NOAA FISHERIES

Endangered Species Act Rice's Whale Critical Habitat Report

Proposed Information Basis and Impact Considerations of Critical Habitat Designation

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Rice's Whale. Credit: NOAA Fisheries taken under MMPA permit 779-1633 to the NMFS SEFSC

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1 Introduction

1.1 Need for Federal Regulatory Action

Rice's whales (*Balaenoptera ricei*) are one of the most endangered large whale species in the world and were initially listed as endangered under the ESA under the name Gulf of Mexico (GOMx) Bryde's whale (*Balaenoptera edeni*). Under the ESA, in addition to determining whether certain species are threatened or endangered, NMFS is responsible for designating critical habitat for endangered and threatened species at the time of listing, to the maximum extent prudent and determinable (16 U.S.C. 1533(a)(3)(A)(i)). At the time of listing, NMFS found the designation of critical habitat was not determinable because sufficient information was not currently available on the geographical area occupied by the species (84 FR 15446, April 15, 2019). We acknowledged gathering information during the status review and public comment period for the proposed rule to list Gulf of Mexico Bryde's whales (81 FR 88639; December 8, 2016), but did not have enough information to determine which habitat features are essential to the conservation of the species and may require special management considerations or protection. We stated that we would continue to gather information and consider the impacts of designation. Under section 4 of the ESA, if critical habitat is not determinable at the time of listing, a final critical habitat designation must be published 1 year after listing (16 U.S.C. 1533(b)(6)(C)(ii)). It has been more than 1 year since the Rice's whale was listed as an endangered species, and significant new information has become available on the geographical area occupied by the species at the time it was listed, which makes critical habitat determinable.

This document is part of the process for determining critical habitat and contains: (1) the biological information used to determine the specific areas containing the features essential to the conservation of the species requiring special management, and (2) consideration of the national security, economic, and other relevant impacts of designating critical habitat.

1.2 Definition of Critical Habitat

Critical habitat is defined in Section 3 of the Endangered Species Act (ESA; 16 U.S.C. 1532(3)) as: (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination that such areas are essential for the conservation of the species. ''Conservation'' is defined in the ESA as the use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary. In other words, conservation is synonymous with recovery in the context of the ESA, thus critical habitat designations identify habitat features necessary to recover listed species.

In addition to the determination of physical or biological features essential for the conservation of the listed species, the ESA requires several additional considerations to inform the delineation of critical habitat. Section 4(a)(3)(B) of the ESA prohibits designating as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DOD) or designated for its use that are subject to an integrated natural resources management plan (INRMP) if the National Marine

Fisheries (NMFS) determines that such a plan provides a benefit to the species. Section 4(b)(2) of the ESA requires the Secretary to take into consideration the economic, national security, and any other relevant impacts of designating any particular area as critical habitat. Additionally, the Secretary has the discretion to exclude any area from a designation if he or she determines that the benefits of exclusion outweigh the benefits of designation, based on the best available scientific and commercial data.

2 Background

2.1 Listing History

Gulf of Mexico Bryde's whales (*Balaenoptera edeni*) were listed as endangered under the ESA by NMFS effective April 15, 2019 (84 FR 15446; April 15, 2019). The final determination was based on the best available information on a suite of demographic, spatial, and susceptibility components that influence the species' vulnerability to extinction in the face of continuing threats over the foreseeable future. With a small population and restricted range, the species is susceptible to multiple threats including: energy exploration, development, and production, oil spills and oil spill responses, vessel collision, fishing gear entanglement, and anthropogenic noise. Therefore, NMFS determined that the species is in danger of extinction throughout all of its range as a result of a combination of threats, and listed them as endangered.

On August 23, 2021, we published a final rule that revised the listing of Rice's whales under the ESA to reflect the change in the scientifically accepted taxonomy and nomenclature of this species (86 FR 47022). Prior to this revision, the Rice's whale had been listed in 2019 under the ESA as an endangered subspecies of the Bryde's whale, *Balaenoptera edeni* (Gulf of Mexico subspecies). The 2019 listing cited the population's high extinction risk and insufficient conservation efforts in place to reduce that risk.

2.2 Species Description and Life History

This section summarizes life history and biological characteristics of endangered Rice's whales to provide context for the determination of physical or biological features that are essential for the conservation of the species. Rice's whales were one of the most impacted shelf and oceanic stock of marine mammals affected by the 2010 *Deepwater Horizon* (DWH) oil spill (*Deepwater Horizon* Natural Resource Damage Assessment Trustees, 2016) and much of what we know about the species has been learned since 2010. Following the DWH event, Rice's whales were estimated to have experienced 17 percent increase in mortality (confidence interval of 7 to 24 percent), 22 percent increase in failed pregnancies (confidence interval of 10 to 31 percent), and an 18 percent higher likelihood of having adverse health effects (confidence interval of 7 to 28 percent) (DWH MMIQT, 2015). An estimated 48 percent of the Rice's whale population was exposed to DWH oil, resulting in an estimated 22 percent maximum decline in population size that will require an estimated 69 years until recovery, meaning the time it would take for the population to return to 95 percent of the baseline trajectory (DWH MMIQT, 2015).

Limited information is available on the life history of Rice's whales. Consequently, we provide specific information for Rice's whales where possible and pertinent information on the closely related Bryde's-like whales in general, highlighting traits that these species likely share. The information below summarizes information contained in the final listing rule (84 FR 15446, April 15, 2019) updated with the best scientific information available.

Like other members of the "Bryde's whale complex" or "Bryde's-like whales" in the genus Balaenoptera, Rice's whales are medium-sized rorqual whales. Rice's whales have a streamlined and sleek body shape, a somewhat pointed, flat rostrum with three prominent ridges (i.e., a large central ridge, and smaller left and right lateral ridges), a large, falcate dorsal fin located about two-thirds of the way back on its body,

and counter-shaded coloration that is fairly uniformly dark dorsally and light to pinkish ventrally (Jefferson et al., 2015). The pectoral fins are uniformly dark, slender and pointed. The head of a Rice's whale makes up about one quarter of its entire body length. Its fluke, or tail, is broad. These whales exhibit no external asymmetrical pigmentation on the lower jaws, differentiating them from fin and Omura's whales. Limited data (from eight whales) indicate total length measurements for Rice's whales ranged from 470 centimeters (cm) (15.4 ft) to 1,265 cm (41.5 ft). The largest verified Rice's whale observed in the GOMx was a lactating female measuring 1,265 cm (41.5 ft) in length and the largest male was 1,126 cm (36.9 ft) (Rosel et al., 2021). Based on bristle coarseness, a stranded animal initially identified as a juvenile sei whale was reclassified as a Bryde's whale (Mead, 1977). While baleen from across the Bryde's whale complex has not been comprehensively analyzed, Mead (1977) and Kato and Perrin (2018) indicate that the baleen bristles from members of the Bryde's whale complex are coarser than those of sei whales. Similarly, Rosel et al. (2021) found that the baleen bristles of three Rice's whales from the GOMx were coarser than that of a sei whale that stranded in the GOMx in 1994.

Similar to other marine mammals, the Rice's whale is considered to be a k-selected species (large body size, long life expectancy, slow growth rate, late maturity, and with few offspring). Taylor et al. (2007) estimate that Bryde's whales worldwide may reproduce every 2 to 3 years and reach sexual maturity at age 9. Given the basic biology of baleen whales, it is likely that under normal conditions, female Rice's whales produce a calf every 2 to 3 years. The sex ratio determined for 32 individual whales stranded or biopsied from the northern GOMx was 18 females and 14 males, which is not significantly different from a 50:50 ratio (Rosel et al., 2021).

Rice's whales are likely breeding in the GOMx, as several smaller animals were identified in the stranding records (Edds et al., 1993) or observed during NMFS Southeast Fisheries Science Center (SEFSC) large-vessel surveys. In October of 2009, a dead, lactating female whale was found in Tampa Bay, with internal injuries consistent with blunt force trauma likely caused by a vessel strike. As a long-lived marine mammal with low reproduction rates and a very small population size, the loss of a single individual could drive the species towards extinction (Franklin, 1980; Rosenfeld, 2014).

As with its life history, little information exists on the behavior of the Rice's whale. Maze-Foley and Mullin (2006) found Rice's whales to have a mean group size of 2 (range 1-5, n = 14), similar to group sizes of the Eden's and Bryde's whales (Wade and Gerrodette, 1993). The Rice's whale is known to be periodically "curious" around ships and has been documented approaching ships in the GOMx (Rosel et al., 2016), as has also been observed in Bryde's whales worldwide (Leatherwood et al., 1976; Cummings, 1985). Two Rice's whales have shown evidence for vessel strike. This includes the dead adult, lactating female mentioned above that was discovered in Tampa Bay in 2009 with injuries, including separated vertebrae, lung damage, and subdermal contusions, consistent with impact caused by a large object, and a free-swimming Bryde's-like whale that was observed in 2019 in the northeastern GOMx with a severely deformed spine posterior to the dorsal fin consistent with a vessel strike. In September 2015, a female Rice's whale was tagged with an acoustic and kinematic data-logging tag in the De Soto Canyon (Soldevilla et al., 2017). Over the nearly 3-day tagging period, the whale spent 47 percent of its time within 15 m of the surface during the day and 88 percent of its time within 15 m of the surface during the night (Soldevilla et al., 2017). Curiosity around vessels, documented injuries consistent with vessel strikes, and documented behavior near the surface for a considerable amount of time illustrate the anthropogenic threat that vessels pose to Rice's whales. Bryde's whales are the third most commonly reported whale species to be struck by vessels in the southern hemisphere (vanWaerbeck and Leaper, 2008).

Taylor et al. (2007) estimated generation length for cetaceans using the following parameters: oldest age (or an estimate based on length), calf survival, adult survival, age at maturity, gestation length, and interbirth interval. For all Bryde's whales, the estimated generation length is 18.4 years using the following estimated parameters: maximum age of 58 years based on length (Best, 1977), age at first reproduction of 9 years based on gestation length (Lockyer, 1984) and age of sexual maturity (IWC, 1997), an interbirth interval of 2.5 years (Lockyer, 1984), calf survival rate of 0.840, and non-calf survival rate of 0.925 (IWC, 1997). According to Rosel et al. (2016), the majority of the samples used to estimate these parameters came from Japanese whaling data from the 'typical' or pelagic form of Bryde's whale in the North Pacific and from South Africa, and are probably the B. e. brydei subspecies.

2.3 Vocalizations and Sound

Sound production associated with behaviors including mating, rearing, social interaction, group cohesion, and feeding have been documented in marine mammal species (Erbe et al., 2016). Baleen whale species produce a variety of highly stereotyped, low-frequency tonal and broadband calls for communication purposes that are thought to function in a reproductive or territorial context, provide individual identification, and communicate the presence of danger or food (Richardson et al., 1995). Marine mammal species with and without specialized biosonar capabilities may rely on biological sounds to find prey, avoid predators, and likely use environmental sounds to support spatial orientation and navigation in three-dimensional marine habitats (Erbe et al., 2016; Cure et al., 2013; Deecke et al., 2002; Gannon et al., 2005). Generally, balaenopterids produce a variety of low-frequency tonal and broadband calls, with durations ranging from 1 to 60 seconds (s), fundamental frequencies between 10-1000 Hertz (Hz), and high source levels from around 145 to over 190 decibels referenced to 1 micropascal (re 1 µPa) at 1 m (Richardson et al., 1995; Miller et al., 2021). Most balaenopterids produce some call types that are distinctive, stereotyped, and unique at the species or population level, including Rice's whales, which can be detected with autonomous passive acoustic monitoring surveys. Bryde's whales worldwide produce a variety of calls that are distinctive among geographic regions, and these calls may be useful for delineating subspecies or populations (Oleson et al., 2003; Širović et al., 2014). In the GOMx, Širović et al. (2014) reported 'Bryde's' whale call types composed of downsweeps (frequency modulated signals with decreasing frequency over time) and downsweep sequences and localized these calls (i.e., researchers recorded the calls on multiple instruments that allowed them to triangulate the location of the calls and then confirmed the location with visual sightings). Rice et al. (2014) detected these sequences, as well as two stereotyped tonal call types that originated from 'Bryde's' whales in the GOMx.

Soldevilla et al. (2022a) used sonobuoys and passive acoustic tagging from three marine mammal surveys with focused effort in the Rice's whale core distribution area between 2015 and 2018 to validate potential call type sources and to characterize Rice's whale calls. Validation includes manually reviewing each automated detection and scoring each as a true or false detection. During concurrent visual and acoustic surveys, acoustic-directed approaches were conducted to obtain visual verifications of sources of localized sounds. The call repertoire that was validated to Rice's whales includes downsweep sequences (including downswept pulse pairs), long-moan calls, and tonal-sequence calls. Širović et al. (2014) proposed a fourth Rice's whale call type, the high-frequency downsweep call, which was not detected during the Soldevilla et al. (2022a) study and therefore the source remains unvalidated.

Soldevilla et al. (2022b) detected novel stereotyped tonal calls at three locations in the northwestern GOMx. The calls are similar to the Rice's whale long-moan calls detected in the northeastern GOMx, but with distinct differences from the northeastern calls and with at least six stereotyped variations. The

cause and occurrence of these call features require further study.

2.4 Distribution, Movement, and Habitat Use

The Rice's whale is the only species of large whale endemic to the United States and the only year-round resident baleen whale species in the Gulf of Mexico (Rosel et al., 2021).

Members of the Bryde's whale complex are tropical and subtropical in distribution, generally non-migratory, and found in all major ocean basins (Rosel et al., 2021). Bryde's-like whales do not migrate long distances to feed in polar or temperate regions (Constantine et al., 2018), nor do they have specific or separate feeding or breeding grounds (Penry et al., 2011).

Based on a compilation of 181 sightings from NMFS marine mammal vessel and aerial survey sightings, the primary Rice's whale core habitat is considered to be in the northeastern GOMx, centered over the De Soto Canyon in waters between 150 m and 410 m depth (Rosel et al., 2021). This area, referred to by NMFS as the Rice's whale "core distribution area," is characterized by seasonal advection of low salinity, high productivity surface waters (i.e., waters with high production of organic matter by planktonic plants), leading to persistent upwelling driven by both winds and interactions with the loop current (Farmer et al., 2022). Figure 1 illustrates the location of the core distribution area in the Gulf of Mexico. In 2017, there was a genetically confirmed sighting of a Rice's whale in the western GOMx off the central Texas coast in 225 m depth (NMFS, 2018a; Rosel et al., 2021).

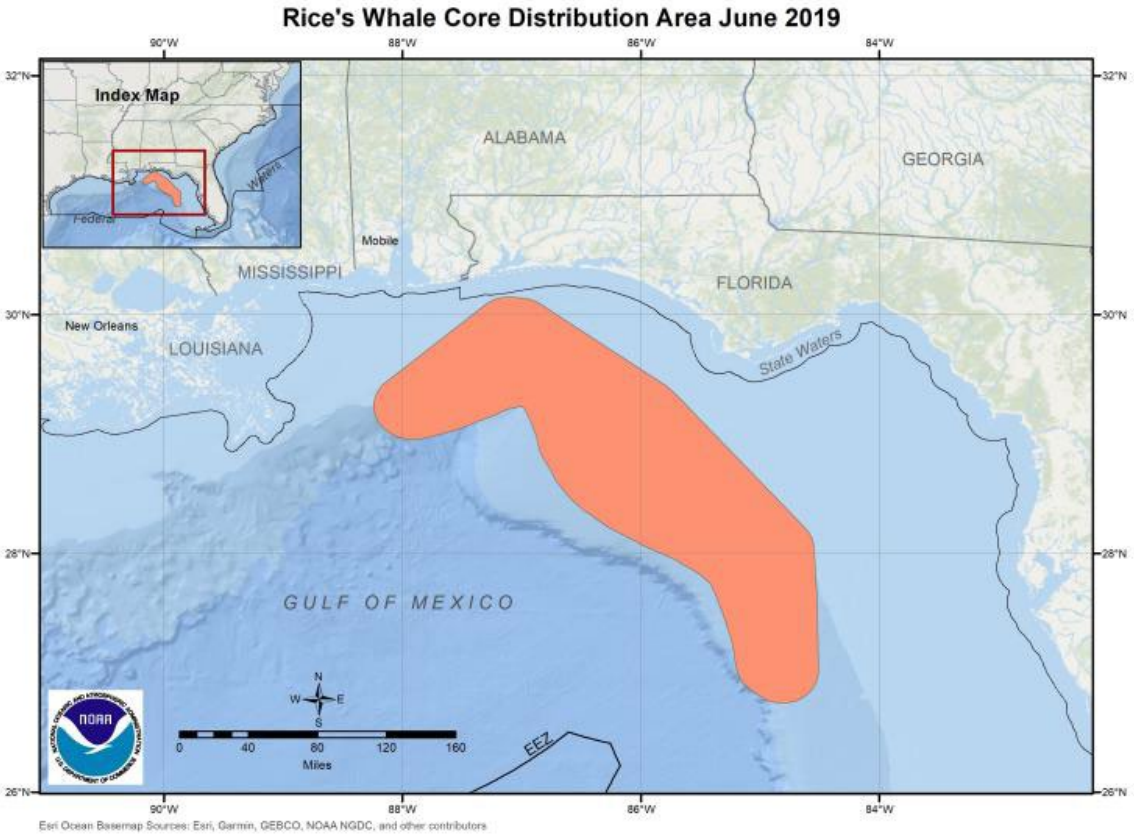

Figure 1. RICE'S WHALE CORE DISTRIBUTION AREA (ROSEL AND GARRISON 2022)

Passive acoustic monitoring recordings from the western GOMx along the shelf break south of the Flower Garden Banks National Marine Sanctuary (FGBNMS) confirm the presence of Rice's whales in the same area as two balaenopterid sightings made by NMFS in the early 1990s (Soldevilla et al., 2022b). A predictive density model highlights the importance of the 200 m isobath as an area Rice's whales may occupy along the northwestern GOMx shelf break (Roberts et al., 2016). Soldevilla et al. (2022b) detected baleen whale calls from passive acoustic moorings deployed from June 2016 to August 2017 in areas of predicted Rice's whale habitat in several locations in the northern GOMx. Passive acoustic recorder site selection was based on the median water depth of 221 m for Rice's whale sightings in the core distribution area and locations of unidentified baleen whale sightings, as well as dispersed sampling sites along the north-central to northwestern GOMx shelf break (Soldevilla et al., 2022b). A combined 1,285 days of acoustic data were collected at four western sites, and a total of 304 days of acoustic data were recorded at the concurrently deployed site in the core distribution area. Variants of Rice's whale long-moan calls were detected at three sites in the northwestern GOMx. At the westernmost FGBNMS site, 1,939 calls were detected on 47 days over 10 months of data collection (16 percent of days with data collected). The eastern FGBNMS site detected 429 calls on 18 days over 10 months (6 percent of days with data collected), and the Eugene Isles South site detected 22 calls on 3 days (1 percent of days with data collected). No calls were detected at a site off Grand Isle, Louisiana. The recorder at the site in the core distribution area detected 66,583 long-moan Rice's whale calls over 11 months of data

collection. On several occasions overlapping calls were detected and in some instances the overlapping calls were of different call subtypes indicating at least two individuals were calling during that encounter. Overlapping calls were recorded at both of the FGBNMS sites and at the site in the core distribution area. Long-moan call detections occurred in sporadic clusters throughout the year, with no evidence of seasonality at the western sites. At the western sites, at least one call was detected in every month of the year, which suggests year-round use of the western habitat area. Further research is needed to understand how many animals are using the northwestern sites and whether animals are moving between the northwestern and northeastern sites, or whether the calls at these sites these represent different groups of animals.

Comparing numbers of acoustic call detections among sites is difficult. Local sound propagation conditions and ambient sound levels influence the ability to detect Rice's whale calls and the area over which whales can be detected. Higher numbers of acoustic call detections at a site may reflect higher call production rates, or it may reflect larger detection areas instead of higher animal presence. Soldevilla et al. (2022b) expected detection ranges at the western FGBNMS site to be approximately 25-50 percent of the detection range at the site in the core distribution area. Ambient noise levels at Rice's whale call frequencies are 6-13 decibels higher at the western FGBNMS site than the site in the core distribution area. Baleen whale calls in the 100-150 Hz frequency range generally can be detected on scales of tens of kilometers in pelagic environments (e.g., McDonald, 2004). Rice's whale long-moan calls were commonly detected on scales of 20-75 km, suggesting a Rice's whale call could be detected over as much as 25 percent of the core distribution area in some conditions (Soldevilla et al., 2022a). In the western GOMx, which has 6-13 decibel higher mean ambient noise levels, resulting in smaller detection distances, the same long-moan calls were detected on two sensors 40 km apart, which suggests the Rice's whale call could be detected out to distances of at least 20 km (Soldevilla et al., 2022b). In the core distribution area, Rice et al. (2014) documented an occurrence of the same call on three sensors with a maximum of 150 km spacing, suggesting the calls could be detected out to distances of at least 75 km at times. Anthropogenic noise sources, including seismic survey airgun pulses and shipping traffic noise, appear to be the main contributors to the increased noise levels that lead to reduced detection ranges in the western GOMx. Studies in baleen whales, including Bryde's whales, have shown a decrease in communication range as a result of masking, which occurs when biologically irrelevant sounds prevent an animal from hearing biologically important sounds (Clark et al., 2009; Cholewiak et al., 2018; Gabriele et al., 2018; Putland et al., 2018). The three westernmost sites used by Soldevilla et al. (2022b) were not far from a major shipping fairway and vessel traffic noise was common in the recordings at those sites. The effects of low-frequency noise from shipping traffic and airguns on researchers' ability to detect calls were apparent in the detectable features of Rice's whale calls in the western GOMx. For example, many of the manually detected calls at the western sites consisted of only the 150 Hz tone due to increased noise levels below 125 Hz, and these were often of low signal-to-noise ratio likely due to a combination of sound propagation losses with distance and higher levels of shipping or seismic survey noise at the lower frequencies.

