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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. 130122061-3061-01]

RIN 0648-XC463

Endangered and Threatened Wildlife; 90-Day Finding on a Petition to List the Whale Shark as Threatened or Endangered Under the Endangered Species Act

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

ACTION: Notice of 90-day petition finding.

SUMMARY: We (NMFS) announce a 90-day finding on a petition to list the whale shark (*Rhincodon typus*) as threatened or endangered under the Endangered Species Act (ESA). We find that the petition does not present substantial scientific or commercial information indicating that the petitioned action may be warranted.

ADDRESSES: Copies of the petition and related materials are available upon request from the Director, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, or online at: <http://www.nmfs.noaa.gov/pr/species/negative.htm>.

FOR FURTHER INFORMATION CONTACT: Lisa Manning, Office of Protected Resources, 301-427-8466.

SUPPLEMENTARY INFORMATION:

Background

On December 21, 2012, we received a petition from the WildEarth Guardians to list the whale shark (Rhincodon typus) as threatened or endangered under the ESA and to designate critical habitat under the ESA. Copies of this petition are available from us (see ADDRESSES).

Section 4(b)(3)(A) of the ESA of 1973, as amended (U.S.C. 1531 et seq.), requires, to the maximum extent practicable, that within 90 days of receipt of a petition to list a species as threatened or endangered, the Secretary of Commerce make a finding on whether that petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted, and to promptly publish the finding in the Federal Register (16 U.S.C. 1533(b)(3)(A)). When we find that substantial scientific or commercial information in a petition indicates the petitioned action may be warranted (a “positive 90-day finding”), we are required to promptly commence a review of the status of the species concerned, which includes conducting a comprehensive review of the best available scientific and commercial information. Within 12 months of receiving the petition, we must conclude the review with a finding as to whether, in fact, the petitioned action is warranted. Because the finding at the 12-month stage is based on a significantly more thorough review of the available information, a “may be warranted” finding at the 90-day stage does not prejudice the outcome of the status review.

Under the ESA, a listing determination may address a “species,” which is defined to also include subspecies and, for any vertebrate species, any distinct population segment (DPS) that interbreeds when mature (16 U.S.C. 1532(16)). A joint NOAA-U.S. Fish and Wildlife Service (USFWS) policy clarifies the agencies’ interpretation of the phrase “distinct population segment” for the purposes of listing, delisting, and reclassifying a species under the ESA (“DPS Policy”; 61 FR 4722; February 7, 1996). A species, subspecies, or DPS is “endangered” if it is in danger

of extinction throughout all or a significant portion of its range, and “threatened” if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (ESA sections 3(6) and 3(20), respectively; 16 U.S.C. 1532(6) and (20)). Pursuant to the ESA and our implementing regulations, the determination of whether a species is threatened or endangered shall be based on any one or a combination of the following five section 4(a)(1) factors: the present or threatened destruction, modification, or curtailment of habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; inadequacy of existing regulatory mechanisms; and any other natural or manmade factors affecting the species’ existence (16 U.S.C. 1533(a)(1), 50 CFR 424.11(c)).

ESA-implementing regulations issued jointly by NMFS and USFWS (50 CFR 424.14(b)) define “substantial information” in the context of reviewing a petition to list, delist, or reclassify a species as the amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted. When evaluating whether substantial information is contained in a petition, we must consider whether the petition: (1) clearly indicates the administrative measure recommended and gives the scientific and any common name of the species involved; (2) contains detailed narrative justification for the recommended measure, describing, based on available information, past and present numbers and distribution of the species involved and any threats faced by the species; (3) provides information regarding the status of the species over all or a significant portion of its range; and (4) is accompanied by the appropriate supporting documentation in the form of bibliographic references, reprints of pertinent publications, copies of reports or letters from authorities, and maps (50 CFR 424.14(b)(2)).

