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Endangered and Threatened Species; Identification of 14 Distinct Population Segments of the Humpback Whale (*Megaptera novaeangliae*) and Proposed Revision of Species-Wide Listing; Proposed Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 130708594–5298–02]

RIN 0648–XC751

Endangered and Threatened Species; Identification of 14 Distinct Population Segments of the Humpback Whale (*Megaptera novaeangliae*) and Proposed Revision of Species-Wide Listing

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

ACTION: Proposed rule; 12-month findings.

SUMMARY: We, NMFS, have completed a comprehensive status review of the humpback whale (*Megaptera novaeangliae*) under the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 *et seq.*) and announce a proposal to revise the listing status of the species. We propose to divide the globally listed endangered species into 14 distinct population segments (DPSs), remove the current species-level listing, and in its place list 2 DPSs as endangered and 2 DPSs as threatened. The remaining 10 DPSs are not proposed for listing based on their current statuses. This proposal also constitutes a negative 12-month finding on a petition to delineate and ''delist'' a DPS of humpback whales spanning the entire North Pacific and a positive 12-month finding on a petition to delineate and ''delist'' a DPS in the Central North Pacific (Hawaii breeding population).

At this time, we do not propose to designate critical habitat for the two listed DPSs that occur in U.S. waters (Western North Pacific, Central America) because it is not currently determinable. In order to complete the critical habitat designation process, we also solicit information on essential physical and biological features of the habitat of these two DPSs.

DATES: Comments must be submitted to NMFS by July 20, 2015. For specific dates of the public hearings, see **SUPPLEMENTARY INFORMATION**. Requests for additional public hearings must be made in writing and received by June 5, 2015.

ADDRESSES: Four public hearings will be held, one each in Juneau, AK, Honolulu, HI, Plymouth, MA, and Virginia Beach, VA. For specific locations of these hearings, see **SUPPLEMENTARY INFORMATION**.

You may submit comments, identified by NOAA–NMFS–2015–0035, by any of the following methods:

Electronic Submission: Submit all electronic public comments via the Federal eRulemaking Portal.

1. Go to *www.regulations.gov/#!docketDetail;D= NOAA-NMFS-2015-0035,*
2. Click the ''Comment Now!'' icon, complete the required fields
3. Enter or attach your comments.

—Or—

Mail: Submit written comments to Marta Nammack, NMFS, 1315 East-West Highway, Room 13536, Silver Spring, MD 20910.

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).

The proposed rule, Status Review report and other materials relating to this proposal can be found on the NMFS Web site at: *http://nmfs.noaa.gov/pr/.*

FOR FURTHER INFORMATION CONTACT: Marta Nammack, NMFS, (301) 427–8469.

SUPPLEMENTARY INFORMATION: On August 12, 2009, we announced the initiation of a status review of the humpback whale to determine whether an endangered listing for the entire species was still appropriate (74 FR 40568). We sought information from the public to inform our review, hired two post-doctoral students to compile the best available scientific and commercial information on the species (Fleming and Jackson, 2011), including the past, present, and foreseeable future threats to this species, and appointed a Biological Review Team (BRT) to analyze that information, make conclusions on extinction risk, and prepare a status review report (Bettridge et al., 2015).

On April 16, 2013, we received a petition from the Hawaii Fishermen's Alliance for Conservation and Tradition, Inc., to classify the North Pacific humpback whale population as a DPS and ''delist'' the DPS under the Endangered Species Act (ESA). On February 26, 2014, the State of Alaska submitted a petition to delineate the Central North Pacific (Hawaii) stock of the humpback whale as a DPS and remove the DPS from the List of Endangered and Threatened Species under the ESA. After reviewing the petitions, the literature cited in the petitions, and other literature and information available in our files, we found that both petitioned actions may be warranted and issued positive 90-day findings (78 FR 53391, August 29, 2013; 79 FR 36281, June 26, 2014). We extended the deadline for receiving information by 30 days to help us respond to the petition to delist the Central North Pacific population (79 FR 40054; July 11, 2014). We incorporated the consideration of both petitioned actions into the status review.

Based on information presented in the status review report, an assessment of the ESA section 4(a)(1) factors, and efforts being made to protect the species, we have determined: (1) 14 populations of the humpback whale meet the DPS policy criteria and are therefore considered to be DPSs; (2) the Cape Verde Islands/Northwest Africa and Arabian Sea DPSs are in danger of extinction throughout their ranges; (3) the Western North Pacific and Central America DPSs are likely to become endangered throughout all of their ranges in the foreseeable future; and (4) the West Indies, Hawaii, Mexico, Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific DPSs are not in danger of extinction throughout all or a significant portion of their ranges or likely to become so in the foreseeable future. Accordingly, we issue a proposed rule to revise the species-wide listing of the humpback whale by replacing it with 2 endangered species listings (Cape Verde Islands/Northwest Africa and Arabian Sea DPSs) and 2 threatened species listings (Western North Pacific and Central America DPSs). We solicit comments on these proposed actions. We also propose to extend the ESA section 9 prohibitions to the 2 threatened DPSs.

Outline

ESA Statutory Provisions, Regulations, and Policy Considerations

Pursuant to the ESA, any interested person may petition to list or delist a species, subspecies, or DPS of a vertebrate species that interbreeds when mature (5 U.S.C. 553(e), 16 U.S.C. 1533(b)(3)(A)). ESA-implementing regulations issued by NMFS and the U.S. Fish and Wildlife Service (FWS) also establish procedures for receiving and considering petitions to revise the lists of endangered and threatened species and for conducting periodic reviews of listed species (50 CFR 424.01).

Once we receive a petition to delist a species, the ESA requires the Secretary of Commerce (Secretary) to make a finding on whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted (16 U.S.C. 1533(b)(3)(A)). In the context of a petition to delist a species, the ESA-implementing regulations provide that ''substantial information'' is that amount of information that would lead a reasonable person to believe that delisting may be warranted (50 CFR 424.14(b)(1)). In determining whether substantial information exists, we take into account several factors, in light of any information noted in the petition or otherwise readily available in our files. To the maximum extent practicable, this finding is to be made within 90 days of the receipt of the petition (16 U.S.C. 1533(b)(3)(A)) and published promptly in the **Federal Register**. Section 4(b)(3)(B) of the ESA requires that, when a petition to revise the List of Endangered and Threatened Wildlife and Plants is found to present substantial scientific and commercial information, we make a finding that the petitioned action is (a) not warranted, (b) warranted, or (c) warranted but precluded from immediate proposal by other pending proposals of higher priority. This finding (the ''12-month finding'') is to be made within 1 year of the date the petition was received, and the finding is to be published promptly in the **Federal Register**. The Secretary has delegated the authority for these actions to the NOAA Assistant Administrator for Fisheries.

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, we interpret an ''endangered species'' to be one that is presently in danger of extinction. A ''threatened species,'' on the other hand, is not presently in danger of extinction, but is likely to become so in the foreseeable future (that is, at a later time). In other words, the primary statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened). In determining whether to reclassify or delist a species, subspecies, or DPS, the ESA and implementing regulations require that we consider the following ESA section 4(a)(1) factors in relation to the definitions of ''endangered species'' or ''threatened species'' (16 U.S.C. 1533(a)(1) and 1533(c)(2); 50 CFR 424.11(d)): The present or threatened destruction, modification, or curtailment of its habitat or range; overutilization of the species for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting a species' continued existence. These are the same factors that we must consider when making an initial determination whether to list a species, subspecies, or DPS as threatened or endangered under the ESA.

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. In evaluating the efficacy of protective efforts not yet implemented or not yet proven to be effective, we rely on the *Policy on Evaluation of Conservation Efforts When Making Listing Decisions* (''PECE''; 68 FR 15100; March 28, 2003) issued jointly by NMFS and the FWS (together, the Services). The ESA regulations require that a species listed as endangered or threatened be removed from the list if the best scientific or commercial data available indicate that the species is no longer endangered or threatened because it has recovered (50 CFR 424.11(d)).

Distinct Population Segment Policy

To be considered for listing under the ESA, a group of organisms must constitute a ''species,'' which the ESA defines 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'' (16 U.S.C. 1532 (16)). Thus, an ESA listing (or delisting) determination can address a species, subspecies, or a DPS of a vertebrate species.

On February 7, 1996, 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. A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions:

(1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.

(2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the ESA.

If a population segment is considered discrete under one or more of the above conditions, its biological and ecological significance is then considered in light of Congressional guidance (see Senate Report 151, 96th Congress, 1st Session) that the authority to list DPSs be used ''sparingly'' while encouraging the conservation of genetic diversity. This consideration may include, but is not limited to, the following:

(1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon;

(2) Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon;

(3) Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or

(4) Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

''Foreseeable Future''

To determine whether listing of a species is warranted, a status review must conclude that the species is ''in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range.'' The ESA uses the term ''foreseeable future'' to refer to the time over which identified threats are likely to impact the biological status of the species. The duration of the ''foreseeable future'' in any circumstance is inherently fact-specific and depends on the particular kinds of threats, the life-history characteristics, and the specific habitat requirements for the species under consideration. The existence of a threat to a species and the species' response to that threat are not, in general, equally predictable or foreseeable. Hence, in some cases, the ability to foresee a threat to a species is greater than the ability to foresee the species' exact response, or the timeframe of such a response, to that threat. For purposes of making these 12-month findings, the relevant consideration is whether the species' population response (*i.e.,* abundance, productivity, spatial distribution, diversity) is foreseeable, not merely whether the emergence of a threat is foreseeable. The foreseeable future extends only as far as we are able to reliably predict the species' population response to a particular threat. We consider the extent to which we can foresee the species' response to each threat.

''Significant Portion of its Range''

NMFS and FWS recently published a final policy to clarify the interpretation of the phrase ''significant portion of the range'' in the ESA definitions of ''threatened species'' and ''endangered species'' (79 FR 37577; July 1, 2014) (Final Policy). The Final Policy reads:

> *Consequences of a species being endangered or threatened throughout a significant portion of its range:* The phrase ''significant portion of its range'' in the Act's definitions of ''endangered species'' and ''threatened species'' provides an independent basis for listing. Thus, there are two situations (or factual bases) under which a species would qualify for listing: A species may be endangered or threatened throughout all of its range or a species may be endangered or threatened throughout only a significant portion of its range.
>
> If a species is found to be endangered or threatened throughout only a significant portion of its range, the entire species is listed as endangered or threatened, respectively, and the Act's protections apply to all individuals of the species wherever found.
>
> *Significant:* A portion of the range of a species is ''significant'' if the species is not currently endangered or threatened throughout its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.
>
> *Range:* The range of a species is considered to be the general geographical area within which that species can be found at the time FWS or NMFS makes any particular status determination. This range includes those areas used throughout all or part of the species' life cycle, even if they are not used regularly (*e.g.,* seasonal habitats). Lost historical range is relevant to the analysis of the status of the species, but it cannot constitute a significant portion of a species' range.
>
> *Reconciling SPR with DPS authority:* If the species is endangered or threatened throughout a significant portion of its range, and the population in that significant portion is a valid DPS, we will list the DPS rather than the entire taxonomic species or subspecies.

The Final Policy explains that it is necessary to fully evaluate a portion for potential listing under the ''significant portion of its range'' authority only if substantial information indicates that the members of the species in a particular area are likely *both* to meet the test for biological significance *and* to be currently endangered or threatened in that area. Making this preliminary determination triggers a need for further review, but does not prejudge whether the portion actually meets these standards such that the species should be listed:

> To identify only those portions that warrant further consideration, we will determine whether there is substantial information indicating that (1) the portions may be significant and (2) the species may be in danger of extinction in those portions or likely to become so within the foreseeable future. We emphasize that answering these questions in the affirmative is not a determination that the species is endangered or threatened throughout a significant portion of its range—rather, it is a step in determining whether a more detailed analysis of the issue is required.
>
> 79 FR 37586.

Thus, the preliminary determination that a portion may be both significant and endangered or threatened merely requires NMFS to engage in a more detailed analysis to determine whether the standards are *actually* met. *Id.* at 37587. Unless both are met, listing is not warranted. The Final Policy explains that, depending on the particular facts of each situation, NMFS may find it is more efficient to address the significance issue first, but in other cases it will make more sense to examine the status of the species in the potentially significant portions first. Whichever question is asked first, an affirmative answer is required to proceed to the second question. *Id.* (''[I]f we determine that a portion of the range is not ''significant,'' we will not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we will not need to determine if that portion was ''significant.''). Thus, if the answer to the first question is negative—whether in regard to the significance question or the status question—then the analysis concludes and listing is not warranted.

Background

The humpback whale (*Megaptera novaeangliae*) was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969, the precursor to the ESA. When the ESA was enacted in 1973, the humpback whale was transferred to the List of Endangered and Threatened Wildlife and Plants, retaining endangered status, and, because of its endangered ESA status, was considered ''depleted'' under the Marine Mammal Protection Act (MMPA). NMFS issued a recovery plan for the humpback whale in 1991, and its long-term numerical goal was to increase humpback whale populations to at least 60 percent of the number existing before commercial exploitation or of current environmental carrying capacity. The recovery team recognized that those levels could not then be determined, so in the meantime, the interim goal of the recovery plan was to double the population size of extant populations within the next 20 years (*http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_humpback.pdf*). In fact, the historical size of humpback whale populations continues to be uncertain (Ruegg *et al.,* 2013, and references therein; Bettridge *et al.,* 2015).

The taxonomy, life history, and ecology of the humpback whale are thoroughly reviewed in Fleming and Jackson (2011) and summarized in the BRT's status review report (Bettridge *et al.,* 2015; available at *http://www.nmfs.noaa.gov/pr/species/statusreviews.htm*). The humpback whale is a large baleen whale of the family Balaenopteridae. It is found around the world in all oceans. The humpback whale has long pectoral flippers, distinct ventral fluke patterning, dark dorsal coloration, a highly varied acoustic call (termed 'song'), and a diverse repertoire of surface behaviors.

Its body coloration is primarily dark grey, but individuals have a variable amount of white on their pectoral fins, flukes, and belly. This variation is so distinctive that the pigmentation pattern on the undersides of their flukes is used to identify individual whales. Coloring of the ventral surface varies from white to marbled to fully black. Dorsal surfaces of humpback whale pectoral flippers are typically white in the North Atlantic and black in the North Pacific (Perrin *et al.,* 2002), and the flippers are about one-third of the total body length. Similar to all baleen whales, body lengths differ between the sexes, with adult females being approximately 1–1.5m longer than males. The humpback whale reaches a maximum of 16–17 m, although lengths of 14–15 m are more typical. Adult body weights in excess of 40 tons make them one of the largest mammals on earth (Ohsumi, 1966).

With one exception, humpback whales are highly migratory, spending spring, summer, and fall feeding in temperate or high-latitude areas of the North Atlantic, North Pacific, and Southern Ocean and migrating to the tropics in winter to breed and calve. The Arabian Sea humpback whale population does not migrate extensively, remaining in tropical waters year-round (Baldwin, 2000; Minton *et al.,* 2010b).

There are 14 known breeding grounds for humpback whales, and there may be other breeding grounds of unknown location. Whales using the unknown breeding grounds may be associated to some degree with whales from the known breeding grounds.

Whales from all known breeding grounds except the Arabian Sea migrate to summer feeding areas. Humpback whales have high site fidelity to both the winter breeding grounds and summer feeding grounds. Whales from a single breeding ground may migrate to different feeding grounds. In addition, feeding grounds may host whales from different breeding grounds. Because humpback whales can be individually identified through unique fluke patterns, researchers are able to match photos of whales on breeding grounds and feeding grounds, thereby tracing their migrations.

Although the patterns of migration and distribution are clear for many breeding groups, researchers have identified whales on some feeding grounds that have never been sighted in any of the known breeding grounds. Depending on the strength of the evidence, scientists may infer that an additional breeding population exists but that its breeding grounds are unknown. We explore this subject further in the ''Distinct Population Segment Analysis, By Subspecies'' section below.

