28 September 2023

Mr. David Bernhart, Assistant Regional Administrator
Protected Resources Division
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
Saint Petersburg, Florida 33701

Dear Mr. Bernhart:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's (NMFS) 24 July 2023 *Federal Register* notice (88 Fed. Reg. 47453) proposing to designate critical habitat for Rice's whale (*Balaenoptera ricei*), as well as the "Endangered Species Act Rice's Whale Critical Habitat Report."[1] The Commission commends NMFS for the research conducted on Rice's whales to date and its efforts to collect and compile information to support the designation of critical habitat.

Background

NMFS listed the Gulf of Mexico subspecies of Bryde's whale (*Balaenoptera edeni*) as endangered under the Endangered Species Act (ESA) in December 2016 (81 Fed. Reg. 88639 and 81 Fed. Reg. 92760). NMFS subsequently published a final rule in August 2021 (86 Fed. Reg. 47022) to change the taxonomic classification and name of the species to Rice's whale to reflect the determination that these whales constitute a separate species. The ESA requires the designation of critical habitat concurrent with a species listing, unless NMFS finds that critical habitat was not determinable at the time of listing, which NMFS asserted to be the case in the final rule. If critical habitat is not designated at the time of listing, a final critical habitat designation must be published within one year. When NMFS missed that deadline, the Natural Resources Defense Council and Healthy Gulf filed a lawsuit to compel a designation and entered into a settlement agreement with NMFS requiring that a proposed rule designating Rice's whale critical habitat be submitted to the Office of the Federal Register by 15 July 2023 and a final rule be issued by 15 June 2024.

Critical habitat designation

Section 3(5)(A) of the ESA defines critical habitat as (1) areas occupied by the species at the time of listing that include physical or biological features essential for its conservation and that may require special management considerations or protection and (2) areas outside the species' geographic range at the time of listing that are essential for its conservation. Implementing regulations further define essential physical or biological features as features that occur in specific

[1] "Endangered Species Act Rice's Whale Critical Habitat Report – Proposed Information Basis and Impact Considerations of Critical Habitat Designation" prepared by NMFS, July 2023.

areas and that are essential to support the life history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics, may include habitat characteristics that support ephemeral or dynamic habitat conditions, and may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity (50 C.F.R. § 424.02).

NMFS identified the following single feature as essential to the conservation of Rice's whale: "Gulf of Mexico continental shelf and slope waters between the 100 and 400 m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth." NMFS specified that this feature has the following attributes that support Rice's whales' ability to forage, develop, communicate, reproduce, rear calves, and migrate:

- Sufficient density, quality, abundance, and accessibility of small demersal and vertically-migrating prey species, including Scombriformes, Stomiiformes, Myctophiformes, and Myopsida;
- Marine water with (i) elevated productivity, (ii) bottom temperatures of 10–19 degrees Celsius, and (iii) levels of pollutants that do not preclude or inhibit any demographic function; and,
- Sufficiently quiet conditions for normal use and occupancy, including intraspecific communication, navigation, and detection of prey, predators, and other threats.

The identification of continental shelf and slope waters between the 100 and 400 m isobaths as habitat for Rice's whales is consistent with studies cited in the critical habitat report (Rosel et al. (2021), Soldevilla et al. (2022 a, b), Kiszka et al. (2023))[2], as well as Kok et al. (2023) and Rapucci et al. (2023). Those studies confirm that nearly all visual sightings and acoustic detections to date of Rice's whales in the northern Gulf of Mexico (Florida to Texas) have occurred in waters between the 100 and 400 m isobaths and that biologically important behavior, such as foraging and resting, occurs in those areas. A number of human activities also occur in those areas and pose a threat to the proposed critical habitat, thereby warranting special management considerations or protection. Such activities include, but are not limited to, in-water construction, energy development (both wind and oil and gas), commercial shipping, aquaculture, military operations, and fishing. After reviewing the science that supports the critical habitat designation, the Commission concurs with NMFS that waters between the 100 m and 400 m isobaths, extending from the U.S. Exclusive Economic Zone boundary off Texas east to the boundary between the jurisdictions of the South Atlantic and Gulf of Mexico Fishery Management Councils off Florida, constitute an essential feature of Rice's whale critical habitat and recommends that the defined area be used to identify Rice's whale critical habitat throughout the northern Gulf.

