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Gulf of Mexico Bryde's Whale



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GOMx Bryde's Whale: ESA Listing Milestones

DATE	EVENT
Jul 31, 2014	Rosel PE, Wilcox LA (2014) Genetic evidence reveals a unique lineage of Bryde's whales in the northern Gulf of Mexico. Endangered Species Research 25:19-34
Sep 18, 2014	Petition to list the GOMx population of Bryde's whales as an endangered species
Apr 6, 2015	90-day finding that the petitioned action may be warranted (80 FR 18343)
Dec 8, 2016	12-Month Finding on the Petition; Proposed rule to List GOMx Bryde's whale (81 FR 88639)
Apr 9, 2019	Final Rule listing GOMx Bryde's whales as endangered under the ESA (84 FR 15446)

GOMx Bryde's Whale: Is this a Species Under the ESA?

Species Description

- Baleen whale
- Globally distributed in tropical and subtropical waters
- Sleek body shape
- Somewhat pointed, flat rostrum w/ three prominent ridges
- Large falcate dorsal fin
- Adult Lengths: >11m (?)



File:Baleia de Bryde.jpg. (2019, January 9). *Wikimedia Commons, the free media repository*. Retrieved 19:49, August 1, 2019 from https://commons.wikimedia.org/w/index.php?title=File:Baleia_de_Bryde.jpg&oldid=334114774.



GOMx Bryde's Whale: Is this a Species Under the ESA?

Genetics

- Distinct from all other Bryde's whales worldwide
- Reproductively isolated)

Vol. 25: 19–34, 2014 doi: 10.3354/esr00606	ENDANGERED SPECIES RESEARCH Endang Species Res	Published online July 31
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Genetic evidence reveals a unique lineage of Bryde's whales in the northern Gulf of Mexico

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ABSTRACT: Bryde's whales *Balaenoptera edeni* are the only year-round resident baleen whale species in the northern Gulf of Mexico (GOMx). The current population abundance estimate is 33 (CV 1.07) and the population is severely restricted in range. We characterized genetic diversity and phylogenetic relationships of these whales to other members of the Bryde's whale complex. We analyzed DNA sequence data from 3 mitochondrial DNA (mtDNA) and 9 nuclear genes, and examined 42 nuclear microsatellite loci for 21 Bryde's whale samples collected in the GOMx and 2 from the western North Atlantic. mtDNA diversity was extremely low; only 2 haplotypes were found in the first 375 bp of the control region and no variability in *cytb* or *cox1* genes was seen. Twenty-five microsatellite loci were monomorphic, 16 had 2 or 3 alleles, and 1 had 4 alleles. Most nuclear genes exhibited shared alleles across balaenopterid species. Phylogenetic reconstruction using the control region and all published Bryde's whale sequences revealed that GOMx Bryde's whale haplotypes are evolutionarily distinct from other members of the Bryde's whale complex examined to date. Within the first 375 bp of the control region, we found 25–26 fixed differences between GOMx haplotypes and those from sei whales and the 2 recognized Bryde's whale subspecies. The GOMx whales are as divergent as these subspecies and species are from each other. The level of divergence suggests a unique evolutionary trajectory worthy of its own taxonomic standing. The small population size and markedly low genetic diversity raise conservation concern for this unique group of whales.

KEY WORDS: Bryde's whale complex · *Balaenoptera edeni* · Mitochondrial DNA · Control region · Cetacean

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INTRODUCTION

Fourteen baleen whale species are currently recognized in 4 families. Of these 14 species, 5 are listed as Endangered by the IUCN, 4 are Data Deficient and 5 are Species of Least Concern (IUCN 2012). However, it is likely that additional species exist but are currently not recognized and therefore are afforded few protections. A case in point is the Bryde's whale complex, a group of baleen whales in which the identity and number of species is unresolved. Currently, 2 forms of Bryde's whales are recognized, differing most obviously in size. The smaller form, Eden's whale, was described first by Anderson (1879)

as *Balaenoptera edeni* from an animal that stranded in Myanmar. These whales are thought to be sexually mature at lengths that rarely exceed 11.5 m and they inhabit primarily coastal and continental shelf waters of the northern Indian Ocean and the western Pacific Ocean (Rice 1998). A larger form of Bryde's whale was first described by Olson (1913) as *B. brydei* from whales harvested off South Africa, primarily at a whaling station in Saldanha Bay on the west coast of South Africa. These whales reach 14–15 m in total length, and inhabit tropical and warm temperate waters worldwide (Rice 1998). Following these initial species descriptions, Jungo (1950) synonymized (as *B. edeni*) the 2 species based on a morpho-

