



OPEN ACCESS

EDITED AND REVIEWED BY
Mariana M.P.B. Fuentes,
Florida State University, United States

*CORRESPONDENCE

Hector Barrios-Garrido
✉ hector.barriosgarrido@my.jcu.edu.au

RECEIVED 19 December 2024

ACCEPTED 27 December 2024

PUBLISHED 16 January 2025

CITATION

Barrios-Garrido H, Tanabe LK,
Vélez-Rubio GM, Ware M
and Wildermann NE (2025)
Editorial: Marine turtles.
Front. Amphib. Reptile Sci. 2:1548605.
doi: 10.3389/famrs.2024.1548605

COPYRIGHT

© 2025 Barrios-Garrido, Tanabe, Vélez-Rubio,
Ware and Wildermann. This is an open-access
article distributed under the terms of the
[Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/).
The use, distribution or reproduction in other
forums is permitted, provided the original
author(s) and the copyright owner(s) are
credited and that the original publication in
this journal is cited, in accordance with
accepted academic practice. No use,
distribution or reproduction is permitted
which does not comply with these terms.

Editorial: Marine turtles

Hector Barrios-Garrido^{1,2,3*}, Lyndsey K. Tanabe^{1,4},
Gabriela M. Vélez-Rubio^{5,6}, Matthew Ware^{7,8}
and Natalie Elizabeth Wildermann¹

¹Marine Science Program, Biological and Environmental Science and Engineering Division, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, ²Departamento de Biología, Facultad Experimental de Ciencias, Universidad de Zulia, Maracaibo, Venezuela, ³Centre for Tropical Water and Aquatic Ecosystem Research, James Cook University, Townsville, Queensland, Australia, ⁴Asian School of the Environment, Nanyang Technological University, Singapore, Singapore, ⁵Karumbé, Montevideo, Uruguay, ⁶Sección de Oceanografía y Ecología Marina, Instituto de Ecología y Ciencias Ambientales, Facultad de Ciencias, Universidad de la República, Montevideo, Uruguay, ⁷Department of Biological Sciences, Florida Gulf Coast University, Fort Myers, FL, United States, ⁸Center for Marine Sciences, University of North Carolina Wilmington, Wilmington, NC, United States

KEYWORDS

sea turtle, global south, conservation challenges, conservation strategies, flagship species, keystone species

Editorial on the Research Topic

Marine turtles

Marine turtles are vital to marine ecosystems, serving as indicators of ocean health and contributing to the ecological balance of marine habitats (Aguirre and Lutz, 2004). However, the Anthropocene has introduced a multitude of human-induced stressors on natural systems, necessitating innovative solutions to mitigate these impacts (Davenport, 2024; Syvitski et al., 2020). Significant aspects of marine turtle biology remain poorly understood (Hamann et al., 2010; Rees et al., 2016; Wildermann et al., 2018), especially in regions of the Global-South (Robinson et al., 2022; 2023; Shanker et al., 2023).

This Research Topic presents a collection of seven studies that advance our understanding of marine turtles in need of conservation action, with research spanning Saudi Arabia, Mexico, Dominica, Uruguay, Brazil, Martinique, and Ecuador. This editorial summarizes four original research manuscripts, one review, one mini review, and one brief research report; all highlighting the complex threats that marine turtles face and underscoring the need for multidisciplinary approaches to develop effective conservation strategies.

Anthropogenic threats to marine turtles

Fisheries bycatch and habitat interactions

Marine turtles face significant mortality from interactions with fisheries (Wallace et al., 2013). The concern of bycatch in gillnets and pelagic longline fisheries, as explored in this Research Topic, remains a critical conservation concern. Understanding the interactions between marine turtles and fisheries is crucial for the development of effective management strategies. A study by El-Khaled et al. investigate hawksbill turtles' interactions with gillnets in Saudi Arabia, revealing that turtles depredate fish caught in the nets, a behavior that can cause

entanglement and potentially lead to mortality. This study underscores the need for modified fishing practices to reduce bycatch and protect turtle populations. Similarly, [Vanucci et al.](#) assess the mortality of marine turtles associated with long-line fisheries in the Santos Basin, Brazil, revealing that bycatch rates in pelagic longline fisheries are disproportionately affecting juvenile and adult turtles. Their findings advocate for stricter regulations, the adoption of bycatch reduction technologies, and targeted outreach to fishers to ensure compliance.