The Commission notes that the *Federal Register* notice and the accompanying critical habitat report do not define explicitly several of the attribute descriptors, namely "sufficient density, quality, abundance, and accessibility" of prey, "elevated productivity", "levels of pollutants" that do not "preclude or inhibit and demographic function", and "sufficiently quiet conditions for normal use

[2] Garrison et al (in review) was also cited in the critical habitat report but has yet to be published.

and occupancy." Although the Commission supports the inclusion of those attributes, the Commission further recommends that NMFS quantify, to the extent practicable, the terms used to describe the attributes of Rice's whale critical habitat to help ensure that research and management actions are effective at protecting such attributes. In the context of better quantifying these attributes, the Commission offers the following additional comments.

Prey

Based on a study of trophic interactions, which included towed net surveys to determine potential prey species in Rice's whale habitat and stable isotope analyses of remotely-sampled Rice's whale skin, Kiszka et al. (2023) determined that Rice's whales preferentially feed on energy-rich fish species, specifically *Ariomma bondi* (silver rag driftfish, order Scombriformes). *A. bondi* is a demersal to benthopelagic schooling fish that occurs over muddy bottom at depths of 50 to 500 m. Near-bottom trawl survey data from NMFS Southeast Fisheries Science Center collected between 2003 and 2023 over the outer shelf of the northern Gulf of Mexico showed that *A. bondi* is common, particularly near the shelf break (unpublished data in Kiszka et al. 2023). However, the relative abundance of *A. bondi* in the water column (1.2 percent) and its biomass relative to other nektonic species (27 percent) was lower than its presence in the diet of Rice's whales (67 percent). Kiszka et al. (2023) concluded that Rice's whales appear to be feeding selectively on *A. bondi*. Such a selective foraging strategy could increase the susceptibility of Rice's whales to factors that limit overall prey availability. Further understanding of the availability of *A. bondi* and other primary prey species in the diet of Rice's whales (including *Diaphus dumerilii*, Dumeril's lanternfish, order Myctophormes, 18 percent; *Doryteuthis pealeii*, longfin inshore squid, order Myopsida, 6 percent; and *Maurolicus weitzmani*, Atlantic pearlside, order Stomiiformes, 9 percent; Kiszka et al. 2023) as a characteristic of critical habitat is therefore needed. Little information is available to suggest where and when Rice's whales feed on the different prey species, or which foraging areas are essential and which are of lesser importance. Given that the most reliable indicator of prey species in cetaceans is stomach content analyses, which have not been available (and are not likely to become available) for Rice's whales, the Commission recommends that NMFS continue to evaluate prey species preferences through all available means to confirm the importance of Scombriformes and other prey species in the diet of Rice's whales and to quantify their presence in Rice's whale habitat.

Productivity, Temperature, and Pollution

Productivity in the northern Gulf is affected by a number of factors, including freshwater input from the Mississippi and Atchafalaya Rivers and the occurrence of warm water eddies that detach from the Loop Current, thereby upwelling deep, nutrient-rich waters that increase productivity (Brokaw et al. 2019, Damien et al. 2021). The Gulf of Mexico has been warming continuously since 1970, with marine heatwaves increasing significantly in frequency, duration, and intensity since 2016 (Feng et al. 2023, Wang et al 2023). The increasing occurrence of marine heat waves and severe weather events in the Gulf of Mexico region affect both the amount and timing of freshwater entering the Gulf, the presence and strength of loop current eddies, and water temperatures at both the surface and at depth—all of which affect productivity.

Productivity in the northern Gulf is also affected by anthropogenic pollutants such as hydrocarbon discharges and oil spills, nitrogen and phosphorus discharge in coastal runoff, and

freshwater and nutrient input from sediment diversions (Bargu et al. 2019, Li et al. 2019, Rabalais and Turner 2019, Pulster et al. 2020). How these and other changes in the Gulf will affect productivity in Rice's whale habitat is unclear and warrants further investigation considering the importance of elevated productivity as an attribute of critical habitat. The Commission recommends that NMFS continue to identify, evaluate, and mitigate, when possible, sources of pollutants and other anthropogenic factors that are impacting productivity throughout Rice's whale critical habitat.

