making effective comments, please visit *https://www2.epa.gov/dockets/commenting-epa-dockets.*

FOR FURTHER INFORMATION CONTACT: Charles Hatten, Environmental Engineer, Control Strategies Section, Air Programs Branch (AR–18J), Environmental Protection Agency, Region 5, 77 West Jackson Boulevard, Chicago, Illinois 60604, (312) 886–6031, *hatten.charles@epa.gov.*

SUPPLEMENTARY INFORMATION: In the Final Rules section of this **Federal Register**, EPA is approving the Indiana's SIP submittal as a direct final rule without prior proposal because the Agency views this as a noncontroversial submittal and anticipates no adverse comments. A detailed rationale for the approval is set forth in the direct final rule. If no adverse comments are received in response to this rule, no further activity is contemplated. If EPA receives adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this proposed rule.

EPA will not institute a second comment period. Any parties interested in commenting on this action should do so at this time. Please note that if EPA receives adverse comment on an amendment, paragraph, or section of this rule, and if that provision may be severed from the remainder of the rule, EPA may adopt as final those provisions of the rule that are not the subject of an adverse comment. For additional information, see the direct final rule which is located in the Rules section of this **Federal Register**.

Dated: June 1, 2017.

Robert A. Kaplan,

Acting Regional Administrator, Region 5.

[FR Doc. 2017–13193 Filed 6–23–17; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 224

[Docket No. 160413329–7546–02]

RIN 0648–XE571

Endangered and Threatened Wildlife and Plants; Proposed Endangered Listing Determination for the Taiwanese Humpback Dolphin Under the Endangered Species Act (ESA)

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: We, NMFS, have completed a comprehensive status review under the Endangered Species Act (ESA) for the Taiwanese humpack dolphin (*Sousa chinensis taiwanensis*) in response to a petition from Animal Welfare Institute, Center for Biological Diversity, and WildEarth Guardians to list the species. Based on the best scientific and commercial information available, including the draft status review report (Whittaker and Young, 2017), and taking into consideration insufficient efforts being made to protect the species, we have determined that the Taiwanese humpback dolphin has a high risk of extinction throughout its range and warrants listing as an endangered species.

DATES: Comments on this proposed rule must be received by August 25, 2017. Public hearing requests must be requested by August 10, 2017.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2016–0041, by either of the following methods:

- *Electronic Submissions:* Submit all electronic comments via the Federal eRulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2016-0041,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written comments to Chelsey Young, NMFS Office of Protected Resources (F/PR3), 1315 East West Highway, Silver Spring, MD 20910, USA. Attention: Taiwanese humpback dolphin proposed rule.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

You can find the petition, status review report, **Federal Register** notices, and the list of references electronically on our Web site at *http://www.fisheries.noaa.gov/pr/species/mammals/dolphins/indo-pacific-humpback-dolphin.html.* You may also receive a copy by submitting a request to the Office of Protected Resources, NMFS, 1315 East-West Highway, Silver Spring, MD 20910, Attention: Taiwanese humpback dolphin proposed rule.

FOR FURTHER INFORMATION CONTACT: Chelsey Young, NMFS, Office of Protected Resources, (301) 427–8403.

SUPPLEMENTARY INFORMATION:

Background

On March 9, 2016, we received a petition from the Animal Welfare Institute, Center for Biological Diversity and WildEarth Guardians to list the Taiwanese humpback dolphin (*S. chinensis taiwanensis*) as threatened or endangered under the ESA throughout its range. This population of humpback dolphin was previously considered for ESA listing as the Eastern Taiwan Strait distinct population segment (DPS) of the Indo-Pacific humpback dolphin (*Sousa chinensis*); however, we determined that the population was not eligible for listing as a DPS in our 12-month finding (79 FR 74954; December 16, 2014) because it did not meet all the necessary criteria under the DPS Policy (61 FR 4722; February 7, 1996). Specifically, we determined that while the Eastern Taiwan Strait population was ''discrete,'' the population did not qualify as ''significant.'' The second petition asserted that new scientific and taxonomic information demonstrates that the Taiwanese humpback dolphin is actually a subspecies, and stated that NMFS must reconsider the subspecies for ESA listing. On May 12, 2016, we published a positive 90-day finding for the Taiwanese humpback dolphin (81 FR 29515), announcing that the petition presented substantial scientific or commercial information indicating the petitioned action of listing the subspecies may be warranted, and explaining the basis for those findings. We also announced the initiation of a status review of the subspecies, as required by section 4(b)(3)(A) of the ESA, and requested information to inform the agency's decision on whether the species warranted listing as endangered or threatened under the ESA.

Listing Species Under the Endangered Species Act

We are responsible for determining whether species are threatened or endangered under the ESA (16 U.S.C. 1531 *et seq.*). To make this determination, we first consider whether a group of organisms

constitutes a ''species'' under section 3 of the ESA, then whether the status of the species qualifies it for listing as either threatened or endangered. Section 3 of the ESA defines species to include ''any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.'' On February 7, 1996, NMFS and the U.S. Fish and Wildlife Service (USFWS; together, the Services) adopted a policy describing what constitutes a DPS of a taxonomic species (61 FR 4722). The joint DPS policy identified two elements that must be considered when identifying a DPS: (1) The discreteness of the population segment in relation to the remainder of the species (or subspecies) to which it belongs; and (2) the significance of the population segment to the remainder of the species (or subspecies) to which it belongs.

Section 3 of the ESA defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range'' and a threatened species as one ''which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' Thus, in the context of the ESA, the Services interpret an ''endangered species'' to be one that is presently at risk of extinction. A ''threatened species,'' on the other hand, is not currently at risk of extinction, but is likely to become so in the foreseeable future. In other words, a key statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either now (endangered) or in the foreseeable future (threatened). The statute also requires us to determine whether any species is endangered or threatened as a result of any of the following five factors: the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence (ESA, section 4(a)(1)(A)–(E)). Section 4(b)(1)(A) of the ESA requires us to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made by any State or foreign nation or political subdivision thereof to protect the species.

Status Review

The status review for the Taiwanese humpback dolphin was completed by NMFS staff from the Office of Protected Resources. To complete the status review, we compiled the best available data and information on the subspecies' biology, ecology, life history, threats, and conservation status by examining the petition and cited references, and by conducting a comprehensive literature search and review. We also considered information submitted to us in response to our petition finding. The draft status review report was subjected to independent peer review as required by the Office of Management and Budget Final Information Quality Bulletin for Peer Review (M–05–03; December 16, 2004). The draft status review report was peer reviewed by three independent specialists selected from the academic and scientific community, with expertise in cetacean biology, conservation and management, and specific knowledge of the Taiwanese humpback dolphin. The peer reviewers were asked to evaluate the adequacy, appropriateness, and application of data used in the draft status review report as well as the findings made in the ''Assessment of Extinction Risk'' section of the report. All peer reviewer comments were addressed prior to finalizing the draft status review report.

We subsequently reviewed the status review report, and its cited references, and we believe the status review report, upon which this proposed rule is based, provides the best available scientific and commercial information on the Taiwanese humpback dolphin. Much of the information discussed below on the dolphin's biology, distribution, abundance, threats, and extinction risk is attributable to the status review report. However, we have independently applied the statutory provisions of the ESA, including evaluation of the factors set forth in section 4(a)(1)(A)-(E), our regulations regarding listing determinations, and our DPS policy in making the 12-month finding determination. The draft status review report (cited as Whittaker and Young 2017) is available on our Web site (see **ADDRESSES** section). In the sections below, we provide information from the report regarding threats to and the status of the Taiwanese humpback dolphin.