At the 90-day stage, we evaluate the petitioner's request based upon the information in the petition including its references, and the information readily available in our files. We do not conduct additional research, and we do not solicit information from parties outside the agency to help us in evaluating the petition. We will accept the petitioner's sources and characterizations of the information presented, if they appear to be based on accepted scientific principles, unless we have specific information in our files that indicates the petition's information is incorrect, unreliable, obsolete, or otherwise irrelevant to the requested action. Information that is susceptible to more than one interpretation or that is contradicted by other available information will not be dismissed at the 90-day finding stage, so long as it is reliable and a reasonable person would conclude that it supports the petitioner's assertions. Conclusive information indicating the species may meet the ESA's requirements for listing is not required to make a positive 90-day finding. We will not conclude that a lack of specific information alone negates a positive 90-day finding, if a reasonable person would conclude that the unknown information itself suggests an extinction risk of concern for the species at issue.

To make a 90-day finding on a petition to list a species, we evaluate whether the petition presents substantial scientific or commercial information indicating the subject species may be either threatened or endangered, as defined by the ESA. First, we evaluate whether the information presented in the petition, along with the information readily available in our files, indicates that the petitioned entity constitutes a "species" eligible for listing under the ESA. Next, we evaluate whether the information indicates that the species at issue faces extinction risk that is cause for concern; this may be indicated in information expressly discussing the species' status and trends, or in information describing impacts and threats to the species. We evaluate

any information on specific demographic factors pertinent to evaluating extinction risk for the species at issue (e.g., population abundance and trends, productivity, spatial structure, age structure, sex ratio, diversity, current and historical range, habitat integrity or fragmentation), and the potential contribution of identified demographic risks to extinction risk for the species. We then evaluate the potential links between these demographic risks and the causative impacts and threats identified in section 4(a)(1).

Information presented on impacts or threats should be specific to the species and should reasonably suggest that one or more of these factors may be operative threats that act or have acted on the species to the point that it may warrant protection under the ESA. Broad statements about generalized threats to the species, or identification of factors that could negatively impact a species, do not constitute substantial information that listing may be warranted. We look for information indicating that not only is the particular species exposed to a factor, but that the species may be responding in a negative fashion; then we assess the potential significance of that negative response.

Many petitions identify risk classifications made by non-governmental organizations, such as the International Union on the Conservation of Nature (IUCN), the American Fisheries Society, or NatureServe, as evidence of extinction risk for a species. Risk classifications by other organizations or made under other Federal or state statutes may be informative, but such classification alone may not provide the rationale for a positive 90-day finding under the ESA. For example, as explained by NatureServe, their assessments of a species' conservation status do "not constitute a recommendation by NatureServe for listing under the U.S. Endangered Species Act" because NatureServe assessments "have different criteria, evidence requirements, purposes

and taxonomic coverage than government lists of endangered and threatened species, and therefore these two types of lists should not be expected to coincide”

(<http://www.natureserve.org/prodServices/statusAssessment.jsp>). Thus, when a petition cites such classifications, we will evaluate the source of information that the classification is based upon in light of the standards on extinction risk and impacts or threats discussed above.

Whale Shark Species Description

The whale shark is the world’s largest fish and is one of three large species of filter-feeding sharks; the others being the basking shark (*Cetorhinus maximus*) and the megamouth (*Megachasma pelagios*) shark. Among the whale shark’s distinctive features are its large, first dorsal fin; large pectoral fins; and an extremely large, transverse mouth near the front end of the head. Also distinctive is the checkerboard pattern of white or yellowish spots and horizontal and vertical stripes over much of its body. Maximum size is not known. The largest reported whale shark was 20 meters (m) total length (TL), but reports of specimens longer than 12 m are uncommon in the literature (Compagno, 2002; Rowat and Brooks, 2012). Longevity is also unknown but has been tentatively suggested to be 60-100 years (Pauly et al., 2000; as cited in Norman, 2005).