Behavior

Humpback whales travel great distances during migration, the farthest migration of any mammal. The longest recorded migration between a breeding area and a feeding area was 5,160 miles (8,300 km). This trek from Costa Rica to Antarctica was completed by seven individuals, including a calf (Rasmussen *et al.,* 2007). One of the more closely studied routes has shown whales making the 3,000-mile (4,830 km) trip between Alaska and Hawaii in as little as 36 days (Allen and Angliss, 2010).

During summer and fall, humpback whales spend much of their time feeding and building fat stores for winter. In their low-latitude wintering grounds, humpback whales congregate and are believed to engage in mating and other social activities. Humpback whales are generally polygynous, with males exhibiting competitive behavior on wintering grounds (Tyack, 1981; Baker and Herman, 1984; Clapham, 1996). A complex behavioral repertoire exhibited in these areas can include aggressive and antagonistic behavior, such as chasing, vocal and bubble displays, horizontal tail thrashing, and rear body thrashing. Males within these groups also make physical contact, striking or surfacing on top of one another.

Also on wintering grounds, males sing complex songs that can last up to 20 minutes and may be heard up to 20 miles (30 km) away (Clapham and Mattila, 1990; Cato, 1991). A male may sing for hours, repeating the song numerous times. All males in a population sing the same song, but that song continually evolves over time (Darling and Sousa-Lima, 2005). Humpback whale singing has been studied for decades, but its function remains in dispute.

Humpback whales are a favorite of whale watchers, as the species frequently performs aerial displays, including breaching, lobtailing, and flipper slapping, the purposes of which are not well understood. Diving behavior varies by season, with average lengths of dives ranging from <5 minutes in summer to 10–15 minutes (and sometimes more than 30 minutes) in winter months (Clapham and Mead, 1999). Typically, humpback whale groups are small (e.g., <10 individuals, but can vary depending on social context and season), and associations between individuals do not last long, with the exception of the mother/calf pairs (Clapham and Mead, 1999).

Feeding

Humpback whales have a diverse diet that varies slightly across feeding areas. The species is known to feed on both small schooling fish and on euphausiids (krill). Known prey organisms include species representing *Clupea* (herring), *Scomber* (mackerel), *Ammodytes* (sand lance), *Sardinops* (sardine), *Engraulis* (anchovy), *Mallotus* (capelin), and krills such as *Euphausia, Thysanoessa,* and *Meganyctiphanes* (Baker, 1985; Geraci *et al.,* 1989; Clapham *et al.,* 1997). Humpback whales also exhibit flexible feeding strategies, sometimes foraging alone and sometimes cooperatively (Clapham, 1993). During the winter, humpback whales subsist on stored fat and likely feed little or not at all.

In the Northern Hemisphere, feeding behavior is varied and frequently features novel capture methods involving the creation of bubble structures to trap and corral fish; bubble nets, clouds, and curtains can be observed when humpback whales are feeding on schooling fish (Hain *et al.,* 1982). Lobtailing and repeated underwater 'looping' movements (referred to as kick feeding) have also been observed during surface feeding events, and it may be that certain feeding behaviors are spread through the population by cultural transmission (Weinrich *et al.,* 1992; Friedlaender *et al.,* 2006). On Stellwagen Bank, in the Gulf of Maine, repeated side rolls have been recorded when whales were near the bottom, which likely serves to startle prey out of the substrate for better foraging (Friedlaender *et al.,* 2009). In many locations, feeding in the water column can vary with time of day, with whales bottom feeding at night and surface feeding near dawn (Friedlaender *et al.,* 2009).

Humpback whales are 'gulp' or 'lunge' feeders, capturing large mouthfuls of prey during feeding rather than continuously filtering food, as may be observed in some other large baleen whales (Ingebrigtsen, 1929). In the Southern Hemisphere, only one style of foraging ('lunge' feeding) has been reported. When lunge feeding, whales advance on prey with their mouths wide open, then close their mouths around the prey and trap them by forcing engulfed water out past the baleen plates. Southern Hemisphere humpback whales forage in the Antarctic circumpolar current, feeding almost exclusively on Antarctic krill (*Euphausia superba*) (Matthews, 1937; Mackintosh, 1965; Kawamura, 1994).

Stomach content analysis from hunted whales taken in sub-tropical waters and on migratory routes indicated that stomachs were nearly always empty (Chittleborough, 1965a). Infrequent sightings of feeding activity and stomach content data suggest that some individuals may feed opportunistically during the southward migration toward Antarctic waters (Matthews, 1932; Dawbin, 1956; Kawamura, 1980).

In the Southern Ocean, Antarctic krill tend to be most highly concentrated around marginal sea ice zones, where they feed on sea ice algae. As a result, Southern Hemisphere humpback whale distribution is linked to regions of marginal sea ice (Friedlaender *et al.,* 2006) and zones of high euphausiid density (Murase *et al.,* 2002), with foraging mainly concentrated in the upper 100m of the water column (Dolphin, 1987; Friedlaender *et al.,* 2006). There is evidence of a positive relationship between prey density and humpback whale abundance (Friedlaender *et al.,* 2006).

Reproduction

The mating system of humpback whales is generally thought to be male-dominance polygyny, also described as a 'floating lek' (Clapham, 1996). In this system, multiple males compete for individual females and exhibit competitive behavior. Humpback whale song is a long, complex vocalization (Payne and McVay, 1971) produced by males on the winter breeding grounds, and also less commonly during migration (Clapham and Mattila, 1990; Cato, 1991) and on feeding grounds (Clark and Clapham, 2004b). The exact function has not been determined, but behavioral studies suggest that song is used to advertise for females, and/or to establish dominance among males (Tyack, 1981; Darling and Bérubé, 2001; Darling *et al.,* 2006). It is widely believed that, while occasional mating may occur on feeding grounds or on migration, the great majority of mating and conceptions take place in winter breeding areas (Clapham, 1996; Clark and Clapham, 2004a). Breeding in the Northern and Southern Hemisphere populations is out of phase by approximately 6 months, corresponding to their respective winter periods.

Sexual maturity of humpback whales in the Northern Hemisphere occurs at approximately 5–11 years of age, and appears to vary both within and among populations (Clapham, 1992; Gabriele *et al.,* 2007b; Robbins, 2007). Average age of sexual maturity in the Southern Hemisphere is estimated to be 9–11 years. In the Northern Hemisphere, calving intervals are between 1 and 5 years, though 2–3 years appears to be most common (Wiley and Clapham, 1993; Steiger and Calambokidis, 2000). Estimated mean calving rates are between 0.38 and 0.50 calves per mature female per year (Clapham and Mayo, 1990; Straley *et al.,* 1994; Steiger and Calambokidis, 2000) and reproduction is annually variable (Robbins, 2007). In the Southern Hemisphere, most information on humpback whale population characteristics and life history was obtained during the whaling period. Post-partum ovulation is reasonably common (Chittleborough, 1965a) and inter-birth intervals of a single year have occasionally been recorded. This may be a consequence of early calf mortality; the associated survival rates for annually born calves are unknown in the Southern Hemisphere.

Humpback whale gestation is 11–12 months and calves are born in tropical waters (Matthews, 1937). Lactation lasts from 10.5–11 months (Chittleborough, 1965a), weaning begins to occur at about age 6 months, and calves attain maternal independence around the end of their first year (Clapham and Mayo, 1990). Humpback whales exhibit maternally directed fidelity to specific feeding regions (Martin *et al.,* 1984; Baker *et al.,* 1990).

The average generation time for humpback whales (the average age of all reproductively active females at carrying capacity) is estimated at 21.5 years (Taylor *et al.,* 2007). Empirically estimated annual rates of population increase range from a low of 0 to 4 percent to a maximum of 12.5 percent for different times and areas throughout the range (Baker *et al.,* 1992; Barlow and Clapham, 1997; Steiger and Calambokidis, 2000; Clapham *et al.,* 2003a); however, Zerbini *et al.* (2010) concluded that any rate above 11.8 percent per year is biologically implausible for this species.

Natural Mortality

Annual adult mortality rates have been estimated to be 0.040 (standard error (SE) = 0.008) (Barlow and Clapham, 1997) in the Gulf of Maine and 0.037 (95 percent confidence interval (CI) 0.022–0.056) (Mizroch *et al.,* 2004) in the Hawaiian Islands populations. In the Southern Hemisphere, estimates of annual adult survival rates have been made using photo-identification studies in Hervey Bay, east Australia (1987–2006), and range between 0.87 and 1.00 (Chaloupka *et al.,* 1999).

Robbins (2007) estimated calf (0–1 year old) survival for humpback whales in the Gulf of Maine at 0.664 (95 percent CI: 0.517–0.784), which is low compared to other areas. Barlow and Clapham (1997) estimated a theoretical calf mortality rate of 0.125 on the Gulf of Maine feeding ground. Using associations of calves with identified mothers on North Pacific breeding and feeding grounds, Gabriele (2001) estimated mortality of juveniles at 6 months of age to be 0.182 (95 percent CI: 0.023–0.518). Survival of calves (6–12 months) and juveniles (1–5 years) has not been described in detail for the Southern Hemisphere. Killer whales are likely the most common natural predators of humpback whales.

Status Review Report

The BRT's status review report compiled the best available scientific and commercial information on: (1) Population structure of humpback whales within the North Pacific, North Atlantic, and Southern Oceans, used to determine whether any populations within these ocean basins meet the DPS policy criteria; (2) the abundance and trend information for each DPS; (3) those ESA section 4(a)(1) factors currently affecting the status of these DPSs; (4) ongoing conservation efforts affecting the status of these DPSs; and (5) the extinction risk of each DPS. See the status review report for further information on the biology and ecology of the humpback whale (Bettridge et al., 2015).

Humpback Whale Subspecies

The BRT reviewed the best scientific and commercial data available on the humpback whale's taxonomy and concluded that there are likely three unrecognized subspecies of humpback whale: North Pacific, North Atlantic, and Southern Hemisphere. In reaching this conclusion, the BRT considered available life history, morphological, and genetic information.

Humpback whales routinely make extensive migrations between breeding and feeding areas within an ocean basin. Despite this potential for long distance dispersal, there is considerable evidence that dispersal or interbreeding of individuals from different major ocean basins is extremely rare and that whales from the major ocean basins are differentiated by a number of characteristics.

Reproductive Seasonality: Humpback whales breed and calve in July–

November in the Southern Hemisphere and in January–May in the Northern Hemisphere (including the Arabian Sea). It is not known if reproductive seasonality in baleen whales is determined genetically or whether it results from a learned behavior (migration to a particular feeding destination) combined with a physiological response to day length.

Behavior: The most obvious behavioral difference is that migrations to and from high latitudes are in opposite times of the calendar year for Southern Hemisphere and most Northern Hemisphere populations, following the difference in reproductive seasonality. A Northern Hemisphere exception to this migration pattern is found in the Arabian Sea where a non-migratory population is found. Although these behavioral differences could be learned, they could also be innate, genetically determined traits. Seasonality in singing and other mating behaviors also follows the differences in reproductive seasonality.

Color patterns: Humpback whales in the Southern Hemisphere tend to have much more white pigmentation on their bodies which is especially noticeable laterally (Matthews, 1937; Chittleborough, 1965b). This has been noted in eastern and western Australia, the Coral Sea, and Oceania, but might not be characteristic of all Southern Hemisphere populations. Rosenbaum *et al.* (1995) ranked ventral fluke coloration patterns from one (nearly all white) to five (nearly all black) and compared whales from several breeding areas. He found that over 80 percent of humpback whales in eastern and western Australia were in Category 1, and that less than 10 percent of whales in three breeding areas in the North Pacific were ranked in that category. Only 36 percent of Southern Hemisphere whales in Colombia were classified in Category 1, but Colombian whales were still, on average, whiter than North Pacific whales. A higher frequency of flippers with white dorsal pigmentations is found in the North Atlantic compared to the North Pacific (Clapham, 2009).

Genetics: Baker and Medrano-Gonzalez (2002) reviewed the worldwide distribution of mtDNA haplotypes.[1] They found three major clades (groups consisting of an ancestor and all its descendants) with significant differences among major ocean basins, though there were no completely fixed differences among these areas. The North Pacific included only the AE and CD clades, the North Atlantic included only the CD and IJ clades, and the Southern Oceans included all three. In a more recent comparison, Jackson *et al.* (2014) found no shared haplotypes between the North Pacific and North Atlantic. Based on patterns of mtDNA variation, Rosenbaum *et al.* (2009b) estimated an average migration rate of less than one per generation between the Arabian Sea and neighboring populations in the southern Indian Ocean, and Jackson *et al.* (2014) also estimated generally <1 migrant per generation among the North Pacific, North Atlantic and Southern Hemisphere populations. Ruegg *et al.* (2013) also found a high degree of genetic differentiation between samples from the North Atlantic and the Southern Hemisphere.

Subspecies Discussion and Conclusions

The BRT considered the possibility that humpback whales from different ocean basins might reasonably be considered to belong to different subspecies. Sub-specific taxonomy is relevant to the identification of DPSs because, under the 1996 DPS policy, the discreteness and significance of a potential DPS is evaluated with reference to the taxon (species or subspecies) to which it belongs. In some cases previous BRTs have determined that sub-specific taxonomy has a large influence on DPS structure (*e.g.,* southern resident killer whales—Krahn *et al.,* 2004a)), while in other cases sub-specific taxonomy has not been relevant (*e.g.,* steelhead trout DPS—Busby *et al.,* 1996).

Rice (1998) reviewed previous subspecies designations for humpback whales. Tomilin (1946) named a Southern Hemisphere subspecies (*M. n. lalandii*) based on body length, but this length difference was not substantiated in subsequent studies. The populations around Australia and New Zealand were described as another subspecies (*M. n. novazelandiae*) based on color patterns and length (Ivashin, 1958). Rice (1998) noted that the statistical ability to classify these proposed subspecies is ''not quite as high as is customarily required for division into subspecies'' and that genetic analyses using restriction-fragment length polymorphisms is not congruent with the proposed regional division. Rice (1998) therefore recommended that *Megaptera novaeangliae* be considered monotypic. As was summarized above, however, since 1998, additional information has accumulated on the genetic distinctiveness of different geographic populations of humpback whales, and some new subspecies have been proposed (Jackson *et al.,* 2014).

One criterion for separation of subspecies is the ability to differentiate 75 percent of individuals found in different geographic regions (Reeves *et al.,* 2004). Based on this criterion, differences in the calendar timing of mating and reproduction could be used to distinguish close to 100 percent of Northern Hemisphere from Southern Hemisphere individuals, but it is not known if this is genetically determined. Based on mtDNA haplotypes that have been identified to date, haplotype could be used to distinguish 100 percent of North Pacific from North Atlantic individuals, but some haplotypes from both ocean basins are shared with the Southern Ocean. Ventral fluke color patterns can be used to correctly differentiate >80 percent of whales in eastern and western Australia from the whales in the North Pacific (Rosenbaum *et al.,* 1995).

The BRT also considered the advice of the Committee on Taxonomy of the Society for Marine Mammalogy (SMM). The BRT asked the Committee: ''Are humpback whales (*Megaptera novaeangliae*) that feed in the North Atlantic, North Pacific, Southern Oceans and Arabian Sea *likely* to belong to different sub-species?'' The SMM was asked only for its scientific opinion on the likelihood of the existence of humpback whale subspecies and was not asked to comment on the relevance of their opinion to the identification of DPSs for humpback whales. The SMM chairman summarized responses from members of the SMM:

> The balance of opinion in the SMM Committee on Taxonomy is that given the evidence on genetics, morphology, distribution and behavior, if a taxonomic revision of the humpback whale were undertaken, it is likely that the North Atlantic, North Pacific and Southern Hemisphere populations would be accorded subspecific status. Whether the Arabian Sea population would merit recognition as a subspecies separate from the Southern Hemisphere whales, with which it is most closely related genetically, is less certain. However, it is clearly geographically isolated and genetically differentiated.