Marine pollution and plastic ingestion

Marine pollution, particularly plastic debris, poses a growing threat to marine turtles ([Nelms et al., 2016](#)). Plastics not only degrade marine habitats but also directly impact turtle health through ingestion and entanglement. [Muñoz-Pérez et al.](#) provide alarming evidence of plastic ingestion in juvenile green turtles in Ecuador's national parks (Galapagos and Machalilla). Their analysis links high levels of plastic ingestion to compromised health metrics, emphasizing the urgent need for regional and global efforts to reduce plastic waste entering marine ecosystems. Given the pervasiveness of plastics in the oceans, future studies should explore the long-term physiological and reproductive impacts of chronic exposure and develop actionable policies to reduce marine litter, particularly in feeding grounds where marine turtles spend most of their life cycle.

Understanding habitat use and connectivity

The role of oceanic currents in dispersal and genetic diversity remains poorly understood, emphasizing the need to study coastal and developmental feeding grounds ([Cardona and Hays, 2018](#)). These transboundary habitats are critical for marine turtle survival, highlighting the need to understand population connectivity to inform effective conservation strategies ([Stokes et al., 2015](#)).

[Levenson et al.](#) track post-hatchling green turtles in the eastern Caribbean, shedding light on the elusive "lost years" of juvenile turtles. The research highlights the importance of oceanic currents in shaping the dispersal of early life stage turtles and emphasizes the need for protecting these critical habitats across multiple exclusive economic zones (EEZs). Interestingly, this study corroborates that the tracked animals primarily inhabit waters of developing countries, particularly Small Island Developing States (SIDS), which often lack the resources for long-term conservation programs to protect threatened species.

Genetic diversity is key to the survival of threatened populations. [Prosdocini et al.](#) examine the genetic composition of green turtles in Uruguayan coastal feeding areas, identifying multiple genetic stocks (nesting origins). This diversity suggests that these feeding grounds are vital for various populations, highlighting the need for targeted cross-boundary conservation measures involving both African and South American countries.

Interdisciplinary approaches for marine turtle conservation and ecosystem recovery

Nowadays, understanding and addressing evolving threats, such as diseases, requires interdisciplinary research to inform conservation actions ([Destoumieux-Garzón et al., 2018](#); [Mashkour et al., 2020](#)). Simultaneously, protecting marine turtles as umbrella species can support the recovery of broader marine ecosystems, emphasizing the need for integrated approaches that benefit numerous species and interconnected habitats ([Dickson et al., 2022](#)).

Effective conservation management requires a comprehensive understanding of emerging threats. [Dupont et al.](#) explore future research avenues for studying fibropapillomatosis, a disease affecting marine turtles worldwide. The study emphasizes the need for interdisciplinary research to understand the disease's etiology and develop effective management strategies. Additionally, [Gallegos-Fernandez et al.](#) emphasize the role of marine turtles in ecosystem recovery, advocating for their protection to safeguard wider marine biodiversity. This work highlights the importance of integrated conservation approaches that will not only protect marine turtles but also benefit the ecosystems and species they support.

Summary

As iconic species, marine turtles have drawn the attention of scientists and the public for decades ([Mazaris et al., 2018](#)). This highlights not only the ecological importance of these species, but also their cultural significance. Hence, addressing threats such as bycatch, habitat degradation, and disease, and by promoting habitat protection and pollution reduction, we can work toward ensuring the survival and recovery of these species. While significant progress has been made, the articles in this Research Topic emphasize the need for advancing and integrating transboundary conservation initiatives. As threats to marine turtles continue to evolve, it is essential that our research and conservation strategies evolve alongside them.

This Research Topic encompasses novel contributions on key themes. By bridging knowledge gaps and fostering collaboration across disciplines, we can work toward a future where marine turtles thrive in healthy and balanced ecosystems. This Research Topic represents a step in that direction, and we hope it inspires continued innovation in marine turtle research and conservation, especially among emerging scientists from Global-South countries ([Shanker et al., 2023](#)).

Author contributions

HB-G: Conceptualization, Investigation, Supervision, Writing – original draft, Writing – review & editing. LT: Conceptualization, Investigation, Supervision, Writing – review & editing. GV-R: Conceptualization, Investigation, Supervision, Writing – review & editing. MW: Conceptualization, Investigation, Supervision,