Whale sharks feed on a variety of planktonic and nektonic organisms (e.g., copepods, sardines, anchovies, squid) and gametes. Stable-isotope analysis of whale shark muscle tissue suggests that as whale sharks grow, consumption of small fish and larger zooplankton of higher trophic levels increases (Borrell et al., 2010). Seasonal feeding aggregations of whale sharks occur in many locations throughout the range (e.g., Belize, Tanzania, Seychelles, Western Australia) in association with localized increases in prey availability such as during fish, crab or

coral spawning events or plankton blooms (Colman, 1997; Roberts and Graham, 2003; Sequeira et al., 2013). Whale sharks are fairly versatile in terms of their feeding methods, which can be one of multiple forms: ram, or active, filter feeding at the water surface; stationary suction feeding; and passive, sub-surface filter feeding (Motta et al., 2010).

Growth and reproduction are poorly described for this species. Basic characteristics, like gestation length, age at maturity, and frequency of reproduction, are not yet known. Growth rates calculated for captive whale sharks range from about 22 to 240 centimeters (cm) per year and vary with initial size and sex of the shark (Rowat and Brooks, 2012). Growth rate estimates for wild whale sharks are highly variable (e.g., 3-82 cm per year) and are confounded by large associated errors (Rowat and Brooks, 2012). Male whale sharks are thought to reach sexual maturity around 7 - 9 m TL, and females are thought to reach maturity at about 9 m TL or larger (Ramírez-Macías et al., 2012; Rowat and Brooks, 2012). Using assumed growth rates and maximum lengths, the age at maturity has been roughly estimated at 8.9 years and 21.4 years by different authors (reviewed in Rowat and Brooks, 2012). Whale sharks are ovoviviparous – meaning the egg cases hatch in utero, and females give birth to live young. Whale sharks are also considered to be highly fecund based on the capture of a pregnant female off the coast of Taiwan in 1995 that contained over 300 embryos, which greatly exceeds the number of embryos reported for any other shark species (Joung et al., 1996). Observations of pregnant or large females are rare, but they have been reported to occur in the southern Sea of Cortez, Mexico; the Galapagos; and the Philippines (Rowat and Brooks, 2012). A total of only 19 small juveniles (less than 1.5 m TL) have been reported in the literature, and available data suggest that size at birth may vary considerably (Rowat and Brooks, 2012). Small, free-living whale sharks (55 to

59 cm TL) have been found off tropical West Africa in the East-Central Atlantic and near Central America in the eastern Pacific, near continental waters and in the open ocean far from land (Wolfson, 1983; Kukuyev, 1996; as cited in Compagno, 2002), suggesting that young may be born in the ocean and that pupping and possibly nursery habitat exist there (Compagno, 2002).

Whale sharks are circumglobal and occur in all tropical and warm-temperate seas (Rowat and Brooks, 2012). Although generally occurring far offshore, whale sharks are also found in more shallow, coastal waters. Whale sharks are typically encountered near the surface and are characterized as epipelagic, but tagging studies reveal they can also dive to mesopelagic (200 – 1,000 m) and even bathypelagic depths (> 1,000 m; Rowat and Brooks, 2012). Satellite telemetry data show that while some whale sharks may remain for relatively long periods of time within a given oceanic region, they are also highly migratory and capable of traveling 1,000s of kilometers (km) in several months (Sequeira et al., 2013). Mean movement distances of whale sharks tagged in two separate studies, one conducted in the Sea of Cortez (Mexico) and one in the Sulu Sea (Malaysia), were very similar - 24 km and 24.7 km per day, respectively (Eckert et al., 2002; Eckert and Stewart, 2001).