Description, Life History, and Ecology of the Petitioned Species

Species Description

The Taiwanese humpback dolphin (*Sousa chinensis taiwanensis*) is a recently recognized subspecies of the Indo-Pacific humpback dolphin (*Sousa chinensis;* Wang *et al.,* 2015). *Sousa chinensis* is a broadly distributed species within the family Delphinidae and order Cetartiodactyla, whereas the Taiwanese subspecies occurs in a restricted area of shallow waters off the western coast of Taiwan. The subspecies of *Sousa chinensis* occurring in the Eastern Taiwan Strait—*Sousa chinensis taiwanensis* (herein referred to as the Taiwanese humpback dolphin) was first described in 2002 during an exploratory survey of coastal waters off western Taiwan (Wang *et al.,* 2004b). Prior to coastal surveys, there were few records mentioning the species in this region, save two strandings, a few photographs, and anecdotal reports (Wang, 2004). Since the first survey in 2002, researchers have confirmed their year-round presence in the Eastern Taiwan Strait (Wang and Yang, 2011).

In terms of distinctive physical characteristics, the Indo-Pacific humpback dolphin is generally easy to distinguish from other dolphin species in its range. In general, the Indo-Pacific humpback dolphin is medium-sized, up to 2.8 m in length, and weighs 250–280 kg (Ross *et al.,* 1994). It is characterized by a robust body, long distinct beak, short dorsal fin atop a wide dorsal hump, and round-tipped broad flippers and flukes (Jefferson and Karczmarski, 2001). The base of the fin measures 5–10 percent of the body length, and slopes gradually into the surface of the body; this differs from individuals in the western portion of the range, which have a larger hump that comprises about 30 percent of body width, and forms the base of an even smaller dorsal fin (Ross *et al.,* 1994).

When young, humpback dolphins appear dark grey with no or few light-colored spots, and transform to mostly white (appearing pinkish) as dark spots decrease with age. However, the developmental transformation of pigment differs between Taiwanese and Chinese humpback dolphin populations, and the spotting intensity on the dorsal fin of the Taiwanese population is significantly greater than that in other nearby populations in the Pearl River estuary (PRE) or Jiulong River estuaries of the Chinese mainland (Wang *et al.,* 2008). In fact, Wang *et al.* (2008) concluded that these differences in pigmentation can be used to reliably distinguish the Taiwanese humpback dolphin from other nearby populations, and Wang *et al.* (2015) further confirmed that Taiwanese humpback dolphins were ''clearly diagnosable from those of mainland China under the most commonly accepted 75 percent rule for subspecies delimitation, with 94

percent of one group being separable from 99 percent of the other.'' Based on this information, as well as additional evidence of geographical isolation and behavioral differences, the authors concluded that the Taiwanese humpback dolphin qualifies as a subspecies, and revised the taxonomy of *Sousa chinensis* to include two subspecies: The Taiwanese humpback dolphin (*S. chinensis taiwanensis*) and the Chinese humpback dolphin (*S. chinensis chinensis*) (Wang *et al.,* 2015). Because of the new information as presented in Wang *et al.* (2015), the Taxonomy Committee of the Society for Marine Mammalogy officially revised its list of marine mammal taxonomy to recognize the Taiwanese humpback dolphin as a subspecies (Committee on Taxonomy, 2016).

Range, Distribution and Habitat Use

The Taiwanese humpback dolphin has a very restricted range, residing in the shallow coastal waters of central western Taiwan throughout the year (Wang *et al.,* 2007a; Wang *et al.,* 2016), with no evidence of seasonal movements (Wang and Yang, 2011; Wang *et al.,* 2016). Although the total distribution of the dolphin covers approximately 750 km^2, the subspecies' core distribution encompasses approximately 512 km^2 of coastal waters, from estuarine waters of the Houlong and Jhonggang rivers in the north, to waters of Waishanding Jhou to the south (Wang *et al.,* 2016). This equates to a linear distance of approximately 170 km. However, the main concentration of the population occurs between the Tongsaio River estuary and Taisi, which encompasses the estuaries of the Dadu and Jhushuei rivers, the two largest river systems in western Taiwan (Wang *et al.,* 2007a). Typically, the Taiwanese humpback dolphin is found within 3 km from the shore (Dares *et al.,* 2014; Wang *et al.,* 2016).

Rarely, individuals have been sighted and strandings have occurred in near-shore habitat to the north and south of its current confirmed habitat; some of these incidents are viewed as evidence that the historical range of the population extended farther than its current range (Dungan *et al.,* 2011). However, two specific anomalous sightings are considered incidences of vagrancy, involving sick or dying animals. All but two sightings have occurred in shallow water, less than 20 m, and as shallow as 1.5 m. The only two sightings that occurred in water deeper than 20 m occurred in habitat where dredging had occurred (Wang *et al.,* 2007b). In fact, the Taiwanese humpback dolphin is thought to be geographically isolated from mainland Chinese populations, with water depth being the primary factor dictating their separation. The Taiwan Strait is 140–200 km wide, and consists of large expanses of water 50–70 m deep (the Wuchi and Kuanyin depressions). Despite extensive surveys, Taiwanese humpback dolphins have never been observed in water deeper than 30 m. As noted previously, the majority of sightings have been made in waters less than 20 m deep, but individuals have been known to cross deep (>30 m) shipping channels in inshore waters that have been dredged (Dares *et al.,* 2014). Thus, deep water is thought to be the specific barrier limiting exchange with Chinese mainland populations (Jefferson and Karczmarski, 2001). *Sousa* species in general have limited mobility, and restriction to shallow, near-shore estuarine habitats is a significant barrier to movement (Karczmarski *et al.,* 1997; Hung and Jefferson, 2004). Thus, confirmed present habitat constitutes a narrow region along the coast, which is affected by high human population density and extensive industrial development (Ross *et al.,* 2010; Karczmarski *et al.,* 2016; Wang *et al.,* 2016).

Overall, water depth and the subspecies' need for access to inshore, estuarine waters, as well as the estuarine distribution of prey species, are likely the main factors underpinning habitat use and distribution of Taiwanese humpback dolphins (Dares *et al.,* 2014; Wang *et al.,* 2016). The input of freshwater to the habitat is thought to be important in sustaining estuarine productivity, and thus supporting the availability of prey for the dolphin (Jefferson, 2000). Across the Taiwanese humpback dolphin habitat, bottom substrate consists of soft sloping muddy sediment with elevated nutrient inputs primarily influenced by river deposition (Sheehy, 2010). These nutrient inputs support high primary production, which fuels upper trophic levels contributing to the dolphin's source of food. Thus, the characteristics defining distribution and habitat use of the Taiwanese humpback dolphin are similar to those of other humpback dolphin populations (Dares *et al.,* 2014).

Diet and Feeding

Information on this Taiwanese humpback dolphin's foraging behavior and specific diet is limited, but the dolphins seem to have an opportunistic diet comprised primarily of estuarine fish (*e.g.,* sciaenids, mugilids, congrids, clupeoids), and either do not or rarely feed on cephalopods and crustaceans (Wang *et al.,* 2016). While the subspecies does not seem to show the same attraction to fishing vessels as the nearby Pearl River estuary (PRE) population, some evidence (*e.g.,* net entanglements and observations of individuals feeding around and behind set gillnets and trawl nets, respectively) indicate that Taiwanese humpback dolphins may opportunistically feed in proximity to deployed fishing gear (Slooten *et al.,* 2013; Wang *et al.,* 2016). As is common to the species as a whole, the Taiwanese subspecies uses echolocation and passive listening to find its prey.

Reproduction and Growth

Little is known about the life history and reproduction of the Taiwanese humpback dolphin, and estimating life history parameters for the subspecies has proven difficult due to the lack of carcasses available for study (Wang *et al.,* 2016). A recent analysis of life history patterns for individuals in the PRE population may offer an appropriate proxy for understanding life history of the Taiwanese humpback dolphin, as the PRE population similarly inhabits estuarine and freshwater-influenced environments affected by comparable threats of pollution, as well as industrial development and fishing activity (Jefferson *et al.,* 2012). Additionally, life history traits of the PRE population are similar to the South African population, suggesting that some general assumptions of productivity can be gathered, even on the genus-level (Jefferson and Karczmarski, 2001; Jefferson *et al.,* 2012). However, it should be noted that environmental factors (*e.g.,* food availability, habitat status) may affect important rates of reproduction and generation time in different populations, and thus comparisons should be regarded with some caution.

