



Case study: Energy Production and Protected Whales

The Gulf of Mexico is a crucial area for U.S. oil and gas resources. The region accounts for fifteen percent of the country's total crude oil production. The U.S. Department of Interior leases blocks in the Gulf of Mexico for oil and gas drilling. The revenue received from leases is distributed to the U.S. Treasury, local governments, Land and Water Conservation Fund, Historic Preservation Fund, and Gulf Coast states (Texas, Louisiana, Mississippi, and Alabama). Lease sales are open to qualified bidders who can place silent auction bids on unleased blocks. The average lease hold on a winning bid is 7-10 years. Oil and gas companies use government regulatory GIS data from the Bureau of Ocean Energy Management (BOEM) to decide what blocks to place bids on. A scheduled lease sale was postponed when a rare whale species was sighted within the proposed lease sale area, outside its supposed habitat area.

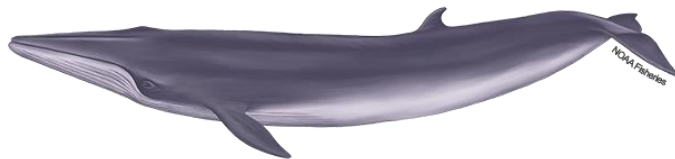


Figure 1: Rice's Whale
Balaenoptera ricei
(<https://www.fisheries.noaa.gov/species/rices-whale>)

Rice's Whale (Figure 1) is one of the most endangered whales in the world. Only 50-100 individual whales are believed to exist. They are found only in the Gulf of Mexico. Noting whale sightings beyond its supposed core habitat area, a recent peer-reviewed study suggests that the whale's habitat should be expanded across waters 100-400 meters deep along the continental shelf in the northeastern Gulf of Mexico (NOAA 2023). Figure 2 shows the whale's known core habitat and proposed habitat extension. The map also illustrates potential conflict between the expanded habitat and existing lease blocks, as well as new blocks that may yet be established.

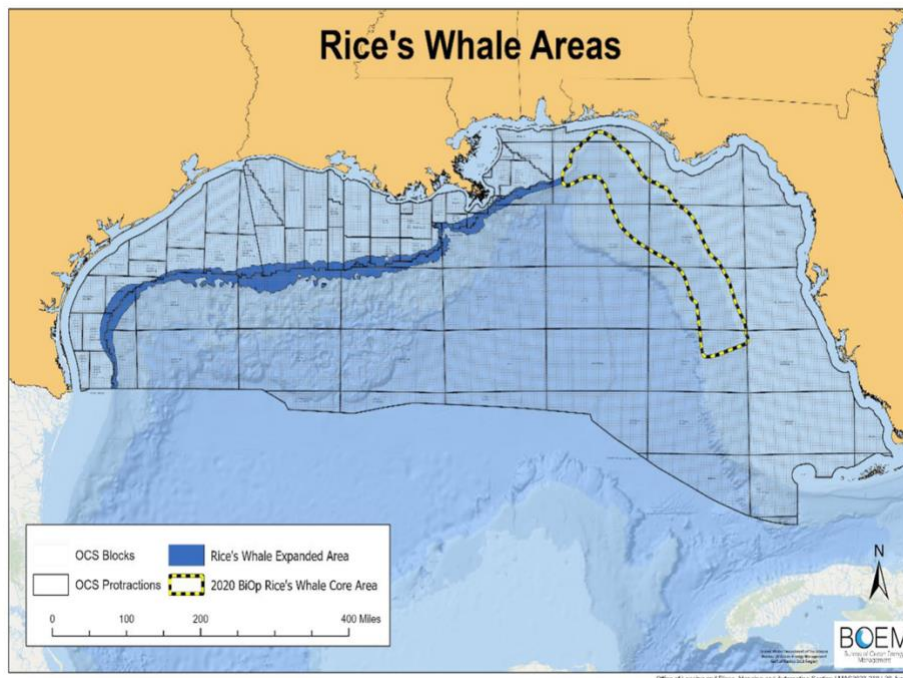


Figure 2: Established core habitat and proposed habitat extension of Rice's Whale in relation to lease blocks and administrative protraction areas. (BOEM 2023 NTL No. 2023-G01, August 17)

As a marine biologist and GIS specialist with the U.S. Department of Interior's Bureau of Ocean Energy Management (BOEM), you are responsible for determining which blocks and how much acreage will be included in the rescheduled lease sale. You have been assigned to create an updated map similar to Figure 2, showing the Rice's Whale habitat and the lease blocks that are in play for the upcoming lease sale. BOEM will publish the map as part of a press release for the public. All GIS feature classes from the map will also be published as shapefiles for download.

The map will include:

- Active blocks
- Blocks included in the current sale
- Protraction areas (Administrative areas within which lease blocks may be established)
- Bathymetry
- Rice's Whale habitat area

BOEM has decided to resume lease block auctions. However, it has also advised lessees and operators to enact measures to protect Rice's Whale within the expanded habitat area (U.S. Department of Interior, 2023). Given that determination, and the current political imperative to reduce high energy costs by increasing production, your department head directs you to maximize the number of new leases by delineating new blocks within the expanded habitat. Mindful of the fact that BOEM's mission includes environmental protection, you are disinclined to offer new blocks in that area. As a BOEM employee, what are your obligations to stakeholders? And as a GIS professional, what are your ethical obligations? What are your options, and which option is best?

References

National Oceanic and Atmospheric Administration (2023). Endangered and Threatened Species; Designation of Critical Habitat for the Rice's Whale.

<https://www.federalregister.gov/documents/2023/07/24/2023-15187/endangered-and-threatened-species-designation-of-critical-habitat-for-the-rices-whale>

United States Department of the Interior, Bureau of Ocean Energy Management (2023). Expanded Rice's Whale Protection Efforts During Reinitiated Consultation with NMFS. BOEM NTL No. 2023-G01, August 17.

<https://www.boem.gov/sites/default/files/documents/about-boem/regulationsguidance/BOEM%20NTL%202023-G01.pdf>

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<http://gisethics.org>

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