While contemporary sightings are primarily confined to the core distribution area in the northeastern GOMx, Rice's whales historically may have had a broader distribution in the northern and southern GOMx. Reeves et al. (2011) reviewed whaling logbooks from the GOMx and identified records of "finback" whales from the north-central GOMx south of the Mississippi River delta and in the southern GOMx on the Campeche Banks. Because fin whales are not part of the GOMx ecosystem, these records were likely Rice's whales misidentified as fin whales (Reeves et al., 2011), suggesting the distribution of the Rice's whale was likely broader than we see currently. In the north-central GOMx, whether Rice's whales stay in this area or their use of this area is restricted to travel between the

northwest and northeast through areas of high shipping traffic near the Mississippi River delta is unknown. Soldevilla et al. (2022b) did not record Rice's whale calls at a site offshore of Grand Isle, Louisiana or during 2 months at a site in the north-central GOMx. The absence of Rice's whale call detections at these sites could indicate an absence of Rice's whales, an absence of calling Rice's whales, or an inability to detect whales in these areas due to higher ambient noise conditions and sound propagation conditions within the Mississippi Canyon. However, Rice's whale western long-moan call variants were detected both at the western-most sites and a site in the core distribution area, which suggests movement between the areas. Rice's whale western long-moan calls were detected on 6.4 percent of days at the site in the core distribution area. Rice's whale western long-moan call variants were detected on the same or consecutive days in the western-most and eastern-most GOMx sites, which were separated by a distance that is too far for one whale to travel in a single day (740 km), indicating that different Rice's whales produced the calls.

Based on the best available data, we conclude that the normal distribution of Rice's whales is limited to the Gulf of Mexico. No NMFS marine mammal vessel or aerial surveys from 1992 through 2019 have recorded a confirmed sighting of Rice's whales or any type of Bryde's whale along the U.S. eastern seaboard (Rosel et al., 2021). While Roberts et al. (2016) predicted a mean monthly abundance of seven Bryde's whales along the entire U.S. eastern seaboard based on four ambiguous "Sei or Bryde's Whale" sightings documented during a number of surveys conducted between 1992 and 2014, Roberts et al. (2023) concluded that the four sightings were most likely sei whales and without any more recent evidence of Bryde's whales, and given the expert opinions of Rosel et al., 2021, that Bryde's whales are effectively absent from the U.S. east coast. Acoustic studies off Jacksonville, Florida (Frasier et al., 2016), North Carolina (Debich et al., 2014), and Norfolk Canyon (Rafter et al., 2018) during 2011 through 2017 have not detected any types of Bryde's whales. This evidence suggests that Bryde's whales, including Rice's whales, are extremely rare along the U.S. east coast (Rosel et al., 2021). Rosel et al. (2021) compiled and scrutinized stranding reports from the U.S. Atlantic coast dating back to 1954 and confirmed six records of whales from the Bryde's whale complex. Of these, only two could be genetically confirmed as Rice's whales. All six whales were characterized as small. Mead (1977) suggested Bryde's whale strandings along the U.S. Atlantic were likely extralimital strays from the GOMx.

Northern Gulf of Mexico continental shelf habitat is characterized by sediment transported by the Mississippi River with soft-bottom sediment being the dominant substrate type (Balsam and Beeson, 2003; Love et al., 2013; Rezak et al., 1985). Froeschke and Dale (2012) attribute 96 percent of the GOMx floor to soft-bottom and 4 percent to hard substrate. This hard substrate provides Essential Fish Habitat (EFH) in the U.S. Exclusive Economic Zone of the GOMx. These substrate types support a wide variety of marine life, with some species' distributions that tend to change with depth, among other environmental factors (Etnoyer, 2009; Gallaway et al., 2001). There are no absolute biological or physical barriers or boundaries separating individual benthic habitats and communities that extend from the depths up across the continental shelf to the shoreline, but there appear to be transition zones with some biota moving between habitats. The continental shelf (10-200 meter depth) is heavily influenced by light, the shoreline, and surface currents, with sand and hardground habitats supporting reef forming corals and non-reef forming corals (Sulak and Dixon, 2015). The continental slope (>200-800 meter depth) is characterized by relatively rapid changes in depth over short horizontal distances with occasional canyons and hardground dominated by seeps or corals (Gallaway et al., 2001).

Garrison et al. (in review) developed a density surface model to predict Rice's whale distribution in the GOMx based on bathymetric and oceanographic features. Visual line transect survey data collected throughout the northern GOMx between 2003 and 2019 were analyzed, including broad-scale

surveys of oceanic waters and directed studies within the Rice's whale core distribution area. Depth, sea surface temperature, surface and bottom salinity, sea surface height, surface geostrophic velocity, chlorophyll-a, and bottom temperature were among the variables considered. The model identified water depth, surface chlorophyll-a concentration, bottom temperature, and bottom salinity as the key parameters that characterize Rice's whale habitat. The model predicted additional suitable Rice's whale habitat outside the core distribution area in the northeastern GOMx, generally throughout the GOMx within 100 and 400 meters depth. Concentration of Rice's whales in the core distribution area appeared to be explained by higher summer chlorophyll-a concentrations, an indicator of phytoplankton abundance and biomass in coastal and estuarine waters, in the northeast region of the GOMx as compared to other regions in the GOMx with suitable bottom temperatures, but less surface productivity.

The Garrison et al. (in review) results build on earlier spatial density modeling efforts for Rice's whales based on sightings data that identified a relatively high density area ranging from shelf-edge Alabama to southwest Florida, with further suitable habitat in a narrower strip of shelf-edge extending to central Texas to the west and the Florida Keys to the east (Roberts et al., 2016). Garrison et al. (in review) stated that the model results are consistent with cold, high salinity water upwelling along the continental shelf break and seasonal inputs of high productivity surface water derived from coastal sources. The presence of eddies that have separated from the warm water loop current and the dominant circulation patterns in the GOMx lead to increased productivity and are likely a factor in maintaining the high density of forage species needed to support Rice's whales. The model also suggests additional habitat outside of U.S. waters in the southern GOMx may be suitable for Rice's whales, however these areas were not further considered, as areas outside U.S. jurisdiction cannot be designated as critical habitat.

2.5 Diet and Foraging

Understanding predator-prey interactions is difficult for highly mobile and elusive species, such as marine mammals, that forage at depth (Sekiguchi et al., 1992; Pauly et al., 1998; Pierce and Boyle, 1991; Trites and Spitz, 2018). Cetaceans rely on predictable prey resources, and changes in prey availability and quality can potentially have population-level consequences, including decreased survival and reproduction rates leading to subsequent population declines (Bearzi et al., 2006; Piroddi et al., 2011; Ford et al., 2010). While information on the feeding ecology and drivers of prey selection are lacking for many cetacean species, foraging specialization has been documented among and within species and populations. Predators with high levels of specialization or higher energetic requirements are more susceptible to risks associated with the decline of their prey (Kiszka et al., 2023).

Worldwide, members of the Bryde's whale complex exhibit a variety of foraging tactics and prey preferences, often with observations of surface feeding. Overall, pelagic schooling fishes in the order Clupiformes (sardines, herring, menhaden, anchovies) are the most commonly recorded prey, along with similar schooling species, such as members of the family Carangidae (Best, 2001; Konishi et al., 2009; Murase et al., 2007; Siciliano et al., 2004; Tershy, 1992; Watanabe et al., 2012). Populations examined further offshore also target krill (Best, 2001; Konishi et al., 2009), while the B. e. brydei population of the Hauraki Gulf in New Zealand appears to prey on copepods and krill along with ray-finned fishes and salps (Carroll et al., 2019).

Diet is poorly characterized for Rice's whales. Stomach contents, which traditionally provide most

information on the diets and feeding ecology of baleen whales, are unavailable for Rice's whales. In 2019, an adult male Rice's whale stranded and died near Flamingo, Florida Bay, on the southwestern coast of Florida in the GOMx (field number FMMSN1908). The whale was collected and a necropsy was performed. However, stomach contents were unavailable due to a sharp piece of intragastric plastic in the second stomach chamber that caused hemorrhaging and acute gastric necrosis leading to the stranding and subsequent mortality of the whale. No direct information on the foraging ecology of Rice's whales exists. Surface feeding has never been observed, and, as a result, fish scales and tissue remains collected from Rice's whale feeding activity are not available. Fecal sampling has not been conducted for Rice's whales. In 2015, Soldevilla et al. (2017) placed an Acousonde suction-cup tag on a Rice's whale in the northeastern GOMx. The tag remained attached for nearly 3 days (63.85 hours) and revealed a diel diving pattern. The whale remained within 15 m the surface of the water 88 percent of the time during the night. Daytime dive behavior was characterized by repeated dives to depths >200 m, likely at or near the seafloor. Some of these deep dives included lunges near the seafloor associated with foraging (Soldevilla et al., 2017). Similar deep foraging dives throughout daylight hours were observed during 25 hours of tag deployment on a Rice's whale in the summer of 2018 (Soldevilla et al., 2022a). This type of bottom feeding is unusual for members of the Bryde's whale complex. What they may have been feeding on at those depths remains unknown.

Although direct evidence of Rice's whale prey species is lacking, analysis of stable isotopes of Rice's whale tissues collected by at-sea biopsies has provided data to better understand the feeding relationships among Rice's whales and other species within the ecosystem, i.e., the food web, also known as the trophic relationships. Stable carbon and nitrogen isotope ratios (noted δ13C and δ15N, respectively) within tissues of a predator reflect those of its prey and provide a useful method for assessing trophic relationships and can help identify foraging habitats. The use of stable isotope analysis of multiple elements (nitrogen, carbon, and sulfur) from biopsy samples collected on free-ranging whales to assess the trophic relationships and feeding ecology of cetaceans has recently increased (e.g., Hooker et al., 2001; Ryan et al., 2013; Caputo et al., 2021).

Kiszka et al. (2023) are the first to attempt to describe the feeding ecology of Rice's whales and the first to examine the potential drivers affecting prey selection by Rice's whales in relation to prey availability and energy density. They used a combination of data from whale skin biopsy samples, fish trawl collections, and analysis of proximate composition in potential prey samples collected during research cruises conducted by the NMFS SEFSC in 2019. To account for the changes in isotopes through the food web, stable isotope mixing models incorporate uncertainty for each parameter and employ trophic enrichment factors (TEF). No TEF is available specifically for Rice's whales and therefore TEFs from the skin of fin whales were used.

Potential Rice's whale prey items were collected in 21 mid-water trawl hauls, conducted during daylight hours in the Rice's whale core distribution area from July 4-28, 2019. Trawls were operated close to the seafloor, consistent with the near-bottom foraging depths of individual Rice's whales observed by Soldevilla et al. (2017, 2022a). The trawls collected 35,598 organisms with an overall biomass of 158.21 kg. A total of 25 species/species groups were identified with 8 of those in less than 10 percent of the trawls. Maurolicus weitzmani, the Atlantic pearlside, was by far the most abundant species by number at 88.05 percent of the total catch (confidence interval of 86 to 90 percent). It also represented 19.67 percent of the total biomass (confidence interval of 17.4 to 22 percent). A different species dominated in biomass: Ariomma bondi, the silver-rag driftfish, made up 26.7 percent of the biomass (confidence interval of 23.9 to 29.5 percent), while making up only 1.21 percent of the total catch by number (confidence interval of 0.6 to 1.9) (Kiszka et al., 2023).

Kiszka et al. (2023) selected four species for the stable isotope mixing model due to their prevalence in the samples and potential significance as a prey source in the community: Doryteuthis pealeii (longfin inshore squid), Diaphus dumerilii (Dumeril's lanternfish), Maurolicus weitzmani, and Ariomma bondi. All Rice's whale tissue samples fell within the mixing polygon, which suggests that the TEF and prey included in the analysis were appropriate. Mixing models of dietary contributions identified Ariomma bondi as the main prey (66.8 percent relative contribution), followed by Diaphus dumerilii (17.8 percent relative contribution), while other prey had minor relative contributions to the diet of Rice's whales (Doryteuthis pealeii, 6.4 percent; and Maurolicus weitzmani, 9.1 percent). While stable isotope mixing models are a useful tool to understand trophic relationships within food webs, stomach content analysis is still the most reliable method to comprehensively investigate the diets of cetaceans. As explained above, stomach content analysis is not available for Rice's whales. Therefore other prey species may be consumed that were not examined in the Kiszka et al. (2023) study.

The availability and quality of prey play important roles in the selection of prey in large predators, such as Rice's whales. Rice's whales forage during the day close to the seafloor. Because these deep dives require significant expenditures of energy, Rice's whales likely need high quality prey to meet their energetic requirements. Energy density data suggest that the high energy content of Ariomma bondi, relative to other available prey species, may be the primary driver of prey selection for Rice's whales. Kiszka et al. (2023) found that Ariomma bondi had significantly greater energy density (kilojoules/gram wet), lipids, and protein compared to the three other species selected for the model. Ariomma bondi were also significantly enriched in energy density (kilojoules/gram dry) compared to Diaphus dumerilii and Maurolicus weitzmani (Kiszka et al., 2023). Moreover, Kiszka et al. (2023) found active prey selection was positive for Ariomma bondi, Doryteuthis pealeii, and Diaphus dumerilii, and that despite the fact Maurolicus weitzmani were the most abundant species in the trawl samples, Maurolicus weitzmani were relatively unimportant in the diets of Rice's whales. This suggests that prey abundance is likely not a primary driver of prey selection for Rice's whales. Overall, the results from Kiszka et al. (2023) suggest that Rice's whales are selective predators, preferentially targeting schooling demersal and vertically migrating prey with the highest energy content.

2.6 Abundance

Estimates of abundance for Rice's whales in the northern GOMx are less than 100 individuals, with mean estimates of <50 individuals remaining (Rosel et al., 2021). Broad-scale aerial and ship-based line transect surveys to estimate cetacean abundance have been conducted in the northern GOMx as far back as 1991. Eleven abundance estimates were made between 1991 and 2012 and ranged between 0 and 44 individuals (see Rosel et al., 2016 for summary of surveys). Surveys with the lowest estimates covered waters primarily off the western GOMx, which is consistent with the species' preference for the northeastern GOMx, particularly the core distribution area. It should be noted, however, none of these surveys were focused on estimating abundance of a rare species and precision of all estimates is poor. The best and most recent population estimate available for Rice's whales is 51 individuals (confidence interval of 20 to 130 whales, Garrison et al., 2020).

3 Critical Habitat Identification

In the following sections, we describe the relevant definitions and requirements in the ESA and implementing regulations at 50 CFR part 424 and the key information and criteria used to prepare this proposed critical habitat designation. In accordance with section 4(b)(2) of the ESA, this proposed critical habitat designation is based on the best scientific data available and takes into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat. Scientific data used to identify potential critical habitat includes the information contained in the status review for the species (Rosel et al., 2016), proposed and final rules to list the Rice's whale under the ESA (81 FR 88639, December 8, 2016; 84 FR 15446, April 15, 2019), articles in peer-reviewed journals, other scientific reports and fishery management plans, and relevant Geographic Information System (GIS) data (e.g., U.S. maritime limits and boundaries data) for geographic area calculations and mapping. To identify specific areas that may qualify as critical habitat for Rice's whale, in accordance with 50 CFR 424.12(b), we undertook the following steps: Identifying the geographical area occupied by the species at the time of listing; identifying physical or biological features essential to the conservation of the species; identifying the specific areas within the geographical area occupied by the species that contain one or more of the physical or biological features essential to the conservation of the species; determining whether these essential features may require special management considerations or protection; and considered whether any specific areas outside the geographical area occupied by the species are essential for the species' conservation. Our evaluation and conclusions are described in detail in the following sections.

4 Geographical Area Occupied by the Species

One of the first steps in the critical habitat designation process is to define the geographical area occupied by the species at the time of listing. NMFS is also required to designate critical habitat based on the best available scientific data. The phrase "geographical areas occupied by the species," which appears in the statutory definition of critical habitat (16 U.S.C. 1532(5)(A)(i)), is defined by regulation as "an area that may generally be delineated around species' occurrences, as determined by the Secretary (i.e., range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals) (50 CFR 424.02).

At the time of listing (84 FR 15446, April 15, 2019), Rice's whales were considered to be limited to the northeastern Gulf of Mexico, in the vicinity of the De Soto Canyon, although historical whaling records and unconfirmed sightings suggested their occurrence in the southern and northwestern GOMx (Rosel et al., 2016). Subsequent publications confirming that Rice's whales are continuing to use the northwestern GOMx include a sighting in the western GOMx off the central Texas coast in 2017 that was genetically confirmed as a Rice's whale (Rosel et al., 2021) and Rice's whale calls that were detected acoustically along the shelf break in the western and northern Gulf of Mexico from July 2016 to August 2017 (Soldevilla et al., 2022b). Soldevilla et al. (2022b) concluded that Rice's whales persistently occur over a broader distribution in the GOMx than was previously understood, which is documented to include both the northeastern and northwestern GOMx.

Rosel et al. (2021) reviewed Bryde's-like whale records in the Caribbean and greater Atlantic. They compiled sighting and stranding data from the U.S. eastern seaboard; reviewed acoustic studies off Cherry Point, North Carolina, in Norfolk Canyon, and off Jacksonville, Florida; and reviewed the published literature for the entire Atlantic Ocean to evaluate the distribution of Bryde's whale taxa in these areas. The investigators found that there are no confirmed sightings of Bryde's whales along the U.S. eastern seaboard and no acoustic detections in the specified study areas. Only six Bryde's whale strandings could be verified in the U.S. Atlantic coast, and of those, two were genetically determined to be Rice's whales. Bryde's whale strandings along the U.S. Atlantic are likely extralimital strays from the Gulf of Mexico (Mead, 1977) or their carcasses may have been transported via currents and winds from their normal distribution (Rosel et al., 2021). Therefore, the Atlantic Ocean is not considered part of the geographical area occupied by Rice's whales.

Because we cannot designate critical habitat areas outside of U.S. jurisdiction (50 CFR 424.12(g)) the geographical area under consideration for this designation is limited to areas under the jurisdiction of the United States that Rice's whale occupied at the time of listing. Based on the information above, we have determined that at the time of listing Rice's whales occupied the Gulf of Mexico.

5 Physical or Biological Features Essential for Conservation

The statutory definition of critical habitat refers to "physical or biological features essential to the conservation of the species," (16 U.S.C. 1532(3)), but the ESA does not specifically define or further describe these features. ESA implementing regulations, however, define such features as those that occur in specific 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. The ESA regulations further provide that a feature may be a single habitat characteristic, or a more complex combination of habitat characteristics and may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity (50 CFR 424.02).

To assess habitat features that may qualify as "essential to the conservation" of Rice's whales, we evaluated physical and biological features that are essential to support the life history needs and support the conservation of Rice's whales within the areas they occupy within U.S. waters. Section 3 of the ESA defines the terms "conserve," "conserving," and "conservation" to mean: "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary" 16 U.S.C. 1532(3).

In the final listing rule, we determined that the Rice's whale is endangered under the ESA throughout all of its range due to its small population size and restricted range, and the threats of energy exploration, development and production, oil spills and oil spill response, vessel collision, fishing gear entanglement, and anthropogenic noise (84 FR 15446, April 15, 2019). Because Rice's whales rely entirely on the GOMx continental shelf and slope waters between the 100 and 400 m isobaths to support all of their life history stages, we have identified physical and biological features that support all of the Rice's whale life-history stages within its restricted range.

Based on the best scientific information available we have identified the following feature as being essential to the conservation of the Rice's whale: GOMx continental shelf and slope associated waters between the 100 and 400 m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth. The following attributes of this feature support Rice's whales' ability to forage, develop, communicate, reproduce, rear calves, and migrate throughout the GOMx continental shelf and slope waters and influence the value of the feature to the conservation of the species:

1. Sufficient density, quality, abundance, and accessibility of small demersal and vertically migrating prey species, including scombriformes, stomiiformes, myctophiformes, and myopsida;
2. 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
3. Sufficiently quiet conditions for normal use and occupancy, including intraspecific communication, navigation, and detection of prey, predators, and other threats.