Maximum longevity for PRE and South African populations is 39 and 40 years, respectively (Jefferson *et al.,* 2012; Jefferson and Karcsmarski, 2001); therefore, we assume that the Taiwanese humpback dolphin experiences a similar life expectancy. Likewise, we also expect the Taiwanese humpback dolphin to have an age at sexual maturity for females similar to that for the PRE and South African populations (12–14 years). In general, it has been assumed that the Taiwanese subspecies experiences long calving intervals, between 3 and 5 years (Jefferson *et al.,* 2012). A recent study on the reproductive parameters of the Taiwanese humpback dolphin confirmed this assumption, and

estimated the mean calving interval (defined as the period between the estimated birth months of two successive calves) to be 3.26 years ± SD 1.23 years (Chang *et al.,* 2016). However, it is important to note that the results of this study are based on only 4 years of data; therefore, females with potentially longer calving intervals would not have been observed or recorded. Taiwanese humpback dolphin births occur throughout the year, but decrease in late summer and through mid-winter, with 69 percent of the estimated months of birth occurring in spring and summer (Chang *et al.,* 2016). In terms of survival, between 1 and 3 calves survive annually to the age of 1-year (mean = 2.75), with survival of calves declining across the initial 3 years of life, from 0.778 (at 6 months) to 0.667 (at 1 year), and from 0.573 to 0.563 at ages of 2 and 3 years, respectively (Chang *et al.,* 2016). Chang *et al.* (2016) hypothesized that the relatively low calf survival observed in the Taiwanese humpback dolphin population is more likely due to anthropogenic factors (*e.g.,* fisheries interactions and habitat destruction) than natural causes. Overall, the Taiwanese humpback dolphin is likely long-lived, slow to mature, and has low recruitment rates and long calving intervals. These life history parameters indicate slow population growth, which contributes to a limited capacity for the subspecies to exhibit resilience to anthropogenic stressors (Chang *et al.,* 2016).

Population Structure

No genetic data exist for the Taiwanese humpback dolphin; therefore, the genetic connectivity within the population cannot be directly assessed. However, in such a small population, social behavior and habitat connectivity may provide clues to the connectivity of the population as a whole. In general, humpback dolphin (*Sousa* spp.) populations are known for having generally weak, fluctuating associations in 'fission-fusion' societies (*i.e.,* social groups that change in size and composition as time passes and individuals move throughout the environment; Dungan, 2016; Wang *et al.,* 2016; Dungan, 2012; Jefferson, 2000). However, a recent study of association patterns in Taiwanese humpback dolphins found that the Taiwanese subspecies exhibits stronger, persistent relationships among individuals, particularly among cohorts of mother-calf pairs (Dungan *et al.,* 2016), with a unique level of stability in the population compared to other humpback dolphin populations (Wang *et al.,* 2016). This high social cohesion is most likely related to cooperative calf rearing, wherein raising offspring with the assistance of peers or kin can increase offspring survivorship and thereby increase the fitness of the population (Dungan *et al.,* 2016). This behavior is thought to be an adaptive response to the dolphin's degraded, geographically restricted environment (which makes it difficult for mothers to support offspring on their own), and to their small population size (which has likely increased the relatedness of individuals) (Dungan, 2011). Calves and their inferred mothers seem to have central positions in the social network, which suggests that mother-calf pairs may be the key underlying factor for overall network structure (Dungan *et al.,* 2016). Given the subspecies' unique cohesive social network, persisting associations, and the reliance on cooperative rearing behaviors of mother-calf groups for reproductive fitness and survival, disruption of these social patterns could have significant ramifications regarding the dolphin's ability to reproduce as well as calf survivorship (Dungan *et al.,* 2016), which is already reportedly low (Chang *et al.,* 2016).

Population Abundance and Trends

There are only two formal estimates of abundance for the Taiwanese humpback dolphin. The first study estimated a population size of 99 individuals (coefficient of variation (CV) = 52 percent, 95 percent confidence interval (CI) = 37–266) based on surveys that used line transects to count animals from 2002 to 2004 (Wang *et al.,* 2007b). A new estimate of population abundance with data collected between 2007 and 2010 using mark-recapture methods of photo identification allowed for higher-precision measurements (Wang *et al.,* 2012). Yearly population estimates from this study ranged from 54 to 74 individuals in 2009 and 2010, respectively (CV varied from 4 percent to 13 percent); these estimates were 25 to 45 percent lower than those from 2002–2004 (Wang *et al.,* 2012). Carrying capacity for the Taiwanese humpback dolphin has been estimated at 250 individuals (which was set higher than the highest point estimate abundance from Wang *et al.* (2012)), as extrapolated from the mean density estimate for the population (Araújo *et al.,* 2014); this estimate suggests that the population abundance has been reduced from historical levels.

An analysis of potential biological removal (PBR), which, under the Marine Mammal Protection Act (MMPA), is a measure of the maximum number of individuals that can be removed from a population without depleting it (Wade, 1998), was conducted to assess the sustainability and stability of the Taiwanese humpback dolphin in the face of present threats, and their projected future trends (Slooten *et al.,* 2013). Using the most current abundance estimate, and assuming that the Taiwanese humpback dolphin population is a closed and discrete population based on information provided in Wang *et al.* (2012), Slooten *et al.* (2013) assessed the number of individuals in the population that may be lost due to occurrences other than natural mortality and still allow for population stability and recovery. The authors calculated that a sustainable population could withstand no more than one human-caused dolphin death every 7 to 7.6 years. Thus, even a single human-caused mortality per year would exceed the PBR by a factor of seven (Slooten *et al.,* 2013). Their assessment took into account all non-natural mortality including fishing, pollution, vessel strikes, habitat destruction, and other human activities, and determined that current removal of individuals from the population exceeds the PBR necessary for population stability which would prevent decline, support natural population growth, and allow for improved status (Slooten *et al.,* 2013). Given the population's mortality rate of 1.5 percent (Wang *et al.,* 2012), current rates of population decline are likely unsustainable.

An extremely low population size estimate (fewer than 100 individuals) is well supported by current available data, and recent population viability analyses (PVAs) suggest that the population is declining due to the synergistic effects of habitat degradation and detrimental fishing interactions (Araújo *et al.,* 2014; Huang *et al.,* 2014). Araújo *et al.* (2014) modeled population trajectory over 100 years using demographic factors alongside different levels of mortality attributed to bycatch, and loss of carrying capacity due to habitat loss/degradation. The model predicted a high probability of ongoing population decline under all scenarios. For instance, population size was predicted to be smaller than the initial size in more than 76 percent of all model runs, with the final population size predicted to be <1 individual (*i.e.,* extinction) in 66 percent of all model runs (Araújo *et al.,* 2014). Another PVA was performed by using an individual-based model to account for parametric uncertainty and demographic stochasticity (Huang *et al.,* 2014). Although this model showed wide

variation in population growth estimates (ranging from a significant decline of −0.113 to a moderate increase of 0.0317), the end result for the subspecies was still an overall decline, with 69.4 percent of simulations predicting a population decline of greater than 25 percent within one generation (*i.e.,* 22 years) and the majority of simulations (54 percent) predicting local extinction within 100 years (Huang *et al.,* 2014).

Overall, although the two PVA studies differed in their findings with regard to the relative importance of bycatch and habitat loss threats, both assessments concluded that the subspecies is in serious danger of going extinct (Wang *et al.,* 2016). Ultimately, strong evidence suggests that the Taiwanese humpback dolphin population size is critically small, and rates of decline are high and likely unsustainable. Further, it is clear that loss of only a single individual within the population per year would substantially reduce population growth rate and is thus unsustainable (Dungan *et al.,* 2011, Slooten *et al.,* 2013)

Assessment of Extinction Risk

The ESA (section 3) defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range.'' A threatened species is defined as ''any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' Neither we nor the USFWS have developed formal policy guidance about how to interpret the definitions of threatened and endangered with respect to what it means to be ''in danger of extinction.'' We consider the best available information and apply professional judgment in evaluating the level of risk faced by a species in deciding whether the species is threatened or endangered. We evaluate demographic risks, such as low abundance and productivity, and threats to the species, including those related to the factors specified in ESA section 4(a)(1)(A)–(E).