Sound

Anthropogenic sound can cause physiological injury to marine mammals at relatively close ranges and disrupt important behaviors—navigating, communicating, foraging, and avoiding predators—at farther ranges (Guan and Brookens 2023). Certain types of anthropogenic sound can also mask communication calls between individuals of the same species and other biologically important sounds (Cholewiak et al. 2018). Although direct measurements of hearing sensitivity in baleen whales are lacking, Rice's whales and other baleen whales are generally believed to be most sensitive to low-frequency sounds (Southall et al. 2019). Ambient low-frequency sound levels in the Gulf of Mexico are some of the highest recorded worldwide, primarily due to sound generated by seismic airguns and commercial shipping (Wiggins et al. 2016, Haver et al. 2021). Rafter et al. (2022) similarly determined that low-frequency sound levels are highest in the central and western portions of the northern Gulf, where seismic exploration and shipping activities occur year-round (Barkaszi and Kelly 2018, Soldevilla et al. 2022a, NOAA Gulf of Mexico Data Atlas[3]). Additional research is needed to determine why fewer Rice's whales may occur in the western Gulf and the relationship between lower densities of whales and higher levels of anthropogenic activity in that area. Efforts are underway by NMFS, the Scripps Institution of Oceanography, and other partners to collect data on ambient sound levels in the Gulf, the presence of cetaceans, and sources of anthropogenic sound in key parts of the Gulf, including in Rice's whale habitat, using a network of passive acoustic monitoring devices (the LISTEN project[4]; Rafter et al. 2022). The Commission recommends that NMFS use data being collected by the LISTEN project and other data as available to further understand the location, temporal variation, and intensity of anthropogenic sound within the Rice's whale critical habitat and its effect on habitat quality.

Please contact me if you would like to discuss any of the Commission's comments and recommendations.

Sincerely,

Peter O. Thomas, Ph.D.,
Executive Director

[3] https://www.ncei.noaa.gov/maps/gulf-data-atlas/atlas.htm?plate=Shipping%20Density
[4] https://www.fisheries.noaa.gov/science-data/passive-acoustic-research-southeast-fisheries-science-center#listen-gomex

References

Bargu, S., D. Justic, J.R. White, R. Lane, J. Day, H. Pearl, and R. Raynie. 2019. Mississippi River diversions and phytoplankton dynamics in deltaic Gulf of Mexico estuaries: A review. Estuarine, Coastal and Shelf Science 221:39–52. https://doi.org/10.1016/j.ecss.2019.02.020

Barkaszi, M.J., and C.J. Kelly. 2018. Seismic survey mitigation measures and protected species observer reports: Synthesis report. OCS Study BOEM 2019-012, Gulf of Mexico OCS Region, Bureau of Ocean Energy Management, New Orleans, Louisiana. 220 pages. https://www.govinfo.gov/app/details/GOVPUB-I-2232d8e5be27ddc3793fcd0f5d426421

Brokaw, R.J., B. Subrahmanyam, and S.L. Morey. 2019. Loop current and eddy-driven salinity variability in the Gulf of Mexico. Geophysical Research Letters 46:5978–5986. https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019GL082931

Cholewiak, D., C.W. Clark, D. Ponirakis, A. Frankel, L.T. Hatch, D. Risch, J.E. Stanistreet, M. Thompson, E. Vu, and S.M. Van Parijs. 2018. Communicating amidst the noise: Modeling the aggregate influence of ambient and vessel noise on baleen whale communication space in a national marine sanctuary. Endangered Species Research 36:59–75. https://doi.org/10.3354/esr00875

Damien, P., J. Sheinbaum, O.P. de Fommervault, J. Jouanno, L. Linacre, and O. Duteil. 2021. Do Loop Current eddies stimulate productivity in the Gulf of Mexico? Biogeosciences 18:4281–4303. https://doi.org/10.5194/bg-18-4281-2021

Feng, Y., B.J. Bethel, Y. Tian, C. Dong, J. Liang, Y. Yao, J. Yuan, Y. Chen, S. Chen, and Y. Yang. 2023. Marine heatwaves in the Gulf of Mexico: Long-term statistics, recent intensifications, and threats on coral reefs. Advances in Climate Change Research 14(4):560–572. https://doi.org/10.1016/j.accre.2023.08.006

Garrison, L.P., A. Martinez, M.S. Soldevilla, J. Ortega-Ortiz, and K.D. Mullin. In review. The habitat of the critically endangered Rice's whale, *Balaenoptera ricei*, in the Gulf of Mexico. Endangered Species Research.

Guan, S., and T. Brookens. 2023. An overview of research efforts to understand the effects of underwater sound on cetaceans. Water Biology and Security 2(2):100141. https://doi.org/10.1016/j.watbs.2023.100141

Haver, S.M. J.D. Adams, L.T. Hatch, S.M. Van Parijs, R.P. Dziak, J. Haxel, S.A. Heppell, M.F. McKenna, D.K. Mellinger, and J. Gedamke. 2021. Large vessel activity and low-frequency underwater sound benchmarks in United States waters. Frontiers in Marine Science 8:669528. https://www.frontiersin.org/articles/10.3389/fmars.2021.669528/full