6 Need for Special Management Consideration or Protection

Specific areas within the geographical area occupied by a species may be designated as critical habitat only if they contain essential features that "may require special management considerations or protection" (16 U.S.C. 1532 (5)(A)(i)(II)). Special management considerations or protection are any "methods or procedures useful in protecting the physical or biological features essential to the conservation of listed species" (50 CFR 424.02).

The essential feature is particularly susceptible to impacts from human activity because of the moderate water depth range where this feature occurs as well as its proximity to the coast. We identified broad categories of actions, or threats, as having the potential to negatively impact the essential feature, or its attributes, and the ability to support the conservation of listed Rice's whales, including, but not limited to, in-water construction, energy development, commercial shipping, aquaculture, military activities, and fisheries. Each of these threats could independently or in combination result in the need for special management or protections of the essential feature. Direct harvest of the prey by fisheries has the potential to negatively impact the essential feature and the ability of feeding areas to support the conservation of Rice's whales. Energy development could inhibit safe, unrestricted passage between important habitat areas to find prey and fulfill other life history requirements. The "may require" standard is met or exceeded with respect to management of the essential feature. Although we do not speculate as to what specific conservation measures might be required in the future through section 7 consultations on particular proposed Federal actions, the impacts from categories of actions described above, combined with those from natural factors may affect the habitat, including the attributes described for its essential feature. We therefore conclude that the essential feature identified herein may require special management considerations or protection generally throughout the species' range because threats to this feature exist.

7 Specific Areas Within the Geographic Area Occupied by the Species Containing the Essential Feature

To determine what areas qualify as critical habitat within the geographical area occupied by the species, we are required to identify "specific areas" within the geographical area occupied by the species that contain the physical or biological features essential to the conservation of the species (50 CFR 424.12(b)(1)(iii)). Delineation of the specific areas is done "at a scale determined by the Secretary [of Commerce] to be appropriate" (50 CFR 424.12(b)(1)). Regulations at 50 CFR 424.12(c) also require that each critical habitat area be shown on a map. Because the ESA implementing regulations allow for discretion in determining the appropriate scale at which specific areas are drawn (50 CFR 424.12(b)(1)), we are not required to, nor do we have the ability to, determine that each square inch, acre, or even square mile independently meets the definition of "critical habitat." A main goal in determining and mapping the boundaries of the specific areas is to provide a clear description and documentation of the areas containing the identified essential feature. This is ultimately crucial to ensuring that Federal action agencies are able to determine whether their particular actions may affect the critical habitat.

To map the specific area, we reviewed available species occurrence and bathymetric data. We used the highest resolution bathymetric data available. We used contours created from NOAA Office for Coastal Management, 2022 Bathymetric Contours, which provides data and maps at https://www.fisheries.noaa.gov/inport/item/54364. These bathymetric data (i.e., isobaths) were used, with other geographic or management boundaries, to draw the boundary on the map of the specific areas identified as meeting the definition of occupied critical habitat. Sighting reports, species presence or absence, scientific papers and other research, the biology and ecology of Rice's whales, and information indicating the presence of one or more of the identified essential features within certain areas of their range were also used to inform the decision making. Expert opinion was important to identifying areas that contain the feature. These experts included a NMFS regional GIS lead, a NMFS Large Whale Recovery Coordinator, and other Rice's whale researchers from the SEFSC.

Ultimately, based on a review of the best available data, we identified one specific area in the Gulf of Mexico that meets the definition of critical habitat for the Rice's whale. To be eligible for designation as critical habitat under the ESA's definition of occupied areas, each specific area must contain at least one essential feature that may require special management considerations or protection. This area meets the definition of "critical habitat" because the best available scientific data indicate that the essential feature is present, as evidenced by Rice's whale sightings data, the presence of Rice's whale prey, and habitat use patterns. Due to the unique ecology of the continental shelf and slope associated waters, use by Rice's whales is largely driven by depth. Therefore, the feature essential to the species' conservation is found in those depths that allow the whales to travel throughout a majority of their range seeking food and opportunities to socialize and reproduce. The area identified as including the essential feature for Rice's whales ranges from the 100 m isobath to the 400 m isobath in the Gulf of Mexico. As noted above, Rice's whale sightings occurred predominantly between the 100 m isobath to the 400 m isobath within the northeastern GOMx centered along the 200 m isobath with one sighting during the summer of 2017 in a water depth of 263 m off the coast of Texas (Garrison et al., in review).

One hundred eighty-one sightings ranged in water depths from 117 m to 408 m, with only two sightings falling outside the range of 151-352 m (Rosel et al., 2021). One Rice's whale was satellite-tagged for 33 days in the core distribution area in 2010 and remained between the 100 m isobath and the 400 m isobath for the duration of tracking (Soldevilla et al., 2017). Additionally, Ariomma bondi is a small schooling fish that occupies demersal habitat over muddy bottoms, typically between 50 m and 500 m, but particularly near the continental shelf break throughout the north-central and northwestern GOMx (Kiszka et al., 2023). Moreover, moored passive acoustic monitoring units placed seaward of the continental shelf break in the western and central GOMx regularly detected Rice's whale vocalizations with no apparent seasonality (Soldevilla et al., 2022b).

The 100 m isobath was selected to delineate the inshore extent of the area that would include the essential feature for Rice's whales due to consistent habitat use at depths greater than 100 m and because no sightings have been made in areas where the water is shallower than 117 m. The 400 m isobath was selected to delineate the offshore extent of the area that would include the essential feature for Rice's whales due to consistent habitat use at depths less than 400 m and because no sightings have been made in areas where the water is deeper than 408 m. This full range of depths, from the 100 m isobath to the 400 m isobath, incorporates nearly all of the recorded locations of Rice's whales and includes those continental shelf and slope waters and feature essential to Rice's whales.

8 Areas Outside of the Geographical Areas Occupied by the Species at the Time of Listing that are Essential for Conservation

ESA section 3(5)(A)(ii) defines critical habitat to include specific areas outside the geographical area occupied by the species at the time of listing if the areas are determined by the Secretary to be essential for the conservation of the species. Our regulations at 50 CFR 424.12(b)(2) further explain that the Secretary will identify, at a scale determined by the Secretary to be appropriate, specific areas outside the geographical area occupied by the species that are essential for its conservation. The 2019 regulations also state that the Secretary will only consider unoccupied areas to be essential where a critical habitat designation limited to geographical areas occupied would be inadequate to ensure the conservation of the species. In addition, for an unoccupied area to be considered essential, the Secretary must determine that there is a reasonable certainty both that the area will contribute to the conservation of the species and that the area contains one or more of those physical or biological features essential to the conservation of the species. Under the pre-2019 regulations, the Secretary's determination of specific areas outside the geographic area occupied by the species that are essential for its conservation must consider the life history, status, and conservation needs of the species based on the best available scientific data.

The 2019 listing rule identified energy exploration, development and production, oil spills and oil spill response, vessel collision, fishing gear entanglement, and anthropogenic noise as the most serious threats to Rice's whales (84 FR 15446, April 15, 2019). The presence of these threats within habitats used by Rice's whales likely influences the species' distribution, abundance, and survival. For example, noise levels in the 100 m to 400 m portion of the northern GOMx may be impacting the environment such that, in locations where noise levels are chronically the highest, Rice's whales may be avoiding habitat they would otherwise inhabit. Should they be designated as critical habitat, the occupied areas identified and discussed above would help conserve areas that support individual growth, reproduction, and development; social behavior; and overall population growth of the species within U.S. jurisdiction. Based on our current understanding of the species' life history, status, and conservation needs, we are not able to identify any specific areas outside the geographical area occupied by the species that are essential for its conservation under either the 2019 regulations or the pre-2019 regulations. Protecting the specific occupied area identified as critical habitat from destruction and adverse modification stemming from Federal actions would help support the species' habitat-based conservation needs.

9 Application of ESA Section 4(a)(3)(B)(i)

Section 4(a)(3)(B)(i) of the ESA prohibits designating as critical habitat any lands or other geographical areas owned or controlled by the DOD, or designated for its use, that are subject to an Integrated Natural Resources Management Plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary [of Commerce] determines in writing that such a plan provides a benefit to the species for which critical habitat is proposed for designation. Our regulations at 50 CFR 424.12(h) provide that, in determining whether an applicable benefit is provided, we will consider:

(1) The extent of the area and features present;

(2) The type and frequency of use of the area by the species;

(3) The relevant elements of the INRMP in terms of management objectives, activities covered, and best management practices, and the certainty that the relevant elements will be implemented; and

(4) The degree to which the relevant elements of the INRMP will protect the habitat from the types of effects that would be addressed through a destruction-or-adverse-modification analysis. There are no geographical areas owned or controlled by the DOD or designated for its use that are subject to an INRMP within the proposed Rice's whale critical habitat.

There are no geographical areas owned or controlled by the DOD or designated for its use that are subject to an INRMP that coincides with any of the areas under consideration for Rice's whale critical habitat.

10 Analysis of Impacts Under ESA Section 4(b)(2)

The foregoing discussion described the specific areas within U.S. jurisdiction that fall within the ESA Section 3(5) definition of critical habitat in that they contain the physical or biological features essential to the Rice's whales' conservation that may require special management considerations or protection. Section 4(b)(2) of the ESA requires that we consider the economic impact, impact on national security, and any other relevant impact, of designating any particular area as critical habitat. Additionally, the Secretary has the discretion to consider excluding any area from critical habitat if she determines the benefits of exclusion (that is, avoiding some or all of the impacts that would result from designation) outweigh the benefits of designation based upon the best scientific and commercial data available. The Secretary may not exclude an area from designation if exclusion will result in the extinction of the species. Because the authority to exclude is discretionary, exclusion is not required for any particular area under any circumstances.

The ESA provides the Services with broad discretion in how to consider impacts. (See, H.R. Rep. No. 95-1625, at 17, reprinted in 1978 U.S.C.C.A.N. 9453, 9467 (1978). "Economics and any other relevant impact shall be considered by the Secretary in setting the limits of critical habitat for such a species. The Secretary is not required to give economics or any other 'relevant impact' predominant consideration in his specification of critical habitat...The consideration and weight given to any particular impact is completely within the Secretary's discretion."). Courts have noted the ESA does not contain requirements for any particular methods or approaches (See, e.g. Bldg. Indus. Ass'n of the Bay Area et al. v. U.S. Dept. of Commerce et al. No. 13-15132, 9th Cir. July 7, 2015 [upholding district court's ruling that the ESA does not require the agency to follow a specific methodology when designating critical habitat under Section 4(b)(2]). For this proposed critical habitat designation, we followed the same basic approach to describing and evaluating impacts as we have for recent critical habitat rulemakings in the NMFS Southeast Region.

The following sub-sections describe the economic, national security, and other relevant impacts that we projected would result from including the specific area described above in the proposed critical habitat designation. We considered these impacts in deciding whether to exercise our discretion to propose excluding particular areas from the designation. Both positive and negative impacts (these terms are used interchangeably with benefits and costs, respectively) were identified and were considered. Impacts were evaluated in quantitative terms where feasible, but qualitative appraisals were used where more appropriate to particular impacts or available information.

The primary impacts of a critical habitat designation result from the ESA Section 7(a)(2) requirement that federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat, and that they consult with NMFS in fulfilling this requirement. Determining these impacts is complicated by the fact that Section 7(a)(2) also requires that federal agencies ensure their actions are not likely to jeopardize listed species' continued existence. One incremental impact of designation is the extent to which federal agencies modify their proposed actions to ensure they are not likely to destroy or adversely modify the critical habitat beyond any modifications they would make because of listing and the requirement to avoid jeopardizing listed species. When the same modification would be required due to impacts to both the species and critical habitat, the impact

of the designation is co-extensive with resulting from the ESA listing of the species (i.e. attributable to both the listing of the species and the designation of critical habitat). To the extent possible, our analysis identified impacts that were incremental due to the proposed designation of critical habitat - meaning those impacts that are over and above impacts attributable to the Rice's whale's listing or any other existing regulatory protections. Relevant, existing regulatory protections (including the species' listing) are referred to as the "baseline" and are also discussed in the following sections.

The following impact analyses describe projected future federal activities that would trigger Section 7 consultation requirements because they may affect the essential feature, and consequently may result in economic, national security, or other relevant impacts. Additionally, these analyses consider whether project modifications that may reduce impacts to the essential feature are likely to be solely a result of the critical habitat designation or co-extensive with another baseline regulation, including the ESA listing of the species.

10.1 Economic Impacts

Economic impacts of the critical habitat designation result through implementation of Section 7 of the ESA in consultations with federal agencies to ensure their proposed actions are not likely to destroy or adversely modify critical habitat. These economic impacts may include both administrative and project modification costs; economic impacts that may be associated with the conservation benefits of the designation are described later. We conducted analysis of the economic impacts of the proposed rule to the geopolitical areas likely to be impacted.

SUMMARY OF KEY FINDINGS

- **Total incremental costs**[1]: Total present value impacts of critical habitat designation for the Rice's whale are projected to be approximately $240,000 over the next ten years (discounted at seven percent), or $37,000 in annualized costs. While a degree of uncertainty underlies this analysis, the results provide an indication of the potential activities that may be affected and a reasonable estimate of future costs of critical habitat designation.
- **Existing baseline protections**: Baseline protections exist throughout the areas proposed for designation. In particular, the listing of the Rice's whale and other marine species requires that measures be taken to protect the whales against threats from energy exploration and development activities, oil spills and spill response efforts; vessel strikes; ocean noise; ocean debris; land- and marine-based discharge of pollutants; and entanglement in fishing gear.
- **Key assumptions**: In general, this analysis assumes that the types, frequencies, and locations of activities that have required Section 7 consultation over the past 12 years is reflective of the types, frequency, and location of activities that will require Section 7 consultation in the future. We further believe it is a reasonable assumption that the breakout of past consultations by informal, formal, and programmatic likely reflects the breakout of future consultations. For those activity categories for which we anticipate this assumption will not hold (e.g., space vehicle launch and recovery operations and wind energy development), our consultation projections reflect the best available information regarding planned future activities and expected reinitiations of ongoing programmatic consultations. To the extent that we handle

[1] Cost estimates are expressed in 2022 dollars. Present values are calculated over ten years (2023 – 2032) assuming a seven percent discount rate.

consultations differently over the next ten years (e.g., more dealt with on a programmatic basis, or critical habitat results in a shift to more formal consultations), our analysis could over or underestimate incremental administrative burden of critical habitat for the Rice's whale.

An additional key assumption is that, where Rice's whales are not present and other baseline protections do not otherwise protect the essential feature of the critical habitat, noise impacts (from seismic surveys, vessel traffic, etc.) will not rise to the level of destruction and adverse modification of the habitat. In this scenario, noise mitigation measures will therefore not need to be implemented specifically due to critical habitat designation.

While there is some uncertainty as to the degree of protection that baseline protections will provide the proposed critical habitat, this analysis concludes that project modifications required to address adverse modification of the critical habitat would already be required due to the listing of Rice's whales and other baseline protections. As a result, incremental costs of the proposed rule are limited to the additional administrative effort required for Section 7 consultations to consider impacts to the critical habitat.

- **Distribution of costs by activity**: Impacts to oil and gas activities permitted or undertaken by the Bureau of Ocean Energy Management (BOEM), Bureau of Safety and Environmental Enforcement (BSEE), and U.S. Coast Guard (USCG) and fishery management (NMFS) are greatest (22 percent and 21 percent of total, respectively), followed by water quality management (Environmental Protection Agency (EPA); 17 percent), military activities (Department of Defense (DOD); 15 percent), wind energy development (BOEM; 10 percent), scientific research and monitoring (NMFS; eight percent), and space vehicle launch and reentry (Federal Aviation Administration (FAA); seven percent). U.S. Army Corps of Engineers-permitted in-water construction activities are projected to account for only one percent of total impacts.

10.1.1 Introduction

The purpose of the economic analysis is to identify and consider the potential economic impacts associated with the designation of critical habitat areas for the Rice's whale. These economic impacts provide information on some of the potential "benefits of exclusion." In addition, this information addresses the requirements of Executive Orders 12866 (as affirmed and supplemented by Executive Order 13563), which directs federal agencies to assess the costs and benefits of regulatory actions.

To estimate the economic impacts of critical habitat designation, this analysis compares the state of the world with and without the designation of critical habitat for the Rice's whale. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already afforded the proposed critical habitat as a result of the listing of the Rice's whale as an endangered species, or as a result of other federal, state, and local regulations or protections. The "with critical habitat" scenario describes the incremental impacts associated specifically with this proposed designation of critical habitat.

To characterize the economic impacts of critical habitat designation for the Rice's whale, this analysis undertakes the following general steps as detailed in the following sections:

1. Characterize the areas proposed for designation, in terms of economic activities and existing management, as well as the presence of overlapping protections such as existing critical habitat designations or conservation areas.
2. Identify the types of projects or activities that may affect critical habitat and that may be subject to Section 7 consultation pursuant to the ESA, and forecast the expected occurrences of these activities within the boundaries of the proposed critical habitat. We used historical data on Section 7 consultations and interviews with NMFS Southeast Region personnel to make these forecasts.
3. Describe the suite of potential project modifications for these activities that may be recommended through Section 7 consultation to ensure they are not likely to destroy or adversely modify critical habitat.
4. Provide information on the distribution of economic impacts across the particular areas proposed for designation.
5. Evaluate the potential economic benefits stemming from the incremental project modifications.

10.1.2 Framework of the economic analysis

The U.S. Office of Management and Budget (OMB) instructs federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions. OMB's guidelines for conducting economic analyses of regulations direct federal agencies to measure the impacts of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action" (U.S. Office of Management and Budget 2003). In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e. occurring over and above existing constraints) are attributable to the proposed regulation. NMFS's and the U.S. Fish and Wildlife Service's regulations addressing the content and timing of critical habitat economic analyses require that the economic analyses of critical habitat rules be focused exclusively on the incremental effects of the designation (50 CFR 424.19).

Accordingly, this economic analysis employs "without critical habitat" and "with critical habitat" scenarios:

1. The "**without critical habitat**" scenario represents the baseline for the analysis, considering protections already afforded the critical habitat proposed for the Rice's whale. The baseline for this analysis is the state of regulation absent designation of new critical habitat.
2. The "**with critical habitat**" scenario describes and where possible monetizes the incremental impacts due specifically to designation of critical habitat for the Rice's whale. Incremental project modifications and associated impacts are those that are expected to occur solely as a result of critical habitat designation.

10.1.2.1 Identifying Baseline Protections

The baseline for this analysis is the existing state of regulation prior to the designation of critical habitat, including the listing of the Rice's whale under the ESA, and other federal, state, and local laws and guidelines. The baseline also reflects a wide range of additional factors beyond compliance with existing regulations that provide protection to the habitat proposed to be designated as critical habitat. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions,

implementation of other regulations and policies by NMFS and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

Baseline impacts and protections include implementation of sections 7, 9, and 10 of the ESA to the extent that they are expected to occur absent designation of critical habitat for the Rice's whale. This analysis does not quantify the baseline costs associated with these protections, as the critical habitat designation will not affect these costs.

- Section 7 of the ESA requires federal agencies to consult with NMFS to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify critical habitat that has already been designated for listed species. Baseline consultations under the jeopardy and adverse modification standards result in administrative costs, as well as costs of implementing any project modifications resulting from consideration of these standards.
- Section 9 defines the actions that are prohibited by the ESA. In particular, it prohibits "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC § 1532). Economic impacts associated with Section 9 that are relevant to this analysis manifest themselves in application of Sections 7 and 10 for listed species. There are no Section 9 prohibitions for critical habitat.
- Under Section 10(a)(1)(B) of the ESA, a non-federal entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project (U.S. Fish and Wildlife Service 2002). The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that effects of incidental take are adequately avoided or minimized. Development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

The protection of listed species and critical habitat is not limited to the ESA. Other federal agencies, as well as state and local governments, may also protect the natural resources under their jurisdiction. If compliance with the Clean Water Act (CWA), Marine Mammal Protection Act (MMPA), state environmental quality laws, or best management practices, for example, protects critical habitat for the Rice's whale, such protective efforts are considered to be baseline protections. Of note, however, such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In such cases, they are considered incremental impacts.

10.1.2.2 Identifying Incremental Impacts

Incremental impacts of critical habitat rules result from changes in the management of projects and activities, above and beyond those changes resulting from existing required or voluntary conservation efforts undertaken due to other federal, state, and local regulations or guidelines.

When critical habitat is designated, Section 7 requires federal agencies to ensure that their actions are not likely to destroy or adversely modify critical habitat, in addition to ensuring that the actions are not likely to jeopardize the continued existence of the species. The added administrative costs of considering critical habitat in Section 7 consultation and the additional impacts of implementing

conservation efforts (i.e., reasonable and prudent alternatives in the case of an adverse modification finding) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat.

In identifying incremental impacts, it is important to consider both economic efficiency and distributional effects resulting from critical habitat designation for the Rice's whale. Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of critical habitat designation, these efficiency effects represent the opportunity costs of resources used or benefits foregone by society as a result of the rule. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets (Gramlich 1990).