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Inter-Research 2014 · www.int-res.com

Distribution

Historical

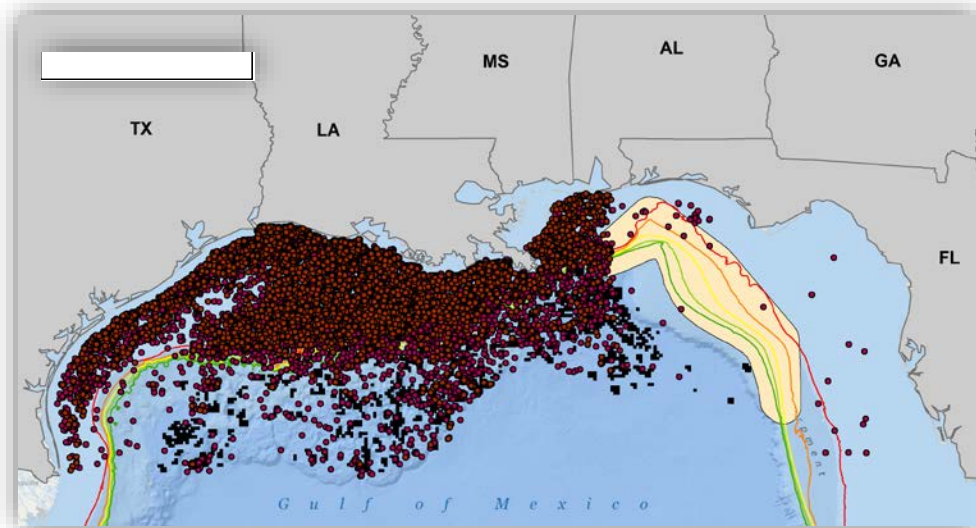
Broadly distributed throughout the GOMx: north-central, southern

Presently: Restricted Range

- Northeastern GOMx in the De Soto Canyon area, along shelf break typically 100-400 m
- Susceptible to environmental events

GOMx Resident

Only year-round resident baleen whale in the Gulf



Life History and Abundance

Life History Estimates (based on other Bryde's whales)

- Maximum age: ~58 yrs
- First reproduction: ~9 yrs
- Interbirth interval: ~2.5 yrs
- Low productivity

Abundance

- Likely fewer than 100 individuals
- Fewer than 50 being mature
- Best estimate is 33 individuals

Susceptible to Small Population Effects

Behavior and Diet

Social

- Typically seen alone or in pairs; may form larger, loose groups when feeding

Foraging

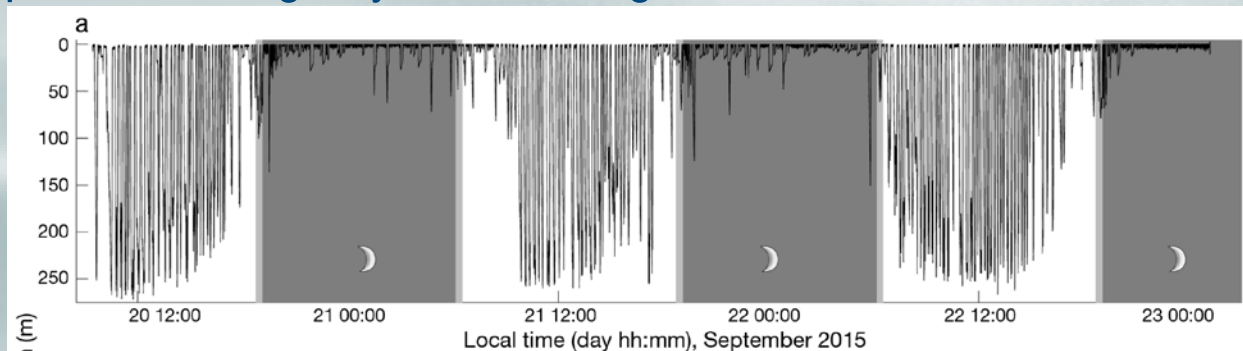
- Appear to feed on small schooling fish (e.g. anchovy, sardine, mackerel and herring)