For purposes of assessing extinction risk for the Taiwanese humpback dolphin, we reviewed the best available information on the species and evaluated the overall risk of extinction facing the Taiwanese humpback dolphin, now and in the foreseeable future. The term ''foreseeable future'' was discussed qualitatively in the status review report and defined as the timeframe over which threats could be projected with a reasonable amount of confidence. After considering the life history of the Taiwanese humpback dolphin, availability of data, and types of threats, we determined that a reasonable foreseeable future should extend out several decades (>50 years). The foreseeable future timeframe is also a function of the reliability of available data regarding the identified threats and extends only as far as the data allow for making reasonable predictions about the species' response to those threats. Given the Taiwanese humpback dolphin's life history traits, including longevity estimated to be upwards of 40 years, estimated maturity range of 12–14 years, low reproductive rates and long calving intervals of >3 years, it would likely take more than a few decades (*i.e.,* multiple generations) for any management actions to be realized and reflected in population abundance indices. Similarly, the impact of present threats to the subspecies could be realized in the form of noticeable population declines within this time frame, as demonstrated by the very low PBR estimate for the dolphin and current mortality rate of 1.5 percent. As the main operative threats to the subspecies include habitat destruction and entanglement in fishing gear, this time frame would allow for reliable predictions regarding the impact of current levels of fishery-related mortality and the previously discussed impacts of habitat destruction as a result of land reclamation and other activities on the biological status of the Taiwanese humpback dolphin.

In determining the extinction risk of a species (and in this case, a subspecies), it is important to consider both the demographic risks facing the species as well as current and potential threats that may affect the species' status. To this end, a demographic risk analysis was conducted for the Taiwanese humpback dolphin. A demographic risk analysis is an assessment of the manifestation of past threats that have contributed to the species' current status and informs the consideration of the biological response of the species to present and future threats. This analysis evaluated the population viability characteristics and trends available for the dolphin, such as abundance, growth rate/productivity, spatial structure and connectivity, and diversity, to determine the potential risks these demographic factors pose to the subspecies. The information from this demographic risk analysis was considered alongside the information previously presented on threats to the subspecies, including those related to the factors specified by the ESA section 4(a)(1)(A)–(E) (and summarized in a separate Threats Assessment section below) and used to determine an overall risk of extinction for the Taiwanese humpback dolphin. Thus, scientific conclusions about the overall risk of extinction faced by the Taiwanese humpback dolphin under present conditions and in the foreseeable future are based on our evaluation of the subspecies' demographic risks and section 4(a)(1) threat factors. Our assessment of overall extinction risk considered the likelihood and contribution of each particular factor, synergies among contributing factors, and the cumulative impact of all demographic risks and threats on the subspecies.

Section 4(b)(1)(A) of the ESA requires the Secretary, when making a listing determination for a species, to take into consideration those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect the species. Therefore, prior to making a listing determination, we also assess such protective efforts to determine if they are adequate to mitigate the existing threats.

Evaluation of Demographic Risks

Abundance

We identified the critically low population abundance of the Taiwanese humpback dolphin as the demographic factor contributing most heavily to the subspecies' risk of extinction. With fewer than 100 individuals and low productivity, even a single human-caused mortality per year is expected to negatively impact the subspecies' continued viability. For example, current annual mortality is estimated at 1.5 percent (Wang *et al.,* 2012) and recent PVAs, which model future scenarios taking into account increasing threats of fishing and habitat loss, confirm the unsustainable decline of the population (Araújo *et al.,* 2014; Huang and Karczmarski, 2014; Huang *et al.,* 2014). In fact, both available PVA assessments conclude that the subspecies is in danger of going extinct (Wang *et al.,* 2016). Overall, the small and declining population size of the Taiwanese humpback dolphin contributes to a high risk of extinction, which is compounded by a variety of ongoing threats to the population and its habitat.

Growth Rate/Productivity

The Taiwanese humpback dolphin is associated with a slow rate of reproduction, long calving intervals, low recruitment rates and a long period of female-calf association. A recent study on the reproductive parameters of

the Taiwanese humpback dolphin indicates low calf survival rate and fecundity (Chang *et al.,* 2016). For the Taiwanese humpback dolphin, low fecundity is likely caused by current threats of habitat contamination, stress, and prey disruption (Chang *et al.,* 2016). As such, ongoing exposure to pollution and stress derived from interactions with anthropogenic activity may act to further reduce reproductive rates of this subspecies in the future. Trends of decreasing reproductive rate are likely to prevent the population's adaptability to stress and impede its ability to increase population levels, even if mitigation efforts are made to address other threats such as bycatch and habitat destruction. Overall, the Taiwanese humpback dolphin's reproductive rate may be expected to decrease over time without efforts to mitigate habitat contamination and stress due to anthropogenic activity occurring throughout the population's range. For the Taiwanese humpback dolphin, a low rate of reproduction and fecundity now, and likely reductions in those rates in the future, contribute to a high risk of extinction.

Spatial Structure/Connectivity

As previously discussed, genetic data are not available for the Taiwanese humpback dolphin; therefore, the genetic connectivity within the population cannot be directly assessed. In such a small population, however, social behavior and habitat connectivity may provide clues to the connectivity of the population as a whole. For the Taiwanese humpback dolphin, habitat includes a very narrow strip of near shore waters. Analysis of social behavior of the population has revealed significant and high levels of interconnectedness and gregarious behavior across this habitat range (Dungan, 2011; Dungan *et al.,* 2016). The population is not subdivided into smaller social groups, as is the case for larger mainland Chinese populations (Dungan, 2011). Rather, the Taiwanese humpback dolphin exhibits high social cohesion relating to its strong population isolation, low abundance, confined geographic distribution, and anthropogenic stressors that have diminished the biological productivity of Taiwan's west coast over the last ~60 years (Dungan *et al.,* 2016; Dungan, 2011). As such, the subspecies' social structure may be unusual relative to other *S. chinensis* populations in that individual dolphins appear to be using stronger, longer-lasting relationships in order to cope with these environmental and demographic differences (Dungan *et al.,* 2016).

As previously discussed, the high social cohesion observed in the Taiwanese humpback dolphin is most likely related to cooperative calf rearing; this behavior is thought to be an adaptive response to the dolphin's degraded, geographically restricted environment (which makes it difficult for mothers to support offspring on their own), and to their small population size (which has likely increased the relatedness of individuals) (Dungan, 2011). The social structure of this small population may be disrupted by several factors. For instance, damming of freshwater input or construction and land reclamation preventing the transit of individuals across its near shore range may lead to genetic and social fragmentation. Currently, the direct impact of habitat alteration on the genetic and social connectivity of the Taiwanese humpback dolphin is based on limited data. Disruption of social structure through mortality or habitat fragmentation may hinder the transfer of information and destabilize the community structure that aids in the adaptability of the small population in the future. Current threats to habitat, fishing entanglement, and direct mortality continue to increase, and may disrupt the social stability and physical connectivity among individuals of the subspecies, particularly through the deaths of breeding females. However, the extent to which these effects directly impact the connectivity of the small and isolated population remains uncertain. Based on the narrow habitat range and isolated nature of the population, with high within-population connectivity, continued alteration and fragmentation of this connectivity due to increasingly constricted habitat may hinder its future ability to adapt to threats, and, therefore, contributes moderately to the subspecies' risk of extinction.

Diversity

While data do not exist to address the genetic diversity of the Taiwanese humpback dolphin, there are several reasons to believe that diversity is reduced in the subspecies. First, with fewer than 100 and possibly fewer than 75 individuals in this reproductively isolated subspecies (which is well below the minimum population size (*i.e.,* at least 250 individuals) required for marine mammals to resist stochastic genetic diversity loss (Huang *et al.,* 2014)), the gene pool may be experiencing critical bottlenecks. Next, social structure is highly connected in the population. This suggests that genetic substructure within the population does not exist, and diversification within the population is not supported by current environmental or behavioral mechanisms. Low diversity may contribute to low capacity for the population to adapt to changes in the marine environment projected in future climate scenarios. The combination of low diversity and small population size most likely increases the population's vulnerability to current and increasing threats. Insufficient data are available to directly determine the effect of small population size on the genetic diversity of the population. However, although insufficient data are available, evidence from abundance and social structure suggest that diversity is likely low, and may contribute moderately to the extinction risk of the subspecies.