We also consider the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities. This information on distributional impacts may be used by decision-makers to assess whether the effects of the designation may unduly burden a particular group or economic sector. For example, while project modifications may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts.

In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a federal permitting agency may enter into a consultation with NMFS to ensure that a particular project will not adversely modify critical habitat. The effort required for consultation is an economic opportunity cost because the agency and/or project proponent's time and effort would have been spent in an alternative activity had the particular area not been included in the designation. When compliance activity is not expected to significantly affect markets—that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price—the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, if a given commercial fishery is precluded from fishing across a large area, the price and quantity of fish on the market may be affected. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the costs of project modifications are expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets. In the case of the proposed critical habitat for the Rice's whale, incremental project modifications are not anticipated to significantly affect activity levels or markets; therefore, this report focuses solely on compliance costs.

Measurements of changes in economic efficiency focus on the net impact of project modifications, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages federal agencies to consider distributional effects separately from efficiency effects (U.S. Office of

Management and Budget 2003). This analysis considers the entities expected to bear the costs associated with the designation, including a separate analysis of potential impacts to small entities (see Section 11 [Appendix A]).

Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of employment and revenue shifts in the local economy. Given the limited nature of incremental impacts likely to result from this designation, measurable regional impacts are not anticipated.

10.1.2.3 Direct Impacts

The two categories of direct, incremental impacts of critical habitat designation are:

1. The administrative costs of conducting Section 7 consultation; and
2. Implementation of any project modifications recommended through Section 7 consultation to avoid potential destruction or adverse modification of critical habitat.

Section 7(a)(2) of the ESA requires federal agencies to consult with NMFS whenever activities that they undertake, authorize, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve NMFS and another federal agency only, such as the U.S. Army Corps of Engineers (USACE). Often, consultations will also include a third party involved in projects, such as the applicant for a CWA Section 404 permit or a Rivers and Harbors Act of 1899 section 10 permit.

During a consultation, NMFS, the federal action agency, and the entity applying for federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the federal agency, and whether there is a private applicant involved. Section 7 consultations with NMFS may be either informal or formal, based on the determination of adverse effects to the species or critical habitat.

Informal consultations consist of discussions between NMFS, the action agency, and applicant (if applicable) concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential adverse effects at an early stage in the planning process. Informal consultations are concluded by determining that the action is not likely to adversely affect listed species or designated critical habitat.

By contrast, a ***formal consultation*** is required if the action agency or NMFS determines that a proposed federal action may adversely affect listed species or designated critical habitat. The formal consultation process results in NMFS's determination in its Biological Opinion (BO) of whether the action is likely to jeopardize a listed species or destroy or adversely modify designated critical habitat, and project modification recommendations to avoid or minimize the impacts of those adverse effects. In addition,

NMFS may conduct programmatic consultations which address an agency's multiple actions on a program, regional, or other basis.

Programmatic consultations can be used to evaluate the expected effects of groups of related agency actions expected to be implemented in the future, where specifics of individual projects such as project location are not definitively known. Programmatic consultations allow for streamlined project-specific consultations because much of the effects analysis is completed up front in the Programmatic Opinion. Regardless of the type of consultation or proposed project, Section 7 consultations can require administrative effort on the part of all participants.

As described above, parties involved in Section 7 consultations include NMFS, a federal action agency, and, in some cases, a third-party applicant. While consultations are required for activities that involve a federal nexus and may affect a listed species regardless of whether critical habitat is designated, the additional consideration of critical habitat may increase the effort for consultations if the project or activity in question may affect critical habitat. Administrative efforts for future consultations may therefore include baseline and incremental impacts.

In general, 3 different scenarios associated with the designation of critical habitat may result in incremental administrative consultation costs:

1. **Additional effort to address adverse effects to new critical habitat in a consultation**: Future consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond addressing effects to listed species or existing designated critical habitat. In this case, only the additional administrative effort required solely to consider effects to the Rice's whale critical habitat is considered an incremental impact of the designation.
2. **Re-initiation of consultation to address adverse effects to critical habitat**: Consultations that have already been completed on an ongoing project or activity may require re-initiation to address critical habitat. In this case, costs of re-initiating the consultation, including all associated administrative and conservation effort costs, are considered incremental impacts of the designation.
3. **New consultation resulting entirely from critical habitat designation**: Critical habitat designation may trigger future consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not). Such consultations, for example, may be triggered in critical habitat areas in which the species are not present, or in areas outside of critical habitat for other listed species. All associated administrative and conservation effort costs of these consultations are considered incremental impacts of the designation.

In addition to administrative costs, Section 7 consultations in proposed critical habitat areas may also include additional project modifications recommended specifically to address potential destruction or adverse modification of the new critical habitat. This analysis refers to "project modifications" as a generic term for recommendations NMFS may make to modify projects or activities for the benefit of the any listed species or their designated critical habitat, or that action agencies or other entities may otherwise undertake to avoid adverse effects of their actions on listed species or their designated critical habitat. The ESA Section 7 Consultation Handbook includes more targeted descriptions for other terminology as follows:

- **Conservation measures** are actions to benefit or promote the recovery of listed species that are included by the federal agency as an integral part of the proposed action. These actions will be taken by the federal agency or applicant, and serve to minimize or compensate for project effects on the species under review. These may include actions taken prior to the initiation of the consultation, or actions which the federal agency or applicant have committed to complete in a biological assessment or similar document.
- **Conservation recommendations** are the Services' non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures that a federal agency can take to minimize or avoid the adverse effects of a proposed action on listed or proposed species, or designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed or proposed species, or designated or proposed critical habitat; and (3) include suggestions on how an action agency can assist species conservation as part of their action and in furtherance of their authorities under Section 7(a)(1) of the ESA.
- **Reasonable and prudent measures** are actions the Secretary believes necessary or appropriate to minimize the impacts, i.e., amount or extent of incidental take. These measures are not imposed for effects to critical habitat; however, they may also reduce the impact of adverse effects to the critical habitat.
- **Reasonable and prudent alternatives** are recommended alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Secretary believes would avoid the likelihood of jeopardizing the continued existence of listed species or the destruction or adverse modification of designated critical habitat (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

For future consultations considering jeopardy and adverse modification, the economic impacts of project modifications undertaken to avoid adverse modification of the proposed critical habitat, above and beyond those that would have been undertaken to avoid jeopardy or adverse modification of existing critical habitat for other listed species, are considered incremental impacts of the critical habitat designation.

In some cases, project modifications that are undertaken in order to avoid jeopardy may also avoid adverse modification of critical habitat. That is, while jeopardy and adverse modification are not the same standard, project modifications undertaken to avoid jeopardy may also result in the project avoiding adverse modification of critical habitat. This finding is often true for aquatic and marine species for which the condition of the habitat is inextricably linked to the health of the species. In other words, while avoidance of adverse modification of critical habitat requires protection of essential features, avoiding jeopardy to the species may require protection of these features even absent critical habitat. Listing protections are relevant to the baseline management of activities wherever the listed species are present.

10.1.2.4 Indirect Impacts

The designation of critical habitat may, under certain circumstances, affect actions that do not have a federal nexus and thus are not subject to the provisions of Section 7 under the ESA. Indirect impacts are those sometimes unintended changes in economic behavior that may occur outside of the influence of the ESA, through other federal, state, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the

designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

OTHER STATE AND LOCAL LAWS

Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other state or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

ADDITIONAL INDIRECT IMPACTS

In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:

- **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the Section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty or Stigma** - NMFS conducts each Section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with NMFS under Section 7 may face uncertainty concerning whether project modifications will be recommended by NMFS and the nature of these modifications. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.

10.1.2.5 Benefits

Under Executive Order 12866, OMB directs federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions. OMB's Circular A-4 distinguishes 2 types of economic benefits: direct benefits and ancillary benefits. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking (U.S. Office of Management and Budget 2003).

In the context of the ESA, the primary purpose of a critical habitat designation (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has also documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research (U.S. Office of Management and Budget 2003).

Critical habitat aids in the conservation of listed species specifically by protecting the essential biological and physical features of critical habitat on which the species' conservation depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate social benefits aside from the conservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat. Section 10.3.1 addresses the potential benefits of this critical habitat designation.

10.1.2.6 Presentation of Results

Impacts are described in present value and annualized terms, applying a discount rate of 7 percent throughout the body of the report. Present value impacts calculated by applying a 3 percent discount rate are also provided for purposes of comparison with values calculated at 7 percent.[2] Present value and annualized impacts are calculated according to the methods described in Figure 2. Presentation of the economic impacts of designation is not disaggregated geographically or jurisdictionally because (1) a single unit comprises the proposed critical habitat and (2) potential impacts to the critical habitat of most of the activities and associated projects considered in this analysis are broadly spatially distributed.

Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this designation through species recovery (i.e., when critical habitat is no longer required). Guidance from OMB indicates that "if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future" (U.S. Office of Management and Budget 2011). The "foreseeable future" for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Accordingly, this analysis forecasts impacts over a ten-year time horizon. OMB supports this time frame stating that "for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years" (U.S. Office of Management and Budget 2011). Therefore, this analysis considers economic impacts to activities over a ten-year period from 2023 through 2032.

[2] The U.S. Office of Management and Budget (OMB) directs federal agencies to report results using discount rates of 3% and 7%. U.S. Office of Management and Budget. 2003. Circular A-4.

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PVc) from year t to T is measured in 2022 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1 + r)^{t-2022}}$$

C_t = cost of incremental impacts in year t

r = discount rate[b]

This analysis also expresses impacts for each activity as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, activities employ a forecast period of ten years, 2023-2032. Annualized future impacts (APVs) are calculated using the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1 - (1 + r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, ten years)

[a] To derive the present value of future impacts to development activities, t is 2023 and T is 2032.

[b] To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of 7%. In addition, OMB recommends sensitivity analysis using other discount rates such as 3%, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003, and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of federal Regulations; Notice," 68 Federal Register 5492, February 3, 2003.)

Figure 2 PRESENT VALUE AND ANNUALIZED IMPACT CALCULATION METHODS

10.1.3 Activities that May Be Affected

To identify the types and geographic distribution of activities that may trigger Section 7 consultation for the Rice's whale critical habitat, we first reviewed the section 7 consultation histories from 2010 through 2021 for both the NMFS Southeast Region and its Office of Protected Resources for:

- Activities consulted on in the areas being proposed as critical habitat for the Rice's whale and
- Activities that take place outside of the areas proposed for critical habitat but whose effects extend into the critical habitat and are therefore subject to consultation.

Of these, the consultation history includes 7 programmatic, 13 formal, and 39 informal consultations that fall within the boundaries of or may otherwise affect the proposed critical habitat for the Rice's whale. We also considered section 7 consultations conducted in 2022 to the extent those consultations support modifying our projections of future consultations based on the 2010-2021 consultation history alone. In addition, we convened discussions with NMFS personnel to identify future activities that may affect Rice's whale critical habitat that may not have been captured by relying on the section 7 consultation history. We reviewed the U.S. Army Corps of Engineers (USACE) permit application database for the South Atlantic Division and Southwestern Division to identify all USACE permit applications for projects located within the proposed critical habitat area. Review of USACE permit application data is useful because the database encompasses USACE-permitted activities that may not have been consulted on in the past if they were outside of previously designated critical habitats or areas containing species protected under the ESA. We compared the USACE permit application data to the NMFS section 7 consultation history and confirmed the latter's completeness, thereby validating use of the NMFS section 7 consultation database to project future informal consultations on USACE-permitted projects.

Based on this information, the types of activities that have the potential to affect the essential feature of the Rice's whale and involve a federal nexus include the following:

- Oil and Gas Activities
- Fishery Management (development of fishery management plans)
- Military Activities (all activities undertaken by the Department of Defense, such as training exercises)
- Water Quality Management (revision of national and state water quality standards, issuance of National Pollutant Discharge Elimination System (NPDES) permits, registration of pesticides)
- Scientific Research and Monitoring
- Space Vehicle and Missile Launches and Reentry
- In-water Construction
- Aquaculture (development of aquaculture facilities)
- Vessel traffic
- Renewable Energy
- Activities that lead to or address greenhouse gas emissions or global climate change

Table 1 summarizes historical Section 7 consultation data for each of these activity categories from 2010 to 2021. Approximately two-thirds of historical consultations occurring within the proposed critical habitat were informal. Formal and programmatic consultations (19 consultations) were primarily associated with fishery management, oil and gas, and military activities. Thirty-four of the 40 informal consultations were associated with water quality management (15 consultations), scientific research

and monitoring (11), and oil and gas activities (8). Impacts to the proposed habitat of oil and gas activities, fishery management, and water quality management, in particular, were widely geographically distributed across the proposed critical habitat area.

Table 1. NMFS SOUTHEAST REGION CONSULTATIONS FOR ACTIVITIES THAT MAY AFFECT PROPOSED RICE'S WHALE CRITICAL HABITAT, BY ACTIVITY TYPE AND ACTION AGENCY (2010 – 2021)

ACTIVITY TYPE	ACTION AGENCY	TOTAL NUMBER OF CONSULTATIONS
Oil and Gas Activities	BOEM, USCG	13
Fishery Management	NMFS	10
Military Activities	DOD	6
Water Quality Management	EPA,USACE	16
Scientific Research and Monitoring	NMFS	11
Space Vehicle Launches and Reentry	FAA	2
In-water Construction	NMFS	1
Aquaculture	NMFS	0
Renewable Energy Development	BOEM	0
Total		**59**

Source: NMFS. Public Consultation Tracking System and Environmental Consultation Organizer.

The remainder of this section provides an overview of each of the activities potentially affected by the proposed critical habitat, including a description of how they are currently managed under the baseline regulatory environment, and how they may affect the essential features of proposed critical habitat for the Rice's whale. Baseline protections exist in large areas proposed for designation; however, there is uncertainty as to the degree of protection that these baseline provisions may provide relevant to future projects. In particular, the ESA listing of the Rice's whale, and associated requirement that activities avoid causing jeopardy to the species, provides the essential feature of the critical habitat significant protections.

As stated above, the listing of the Rice's whale under the ESA requires that activities with a federal nexus not be likely to jeopardize the species. Many types of project modification that are undertaken in order to avoid jeopardy of the whales most likely also avoid adverse effects to critical habitat. Where the proposed critical habitat coincides with areas in which Rice's whales or other protected marine species are present, particularly species whose health is threatened by adverse impacts to the critical habitat essential feature, measures intended to avoid adverse modification of the critical habitat would likely already be recommended to avoid or minimize adverse impacts to the listed species.

Thus, if a project requires consultation to avoid potential adverse effects to the proposed critical habitat as well as Rice's whales or other listed species, and the same project modification would address both types of adverse effects, the costs of project modification are co-extensive, i.e., critical habitat would not add project modification costs. While there is variability as to where within the proposed critical habitat Rice's whales and other listed mobile species are present, anywhere the listed species are present and are protected against project effects that pose both jeopardy and adverse modification threats, project modifications are considered baseline protections which would occur regardless of Rice's whale critical habitat designation.

The above assumption only holds in project areas where species that offer baseline protections to the essential feature of Rice's whale critical habitat are present. These baseline protections would not extend to areas of the proposed critical habitat where project impacts do not pose a jeopardy threat to one or more listed species. NMFS will evaluate projects within the critical habitat that do not pose a jeopardy threat to the Rice's whale or other listed species for their potential adverse effects to the critical habitat. In these situations, NMFS could recommend project modifications specifically due to the Outer Continental Shelf Lands Act designation of critical habitat for the Rice's whale. However, we believe there is very limited potential for projects to adversely affect the critical habitat without posing a jeopardy risk because (1) impacts from most of the forecast activities that could adversely affect the critical habitat are spatially diffuse in nature; and (2) multiple ESA-listed marine species for which adverse effects to the critical habitat are redundant with the species' jeopardy risks occur across the proposed critical habitat. In addition, there is uncertainty with respect to the thresholds at which the prey species, water quality, and noise components of the essential feature are affected to the point that NMFS would determine that a project or activity would likely cause destruction or adverse modification of the critical habitat. For these reasons, we anticipate that the proposed critical habitat will not change the outcome of Section 7 consultations, and additional project modifications will not be necessary.

10.1.3.1 Oil and Gas Activities – BOEM

BOEM is responsible for managing oil and gas resources on the Outer Continental Shelf (OCS) in Federal

PROTECTIONS PROVIDED BY KEY BASELINE REGULATIONS

Baseline protections that reduce the potential effects of future activities on Rice's whale critical habitat include the following:

-The ESA-listing of the species prohibits the "taking" of the animals due to energy exploration and development, oil spills and spill response, ocean noise, ocean debris, and aquaculture.

-The Marine Mammal Protection Act of 1972 mandates the prevention of the diminishment of marine mammal species to the point that they are no longer a significant functioning element of their ecosystem. The MMPA provides for incidental take authorizations provided the take is limited to harassment.

-The primary law governing marine fisheries management in U.S. federal waters, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) fosters the long-term biological and economic sustainability of U.S. marine fisheries. Key objectives of the MSA include the prevention of overfishing and preservation of a safe and sustainable supply of seafood.

-The Outer Continental Shelf Lands Act mandates that BOEM manage development of the Nation's offshore oil and gas resources in an environmentally responsible way.

-The Oil Pollution Act of 1990 is the principal statute governing oil spills in the Nation's waterways. The Act is designed to ensure that adequate resources are available to respond to oil spills and expanded the scope of compensable damages to those impacted by a spill.

-The presence of multiple ESA-listed species in the GOMx, including sei whale, sperm whale, green sea turtle, loggerhead sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, and leatherback sea turtle, protects the essential feature of the proposed critical habitat to the extent that projects or activities that may adversely affect the critical habitat also pose a jeopardy threat to the listed species.

waters (i.e., that are more than three nautical miles offshore). Offshore oil and gas development includes activities related to exploration of the seafloor for resources using methods including seismic surveys. They also include construction, operation, and maintenance of platforms and other facilities associated with extraction and transportation of the resources as well as planning for and responding to emergencies including unexpected releases of oil and gas into the marine environment.

Areas of the potential critical habitat overlap BOEM's Western Gulf of Mexico, Central Gulf of Mexico, and Eastern Gulf of Mexico planning areas. Currently, Federal oil and gas exploration and production activities occur in the Western and Central Gulf of Mexico planning areas.

DESCRIPTION OF THREAT

The Rice's whale status review (Rosel et al. 2016) identified 27 possible threats to GOMx Rice's whales, with the most significant among these sound, vessel collisions, energy exploration, and oil spill response. Sound from oil and gas exploration and development activities are of particular concern to Rice's whale critical habitat since they produce a large amount of low frequency sound (less than 100 Hz) that falls within the hearing range of the species and could therefore adversely affect Rice's whales' use and occupancy critical habitat areas. Similar to other baleen whales, it is likely that Rice's whales rely on their hearing to perform critical life functions (i.e. communication, navigation, mate finding, food location, predator avoidance, etc.). Common sources of sound from oil and gas activities include drilling and production activities conducted from drill ships, metal-legged structures, and submersibles; seismic surveys that are often used in oil and gas exploration and are typically conducted continuously for months at a time; and activities associated with construction of oil platforms such as pile-driving and the use dynamic thrusters located on the sides of vessels (NMFS 2020 and NMFS personnel M. Tucker 2022).

Exposure to spilled oil and dispersants used for oil spill response can decrease the ability of large whales to eat and, for all marine mammals, can irritate or injure the respiratory tract, leading to inflammation or pneumonia; negatively affect animals' ability to absorb or digest foods; and damage liver or kidney function. Nonlethal oil spill effects can include impaired animal health and reproduction and increased susceptibility to diseases. Marine mammals may continue to experience effects from oil spills once they are stopped, including reduction or contamination of prey, direct ingestion of contaminated prey, or displacement from preferred habitat (Rosel et al. 2016).

On April 10, 2010, an explosion on the Deepwater Horizon (DWH) Macondo oil well drilling platform caused the largest marine oil spill in U.S. history, releasing nearly five million barrels of oil into the GOMx (NOAA 2011). From 2012 to 2021 recorded spills resulted from active leases resulted in the release of a total of approximately 22,000 barrels of oil into the GOMx from platforms, rigs, and pipelines associated with oil and gas related activities on active leases, with the largest occurring in 2017 when a fractured pipeline released approximately 16,000 barrels.[3] Over the same ten-year period, there were 173 oil spills of at least one barrel associated with oil and gas related activities in the GOMx, 24 of which were of at least 50 barrels. One-hundred thirty-six of the 149 spills occurred from 2012-2016, including all but four of the spills of at least 50 barrels (BSEE) 2022).

[3] This total does not include oil released from the Taylor Energy oil production platform, which began in 2004 when a hurricane-induced mudslide caused the collapse of the platform located off the coast of Louisiana. Despite the installation of a containment system in 2018 that captures most of the oil currently leaking from the damaged seafloor wells, oil continues to discharge into the open ocean (U.S. Department of the Interior 2022).