Acoustics

- Low frequency calls, may be distinctive to the GOMx

Diving

- Deep dives during day, shallow nighttime dives



Source: Soldevilla MS, Hildebrand JA, Frasier KE, Aichinger Dias L and others (2017) Spatial distribution and dive behavior of Gulf of Mexico Bryde's whales: potential risk of vessel strikes and fisheries interactions. *Endang Species Res* 32:533-550. <https://doi.org/10.3354/esr00834>

ESA Section 4(A)(1) Factor Analysis

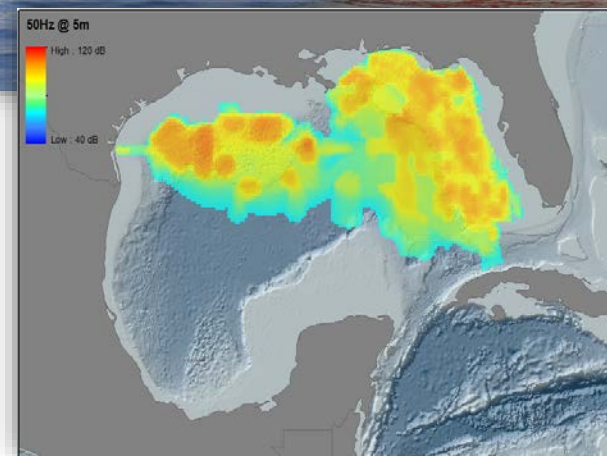
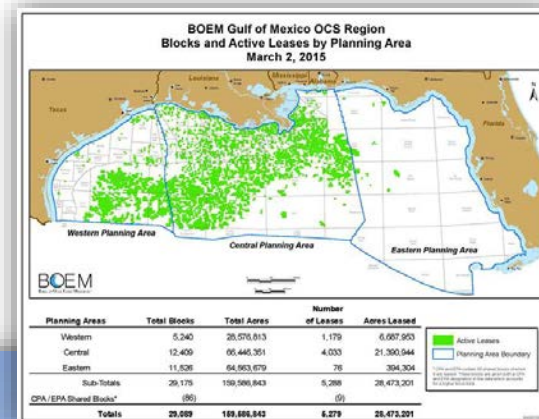
Factor	Rating
A. Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range	High
B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes	Low
C. Disease, Parasites, and Predation	Low
D. Inadequacy of existing Regulatory Mechanisms	High
E. Other Natural or Manmade Factors Affecting Its Continued Existence	Moderate-High

NMFS Threat Conclusion

Most Serious Threats

- Small Population Size
- Energy Exploration, Development, and Production
- Oil Spills & Spill Response
- Vessel Collision
- Anthropogenic Noise
- Fishing Gear Entanglement

Source: 84 FR 15446



Fishing Gear Entanglement

- Whales have been hooked, trapped, entangled (Read 2008, Reeves et al., 2013)
- Bycatch rates are underestimated
- Known GOMx events:
 - 1974 Ancloste Key, FL entangled in polypropylene line
 - Longline entanglement (Waring *et al.* 2004)
 - 2003 trap/pot entanglement in NC