Specific habitat requirements of whale sharks are not yet fully understood; however, efforts have been made to elucidate what environmental features drive whale shark migrations and habitat preferences. Episodic aggregations of whale sharks in warm, coastal habitats have been mainly linked to food blooms, sea surface temperature, and currents (Coleman, 1997; Sequeira et al., 2013). Wilson et al. (2001) examined the seasonal feeding aggregations at Ningaloo Reef, Western Australia, and found evidence suggesting a linkage between whale shark

abundance and oceanographic processes, with greater abundances of whale sharks associated with La Niña years. In terms of pelagic habitats, modeling efforts indicate that sea surface temperature is a main predictor of whale shark distribution in the open ocean (Sequeira et al., 2011). In one study, which modeled 1,185 whale shark sightings from a 17- year time series, 90 percent of the whale shark sightings occurred within the fairly narrow temperature range of 26.5 to 30 degrees Celsius (Sequeira et al., 2011). Other factors such as distance to continental shelf edge, water depth, and chlorophyll a, have also been shown to have some correlation with whale sharks distribution (Sequeira et al., 2011; McKinney et al., 2012). Interestingly, surface currents do not appear to have a significant influence on migration. Sleeman et al. (2010) found that whale sharks tagged at Ningaloo Reef traveled actively and independently of surface currents despite the added energetic costs of doing so.

Analysis of the Petition

The petition clearly indicates the administrative measure recommended and gives the scientific and any common name of the species involved. The petition also contains a narrative justification for the recommended measure and provides information on the species' taxonomy, geographic distribution and threats. Limited information is provided on past and present numbers, population status and trends. The petition is accompanied by internet articles, emails, websites, unpublished reports, Federal Register notices, and published literature. A synopsis of our analysis of the information provided in the petition and readily available in our files is provided below.

Distinct Population Segments

The petition requests that we list whale sharks throughout their range or list any DPSs that we may find to exist. To meet the definition of a DPS, a population must be both discrete from other populations of the species and significant to the species as a whole (61 FR 4722; February 7, 1996). The petition does not suggest possible delineations of particular populations or provide information to identify particular DPSs of whale sharks. The petition does note, however: “While it is entirely possible that there are subpopulations of whale sharks within each ocean or region, the relative scarcity of information on the species and its highly migratory nature make it difficult to know for sure whether such subpopulations exist.”

Information in our files indicates there is low genetic differentiation among geographic whale shark populations and a history of gene flow among populations. One study, using mitochondrial DNA, found that the most common haplotype is globally distributed and that differentiation among the three major ocean basins is low, especially relative to other globally distributed shark species (Castro et al., 2007). A second study, using nuclear DNA, also found low differentiation among whale sharks from geographically distinct populations (Schmidt et al., 2009). Data from both studies indicate significant gene flow among Indian and Pacific Ocean populations and a lower level of interaction with Atlantic populations (Castro et al., 2007; Schmidt et al., 2009). Satellite tracking data show that whale sharks make frequent, regional and at least occasional, longer-range migrations, providing some behavioral evidence to support the genetic data (reviewed in Sequeira et al., 2013). A recent review article synthesizes the existing genetic, telemetry and sightings data and presents a conceptual model of whale sharks as a single, global meta-population (Sequeira et al., 2013). These authors suggest that whale sharks can move among the three major ocean basins every 2-4 years, thereby connecting populations

on a generational time-scale (Sequeira *et al.*, 2013). Based on this information, we conclude that delineation of discrete populations and evaluation of the significance of those populations are not currently possible. Thus, in evaluating the petition, we considered the taxonomic species.

Whale Shark Status and Trends

The petition states that population size is unknown for whale sharks but points to its “vulnerable” status on the IUCN (International Union for Conservation of Nature and Natural Resources) Red List and its Appendix II listing under CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) as evidence of an imperiled status. The petition asserts that a global decline of whale sharks has been caused mainly by commercial fishing – both direct harvest and bycatch - and points to the declines in whale shark landings that occurred during the late 1990’s in Taiwan and the Philippines. Additional information on historical or present abundance or population trends is not presented in the petition.

Both Taiwan and the Philippines have closed their whale shark fisheries, as have multiple, other range states (Rowat and Brooks, 2012). The threat of commercial fishing is discussed in more detail below (see “Overutilization”).