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

Between 2010 and 2021, NMFS conducted several hundred informal consultations and two formal consultations related to oil and gas exploration and development activities occurring throughout all U.S. waters of the GOMx. The large majority of these consultations were with BOEM on various phases of approvals for oil and gas projects and were completed between 2010 and 2014, prior to the issuance of a programmatic biological opinion on federally regulated oil and gas activities in the GOMx. Approximately 15 consultations with the Federal Energy Regulatory Commission (FERC) related to liquefied natural gas infrastructure development (e.g., liquefaction and transportation facilities), including one formal consultation, were completed over this time frame, with all but three of these consultations completed after 2015. NMFS also consults with USCG on deepwater port projects in the GOMx. USCG is currently engaged in formal consultation with NMFS on three deepwater ports, with four deepwater ports expected to be operational within the next four years. The vast majority of consultations on oil and gas activities, including Liquified Natural Gas (LNG) infrastructure development and deepwater ports, were on projects located in areas of the GOMx well outside the proposed critical habitat. See Table 2 for the projected number of consultations over the next 10 years considering effects of oil and gas activities on the proposed critical habitat.

In 2020, the programmatic Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico came into effect, with federal action agencies including BOEM, BSEE, EPA and NMFS. The biological opinion provides for project-specific review by the action agency and/or NMFS of an activity that is authorized under the programmatic action detailed in the biological opinion (NMFS 2020). NMFS has conducted hundreds of these "step-down" reviews since the 2020 biological opinion was issued. The biological opinion was developed, in part, to reflect changes to the environmental baseline in the GOMx in the wake of the DWH oil spill (NMFS 2020). The opinion established that 1) all ongoing oil and gas activities will be evaluated in a Gulf-wide programmatic opinion and 2) lease sale plans proposed by BOEM in the future will require consultation under Section 7 of the ESA. Further, the opinion analyzes the effects of all on-going and future oil and gas activities related to leases awarded through 2029 on ESA-listed species and species proposed to be listed as well as designated critical habitat in the entire GOMx. Given the generally expected 40-year lifetime of each individual lease (through decommissioning), this opinion analyzes effects over approximately the next 50 years.

The GOMx is the primary source of offshore oil and gas for the U.S. generating about 97 percent of all U.S. OCS oil and gas production. For oil and gas leasing purposes, the GOMx is divided into three geographic leasing areas: the Western Planning Area (WPA), the Central Planning Area (CPA), and the Eastern Planning Area. The WPA covers approximately 28.58 million acres (115.7 thousand km^2) and is located 10.4 mi (16.7 km) offshore Texas and extends seaward to the limits of the U.S. EEZ. It is bounded on the west and north by the federal-state boundary offshore Texas and on the south by the maritime boundary with Mexico. The eastern boundary begins at the offshore boundary between Texas and Louisiana and proceeds southeasterly (Rosel et al. 2016). As of February 2022, there were 213 active leases in the WPA, including 34 producing leases (BOEM 2022a).

The CPA covers approximately 66.45 million acres (268.9 thousand km^2) and is located 3.5 mi (5.5 km) offshore Louisiana, Mississippi, and Alabama and extends seaward to the limits of the EEZ. As of February 2022, there were 1,780 active leases in the CPA, including 439 producing leases. The Eastern Planning Area covers approximately 64.56 million acres (261.3 thousand km^2) and is located 10 miles (16 km) offshore Florida. Thirteen sales have been held in this planning area and 105 wells drilled, with significant discoveries of natural gas. However, there has been no production from the wells in this planning area (Rosel et al. 2016). The Gulf of Mexico Energy Security Act of 2006 established restrictions

on oil and gas leasing in a portion of the Central Gulf of Mexico Planning Area and most of the Eastern Gulf of Mexico Planning Area through June 30, 2022. These areas were further withdrawn from disposition until June 30, 2032, by Presidential Memorandum, in September, 2020 (BOEM 2022b).

The Secretary of the Interior prepares national programs for the OCS oil and gas program that provide for lease sales in five-year cycles. The Outer Continental Shelf Lands Act requires the Secretary of the Interior to consider the environmental effects of oil and gas exploration and development operations the when preparing a five-year program (43 USC § 1344). On July 1, 2022, the DOI made available for public comment the Proposed Program for the 2023-2028 National Outer Continental Shelf Oil and Gas Leasing Program and the Draft Programmatic Environmental Impact Statement for the 2023-2028 Program. The Proposed Program includes no more than ten potential lease sales in the GOMx (BOEM 2022c).

There is a high concentration of oil and gas-related vessel traffic off the southeastern coast of Louisiana. The proposed designation of critical habitat does not create protected areas or vessel speed restrictions within the proposed critical habitat area. Rather, it requires that federal agencies consult with NMFS on actions that may affect the critical habitat. Any required mitigation measures that may flow from a consultation would be implemented by the regulated industry, typically through requirements imposed by the action agencies through conditions of approval on plans and permits, and through lease stipulations. Baseline protections in the Rice's whale core distribution area require speed restrictions on some vessel traffic, as well as night closures due to the presence of Rice's whales. In the following section, we discuss existing baseline protections related to oil and gas activities that are attributable to the presence of Rice's whales.

REGULATORY BASELINE

The Oil Pollution Act (OPA) of 1990 (33 U.S.C. 2701-2761) is the principal statute governing oil spills in the nation's waterways. This Act was passed in the wake of the Exxon Valdez oil spill in March of 1989. After this spill, the U.S. identified two major issues (1) it lacked adequate resources, particularly federal funds, to respond to oil spills; and (2) the scope of damages to those impacted by a spill that are compensable under federal law was fairly narrow. The OPA was designed to address both of these deficiencies through the establishment of new requirements for oil transportation, oil spill response capabilities of the federal government and industry, and cleanup. In addition, the process established by OPA makes the owner or operator of a facility that discharges oil liable for the cost associated with cleanup of the spill and damages caused by the spill (Rosel et al. 2016).

Rice's whales receive significant protections against threats posed by oil and gas exploration and development activities because of their ESA status as an endangered species. The Biological Opinion on BOEM GOMx Oil and Gas Program (NMFS 2017) identifies these protections, which include the following that also offer a degree of protection to the Rice's whale critical habitat:

- BOEM/BSEE protected species stipulations that apply after a lease sale occurs. Lessee and operator requirements include flotsam removal, posting signs regarding marine debris, vessel speed and distance protocols when Rice's whales (or other marine mammals and sea turtles) are observed, seismic survey mitigation measures including use of an exclusion zone, addressing important habitats in oil spill contingency plans, and immediate reporting of stranded animals. The vessel speed and distance protocols and seismic survey mitigation measures reduce the risk of adverse modification of the Rice's whale critical habitat, while the oil spill contingency plans that address important habitats reduce the threat to Rice's whale prey species.

- BOEM NTL No. 2016-G02 seismic survey mitigation measures, including ramp-up procedures, the use of a minimum sound source, airgun testing and protected species observation and reporting.
- Mitigation measures applied under the NMFS Permits and Conservation Division's MMPA rule to minimize adverse effects of geological and geophysical surveys to marine mammals, including the following: time-area restrictions on airgun surveys for coastal areas, Rice's whale areas, and the Dry Tortugas; Passive Acoustic Monitoring (PAM) requirements; visual monitoring requirements involving PSOs; monitoring zone specifications; ramp-up requirements for airgun surveys; specified exclusions zones; and shutdown and power-down requirements.
- Multiple BSEE and BOEM measures to ensure compliance with oil spill risk mitigation requirements and timely containment of a large oil spill should such a spill occur.
- EPA proposed amendments to the National Contingency Plan on the use of oil spill dispersants to ensure that chemical and biological agents have met efficacy and toxicity requirements.

Rice's whales were considered in a 2021 biological opinion on the use of dispersants and in-situ burning (ISB) to mitigate impacts of oil spills. The biological opinion concluded that any loss of Rice's whale prey species in the area of a spill due to the use of dispersants would be a localized effect and that the effects of contamination or localized declines in prey as a result of dispersant application on ESA-listed whales would be insignificant. Noise from overflights conducted prior to dispersant application and prior to and during ISB operations, as well as from aircraft and vessels during dispersant application and ISB operations, could cause temporary and localized impacts to the critical habitat, but the impacts would be temporary due to project design criteria (NMFS 2021a).

The measures summarized in this section specific to minimizing the risk and impacts of oil spills from oil and gas exploration and development activities provide significant protections to Rice's whale prey species and marine waters throughout the proposed critical habitat. In addition, noise mitigation measures designed to protect the species already contribute to the preservation of sufficiently quiet conditions for Rice's whales' normal use and occupancy of the proposed critical habitat wherever the whales or other protected marine species are present. There is uncertainty with regard to the degree to which these noise mitigation measures would be employed in areas of the proposed critical habitat where Rice's whales or other protected marine species are not present. However, given the additional uncertainty about the extent to which noise associated with oil and gas exploration and development activities would impact the proposed critical habitat and, specifically, Rice's whales' normal use and occupancy, we consider it speculative to project that section 7 consultations on individual projects or recurring activities would determine these impacts to constitute destruction or adverse modification of the critical habitat. As a result, we anticipate that incremental costs associated with oil and gas exploration and production as a result of the Rice's whale critical habitat will be limited to administrative costs of consultation.

10.1.3.2 Fishery Management – NMFS

There are a number of fisheries within the proposed critical habitat which are regulated through Fisheries Management Plans (FMPs) developed under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The FMPs are designed and implemented by NMFS through the GOMx Fisheries Management Council. Revisions to FMPs resulted in 7 formal consultations and 5 informal consultations from 2010 to 2021 relevant to the proposed critical habitat areas.

DESCRIPTION OF THREAT

Certain commercial fishing activities can directly affect critical habitat by physically removing prey species from the habitat. The removal can occur either directly through the harvest of a target species or indirectly as bycatch in other fisheries. Rice's whales forage on small vertically migrating and demersal schooling fish including species in the anchovy, sardine, mackerel, herring, and oceanic lightfish families, and on invertebrates, including euphausiids and pelagic red crabs, with rare instances of squid and copepods. Direct competition between Rice's whales and commercial or recreational fisheries does not appear likely based on the current distribution of Rice's whales, the distribution of fishery effort, and presumed fish and invertebrate habitat (Rosel et al. 2016).

The large pelagics longline fishery is the only pelagics fishery in the GOMx. Thus, removal of Rice's whales' prey species could occur through bycatch but not due to their harvest as target species. The large pelagic longline fishery operates year-round and operates throughout most of the GOMx in waters deeper than 300 m. Longline gear, which consists of a mainline, gangions, baited hooks, high-flyer buoys to monitor gear position while fishing, and possibly weights to stabilize line in the water column, poses a minor bycatch threat to small pelagic prey species. The shrimp trawl fishery mainly targets penaeid shrimp in GOMx waters less than 120 m deep but also targets royal red shrimp in deeper waters that overlap with the proposed critical habitat. The shrimp trawl fishery removes a significant amount of biomass from the GOMx ecosystem but its limited overlap with the proposed critical habitat mitigates its potential to significantly reduce the abundance of prey species. The reef fish snapper grouper fishery and the GOMx shark fishery use bottom longline gear consisting of a monofilament mainline up to a mile in length anchored on the seafloor at either end with buoy lines marked by high flyer flags. Up to 1,000 baited hooks can be attached to the mainline via leaders (gangions or snoods), and gear can soak anywhere from hours to days. As with the large pelagic longline fishery gear, this gear poses a minor bycatch threat to small pelagic prey species. The two main GOMx commercial fisheries for small schooling fish are the GOMx menhaden purse-seine fishery and the Florida west coast sardine purse seine fishery. The menhaden fishery is limited to inshore and nearshore waters, while the Florida west coast sardine purse seine fishery is mainly in waters less than 50 m deep.

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

Commercial landings across GOMx commercial fisheries totaled approximately 1.4 billion pounds in 2019, with a total value of just under $800 million (NMFS 2021b). Several of these fisheries are active in GOMx waters between the 100 meter and 400 meter isobaths and therefore overlap with the proposed critical habitat. These include the GOMx large pelagics longline, GOMx shrimp trawl, GOMx butterfish trawl, snapper-grouper and other reef fish bottom longline/hook-and-line, and shark bottom longline/hook-and-line fisheries (Rosel et al. 2016). Most GOMx commercial fisheries are located in waters shallower than 100 meters in depth.

REGULATORY BASELINE

The MSA calls for direct actions to stop or reverse the continued loss of fish habitats (16 U.S.C. 1801–1883). Toward this end, Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. Under the MSA, Congress directs NMFS and the eight regional fishery management councils to describe and identify EFH in FMPs and fishery ecosystem plans; minimize, to the extent practicable, the adverse effects of fishing on EFH; and identify other actions to encourage the conservation of EFH.

The GOMx FMC has designated EFH for all seven of its FMPs, including Coastal Migratory Pelagics (CMP), Reef Fish, and Shrimp. The 2015 Biological Opinion on the continued authorization of the FMP for

Coastal Migratory Pelagic Resources in the Atlantic and GOMx (NMFS 2015) determined that 6 species of listed whales – including 3 (blue, sei, and sperm) that inhabit GOMx waters within the CMP fishery – were not likely to be adversely affected by the proposed action. The 2021 reinitiation of the Southeast U.S. Shrimp Fisheries in Federal Waters concluded that the fishery is "extremely unlikely to adversely affect any large whales protected by the ESA" (NMFS 2021c). It is possible that these and other FMPs would have to consider effects on Rice's whale critical habitat, but reinitiation of the consultation is more likely to occur due to consideration of the potential for jeopardy to the species.

As part of future consultations on GOMx fisheries that overlap with areas where Rice's whales are present, NMFS will evaluate whether effects of the fisheries management on the prey species would lead to jeopardy, and may make recommendations for modifications to avoid this outcome. Even outside of ESA section 7 consultation, NMFS considers effects of fisheries management on the humpback whales through the MMPA. The MMPA prohibits "harassment" of marine mammals, which is defined to include impacts of activities on marine mammal feeding.[4]

No GOMx fisheries directly target Rice's whale prey species, thus limiting the threat to prey from fisheries activities to bycatch of fisheries that overlap with the proposed critical habitat. The total prey species biomass removed as bycatch from fishing in the GOMx could be a threat to the proposed critical habitat but the impact is unknown (Rosel et al. 2016). Given this uncertainty, NMFS does not anticipate that the designation of critical habitat will result in additional conservation efforts for fisheries. The incremental costs of the designations on commercial fisheries are thus most likely limited to the administrative costs incurred in the course of section 7 consultation by NMFS, Federal action agencies, and third parties.

10.1.3.3 Military Activities - DOD

Military activities encompass all activities conducted by the Department of Defense (DOD). The U.S. Navy and U.S. Air Force conduct operations in the GOMx that have the potential to damage critical habitat. Consultations related to these activities included five formal consultations and one informal consultation from 2010 to 2021.

DESCRIPTION OF THREAT

Training and testing activities conducted by the U.S. Navy in its Atlantic Fleet Training and Testing (AFTT) Study Area and by the U.S. Air Force in its Eglin Gulf Testing and Training Range (EGTTR) present the primary threat to essential features of critical habitat. AFTT activities that include sonar testing and detonations and EGTTR activities such as aircraft overflight and explosive detonations have the potential to affect the whales' normal use and occupancy of the operational areas due to noise impacts. The EGTTR is used by military units both at Eglin AFB and from bases across the continental United States for a variety of weapon testing and tactics development. These missions often include air-to-surface operations that involve firing live and inert missiles, bombs, and bullets from air, land, and sea platforms. This testing primarily occurs in W-151, one of the 11 blocks into which the EGTTR is divided, along the western panhandle to approximately 120 miles off-shore (NMFS 2017).

[4] Specifically, Level B Harassment under the MMPA refers to act that, "have the potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." (16 U.S.C. 1361)

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

Between 2010 and 2021, NMFS conducted 4 formal consultations and 1 informal consultation related to Air Force activities in or near the proposed critical habitat. The most recent of these, a biological and conference opinion published in 2017, evaluated potential effects to Rice's whales (NMFS 2017). EGTTR testing and training activities include air-to-surface firing or dropping of munitions from aircraft toward targets located on the GOMx surface with detonations occurring, above, at, or slightly below the water surface. Operations that involve detonations of live bombs, missiles, and rockets at or below the water surface occur at a designated site located approximately 27.4 km offshore from Santa Rosa Island at a water depth of about 35 m. However, other missions that involve detonations occur shoreward of the 200 m bathymetry line, which includes areas within the proposed critical habitat. Aircraft operations are conducted in areas over the proposed critical habitat, and missions may occur during any season or month. The Air Force made a no effect determination for Rice's whale, but NMFS concluded that the EGTTR activities proposed to be conducted in the action area for the reasonably foreseeable future may affect, but are not likely to adversely affect Rice's whales.

The 2018 AFTT, Biological Opinion concluded that Rice's whales will likely experience temporary threshold shift (TTS), behavioral response, and physiological stress from the Navy's use of sonar and other transducers. According to the Navy's modeling, a total of 51 instances of harassment are reasonably certain to occur from Navy sonar annually. An additional 4 instances of TTS expected annually due to explosives, and 1 whale is expected to experience permanent threshold shift every five years. However, NMFS concluded that it did not anticipate these instances of TTS and behavioral harassment to result in fitness consequences to individual Rice's whales or, more generally, for these impacts to result in reductions in overall reproduction, abundance, or distribution of Rice's whales (NMFS 2018).

REGULATORY BASELINE

The AFTT and EGTTR Biological Opinions written by NMFS have considered the effects of military testing and training exercises on Rice's whales, the results of which provide some degree of baseline protection absent critical habitat. For example, NMFS' Biological Opinion on AFTT activities describes standard operating procedures and procedural mitigation measures to provide for safety and mission success and the conservation of whales, sea turtles, and other protected biological resources. These include:

- The use of lookouts for a variety of purposes, including observing for the presence of biological resources;
- Implementation of mitigation zones around specific activities wherein the activity will be ceased or modified if a marine mammal enters the area;
- Powering down of sonar, halting of explosions, or maneuvering of a vessel in response to a sighting of an applicable biological resource (e.g., ESA-listed species);
- Suspension or alteration of an activity based on applicable mitigation measures when a marine mammal or sea turtle is sighted, until the animal has left the mitigation zone;
- Conducting no more than 200 hours of hull-mounted mid-frequency active sonar per year within the Rice's whale mitigation area, which largely coincides with the Rice's whale CDA; and
- Restricting the use of explosives (except during mine warfare activities) to areas outside of the Rice's whale mitigation area.

The 2017 Biological Opinion on EGTTR activities describes similar requirements to reduce the likelihood

of adverse impacts to protected marine resources, including:

- Pre-mission monitoring by trained observers to (1) evaluate the mission site for environmental suitability, and (2) verify that the zone of influence is free of visually detectable sea turtles and potential sea turtle indicators as well as marine mammals;
- Post-mission monitoring to determine the effectiveness of pre-mission mitigation by reporting sightings of any dead or injured sea turtles and marine mammals;
- Delay or rescheduling of air-to-surface missions when sea state conditions limit observers' ability to locate marine species at or near the surface, per the discretion of protected species observers or a Lead Biologist; and
- Limiting air-to-surface missions to no earlier than two hours after sunrise and no later than two hours prior to sunset to ensure adequate daylight for pre- and post-mission monitoring, with the exception of specific gunnery missions.

As a result of the measures already in place to protect the whales from impacts due to military training and testing, NMFS anticipates it is unlikely that additional conservation efforts will be recommended as a result of the critical habitat. The incremental costs of the designations on military activities are thus most likely limited to the administrative costs incurred in the course of section 7 consultation by NMFS and the DOD.

10.1.3.4 Water Quality Management – EPA

This activity encompasses efforts by the EPA, states, and territories to establish appropriate water quality standards, as well as ocean discharges and onshore activities that have the potential to affect water quality. This activity also includes the registration of pesticides by the EPA.

DESCRIPTION OF THREAT

Changes in onshore land use practices can adversely affect the water column and harm the abundance and quality of Rice's whale prey. For example, the release of persistent organic pollutants (POPs) from sources such as pesticides, household and industrial items, and flame retardants creates a threat to the marine environment. POPs can enter the food web through mechanisms including agricultural runoff, oceanic and atmospheric circulation, and combustion. Once consumed, POPs may repress immune system function, impair growth, reproduction, and ontogenetic development, and cause lesions/disease of various organ systems (Rosel et al. 2016). However, POP concentrations have not been investigated in Rice's whales and the threat of serious health effects from bioaccumulation of POPs in Rice's whales appears to be low.

Harmful algal blooms (HABs) can affect the environment by producing toxins, depleting oxygen in the water, clogging fish gills, and shading seagrass. Largely due to human activities that generate agricultural and urban runoff, HABs are increasing in frequency, duration and intensity throughout the world. The most common HAB species, commonly known as the red tide organism, occurs throughout the GOMx, with blooms developing as far as 10 to 40 miles offshore. HABs are known to negatively affect marine mammal populations through acute and chronic detrimental health effects, including reproductive failure. While the majority of effects from HABs in the northern GOMx are seen in common bottlenose dolphins, Rice's whales may also be exposed to adverse effects from HABs in this area, particularly since HABS are increasing in frequency, duration and intensity in the GOMx. However, the extent to which HABs threaten the health of Rice's whales is uncertain (Rosel et al. 2016).