Using its structured decision making process (whereby each BRT member distributed 100 likelihood points among different scenarios), the BRT considered the likelihood of a single global species with no subspecies scenario, a three-subspecies scenario (North Atlantic, North Pacific, and Southern

[1] A mtDNA haplotype is a group of genes, or alleles, that is maternally inherited; genetic differentiation is generally based on allele frequency differences between populations, which are measured by F_{ST} or related statistics; F_{ST} is a measure of the genetic distance between populations, or difference in the allele frequency between two populations.

Hemisphere), and a four-subspecies scenario (North Atlantic, North Pacific, Southern Hemisphere, and Arabian Sea). The BRT's allocation of likelihood points indicates that in the opinion of the BRT, the most likely scenario is the 3-subspecies scenario.

In October 2014, after the BRT report was completed, the SMM updated its species and subspecies list to recognize the North Atlantic, North Pacific, and Southern Hemisphere humpback whale populations as subspecies: *Megaptera novaeangliae kuzira* (North Pacific), *M. n. novaeangliae* (North Atlantic) and *M. n. australis* (Southern Hemisphere) (*http://www.marinemammalscience.org/index.php?option=com_content&view=article&id=758&Itemid=340*). This update was based on mtDNA and DNA relationships and distribution, as described in Jackson *et al.* (2014). We therefore consider whether the various humpback whale population segments identified by the BRT satisfy the DPS criteria of discreteness and significance relative to the subspecies to which they each belong: North Atlantic, North Pacific, and Southern Hemisphere subspecies.

Distinct Population Segment Analysis, By Subspecies

North Atlantic

Overview

In the Northern Hemisphere, humpback whales summer in the biologically productive, northern latitudes and travel south to warmer waters in winter to mate and calve. Migratory routes and migratory behavior are likely to be maternally directed (Martin *et al.,* 1984; Baker *et al.,* 1990). Feeding areas are often near or over the continental shelf and are associated with cooler temperatures and oceanographic or topographic features that serve to aggregate prey (Moore *et al.,* 2002; Zerbini *et al.,* 2006a).

Primary humpback whale feeding areas in the North Atlantic Ocean range from 42° to 78°N and include waters around Iceland, Norway, and the Barents Sea in the central and eastern North Atlantic Ocean, and western Greenland, Newfoundland, Labrador, the Gulf of St. Lawrence and the Gulf of Maine in the western North Atlantic Ocean. Known breeding areas occur in the West Indies and, to a much lesser extent, around the Cape Verde Islands (Katona and Beard, 1990; Clapham, 1993; Palsbøll *et al.,* 1997). A relatively small proportion of whales in the North Atlantic Ocean feed in U.S. waters. The predominant breeding and calving area lies in the territorial sea of the Dominican Republic, although whales are also found scattered throughout the rest of the Antilles and coastal waters of Venezuela. The Silver/Navidad/Mouchoir Bank complex hosts the largest single breeding aggregation of humpback whales in the West Indies.

Recently, a few humpback whales have also been found in the Mediterranean Sea but little is known about humpback whale use of this region and there is no evidence of a large humpback whale presence there, either currently or in historical times (Frantzis *et al.,* 2004). There are also sporadic sightings of humpback whales in a wide range of places, including waters offshore from the mid-Atlantic and Southeast United States, in the Gulf of Mexico, and in the waters around Ireland. Bermuda is a known mid-ocean stopover point for humpback whales on their northbound migration (Stone *et al.,* 1987).

Discreteness

Genetic studies have identified 25 humpback whale haplotypes in the western North Atlantic, 12 haplotypes in eastern North Atlantic samples, and 19 haplotypes in whales that feed during the summer in the Gulf of Maine (Palsbøll *et al.,* 1995; Larsen, 1996a; Rosenbaum *et al.,* 2002). Humpback whales in the North Atlantic Ocean appear to have higher haplotype diversity than humpback whales in the North Pacific Ocean (Baker and Medrano-González, 2002). Haplotype diversity is lowest in populations around Norway and Iceland and higher around the northwestern feeding areas off Greenland, Gulf of St. Lawrence and Gulf of Maine (Baker and Medrano-González, 2002). Observed nucleotide diversity is also higher in the North Atlantic than in the North Pacific (Baker and Medrano-González, 2002).

Whales that breed in the West Indies and Cape Verde Islands co-mingle in North Atlantic feeding areas. Palsboll *et al.* (1995) and Valsecchi *et al.* (1997) found significant (F_{ST}= ~0.04) levels of mtDNA and nuclear genetic variation among North Atlantic feeding areas, suggesting there are genetically distinct breeding areas (there are no published genetic studies directly comparing whales in the West Indies breeding areas with whales in the Cape Verde Islands breeding areas). Photo-ID and genetic matching data suggest no evidence for substructure within the West Indies breeding population (reviewed by Fleming and Jackson (2011)), so this differentiation likely is due to genetic divergence between the West Indies and another North Atlantic breeding population, likely associated with the Cape Verde Islands or possibly other areas in the Northeastern Atlantic.

Most of the humpback whales on the western North Atlantic feeding grounds (Gulf of Maine, Gulf of St. Lawrence, West Greenland, and eastern Canada) come from the well-studied West Indies breeding ground (approximately 90 percent) (Clapham *et al.,* 1993; Mattila *et al.,* 2001). Some of the whales from the Iceland and Norway feeding grounds also come from the West Indies breeding grounds, but genetic evidence suggests that most whales from the Iceland and Norway feeding grounds migrate from some other breeding ground. The location of possible breeding grounds of these whales is not well understood, but Clapham *et al.* (1993) suggest it may be in the eastern tropical Atlantic Ocean. Sighting histories of the Cape Verde Islands whales link them to feeding grounds in the waters off Iceland or Norway (Katona and Beard, 1990; Jann *et al.,* 2003), and the Cape Verde Islands is the only candidate breeding ground from historical whaling records. However, current studies show only a small number of whales in the Cape Verde Islands—far fewer than the non-West Indies whales known to exist in the northeastern Atlantic. The Cape Verde Islands may therefore be part of a larger breeding area, or there may be a third separate breeding area that is as yet undiscovered (Charif *et al.,* 2001; Reeves *et al.,* 2002). The possibility of a third breeding area unassociated with the Cape Verde Islands is supported by nuclear DNA, as there is a significant degree of heterogeneity in nuclear DNA among populations in the western, central (Iceland) and eastern (Norway) North Atlantic feeding grounds (Larsen, 1996b).

The BRT concluded there are two populations of humpback whales in the North Atlantic Ocean meeting the discreteness criteria under the DPS policy—one with breeding grounds in the West Indies and another with breeding grounds near Cape Verde Islands and a possible associated breeding area, likely off Northwest Africa. In particular, whales from the West Indies and the Cape Verde Islands breeding grounds are discrete based on: (1) No photographic matches between individuals using the West Indies and Cape Verde Islands areas (acknowledging that there is a large sample size for the West Indies breeding grounds and a small sample size for the Cape Verde Islands breeding grounds); (2) occupation of both breeding grounds at the same time; (3) evidence from 19th century whaling data of a historically larger population at the Cape Verde Islands than exists today; and (4) genetic heterogeneity in the feeding grounds indicating that the West Indies is not the only breeding ground. Because the Cape Verde Islands cannot account for the abundance of whales estimated from the eastern North Atlantic feeding grounds that are not documented using the West Indies, there must be an additional breeding area, likely near Northwest Africa, and possibly associated with the Cape Verde Islands.

Significance

The West Indies breeding ground includes the Atlantic margin of the Antilles from Cuba to northern Venezuela, with the Silver/Navidad/Mouchoir Bank complex comprising a major breeding ground. Whales from this breeding ground have a feeding range that primarily includes the Gulf of Maine, eastern Canada, and western Greenland. While many West Indies whales also use feeding grounds in the central North Atlantic (Iceland) and eastern North Atlantic (Norway), many whales from these feeding areas appear to winter in another location.

The BRT concluded this discrete group of whales is significant to the North Atlantic subspecies due to the significant gap in the breeding range that would occur if it were extirpated. Loss of the West Indies population would result in the loss of humpback whales from all of the western North Atlantic breeding grounds (Caribbean/West Indies) and feeding grounds (United States, Canada, Greenland).

The Cape Verde Islands/Northwest Africa breeding grounds include waters surrounding the Cape Verde Islands as well as an undetermined breeding area in the eastern tropical Atlantic, which may be more geographically diffuse than the West Indies breeding ground. The population of whales breeding in Cape Verde Islands plus this unknown area likely represents the remnants of a historically larger population breeding around Cape Verde Islands and Northwest Africa (Reeves *et al.,* 2002). There is no known overlap in breeding range with North Atlantic humpback whales that breed in the West Indies. As noted above, the BRT determined the population was discrete from the West Indies population based upon genetic evidence that suggests a second breeding ground occupied by whales that feed primarily off Norway and Iceland. It also determined that this population was significant to the North Atlantic subspecies because of the gap that would exist in the breeding range if it were extirpated.

We agree with the BRT and we therefore identify two DPSs of the North Atlantic humpback whale subspecies: (1) West Indies DPS; and (2) Cape Verde Islands/Northwest Africa DPS.

North Pacific

Overview

Humpback whales in the North Pacific migrate seasonally from northern latitude feeding areas in summer to low-latitude breeding areas in winter. Feeding areas are dispersed across the Pacific Rim from California, United States, to Hokkaido, Japan. Within these regions, humpback whales have been observed to spend the majority of their time feeding in coastal waters. Breeding areas in the North Pacific are more geographically separated than the feeding areas and include: (1) Regions offshore of mainland Central America; (2) mainland, Baja Peninsula and the Revillagigedos Islands, Mexico; (3) Hawaii; and (4) Asia including Ogasawara and Okinawa Islands and the Philippines. About half of the humpback whales in the North Pacific Ocean breed and calve in the U.S. waters off Hawaii; more than half of North Pacific Ocean humpback whales feed in U.S. waters.

Humpback whales in the North Pacific rarely move between these breeding regions. Strong fidelity to both feeding and breeding sites has been observed, but movements between feeding and breeding areas are complex and varied (Calambokidis *et al.,* 2008). An overall pattern of migration has recently emerged. Asia and Mexico/Central America are the dominant breeding areas for humpback whales that migrate to feeding areas in lower latitudes and more coastal areas on each side of the Pacific Ocean, such as California and Russia. The Revillagigedo Archipelago and Hawaiian Islands are the primary winter migratory destinations for humpback whales that feed in the more central and higher latitude areas (Calambokidis *et al.,* 2008). However, there are exceptions to this pattern, and it seems that complex population structure and strong site fidelity coexist with lesser known, but potentially high, levels of plasticity in the movements of humpback whales (Salden *et al.,* 1999).

Discreteness

Baker *et al.* (2013) recently analyzed genetic variation in a large (n = 2,193) sample of whales from 8 breeding and 10 feeding regions within the North Pacific. The 8 possible breeding regions included the Philippines, Okinawa, Ogasawara, Hawaii, Revillagigedo, Baja California, the Mexican mainland coast, and Central America. In addition, results from Calambokidis *et al.* (2008) indicate the existence of at least one additional breeding area whose location has not been identified. Overall, the level of genetic divergence among breeding areas at the mtDNA control region was substantial (F_{ST} = 0.093). Pairwise estimates of divergence among breeding areas ranged from none (F_{ST} = ~0.000; Philippines vs Okinawa) to very high (F_{ST} > 0.2 for Hawaii versus Okinawa and Philippines, and Hawaii versus Central America). In addition to little divergence between Okinawa and the Philippines, the three Mexican areas (mainland coast, Baja California, and Revillagigedos Islands) were not significantly differentiated. In contrast to the mtDNA variation, the breeding areas were less strongly (but still significantly) differentiated at 10 nuclear microsatellite loci (F_{ST} = 0.006), suggesting the possibility of some male mediated gene flow among breeding areas. After application of an adjustment for diversity (Hedrick, 2005; Baker *et al.,* 2013), the effect size increased to F'_{ST} = 0.0128 and F'_{ST} = 0.0214 for feeding and breeding grounds, respectively. Of these nine areas, two are likely migratory routes to other locations and might therefore not be primary breeding grounds: the waters off Baja California and the Ogasawara Islands.

Similarly, some humpback whales migrating to the Okinawa Islands pass by the Ogasawara Islands, and the Ogasawara Islands are also thought likely to be along the migration route to the unidentified breeding area that was described in Calambokidis *et al.* (2008). Because of the existence of an unidentified breeding area, the population structure of the western North Pacific populations proved more challenging. Humpback whales in Okinawa were not significantly different in either mtDNA or nDNA from whales in the Philippines (Baker *et al.,* 2013). Mitochondrial DNA and nDNA markers from the pooled populations from Okinawa and the Philippines populations differ significantly from those of humpback whales in the Ogasawara Islands and all other populations (Baker *et al.,* 2013). However, given the likelihood that Ogasawara whales are only passing through en route to two or more migratory destinations, the BRT members concluded that there are likely two discrete populations consisting of an Okinawa/Philippines population and an unknown breeding group, both using the Ogasawara area as a migratory corridor. Given the uncertainty about the location of the other breeding ground, and the use of a common migratory corridor by the known group and the unknown group, we have decided to include the unknown breeding group in the Okinawa/ Philippines population. We refer to this combined discrete population as the Western North Pacific population.

The Hawaii population of humpback whales is separated by the greatest geographic distance from neighboring populations and was significantly different from other populations in both frequencies of mtDNA haplotypes and nDNA (microsatellite) alleles (Baker *et al.,* 2013). The BRT therefore concluded that whales wintering in Hawaii constitute a discrete population.

In Mexico, available genetic and demographic studies indicate that humpback whales migrating to mainland Mexico and to the Revillagigedos Islands pass by the tip of Baja California. The BRT therefore concluded that humpback whales off Baja California should not be considered a discrete population. Further, the mainland population in Mexico does not differ significantly from the Revillagigedos population in its mtDNA haplotype frequencies (Baker *et al.,* 2013). Photo-identification studies also indicate considerable movement of individuals between mainland and offshore island breeding areas in Mexico (Calambokidis *et al.,* 2008). The BRT therefore concluded that mainland Mexico and the Revillagigedos populations are a single Mexico population discrete from all other populations.

In the eastern North Pacific, humpback whales in Central America have a unique mtDNA signature, as reflected in the frequencies of haplotypes (Baker *et al.,* 2008a; Baker *et al.,* 2008b). This frequency composition is significantly different from that in whales from all other breeding grounds in the North Pacific. The BRT concluded that humpback whales in Central America are a discrete population.

Thus while the BRT concluded there are five breeding populations of humpback whales in the North Pacific that meet the criteria for being discrete under the DPS Policy guidelines, we propose to identify four: (1) Western North Pacific (includes Okinawa/ Philippines and the unidentified breeding area in the western North Pacific); (2) Hawaii (3) Mexico (includes mainland Mexico and the Revillagigedos Islands); and (4) Central America.

Significance

In evaluating whether any discrete population differed in its ecological characteristics from others, the BRT weighted ecological differences among feeding areas more heavily than among breeding areas, since it concluded that the ecological characteristics of humpback whales in their breeding ranges were largely similar among populations. In contrast, the BRT concluded whales largely foraging in different large marine ecosystems inhabit different ecological settings and that this is relevant in evaluating the significance of these populations. The BRT stated that, within the North Pacific, the Okinawa/Philippines, Hawaii, Mexico, and Central America populations tend to feed in different marine ecosystems, although there is some overlap. The Western North Pacific population, which feeds in the Western Bering Sea (the Okinawa/ Philippines population) and the Aleutian Islands (the unidentified breeding population), feeds in an ecosystem entirely different from the others in the North Pacific. The BRT also noted that the Central America population's breeding habitat is ecologically unique for the species as it is the only area where documented geographic overlap of populations that feed in different hemispheres occurs, potentially creating a conduit for genetic exchange between the two hemispheres. While a minority of members believed that this was an example of temporal and geographic overlap rather than a unique ecological setting, we conclude that the Central America population is significant to the ocean-basin based North Pacific subspecies because of its ecologically unique breeding habitat. We agree with the BRT that the Western North Pacific and Central America populations occupy unique ecological settings (unique breeding and feeding grounds for the Western North Pacific, unique breeding habitat for the Central America population), and therefore, they both are significant to the North Pacific subspecies.

