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**Update on the Gulf of Mexico Bryde's whale/Rice's Whale Research and Conservation—  
2020-2021**

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## **Update on the Gulf of Mexico Bryde's whale/Rice's Whale Research and Conservation—2020-2021**

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### Research

#### Taxonomy

In January 2021, a publication recommending full species status for the Bryde's whales in the Gulf of Mexico was published (Rosel et al. 2021). Using both genetic and morphological data, the authors identified diagnostic differences between the whales in the Gulf of Mexico and Bryde's whales found throughout the rest of the world. The Society for Marine Mammalogy's Taxonomy Committee reviewed the publication and concurred with the findings. The new species name is *Balaenoptera ricei* with the suggested common name of Rice's whale.

The National Marine Fisheries Service is in the process of filing the paperwork necessary to formally change the scientific and common name associated with the Endangered Species listing and the stock assessment reports.

#### Passive Acoustic Monitoring

A variety of passive acoustic studies are ongoing in the Gulf of Mexico focused on these whales including:

- Analyses of recordings from real-time DIFAR sonobuoys deployed during large vessel NOAA cruises in the northeastern Gulf of Mexico (funded under the Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS) project funded by the U.S. Bureau of Ocean Energy Management and by the NOAA RESTORE Science programs) to validate call types produced by whales are nearly complete. A manuscript is being drafted to submit for peer review this year.
- Analysis of the 2016-2017 western Gulf of Mexico passive acoustic dataset is complete and a draft manuscript is in preparation to submit for peer review this year.
- Two passive acoustic instruments deployed in August 2019 in the northwestern Gulf of Mexico as follow up to the previous instruments, were recovered in August 2020, and a concurrently deployed eDNA sampler was deployed from February to August 2020. A third western Gulf of Mexico instrument deployed by our collaborator Dr. Ana Sirovic at Texas A&M Galveston was not recovered.
- Acoustic detections from automated acoustic detector algorithms applied to eight years of data from a HARP deployment in the northeastern Gulf of Mexico core habitat for the whales have been validated. Anticipate drafting and submitting manuscript for peer review in 2021.
- One HARP was deployed in January 2020 along the shelf-break off Tuxpan in Mexican waters in collaboration with Mexican scientists. We have four more HARPs in Mexico that we will attempt to deploy before our lease on them runs up; dependent on COVID19 and ship availability. A HARP was deployed along the shelf break west of Venice, FL in August 2020. We anticipate recovering the Tuxpan and Venice HARPs in August 2021.
- The U.S. Navy provided support to deploy a large-scale passive acoustic array that completely covers the primary habitat of the whales in the northeastern Gulf of Mexico. Deployment of this array has been delayed due to COVID. We are actively seeking vessel options to complete this work as soon as possible, COVID and vessel-time permitting, for a total of 18 months). We will look at variation in seasonal call density across the array to understand core habitat usage over time.
- Under a NOAA Restore Science Program funded project, we began deployment of a long-term, large-scale passive acoustic monitoring project throughout the Gulf of Mexico (U.S, Mexico, and International waters), in collaboration with the *Deepwater Horizon* noise mitigation project (see below). Three new long-term HARPs, four new one-year HARPs (on a yearly rotation from August 2020-2025), and two tracking HARPs were deployed in August 2020. These data will allow us to evaluate whether the whales ever occur on these Gulf-wide instruments in deeper waters.

#### Abundance

A new abundance estimate, 51 (CV=0.50), was generated from vessel based visual line-transect surveys conducted in the northern Gulf of Mexico. One survey was conducted from 2 July to 25 August 2017 and the second survey

was conducted from 11 August to 6 October 2018 and covered waters from the continental shelf edge (~200-m isobath) to the seaward extent of the U.S. EEZ (Garrison *et al.* 2020). Due to the restricted habitat range of these whales, survey effort was re-stratified to include only effort within their core habitat area, including 941 km of effort in 2017 and 848 km of effort in 2018. Sightings from these surveys were combined with those from surveys conducted between 2003-2015 to develop a detection probability function using line-transect Distance methods. See Garrison *et al.* (2020) for survey and analytical details.

### Trophic Ecology

Research on the trophic ecology and habitat of these whales in the Gulf of Mexico continues through a project funded by the NOAA RESTORE Science Program. The project began in 2017 and will be completed at the end of May 2021. Three research cruises were conducted during 2018 and 2019 which included visual and passive acoustic surveys (described above) for distribution and to examine habitat preferences and oceanographic correlates. Small boat operations during the survey collected photo-identification data, biopsy samples, and kinematic behavioral tags to study foraging behaviour. Multi-frequency scientific echosounder data were collected throughout the surveys to quantify acoustic backscatter and prey fields and trawl surveys were conducted during 2019 to collect samples of potential prey. Environmental DNA (eDNA) water samples were collected in the presence of whales to develop species-specific eDNA detection methodologies for non-invasive detection of the whales and water samples were also collected at depth from fish aggregation to use eDNA to evaluate fish biodiversity at the depth the whales appear to be feeding. Finally, an uncrewed aerial drone was deployed during one leg of a cruise as a pilot study to collect photogrammetry data for examination of body condition and size estimates. Stable isotope analyses from whale skin samples and potential prey were conducted to examine trophic level and identify potential prey species, and proximate composition analyses of prey have been completed to examine energy content of preferred prey species. Additional planned analysis of whale skin and blubber samples include genetic studies, mercury content from skin, persistent organic pollutants, and hormones from blubber samples.

