

Peer Review

Review of: "Feeding Ecology and Activity Rhythms of the Critically Endangered Hawksbill Turtle"

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This manuscript presents valuable findings on the feeding ecology and daytime activity budget of hawksbill turtles, which I believe are worthy of publication. However, in its current form, the manuscript requires major revisions to improve its readability and to enhance the impact of the findings. While the writing is generally sound, several sections are confusing or unclear. I also recommend adding line numbers to facilitate detailed corrections.

Major Comments:

1. It should be made explicit that the time budget presented concerns only daytime activity and does not reflect a 24-hour (around-the-clock) time budget.
2. The study site requires a clearer introduction. There is confusion between Le Diamant (the town), Le Sec du Diamant, and Le Rocher du Diamant. A more precise description, possibly with a map, would help readers unfamiliar with the area. Figure 2 should be improved.
3. In the methodology, there is a problematic mixing of non-equivalent metrics: *Prey selection* is presented as the number of bites, *Potential prey* is given as an abundance index. It is unclear how these two measures relate or how selection is quantified. The authors should clarify or justify the comparability of these metrics.
4. There is confusion in the Results regarding: (1) The various figures presented (number of bites, hours of recording, time budget percentages, etc.) and (2) The actual sample size: it is not clear whether data come from five, six, or seven turtles. This needs to be clearly stated and consistently used throughout the manuscript.
5. The Discussion requires substantial reorganization. It should focus only on the results presented in the paper. Currently, the time budget is discussed alongside diving behavior, and unreported

observations (such as diurnal behavior) are mentioned without corresponding results. Consider adding a dedicated Limitations section to separate the study's constraints from the main findings. The discussion could be significantly shortened and sharpened to highlight the most important findings and make the key messages clearer and more impactful.

Specific comments

Abstract:

1. Provide the average size (+SD) of individuals and the total time of monitoring.
2. I think this sentence is misleading and should be rephrased: "Findings show that hawksbills spend more than half of their time feeding at a depth of 14.43 ± 9.72 m, especially in the morning." They spend more than half their time feeding: during daytime only, during the whole recording duration of ...? At an average depth of 14.43. Maybe cut it in two to make important information clearer.

Introduction

1. "What is known, however, is that hawksbills in Martinique exhibit strong site fidelity to their foraging grounds": not only in Martinique, provide a specificity of the region or rephrase.
2. I don't feel like Figure 1 facilitates understanding of the text. The text is already clear by itself. I would recommend improving the figure or removing it.

M&M

Section 2.2

1. Figure 2 could be largely reduced in size by rearranging it. I suggest removing the municipal boundaries of Martinique; bathymetric lines are difficult to read (in both maps) and could be removed from the map of the Caribbean. Consider placing the maps side by side and zooming in on the study site or showing the delimitation of the study site with a square.
2. "Based on previous research done on food selection and habitat use patterns of green sea turtles in Martinique^{[27][8][41]}, similar techniques were applied to the hawksbills monitored." Unclear. Consider adding it further down the text: "[...] cameras (CATS, Customized Animal Tracking Solutions, Germany) in "Le Sec du Diamant" between November 2022 and May 2023 following a methodology previously applied on green [refs]."
3. Is the study site called "Le sec du diamant" or "Le diamant" (Figure 2)?

4. Consider adding a photograph of the final installation; it would allow better reproducibility and also show where the camera is positioned to record the feeding behavior (on the side? the back?). Rearranging Figure 2 would leave space to do that.

Section 2.3

1. “A total of 44 distinct behavioral categories [...]” belongs in the results section.

Section 2.4

1. “At the Diamant” -> “At Le Diamant” or “At Le sec du Diamant” to be more precise on the name of the study site.
2. “Twenty percent of bites could be confidently assigned [...]” is a result, and it is already stated in the results. In the section, simply describe the methodology to assign or not assign a prey category.
3. “[...] due to the dorsal placement of the turtle-borne camera.” So the camera is placed on the back. This should be described earlier.

Section 2.5

1. The sentence “Potential prey identified in the laboratory were compared to prey consumed as observed in video recordings to determine prey selection” needs clarification. The two measures being compared—potential prey (expressed as an abundance index) and prey selection (number of bites)—are not directly equivalent, and it is unclear how they are meaningfully compared. From Figure 5, it seems these metrics are summed, but the rationale for this approach is not explained. Are there references supporting this method? I suggest describing and analyzing these two metrics separately and explaining how they can be compared.
2. You need to better justify that the sampled area matches the foraging site of the studied individuals.