Kiszka, J.J., M. Caputo, J. Vollenweider, M.R. Heithaus, L.A. Dias, and L.P. Garrison. 2023. Critically endangered Rice's whales (*Balaenoptera ricei*) selectively feed on high-quality prey in the Gulf of Mexico. Scientific Reports 13:6710 https://doi.org/10.1038/s41598-023-33905-6

Kok, A.C.M., M.J. Hildebrand, M. MacArdle, A. Martinez, L.P. Garrison, M.S. Soldevilla, and J.A. Hildebrand. 2023. Kinematics and energetics of foraging behavior in Rice's whales of the Gulf of Mexico. Scientific Reports 13:8996. https://doi.org/10.1038/s41598-023-35049-z

Lawson, M.C., J.A. Cullen, C.C. Nunnally, G.T. Rowe, and D.N. Hala. 2021. PAH and PCB body-burdens in epibenthic deep-sea invertebrates from the northern Gulf of Mexico. Marine Pollution Bulletin 162:111825. https://doi.org/10.1016/j.marpolbul.2020.11182

Li, G., Z. Wang, and B. Wang. 2022. Multidecade trends of sea surface temperature, chlorophyll-a concentration, and ocean eddies in the Gulf of Mexico. Remote Sensing 14:3754. https://doi.org/10.3390/rs14153754

Pulster, E.L., A. Garcia, M. Armenteros, G. Toro-Farmer, S.M. Snyder, B.E. Carr, M.R. Schwaab, T.J. Nicholson, J. Mrowicki, and S.A. Murawski. 2020. A first comprehensive baseline of hydrocarbon pollution in Gulf of Mexico fishes. Scientific Reports 10:6437. https://www.nature.com/articles/s41598-020-62944-6

Rabalais, N.N., and R.E. Turner. Gulf of Mexico hypoxia: Past, present, and future. Limnology and Oceanography Bulletin 28(4):117–124. https://doi.org/10.1002/lob.10351

Rafter, M.R., K.E. Frasier, M.S. Soldevilla, L. Hodge, H. Frouin-Mouy, and I. Pérez Carballo. 2022. LISTEN GoMex: 2010–2021 Long-term investigations into soundscapes, trends, ecosystems, and noise in the Gulf of Mexico. MPL Technical Memorandum #662, Scripps Institution of Oceanography, University of California San Diego, La Jolla, California.. 147 pages.

Rappucci, G., L.P. Garrison, M. Soldevilla, J. Ortega-Ortiz, J. Reid, L. Aichinger-Dias, K. Mullin, and J. Litz. 2023. Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS): Marine mammals, Volume 1, report. OCS Study BOEM 2023-042, Gulf of Mexico OCS Region, Bureau of Ocean Energy Management, New Orleans, Louisiana. 104 pages.

Rosel, P.E., L.A. Wilcox, T.K. Yamada, and K.D. Mullin. 2021. A new species of baleen whale (*Balaenoptera*) from the Gulf of Mexico, with a review of its geographic distribution. Marine Mammal Science 37:577–610. https://repository.library.noaa.gov/view/noaa/47278

Soldevilla, M.S., A.J. Debich, L.P. Garrison, J.A. Hildebrand, and S. Wiggins. 2022a. Rice's whales in the northwestern Gulf of Mexico: Call variation and occurrence beyond the known core habitat. Endangered Species Research 48:155–174. https://doi.org/10.3354/esr01196

Soldevilla, M.S., K. Ternus, A. Cook, J.A. Hildebrand, K.E. Frasier, A. Martinez, and L.P. Garrison. 2022b. Acoustic localization, validation, and characterization of Rice's whale calls. The Journal of the Acoustical Society of America 151(6):4264–4278. https://repository.library.noaa.gov/view/noaa/45071

Southall, B.L., J.J. Finneran, C. Reichmuth, P.E. Nachtigall, D.R. Ketten, A.E. Bowles, W.T. Ellison, D.P. Nowacek, and P.L. Tyack. 2019. Marine mammal noise exposure criteria: Update scientific recommendations for residual hearing effects. Aquatic Mammals 45(2):125–232. https://www.aquaticmammalsjournal.org/article/vol-45-iss-2-southall/

Wang, Z., T. Boyer, J. Reagan, and P. Hogen. 2023. Upper-oceanic warming in the Gulf of Mexico between 1950 and 2020. Journal of Climate 36:2721–2734. https://journals.ametsoc.org/view/journals/clim/36/8/JCLI-D-22-0409.1.xml

Wiggins, S.M., J.M. Hall, B.J. Thayre, and J.A. Hildebrand. 2016. Gulf of Mexico low-frequency soundscape impacted by airguns. The Journal of the Acoustical Society of America 140:176. https://doi.org/10.1121/1.4955300