According to Article II of CITES, species listed on Appendix II are those that are “not necessarily now threatened with extinction but may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival.” The United States proposed to add whale sharks to Appendix II in 2000, and the species was ultimately added to that Appendix in 2003. Based on the CITES definitions and standards for listing species on Appendix II, neither the proposal to add whale sharks to Appendix II in 2000, nor their actual listing on Appendix II in 2003, are themselves inherent

indications that whale sharks may now warrant threatened or endangered status under the ESA. Species classifications under CITES and the ESA are not equivalent, and criteria used to evaluate species are not the same. Thus, we instead consider the available information on the threat of international trade and, more specifically, commercial fishing. See “Threats to Whale Sharks” section below for further discussion.

The last IUCN assessment of whale sharks was completed in 2005, and since then several estimates of global and subpopulation abundance have been made. Whale sharks are being studied in various locations across the range, and identification of larger aggregations of animals in previously unknown locations suggests that global abundance may be higher than previously thought (Schmidt et al., 2009). Perhaps most heavily studied have been the whale sharks of Ningaloo Reef, Western Australia, where the local population has been estimated at approximately 300-500 individuals (95 percent confidence interval (CI)) using closed population models and at 320-440 (95 percent CI) using open population models (Meekan et al., 2006). Using mark-recapture techniques and an open-population model, Ramírez-Macías et al. (2012) estimated 521- 802 (95 percent CI) whale sharks in the aggregation near Holbox Island, Mexico. These and other studies of seasonal whale shark aggregations provide useful information about particular aggregations, but the sample populations typically consist primarily of immature males and few females and adults, and thus are not likely to be representative of the wider population (Rowat and Brooks, 2012). Several authors have discussed how, given these skewed sample populations, key data requirement of the population models are not met, making strong inferences about population size difficult (e.g., Graham and Roberts, 2007; Riley et al., 2010). However, in addition to the studies of individual whale shark aggregations, genetic data have

been used to estimate the effective population size of whale sharks, meaning the number of individuals contributing offspring to the next generation. Using mitochondrial DNA from whale shark samples collected from aggregation areas across the entire species' range, Castro et al. (2007) calculated an estimated effective population size of 238,000 to 476,000 adults. Using microsatellite DNA samples from across the species' range, Schmidt et al. (2009) estimated an effective population size of 103,572, with a standard error range of 27,401–179,794 animals. While these values are only rough estimates of the actual effective population size, the relatively large estimates indicate that population sizes may be much larger than previously assumed (Castro et al., 2007). It is also clear that adult whale shark habitat consists of more than just the surface waters occupied by transient feeding aggregations, where nearly all of the observations of living whale sharks have occurred (Castro et al., 2007).

In conclusion, while data are still limited with respect to population size and trends, we find the petition insufficient in terms of presenting substantial information on whale shark abundance, trends or status to indicate the petitioned action may be warranted.

Threats to Whale Sharks

The petition lists four main categories of threats to whale sharks: habitat destruction, overutilization, inadequacy of existing regulatory mechanisms, and other natural and manmade factors. We discuss each of these below.

Habitat Destruction

The petition lists several causes of current and threatened destruction of whale shark habitat: human population growth, coastal pollution and “dead zones,” climate change, the Deepwater Horizon oil spill, and oil drilling in the Gulf of Mexico. The petition focuses on the

Gulf of Mexico as “critical habitat” and states that the large dead zone in particular has “made a large swath of the Gulf [of Mexico] uninhabitable for the species.”