The BRT noted that in the North Pacific Ocean, loss of the Okinawa/ Philippines population would likely result in a significant gap in the North Pacific feeding range as these individuals are the only breeding population to migrate primarily to Russia, and loss of this population would therefore result in a loss of feeding range along the Russian coast. We concur with this conclusion, but because we have combined the unknown breeding group that feeds in the Aleutian Islands with the Okinawa/ Philippines population, we need to assess whether this combined Western North Pacific population is significant to the ocean-basin based North Pacific subspecies. We conclude that the loss of the Western North Pacific population would result in a significant gap in the range of the North Pacific subspecies because if loss of the Okinawa/ Philippines population would result in a significant gap, then the loss of a larger combined population would, too. The loss of humpback whales from the Hawaii breeding population would result in loss of humpbacks from the Hawaiian Islands, and this would represent a significant gap in the range of the North Pacific subspecies. We conclude that the Western North Pacific and the Hawaii populations both meet the significance criterion of the DPS Policy because loss of these populations would result in a significant gap in the range of the North Pacific subspecies. While the loss of the Mexico or Central America populations would not result in a significant gap in the range of their feeding grounds because their feeding grounds overlap, it would result in a significant gap in their breeding grounds, and therefore, we consider the Mexico and Central America populations also to be significant to the North Pacific subspecies.

The BRT discussed whether there was evidence for marked genetic divergence among any of the discrete populations. Although there was not clear agreement on the definition of ''marked,'' the BRT concluded that strong patterns of genetic differentiation in mtDNA sequence among most of the North Pacific breeding populations indicated marked genetic divergence, consistent with the conclusions in Baker *et al.* (2013). The overall level of differentiation among breeding populations within the North Pacific ($F_{ST} = 0.09$) was similar to the level of divergence among ocean basins and is consistent with a relatively high degree of divergence of these populations. Further, in reviewing Baker *et al.* (2013), all populations that we have identified as discrete in the North Pacific are strongly differentiated from each other at the p-value [2] of 0.01 level or better, except for the Central America/ Philippines pair, which are differentiated from each other at p-value of 0.05. Therefore, we agree with the BRT and conclude that all four of the discrete populations we have identified in the North Pacific (Western North Pacific, Hawaii, Mexico, and Central

[2] The p-value is the probability of obtaining a test statistic result at least as extreme as the one that was actually observed, assuming that the null hypothesis is true; a small p-value (typically ≤ 0.05) indicates strong evidence against the null hypothesis; a null hypothesis is a general statement or default position that there is no relationship between two measured phenomena.

America) are significant to the North Pacific subspecies because of marked genetic differentiation.

Although the petitioned North Pacific population could also satisfy the discreteness and significance criteria of the DPS Policy, there are other plausible and scientifically supported approaches to dividing the species into DPSs. We conclude that our modification of the BRT's approach for humpback whales in the North Pacific (*i.e.,* combining the unknown breeding group with the Okinawa/Philippines population) is more appropriate to further the purposes of the ESA because it represents a more risk-averse approach with respect to the unknown breeding group. As discussed above, identification of the Western North Pacific, Hawaii, Mexico, and Central America populations as DPSs is supported by the best available scientific and commercial information. We are exercising the discretion afforded to us as an expert agency charged with administering the ESA in the face of conflicting proposals (*i.e.,* petitions to delist North Pacific and Central North Pacific populations) to recognize these four populations as DPSs. Therefore, we will evaluate the status of each of these four DPSs in the North Pacific rather than recognizing a single North Pacific DPS and evaluating its combined status (*i.e.,* the approach offered by the Hawaii Fishermen's Alliance). The petition to delineate the North Pacific population as a DPS and ''delist'' it is therefore denied (*i.e.,* the petitioned action is not warranted). The petitioned Central North Pacific population is the same as the Hawaii DPS we have identified; therefore, we will evaluate the status of the Hawaii DPS to determine whether it is warranted for listing.

The following populations of the North Pacific humpback whale subspecies meet the discreteness and significance criteria for being a DPS under the DPS Policy: (1) Western North Pacific; (2) Hawaii; (3) Mexico; and (4) Central America.

Southern Hemisphere

Overview

There are at least eleven breeding grounds identified in the Southern Hemisphere at temperate latitudes: Brazil, Gabon and central West Africa, Mozambique, the Comoros Archipelago, Madagascar, West Australia, East Australia, New Caledonia, Tonga, French Polynesia, and the southeastern Pacific, (Stevick *et al.,* 2006; Zerbini *et al.,* 2006b; Engel and Martin, 2009; IWC, 2011). The Arabian Sea breeding ground is also at a temperate latitude and, while it is in the Northern Hemisphere, we discuss it here because we determined earlier that it was part of the Southern Hemisphere subspecies of the humpback whale.

The primary mating/calving ground of humpback whales in the western South Atlantic Ocean is the coast of Brazil. This population migrates to feeding grounds located east of the Scotia Sea near South Georgia and the South Sandwich Archipelagos (Stevick *et al.,* 2006; Zerbini *et al.,* 2006b; Engel *et al.,* 2008; Engel and Martin, 2009; Zerbini *et al.,* 2011). The winter breeding distribution of humpback whales in the southwestern Atlantic (June to December) is concentrated around the Abrolhos Bank region in Brazil (15–18° S.) and 500 km north, along the north coast of Bahia State and Espirito Santo State (Rossi-Santos *et al.,* 2008) and near Salvador and Recife.

A humpback whale winter breeding and calving ground is located off central western Africa between ~6° S. and ~6° N. in the eastern Atlantic. Periods of peak abundance are found between July and September, with some whales still present as late as December and January in Angola, Gabon and São Tomé (Weir, 2007). The Gabon/Southwest Africa region appears to serve a variety of purposes with some individual whales remaining in the area through the year while some use the area for feeding and others for mating (Bettridge *et al.,* 2015).

At least three winter breeding aggregations of humpback whales have been suggested in the southwestern Indian Ocean from historical whaling records and contemporary surveys (Wray and Martin, 1983; Best *et al.,* 1998). One is associated with the mainland coastal waters of southeastern Africa, extending from Mozambique (24° S., Findlay *et al.,* 1994) to as far north as Tanzania and southern Kenya (Wamukoya *et al.,* 1996; Berggren *et al.,* 2001; O'Connor *et al.,* 2009). The second is found in the coastal waters of the northern Mozambique Channel Islands (Comoros Archipelago) and the southern Seychelles (Bettridge *et al.,* 2015). The third is associated with the coastal waters of Madagascar (15–25° S.), best described in Antongil Bay on the east coast (Rosenbaum *et al.,* 1997).

At least three migratory pathways to Antarctic summer feeding grounds in this region have been proposed using a compilation of data from surveys, whaling and acoustic records and sightings (Best *et al.,* 1998). Humpback whale wintering grounds and coastal migratory routes in the eastern Indian Ocean are located between 15–35° S. along the west coast of Australia, with major calving grounds occurring in the Kimberley Region (15–18° S.) and resting areas on the southern migration at Exmouth Gulf (21° S.) and at Shark Bay (25° S.) (Bannister and Hedley, 2001; Jenner *et al.,* 2001).

Humpback whales along the east coast of Australia are thought to breed primarily in waters inside the Great Barrier Reef (16–21° S.) (Chittleborough, 1965; Simmons and Marsh, 1986) and are seen as far north as Murray Island at ~10° S. (Simmons and Marsh, 1986). Discovery marks and satellite telemetry suggest east Australian whales feed in a broad swath of the Antarctic between 100° E. and 175° W., or that they frequent at least two feeding regions, one due south of eastern Australia stretching to the east beneath New Zealand, and one south of west Australia at ~100° E. and accessed via migration through Bass Strait.

The longitudinal distribution boundaries of humpback whales wintering in Oceania lie between ~160° E. (west of New Caledonia) and ~120° W. (east of French Polynesia) and latitudinally between 0° and 30° S. (Reeves *et al.,* 1999), a range that includes American Samoa (United States), the Cook Islands, Fiji, French Polynesia (France), Republic of Kiribati, Nauru, New Caledonia (France), Norfolk Island, New Zealand, Niue, the Independent State of Samoa, Solomon Islands, Tokelau, Kingdom of Tonga, Tuvalu, Vanuatu, Wallis and Futuna (France).

The wintertime breeding distribution of humpback whales in the southeastern Pacific (May to November) includes the coastal waters between Panama and northern Peru, with the main wintering areas concentrated in Colombia (Gorgona Island, Málaga Bay and Tribugá Gulf), Panama, and Ecuador. Low densities of whales are also found around the Galápagos Islands (Félix *et al.,* 2006b), and coastal sightings have been made as far north as Costa Rica (Coco Island and Golfo Dulce, 8° N.) (Acevedo and Smultea, 1995; May-Collado *et al.,* 2005). In the summer months, these whales migrate to feeding grounds located in waters off southern Chile, the Magellan Strait, and the Antarctic Peninsula (May-Collado *et al.,* 2005; Félix *et al.,* 2006b; Acevedo *et al.,* 2008).

Sightings and survey data suggest that humpback whales in the Arabian Sea are primarily concentrated in the shallow near-shore areas off the coast of Oman, particularly in the Gulf of Masirah and Kuria Muria Islands regions (Minton, 2004); sightings and strandings suggest a population range that encompasses the northern Gulf of

Aden, the Balochistan coast of Pakistan, and western India and Sri Lanka, with occasional sightings on the Sistan and Baluchistan coasts of Iran, and also Iraq (Al Robaae, 1974; Braulik *et al.,* 2010). Photo-identification re-sightings suggest humpback whales move seasonally between the Dhofar region (Kuria Muria Islands) in winter and the Gulf of Masirah to the north in summer, with similar re-sighting rates between and within regions (Minton *et al.,* 2010b).

Despite extensive comparisons of photo-identification catalogues and genotyped individuals between Oman and the other Indian Ocean catalogues and genetic datasets, no matches have been detected between regions (Pomilla *et al.,* 2006; Minton *et al.,* 2010a). Humpback whales from this region carry fewer and smaller barnacles than Southern Hemisphere whales, and do not exhibit the white oval scars indicative of cookie cutter shark (*Isistius brasiliensis*) bites, a feature commonly seen on some Southern Hemisphere humpback whales (Mikhalev, 1997).

Connections between the Arabian Sea population with the other Northern Hemisphere populations are highly unlikely as there is no accessible northward passage from the Arabian Sea. Furthermore, there are no mitochondrial DNA haplotypes or song patterns shared with North Pacific humpback whales (Whitehead, 1985; Rosenbaum *et al.,* 2009); thus, on current evidence, and in the absence of comparisons with far western North Pacific humpbacks, it appears that whales from these populations have no recent biological connectivity. Analysis of fetal lengths in pregnant females killed by Soviet whalers clearly indicate that this population exhibits a Northern Hemisphere reproductive cycle, with births occurring in the boreal winter (Mikhalev, 1997).

Discreteness

Olavarría *et al.* (2007) analyzed patterns of mtDNA control region variation obtained from 1,112 samples from 6 breeding grounds in the South Pacific: New Caledonia, Tonga, Cook Islands, eastern Polynesia, Colombia, and Western Australia. Of these areas, the samples from Colombia were most differentiated (F_{ST} = 0.06—0.08 in pairwise comparison to other areas). Pairwise divergence among the other areas was lower (F_{ST} = 0.01—0.05). All pairwise comparisons were statistically >0, however, and indicated a lack of free exchange among these breeding areas. Levels of haplotype diversity were generally very high (0.90—0.97). Rosenbaum *et al.* (2009) conducted a similar study of breeding areas in the Southern Atlantic and Western Indian Oceans, including the coastal areas of Brazil, Southwestern Africa, and Southeastern Africa. Levels of differentiation among these are statistically significant but relatively low, with F_{ST} ranging from 0.003 (among two Southwestern African locations) to 0.017 (between Brazil and Southeastern Africa). Although there was some detectable differentiation among samples from Southwestern and Southeastern African coastal locations (B1/B2 and C1/C2/C3 International Whaling Commission (IWC) stocks, respectively), the levels of divergence within these areas were very low (F_{ST} = 0.003–0.009 within the ''B'' stock and 0.002–0.005 within the ''C'' stock). The estimated number of migrants per generation was 26 between Brazil and Southwestern Africa, and 33 between Southwestern and Southeastern Africa.

A report on an IWC workshop devoted to Southern Hemisphere stock structure issues (IWC, 2011) recognizes at least seven ''breeding stocks'' associated with low-latitude, winter breeding grounds and, in some cases, migratory corridors. These seven breeding stocks are referred to alphabetically, from A to G, to distinguish them from the six management areas on feeding grounds of the Antarctic, referred to as Areas I–VI. The current breeding stock designations are southwestern Atlantic (A), southeastern Atlantic (B), southwestern Indian Ocean (C), southeastern Indian Ocean (D), southwestern Pacific (E), Oceania (E and F) and southeastern Pacific (G). These designations have been subdivided to reflect improved understanding of substructure within some of these regions: Gabon (B1) and Southwest Africa (B2) in the southeastern Atlantic; Mozambique (C1), the Comoros Archipelago (C2), Madagascar (C3) and the Mascarene Islands (C4) in the southwestern Indian Ocean, east Australia (E1), New Caledonia (E2), Tonga (E3), the Cook Islands (F1) and French Polynesia (F2) in the southwestern Pacific and Oceania. The IWC has also chosen to include in this assessment, a year-round population of humpback whales found in the Arabian Sea, north of the equator in the northern Indian Ocean (formerly referred to as breeding stock X).

The BRT noted that the magnitude of mitochondrial DNA differentiation (as measured by F_{ST}) was generally lower among Southern Hemisphere breeding areas than it is in the Northern Hemisphere, indicating greater demographic connectivity among these areas. Even so, significant differentiation was present among major breeding areas, and the estimated number of migrants/generation among areas was small compared to the estimated sizes of the populations.

The BRT members concluded that the seven breeding stocks of humpback whales currently formally recognized by the IWC in the Southern Hemisphere meet the criteria for being discrete populations under the DPS Policy guidelines, except that they agreed that the dividing line between IWC stocks E and F was between eastern Australia and Oceania (defined here to include New Caledonia, Tonga, Samoa, American Samoa, and French Polynesia), as there are large differences in the rates of recovery between these two regions, indicating they are demographically independent. Breeding populations in New Caledonia and east Australia are separate, but some overlap between the populations occurs: some whales bound for New Caledonia use the same migratory pathways as some whales headed past east Australia. There was consensus among the BRT to divide the Southern Hemisphere into seven discrete populations: Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania (including New Caledonia, Tonga, Cook Islands, Samoa, American Samoa and French Polynesia), and Southeastern Pacific (Colombia and Ecuador). We agree with the BRT's conclusions, based on the significant mitochondrial DNA differentiation among major breeding populations.

With regard to the Arabian Sea population, nuclear and mitochondrial DNA diversity of humpback whales from Oman (up to 47 individuals sampled) is the lowest among all breeding grounds (Pomilla *et al.,* 2006; Olavarría *et al.,* 2007; Rosenbaum *et al.,* 2009). Mitochondrial DNA analysis revealed only eight distinct haplotypes, half of which are exclusive to Oman (not detected on other breeding grounds, Pomilla *et al.,* 2006). Haplotype diversity at the mtDNA control region is markedly lower than in other populations (0.69 vs 0.90–0.98 for Southern Hemisphere populations and 0.84 for North Pacific populations) (Olavarría *et al.,* 2007; Rosenbaum *et al.,* 2009; Baker *et al.,* 2013).