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

A number of activities that occur inland of the critical habitat may affect the critical habitat, primarily through potential impacts to water quality. EPA-permitted projects that resulted in Section 7 consultations from 2010 to 2021 and that could impact the critical habitat occurred throughout the GOMx region, from the west coast of Florida to the southeast coast of Texas.

Although they do not occur within the critical habitat, future section 7 consultations on these projects and activities may require consideration of the potential for adverse modification of the whales' critical habitat. Based on NMFS' consultation history, the inland activities for which section 7 consultations could consider potential effects on Rice's whale critical habitat include:

- Power plant operations
- Chemical manufacturing operations
- Agriculture/land management pesticide and herbicide application

REGULATORY BASELINE

The CWA directs states to adopt water quality standards for their waters subject to the CWA. These standards include water quality criteria expressed as constituent levels representing a quality of water that supports a particular designated use. States are required to review applicable water quality standards at least once every three years and, if appropriate, revise or adopt new water quality standards and submit to EPA for review and approval or disapproval. EPA consults with NMFS on approvals of water quality standard submissions that may affect listed species at this time.

The National Pollution Discharge Elimination System (NPDES) program provides a method of achieving water quality standards by regulating point sources of pollution into U.S. waters. States can be granted primacy by EPA to manage NPDES permits, though EPA retains the right to reject state programs and administer permits according to its own standards. Florida, Alabama, Mississippi, Louisiana, and Texas all are fully authorized to manage their own NPDES programs. As part of the process of developing water quality standards, EPA considers levels needed to protect potentially impacted listed species and designated critical habitat. Current water quality standards of GOMx states include minimum standards for water color and turbidity, nutrient levels, dissolved oxygen levels, discharge temperatures, and toxicity, among other criteria. The standards vary by state, but all include as general guidelines the protection of marine waters, specifically aquatic life and habitats.

The 2016 Biological Opinion on EPA Pesticides General Permit (PGP) for Discharge of Pollutants into U.S. Waters considered the impacts to protected species throughout the GOMx. While the opinion was issued prior to the listing of the Rice's whale, it concluded that exposures to pesticide discharges authorized under the EPA's PGP would be extremely unlikely for several species of whales, including fin, sei, and sperm whales, because they do not frequent coastal waters where EPA has permitting authority (NMFS 2016a). The opinion did not explicitly consider impacts to designated critical habitat for the listed whales.

The added need to consider critical habitat for Rice's whales is unlikely to generate additional conservation efforts with respect to consultations on inland activities. As a result, this analysis expects that the critical habitat will generate only additional administrative effort as part of future consultation on these activities.

10.1.3.5 Scientific Research and Monitoring – NOAA

Scientific research and monitoring activities occurring within the area proposed for designation are primarily related to NMFS research on marine species and NMFS' agreements with GOMx states under the Endangered Species Act Section 6 Program, which provides a mechanism for cooperation between NOAA Fisheries and states in the conservation of threatened, endangered, and candidate species (NMFS 2022a).

DESCRIPTION OF THREAT

Scientific research activities that involve interaction with marine mammals have the potential to disturb or injure them. As noted in the 2016 Bryde's whale status review, biopsy sampling, specifically, requires that researchers obtain a letter of authorization or permit under the ESA and/or MMPA. Negative impacts to the Rice's whale critical habitat from research activities would most likely be attributable to vessel traffic associated with these activities.

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

Rice's whales were considered in NMFS' 2019 Biological Opinion on the issuance of scientific research permits for research on marine mammals in the Western North Atlantic Ocean, GOMx, and Caribbean Sea. The proposed action included the approach of research vessels and tagging of whales. The biological opinion concluded that while individual whales may experience stress, minor injury from tagging or the taking of a biopsy, or alteration of behavior in some way, no mortalities from the proposed action were expected. The opinion further concluded that the research activities would not impede the recovery objectives for Rice's whales (NMFS 2019). NMFS also conducted several informal consultations between 2010 and 2021 on Gulf state requests for renewal of Section 6 Cooperative Agreements as well as an informal consultation in 2010 on a NOAA research cruise in Northern GOMx to evaluate the effects of the BP Deepwater Horizon oil spill on mid-water species.

REGULATORY BASELINE

Negative impacts to the Rice's whale critical habitat from research activities would likely be minimal and temporary. As no incremental conservation efforts are expected for this activity type. Costs of the designation will be limited to the administrative cost of considering critical habitat in ongoing and new consultations anticipated over the next ten years.

10.1.3.6 Space Vehicle Launches and Re-Entry - FAA

Commercial vehicle space travel is an emerging industry with operations in the GOMx, Atlantic Ocean, and Pacific Ocean. Space vehicle launches require licensing by the Federal Aviation Administration (FAA), thereby creating a Federal nexus and triggering section 7 consultation.

DESCRIPTION OF THREAT

SpaceX vehicle landings can occur throughout the proposed critical habitat. NMFS is particularly concerned about nighttime SpaceX vehicle landings because of the possibility of vessel strikes. However, potential impacts on Rice's whale critical habitat at any time could include reduction in prey availability due to noise disturbance (due to sonic boom and landings) and explosions (in the event of an unsuccessful landing), and reduced prey quality as a result of contamination (via discharge of fuel in the event of an unsuccessful landing).

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

As an emerging industry, past trends are unlikely to reflect likely future activity. NMFS completed two informal consultations with the FAA, in 2013 and 2018, on development of the proposed SpaceX launch site in Boca Chica, Cameron County, Texas. In 2021 the FAA published a final environmental assessment and finding of no significant impact for issuing a reentry license to SpaceX for landing the Dragon Spacecraft in the GOMx (FAA 2021). The reentry license would authorize SpaceX to conduct up to six Dragon landing operations per year in the GOMx, which would act as a contingency landing site in the event of hazardous conditions in either the Pacific Ocean or Atlantic Ocean. Each landing operation would include orbital reentry, splashdown, and recovery. Five permitted re-entries and landings of SpaceX vehicles occurred in the GOMx from January 2021 through January 2022. SpaceX has 6 planned vehicle launches through June 2022. It is unknown how many associated reentries/landings will occur in the GOMx.

REGULATORY BASELINE

In January 2022, NMFS issued a programmatic concurrence letter to the FAA's Office of Commercial Space Transportation that provides for the FAA, U.S. Space Force, and National Aeronautics and Space Administration to consult with NMFS on these types of operations on a programmatic basis (NMFS 2022b). The programmatic consultation identifies several PDCs that serve to reduce the risk of these activities adversely affecting Rice's whales and their habitat. These include:

- Utilization of all feasible alternatives to avoid landing in the Rice's whale CDA, to the extent possible;
- Limit of one splashdown, reentry, and recovery of the SpaceX Dragon capsule the in Rice's whale core habitat distribution area per year;
- No operations, spacecraft, launch or reentry vehicle landings, or expended components, other than those related to the Dragon capsule, will occur in the Rice's whale core habitat distribution area;
- Education and observation requirements to protect ESA-listed and MMPA-protected species;
- Vessel speed and distance requirements to avoid impacts with ESA-listed and MMPA-protected species; and
- Adherence to a Hazardous Material Emergency Response Plan in the event of a failed launch operation.

Given the presence of multiple ESA-listed species in the GOMx, as well as the PDCs identified above, measures to avoid, minimize, or offset any adverse effects stemming from the action are already considered as part of section 7 consultation. Thus, it is unlikely that designation of critical habitat for the Rice's whale will change the outcome of consultations on space vehicle launches. As no incremental conservation efforts are expected for this activity type, costs of the designation will be limited to the administrative cost of considering critical habitat in ongoing and new consultations anticipated over the next ten years.

10.1.3.7 Coastal and In-Water Construction – USACE

Construction activities in U.S. waters are regulated by the USACE. USACE regulated construction in administering permits through the CWA and the Rivers and Harbors Act of 1899. Section 404 of the CWA authorizes USACE to regulate and permit the discharge of dredged or fill material into waters of the United States (33 USC § 1344). Sections 9 and 10 of the Rivers and Harbors Act of 1899 authorize USACE to regulate and permit structures and work affecting navigable waters of the United States (33 USC §§ 401 et seq.).

USACE-permitted activities include docks, marinas, artificial reefs, pipelines/cables, seawalls, dredging, shoreline stabilization, and other in-water and coastal construction projects, nearly all of which occur shoreward of the 100 m isobath. Only one USACE-permitted in-water construction project occurred within the proposed critical habitat from 2010 to 2021. The project, the installation of eight surface mooring buoys to enhance recreational fishing activities in the northern GOMx, could impact the critical habitat through noise generated during buoy installation. It is anticipated that in-water construction activities will continue to have limited potential to impact the critical habitat. The incremental costs of the designation on in-water construction activities are thus most likely limited to the administrative costs incurred in the course of section 7 consultation.

10.1.3.8 Aquaculture – NMFS

Aquaculture facilities are regulated under Fishery Management Plans (FMPs) for fisheries in federal waters. FMPs are developed by regional Fishery Management Councils and implemented by NOAA Fisheries under the authority of the MSA (Rosel et al. 2016).

DESCRIPTION OF THREAT

The siting of aquaculture cages in the route of marine mammal migratory pathways or within critical feeding and breeding grounds may displace marine mammals from their habitats (Markowitz et al. 2004, Cañadas & Hammond 2008). Ecosystem risks associated with the development of aquaculture facilities include hurricanes, other natural or man-made catastrophes, or the spread of disease from farm to wild stocks.

EXTENT OF ACTIVITY WITHIN CRITICAL HABITAT AREAS

There are currently no aquaculture projects located within the proposed critical habitat. One entity is seeking permitting for a commercial aquaculture project in federal waters in the GOMx. The project would be sited south of Pensacola, within the Rice's whale core distribution area. The project site is also approximately 5 km from the 100m isobath, but impacts from the project could be far-reaching and extend into 100m-400m deep waters.

NMFS is considering nine preliminary options for Aquaculture Opportunity Areas (AOAs) locations in Federal waters of the Gulf of Mexico, based on results of a comprehensive spatial modeling study published by the National Centers for Coastal Ocean Science. The areas, each of which covers between 500 and 2,000 acres, were selected based on consideration of administrative borders, military interests, potential impacts to navigation and transportation, energy and industry infrastructure, commercial and recreational fishing, natural and cultural resources, and oceanography. However, the maximum depth of each of the nine areas is less than 95 m (NOAA 2021). Thus, these potential aquaculture projects are not anticipated to overlap with or affect the proposed critical habitat. No other known aquaculture projects are forecasted to occur within the proposed critical habitat.

REGULATORY BASELINE

The statutory basis for NOAA's aquaculture activities includes the Magnuson-Stevens Fishery Conservation and Management Act, the Marine Mammal Protection Act, the Endangered Species Act, the Coastal Zone Management Act, the National Marine Sanctuaries Act, and the Fish and Wildlife Coordination Act. Under these laws, in addition to the National Environmental Policy Act, NOAA is responsible for considering and preventing and/or mitigating the potential adverse environmental impacts of planned and existing marine aquaculture facilities through the development of fishery management plans, sanctuary management plans, permit actions, proper siting, and consultations with

other regulatory agencies at the federal, state, and local levels (Rosel et al. 2016).

NMFS is in the process of defining Aquaculture Opportunity Areas in the GOMx. These are geographic areas that will be evaluated for their potential for sustainable commercial aquaculture. The criteria used to identify these locations include, but are not limited to, proximity to critical fish habitat and oil and natural gas infrastructure, historical fishing activity, and relative vessel traffic (Gulf of Mexico Fishery Management Council 2022). The areas comprising the proposed Rice's whale critical habitat have received a very low suitability score, with only coral-covered areas receiving a lower score. GOMx waters between 100 m and 400 m in depth have been deemed not suitable because of the presence of Rice's whales and other endangered and threatened species (NMFS personnel J. Powell 2022).

Siting aquaculture projects within the proposed critical habitat would present a take threat to the species. Given the small and declining Rice's whale population, the death of even one animal as a result of aquaculture-related activity would constitute a significant conservation/restoration impact.

10.1.3.9 Vessel Traffic – USCG

Vessel traffic may affect the ability of Rice's whales to access prey if the whales behaviorally avoid high traffic areas or are unable to detect prey due to increased vessel noise levels, thus posing a potential threat to Rice's whale critical habitat. Vessel traffic has a Federal nexus through the shipping lanes established by the United States Coast Guard (USCG) under the Ports and Waterways Safety Act as well as through USCG maintenance of the network of maritime aids to navigation.

NMFS' section 7 consultation history did not identify any consultations from 2010 to 2021 related to vessel traffic in the GOMx. We are not aware of any previously completed consultations with USCG that would require reinitiation as a result of designating critical habitat for Rice's whales. As with other activities potentially affecting critical habitat, NMFS does not anticipate the critical habitat will generate additional conservation efforts for Rice's whales associated with vessel traffic management or aids to navigation. Should USCG consult with NMFS in the future on vessel traffic management in the GOMx, incremental costs will be limited to the additional administrative costs of consultation.

10.1.3.10 Renewable Energy – BOEM

BOEM has recently assessed the technical and economic potential of renewable energy development in the GOMx, concluding that offshore wind has potential to deliver utility scale electricity from ocean-based renewable energy in the GOMx. However, the greatest wind resource capacity in the GOMx is in shallow waters less than 60 m deep (Musial et al. 2020). In addition, NMFS recently recommended that no offshore wind leasing and/or development occur within the boundaries of the currently known distribution of Rice's whales in the western and central GOMx, between the 100 to 400 m isobaths. NMFS' recommendation was based on the potential for offshore wind energy development activities to cause the following stressors to the Rice's whales: vessel strikes; entanglement; entrapment; habitat destruction and modification and reduction in habitat range; changes to migrating or reproduction behavior; impacts to prey and prey availability; marine debris; disruption of feeding caused by alterations to diving patterns; noise impacts; and increased predation risks.

In December 2022, NMFS issued a programmatic letter of concurrence to BOEM for "BOEM's issuance of commercial and/or research wind energy lease(s) within the GOM Call Area in waters no deeper than the 100-meter isobath and granting Rights-of-Use and Easements (RUEs) and Rights-of-Ways (ROWs) in support of wind energy development." The survey activities considered in the consultation include "geophysical and geotechnical surveys and the deployment, operation, and decommissioning of met

buoys that are expected to take place within offshore wind lease areas following lease issuance for up to 18 leases to be issued over the next 10 years…in the GoMex Call Area from shore seaward to the 100-meter bathymetric contour." The letter further notes that "limiting the action area to the 100-meter bathymetric contour greatly reduces the potential effects of the proposed action to Rice's whale, such as vessel strikes" (NMFS 2022c). Despite the limited potential for activities within the scope of the programmatic consultation to affect Rice's whales or the proposed critical habitat, NMFS considers it possible that these or additional wind energy development activities could affect the proposed critical habitat over the next ten years.

10.1.3.11 Activities that Lead to or Address Greenhouse Gas Emissions or Global Climate Change

Activities that lead to global climate change (e.g. greenhouse gas emissions) may affect the proposed critical habitat's temperature and productivity parameters of the essential feature. Such activities have the potential to increase water temperature. Regulation of greenhouse gas emissions is the most-likely activity with a federal nexus. However, there is no record of consultations on federal activities related to greenhouse gas emissions. Further, the EPA recently reiterated its analysis that Section 7 consultation is not required for regulations that address emissions because "any potential for a specific impact on listed species in their habitats associated with these very small changes in average global temperature and ocean pH is too remote to trigger the threshold for ESA section 7(a)(2)" (80 FR 64509; October 23, 2015).

Based on the lack of historical consultations and EPA's opinion that Section 7 consultation is not triggered by regulation of greenhouse gas emissions, we have no basis to project future consultations that may affect the proposed critical habitat. Therefore, this analysis will not include this category of activities in the estimation of incremental costs.

10.1.4 Projection of Future Section 7 Consultations

This section discusses the methods applied to forecast the quantity and distribution of future Section 7 consultations that will consider the Rice's whale critical habitat. Significant uncertainty exists with respect to the levels and locations of future projects and activities that may require Section 7 consultation considering critical habitat for Rice's whales. Our analysis bases forecasts of future Section 7 consultations on historical information, as well as input from Federal agencies regarding expectations of future activities on which consultation with NMFS is anticipated. The use of historical consultation data to inform projections of future consultations may overstate impacts to the extent NMFS handles more consultations on a programmatic basis, or it may understate impacts if more formal consultations are required as a result of critical habitat designation. However, this analysis provides a signal of costs likely to occur in a given area. This analysis relies on the best available information to forecast future projects and activities, including:

1. Information on the historical frequency and location of projects with a federal nexus as indicated by the section 7 consultation histories from 2010 to 2021 for the NMFS Southeast Region and Office of Protected Resources.
2. Targeted interviews with NMFS SERO biologists to identify anticipated future projects that may affect Rice's whale critical habitat.
3. Input from Federal action agencies regarding the anticipated scope of future activities that could affect the proposed critical habitat.

With certain exceptions, we consider it reasonable to assume that the breakdown of past consultations

by type (into informal, formal, and programmatic consultations) and activity category (e.g., scientific research and monitoring, water quality management, etc.) between the years 2010 and 2021 generally reflects the breakdown of future consultations. Accordingly, we assume for most potentially impacted activity categories that the number and type of activities occurring within or affecting Rice's whale critical habitat will not change in the future. Activity categories to which we do not apply this assumption include space vehicle launches and reentry, wind energy development, oil and gas exploration and development, and military activities. For oil and gas and military activities, we anticipate that current programmatic and formal consultations on activities that could affect the proposed critical habitat will require two reinitiations each over the next 10 years and that each of these will consider effects to Rice's whale critical habitat. As documented in Section 10.1.3.6., we assume space vehicle launch and reentry operations will continue to be consulted on through the existing programmatic consultation, which we anticipate will require reinitiation to consider effects to Rice's whale critical habitat. While there is considerable uncertainty regarding the scope of future wind energy development activities that would require Section 7 consultation on effects to Rice's whale critical habitat, our projections reflect the assumed reinitiation of the current programmatic consultation on site characterization and assessment activities. Our projections also assume formal consultation on the construction and/or operation of the projects would affect the proposed critical habitat. As explained in Sections 10.1.3.8, this analysis forecasts that no consultations on aquaculture activities over the next 10 years will consider Rice's whale critical habitat. This analysis further forecasts that no consultations specific to vessel traffic will occur over the next 10 years because impacts of vessel traffic to the critical habitat are considered in consultations on projects in other activity categories such as fishery management, oil and gas activities, and scientific research.

The designation of critical habitat for the Rice's whale is not expected to result in any new Section 7 consultations that would not have already been expected to occur absent designation (*i.e.,* triggered solely by the designation of critical habitat). This is because all categories of activities identified as having the potential to affect the proposed essential feature also have the potential to affect the endangered Rice's whales or other listed species or critical habitat.

10.1.4.1 Projected Consultations

In total, we project that approximately 49 Section 7 consultations are likely to consider the Rice's whale critical habitat over the 2023–2032 period. We did not project the specific location or timing of future consultations because:

- The geographic and temporal distribution of future projects that could impact the critical habitat is unknown;
- The proposed critical habitat is not disaggregated into different geographic or jurisdictional units; and
- Most of the projected consultations are on activities with action areas that are not spatially concentrated.

Table 2 displays the expected number of future consultations from 2023 through 2032 by activity and consultation type. Water quality projects are projected to account for the largest share (27 percent) of consultations, followed by consultations related to scientific research and monitoring (19 percent). Oil and gas and fishery management activities are forecasted to account for 18 percent each, with military activities accounting for 8 percent of consultations and wind energy development accounting for an additional six percent. Of the 49 forecasted consultations, approximately eight are expected to be programmatic, 12 formal, and 29 informal. Approximately 10 of the 49 consultations forecasted to

consider Rice's whale critical habitat over the next 10 years are anticipated to be reinitiations of current consultations to specifically address effects to Rice's whale critical habitat.

Table 2. FORECASTED SECTION 7 CONSULTATIONS WITH INCREMENTAL COSTS DUE TO RICE'S WHALE CRITICAL HABITAT DESIGNATION (2023 – 2032)

Consultation Type	Oil & Gas	Wind Energy	Fishery Mgmt.	Military	Water Quality	Scientific Research	Space Launch & Reentry	Construction	Total
Programmatic	3	1	0	2	1	0	1	0	8
Formal	1	2	7	2	0	0	0	0	12
Informal	5	0	2	1	13	9	0	1	29
TOTAL	9	3	9	4	14	9	1	1	49
% of Total	18%	6%	18%	8%	27%	19%	2%	2%	100%

Note: Some rows and columns do not sum to totals due to rounding.