Summary of Factors Affecting the Taiwanese Humpback Dolphin

As described above, section 4(a)(1) of the ESA and NMFS' implementing regulations (50 CFR 424.11(c)) state that we must determine whether a species (or in this case, a subspecies) is endangered or threatened because of any one or a combination of the following factors: The present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence. We evaluated whether and the extent to which each of the foregoing factors contributed to the overall extinction risk of the Taiwanese humpback dolphin. We summarize information regarding each of these threats below according to the factors specified in section 4(a)(1) of the ESA. The best available information indicates that habitat destruction, modification, or curtailment of the subspecies' habitat or range (*e.g.,* land reclamation, fresh water diversion, and pollution) and other natural or manmade factors (*e.g.,* bycatch and fisheries entanglement and vessel strikes) contribute significantly to the subspecies' risk of extinction. We also determined that the inadequacy of existing regulatory mechanisms to control these threats is also contributing significantly to the dolphin's extinction risk. We determined that overutilization for commercial, recreational, scientific or educational purposes, disease, or predation are not operative threats on the species, although we do recognize that these threats may act synergistically with the more high-risk threats. See Whittaker and Young (2017) for additional discussion of all ESA section 4(a)(1) threat categories.

Destruction, Modification, or Curtailment of the Species Habitat or Range

As previously discussed in the *Range, Distribution and Habitat Use* section of this proposed rule, the Taiwanese humpback dolphin is an obligatory shallow water inshore species known for its restricted distribution and narrow habitat selectivity; thus, degradation of coastal habitats can have significant consequences for the subspecies, including impacts to persistence and distribution of the subspecies (Karczmarski *et al.,* 2016). Like many estuarine habitats, that of the Taiwanese humpback dolphin is negatively impacted by highly concentrated human activity. In fact, out of Taiwan's human population of 23 million, approximately 90 percent live in counties bordering the west coast of Taiwan, and thus abutting the Taiwanese humpback dolphin's habitat (Ross *et al.,* 2010). In addition to high population density, the coastal region is associated with persistent industrial development, land reclamation, and freshwater diversion, all of which destroy and degrade estuarine habitat upon which the Taiwanese humpback dolphin depends (Sheehy, 2009; Thamarasi, 2014). Below, we discuss several factors that may be contributing to the destruction, modification, or curtailment of the Taiwanese humpback dolphin's habitat and/or range, including coastal development/land reclamation, freshwater diversion, and contaminants/pollutants.

Land reclamation due to industrial activity and coastal development contributes to widespread loss and degradation of Taiwanese humpback dolphin habitat. Over the past three decades, the west coast of Taiwan has undergone large alterations of coastal environments due to embankment, land reclamation, coastal construction, and shoreline development, including the construction of break-walls and dredging activities. These activities have increased over the last 50 years and are expected to continue into the future, largely unchecked (Wang *et al.,* 2004a; Wang *et al.,* 2007a; Karczmarski *et al.,* 2016). In fact, recent studies have documented extensive loss of native estuarine habitat across the Taiwanese humpback dolphin's range. For example, from 1995 to 2007, actions taken to control for erosion and flooding, as well as the expansion of structures such as fishing ports, power plants, and other public facilities, resulted in a 20 percent decline in natural coastline within the Taiwanese humpback dolphin's habitat (Wang *et al.,* 2016).

Another study estimated that land reclamation activities since 1972 have destroyed over 222 km^2 of habitat along the western coast of Taiwan, equating to 23 percent and 40 percent of dolphin habitat and foraging habitat, respectively (Karczmarski *et al.,* 2016). However, the authors note that this is likely an underestimation of true impacts, as the study only considered habitat loss due to land reclamation and did not account for other impacts to the dolphin's habitat (Karczmarski *et al.,* 2016). Results of this study indicate that the dolphin likely had a continuous distribution prior to any land reclamation activities, whereas the subspecies' current distribution appears fragmented into two zones separated by an area of potential avoidance. Therefore, Karczmarski *et al.* (2016) concluded that the current discontinuous distribution of Taiwanese humpback dolphins is likely due to varying levels of habitat degradation rather than ''natural patchiness of their environment.''

In contrast, Dares *et al.* (2017) found that Taiwanese humpback dolphins exhibited temporal and spatial variation in mean densities across their range, and that dolphin density was not directly linked to any environmental factors (*e.g.,* depth, sea surface temperature, salinity, and proximity to the nearest source of fresh water). In fact, all metrics analyzed in the study, including dolphin sightings, dolphin density, and mother-calf pairs, were higher in waters adjacent to major reclamation projects as compared to more natural waters where major reclamation activities had not occurred. Unlike other cetacean species, Taiwanese humpback dolphins are confined to a relatively small amount of suitable habitat and restricted to shallow estuarine waters; therefore, the dolphins do not have the option to relocate to other areas when high quality habitats are degraded or lost to reclamation activities (Dares *et al.,* 2017). Therefore, the authors conclude that ''rather than a real preference for waters adjacent to reclaimed coastlines'' the patterns observed in the study are likely because the locations of these large construction sites and activities are in close proximity to the two largest estuaries in the range of the subspecies (Dares *et al.,* 2017).

Despite the differences in distribution and habitat use observed in these recent studies, the large elimination of suitable habitat negatively affects the Taiwanese humpback dolphin in several ways. First, habitat fragmentation due to high levels of industrial development may reduce connectivity among estuaries along the narrowly distributed range of the population. This can physically limit the ability of individuals to associate with each other, which could have detrimental impacts on the dolphin's reproductive output and calf survivorship, particularly given the subspecies' high social cohesion and dependence on cooperative calf-rearing behaviors (Dungan *et al.,* 2016). Next, waste discharge from industrial activity leads to water and sediment contamination. Given the extremely limited availability of suitable habitat for the dolphin, use of lower quality habitat near coastal developments because of land reclamation can also expose the dolphins to areas of higher effluent discharge and pollutants (Dares *et al.,* 2017). Finally, dredging and hydraulic sand fill methods used frequently for industrial land reclamation in the area not only encroach upon limited habitat, but also have the potential to disrupt the distribution of vital prey species of the population (Ross *et al.,* 2010; Dungan *et al.,* 2011).

In addition to land reclamation, fresh water diversion likely has significant impacts to the Taiwanese humpback dolphin, as the subspecies is dependent upon freshwater inflow to support the productivity and ecosystem health of its estuarine habitat. This habitat need of freshwater inflow for the Taiwanese humpback dolphin is similar to that shown for the PRE population of humpback dolphins in mainland China, where freshwater inflow has been shown to support steady estuarine ecosystem production upon which the dolphin relies for prey (Jefferson and Hung, 2004). This freshwater flow is drastically reduced by dams, flood control, and river diversions related to industrial development and diversion for agricultural and municipal purposes (Dungan *et al.,* 2011). In Taiwan, freshwater flow from all major rivers to estuaries has decreased by as much as 80 percent due to anthropogenic diversion (Ross *et al.,* 2010). Landsat data also show a drastic reduction and weakening of annual discharge from major rivers along Taiwan's west coast since 1972, as indicated by the reduced width of the channel and alluvial fans at river mouths (Karczmarski *et al.,* 2016). Dams are already in place for many rivers in Western Taiwan, and have resulted in widespread loss of estuarine mudflat habitat, which is vital to Taiwanese humpback dolphin foraging and productivity. For example, the Coshui (Juoshuei) River that once