We agree with the petitioner that human population growth, coastal pollution, and climate change have various, negative, environmental consequences. Mechanisms presented in the petition to explain how these threats are impacting whale shark habitats include the increasing number and size of dead zones, loss of fish species, and coral bleaching. Both fish and coral species are affected to varying degrees around the world by the inter-related threats of human populations, pollution and climate change. Dead zones, or areas of very low levels of dissolved oxygen (2-3 parts per million), occur throughout the world, typically in estuaries and coastal areas, and cause mortality of organisms at or near the bottom. These threats and mechanisms, however, are general in nature, and neither the petition nor the available information provides clear linkages to whale sharks or whale shark habitat use. Whale sharks occur in oceanic and coastal waters, are highly mobile, and consume a variety of prey species. Neither the petition nor the information in our files provides evidence to indicate whale sharks are experiencing prey-limitations, or that dead zones and loss of coral reef habitat are limiting the distribution or range of this species. For the specific example of the Gulf of Mexico, sighting records and modeling efforts indicate that seasonal whale shark feeding areas exist in the northern Gulf of Mexico, primarily along the productive continental shelf edge; and that the spatial distribution of suitable whale shark habitat is dynamic, meaning it can vary from year to year (McKinney *et al.*, 2012). For the most part, this habitat does not overlap with the Gulf of Mexico dead zone, which occurs along the coast, on the continental shelf, typically from Texas to Louisiana, and can vary in size and exact location from year to year.

The petition also discusses the very specific threat of the Deepwater Horizon oil spill and asserts it has degraded important whale shark habitat. The petition further states that the extensive oil drilling in this region and the “high probability” of future spills also pose a serious threat to this important whale shark habitat. The Deepwater Horizon spill was a catastrophic disaster, and such events are extremely problematic for endemic species in particular. While some whale sharks may have been exposed to oil and suffered some harm, possibly even through the ingestion of contaminated prey, it is unknown at this time whether and to what extent there are acute or chronic effects on whale sharks at a population level. A reference cited in the petition discusses observations made by scientists at Mote Marine Laboratory of elevated numbers of whale sharks in the more pristine waters near Florida’s Gulf Coast during the summer months following the spill (Handwerk, 2010). These observations have led researchers to ask whether whale sharks that typically use the northern Gulf of Mexico were responding to the spill by avoiding the impacted area.

In summary, the petition, the references cited, and information in our files do not comprise substantial information indicating there is present or threatened destruction, modification, or curtailment of the whale shark’s habitat or range such that listing may be warranted.

Overutilization

The petition states that commercial fishing is the greatest contributor to the overutilization of whale sharks and refers to landings information for fisheries in India, Taiwan and the Philippines. The petition also states that whales sharks are “heavily fished” in Taiwan. Whale shark fishing in Taiwan, however, as well as in India and the Philippines, is currently

prohibited (Rowat and Brooks, 2012). Whale sharks are also legally protected in Australia, Belize (at Gladden Spit), Honduras, Mexico, the Maldives, Malaysia, Thailand, and the Atlantic waters of the United States (Norman, 2005). Information in our files does, however, indicate that while a targeted fishery for whale sharks does not yet exist in China, a commercial fishery may be emerging, and monitoring is needed to determine the extent to which incidental catch is occurring and what effects this may be having on whale shark populations in China (Li et al., 2012).

The petition states that in addition to direct commercial harvest, incidental capture of whale sharks has resulted in population decline. No information about population declines as a result of bycatch, however, is provided. Information in our files about the response of fishermen to incidental capture of whale sharks in small-scale fisheries is mixed. Interviews conducted with local fishermen in China indicate that some fishermen consider them a nuisance species and will kill them to minimize damage to their nets, while others have assisted with transferring incidentally captured whale sharks to a rehabilitation center (Li et al., 2012). In Tanzania, fishermen reportedly do not actively hunt for whale sharks and instead actively avoid them to prevent damage to their nets (Norman, 2005). Following the prohibition on killing whale sharks in Taiwan in 2008, Hsu et al. (2012) reports that an unprecedented number of incidentally caught whale sharks were released alive (n=154).