Results

Section 3.1

1. “Seven hawksbills”? It says six in the abstract. Then in 3.2.1, it says five individuals. Please clarify.
2. Ok, so from Table 1, I understand that there are two sites. It should be made clearer in M&M.
3. How the sex is determined should be described in the M&M section. We understand that it is based on tail length, but it should be stated in M&M. Also, explain why you are sure that they are all mature in M&M.

4. In Table 1, replace “see above” with “see #3.”

Section 3.2

1. “In total, 70 h of multi-sensor recordings [...]” so 70 h when the camera is recording? The recording time when the camera is off (during the night) is not counted here. Clarify.
2. Average “dive duration was 52.2 [...]”.
3. Unclear: “Maximum depth was 17.8 m [...]”. The deepest dive observed [...]”. I guess this is the average maximum depth that is 17.8 m, but what exactly does it correspond to? During each dive, you record a maximum depth, then you calculate the average of these max depths?
4. “The behavior of the individuals differed in terms of dive duration ($p < 0.001$, Kruskal-Wallis, $n = 222$) and mean depth ($p < 0.001$, Kruskal-Wallis, $n = 222$).” Not sure what “mean depth” refers to here? The maximum depth at each dive? I guess $n = 222$ is the number of dives. Please clarify this.

Section 3.3

1. “The mean bite rate was 9.01 bites/minute.” During feeding behavior? Obvious but needs to be said.
2. 74 hours of recording? In 3.2.1, you said 70 h of recording.
3. 39 hours and 52 minutes of feeding out of 74 hours and 45 minutes of recording in total gives: 53.3%, while in 3.2.1, the feeding time budget is 58.2%. Why?
4. The 3,434 number of bites considered. So in the end, you use 35% of bites in the statistics or only 20%. This is unclear.
5. Fig 13 -> Fig 5?
6. Figure 4 lacks the abscissa axis, and what are the 644 bites considered here in the caption?

Section 3.4

1. “Samples were expertly analyzed through morphological analysis and DNA barcoding at Università Politecnica Delle Marche (UNIVPM) and Stazione Zoologica Anton Dohrn Napoli” -> M&M
2. In Figure 5, the habitat sampling and the number of bites are mixed to give a parameter: “number of observations”? See my comment on M&M section 2.5. Maybe convert both metrics to percentages and compare them side by side.

Discussion

1. "This study highlights key findings, such as that hawksbills spend 55.4% of their time feeding and forage at depths of <20 m." Where was this result given in the text? You cannot present new results in the discussion. I suggest removing this sentence to start with the more general findings of the paper.
2. Section 4.1, I did not understand the relevance of this section with respect to the results of the paper. "The size of the single female captured (CCL= 77 cm) was lower than those of the males found (CCL= 82.2 ± 1.76 cm);" this cannot lead to any conclusion; one female has no statistical value. Did all the sea turtles "found" get captured? Are the captured individuals representative of the aggregation at Le Diamant? "No juveniles were found during this study, contrary to our initial hypothesis." What was the initial hypothesis? Does "found" mean captured or seen? I think this section should be removed.
3. Section 4.2: there is an ambiguity in the term 'time' or 'day'. A day could mean 24 hours or only daytime, when the sun is up. In your case, it is the second option. This should be clarified because when it is stated that: "Studied hawksbills allocated most of their time to feeding activity (>50%) and resting (<30%)." "it's actually the time during which the sun is up.
4. Section 4.2: "Behavioral patterns observed in this study suggest that hawksbills exhibit distinct diel activity, with diurnal resting occurring in some individuals" did you analyze the data during the night? This was not presented. You should not introduce new results in the discussion.
5. Section 4.2: "In our study, one female exhibited intense foraging activity during ten hours of monitoring, consistent with an income-breeding strategy at the end of the nesting season" Is it the end of the nesting season in Martinique? Maybe think of providing context to better analyze their feeding behavior.
6. Section 4.2: "[...] while males engaged in resting behavior across both days, suggesting inter-individual variability in energy allocation." Where is this presented in the manuscript? You cannot bring new results into the discussion; you must discuss the results that were presented.
7. Section 4.2: "Surfacing was observed for respiratory purposes only, with short surface intervals of 1 min $44 \text{ s} \pm 5 \text{ min } 15 \text{ s}$." On average!
8. Section 4.2: "However, no diurnal basking was observed in the video recordings." What do you mean? You did not analyze the data during the night, and diurnal activity was not investigated in the paper.
9. Section 4.2: "As hawksbills spend more than half of their time feeding," -> during daytime

10. Section 4.3: “ [...] revealing that Porifera accounted for 75% of observed feeding activity.” Where is this result?

Declarations

Potential competing interests: No potential competing interests to declare.