Genetic data (nuclear microsatellites and mitochondrial control region) and fluke pigmentation markings indicate that the Arabian Sea breeding population is significantly differentiated from Southern Indian Ocean breeding grounds (Rosenbaum *et al.,* 2009). Nuclear genetic analysis suggests that this population is the most strongly and significantly differentiated in all comparisons among other Indian Ocean and South Atlantic breeding populations (pair-wise F_{ST} range between Oman and Southern Indian Ocean breeding populations = 0.38–0.48) (Pomilla *et al.,* 2006). Levels of mitochondrial DNA differentiation between Oman and other Indian Ocean breeding grounds are around ten times higher than among the other breeding grounds (pair-wise F_{ST} range between Oman and other Indian Ocean breeding populations 0.11–0.15) (Rosenbaum *et al.,* 2009).

The BRT concluded, and we agree, that the Arabian Sea population is discrete from all other populations because of its low haplotype diversity compared to Southern Hemisphere and North Pacific populations, its differentiation in mtDNA and nDNA markers, and fluke pigmentation differences between whales in the Arabian Sea and in the Southern Indian Ocean.

Significance

The BRT noted that, within the Southern Hemisphere, most breeding populations feed in the same Antarctic marine ecosystem. One exception is the Brazil population, which feeds north of 60° S. in the South Georgia and South Sandwich Islands area (IWC, 2011). In addition to feeding in the Antarctic system, the Gabon/Southwest Africa population may also feed along the west coast of South Africa in the Benguela Current, but this is uncertain (IWC, 2011). Like the Central America population, the Southeastern Pacific breeding population may also be ecologically unique as it is the only population in the Southern Hemisphere to occupy an area also used by a Northern Hemisphere population. We conclude that the Brazil, Gabon/Southwest Africa, and Southeastern Pacific populations occupy unique ecological settings and are therefore significant to the Southern Hemisphere subspecies of the humpback whale.

For the Southern Hemisphere, determination of feeding range is more difficult since Antarctic feeding areas are less well studied and fewer connections between breeding and feeding populations have been made. However, some populations such as Brazil, Southwest Africa, Southeast Africa, and the Southeastern Pacific are believed to have fairly discrete and non-overlapping feeding areas, suggesting that if any of these feeding areas were lost it would, in combination with the lost breeding area, result in a significant gap in the range. We conclude, therefore, that the Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, and Southeastern Pacific populations are significant to the Southern Hemisphere subspecies of the humpback whale because their loss would result in significant gaps in the range of the Southern Hemisphere subspecies. Further, we believe that the loss of the West Australia, East Australia, and Oceania populations would also result in significant gaps in the ranges of the Southern Hemisphere subspecies because their non-overlapping breeding ranges are quite extensive.

In the Southern Hemisphere, the Southeastern Pacific population is the only breeding population that contains a genetic signal from Northern Hemisphere populations, giving it a unique genetic signature within the Southern Hemisphere (Baker *et al.,* 1993; Baker and Medrano-González, 2002). It is also the most divergent of any of the Southern Hemisphere populations (Olavarría *et al.,* 2007). In addition, individuals in this region are morphologically distinct as they have darker pectoral fin coloration than other individuals in the Southern Hemisphere (Chittleborough, 1965), although the genetic basis for this trait is not known. Nonetheless, a majority of the BRT concluded that the Southeastern Pacific population was sufficiently differentiated so as to differ 'markedly' in its genetic characteristics from other Southern Hemisphere populations. In contrast, all other Southern Hemisphere populations were characterized by generally low levels of differentiation among them, consistent with demographically discrete populations but not necessarily with marked genetic divergence associated with long-term isolation (Olavarría *et al.,* 2007; Rosenbaum *et al.,* 2009). We conclude that the Southeastern Pacific population of the humpback whale is significant to the Southern Hemisphere population of the humpback whale because it differs markedly in its genetic characteristics from other Southern Hemisphere populations. We conclude that each of the seven discrete Southern Hemisphere populations (Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific) satisfies at least one significance factor of the DPS Policy, and, therefore, we consider them to be DPSs.

The Arabian Sea population persists year-round in a monsoon driven tropical ecosystem with highly contrasting seasonal wind and resulting upwelling patterns. The BRT therefore concluded that this population persists in a unique ecological setting. The Arabian Sea population segment does not migrate extensively, but instead feeds and breeds in the same geographic location. No other humpback whale populations occupy this area and hence, a loss of the Arabian Sea population would result in a significant gap in the range of the Southern Hemisphere subspecies. The BRT also concluded that the Arabian Sea population differs markedly in its genetic characteristics from other populations in the Indian Ocean and worldwide. The degree of genetic differentiation at multiple genetic markers between this population and other populations is similar to or greater than the degree of divergence among the North Pacific, North Atlantic, and Southern Hemisphere areas. The BRT unanimously concluded that the Arabian Sea population would be considered a DPS under any global taxonomic scenario, due to its marked genetic divergence from all other populations and unique ecological setting. We agree that the Arabian Sea population occupies a unique ecological setting, its loss would result in a significant gap in the range of the Southern Hemisphere subspecies, and it differs markedly in its genetic characteristics from other populations. Therefore, it meets the significance criterion of the DPS policy, and we identify the Arabian Sea population as a DPS.

Extinction Risk Assessment

The BRT discussed the relationship between population size and trend and extinction risk, citing relevant literature on small population size, environmental and demographic stochasticity, genetic effects, catastrophes, and extinction risk (*e.g.,* Franklin, 1980; Soulé, 1980; Gilpin and Soulé, 1986; Allendorf *et al.,* 1987; Goodman, 1987; Mace and Lande, 1991; Frankham, 1995; Lande, 1998; Lynch and Blanchard, 1998; Lynch and Lande, 1998; Frankham, 1999; Brook *et al.,* 2006; Mace *et al.,* 2008) and concluding that population size criteria similar to those described in Mace *et al.* (2008) (International Union for Conservation of Nature and Natural Resources (IUCN) Red List criteria) could be considered carefully but not used as the sole criterion for evaluating extinction risk. The criteria the BRT considered are that a DPS with a total population size >2,000 was not likely to be at risk due to low abundance alone, a DPS with a population size <2,000 would be at increasing risk from factors associated with low abundance (and the lower the population size, the greater the risk), a DPS with a population size <500 would be at high risk due to low abundance, and a DPS with a population size <100 would be at extremely high risk due to low abundance. But again, this was not the sole criterion considered by the BRT, as the BRT also considered how any of the factors (or threats) listed under ESA section 4(a)(1) contribute to the extinction risk of each DPS now and in the foreseeable future. Demographic factors that cause a species to be at heightened risk of extinction, alone or in combination with other threats under section 4(a)(1), are considered under ESA Factor E—other natural or manmade factors affecting the continued existence of the species. Ultimately, the BRT considered both the abundance and trend information and the threats to each DPS before making its conclusions on overall extinction risk for each DPS.

The BRT considered abundance and trend information and categorized each DPS' abundance as described above and indicated whether the population trend was increasing strongly, increasing moderately, stable/little trend, or declining. The BRT included an ''unknown'' category where data were not sufficient to detect a trend. To express uncertainty in abundance or trend information for any DPS, the BRT categorized abundance and trend in more than one category. As noted above, while NMFS' 1991 Humpback Whale Recovery Plan recommended that populations grow to at least 60 percent of their historical (pre-hunting) abundance to be considered recovered, it did not identify specific numerical targets due to uncertainty surrounding historical abundance levels. So, the plan suggested an interim goal of doubling the population sizes within 20 years, which corresponds to an annual growth rate of about 3.5 percent. Because historical size of humpback whale populations continues to be uncertain (Bettridge *et al.,* 2015) two decades after the recovery plan was finalized, and humpback whale survey periods have not spanned 20 years since issuance of the 1991 recovery plan, data are not available to evaluate the status of humpback whale populations against these goals. Therefore, the BRT focused its biological risk analysis primarily on recent abundance trends and whether absolute abundance was sufficient for biological viability in light of consideration of the factors under Section 4(a)(1). This is a valid approach that we often use to evaluate the risk of extinction to populations.

The BRT also ranked the severity of 16 current or imminent threats to the humpback whale DPSs (1 = low or none, threat is likely to have no or minor impact on population size or the growth rate; 2 = medium, threat is likely to moderately reduce the population size or the growth rate of the population; 3 = high, threat is likely to seriously reduce the population size or the growth rate of the population, 4 = very high, threat is likely to eliminate the DPS, unknown = severity of threat is unknown) and also indicated whether the trend of any threat was increasing.

Finally, the BRT members assessed the risk of extinction for each DPS by distributing 100 likelihood points among 3 categories of extinction risk: (1) High Risk = a species or DPS has productivity, spatial structure, genetic diversity, and/or a level of abundance that place(s) its persistence in question. The demographics of a species/DPS at such a high level of risk may be highly uncertain and strongly influenced by stochastic and/or small population effects. Similarly, a species/DPS may be at high risk of extinction if it faces clear and present threats (*e.g.,* imminent destruction, modification, or curtailment of its habitat; or disease epidemic) that are likely to create an imminent risk of extinction; (2) Moderate Risk = a species or DPS is at moderate risk of extinction if it exhibits characteristics indicating that it is likely to be at a high risk of extinction in the future. A species/DPS may be at moderate risk of extinction due to projected threats and/or declining trends in abundance, productivity, spatial structure, or diversity; and (3) Not at Risk = a species or DPS is not at risk of extinction.

The BRT decided to evaluate risk of extinction over a time frame of approximately 60 years, which corresponds to about three humpback whale generations. The BRT concluded it could be reasonably confident in evaluating extinction risk over this time period (the foreseeable future) because current trends in both the biological status of the species and the threats it faces are reasonably foreseeable over this period of time. In making our listing determinations, we have applied this same time horizon. In the next sections, we summarize the information presented in the BRT's status review report; see Bettridge *et al.* (2015) for more details.

Abundance and Trends for Each DPS

West Indies DPS

As discussed above, this DPS consists of the humpback whales whose breeding range includes the West Indies and whose feeding range primarily includes the Gulf of Maine, eastern Canada, and western Greenland. While many West Indies whales also use feeding grounds in the central (Iceland) and eastern (Norway) North Atlantic, many whales from these feeding areas appear to winter in another location. The breeding range of this DPS within the West Indies is the entire Antillean arc, from Cuba to the Gulf of Paria, Venezuela.

Several abundance estimates for the West Indies DPS have been made from photo-identification studies and biopsy samples and genetic identification using a Chapman 2-sample estimator, some comparing feeding ground samples to West Indies breeding ground samples, others comparing breeding ground samples to breeding ground samples (Palsbøll *et al.,* 1997; Smith *et al.,* 1999; Clapham, 2003; Clapham *et al.,* 2003a; Stevick *et al.,* 2003; Barlow *et al.,* 2011; Waring *et al.,* 2012). Those estimates using breeding-to-breeding ground comparisons tend to be negatively biased (Barlow *et al.,* 2011). The most accurate estimate made using photo-identification studies for the Years of the North Atlantic Humpback (YONAH) data (1992 and 1993 data) was 10,752 (CV = 6.8 percent) (Stevick *et al.,* 2003). A Chapman 2-sample estimator was also applied to the genetic identification data, again using the feeding grounds (Gulf of Maine, Canada, and Greenland) as the mark, and the West Indies breeding ground as the recapture. This resulted in an estimate of 10,400 (95 percent CI 8,000–13,600; Smith *et al.,* 1999). Note that this is nearly identical to the photo-based estimate using an identical estimator (10,752 photo vs. 10,400 genetic).

Additional sampling was conducted in the West Indies in 2004 and 2005 in order to obtain an updated abundance estimate for the West Indies population (More of North Atlantic Humpbacks (MONAH) project; (Clapham, 2003; Waring *et al.,* 2012), and the BRT reviewed a preliminary analysis of these data. A Chapman 2-sample estimator was applied to the MONAH genetic identification data, using the feeding grounds (Gulf of Maine only) as the mark, and the West Indies breeding ground as the recapture, resulting in an estimate of 12,312 (95 percent CI 8,688–15,954) (NMFS unpublished data). This estimate is nearly directly comparable to the genetic estimate of 10,400 for 1992–93 (Smith *et al.,* 1999), with the exception that the earlier YONAH estimate used marked animals from Canada and West Greenland in addition to the Gulf of Maine. If it can be assumed that whales from Canada and Greenland have the same capture probability in the West Indies as do whales from the Gulf of Maine, this should not introduce any bias. The MONAH estimate of 12,312 is consistent with the increasing trend for the West

Indies shown in Stevick *et al.* (2003), though it suggests the increasing trend in the population has slowed down.

Stevick *et al.* (2003) estimated the average rate of increase for the West Indies breeding population at 3.1 percent per year (SE = 0.5 percent) for the period 1979–1993, but because of concerns that the same data may have been used twice and potentially lead to an over-estimate of the precision of the trend estimate, they re-calculated the trend analysis using only one set of abundance estimates for each time period. The revised trend for this time period was still 3.1 percent (SE=1.2 percent). When the MONAH estimate of 12,312 was added to the analysis, the increase from 1979–80 to 2004–05 was estimated to be 2.0 percent (SE=0.6 percent) per year, lower than for the earlier time period, but the increase was still significantly different from 0.0 (p = 0.008). The Silver Bank population, which serves as a proxy for the West Indies DPS, may be increasing or may be leveling off, but there are not enough data yet to support a strong conclusion.

In contrast, estimates from feeding areas in the North Atlantic indicate strongly increasing trends in Iceland (1979–88 and 1987–2007), Greenland (1984–2007), and the Gulf of Maine (1979–1991). There is some indication that the increase rate in the Gulf of Maine has slowed in more recent years (6.5 percent from 1979 to 1991 (Barlow and Clapham (1997)), 0–4 percent from 1992–2000 (Clapham *et al.* (2003a))). It is not clear why the trends appear so different between the feeding and breeding grounds. A possible explanation would be that the Silver Bank breeding ground has reached carrying capacity, and that an increasing number and percentage of whales are using other parts of the West Indies as breeding areas. If local abundance has indeed increased in some areas other than Silver Bank, it would suggest that the West Indies population is larger than estimated by the MONAH study, and that the increase rate of the overall population may be higher than the 2 percent we estimate.

Cape Verde Islands/Northwest Africa DPS

The population abundance and population trend for the Cape Verde Islands/NW Africa DPS are unknown. The Cape Verde Islands photo-identification catalog contains only 88 individuals from a 20-year period (1990–2009) (Wenzel *et al.,* 2010). Of those 88 individuals, 20 (22.7 percent) were seen more than once, 15 were seen in 2 years, 4 were seen in 3 years, and 1 was seen in 4 years. The relative high re-sighting rate suggests a small population size with high fidelity to this breeding area, although the DPS may also contain other, as yet unknown, breeding areas (Wenzel *et al.,* 2010).

Western North Pacific DPS

The abundance of humpback whales in the Western North Pacific is estimated to be around 1,000, based on the photo-identification, capture-recapture analyses from the years 2004–2006 by the ''Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific'' (SPLASH) program (Calambokidis *et al.,* 2008) from two primary sampling regions, Okinawa and Ogasawara. The growth rate of the Western North Pacific DPS is estimated to be 6.9 percent (Calambokidis *et al.,* 2008) between 1991–93 and 2004–06, although this could be biased upwards by the comparison of earlier estimates based on photo-identification records from Ogasawara and Okinawa with current estimates based on the more extensive records collected in Ogasawara, Okinawa, and the Philippines during the SPLASH program. However, the overall number of whales identified in the Philippines was small relative to both Okinawa and Ogasawara, so any bias may not be large. Overall recovery seems to be slower than in the Central and Eastern North Pacific. Humpback whales in the Western North Pacific remain rare in some parts of their former range, such as the coastal waters of Korea, and have shown no signs of a recovery in those locations (Gregr, 2000; Gregr *et al.,* 2000).