supplied sediment to the Waisanding sand bar has been diverted and restricted by the Formosa Petrochemical Corporation plant, resulting in shifts and shrinking of the sand bar (Chen, 2006). Taiwanese dams and their total capacity have increased exponentially over the past century, resulting in significant loss and alteration of natural estuarine systems. Finally, pollution and habitat contamination pose a threat to the health of long-lived species such as the humpback dolphin. Due to concentrated industrial and human activity, high levels of pollution are discharged into the habitat of the Taiwanese humpback dolphin (Wang *et al.,* 2007a). The sources of these pollutants include marine boat repair, fish processing, fueling stations, ship dumping, pipeline leakage, municipal and residential waste, industrial effluent, and livestock runoff (Ross *et al.,* 2010). The discharge of toxic pollutants into coastal waters of Taiwan is largely unregulated. For instance, an estimated 740,000 tons of waste oil from boats enters the marine environment in Taiwan each year (Wang *et al.,* 2007b). In addition, over 70 percent of wastewater is discharged into river systems untreated, and subsequently runs off into near shore estuarine habitat (Chen *et al.,* 2007). Particularly damaging are persistent organic, heavy metal, and trace metal pollutants which negatively interact with cetacean development and reproduction and are associated with carcinogenic and teratogenic properties (Reijnders, 2003; Ramu *et al.,* 2005). These toxins have been found to accumulate and become concentrated in the marine sediment off the coast of Taiwan affected by freshwater input, impacting the Taiwanese humpback dolphin habitat (Chen *et al.,* 2007; Hung *et al.,* 2010). Even toxins which were banned in the 1980s, such as polychlorinated biphenyls (PCBs), remain present in poorly maintained machinery and industrial equipment, thus their accumulation is expected to continue in the future (Chou *et al.,* 2004).

Pollution can affect the Taiwanese humpback dolphin in two ways: Directly influencing the health of the animal or influencing prey that the dolphin later ingests, thus leading to bioaccumulation of toxins in the dolphin. To date, only one study has analyzed the potential bioaccumulation of toxins specifically for the Taiwanese humpback dolphin population. Riehl *et al.* (2012), using a life-history based contaminant accumulation model for marine mammals, estimated that 68 percent of the population is at risk for immunotoxicity based on a 17 mg/kg lipid weight (LW) threshold for immunotoxicity (noting that there are several lower level thresholds shown to impact the health of marine mammals). Model outputs using a ''best-case'' scenario (*e.g.,* diet of 100 percent *Johnius* spp.) resulted in average adult males reaching the threshold concentration just prior to turning 9.3 years of age. In contrast, the average adult female would only acquire enough PCBs to reach concentrations of 2.84 mg/kg LW due to offloading much of their body burden to their offspring after giving birth (Riehl *et al.,* 2012). Although the study was based on limited species-specific data inputs to the model, humpback dolphins in the PRE, affected by similar threats of industrial development and habitat contamination, have demonstrated elevated concentrations of organochlorines including PCBs, hexachlorocyclohexanes (HCHs), and dichlorodiphenyltrichloroethanes (DDTs) (Parsons, 2004; Ramu *et al.,* 2005; Jefferson *et al.,* 2006). For example, in humpback dolphins off the coast of Hong Kong, the concentration of DDTs was as high as 470 μg/g LW, and PCBs as high as 78 μg/g (Ramu *et al.,* 2005). Toxicity analysis (which compares these concentrations with known toxic effects from other marine mammals) strongly suggests that these chemicals impair reproduction and suppress immune function in the Indo-Pacific humpback dolphin (Ramu *et al.,* 2005). This is particularly concerning given the already low reproductive rate of the dolphin.

Overutilization for Commercial, Recreational, Scientific or Educational Purposes

We assessed two factors that may contribute to the overutilization of the subspecies: Whale watching and scientific research. While some whale watching and recreational observation of marine mammals occurs off the coast of Taiwan, it is unlikely that these activities contribute heavily to the extinction risk for the Taiwanese humpback dolphin relative to other threats. However, some tours targeting the Taiwanese humpback dolphin have been permitted to operate despite recommendations against any boat-based dolphin watch tour targeting the subspecies (Wang, pers. comm., 2017; Wang *et al.,* 2007a). Therefore, while whale watching tours on their own are unlikely to pose a significant threat to the dolphin, any additional stressor on the population likely acts synergistically with other more prominent threats and contributes to the subspecies' extinction risk.

It is also unlikely that scientific monitoring has a negative impact on the Taiwanese humpback dolphin. The dolphin was only first observed in 2002, and since then several scientific surveys have sought to characterize its status and abundance. The low frequency of these surveys, and reliance on non-invasive photo identification, are unlikely to pose serious threats to the subspecies.

Inadequacy of Existing Regulatory Mechanisms

There are few regulations in place for the protection of the Taiwanese humpback dolphin. For example, the Taiwanese humpback dolphin is listed under Taiwan's Wildlife Conservation Act as a Level I protected species, which grants species the highest level of legal protection. Article 4 of the Act designates humpback dolphins as ''protected wildlife'', and Article 18 states that these animals are ''not to be disturbed, abused, hunted [or] killed'' (Wang *et al.,* 2016). Nonetheless, there appear to be no associated regulatory or enforcement actions for the prevention of bycatch and entanglement of the population, or extensive habitat degradation (Wang *et al.,* 2016). For example, several years after Ross *et al.* (2010) published recommendations for legally protecting the confirmed and suitable habitat for the Taiwanese humpback dolphins, the Forestry Bureau of Taiwan proposed ''Major Wildlife Habitat'' for the dolphins in 2014; however, the proposed protected area did not cover the minimum area recommended for protection (Wang *et al.,* 2016). Given the already restricted amount of suitable habitat available to the dolphin, providing legal protection for an area that does not cover the subspecies' entire distribution may put the dolphins at risk of encountering increased threats occurring just outside the protected area (also known as the ''edge effect''; see original citations in Wang *et al.,* 2016). Furthermore, regardless of potential inadequacies of the proposed protected area, the ''Major Wildlife Habitat'' proposal has not yet been implemented (Wang *et al.,* 2016). Therefore, based on current knowledge of the population, and despite providing the highest level of legislative protection, the Wildlife Conservation Act appears inadequate to control for the primary threats to the species and has thus far proven unsuccessful in slowing population decline.

While many recommendations have been made to guide the future conservation and recovery of the

population (Wang *et al.,* 2004a; Wang *et al.,* 2007a; Ross *et al.,* 2010; Ross *et al.,* 2011), no current regulatory mechanisms are in place to address the major threats to the subspecies and its future viability. Development and industrialization of the region are largely unregulated. Likewise, fishing and marine mammal bycatch are also unregulated.

Therefore, based on the foregoing information, we conclude that existing regulations for the Taiwanese humpback dolphin are inadequate. That is, the laws that are in place currently are not effectively controlling for the main identified threats to the species (*e.g.,* habitat destruction and fishing interactions) and will likely not prevent future population decline.

Other Natural or Manmade Factors Affecting Its Continued Existence

We assessed several potential threats that fall under the category of Other Natural or Manmade Factors, including bycatch and entanglement in fishing gear, vessel strikes, acoustic disturbance, and climate change. Among these threats, injury and mortality due to bycatch and entanglement in fishing gear and vessel strikes were by far the most significant threats to the continued existence of the Taiwanese humpback dolphin. We discuss these threats in detail below. Detailed information on the other threats (*i.e.,* acoustic disturbance and climate change) can be found in the draft status review report (Whittaker and Young, 2017).

As noted previously, entanglement and mutilation due to interactions with fishing gear are likely the most serious direct and immediate threat to the Taiwanese humpback dolphin (Wang *et al.,* 2016; Wang *et al.,* 2017). Bycatch poses a significant threat to small cetaceans in general, where entanglement in fishing gear results in widespread injury and mortality (Read *et al.,* 2006). Taiwanese fisheries reports indicate that entanglement in fishing gear kills thousands of small cetaceans in the region (Chou, 2006). Although there are many types of fishing gear used throughout the subspecies' habitat, the two fishing gear types most hazardous to small cetaceans are gillnets and trammel nets, thousands of which are set in coastal waters off western Taiwan (Dungan *et al.,* 2011; Slooten *et al.,* 2013).