Results to date demonstrate that the physical oceanography of the core habitat, including surface inputs of high productivity water and bottom upwelling, likely maintain high secondary productivity in the region. Echosounder data identified patchily distributed but dense aggregations of swim-bladdered fish that occur near the bottom during daylight hours in the depth ranges where whales are frequently observed. The kinematic acoustic tags show that whales conduct deep foraging dives throughout the day and are feeding near the bottom. The trawl survey data included collections of smaller, vertically migrating fish along with larger demersal species from fish aggregations. The stable isotope data indicate that the whales may feeding primarily on the silver-rag drift fish (*Ariomma bondi*) which is a demersal schooling fish with a smaller dietary contribution from myctophids and other small vertical migrators. Ongoing work will combine the trawl data, calorimetric analysis of prey, and energetics estimated from the kinematic tags to develop an energy budget for these whales.

Project outcomes will inform Endangered Species Act critical habitat evaluation, Restoration projects from the *Deepwater Horizon* oil spill related to assessing noise impacts and reduction of vessel strike risk, and result in more accurate description of the habitat being used by the whales to inform spatial planning for aquaculture and other economic activities in the Gulf of Mexico

### Deepwater Horizon oil spill Restoration Plans status and updates

There are currently two post *Deepwater Horizon* restoration projects planned in the Gulf of Mexico that may affect these whales:

- Vessel Collision Mitigation. This project's aim is to reduce and mitigate vessel strikes with large whales in the Gulf of Mexico. It is in early planning stages with implementation planning anticipated during 2021.
- Noise Mitigation. The goal of this project is to reduce impacts of anthropogenic noise on cetaceans in the Gulf of Mexico. Implementation planning for this project began in 2020. The passive acoustic monitoring activity to record and evaluate changes in ambient noise and cetacean populations over the life of the project began in August 2021. Data were recovered from HARPs at five historic sites, HARPs were redeployed at four of these sites (including one in the core Rice's whale habitat) and the remaining HARP was moved to a new site further west, and two MARPs were deployed to measure shipping noise. Data are being analyzed. Other activities for the noise mitigation project are still in planning stages.

## Management advances

- Final Recovery Outline. In September 2020, Protected Resources staff at the Southeast Regional Office (SERO) completed a recovery outline for the Gulf of Mexico Bryde's whale. Recovery Outlines are the first step in NMFS' recovery planning process for newly listed species. The recovery outline is intended primarily for internal use by NMFS as an interim planning document.
- ESA Section 7 Consultations. We've continued consulting on a number of federal projects.
- Recovery Plan Development. We awarded a contract for professional facilitation services to assist in convening recovery planning workshops. The purpose of the workshops is to gather information, facts, and perspectives on how to recover the whales in the Gulf of Mexico, including identifying potential recovery criteria and actions to address the threats to the species. An agency steering committee has been very active and meeting regularly with the facilitator to plan the workshops. Although plans are still being developed, we are tentatively planning to hold a number of workshops in May and June. The workshops will be used to inform our development of a recovery plan for these whales.
- Taxonomy/Name Change. The SERO is in the process of developing a Federal Register (FR) to formally change the name "Gulf of Mexico Bryde's whale" to the "Rice's whale." Once that notice is on its way to FR publication, we will make the name change in the SAR. Prior to initiating this paperwork, NMFS awaited notification from the Taxonomy Committee of the Society for Marine Mammalogy (SMM) that they had reviewed the new publication recommending recognition of the Bryde's whales in the Gulf of Mexico as a different species, and that they agreed with the findings and would place the new species in the accepted list of taxonomic names. NMFS received that notification on March 4, 2021. Importantly, the name of the species does not affect the protections it receives under the ESA or the MMPA.
- Critical Habitat. SERO developed a scope of work and funded a contracted staff member to work on our critical habitat determination. SEFSC research currently being analyzed and written up will likely be important considerations when assessing critical habitat.
- Gulf of Mexico Weather Buoys. Several weather buoy stations were identified near and within the Bryde's whale (BRWH) designated habitat in the Gulf of Mexico. SERO PRD staff worked with NOAA's National Data Buoy Center (NDBC) to add a message to the web pages of twenty-two stations to bring awareness about these whales. Mariners that use NDBC to acquire marine weather will now see a short message encouraging slow transit speeds to reduce vessel strikes to the year-round resident whales, as well as information to report sightings and resources to learn more.

## Citations

Garrison, LP, J Ortega-Ortiz and G Rappucci. 2020. Abundance of marine mammals in waters of the U.S. Gulf of Mexico during the summers of 2017 and 2018. National Marine Fisheries Service, Southeast Fisheries Science Center, PRD Contribution: #PRD-2020-07. 56p.

Rosel, PE, LA Wilcox, TK Yamada, and KD 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.