-85, I would suggest a simple statement indicating that the same data sets in V.A.2.b were consulted and list any distinguishing methods. For example, there is more detail provided here about kernel density (applicable to V.A.2.b?). Also, stable isotopes were used to identify summer foraging grounds and not winter grounds; the satellite telemetry data in those studies is what id'd winter areas. [Last paragraph, first several sentences, page 87]

Response: Good point, and while originally intending to have each section stand alone in methods, it is unnecessarily duplicative. Text changed and some additional text was added to V.A.2.b.

V.A.3.e. Constricted Migratory Habitat (Northwest Atlantic Ocean DPS)

Comment: How was this determined? Arbitrarily? Why have a land constriction? What about constriction due to current (e.g. Gulf Stream transport for youngest post hatchlings/neonates??)? The wording of this sentence is also awkward. [1st para of section, 2nd sentence, page 89]

Response: Ocean currents (ie. the Gulf Stream and Florida Loop Current) are considered under the oceanic habitat section. It is not the same as what we are labeling constricted migratory habitat. The addition of “constricted by geographic features” was added for this habitat type because some of the active migratory corridors identified, such as by Foley, were very broad, less-defined routes.

Comment: This somewhat contradicts the earlier definition that constrains things by land. [list of considerations, page 90]

Response: We don’t believe it is contradictory.

Comment: Mansfield 2006 [1st sentence of 3rd para, highlighted Mansfield et al 2009, page 90]

Response: Already covered by Mansfield 2009 and other citations.

V.A.3. Sargassum (Northwest Atlantic Ocean DPS)

Comment: I would appreciate a paragraph, if not elsewhere that I may have missed, that discusses Sargassum itself. The species involved, the life-history of the algae, is there dependence on benthic stages. My marine biology 101 is rusty but as I recall the Sargassum in the epipelagic Atlantic and Gulf is self-sustaining, or is it? What are some of the relevant ecological facts about Sargassum? What limits it, etc..? There are bits and pieces down below, but a good background paragraph on Sargassum biology would be much welcome. [General comment on section]

Response: Text added to earlier section (III.A.3).

Comment: But the youngest age classes are typically found at the surface...(new data: Mansfield *et al.* 2012) [condition 5, page 93]

Response: Yes, but this water depth aspect was related to the nearest shore water depth. That is, the surf zone wasn’t considered to be ideal habitat for Sargassum (details below), so the nearshore Sargassum habitat only extends to 10 m depth. The vertical water column depth (e.g., within 5 m of surface in more offshore waters) was not included, as the Sargassum habitat would be critical habitat whenever PCEs are met (not necessarily within a certain water column depth).

Comment: Citing Mansfield *et al.* in review [2nd para, sentence starting, “Within U.S. waters, neonate loggerheads...,” page 94]

Response: Acknowledged.

Comment: This is very misleading. The study referred to in Mansfield and Putman in press (that paper cites another paper that is in review) does not associated the tracked turtles with Sargassum. It does associated the tracked turtles with the Gulf Stream, however. An oceanography feature that should be given more consideration in this BO, particularly for the importance of early loggerhead migration. 2nd para, last sentence, page 94]

Response: Acknowledged and text revised (and moved to earlier section where data is presented). The point of this text was to validate the 40 N lat cut off as both data sets generally extend up to 40 N lat. in US waters. Text removed here and revised in earlier section.

Comment: Footnote number and text linkage are missing for what appears to be a footnote at the bottom of p. 94. [top of page 95]

Response: Footnote fixed (footnote on previous page).

V.A.4. Oceanic (Northwest Atlantic DPS)

Comment: What about the Gulf Stream?? [NMFS could find no specific habitat features that were essential to the conservation of the species within this area other than Sargassum, page 95]

Response: Provided text to address the Gulf Stream issue.

V.B.3.a. Central North Pacific (North Pacific Ocean DPS)

Comment: I suggest a similar list of conditions be provided for the Atlantic [Referring to list of conditions, page 96]

Response: The Pacific group focused on such features for the Central North Pacific because that is an open-ocean area surrounding the islands. That is not the case in the Atlantic EEZ.

Comment: Is this cited with permission?? Data access and use policies are in place for all STAT data. Check with Michael Coyne and the data owner before providing a direct link as there are copyright considerations. [http://www.seaturtle.org/tracking/?project_id=22, top of page 97]

Response: Permission is confirmed via email from Hoyt Peckham to Irene Kelly on 1/24/2013

Comment: Is this in regards to nest counts in Japan, catch rates in the Eastern Pacific, other? Seems like it should [sic, rest of sentence missing in comment; 2nd full para, 1st sentence, page 97]

Response: Edits made to address comments. Agree that additional citations were necessary.

VI.A.2.a. Nearshore Reproductive Habitat

Comment: Onshore? [Refers to 2nd management consideration, page 99]

Response: Changed to include all lights

VI.A.2.b. Winter Habitat

Comment: What about alternative offshore energy development, etc.?? [refers to list of management considerations, page 100]

Response: In #4, but added more verbage to make clear.

VII.A.2.a.(ii) Migratory Habitat General Description

Comment: Figures would be helpful [page 103]

Response: Yes, we are adding figures for each CH section in this report, right?

VII.A.2.b. Nearshore Reproductive Habitat, Winter Habitat, Breeding Habitat, and Migratory Habitat Specific Unit Descriptions

Comment: What about foraging habitat (there are satellite data available as described earlier in this BO). What about the Chesapeake Bay? [End of section, page 111]

Response: These area summaries are dealing with areas recommended for designation as critical habitat. The fact that no foraging areas are recommended for designation is discussed earlier.

VII.A.4. Oceanic

Comment: As mentioned before, what about the Gulf Stream? [page 112]

Response: Text to address the Gulf Stream and Florida Loop Current has been added in previous sections. These area summaries deal with areas recommended for designation as critical habitat. The fact that no additional oceanic areas are recommended for designation is discussed earlier.