Injury due to entanglement is evident in the Taiwanese humpback dolphin population, identified by characteristic markings on the body, including constrictive line wraps, and direct observation of gear wrapped around the dolphin (Slooten *et al.,* 2013). One study determined that over 30 percent of the Taiwanese humpback dolphin population exhibits evidence of fisheries interactions including wounds, scars, and entanglement (Wang *et al.,* 2007a; Slooten *et al.,* 2013), with 59.2 percent of injuries (lethal and non-lethal) observed confirmed to have originated from fisheries interactions (Slooten *et al.,* 2013). In a more recent study that expands upon Slooten *et al.* (2013), Wang *et al.* (2017) determined that nearly 60 percent of the individuals examined in the study (n = 78) bore major injuries caused by human activities, with 93 major injuries recorded on 46 individuals. The authors defined ''major injuries'' as those that would likely comprise the dolphin's health, survivorship or reproductive potential. Not only was a large proportion of the population injured, more than half of the individuals suffered multiple injuries, with several new injuries observed. Consequently, this means that the risk of injury by human activities is ongoing. In fact, from 2007 to 2015, 11 new human-caused injuries were recorded on 9 individuals. Therefore, the population incurred a minimum of 1.38 new injuries each year of the study, which resulted in a total major injury rate of 1.13 individuals/year (Wang *et al.,* 2017). However, the authors note that despite the fact that all metrics evaluated in the study were high, they were still likely underestimates of the total impacts. For example, fatal injuries in which the animal dies immediately or soon after could not be considered and thus were not factored into the overall measure of impact. Two individuals have been found dead since 2009 with indications of gillnet entanglement injuries (Wang *et al.,* 2017) and thus far, there has been no action to reduce any of the major threats identified more than a decade ago at the first workshop on the conservation and research needs of the subspecies (Wang *et al.,* 2004a; Wang *et al.,* 2017). Overall, without immediate actions to control for threats from local fisheries (especially net fisheries) and other major threats identified to the subspecies, the Taiwanese humpback dolphin likely faces imminent extinction (Wang *et al.,* 2017).

In addition to direct effects of fishing activity on the Taiwanese humpback dolphin, indirect effects of fishing include: Depletion of prey resources, pollution, noise disturbance, altered behavioral responses to prey aggregation in fishing gear, and potential changes to social structure arising from the deaths of individuals. Individuals of the Taiwanese humpback dolphin have shown potential evidence of disturbance due to such effects (Slooten *et al.,* 2013). For example, recent surveys have observed dolphins with emaciated and poor body condition, suggesting declines in prey abundance, increased foraging effort, or disease (Slooten *et al.,* 2013). While most Taiwanese humpback dolphin prey species are small and not commercially valuable (Barros *et al.,* 2004), decreases in their abundance due to bycatch and subsequent fishmeal production may lead to over-exploitation, and reduce prey availability for the dolphin (Slooten *et al.,* 2013). Increased prey aggregation due to fishing can also attract mothers and calves, putting them at greater risk of entanglement and injury; this has been observed in the PRE population, and is most likely behavior common to the Taiwanese humpback dolphin as well (Jefferson, 2000). Finally, death and injury of individuals due to fishing activity can disrupt social structure, which may affect the survival of calves or transfer of generational information throughout the social network. For example, loss of a mature female may impact the trajectory of learning and survival techniques passed on to a calf in its first several years.

In addition to bycatch and entanglement, fishing activities can affect dolphins by increasing the likelihood of vessel strikes due to increased boat traffic. The waters off Taiwan are highly concentrated with human boat activity, including transportation, industrial shipping, commercial fishing, sand extraction, harbor dredging, and commercial dolphin watching. This activity is unmitigated, and its concentration has increased dramatically over the past few decades. In fact, the trend in boating and fishing activity in the region has increased by more than 750 percent since the 1950s, and its increase is expected to continue into the foreseeable future (Huang and Chuang, 2010). Fishing vessels alone contribute a large fraction of this boating activity; an estimated 6,300 fishing vessels are currently active inside the dolphins' habitat (operating from ports in the six coastal counties fronting the dolphins' habitat), and 45 percent of them are regularly engaged in fishing coastal waters (Slooten *et al.,* 2013). The fleet is over-capitalized due to technological improvements, and thus fishing pressure and negative interactions between fishing gear/vessels and cetaceans are increasing (Wang *et al.,* 2007b). Additionally, this traffic is

unregulated, and poses a threat to the limited and narrow habitat available to the subspecies. The noise from these vessels may be disorienting for the dolphins, which rely upon acoustic sensory systems to communicate, forage, and interact with their environment, and thus increase the potential for a strike. In addition, individuals, especially females and calves, may be attracted to fishing vessels due to elevated prey concentration, which can lead to mortality via vessel strike. Humpback dolphins off the coast of Hong Kong, which interact with comparable levels of vessel traffic and face similar threats to habitat, have demonstrated unmistakable evidence of propeller cuts on their bodies, and vessel strikes have been determined as the conclusive cause of mortality in a high proportion of stranding incidents (Jefferson, 2000).

Aside from direct mortality, interaction with vessel traffic may alter behavior of the dolphin, causing stress, reducing foraging efficiency, increasing the threat of predation, and altering behaviors that support its productivity. For instance, in individuals off the coast of Hong Kong, mother-calf pairs demonstrated the greatest level of disturbance by vessel traffic; it has been hypothesized that separation of the calf due to vessel disturbance could easily increase risk of predation, aside from the direct injury of a vessel strike (Van Parijs and Corkeron, 2001).

Overall Extinction Risk Summary

We identified several threats that likely affect the continued survival of the Taiwanese humpback dolphin, including destruction, modification, and curtailment of its habitat (*e.g.,* land reclamation, industrial, agricultural, and municipal pollution, and river diversion), and other natural or manmade factors, such as bycatch and entanglement in fishing gear, vessel strikes, and acoustic disturbance. Of these threats, destruction and modification of habitat through land reclamation, river flow diversion, and pollution, as well as entanglement and bycatch pose the highest risk of extinction for the Taiwanese humpback dolphin. These threats are immediate, and intensity of these threats is likely to increase in the future. Regulations to mitigate these threats are not currently in place, and plans for mitigation have not yet been implemented. The analysis of demographic factors above identified several characteristics that elevate the population's vulnerability to these threats. For example, heavily diminished and declining population size drastically elevates the impact of even a single mortality event. Evidence suggests that diversity of the population is low, which reduces the resiliency of the population to threats and changes in its habitat. The population appears to be cohesive, most likely due to low population size and the narrow extent of its habitat. The potential for future disruption of social structure due to habitat fragmentation may heavily impact the transfer of generational information, calf survival, and foraging success. Finally, the population exhibits naturally low rates of reproduction and productivity, and data suggest that stress and habitat pollution act to further reduce the population's fecundity and productivity. Given these demographic characteristics, the aforementioned threats work synergistically to disrupt social structure, increase stress, limit food availability, and reduce fecundity while resulting in direct loss through mortality, injury, and prevention of population recovery. Due to the immediacy and intensity of threats, and demographic characteristics increasing the vulnerability of the population, we have concluded that the Taiwanese humpback dolphin has an overall high risk of extinction.

Conservation Efforts

Section 4(b)(1)(A) of the ESA requires the Secretary, when making a listing determination for a species, to take into account those efforts, if any, being made by any State or foreign nation to protect the species.

Non-governmental organizations (NGOs), scientists, activists and residents of Taiwan have invested significant amounts of time and resources into the conservation of the Taiwanese humpback dolphin (Wang *et al.,* 2016). For example, a series of workshops have been conducted to discuss the conservation of the Taiwanese humpback dolphin. These took place in 2004, 2007, 2011 and 2014, bringing together scientists, policy makers, and international partners to discuss conservation options for the subspecies. The overarching goals of each workshop were to define the conservation status, current threats, and outline potential conservation measures that would best help to improve the status of the subspecies. Since these workshops, research on the population has increased greatly, and understanding of the subspecies' abundance and population trends have improved. However, actions have yet to be taken by the local government to reduce any of the major existing threats faced by the subspecies (Wang *et al.,* 2016). We could not find any additional information on protective efforts for the Taiwanese humpback dolphin that would reduce its current risk of extinction.