Hawaii DPS

Calambokidis *et al.* (2008) estimated the size of the humpback whale populations frequenting the Hawaii breeding area at 10,000 individuals, and assuming that proportions from the Barlow *et al.* (2011) estimate of 21,808 individuals in breeding areas in the North Pacific are likely to be similar to those estimated by Calambokidis *et al.* (2008), the population size frequenting the Hawaii breeding area would have increased to about 12,000 individuals. The most recent growth rate for this DPS was estimated between 5.5 percent and 6.0 percent (Calambokidis *et al.,* 2008).

Mexico DPS

A preliminary estimate of abundance of the Mexico DPS is 6,000–7,000 from the SPLASH project (Calambokidis *et al.,* 2008), or higher (Barlow *et al.,* 2011). There are no estimates of precision associated with that estimate, so there is considerable uncertainty about the actual population size. However, the BRT was confident that the population is likely to be much greater than 2,000 in total size. Estimates of population growth trends do not exist for the Mexico DPS by itself. Given evidence of population growth throughout most of the primary feeding areas of the Mexico DPS (California/Oregon (Calambokidis *et al.,* 2008), Gulf of Alaska from the Shumagins to Kodiak (Zerbini *et al.,* 2006a)), it was considered unlikely this DPS was declining, but the BRT noted that a reliable, quantitative estimate of the population growth rate for this DPS is not currently available.

Central America DPS

Individual humpback whales in the Central America DPS migrate from breeding grounds off Costa Rica, Panama, Guatemala, El Salvador, Honduras, and Nicaragua to feeding grounds off California, Oregon, and Washington. A preliminary estimate of abundance of the Central America population is ~500 from the SPLASH project (Calambokidis *et al.,* 2008), or ~600 based on the reanalysis by Barlow *et al.* (2011). There are no estimates of precision associated with these estimates, so there is considerable uncertainty about the actual population size. Therefore, the actual population size could be somewhat larger or smaller than 500–600, but the BRT considered it very unlikely to be as large as 2,000 or more. The size of this DPS is relatively low compared to most other North Pacific breeding populations (Calambokidis *et al.,* 2008). The trend of the Central America DPS was considered unknown.

Brazil DPS

The most recent abundance estimate for the Brazil DPS comes from aerial surveys conducted off the coast of Brazil in 2002–2005 (Andriolo *et al.,* 2010). These surveys covered the continental shelf between 6° S. and 24°30′ S. and provided a best estimate of 6,400 whales (95 percent CI = 5,000–8,000) in 2005. This estimate corresponds to nearly 24 percent of this DPS' pre-exploitation abundance (Zerbini *et al.,* 2006d). Nearly 80 percent of the whales are found in the Abrolhos Bank, the eastern tip of the Brazilian continental shelf located between 16° S. and 18° S. (Andriolo *et al.,* 2010). The best estimate of population growth rate is 7.4 percent per year (95 percent CI = 0.5–14.7 percent) for the period 1995–1998 (Ward *et al.,* 2011).

Gabon/Southwest Africa DPS

The lower and upper bounds of the abundance estimate for Iguela, Gabon, are 6,560 (CV=0.15) for 2001–2004 and 8,064 (CV=0.12) for 2001–2005. These were generated using mark-recapture genetic data, and numerous other (generally similar) estimates are available depending on model assumptions (Collins *et al.,* 2008). There are no trends available for this DPS, and it is not entirely clear how the estimates relate to potential subdivision within the DPS (Collins *et al.,* 2008). Using a Bayesian estimation methodology, Johnston and Butterworth (2008) estimate the Gabon population to be in the range of 65–90 percent of its pre-exploitation size.

Southeast Africa/Madagascar DPS

The most recent abundance estimates for the Madagascar population were from surveys of Antongil Bay, 2000–2006 (Cerchio *et al.,* 2009). Estimates using data from 2004–2006 and involving ''closed'' models of photo-identification of individuals and genotype data were 7,406 (CV = 0.37, CI: 2106–12706) and 6,951 (CV = 0.33, CI: 2509–11394), respectively. Additional estimates were made using various data sets (*e.g.,* photo-identification and genotype) and models, estimating 4,936 (CV = 0.44, CI: 2137–11692) and 8,169 individuals (CV = 0.44, CI 3476–19497, Cerchio *et al.,* 2009). The mark-recapture data were derived from surveys over several years and thus may represent the abundance of whales breeding off Madagascar, in addition to possibly whales breeding in Mayotte and the Comoros (Ersts *et al.,* 2006), and to a smaller degree from the East African Mainland (Razafindrakoto *et al.,* 2008).

Earlier estimates exist, including one of 2,532 (CV = 0.27) individuals (Best *et al.,* 1996) based on surveys of the continental shelf region across the south and southeast coasts of Madagascar in 1994. However, these surveys likely did not cover the full distribution of humpback whales in the area. Data from a 1991 survey yielded an estimate of 1,954 whales (CV = 0.38) (Findlay *et al.,* 1994). A subsequent line transect survey in 2003 included a larger region of the coast (Findlay *et al.,* 2011). From these, two estimates were generated in 2003: 6,664 whales (CV = 0.16); and 5,965 (CV = 0.17) when data were stratified by coastal regions.

Two trends in relative abundance have been calculated from land-based observations of the migratory stream passing Cape Vidal, east South Africa in July 1998–2002, and July 1990–2000. The first was an estimate of 12.3 percent per year (Findlay and Best, 2006) (however, this estimate is likely outside biological plausibility for this species (Bannister and Hedley, 2001; Noad *et al.,* 2008; Zerbini *et al.,* 2010)); and the second is 9.0 percent (an estimate that is within the range calculated for other Southern Hemisphere breeding grounds (*e.g.,* Ward *et al.,* 2006; Noad *et al.,* 2008; Hedley *et al.,* 2009)). Both rates are considered with caution because the surveys were short in duration. It is not certain that these estimates represent the growth rate of the entire DPS. Given this uncertainty, and the uncertainty from the short duration of the surveys, it is likely the DPS is increasing, but it is not possible to provide a quantitative estimate of the rate of increase for the entire DPS.

West Australia DPS

Abundance of northbound humpback whales in the southeastern Indian Ocean in 2008 was estimated at 21,750 (95 percent CI = 17,550–43,000) based upon line transect survey data (Hedley *et al.,* 2009). The current abundance appears likely close to the historical abundance for the DPS, although there is some uncertainty of the historical abundance because of difficulties in allocating catch to specific breeding populations (IWC, 2007a). The current abundance is large relative to any of the general guidelines for viable abundance levels (see earlier discussion). The rate of population growth is estimated to be ~10 percent annually since 1982, which is at or near the estimated physiological limit of the species (Bannister, 1994; Bannister and Hedley, 2001) and well above the interim recovery goal.

East Australia DPS

Abundance of the East Australia DPS was estimated to be 6,300–7,800 (95 percent CI: 4,040–10,739) in 2005 based on photo-ID data (Paton and Clapham, 2006; Paton *et al.,* 2008; Paton *et al.,* 2009). The annual rate of increase is estimated to be 10.9 percent for humpback whales in the southwestern Pacific Ocean (Noad *et al.,* 2008). This estimate of population increase is very close to the biologically plausible upper limit of reproduction for humpbacks (Zerbini *et al.,* 2010). The surveys presented by Noad *et al.* (2005; 2008) have remained consistent over time, with a strong correlation (r > 0.99) between counts and years.

Oceania DPS

The Oceania humpback whale DPS is of moderate size (3,827 whales in New Caledonia, Tonga, French Polynesia and Cook Islands combined; CV=0.12) (South Pacific Whale Research Consortium *et al.,* 2006); however, no trend information is available for this DPS. The DPS is quite subdivided, and the population estimate applies to an aggregate (although it is known that sub-populations differ in growth rates and other demographic parameters). There are some areas of historical range extent that have not rebounded and other areas without historical whaling information (Fleming and Jackson, 2011). There is uncertainty regarding which geographic portion of the Antarctic this DPS uses for feeding. The complex population structure of humpback whales within the Oceania region creates higher uncertainty regarding demographic parameters and threat levels than for any other DPS.

Southeastern Pacific DPS

Individuals of the Southeastern Pacific population migrate from breeding grounds between Costa Rica and northern Peru to feeding grounds in the Magellan Straits and along the Western Antarctic Peninsula. Though no quantitative growth rate information is available for this DPS, abundance estimates over a 13-year period suggest that the DPS size is increasing, and abundance was estimated to be 6,504 (95 percent CI: 4270–9907) individuals in 2005–2006 (Félix *et al.,* 2006a; Félix *et al.,* 2011). Total abundance is likely to be larger because only a portion of the DPS was enumerated.

Arabian Sea DPS

Mark-recapture studies using tail fluke photographs collected in Oman from 2000–2004 yielded a population estimate of 82 individuals (95 percent CI: 60–111). However, sample sizes were small, and there are various sources of possible negative bias, including insufficient spatial and temporal coverage of the population's suspected range (Minton *et al.,* 2010b).

Reproductive rates in this DPS are not well understood. Cow-calf pairs were very rarely observed in surveys off the coast of Oman, composing only 7 percent of encounters in Dhofar, and not encountered at all since 2001. Soviet whaling catches off Oman, Pakistan and northwestern India also included low numbers of lactating females (3.5 percent of mature females) relative to pregnant females (46 percent of mature females) (Mikhalev, 1997).

No trend data are available for this DPS. A low proportion of immature whales (12.4 percent of all females) was also found, even though catches were indiscriminate with respect to sex and condition (Mikhalev, 1997), suggesting that either calf mortality in this DPS is high, immature animals occupy areas that have not been surveyed, or that the whales have reproductive 'boom and bust' cycles which respond to high annual variation in productivity. The

BRT noted that the entire region has not been surveyed; however, in areas where the whales are likely to be, not many whales have been observed. The BRT noted that this is a very small population but felt that there was some uncertainty in abundance estimates.

Summary of Abundance and Trends

The BRT summarized abundance and trend information for all humpback whale DPSs (Tables 7 and 8 in Bettridge *et al.,* 2015).

In the North Atlantic Ocean, the abundance of the West Indies DPS is much greater than 2,000 individuals and is increasing moderately. However, little is known about the total size of the Cape Verde Islands/Northwest Africa DPS, and its trend is unknown.

In the Pacific Ocean, the abundance of the Okinawa/Philippines DPS (as identified by the BRT) is thought to be about 1,000 individuals with unknown trend. Little is known about the abundance of humpback whales from the unknown breeding ground (identified as the Second West Pacific DPS by the BRT), but it is likely to number at least 100 or more, with unknown trend. Combining this information, we conclude that there are at least 1,100 individuals in the Western North Pacific DPS, and the trend is unknown. The abundances of the Hawaii and Mexico DPSs are known to be much greater than 2,000 individuals and are thought to be increasing moderately. The abundance of the Central America DPS is thought to be about 500 individuals with unknown trend.

In the Southern Hemisphere, all seven DPSs are thought to be greater than 2,000 individuals in population size. The Brazil DPS is increasing either rapidly or moderately. The trend in the Gabon/Southwest Africa DPS is unknown, while the Southeast Africa/Madagascar DPS is thought to be increasing. The West Australia and East Australia DPSs are both large and increasing rapidly. The Southeastern Pacific DPS is thought to be increasing. And the trend of the Oceania DPS is unknown.

The estimated abundance of the Arabian Sea DPS is less than 100, but its entire range was not surveyed, so it could be somewhat larger. Its trend is unknown.

Summary of Section 4(a)(1) Factors Affecting the 14 Humpback Whale DPSs

Section 4 of the ESA (16 U.S.C. 1533) and implementing regulations at 50 CFR part 424 set forth procedures for adding species to the Federal List of Endangered and Threatened Species. Under section 4(a)(1) of the ESA, the Services must determine if a species is threatened or endangered because of any of the following five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

In this rulemaking, information regarding the status of each of the 14 humpback whale DPSs is considered in relation to these factors. The information presented here is a summary of the information in the Status Review Report (Bettridge *et al.,* 2015). The reader is directed to the Threats Analysis subsection under each DPS in the Status Review Report for a more detailed discussion of the factors and how they affect each DPS.

Section 4(a)(1) Factors Applicable to All DPSs

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

The BRT discussed habitat-related threats to humpback whale populations, including coastal development, contaminants, energy exploration and development, and harmful algal blooms (HABs). Substantial coastal development is occurring in many regions, and may include construction that can cause increased turbidity of coastal waters, higher volume of ship traffic, and physical disruption of the marine environment. Noise associated with construction (*e.g.,* pile driving, blasting, or explosives) and dredging has the potential to affect whales by generating sound levels believed to disturb marine mammals under certain conditions. The majority of the sound energy associated with both pile driving and dredging is in the low frequency range (<1,000 Hz) (Illingworth and Rodkin Inc., 2001; Reyff, 2003; Illingworth and Rodkin Inc., 2007). Because humpback whales would only be affected when close to shore, the BRT believed that these effects on the whales would generally be low. However, if coastal development occurred in seasonal areas or migration routes where whales concentrate, individuals in the area could be more seriously affected. Scheduling in-water construction activities to avoid those times when whales may be present would likely minimize the disturbance. The BRT was unaware of any circumstance of coastal development resulting in humpback whale serious injury or mortality and therefore determined that in general coastal development likely poses a low level threat to humpback whales.

For purposes of the status review, the BRT agreed to consider as contaminants heavy metals, persistent organic pollutants, effluent, airborne contaminants, plastics, and other marine debris and pollution, with the exception of oil spills, which is evaluated under ''energy exploration and development.'' Numerous regions were highlighted as having known or hypothesized high contaminant levels from run-off, large human populations, and low levels of regulatory control. Halogenated organic pollutants (including dichloro-diphenyl-trichloroethane (DDT)), hexachlorocyclohexane (HCH) and chlordane (CH) insecticides, polychlorinated biphenyl (PCB) coolants and lubricants, and polybrominated diphenyl ether (PBDE—flame retardants) can persist in the environment for long periods. Air-borne pollutants are particularly concentrated in areas of industrialization, and in some high latitude regions (Aguilar *et al.,* 2002). While the use of many pollutants is now either banned or strictly regulated in some countries (*e.g.,* DDTs and PCBs), their use is still unregulated in many parts of world, and they can be transported long distances via oceanographic processes and atmospheric dispersal (Aguilar *et al.,* 2002).

Humpback whales can accumulate lipophilic compounds (*e.g.,* halogenated hydrocarbons) and pesticides (*e.g.,* DDT) in their blubber, as a result of feeding on contaminated prey (bioaccumulation) or inhalation in areas of high contaminant concentrations (*e.g.,* regions of atmospheric deposition) (Barrie *et al.,* 1992; Wania and Mackay, 1993). Some contaminants (*e.g.,* DDT) are passed on maternally to young during gestation and lactation (*e.g.,* fin whales, Aguilar and Borrell, 1994). Elfes *et al.* (2010) described the range and degree of organic contaminants accumulated in the blubber of humpback whales sampled on Northern Hemisphere feeding grounds. Concentrations were high in some areas (Southern California and Northern Gulf of Maine), possibly reflecting proximity to industrialized areas in the former case, and prey choice in the latter (Elfes *et al.,* 2010). There were also higher levels of PCBs, PBDEs, and CH insecticides in the North Atlantic Ocean (Gulf of Maine and Bay of Fundy) than in the North Pacific (California, Southeast Alaska, Aleutian Islands). The highest levels of DDT were found in whales feeding off Southern

California, a highly urbanized region of the coast with substantial discharges (Elfes *et al.,* 2010). This same study found a linear increase in PCB, DDT, and chlordane concentration with age of the whales sampled. Generally, concentrations of these contaminants in humpback whales were low relative to levels found in odontocetes (O'Shea and Brownell, 1994). Little information on levels of contamination is available from humpback whales on Southern Hemisphere feeding grounds.

