

All information associated with the Biological Report is to remain strictly confidential until it is posted to the NOAA Fisheries (NMFS) website.

**Terms of Reference for the Peer Review
of the Endangered Species Act Draft Biological Report on the Proposed Designation of
Marine Critical Habitat for the Green Turtle, *Chelonia mydas***

Evaluate the adequacy, appropriateness, and application of data used in the Endangered Species Act Biological Report on the Proposed Designation of Marine Critical Habitat for the Green Turtle (i.e., the Biological Report).

1. In general, does the Biological Report include and cite the best scientific and commercial information available on the DPS, the features essential to its conservation (that may require special management consideration or protection), and the areas containing those features? If additional information is possible, please identify that information and how to attain it.

In general, yes. There is updated information due to my ongoing dissertation research that focuses on Guam's nesting green turtles. In the draft Biological Report, I provided the updated number of tagged nesting turtles (n = 38) from 2018 to 2022. Additionally, one nesting female was encountered in May 2022 that had a flipper tag originating from Ishigaki Island, Japan. I edited the number of recaptures from "five" to "six" on Page 3 of the Biological Report.

Yes – the report is beautifully executed and contains all available data on the species discussed.

YES

Yes, in general the best available data are cited. I've included additional unpublished spatial data from my PhD research in my email response. A couple other citation to note:

In section 4.2.3.2 Special Management Considerations or Protection: Would it be relevant to cite the estimated number of surface-pelagic turtles impacted by the DWH oil spill? Such as the 148,000 green turtle estimate by McDonald et al. 2017.

McDonald, T. L., Schroeder, B. A., Stacy, B. A., Wallace, B. P., Starcevich, L. A., Gorham, J., ... & Witherington, B. E. (2017). Density and exposure of surface-pelagic juvenile sea turtles to Deepwater Horizon oil. *Endangered Species Research*, 33, 69-82.

In section 4.2.3.3 Area Containing the Foraging and Resting EFs: Where the Shamblin et al. 2018 mixed stock analysis is referenced, I have another mixed stock analysis for surface-pelagic green turtles currently submitted for publication. Our results mirror those by Shamblin et al. for the most part, but with additional resolution suggesting higher connectivity between the Bay of Campeche and the surface-pelagic green turtles encountered off Louisiana, while there were higher contribution estimates from Quintana Roo for turtles encountered off Cortez, Florida.

Yes and where I know of new work or as yet unpublished data, I note this within the text with the relevant citations or data owners (e.g., Katrina Phillips' dissertation dataset, Dean Bagley's more recent adult male and female green turtle satellite tracks, among other data). Even with the

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newer data, the general findings and conclusions would not be altered or changed in light of additional data and most of my comments are to refine statements within the text to better reflect the newer data.

Some additional things/data to consider include (1) the importance of the Gulf Stream along the Atlantic US coast for early dispersal of hatchling/post-hatchling turtles (citation: Mansfield et al. 2021, the green turtle lost years tracking paper already cited in text) and also Putman et al. 2019 is a good resource (citation and link provided below). The Report provides data and information on the hatchling frenzy period; however, the period just beyond the frenzy period is also important and the Gulf Stream plays a very important role in the early dispersal of young oceanic/surface-pelagic turtles. This is important in the event that turbines or other energy-harvesting methods are placed in the Gulf Stream (or other regions where turtles may occur for that matter). The Putman et al. paper is likely useful for several sections of the Report:

Putman, N.F., E.E. Seney, P. Verley, D. Shaver, M. López-Castro, M. Cook, V. Guzmán, B. Brost, S. Ceriani, M. Díaz, J. Raúl, L.J. Peña, M. Tzeek, R. Valverde, C. Cantón, L. Howell, J. Ley, M. Tumlin, W. Teas, C. Caillouet Jr., E. Cuevas, B. Gallaway, P. Richards, and K.L. Mansfield. 2019. Predicted distributions and abundances of the sea turtle “lost years” in the western North Atlantic Ocean. *Ecography*. 43:506–517. DOI: [10.1111/ecog.04929](https://doi.org/10.1111/ecog.04929). Open access.

The Gulf Stream provides similar early dispersal transport (and migratory support) for loggerheads (Mansfield et al. 2014), as well as over-wintering habitat for multiple life stages of loggerheads (Mansfield et al. 2009).

The Mansfield et al. 2021 paper also highlights (2) the importance of the Sargasso Sea as a sea turtle nursery (surface-pelagic/oceanic greens, as well as loggerheads per Mansfield et al. 2014). This should be noted if portions of the Sargasso Sea falls within the US EEZ.