Writing – review & editing, NW: Conceptualization, Investigation, Supervision, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- Aguirre, A. A., and Lutz, P. L. (2004). Marine turtles as sentinels of ecosystem health: is fibropapillomatosis an indicator? *EcoHealth* 1, 275–283. doi: 10.1007/s10393-004-0097-3
- Cardona, L., and Hays, G. C. (2018). Ocean currents, individual movements and genetic structuring of populations. *Mar. Biol.* 165, 1–10. doi: 10.1007/s00227-017-3262-2
- Davenport, J. (2024). Sea turtles in the anthropocene. *Biol. Environment: Proc. R. Irish Acad.* 124, 103–129. doi: 10.1353/bae.2024.a945751
- Destoumieux-Garçon, D., Mavingui, P., Boetsch, G., Boissier, J., Darriet, F., Duboz, P., et al. (2018). The One Health concept: 10 years old and a long road ahead. *Front. Veterinary Sci.* 5. doi: 10.3389/fvets.2018.00014
- Dickson, L. C., Negus, S. R., Eizaguirre, C., Katselidis, K. A., and Schofield, G. (2022). Aerial drone surveys reveal the efficacy of a protected area network for marine megafauna and the value of sea turtles as umbrella species. *Drones* 6, 291. doi: 10.3390/drones6100291
- Hamann, M., Godfrey, M. H., Seminoff, J. A., Arthur, K., Barata, P. C. R., Bjorndal, K. A., et al. (2010). Global research priorities for sea turtles: informing management and conservation in the 21st century. *Endangered Species Res.* 11, 245–269. doi: 10.3354/esr00279
- Mashkour, N., Jones, K., Kophamel, S., Hipolito, T., Ahasan, S., Walker, G., et al. (2020). Disease risk analysis in sea turtles: A baseline study to inform conservation efforts. *PLoS One* 15, e0230760. doi: 10.1371/journal.pone.0230760
- Mazaris, A. D., Gkazinou, C., Almpandou, V., and Balazs, G. (2018). The sociology of sea turtle research: evidence on a global expansion of co-authorship networks. *Biodiversity Conserv.* 27, 1503–1516. doi: 10.1007/s10531-018-1506-1
- Nelms, S. E., Duncan, E. M., Broderick, A. C., Galloway, T. S., Godfrey, M. H., Hamann, M., et al. (2016). Plastic and marine turtles: a review and call for research. *ICES J. Mar. Sci.* 73, 165–181. doi: 10.1093/icesjms/fsv165
- Rees, A., Alfaro-Shigueto, J., Barata, P., Bjorndal, K., Bolten, A., Bourjea, J., et al. (2016). Are we working towards global research priorities for management and conservation of sea turtles? *Endang Species Res.* 31, 337–382. doi: 10.3354/esr00801
- Robinson, N. J., Aguzzi, J., Arias, S., Gatto, C., Mills, S. K., Monte, A., et al. (2023). Global trends in sea turtle research and conservation: Using symposium abstracts to assess past biases and future opportunities. *Global Ecol. Conserv.* 47, e02587. doi: 10.1016/j.gecco.2023.e02587
- Robinson, N. J., Mills, S., St. Andrews, L., Sundstrom, A., Thibodeau, J., Yaney-Keller, A., et al. (2022). Representation in sea turtle science: Slow progress towards gender equity and globalization revealed from thirty years of symposium abstracts. *Front. Mar. Sci.* 9. doi: 10.3389/fmars.2022.943056
- Shanker, K., Early Capistran, M. A., Urteaga, J., Mohd Jani, J., Barrios-Garrido, H., and Wallace, B. P. (2023). “Decolonizing sea turtle conservation,” in *SWOT – The State of the World’s Sea Turtles*, Ross, California, USA: R.B. Mast, B.J. Hutchinson, P.E. Villegas and A. Bandimere. vol. 18, , 31–35. Available at: <https://www.seaturtlestatus.org/swot-report-vol-18> (Accessed December 1, 2024).
- Stokes, K. L., Broderick, A. C., Canbolat, A. F., Candan, O., Fuller, W. J., Glen, F., et al. (2015). Migratory corridors and foraging hotspots: critical habitats identified for Mediterranean green turtles. *Diversity Distributions* 21, 665–674. doi: 10.1111/ddi.12317
- Syvitski, J., Waters, C. N., Day, J., Milliman, J. D., Summerhayes, C., Steffen, W., et al. (2020). Extraordinary human energy consumption and resultant geological impacts beginning around 1950 CE initiated the proposed Anthropocene Epoch. *Commun. Earth Environ.* 1, 32. doi: 10.1038/s43247-020-00029-y
- Wallace, B. P., Kot, C. Y., DiMatteo, A. D., Lee, T., Crowder, L. B., and Lewison, R. L. (2013). Impacts of fisheries bycatch on marine turtle populations worldwide: toward conservation and research priorities. *Ecosphere* 4, 1–49. doi: 10.1890/ES12-00388.1
- Wildermann, N. E., Gredzens, C., Avens, L., Barrios-Garrido, H. A., Bell, I., Blumenthal, J., et al. (2018). Informing research priorities for immature sea turtles through expert elicitation. *Endanger Species Res.* 37, 55–76. doi: 10.3354/esr00916

Publisher’s note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.