Proposed Determination

Section 4(b)(1) of the ESA requires that we make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and taking into account those efforts, if any, being made by any state or foreign nation, or political subdivisions thereof, to protect and conserve the species. We have independently reviewed the best available scientific and commercial information, including the petition, public comments submitted on the 90-day finding (81 FR 1376; January 12, 2016), the draft status review report (Whittaker and Young, 2017), and other published and unpublished information, and we have consulted with species experts and individuals familiar with the Taiwanese humpback dolphin subspecies. We considered each of the section 4(a)(1) factors to determine whether it contributed significantly to the extinction risk of the species on its own. We also considered the combination of those factors to determine whether they collectively contributed significantly to the extinction risk of the species. Therefore, our determination set forth below is based on a synthesis and integration of the foregoing information, factors and considerations, and their effects on the status of the subspecies throughout its range.

We conclude that the Taiwanese humpback dolphin is presently in danger of extinction throughout its range. We summarize the factors supporting this conclusion as follows: (1) The best available information indicates that the subspecies has a critically small population of less than 100 individuals, which is likely declining; (2) the Taiwanese humpback dolphin has a very restricted range, occurring only in the shallow waters off the western coast of Taiwan; (3) the subspecies possesses life history characteristics that increase its vulnerability to threats, including that it is long-lived and has a late age of maturity, slow population growth, and low rate of reproduction and fecundity; (4) the subspecies is confined to limited habitat in a heavily impacted area of coastline where ongoing habitat destruction (including coastal development, land reclamation, and fresh water diversion) contributes to a high risk of extinction; (5) the Taiwanese humpback dolphin is

experiencing unsustainable rates of fisheries interactions, including mortality and major injuries due to bycatch and entanglement in fishing gear; and (6) existing regulatory mechanisms are inadequate for addressing the most important threats of habitat destruction and fisheries interactions.

As a result of the foregoing findings, which are based on the best scientific and commercial data available, we conclude that the Taiwanese humpback dolphin is presently in danger of extinction throughout all of its range. Accordingly, the Taiwanese humpback dolphin meets the definition of an endangered species, and thus warrants listing as an endangered species at this time.

Effects of Listing

Conservation measures provided for species listed as endangered or threatened under the ESA include the development and implementation of recovery plans (16 U.S.C. 1533(f)); designation of critical habitat, if prudent and determinable (16 U.S.C. 1533(a)(3)(A)); a requirement that Federal agencies consult with NMFS under section 7 of the ESA to ensure their actions do not jeopardize the species or result in adverse modification or destruction of designated critical habitat (16 U.S.C. 1536); and, for endangered species, prohibitions on the import and export of any endangered species; the sale and offering for sale of such species in interstate or foreign commerce; the delivery, receipt, carriage, shipment, or transport of such species in interstate or foreign commerce and in the course of a commercial activity; and the ''take'' of such species within the U.S., within the U.S. territorial sea, or on the high seas (16 U.S.C. 1538). Recognition of the species' imperiled status through listing may also promote conservation actions by Federal and state agencies, foreign entities, private groups, and individuals.

Identifying Section 7 Consultation Requirements

Section 7(a)(2) (16 U.S.C. 1536(a)(2)) of the ESA and NMFS/FWS regulations require Federal agencies to confer with us on actions likely to jeopardize the continued existence of species proposed for listing, or that result in the destruction or adverse modification of proposed critical habitat. If a proposed species is ultimately listed, Federal agencies must consult on any action they authorize, fund, or carry out if those actions may affect the listed species or its critical habitat and ensure that such actions are not likely to jeopardize the continued existence of the species or result in adverse modification or destruction of critical habitat should it be designated. It is unlikely that the listing of this subspecies under the ESA will increase the number of section 7 consultations because the subspecies occurs outside of the United States and is unlikely to be affected by Federal actions.

Critical Habitat

Critical habitat is defined in section 3 of the 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'' means the use of all methods and procedures needed to bring the species to the point at which listing under the ESA is no longer necessary. Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the extent prudent and determinable, critical habitat be designated concurrently with the listing of a species. However, critical habitat cannot be designated in foreign countries or other areas outside U.S. jurisdiction (50 CFR 424.12(g)). The Taiwanese humpback dolphin is endemic to Taiwan and does not occur within areas under U.S. jurisdiction. There is no basis to conclude that any unoccupied areas under U.S. jurisdiction are essential for the conservation of the subspecies. Therefore, we do not intend to propose any critical habitat designations for the subspecies.

Public Comments Solicited on Listing

To ensure that the final action resulting from this proposal will be as accurate and effective as possible, we solicit comments and suggestions from the public, other governmental agencies, the scientific community, industry, environmental groups, and any other interested parties. Comments are encouraged on this proposal (See **DATES** and **ADDRESSES**). Specifically, we are interested in new or updated information regarding: (1) The range, distribution, and abundance of the Taiwanese humpback dolphin; (2) the genetics and population structure of the Taiwanese humpback dolphin; (3) habitat within the range of the Taiwanese humpback dolphin that was present in the past, but may have been lost over time; (4) any threats to the Taiwanese humpback dolphin (*e.g.,* fishing gear entanglement, habitat destruction, etc.); (5) current or planned activities within the range of the Taiwanese humpback dolphin and their possible impact on the subspecies; (6) recent observations or sampling of the Taiwanese humpback dolphin; and (7) efforts being made to protect the Taiwanese humpback dolphin.

Role of Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing minimum peer review standards, a transparent process for public disclosure of peer review planning, and opportunities for public participation. The OMB Bulletin, implemented under the Information Quality Act (Pub. L. 106–554), is intended to enhance the quality and credibility of the Federal government's scientific information, and applies to influential scientific information or highly influential scientific assessments disseminated on or after June 16, 2005. To satisfy our requirements under the OMB Bulletin, we obtained independent peer review of the status review report. Independent specialists were selected from the academic and scientific community for this review. All peer reviewer comments were addressed prior to dissemination of the final status review report and publication of this proposed rule.

References

A complete list of all references cited herein is available upon request (see **FOR FURTHER INFORMATION CONTACT**).

Classification

National Environmental Policy Act

Section 4(b)(1)(A) of the ESA restricts the information that may be considered when assessing species for listing and sets the basis upon which listing determinations must be made. Based on the requirements in section 4(b)(1)(A) of the ESA and the opinion in *Pacific Legal Foundation* v. *Andrus,* 675 F. 2d 825 (6th Cir. 1981), we have concluded that ESA listing actions are not subject to the environmental assessment requirements of the National Environmental Policy Act (NEPA).

Executive Order 12866, Regulatory Flexibility Act, and Paperwork Reduction Act

As noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered

when assessing the status of a species. Therefore, the economic analysis requirements of the Regulatory Flexibility Act are not applicable to the listing process.

In addition, this proposed rule is exempt from review under Executive Order 12866. This proposed rule does not contain a collection-of-information requirement for the purposes of the Paperwork Reduction Act.

Executive Order 13132, Federalism

In accordance with E.O. 13132, we determined that this proposed rule does not have significant Federalism effects and that a Federalism assessment is not required. Given that this subspecies occurs entirely outside of U.S. waters, there will be no federalism impacts because listing the subspecies will not affect any state programs.

List of Subjects in 50 CFR Part 224

Endangered and threatened species, Exports, Imports, Transportation.

Dated: June 20, 2017.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 224 is proposed to be amended as follows:

PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 224 continues to read as follows:

Authority: 16 U.S.C. 1531–1543 and 16 U.S.C 1361 *et seq.*

■ 2. In § 224.101, amend the table in paragraph (h), by adding an entry, by common name, ''Dolphin, Taiwanese humpback'' under ''Marine Mammals'' in alphabetical order, to read as follows:

§ 224.101 Enumeration of endangered marine and anadromous species.

* * * * *

(h) * * *

Species [1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
*	*	*	*	*	*
MARINE MAMMALS					
*	*	*	*	*	*
Dolphin, Taiwanese humpback.	*Sousa chinensis taiwanensis*.	Entire subspecies	[Insert **Federal Register** page where the document begins], [date of publication when published as a final rule].	NA	NA
*	*	*	*	*	*

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722; February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612; November 20, 1991).

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