Also, within the Gulf of Mexico, (4) the importance of the West Florida Shelf as a surface-pelagic developmental region and ontogenetic transition zone for turtles transitioning from their offshore/surface to coastal/benthic habitats. The data from my lab (Katrina Phillip’s dissertation) should help elucidate this. But the Shelf in particular is important to note in the event that it is opened to offshore wind/energy/oil exploration or in the event of another oil spill in the region. The data supporting this assertion about the West Florida Shelf is in the process of being written up for publication and should hopefully be published by the end of 2022.

As noted in the text of the Report, Chris Long’s dissertation helps document (3) the impact of harmful algal blooms (HABs) on juvenile green turtles within their developmental foraging habitats, including a shift in diet from mostly seagrass to more drift algae over time due to changes in forage availability. Few data are available regarding HABs and turtles; however, these events are becoming more frequent within Florida and other regions and will directly impact coastal foraging/resting areas. A closer look at this threat and any available data would be useful/helpful (use Chris Long’s dissertation as a starting point for additional ~recent available citations, along with his first paper – both citations are provided in my comments within the Report).

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I think that several of the figures should be updated to better reflect the available data. UCF has several long-term datasets and sampling areas in the Gulf of Mexico (Fig depicting oceanic sampling areas), coastal foraging areas, and adult male and female telemetry maps. I've noted this in my comments within the Report. Dr. Erin Seney (UCF, I can provide contact info upon request) is also a good source of green turtle diet data for Florida (all coasts) and should have some poster and oral presentation data that could be cited.

Table 2 of the FULL report: the surface-pelagic stage of green turtles (and loggerheads) in the Gulf of Mexico is not so well delineated to oceanic/offshore (NON-neritic) habitats – the West Florida Shelf extends far offshore and we see the *Sargassum* habitat typically associated with “oceanic” waters overlapping with the shallower W. FL. Shelf waters that technically should be termed “neritic”. I recommend finessing the language here to better reflect the reality of where the surface-pelagic turtles occur in the Gulf of Mexico (along with their primary habitat, *Sargassum*).

2. Are the areas identified and conservation benefit ratings factually supported by the information provided? Are the conclusions sound and logical?

Yes, these areas are supported by the provided information. These conclusions are sound and logical.

Yes.

YES

Yes for the most part. As was mentioned, I wonder if the high priority given to the coast of southern Texas versus Louisiana is an artifact of sampling effort, but based on the best available data the conclusions are supported by the data.

Yes – please see comments/thought above regarding the additional data available to better complete “best available data” sets.

Inwater Research Group may have some additional data from the NRDA responses during the BP oil spill that could fill some data gaps in the LA – MS – AL region of the northern Gulf of Mexico. I question that the lack of information for this region is more a matter of sampling bias than no turtles. Historically, this region has been under-studied.

3. Are there any essential features or areas containing essential features that were not identified in the Biological Report?

Essential features and areas containing essential features were adequately identified.

No.

NO

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Not that I know of. I was surprised that the long-term inwater sampling research by UCF in the Indian River Lagoon and Trident Basin were not included on Figure 23, but they were mentioned in the text.

Yes – see my comments above regarding the Gulf Stream, Sargasso Sea, and West Florida Shelf. Also, along the lines of the Gulf Stream, the Loop Current and Straits of Florida likely also play a role in turtle dispersal (early oceanic stage – see comments in Report regarding turtles tracked from offshore in the northern Gulf to the N. Atlantic) and migration (particularly between adult foraging and breeding/nesting areas). The Loop Current and Straits contribute to the connectivity between the Gulf and western N Atlantic.

4. Do you disagree with any of the conservation benefit ratings or areas identified in the Biological Report? If so, please provide an explanation and data to support your suggestions.

I agree with the conservation benefit ratings and the identified areas.

No.

NO

No, for the data I have seen from Sargassum habitat and coastal Florida, I agree with the current benefit rating of “High”.

I do not disagree with the conservation benefit ratings or areas identified in the Report – I agree with and support the findings.

5. If available, is opposing scientific information acknowledged and discussed? If available but not identified, please provide opposing scientific information.

No opposing scientific information is available.

No opposing information is required, as much of the data are recent (2010-2022) and has yet to be published.

YES

None noted

I am unaware of opposing scientific information that should be acknowledged or discussed.

6. Where there are uncertainties, are they clearly stated and assessed? If not, please identify uncertainties.

Yes, they are clearly stated and assessed.

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No – all changes recommended are minor spelling and/or grammatical errors.

YES

Uncertainties are clear

The uncertainties are clearly stated and assessed. I think that there are additional items that could be included related to the need for more data on the effects of Harmful Algal Blooms on sea turtles, and also any other diseases/health concerns aside from FP that would affect the recovery of the N Atl. Population.

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