The petition highlights the tuna purse seine fishery and the practice of setting nets around whale sharks as a major source of whale shark mortality, injury and physiological stress. Based on purse seine fleet records of whale shark-associated sets, whale shark mortality rates can be high but also seem to vary widely (Rowat and Brooks, 2012; WCPFC, 2012). The highest

mortality appears to have been occurring in the Pacific fleets (Rowat and Brooks, 2012), which consequently led to a ban on setting nets around whale sharks by the Western and Central Pacific Fisheries Commission (WCPFC) in 2012 (effective January, 2014). The WCPFC is developing guidelines for the safe release and handling of whale sharks and will be making these available to fishing vessels (WCPFC, 2011). The Parties to the Nauru Agreement, which collectively control one of the world's largest tuna purse seine fisheries, also agreed in 2010 that vessels shall not engage in fishing or related activity in order to catch tuna associated with whale sharks. Very recently, both the Indian Ocean Tuna Commission (IOTC) and the Inter-American Tropical Tuna Commission (IATTC) have also adopted whale shark provisions similar to the WCPFC's.

A third category of overutilization discussed in the petition is the dive-based ecotourism occurring in many of the predictable whale shark aggregation areas throughout the world. The petition specifically identifies diver interactions with whale sharks, such as close approaches, touching and riding, as forms of harassment that potentially disrupt normal life functions. We strongly advocate against touching, handling, or riding any marine wildlife. It remains highly speculative, however, whether any short or long term impacts to whale shark populations are occurring as result of tourist activities (Colman, 1997). Whale shark encounters with divers and tourists are also generally limited to those portions of the population and those times of year when whale sharks form seasonal aggregations in coastal areas. Thus, given their largely offshore existence, whale sharks have considerable refuge from interactions with ecotourism operations. In a preliminary investigation of whale shark tolerance of snorkelers, Rezzolla and Storai (2010) analyzed categories of whale shark behaviors and interactions with humans to produce an index of distress. In their study, which took place in the Gulf of Tadjoura, Djibouti,

snorkeler presence was not found to result in any negative interference with natural whale shark behavior in a large majority of encounters; and, in only 12.7 percent of encounters (N=55) did whale sharks demonstrate a defensive attitude (i.e., banking; Rezzolla and Storai, 2010). For whale sharks at Ningaloo Reef, where dive-based ecotourism has a relatively long history, recent modeling of the population provides no evidence of a population decline; nor is there any indication among tour operators and park managers that whale sharks at North Ningaloo are becoming harder to find (Holmberg *et al.*, 2009).

Taking a precautionary approach, however, some countries have instituted certain restrictions on ecotourism activities. In Belize, only six dive and snorkel boats are allowed within the area designated for whale shark viewing, and diving at dusk and night are prohibited except for permitted research purposes (Heyman *et al.*, 2001; Ramírez-Macías *et al.*, 2012). Also, in 1993, with the increasing numbers of tourists visiting Ningaloo Marine Park to see the whale sharks, the Western Australian Department of Conservation and Land Management instituted a licensing system to manage commercial operations within the park and reduce disturbance to whale sharks (Coleman, 1997). Protections there include limitations on the number of licensed tour operators; restrictions on approach speeds, distances and time vessels can be near the sharks; and restrictions on numbers, behavior and proximity of divers to the sharks (DOEC, 2012).

Given the information discussed above, we conclude that the petition, the references cited, and information in our files do not comprise substantial information indicating there is overutilization for commercial, recreational, scientific or educational purposes such that listing may be warranted.

Inadequacy of Existing Regulatory Mechanisms

The petition acknowledges that different national and international protections have been implemented to conserve whale sharks but states that these existing protections are either ineffective or lack enforcement. Citing the last IUCN assessment, the petition asserts that illegal fishing is continuing despite fishing bans. The IUCN assessment, however, only reports that “... illegal fishing [in the Philippines] and attempted export of meat still continues on a small scale, with shipments having been impounded by customs authorities (Anon, 2002b)” (see Norman, 2005). Additional information on the extent of illegal fishing in the Philippines or elsewhere is not provided.