The health effects of different doses of contaminants are currently unknown for humpback whales (Krahn *et al.,* 2004c). There is evidence of detrimental health effects from these compounds in other mammals, including disease susceptibility, neurotoxicity, and reproductive and immune system impairment (Reijnders, 1986; DeSwart *et al.,* 1996; Eriksson *et al.,* 1998). Contaminant levels have been proposed as a causative factor in lower reproductive rates found among humpback whales off Southern California (Steiger and Calambokidis, 2000), but at present the threshold level for negative effects, and transfer rates to calves, are unknown for humpback whales. Metcalfe *et al.* (2004) found in biopsy-sampled humpback whale young-of-the-year in the Gulf of St. Lawrence PCB levels similar to that of their mothers and other adult females, indicating that bioaccumulation can be rapid, and that transplacental and lactational partitioning did little to reduce contaminant loads.

Although there has been substantial research on the identification and quantification of such contaminants on individual whales, no detectable effect from contaminants has been identified in baleen whales. There may be chronic, sub-lethal impacts that are currently unknown. The difficulty in identifying contaminants as a causative agent in humpback whale mortality and/or decreased fecundity led the BRT to conclude the severity of this threat was low in all regions, except where lack of data indicated a finding of unknown.

The BRT defined identified threats from energy exploration and development to include oil spills from pipelines, rigs, or ships, increased shipping, and construction surrounding energy development (oil, gas, or alternative energy). This category does not include noise from energy development, which is considered under ''anthropogenic noise.'' Little is known about the effects of oil or petroleum on cetaceans and especially on mysticetes (baleen whales, characterized by having baleen plates for filtering food from water, rather than teeth like in the toothed whales (odontocetes)). Oil spills that occur while whales are present could result in skin contact with the oil, baleen fouling, ingestion of oil, respiratory distress from hydrocarbon vapors, contaminated food sources, and displacement from feeding areas (Geraci *et al.,* 1989). Actual impacts would depend on the extent and duration of contact, and the characteristics of the oil. Most likely, the effects of oil would be irritation to the respiratory membranes and absorption of hydrocarbons into the bloodstream (Geraci *et al.,* 1989). Polycyclic aromatic hydrocarbons (PAHs) are components of crude oil which are not easily degraded and are insoluble in water, making them quite detrimental in the marine environment (Pomilla *et al.,* 2004). PAHs have been associated with proliferative lesions and alteration to the immune and reproductive systems (Martineau *et al.,* 2002). Long-term ingestion of pollutants, including oil residues, could affect reproduction, but data are lacking to determine how oil may fit into this scheme for humpback whales.

Although the risk posed by operational oil rigs is likely low, failures and catastrophic events that may result from the presence of rigs pose high risks. Since the BRT had already determined that threat assessments would focus on present threats, the mere presence of oil rigs was not interpreted to warrant a threat level above low. However, the level of impact that such a catastrophic event may have on a population was considered in the evaluations.

Some algal blooms are harmful to marine organisms and have been linked to pollution from untreated industrial and domestic wastewater. Toxins produced by different algae can be concentrated as they move up the food chain, particularly during algal blooms. Naturally occurring toxin poisoning can be the cause of whale mortalities and is particularly implicated when unusual mortality events (UME) occur. Despite these UMEs, the BRT determined that HABs represent a minor threat to most humpback whale populations. HABs may be increasing in Alaska, but the BRT was unaware of records of humpback whale mortality resulting from HABs in this region.

B. Overutilization for Commercial, Recreational, Scientific or Educational Purposes

The BRT described whaling (commercial, scientific, subsistence hunting, and other ''hunts''), whale-watching, and scientific research activities and evaluated whether they were impacting humpback whales. Direct hunting, although rare today, was the main cause of initial depletion of humpback whales and other large whales. The BRT believed that the likelihood that commercial whaling will resume in the foreseeable future is currently low (see discussion under Inadequacy of Regulatory Mechanisms below). With regard to scientific whaling, Japan has already announced its plan to remove humpback whales from its scientific proposals in the future (Government of Japan, 2014).

In summary, the current impact of all whaling activities on global humpback whale populations is very low, with only a handful of humpback whales taken annually in two known aboriginal harvests. The BRT discussed the possibility of expanded commercial whaling of humpback whales in the Southern Ocean but determined that new whaling action in the foreseeable future was unlikely. Therefore, the BRT attributed a low level risk of whaling for all but one DPS (see Western North Pacific DPS section).

Whale-watch tourism is a global industry with major economic value for many coastal communities (O'Connor *et al.,* 2009). The industry has been expanding rapidly since the 1980s (estimated 3.7 percent global increase in whale watchers per year between 1998–2008, O'Connor *et al.,* 2009; Kessler and Harcourt, 2012). Whale-watching operations have been documented in 119 countries worldwide as of 2008, including on many humpback whale feeding grounds, breeding grounds, and migratory corridors (O'Connor *et al.,* 2009). Efforts to manage whale-watching operations have included limiting the number of whale-watching vessels, limiting the time vessels spend near whales, specifying the manner of operating around whales, and establishing limits to the period of exposure of the whales. In some areas, whale-watching industries operate under regulations while others operate under guidelines or are still unregulated, and this industry is still growing rapidly in many areas (over 10 percent per year in Oceania, Asia, South America, Central America and the Caribbean) (Carlson, 2009; O'Connor *et al.,* 2009).

Weinrich *et al.* (2008) observed that the most common reported response of humpback whales to whale-watching boats was increased swimming speed during exposure; there was little evidence of significant effects on inter-breath intervals and blow rates. Passive acoustic monitoring and localization of humpback whale songs in the presence of whale-watching boats on Brazilian breeding grounds also found that whales moved away from the boat in the majority of cases (68.4 percent of the time when boats were less than 2.5 miles (4.0 km) distant, Sousa-Lima and Clark, 2009).

Only one study has attempted to assess the population-level effects of whale-watching on humpback whales, as the relevant parameters are very difficult to measure. Weinrich and Corbelli (2009) reported that calving rate and calf survival to age 2 in humpback whales on Stellwagen Bank (part of the Gulf of Maine feeding ground) did not seem to be negatively affected by whale-watching. The authors noted, however, that in areas of heavy ship traffic, isolating the impacts of whale-watching on biological parameters is difficult and may not be conclusive (Weinrich and Corbelli, 2009) and is difficult to determine at either the individual or population level.

The BRT discussed the available evidence regarding the impact of whale-watching on humpback whale populations. All available evidence supports the conclusion that the impact of these activities on humpback whale populations is negligible, and the BRT determined this threat is low for all DPSs.

Humpback whales have been the subject of field research studies for decades. The primary objective of many of these studies has generally been to gather data for behavioral and ecological studies. In the United States, permits authorize investigators to make close approaches to endangered whales for photographic identification, biopsy sample collection, behavioral observations, passive acoustic recording, aerial photogrammetry, satellite tagging, and underwater observations. Research on humpback whales is likely to continue and increase in the future, especially for the collection of genetic information, photographic studies, and acoustic studies. Research activities could result in disturbance to humpback whales, but they are closely monitored and evaluated in the United States in an attempt to minimize any necessary impacts of research. Regulation of research activities in other nations varies from effectively no regulation to regulations comparable to those in the United States. The BRT discussed the available evidence regarding the impact of scientific research on humpback whale populations. All available evidence supports the conclusion that the impact of these activities is negligible, and the BRT determined this threat is low for all DPSs.

C. Disease or Predation

Information on disease or parasites is unavailable for many humpback whale populations. Direct monitoring of species biochemistry and pathology, used to determine the state of health in humans and domestic animals, is very limited for humpback whales, and there is little published on humpback whale disease as a result. Humpback whales carry a crustacean ectoparasite (the cyamid *Cyamus boopis*). While the whale is the main source of nutrition for this parasite (Schell *et al.,* 2000), there is little evidence that the parasite contributes to whale mortality. Humpback whales can also carry the giant nematode *Crassicauda boopis* (Bayliss, 1920), which is known to cause a serious inflammatory response (leading to vascular occlusion and kidney failure) in a few balaenopterid species (Lambertsen, 1992).

Individual humpback whales in Hawaiian waters have a high occurrence of skin lesions, but it is unclear whether this is due to a parasite or disease. It is estimated that approximately 60 percent of adults in Hawaii and Oceania have these skin lesions. Whether the lesions are entirely benign is unknown. The BRT concluded that where some information is available, disease and parasites do not pose a substantial threat to humpback whale populations.

The most common predator of humpback whales is the killer whale (*Orcinus orca,* Jefferson *et al.,* 1991), though predation by large sharks may also occur. Attacks by false killer whales (*Pseudorca crassidens*) have also been reported or inferred on rare occasions. Attacks by killer whales on humpback whale calves has been inferred by the presence of distinctive parallel 'rake' marks from killer whale teeth across the flukes (Shevchenko, 1975). While killer whale attacks of humpback whales are rarely observed in the field (Ford and Reeves, 2008), the proportion of photo-identified whales bearing rake scars is between zero and 40 percent, with the greater proportion of whales showing mild scarring (1–3 rake marks) (Wade *et al.,* 2007; Steiger *et al.,* 2008). This suggests that attacks by killer whales on humpback whales vary in frequency across regions. It also suggests that either most killer whale attacks result in mild scarring, or those resulting in severe scarring (4 or more rakes, parts of fluke missing) are more often fatal. Most observations of humpback whales under attack from killer whales reported vigorous defensive behavior and tight grouping when more than one humpback whale was present (Ford and Reeves, 2008).

Photo-identification data indicate that rake marks are usually acquired in the first year of life, although attacks on adults also occur (Wade *et al.,* 2007; Steiger *et al.,* 2008). Killer whale predation may influence survival during the first year of life (Wade *et al.,* 2007). There has been some debate as to whether killer whale predation (especially on calves) is a motivating factor for the migratory behavior of humpback whales (Corkeron and Connor, 1999; Clapham, 2001). How significantly motivating this factor is also depends on the importance of humpback whales in the diet of killer whales, another debated topic that remains inconclusive (Springer *et al.,* 2003; Wade *et al.,* 2007; Kuker and Barrett-Lennard, 2010). No analyses of killer whale stomach contents have revealed remains of humpback whales (Shevchenko, 1975), suggesting that if humpback whales are taken at all, they comprise at most a small part of the diet. However, these analyses took place during the height of the whaling period, when humpback whales were at a low density and may therefore have been less available for predation.

There is also evidence of shark predation on calves and entangled whales (Mazzuca *et al.,* 1998). Shark bite marks on stranded whales may often represent post-mortem feeding rather than predation, *i.e.,* scavenging on carcasses (Long and Jones, 1996).

The threat of predation was ranked as low or unknown for all DPSs because the level of mortality is unknown, but it is likely not prohibiting population growth.

D. Inadequacy of Existing Regulatory Mechanisms

Numerous international and regional regulatory mechanisms are in place to protect humpback whales directly or indirectly.

The International Whaling Commission (IWC) was set up under the International Convention for the Regulation of Whaling (ICRW), signed in 1946. The IWC established an international moratorium on commercial whaling for all large whale species in 1982, effective in 1986; this affected all member (signatory) nations (paragraph 10e, IWC, 2009a). The IWC has set the catch limits for commercial whaling at zero since 1985. Since that time, the IWC's Scientific Committee has developed a stock assessment and catch limit methodology called the "revised management procedure," with the goal of providing information on catch limits consistent with maintaining sustainable populations. As of 2014, the IWC has maintained the zero catch limit, and this policy has engendered considerable debate within the organization. The IWC's regulations provide a process by which countries may object to specific provisions, and Norway and Iceland currently allow commercial whaling based on these objections.

Iceland and Norway currently hunt a number of whale species commercially under objection to the IWC moratorium, although humpback whales have not been hunted by either nation in recent years. The present international moratorium on commercial whaling will remain in place unless a 75 percent majority of IWC signatory members votes to lift the moratorium. If this were to happen, then, under current IWC management procedures, humpback whale stocks considered to have recovered to over 54 percent of their pre-whaling levels (based on a detailed ''comprehensive assessment'' of their population status) could be subject to commercial whaling, with a quota that in theory would be determined by the Revised Management Procedure. This procedure implements a quasi-Bayesian Catch Limit Algorithm to calculate allowable catches for each stock (Cooke, 1992). The effects of these catches on population abundance would be simulated via a series of Implementation Simulation Trials prior to agreement of quotas for commercial hunting. Since whaling is carried out under objection by Iceland and Norway, they are not subject to this management scheme for allocating quotas for any species.

The United States first incorporated the IWC's regime into domestic law in the 1971 Pelly Amendment to the Fisherman's Protective Act of 1967. This amendment provides that when the Secretary of Commerce determines that the nationals of a foreign country are diminishing the effectiveness of an international fishery conservation program (including the IWC's program), the Secretary shall certify this fact to the President. The President then has the discretion to ban importation of fishing products from the offending country. The United States has threatened sanctions under the Pelly Amendment on a number of occasions, but to date, it has not imposed economic sanctions on marine products. In November 1974, pressure from the United States contributed to Japan and the Soviet Union complying with the 1974–1975 quotas. Norway was certified in 1987 and several times thereafter. Japan has been certified three times, the last being in 2000, and Iceland has been certified several times, including in 2011 for whaling activities.

These measures were further strengthened by the 1979 Packwood-Magnuson Amendment to the Fishery Conservation and Management Act of 1976. It provides that, when the Secretary of Commerce certifies that a country is diminishing the effectiveness of the work of the IWC, the Secretary of State must reduce that country's fishing allocation in U.S. waters by at least 50 percent. Certification under the Packwood-Magnuson Amendment also serves as certification under the Pelly Amendment. The threatened application in 1980 of the Packwood-Magnuson and Pelly Amendments led South Korea to agree to follow IWC guidelines restricting the use of cold (*i.e.,* non-explosive) harpoons. Faced with similar pressure, the Republic of China (Taiwan) placed a complete ban on whaling in 1981. Without United States support, it is possible that the 1986 moratorium would have been substantially limited, as nations such as Iceland, Japan, Norway, and the Soviet Union would have opted out and continued commercial whaling.

Since implementation of the international moratorium on whaling, some nations have continued to hunt whales under Article VIII of the ICRW, which allows the killing of whales for scientific research purposes. Three nations originally conducted scientific whaling: Iceland, Norway, and Japan. Presently only Japan pursues scientific whaling, under the programs JARPAII and JARPNII ('Japanese Whale Research Program under Special Permit in the Antarctic' and 'North Pacific,' respectively). Scientific whaling is presently unregulated, and no catch limits are enforced for this activity (Clapham *et al.,* 2003b). In 2012, the Government of Japan issued Special Permits authorizing the implementation of a catch limit of Antarctic minke, fin, and humpback whales for scientific purposes in the Southern Ocean; a research catch limit of up to 50 humpback whales was included in the Special Permits. To date, however, no humpback whales have been taken for scientific research by any country. On March 31, 2014, after the 2013/14 Japanese whale hunt season in the Antarctic, the International Court of Justice ruled that past Japanese whaling programs were illegal, and Japan immediately terminated its JARPAII programs. In September 2014, Japan agreed to a new requirement to submit new research proposals to the IWC 6 months before the next annual IWC Scientific Committee meeting (in May 2015) so that the IWC could assess whether lethal samples are necessary for a specific research program and whether the number of whales sampled is scientifically justified. Because of the timing, Japan will not hunt whales in the Southern Ocean during the 2014/15 season, and this will be the first time in 30 years that Japan has not hunted for whales in the Antarctic. Japan's proposed research plan for new scientific whale research programs in the Antarctic Ocean (NEWREP–A, *http://iwc.int/sc-documents*) was released on November 19, 2014, and it includes only a small number of minke whales.