Fishery Gear/Activity Analysis¹

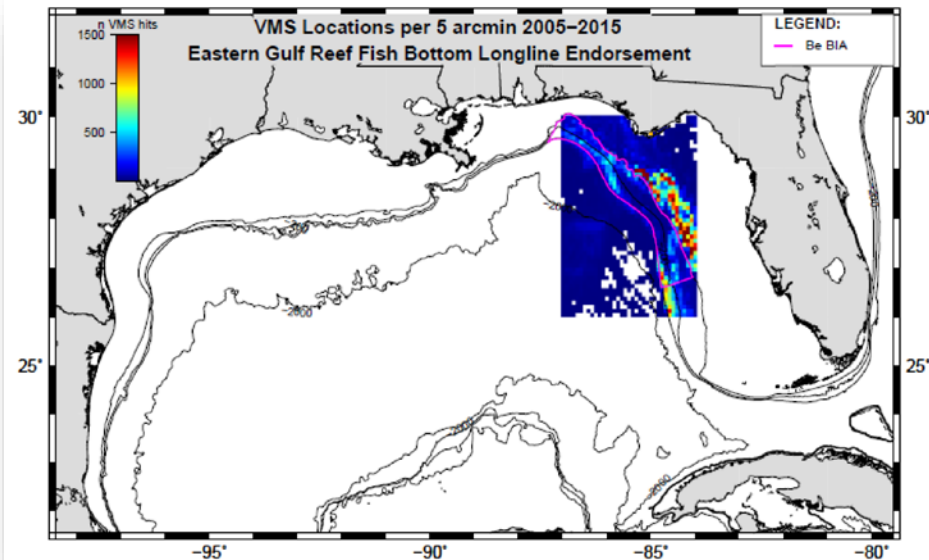
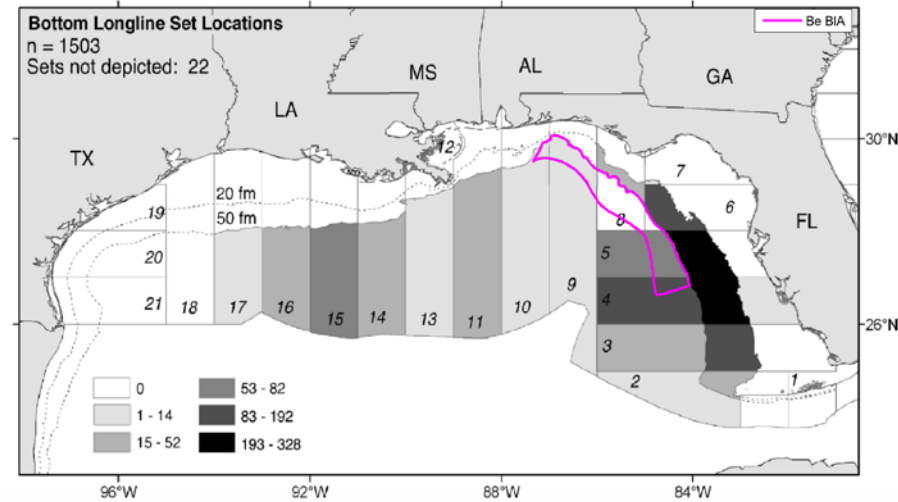
SRT evaluated 12 GOMx fisheries; 5 overlap or possibly overlap with Bryde's whale BIA and use gear types that pose entanglement risk to whales

- GOMx Large Pelagics Longline Fishery
- GOMx Shrimp Trawl Fishery
- GOMX Butterfish Trawl Fishery
- Reef Fish S-G Fishery
- GOMx Shark Fishery

¹Rosel, P. E., P. Corkeron, L. Engleby, D. Epperson, K. D. Mullin, M. S. Soldevilla, B. L. Taylor. 2016. Status Review of Bryde's Whales (*Balaenoptera edeni*) in the Gulf of Mexico under the Endangered Species Act. NOAA Technical Memorandum NMFS-SEFSC-692

SRT's Reef Fish Snapper-Grouper Fishery Considerations

- Bryde's whales feed at bottom
 - mainlines are on bottom
- Vertical buoy line
- Potential geospatial overlap between bottom longline gear and Bryde's whales
- Yellowedge grouper and tilefish species have similar distribution to GOMX Bryde's whales



Rosel, P. E., P. Corkeron, L. Engleby, D. Epperson, K. D. Mullin, M. S. Soldevilla, B. L. Taylor. 2016. Status Review of Bryde's Whales (*Balaenoptera edeni*) in the Gulf of Mexico under the Endangered Species Act. NOAA Technical Memorandum NMFS-SEFSC-692

Effects of this Rulemaking (84 FR 15446)

- **ESA section 7 consultation**
 - Any action authorized, funded, or carried out by a federal agency would need to undergo ESA section 7 consultation to insure their actions are not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of their critical habitat should it be designated.
- **Prohibitions on take**
 - Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) for scientific purposes or to enhance the propagation or survival of a listed species. Section 10(a)(1)(B) incidental take permits are required for non-Federal activities that may incidentally take a listed species in the course of an otherwise lawful activity.
- **MMPA**
 - A marine mammal species or stock automatically gains “depleted” status under the MMPA when it is listed under the ESA, which provides heightened protections.
- **Critical Habitat**
 - Critical habitat not determinable at the time of listing, but may be designated in the future.
- **Recovery Planning**
 - Section 4(f) of the ESA directs us to develop and implement recovery plans for threatened and endangered species. Final recovery plans should be completed within 2.5 years of listing.



“Small scale incremental impacts over time or a single catastrophic event could result in extinction of the species.” -Rosell et al. 2016



“...a regional cooperative effort to protect and restore the population is necessary. Federal, state, and the private sectors will need to cooperate to conserve listed GOMx Bryde’s whales and the ecosystem upon which they depend.”

Questions?