The petition also asserts that the CITES Appendix II listing of whale sharks offers insufficient protection. The petition argues that because an Appendix II listing requires issuance of export permits only and not import permits, the CITES listing does not address domestic consumption nor the potential for landing whale sharks caught in one country at ports of another country. No information accompanies these statements to indicate whether or not such activities are occurring to any degree that would constitute a concern for whale sharks. The petition also argues that the CITES listing is insufficient because the requirements are ‘easily circumvented’ and lack adequate enforcement. While we agree enforcement challenges probably exist, no specific information in the petition or in our files indicates that illegal foreign trade is posing a threat that may be creating an extinction risk for whale shark populations.

CITES can be an effective tool to control, track and regulate trade, but it is not intended to replace fisheries and other forms of management. At least a dozen countries have developed national conservation measures for whale sharks, including bans on capture and killing of whale

sharks in those countries where targeted whale shark fishing was once relatively intense (Rowat and Brooks, 2012). Whale sharks also receive protection under the Shark Conservation Act of 2010 (Pub.L. 111-348, January 4, 2011), which prohibits removing fins from sharks harvested seaward of state waters or possessing such unattached shark fins at port or at sea by any person subject to the jurisdiction of the United States; the High Seas Driftnet Moratorium Protection Act (16 U.S.C. 1826h-k), which, among other provisions, allows for the identification and certification of nations by the United States to address bycatch of protected species and shark catches; and through the fisheries management actions by the WCPFC, IOTC and IATTC. In addition several U.S. coastal states have adopted measures to conserve sharks. Whale sharks are listed on Appendix II of the Convention of Migratory Species of Wild Animals (“the Bonn Convention”), which provides an international forum for the development of a conservation and management plan (Rowat and Brooks, 2012). Whale sharks are also likely to benefit from the United Nations Food and Agriculture Organization’s International Plan of Action for the Conservation and Management of Sharks, which calls for conservation and management of sharks to allow for long-term, sustainable use and has already stimulated the development of over a dozen national plans of action (Rowat and Brooks, 2012). Conservation efforts may be further bolstered by the increasing demand for live whale sharks in countries where ecotourism has replaced fishing as a source of revenue (Norman, 2005).

In conclusion, we find that the information presented in the petition and available in our files does not comprise substantial information indicating inadequacies of existing regulatory mechanisms such that listing may be warranted.

Other Natural and Manmade Factors

The petition lists the whale shark's susceptibility to fishing and natural history strategy as additional threats to whale sharks. Several biological characteristics of whale sharks - including large body size, long life span, and late maturation – do suggest that this species cannot sustain high levels of exploitation. This statement is supported by the reported declines in landings in the now closed whale shark fisheries in Taiwan, India and the Philippines following the increase in popularity and price of whale shark meat in the 1990's (Compagno, 2002; Hsu et al., 2012). In fact, the IUCN listing was based largely on the observed and projected declines in fisheries from the Indian and Philippine fisheries, both of which are now closed (Rowat and Brooks, 2012). In the absence of these targeted fisheries or evidence of overutilization of whale sharks, the natural history characteristics of whale sharks do not inherently pose a threat to the species. Broad statements in the petition that whale sharks are “currently experiencing the type of rapid chaotic change that makes their K-selected life history pattern a liability,” and that they are “being fished from their remaining habitat at a rate greater than they can replenish their numbers” are not accompanied by supporting data or information about whale sharks. In conclusion, we find that there is not substantial information indicating that the other natural or manmade factors named in the petition are operating such that listing may be warranted.

Petition Finding

After reviewing the information contained in the petition, as well as information readily available in our files, we conclude the petition does not present substantial scientific or commercial information indicating the petitioned action may be warranted.

References Cited

A complete list of references is available upon request to the Office of Protected Resources (see ADDRESSES).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Dated: August 12, 2013.

Samuel D. Rauch III,
Deputy Assistant Administrator for Regulatory Programs,
performing the functions and duties of the
Assistant Administrator,
National Marine Fisheries Service.

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