10.1.4.2 Project Modifications

As documented in Section 10.1.3, we do not expect that the proposed designation will result in the need for any project modifications above and beyond those that would already be required due to the listing of the Rice's whale and/or the protection of other listed species and habitat that overlap the proposed critical habitat. Based on the best available information regarding the potential adverse impacts of the activities described in Section 10.1.3, we do not believe that these impacts would cause the destruction or adverse modification of Rice's whale critical habitat. Consequently, analysis of incremental impacts of the proposed designation is limited to incremental administrative effort.

10.1.5 Estimated Incremental Costs

As discussed previously, this analysis considers both direct and indirect impacts of the critical habitat designation. Direct impacts are the costs associated with additional administrative effort required to conduct Section 7 consultations. Indirect impacts are those changes in economic behavior that may occur due to critical habitat designation for reasons other than direct ESA requirements, i.e., those impacts which are "triggered" by critical habitat designation through other federal, state, or local actions, or which are otherwise unintended. Some common types of indirect impacts include time delays, regulatory uncertainty, and stigma effects.

To calculate present value and annualized impacts, guidance provided by OMB specifies the use of a real annual discount rate of 7 percent. In addition, OMB recommends sensitivity analysis using other discount rates, such as 3 percent, which some economists believe better reflects the social rate of time preference (i.e., the willingness of society to exchange the consumption of goods and services now for the consumption of goods and services in the future). Accordingly, this section presents results at both 7 percent and 3 percent discount rates.

10.1.5.1 Administrative Section 7 Costs

The effort required to address adverse effects to the proposed critical habitat is assumed to be the same, on average, across categories of activities. Informal consultations are expected to require comparatively low levels of administrative effort, while formal and programmatic consultations are expected to require comparatively higher levels of administrative effort. For all formal and informal

consultations, we anticipate that incremental administrative costs will be incurred by NMFS, a federal action agency, and, potentially, a third party. For programmatic consultations, we anticipate that costs will be incurred by NMFS and a federal action agency. Incremental administrative costs are expected for all consultations that either occur inside Rice's whale critical habitat or that occur outside of the critical habitat but could impact the essential feature.

Incremental administrative costs per consultation considering effects to Rice's whale critical habitat, but that would occur absent designation of critical habitat for the Rice's whale, are expected, on average, to be $12,000 for programmatic, $6,300 for formal consultations, and $3,000 for informal consultations (see Table 3). These costs are assumed to double, on a per consultation basis, for consultations that are reinitiated specifically to consider effects to Rice's whale critical habitat.

Table 3. INCREMENTAL COSTS PER CONSULTATION RESULTING FROM THE ADDITIONAL ADMINISTRATIVE EFFORT TO ADDRESS ADVERSE MODIFICATION FOR ACTIVITIES IN RICE'S WHALE CRITICAL HABITAT (2022 DOLLARS)

Consultation Type	NMFS	Federal Action Agency	Third Party	Biological Assessment	Total Cost
Informal	$870	$1,100	$540	$530	$3,000
Formal	$1,900	$2,200	$930	$1,300	$6,300
Programmatic	$5,800	$4,900	NA	$1,500	$12,000

Source: Industrial Economics analysis of full administrative costs which was based on data from the federal Government Schedule Rates, and a review of consultation records from several Service field offices across the country conducted in 2002; revised by NMFS to reflect current federal Government Schedule Rates for the locality pay area of Miami-Ft. Lauderdale-St. Lucie, FL (U.S. Office of Personnel Management 2022).

We estimate the incremental administrative costs of Section 7 consultation by applying these per consultation costs to the forecast number of consultations (presented earlier in Section 10.1.4; the resulting costs are presented in Table 4. We anticipate that there will be eight programmatic consultations, 12 formal consultations, and 29 informal consultations which will require incremental administrative effort. Incremental administrative costs are expected to total approximately $240,000 over the next ten years (discounted at 7 percent), or annualized costs of $37,000. Table 4 presents incremental administrative costs by activity type. Impacts to oil and gas activities and fishery management are greatest (22 percent and 21 percent of total, respectively), followed by water quality management (17 percent), military activities (15 percent), wind energy development (10 percent), scientific research and monitoring (eight percent), and space vehicle launch and reentry (seven percent).

Table 4. INCREMENTAL ADMINISTRATIVE COSTS, BY ACTIVITY TYPE 2023-2032 (2022 DOLLARS)

Activity	Total Cost (7% discount rate)	Share of Total (%)	Total Cost (3% discount rate)	Annualized Cost
Oil and Gas Activities	$53,000	22%	$67,000	$8,100
Wind Energy Development	$24,000	10%	$31,000	$3,700
Fishery Management	$52,000	21%	$66,000	$7,900

Activity	Total Cost (7% discount rate)	Share of Total (%)	Total Cost (3% discount rate)	Annualized Cost
Military	$36,000	15%	$46,000	$5,500
Water Quality	$41,000	17%	$52,000	$6,200
Scientific Research and Monitoring	$18,000	8%	$23,000	$2,800
Space Vehicle Launches and Reentry	$16,000	7%	$20,000	$2,400
Construction	$1,700	1%	$2,100	$250
TOTAL	$240,000	100%	$310,000	$37,000

Note: The estimates may not sum to the totals reported due to rounding.

10.1.5.2 Indirect Costs

Project proponents may experience indirect effects of the designation including costs associated with project delay due to the increased length of time it will take for review of projects. For example, critical habitat designation could increase the amount of time required to review a coastal natural gas pipeline project. Another potential indirect effect is uncertainty on the part of project sponsors and federal action agencies regarding the potential need for project modification to avoid adverse modification of the critical habitat. While we do not anticipate that critical habitat will require project modifications incremental to those already required due to the regulatory baseline, project sponsors could delay development if they suspect their projects could receive additional scrutiny as a direct result of potential impacts specific to Rice's whale critical habitat.

Forecasting the costs associated with the regulatory uncertainty and potential project delays resulting from the designation of Rice's whale critical habitat is too speculative to be quantified in this analysis. However, for most projects, delays attributable to the additional time to consider the Rice's whale critical habitat as part of future Section 7 consultations are expected to be minor given that most projects would already have to consider Rice's whales and other protected marine species in the context of listing the species.

10.1.5.3 Caveats and Uncertainties

There are several important uncertainties underlying the calculation of incremental costs that could result from the designation of Rice's whale critical habitat. These uncertainties, and their significance with respect to the results, are summarized in Table 5. In general, these uncertainties are not expected to significantly impact the results of the analysis.

Table 5. SUMMARY OF UNCERTAINTIES

Assumption/Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts
This analysis relies on patterns of Section 7 consultation within the past 12 years to forecast future rates of consultation activity. With the exception of activities related to space vehicle launch and reentry, the analysis assumes that past consultation rates provide a good indication of future activity levels and distribution of activities.	**Unknown.** May overestimate or underestimate incremental impacts.	**Likely minor.** Data are not available to determine whether the rates or locations of activities subject to consultation are likely to change over time. To the extent that activities increase over the next ten years, our analysis may underestimate incremental costs. Further, if designation of Rice's whale critical habitat leads NMFS to determine that activities which previously required informal consultation now require formal consultation, our analysis may understate the number of future formal consultations and overstate the number of future informal consultations. To the extent NMFS handles more consultations on a programmatic basis, our forecast of consultations may lead us to overestimate formal and informal consultation levels, thus overstating administrative impacts. The estimated incremental impacts per consultation are, however, relatively minor, and we accordingly do not anticipate variations in consulting rates or locations to significantly change the finding of our analysis.
The analysis assumes that baseline protections to Rice's whales and other listed species that overlap with the proposed critical habitat will provide sufficient protection to avoid adverse modification of Rice's whale critical habitat, thus making additional project modifications unnecessary.	May result in an **underestimate** of costs.	**Potentially major.** NMFS anticipates that it is unlikely that critical habitat designation will generate recommendations for project modifications that are additional to those that would be recommended absent designation. However, NMFS will review each project or activity at the time of consultation to determine whether additional project modifications may be needed to avoid adverse modification of critical habitat. If projects that impact Rice's whale critical habitat were to require additional project modifications, our analysis may underestimate costs. This may particularly apply to areas of the critical habitat where Rice's whales are not commonly present.

Assumption/Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts
The analysis considers potential future changes to water quality standards, and the ultimate impacts of changing those standards, to be baseline impacts.	May result in an **underestimate** of costs.	**Potentially major.** Recommendations that result from Section 7 consultation on water quality standards may result in more stringent water quality standards; however, this would likely occur regardless of critical habitat designation due to the presence of Rice's whales and multiple other listed species. NMFS believes that the recommendations would likely remain the same. However, if this critical habitat designation generates additional or more stringent recommendations to avoid adverse modification of the proposed critical habitat, impacts of the critical habitat designation may be understated.
The analysis assumes no new consultations will be triggered by the designation of critical habitat for the Rice's whale.	May **underestimate** incremental impacts.	**Likely minor**. Consultations that cover activities occurring in areas of the proposed critical habitat where no listed species are present are unlikely to occur solely in these areas. This is due to the spatially diffuse nature of impacts of most of the activities that could affect Rice's whale critical habitat. However, to the extent that any Section 7 consultations occur related to activities solely in these areas, critical habitat may trigger new consultations, leading us to understate incremental impacts.
The analysis does not quantify potential indirect impacts associated with time delay.	May result in an **underestimate** of costs.	**Likely minor**. For new projects that involve construction, the USACE will be required to consult with NMFS due to the presence of the listed marine species that occur in areas that would be impacted. Therefore, the indirect incremental impact associated with time delay on new projects would be limited to any costs (*e.g.,* additional cost of renting equipment) incurred specifically during the additional time necessary to complete the analysis of adverse modification of the proposed critical habitat. The bulk of any time delays would be expected to occur regardless of this proposed critical habitat.

Assumption/Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts
The analysis assumes that all Section 7 consultations on coastal projects that impact water quality will have to consider the proposed critical habitat.	May result in an **overestimate** of costs.	**Likely minor**. Given that the shoreward boundary of the proposed critical habitat is the 100 m isobath, it is possible that some inshore, EPA-permitted projects could have no impact on Rice's whale critical habitat. Thus, this analysis overstates impacts to the extent that projected future consultations on EPA-permitted projects are incorrectly assumed to consider Rice's whale critical habitat.
The analysis assumes that no wind energy projects will occur over the next 10 years inside the Rice's whale critical habitat.	May result in an **underestimate** of costs.	**Likely minor**. Based on NMFS' recent recommendation to BOEM, no future wind energy projects are anticipated within the proposed critical habitat. This could lead to an underestimate of costs if BOEM grants leases for wind energy development in areas either inside of or relatively close to the critical habitat. Section 7 consultations would likely already occur because of the presence of Rice's whales and other listed species, but these consultations would have to consider impacts to the critical habitat.

10.1.6 Economic Impacts Summary

In summary, there are significant baseline protections that exist in the areas being proposed for Rice's whale critical habitat designation. The incremental impacts for the proposed designation are projected to reflect the incremental administrative effort required for Section 7 consultations to consider the critical habitat. Taking into consideration several assumptions and uncertainties, total projected incremental costs are approximately $240,000 over the next ten years[5] ($37,000 annualized). Notwithstanding the uncertainty underlying the projection of incremental costs, the results provide an indication of the potential activities that may be affected and a reasonable projection of future costs.

10.2 National Security Impacts

Impacts to national security may result from critical habitat designation if the designation triggers future ESA Section 7 consultations because a proposed military activity "may affect" the physical or biological feature(s) essential to the listed species' conservation. Anticipated interference with mission-essential training or testing or unit readiness, through the additional commitment of resources by the DOD or USCG to an adverse modification analysis and expected requirements to modify the action to prevent adverse modification of critical habitat, has been identified as a negative impact of critical habitat

[5] Cost estimates are expressed in 2022 dollars. Present values are calculated over ten years (2023 – 2032) assuming a 7 percent discount rate.

designations. Whether national security impacts result from the designation depends in part on:

- Whether future consultations and associated project modifications and/or implementation of reasonable and prudent measures and terms and conditions would already be required due to potential effects to Rice's whale or other ESA-listed species; and

- Whether project modifications resulting from suggested reasonable and prudent alternatives would already be implemented to avoid the destruction or adverse modification of previously designated critical habitat, regardless of the Rice's whale critical habitat designation.

As identified in Section 10.1.3.3, the U.S. Navy and Air Force conduct military activities that may affect the proposed critical habitat and require consultation. However, as documented in this report, the proposed rule is not expected to result in any new or additional modifications of military training and testing operations beyond those that would be required due to the year-round presence of Rice's whales and other ESA-listed species in the areas of operation. We do not anticipate that the proposed rule would result in incremental impacts beyond the administrative effort required of the Navy and Air Force to consider potential adverse effects. National security impacts could result from the designation of critical habitat for the Rice's whale if it is determined through Section 7 consultation that modifications to the Navy's or Air Force's training and testing activities are required to implement a reasonable and prudent alternative to avoid adverse modification to the critical habitat alone. While NMFS may also make conservation recommendations to reduce and minimize adverse effects to critical habitat that do not reach a level of destruction or adverse modification, such recommendations would be non-binding suggestions. Thus, the implementation of such recommendations would be voluntary and are not considered economic effects of this rulemaking.

We anticipate four consultations will address effects to Rice's whale critical habitat over the next 10 years. These include two reinitiations of a programmatic consultation on U.S. Navy Atlantic Fleet Testing and Training operations and two reinitiations of a formal consultation on U.S Air Force training and testing operations based out of Eglin Air Force Base. While these reinitiated consultations represent an incremental administrative impact of the proposed rule, the reinitiated consultations would not impact national security.

10.3 Other Relevant Impacts

Past critical habitat designations have identified three broad categories of other relevant impacts: conservation benefits, both to the species and to society; impacts on governmental or private entities that are implementing existing management plans that provide benefits to the listed species; and educational and awareness benefits.

10.3.1 Conservation Benefits

The primary goal of critical habitat designation is to support the long-term conservation and recovery of the Rice's whale. For some listed species, critical habitat designation contributes directly to conservation and recovery of the species due to additional conservation efforts implemented as a result of the Section 7 consultation process to avoid adverse modification of critical habitat. Section 9.1.5 of this report evaluates the expected economic costs that may be generated by the critical habitat designation for Rice's whales. This analysis concludes that, based on the best available information at this time, it is unlikely that the need to avoid adverse modification would trigger additional conservation efforts above

and beyond those that would be undertaken to avoid jeopardy. However, this analysis emphasizes the uncertainty associated with that finding. Following the designation of critical habitat, each consultation will be subject to analysis of potential for jeopardy and of adverse modification based on the specific circumstances of the planned project or activity. If for a given future project, NMFS identifies a reasonable and prudent alternative to avoid adverse modification that would not have been made but for the critical habitat designation (i.e., would not have been made to avoid jeopardy to Rice's whales or other listed species), the associated costs and benefits would be considered economic effects of this rulemaking. In addition, given the additional requirement to consider effects to the critical habitat, federal agencies may modify the design of their action prior to entering into formal consultation. As these modifications are decided upon prior to entering into formal consultation, such decisions cannot be forecasted.

Given these uncertainties, this analysis is unable to quantify the economic benefits of this rulemaking. This section therefore discusses the economic literature on the benefits of conservation of Rice's whales, in general, but does not estimate the extent to which this rule contributes to that conservation. The economics literature demonstrates that, in general, conservation and recovery of the whales would generate economic benefits both associated with potential use values people hold for the whales (e.g. for wildlife viewing), as well as non-use values (i.e. people's preference for the continued existence of the whales regardless of any direct or indirect use of the animals).

ESTIMATING ECONOMIC BENEFITS OF SPECIES AND HABITAT CONSERVATION

As noted above, the primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as Rice's whales.[6] As discussed previously, the primary, regulatory benefit of critical habitat designations stem from the ESA section 7(a)(2) requirement that all Federal agencies ensure their actions are not likely to destroy or adversely modify the designated habitat. Critical habitat rules contribute to conservation and recovery by focusing on protecting the physical and biological features of habitat that are essential to the conservation of the species. In this case, attributes of the essential feature include the whales' prey, marine water of such a quality and condition as to not preclude or inhibit any demographic function, and sufficiently quiet conditions for the whales' normal use and occupancy of their critical habitat.

Beyond the potential for critical habitat to trigger additional conservation efforts as part of Section 7 consultations, critical habitat may indirectly affect conservation behaviors in ways that generate both opportunity costs and conservation benefits. For example, critical habitat provides notice to other Federal agencies of areas and features important to species conservation; provides information about the types of activities that may reduce the conservation value of the habitat; and may stimulate research, voluntary conservation actions, and outreach and education activities. To the extent that this information causes agencies, organizations, or individuals to change their behavior for the benefit of Rice's whales, these changes would be beneficial to the whales and would be considered benefits of this rulemaking. These changes in behavior could also trigger opportunity costs, for example due to the time or money spent to reduce the risk of negatively affecting the species or its habitat.

Economic benefits should be measured in terms of the value people hold for the conservation benefits to Rice's whales resulting from the rule. As discussed above, we are unable to estimate the conservation

[6] The term "conservation" means "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary" (16 U.S.C. 1532).

benefits of this rule. This section provides a discussion on the value of conservation of Rice's whales in general but should not be interpreted as an estimation of benefits for this rule.

From an economic perspective, the "value" of an animal or species reflects the full range of contributions the species makes to people's well-being. In the context of welfare economics, value is most frequently measured in terms of people's "willingness-to-pay" (WTP) for a good or service, where WTP is the maximum amount (typically in monetary terms) that an individual would be willing to pay rather than do without a particular benefit. OMB recognizes WTP as the appropriate measure for valuing costs and benefits in the context of regulatory analysis (U.S. Office of Management and Budget 2003). WTP is inclusive of all use and non-use services and includes the following:

1. **Market value**: This is relevant to species, such as shrimp, that are bought and sold in commercial markets. This type of value is generally quantifiable based on market data but is irrelevant to Rice's whales.

2. **Non-market use value**: Non-market use values are associated with uses of a given resource outside of markets, including for recreational purposes such as hunting or fishing. For example, whale watching provides a non-market value. The value people hold for this activity is measured by the utility they derive from the activity above and beyond what they pay for it.

3. **Non-use value**: The concept of non-use values recognizes that people may have a positive preference for a good or service beyond any current or even expected future use. Non-use values are thought to reflect an environmental ethic and are a measure of the utility that people derive from indicators of improved ecological health or functioning. Economists generally see these values as motivated by three key factors:

    - Existence value, defined as the benefit gained simply from knowing the resource exists;

    - Option value, allowing for potential use of the resource in the future; and/or

    - Bequest value, reflecting a desire to ensure continued existence of the resource for future generations.

4. **Ecological value**: Perhaps more indirectly, ecological value may contribute to people's WTP for the species, for example as a predator or prey species, or in supporting a healthy, stable, resilient ecosystem. The ecological function of a species may contribute to the total economic value of other resources (e.g., species interconnected by the food chain) or to the broader ecosystem.

Quantification and monetization of conservation benefits for listed species requires two primary pieces of information: (1) data on the incremental change in the species population or in the probability of species recovery resulting from the designation; and (2) data on the public's willingness to pay for this incremental change.

Determining the incremental effect of the critical habitat designation on Rice's whale conservation and recovery is not feasible at this time as we are unable to predict any conservation efforts triggered by this rule. Moreover, this analysis has not identified any activities for which it is likely that Section 7 consultation on effects to critical habitat for the Rice's whales will result in different conservation efforts than Section 7 consultation without the critical habitat. This is because protection of the essential

feature of Rice's whale critical habitat is generally important to the conservation and recovery of the whales themselves, even outside of the need to consider adverse modification of critical habitat. As noted above, should NMFS identify a reasonable and prudent alternative to a proposed action to avoid adverse modification that would not have been made but for the critical habitat designation, the associated costs and benefits of that project modification would be considered economic effects of this rulemaking. NMFS may also make conservation recommendations to reduce and minimize adverse effects to critical habitat that do not reach a level of destruction or adverse modification. However, the implementation of such recommendations would be voluntary and therefore are not considered economic effects of this rulemaking.

Although the critical habitat is not expected to change NMFS' identification of conservation efforts for the whales, the adverse modification analysis conducted as part of Section 7 consultations provides useful scientific information to build upon NMFS' and other Federal agencies' understanding of the biological needs of, and threats to, Rice's whales. This scientific information is an ancillary benefit of the consultations.

In the remainder of this section, we provide a more detailed description of the economic techniques that economists employ to monetize the benefits of species and habitat conservation and provide an overview of the existing literature specifically related to ESA-listed marine species. These studies provide evidence that regulatory and other efforts to increase the recovery probability of Rice's whales — including critical habitat designation — benefit societal well-being.

ECONOMIC METHODS APPLIED TO ESTIMATE USE AND NON-USE VALUES OF SPECIES AND HABITAT CONSERVATION

Various economic benefits, measured in terms of social welfare (i.e., people's well-being as measured in terms of producer and consumer surplus) or regional economic performance (e.g., regional income or employment), may result from conservation efforts for listed species. Economists apply a variety of methodological approaches to estimate use and non-use values for species and for habitat improvements. Stated preference techniques include such tools as the contingent valuation method, conjoint analysis, or contingent ranking methods. In simplest terms, these methods employ survey techniques, asking respondents questions that provide insight into what they would be willing to pay for a resource or for programs designed to protect a resource. A substantial body of literature has been developed that describes the application of this technique to the valuation of natural resource assets.

More specific to use values for species or habitats, revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities (i.e., people "reveal" their value through their behavior). For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models are rooted in the idea that the value of a recreational resource can be estimated by analyzing the travel and time costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of site-specific characteristics on property values.

SUMMARY OF BENEFITS DISCUSSION

- Given the uncertainty regarding conservation efforts that may be triggered by this rule, we are unable to quantify the benefits. This section therefore provides an overview of economic literature on the benefits of the overall conservation of the Rice's whale. The economic benefits described are not benefits specifically of this rulemaking.
- The primary goal of critical habitat designation is to support long-term conservation and recovery of the whales. Conservation efforts potentially triggered by this rule would result in benefits, including use benefits (e.g., wildlife-viewing), non-use benefits (e.g., existence values), and ancillary ecosystem service benefits (e.g., water quality improvements and enhanced habitat conditions for other marine species).
- The existing economics literature regarding the public's value for the recovery of ESA-listed marine species indicates that populations across the broader U.S. are willing to pay for the recovery of the species. Recent studies identified average willingness to pay (WTP) per U.S. household of $86, $108, and $76 (2021 dollars) per year for ten years for the recovery of North Pacific Right whales, southern resident killer whales, and humpback whales, respectively.
- Absent information on the incremental change in Rice's whale populations or recovery potential associated with the designation of critical habitat, this analysis is unable to apply the available literature to quantify or monetize associated incremental use and non-use economic benefits. This literature suggests, however, that Rice's whales have value to people nationally.

An ideal study for use in quantifying the social welfare values of critical habitat designation for Rice's whales would be specific to measuring the incremental benefits to Rice's whales generated by any conservation efforts that may result from this rule. Absent primary research specific to the policy question, the following section describes existing studies focused on protected whale species to provide perspective on these social welfare values associated with ESA-listed whales. This summary is limited to the available information describing values of whales and other marine species within the United States. Studies estimating the value of whale watching are excluded because larger cetaceans, including Rice's whales, are rarely seen in the GOMx except in deeper water far from the coastal areas where the cetacean viewing industry generally operates.

Available Literature Valuing Threatened or Endangered Species

A study by Loomis and White (1996) estimated U.S. households' WTP for 18 rare, threatened, or endangered species through review and analysis of 20 contingent valuation method studies. Average annual WTP values for gray whales and sea otters were $49 (2021 dollars) and $55 for sea otters, respectively. For humpback whales, the study found that U.S. households, on average, were willing to make a lump sum payment of $325 (2021 dollars) to ensure the preservation of the species. The study further determined that the costs per household were considerably lower than the benefits per household for each of the 18 species.

Richardson and Loomis (2009) estimated a model (i.e., a willingness-to-pay function) to value threatened or endangered species based on estimates from multiple studies. This meta-analysis is based on 31 studies with 67 willingness-to-pay observations published from 1985 to 2005 evaluating economic values of endangered, threatened or rare species primarily applying contingent valuation methods. The

economic values expressed in the studies that inform the model reflect primarily recreational use, as well as nonuse values. The species included in the study are primarily marine and riverine species (whales, dolphins, seals, otters, sea lions, sea turtles, salmon, and other listed fish species), as well as some avian and other species.

Wallmo and Lew (2012) conducted a stated-preference choice experiment to estimate the value of recovering or downlisting 8 threatened and endangered species in the United States, including loggerhead and leatherback sea turtles, North Pacific and North Atlantic right whales, upper Willamette River Chinook salmon, Puget Sound Chinook salmon, Hawaiian monk seals, and smalltooth sawfish. Based on a survey in May 2009 of a random sample of 8,476 U.S. households, the authors estimated that WTP values ranged from $47/household (2021 dollars) per year for 10 years for recovering Puget Sound Chinook salmon to $86/household per year for 10 years for recovering the North Pacific right whale.

Wallmo and Lew (2015) conducted a separate stated preference study in 2010 that evaluated people's WTP for recovery of 8 west coast species, including the hawksbill sea turtle, southern resident killer whale, and humpback whale. The study identified an average WTP per household in Washington, Oregon, and California of $109 and $79 (2021 dollars) per year for 10 years for the recovery of the southern resident killer whales and humpback whales, respectively. The study additionally estimated an average WTP per household across the broader U.S. of $108 and $76 (2021 dollars) per year for 10 years for the recovery of the two whale species. The WTP from the national sample identified values close to the WTP of west coast households, suggesting that the value the public holds for the whales is not tied to proximity to the resource.

10.3.2 Educational and Awareness Benefits

There is the potential for education and awareness benefits arising from the critical habitat designation. This potential stems from two sources: (1) entities that engage in Section 7 consultation, including Federal action agencies and, in some cases, third party applicants; (2) members of the general public interested in Rice's whale conservation; and (3) state and local governments that take action to complement the critical habitat designation. Certain entities, such as applicants for particular permits, may alter their activities to benefit the essential feature of the critical habitat because they were made aware of the critical habitat designation through the section 7 consultation process. Similarly, Federal action agencies that undertake activities that affect the critical habitat may alter their activities to benefit the critical habitat. Members of the public interested in conservation also may adjust their behavior to benefit critical habitat because they learned of the critical habitat designation through outreach materials or the regulatory process. In our experience, designation raises the public's awareness that there are special considerations to be taken within the area.

10.3.3 Impacts to Governmental and Private Entities

Similarly, state and local governments may be prompted to enact laws or rules to complement the critical habitat designation and benefit the Rice's whale. Those laws would likely result in additional impacts of the designation. The designation may have some benefit to state and local resource agencies in that the rule more clearly defines the physical and biological feature essential to the conservation of the species and the marine areas in which that feature is found. While this designation would not alter where and what non-federally sponsored activities may occur, it may assist local governments in long-range planning (rather than waiting for case-by-case ESA Section 7 consultations to occur); provide

notice to other Federal agencies of areas and features important to species conservation; provides information about the types of activities that may reduce the conservation value of the habitat; and may stimulate research, voluntary conservation actions, and outreach and education activities. However, it is impossible to quantify the beneficial effects of the awareness gained through or the secondary impacts from state and local regulations resulting from the critical habitat designation.

Many previous critical habitat impact analyses evaluated the impacts of the designation on relationships with, or the efforts of, private and public entities that are involved in management or conservation efforts benefiting listed species. These analyses found that the additional regulatory layer of a designation could negatively impact the conservation benefits provided to the listed species by existing or proposed management or conservation plans. For example, NMFS considers the impacts of critical habitat designation on Indian Tribal sovereignty and participation in conservation activities.

Impacts on entities responsible for natural resource management, conservation plans, or the functioning of those plans depend on the type and number of Section 7 consultations that may result from the designation in the areas covered by those plans, as well as any potential project modifications recommended by these consultations. Negative impacts to these entities could result if the designation interferes with these agencies' ability to provide for the conservation of the species, or otherwise hampers management of these areas. However, existing management plans and associated regulations include significant protections to the essential feature of the proposed critical habitat. As a result of these protections, consultations related to protected area management over the next ten years are not expected to result in incremental project modifications. Any incremental Section 7 impacts of the proposed critical habitat designation will likely be limited to administrative costs. Thus, it is not anticipated that negative impacts to agencies' ability to provide for the conservation of the Rice's whale would result from designation.

11 Impacts on Small Business (Appendix A)

The Regulatory Flexibility Act (RFA) establishes a principle that agencies shall endeavor, consistent with the objectives of a rule and applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. A draft Initial Regulatory Flexibility Analysis (IRFA) was prepared for this proposed rule pursuant to Sec. 603 of the RFA. An IRFA does not contain any decision criteria; instead, the purpose of an IRFA is to inform the agency, as well as the public, of the expected economic impacts of the proposed action and to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the proposed action and applicable statutes.

This analysis considers the extent to which the potential economic impacts associated with the designation of critical habitat for the Rice's whale could be borne by small businesses. Information for this analysis was gathered from the Small Business Administration (SBA) (SBA 2022) and the Dun and Bradstreet Hoovers database. The analysis of impacts to small entities relies on the estimated incremental impacts resulting from the proposed critical habitat designation.

11.1 Summary of Findings

This IRFA anticipates that the proposed critical habitat will result in negligible impacts to small entities. In-water construction is likely the only activity category for which a portion of incremental costs of the proposed rule would be borne by third parties. Incremental costs of the proposed rule to activities other than in-water construction would likely be borne entirely by federal agencies, which, by definition, are not small entities. As documented in Section 10.1.3 of the economic analysis, incremental impacts of the proposed rule are expected to be limited to the administrative costs of addressing Rice's whale critical habitat in future section 7 consultations, as any project modifications to activities that may affect the proposed critical habitat would be required absent designation. As noted in Section 10.1.4, the forecast of section 7 consultations that would consider Rice's whale critical habitat over the next ten years includes consultation on approximately one construction project over the ten years. Based on assumptions regarding incremental administrative costs of consultation to third parties, this would result in an average annualized cost of $250 to the third party involved in the project. This is reasonable given 1) the nearshore boundary of the proposed critical habitat is the 100 m depth contour and well offshore of coastal areas where most in-water construction activity occurs and 2) the section 7 consultation history includes only one USACE-permitted in-water construction project within the proposed critical habitat from 2010 to 2021. It is uncertain whether the impacted third party would be a small entity, and it is likely that at least a portion of the incremental costs of consultation would be passed along to the project applicant. In the case of the construction project that occurred within the proposed critical habitat between 2010 to 2021, the project applicant was Okaloosa County, which with a population of over 200,000 does not qualify as a small governmental jurisdiction. Based on this analysis, this IRFA therefore concludes that the proposed designation of critical habitat for the Rice's whale would result in negligible impacts to small entities.

11.2 IRFA Requirements

The Regulatory Flexibility Act, passed in 1980, requires Federal agencies to consider the impacts of proposed regulations on small entities. When a proposed regulation is published for public comment in the *Federal Register*, it must be accompanied by an IRFA. As described in 5 U.S. Code § 603, each IRFA is required to contain:

1. "a description of the reasons why action by the agency is being considered;

2. a succinct statement of the objectives of, and legal basis for, the proposed rule;

3. a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;

4. a description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;

5. an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap or conflict with the proposed rule." (5 USC § 603)

Additionally, each IRFA is required to contain "a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any

significant economic impact of the proposed rule on small entities."

11.3 Why Action by the Agency Is Being Considered

On April 15, 2019, NMFS published a final rule (84 FR 15446) to list the Gulf of Mexico Bryde's whale (*Balaenoptera edeni*) as an endangered subspecies under the Endangered Species Act (ESA). On August 23, 2021, NMFS issued a direct final rule (86 FR 47022) to revise the common and scientific name of the Gulf of Mexico Bryde's whale to Rice's whale, *Balaenoptera ricei*, and classification to species. As a requirement of the ESA, critical habitat must be designated for all species listed as threatened or endangered (50 CFR 424.12). Designation of critical habitat is being proposed in order to fulfill this legal requirement of the ESA.

11.4 Objectives of and Legal Basis for the Proposed Rule

The objective of this critical habitat rule is to use the best scientific data available to designate critical habitat for the Rice's whale, which is listed as endangered under the ESA. The designation is designed to meet the conservation needs of the Rice's whale and ultimately aid in species recovery. The ESA defines critical habitat as:

1. "The specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection, and;

2. Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species." (50 CFR 424.02)

11.5 Summary of Significant Issues Raised in Public Comment in Response to the IRFA

This IRFA has not yet been reviewed for public comment.

11.6 Description and Estimate of the Number of Small Entities to which the Proposed Rule Will Apply

The RFA defines three types of small entities:

- **Small Business**. Section 601(3) of the RFA defines a small business according to the definition of a small business concern provided in section 3 of the Small Business Act (SBA). The SBA broadly defines a small business concern as a business which is "independently owned and operated and which is not dominant in its field of operation." (15 USC § 632) The SBA provides industry-specific criteria based on either revenues or number of employees that delineate which businesses meet this definition.

- **Small Organization**. Section 601(4) of the RFA defines a small organization as a non-profit enterprise that is independently owned and operated and not dominant in its field.
- **Small Governmental Jurisdiction**. Section 601(5) of the RFA defines a small government jurisdiction as a government of a county, city, town, township, village, school district, or special district, with a population less than 50,000.

The RFA requires consideration of direct impacts to small entities that may result from the proposed rule. For critical habitat designation, all potential direct impacts are incurred through the Section 7 consultation process. Though Section 7 of the ESA only applies to activities with a federal nexus, small entities may be involved through projects that are funded or permitted through federal agencies.

Indirect impacts of critical habitat are unintended changes in economic behavior that may occur outside of the ESA, through other federal or non-federal actions, and that are caused by the designation of critical habitat. Economic effects expected to occur regardless of critical habitat designation are considered baseline impacts. While it is possible that indirect impacts to small entities may occur as a result of the proposed rule, these impacts are not quantified in this IRFA.

The regulatory mechanism through which critical habitat protections are enforced is Section 7 of the ESA, which directly regulates only those activities carried out, funded, or permitted by a federal agency. By definition, federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by proposed rule or by a delegation of impact from the directly regulated entity.

This IRFA focuses on identifying small entities that may bear the incremental impacts of this rulemaking. In addition to the administrative costs of participating in consultations, section 10.1.3 of the draft information report identifies the following economic activities as potentially requiring ESA Section 7 consultation because they may affect the essential features of Rice's whale critical habitat. These activities are:

- Oil and gas activities
- Fishery management
- Military activities
- Water quality management
- Scientific research and monitoring
- Space vehicle launch and reentry
- Coastal and in-water construction
- Aquaculture
- Vessel traffic
- Renewable energy
- Activities that lead to or address greenhouse gas emissions or global climate change

Though there is uncertainty regarding which future Section 7 consultations will involve third parties, the activity categories described in section 10.1.3 of the draft economic analysis provide some indication of the probability of third party involvement. As explained in section 10.4, this IRFA assumes in-water construction is the only activity category for which any portion of incremental impacts of designation could be borne by small entities. As documented in section 10.1.3 and section 10.4, incremental costs of

the proposed critical habitat are anticipated to be limited to the administrative costs of addressing Rice's whale critical habitat in future section 7 consultations, as any project modifications to activities that may affect the proposed critical habitat would be required absent designation. Based on projections of future section 7 consultations (see section 10.1.4 of the draft information report), at most one small entity would be impacted by the proposed rule over the next ten years. This IRFA therefore concludes that the proposed rule would result in extremely limited impacts to small entities.

11.7 Description of Reporting and Recordkeeping Efforts

The Proposed Rule does not require "reporting" or "recordkeeping" efforts as defined by the Paperwork Reduction Act. However, designation of critical habitat will require federal agencies to consult with NMFS regarding any potential impacts to critical habitat from federal actions, and project modifications or monitoring to address such impacts, which a third party may carry out. This process is likely to involve communication with NMFS and federal funding or authorizing agencies through letters, phone calls, or in-person meetings.

11.8 Identification of Relevant Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rule

The proposed rule will not duplicate or conflict with any other laws or regulations. However, the protection of listed species and habitat under critical habitat may overlap other sections of the ESA. For instance, listing of the endangered Rice's whale under the ESA already requires federal agencies to consult with NMFS to avoid jeopardy to the species. However, this analysis only examines the incremental impacts to small entities from the proposed critical habitat rule.

11.9 Description of Alternatives to the Proposed Rule Which Accomplish the Objectives and Which Minimize Impacts on Small Entities

The RFA requires consideration of alternative rules that would minimize impacts to small entities. We considered the following alternatives when developing the proposed critical habitat rule.

11.9.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE

We considered the alternative of not designating any additional critical habitat for the Rice's whale. Under this alternative, conservation and recovery of the listed species would depend exclusively upon the protection provided under the ''jeopardy'' provisions of section 7 of the ESA. This alternative would impose no additional economic, national security, or other relevant impacts. However, after compiling and reviewing the biological information for the Rice's whale, we have determined that the physical and biological feature forming the basis for our critical habitat designation is essential to the Rice's whale's conservation, and conservation of the species will not succeed without this feature being available. Thus, the lack of protection of the critical habitat feature from adverse modification could result in continued declines in abundance of Rice's whale, and loss of associated economic and other biodiversity values the whale provides. Thus, the no action alternative is not necessarily a ''no cost'' alternative for small entities. Moreover, this option would not be legally viable under section 4 of the ESA, which

specifically requires that we designate critical habitat to the maximum extent prudent and determinable based on consideration of the best available scientific information

11.9.2 ALTERNATIVE 2: PREFERRED ALTERNATIVE

Under this alternative, we would designate the area ranging from the 100 m depth contour to the 400 m depth contour in GOMx waters from the Texas-Mexico border east to the boundary between the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council (50 CFR 600.105(c)) off of Florida. This area contains the physical and biological feature essential to the conservation of Rice's whales. The preferred alternative was selected because it implements the critical habitat provisions of the ESA by including the feature we believe is essential to the conservation of the species based on the best available scientific information on the Rice's whale and offers greater conservation benefits relative to either of the other alternatives.

11.9.3 ALTERNATIVE 3: DIFFERENT GEOGRAPHIC BOUNDARIES

Under the third alternative that would have delineated different geographic boundaries, we would propose to designate a smaller area within the GOMx as critical habitat. Under section 4(b)(2) of the ESA, NMFS has the discretion to exclude a particular area from designation as critical habitat even though it meets the definition of "critical habitat" if the benefits of exclusion (i.e., the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation (i.e., the conservation benefits to the Rice's whale if an area were designated), as long as exclusion of the area will not result in extinction of the species. However, following our consideration of probable national security, economic, and other relevant impacts of designating all the specific areas, we rejected this alternative. We determined that the benefits of excluding any particular areas ranging from the 100 m depth contour to the 400 m depth contour in GOMx waters from the Texas-Mexico border east to the boundary between the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council (50 CFR 600.105(c)) off of Florida did not outweigh the conservation benefits of designating those areas. Thus, this alternative was rejected in favor of the preferred alternative.

12 Data and Assumptions for Estimating Administrative Costs of Section 7 Consultations (Appendix B)

This analysis projected administrative costs of Section 7 consultations based on a model developed by Industrial Economics, Incorporated (IEc) in 2002 to inform economic analyses of critical habitat rules. Considered by NMFS to represent the best available information on administrative costs for its critical habitat rulemakings, the model's development relied on interviews with Federal agency staff with significant experience implementing Section 7 consultations and has been adjusted over the course of dozens of rulemakings, as appropriate, by NMFS biologists and Federal agency staff.

The estimated level of effort for time spent in consultations reflects Federal agency staff estimates of hours or days spent by task and consultation type, as well as the staff level (in terms of the Federal General Schedule (GS) level) typically assigned to these tasks. To account for variable complexity across consultations, the interviewees described time estimates and GS level assignments at low and high levels of effort for each consultation type. Separately, the model considers the number of hours and hourly rate to conduct Biological Assessments.

Wages for Federal agency employees reflect the midpoint between Step 1 and Step 10 within each GS level using the GS Hourly Rates and assume an overhead multiplier of 2.5.

Exhibit B.1 describes the resulting key assumptions related to total hours and wage level for consultations and technical assistances that consider both the listing of the species (jeopardy) and critical habitat (adverse modification). Adverse modification costs are assumed 25 percent of total consultation costs. The consultation costs in Table 3 of this analysis reflect the average of the low and high levels of effort by consultation type and entity.

Exhibit B.1. KEY HOUR AND WAGE RATE ASSUMPTIONS USED IN THE SECTION 7 COST MODEL

Consultation Type	Effort Level	FWS/NMFS		Federal Action Agency		Third Party		Biological Assessments	
		Total Hours	GS Level	Total Hours	GS Level	Total Hours	Hourly Wage	Total Hours	Hourly Wage
Technical Assistance	Low	5	GS-10			6	$100		
	High	13	GS-10			15	$100		
Informal Consultation	Low	19	GS-10			12	$100	0	$100
	High	45	GS-12	56	GS-12	29	$100	40	$100
Formal Consultation	Low	45	GS-12	56	GS-12	29	$100	56	$100
	High	74	GS-13	94	GS-12	41	$100	56	$100
Programmatic Consultation	Low	200	GS-11	160	GS-11			56	$100
	High	280	GS-11	240	GS-11			56	$100

Source: Industrial Economics, Incorporated. Final Economic Analysis of Critical Habitat Designation for Humpback Whales. 2020.

13 References

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16 USC § 1532. Definitions in: Title 16 Chapter 35 – Endangered Species.

33 USC § 1344. Permits for Dredged or Fill Material.

33 USC §§ 401 et seq. 1938. Protection of Navigable Waters and of Harbor and River Improvements Generally.

43 USC § 1344. Submerged Lands. Subchapter III – Outer Continental Shelf Lands.

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