The IWC also develops catch limits for aboriginal whaling, including take of humpback whales in coastal areas of Greenland and the West Indies. The ICRW allows for signatory nations to harvest whales for scientific purposes through their own national permit process, although humpback whales have not been reported to have been taken under this process. The current commercial whaling moratorium is providing significant protection to humpback whales.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is aimed at protecting species at risk from unregulated international trade. CITES regulates international trade in animals and plants by listing species in one of its three appendices. The level of monitoring and control to which an animal or plant species is subject depends on the appendix in which the species is listed. Appendix I includes species threatened with extinction which are or may be affected by trade; trade of Appendix I species is only allowed in exceptional circumstances. Appendix II includes species not necessarily threatened with extinction presently, but for which trade must be regulated in order to avoid utilization incompatible with their survival. Appendix III includes species that are subject to regulation in at least one country, and for which that country has asked other CITES Party countries for assistance in controlling and monitoring international trade in that species. Humpback whales are currently listed in Appendix I under CITES. With the IWC commercial whaling moratorium in place since 1985, commercial trade has not been a problem for humpback whales. However, if the moratorium should ever be lifted in the future, the humpback whale's CITES Appendix I listing would restrict trade so that it would not contribute to the extinction risk of the species. Given this support and the long history of CITES work and resolutions to support the IWC whaling moratorium, we do not expect the

CITES status of the humpback whale to change if ESA protections are removed from the species or any DPSs of the species. For example, CITES Resolution Conf. 11.4 (Rev. CoP12) welcomed the Resolution passed by the IWC at its Special Meeting in December 1978 requesting that the Conference of the Parties to the Convention, at its second meeting, take all possible measures to support the IWC ban on commercial whaling for certain species and stocks of whales.

The International Maritime Organization (IMO), a United Nations agency and the recognized international authority on shipping and safety at sea, participates in reducing the shipping industry's impacts to the sea from pollution (oil, garbage, noxious substances). Regulations to address pollution from maritime vessels include MARPOL (International Convention for the Protection of Pollution from Ships), MARPOL Annexes, International Conventions on Oil Pollution Preparedness Response and Co-operation, and Prevention of Marine Pollution by Dumping of Wastes and Other Matter. The IMO's Marine Environment Protection Committee designates regions as ''Particularly Sensitive Sea Areas'' (PSSA) and ''Areas to be Avoided'' for various ecological, economic, or scientific reasons. PSSA regions include The Great Barrier Reef (Australia), the Galápagos Islands (Ecuador), and the Papahanaumokuakea Marine National Monument (North Pacific).

The IMO was approached for the first time regarding conservation of an endangered whale species in 1998—a protective measure for North Atlantic right whales (Silber *et al.,* 2012). Since then, the IMO has been approached over a dozen times with nations' proposals to establish or amend routing measures in various locations to reduce the threat of vessel collisions with endangered whales, including humpback whales (Silber *et al.,* 2012). For example, the IMO has endorsed Areas To Be Avoided in U.S. and Canadian waters to reduce the threat of ship strikes of right whales (Fleming and Jackson, 2011, pp. 28–29), measures that also benefit humpback whales. IMO-endorsed modifications to Traffic Separation Schemes (TSS) have been established in areas off Boston, San Francisco, and near Santa Barbara (the latter two primarily for humpback whales); and a new TSS, along with vessel speed advisories, has been proposed for the Pacific side of the Panama Canal to protect large whale species from vessel collisions.

Humpback whales are protected by the MMPA (16 U.S.C. 1361 *et seq.*). The West Indies, Western North Pacific, Hawaii, Mexico, and Central America DPSs of the humpback whale can be found in U.S. waters and are protected under the MMPA when in U.S. waters as well as from takings by U.S. vessels or persons on the high seas. The MMPA includes a general moratorium on the taking and importing of marine mammals, which is subject to a number of exceptions. Some of these exceptions include take for scientific purposes, public display, subsistence use by Alaska Natives, and unintentional incidental take coincident with conducting lawful activities.

U.S. citizens who engage in a specified activity other than commercial fishing (which is specifically and separately addressed under the MMPA) within a specified geographical region may petition the Secretaries to authorize the incidental, but not intentional, taking of small numbers of marine mammals within that region for a period of not more than 5 consecutive years (16 U.S.C. 1371(a)(5)(A)). The Secretary ''shall allow'' the incidental taking if the Secretary finds that ''the total of such taking during each five-year (or less) period concerned will have a negligible impact on such species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.'' If the Secretary makes the required findings, the Secretary also prescribes regulations that specify: (1) Permissible methods of taking, (2) means of effecting the least practicable adverse impact on the species, their habitat, and their availability for subsistence uses, and (3) requirements for monitoring and reporting.

Similar to promulgation of incidental take regulations, the MMPA also established an expedited process by which U.S. citizens can apply for an authorization to incidentally take small numbers of marine mammals where the take will be limited to harassment (16 U.S.C. 1371(a)(5)(D)). These authorizations are limited to 1 year, and, as with incidental take regulations, the Secretary must find that the total of such taking during the period will have a negligible impact on such species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses. NMFS refers to these authorizations as Incidental Harassment Authorizations.

Under the MMPA, NMFS also evaluates and provides permits for the taking of large whale species for those engaged in scientific research focused on those species. NMFS has also issued rules under the authority of the MMPA and the ESA to promulgate regulations to address the threat of vessel collisions with large whale species, and these regulations would remain in place even if humpback whales are no longer listed under the ESA.

The MMPA provides additional protections to ''depleted'' marine mammals. For example, NMFS may not provide a take waiver for depleted stocks (section 101(a)(3)(A)), authorize importation of individual animals taken from depleted marine mammal stocks except pursuant to a permit for scientific research or for enhancing the survival or recovery of a species or stock (section 102(b)(3)(B)), or issue research permits involving the lethal taking of a marine mammal from a species or stock that is depleted (unless the Secretary determines that the results of such research will directly benefit that species or stock, or that such research fulfills a critically important research need)(section 104(c)(3)(B)). In addition, if a stock is depleted, it is automatically considered ''strategic,'' which then has other management implications. For example, under Section 112(e) of the MMPA, if the Secretary determines that impacts on rookeries, mating grounds, or other areas of similar ecological significance to marine mammals may be causing the decline or impeding the recovery of a strategic stock, the Secretary may develop and implement conservation or management measures to alleviate those impacts. Also, under Section 118, the Secretary may develop and implement a take reduction plan designed to assist in the recovery or prevent the depletion of each strategic stock that interacts with a commercial fishery.

The humpback whale is considered ''depleted'' under the MMPA because of its endangered status under the ESA. See Effects of this Rulemaking below for a discussion of the potential consequences of removing ESA protections from the humpback whale. While MMPA ''depleted'' status provides additional protections to humpback whales, the MMPA provides substantial protections to humpback whales in U.S. waters and from takings by U.S. persons and vessels on the high seas, whether they are depleted or not.

The ESA requires Federal agencies to conduct their activities in such a way as to conserve species listed as threatened or endangered. Section 7 of the ESA also requires Federal agencies, in consultation with the FWS and/or NMFS, to ensure that activities they authorize, fund or carry out are not likely to jeopardize the continued existence of any listed species (or species proposed for listing) or result in the destruction or adverse modification of designated or proposed critical habitat of such species. We have conducted scores of Section 7 consultations with the United States Coast Guard (USCG), the Army Corps of Engineers, the Bureau of Ocean Energy Management, and other agencies to ensure actions by these agencies do not adversely affect listed large whale species, including humpback whales. The ESA forbids the import, export, or interstate or foreign sale of species listed as endangered without a special permit. It also makes ''take'' of species listed as endangered illegal—forbidding, among other things, the killing, harming, harassing, pursuing, or removing the species from the wild (16 U.S.C. 1532(19)). Any or all of these protections may be provided to a species listed as threatened through regulations issued under ESA section 4(d)(16 U.S.C. 1533(d)). Of course, ESA protections for a species apply only if a species is listed as threatened or endangered under the ESA.

Whale strike mitigation measures currently in place for some vessels and regions include using dedicated observers (Weinrich and Pekarik, 2007), speed reduction in some important habitat areas (73 FR 60173; October 10, 2008), and shifting of shipping lanes away from areas of whale concentration to accommodate humpback whales and other species. Passive acoustic monitoring in areas of high shipping traffic also has promise for notifying mariners of whales in the area, as this method is relatively inexpensive, although detection is limited to vocalizing whales and specific source locations can be hard to determine (Silber *et al.,* 2009).

TSSs are in place for San Francisco Bay and the Santa Barbara Channel to ensure safety of navigation. These TSSs were amended in June 1, 2013, to lessen the possibility of fatal vessel collisions with humpback whales and other listed large whale species. Modifications include narrowing and extending the Northern and Western approaches while the inbound lane of the Santa Barbara Channel TSS has been shifted shoreward to reduce the co-occurrence of ships and whales and reduce the likelihood of a vessel/whale collision. We expect these TSSs and modifications to help reduce the likelihood of vessel collisions with humpback whales.

Congress enacted the Coastal Zone Management Act (CZMA) in 1972 when it realized that rapid growth was threatening the vital productive coastal areas of the country. Congress determined that the most effective management of coastal resources would be achieved if states were given a major role in developing and administering management programs. The Act sought to assure the states that their management programs would not be disregarded by Federal agencies whose activities would affect the coastal zone. For example, the stepped-up Outer Continental Shelf (OCS) development policies of the early 1970s led to the 1976 amendments that assured greater state involvement in the planning stages of oil and gas development.

The CZMA accomplishes its goal primarily by encouraging the states to develop voluntary coastal zone management programs. Once a state has an approved program, it becomes eligible for Federal funds and acquires the benefit of the ''consistency provisions.'' Sections 307(c) and 307(d) of the CZMA establish classes of Federal activities that must be consistent with state programs. These include Federal activities that directly affect the coastal zone, development projects, Federal licenses and permits, OCS exploration, development, and production plans, and Federal assistance to states and local governments. Every coastal state in the United States except for Alaska currently has an approved coastal zone management program. Consistency determinations under the CZMA help to ensure that OCS projects do not adversely impact humpback whales or humpback whale habitat.

The U.S. Park Service has jurisdiction over marine waters (through the Fish and Wildlife Coordination Act) in Glacier Bay National Park and Preserve (established 1980; modified 1985). The following regulations are in place to protect humpback whales occurring there in the summer: Restrictions on the number of vessels entering park waters; restrictions on vessel operating conditions in the known presence of humpback whales, mandatory vessel operating requirements in certain designated ''whale waters,'' mandatory vessel speed limits at certain times and locations; mandatory boater education for boaters entering the area, regulations restricting the harvest of humpback whale prey species and ship board observers to quantify ship strikes and interactions between cruise ships and whales. These regulations should contribute somewhat to reducing the extinction risk of the Hawaii and Mexico DPSs of the humpback whale because some of these individuals feed in the park.

Under the National Marine Sanctuaries Act, NOAA has broad discretion to enact guidelines and regulations to provide protection to a number of large whale species, including the humpback whale in key aggregation locations. Humpback whales routinely occur in Stellwagen Bank, Gulf of the Farrallones, Channel Islands, Monterey Bay, Cordell Bank, and Olympic Coast National Marine Sanctuaries. The Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) was established primarily to provide protections to a key North Pacific humpback whale breeding/nursery area, and therefore, it should contribute to reducing the extinction risk of the Hawaii DPS of the humpback whale. NOAA's Office of National Marine Sanctuaries recently proposed to expand the boundaries and scope of the HIHWNMS, amend the regulations for HIHWNMS, change the name of the sanctuary, and revise the sanctuary's terms of designation and management plan (80 FR 16224; March 26, 2015). The purpose of the proposed action is to transition the HIHWNMS from a single-species management approach to an ecosystem-based management approach. As part of these revisions, NOAA proposed to revise the existing HIHWNMS humpback whale approach regulation at 15 CFR 922.184 to help minimize incidences of humpback whale harassment or injury, to reduce adverse behavioral responses, and to limit vessel strikes within the sanctuary (80 FR 16224; March 26, 2015, at 16227).

The Stellwagen Bank and Gulf of the Farallones National Marine Sanctuaries, in particular, have active humpback whale research programs and/or have established vessel speed advisories, whale approach guidelines, and other measures to reduce human threats to humpback and other large whale species. These two national marine sanctuaries should contribute to reducing the extinction risk of the West Indies, Mexico, and Central America DPSs, as they provide protections to humpback whales in these DPSs when they are in their feeding grounds.

Numerous nations have defined marine protected areas and sanctuaries that provide some protection to humpback whales (Hoyt, 2011), and various nations have developed local regulations or guidelines governing whale watching activities (O'Connor *et al.,* 2009). Hundreds of national laws also exist related directly or indirectly to the conservation of marine mammals (Bettridge *et al.,* 2015, Appendix B). Where appropriate, some of these are discussed in more detail in the DPS-specific sections.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Competition with fisheries, aquaculture, anthropogenic sound, vessel strikes, fishing gear entanglement, and climate change are all factors that may negatively impact humpback whales.

The BRT discussed the issue of competition with fisheries at length. In some areas, (*e.g.,* Northern Gulf of Maine and Southeast Alaska) fishermen encircle feeding humpback whales and harvest fish from the bait balls upon which humpback whales feed (D. Matilla, unpublished observation). However, there is no evidence that this impacts the individuals or significantly depletes the food source. In a review of the evidence for interspecific competition in baleen whales, Clapham and Brownell (1996) found it to be extremely difficult to prove that inter-specific competition comprises an important factor in the population dynamics of large whales.

Aquaculture is not known to be a significant threat to humpback whales. Some entanglements have been recorded off Australia. Colombia has substantial aquaculture activity in inshore areas, but there is no information regarding the impact of this activity on humpback whales. The BRT determined that for most DPSs, aquaculture does not pose a significant threat to humpback whales and should be assigned a low threat level. Sufficient information was not available to determine the threat level to the Western North Pacific and Arabian Sea DPSs.

Humans introduce sound intentionally and unintentionally into the marine environment for navigation, oil and gas exploration and acquisition, research, and military activities, to name a few examples. Noise exposure can result in a range of impacts, from those causing little or no impact to those being potentially severe, depending on the source, level, and various other factors. Response to noise varies by many factors, including the type and characteristics of the sound source, distance between the source and the receptor, characteristics of the animal (*e.g.,* hearing sensitivity, behavioral context, age, sex, and previous experience with sound source) and time of day or season. Noise may be intermittent or continuous, steady (non-impulsive) or impulsive, and may be generated by stationary or moving sources. As one of the potential stressors to marine mammal populations, noise may seriously disrupt communication, navigational ability, and social patterns. Humpback whales use sound to communicate, navigate, locate prey, and sense their environment. Both anthropogenic and natural sounds may cause interference with these functions.

Anthropogenic sound has increased in all oceans over the last 50 years and is thought to have doubled each decade in some areas of the ocean over the last 30 or so years (Croll *et al.,* 2001; Weilgart, 2007; Hildebrand, 2009). High levels of ambient anthropogenic noise are known to elicit behavioral, acoustic, and physiological responses from large whales, though the specific nature of these responses remains largely unknown (Nowacek *et al.,* 2007). Low-frequency sound comprises a significant portion of this increase and stems from a variety of sources including that primarily from shipping, and an increasing amount from oil and gas exploration in some areas, as well as research and naval activities. Understanding the specific impacts of these sounds on mysticetes is difficult. However, it is clear that the geographic scope of potential impacts is vast as low-frequency sounds can travel great distances under water, but these sounds have the potential to reduce communication space (*e.g.,* shipping was predicted to reduce communication space of singing humpback whales in the northeast by 8 percent; Clark *et al.,* 2009).

Humpback whales do not appear to be often involved in strandings related to noise events. There is one record of two whales found dead with extensive damage to the temporal bones near the site of a 5,000 kg explosion which likely produced shock waves that were responsible for the injuries (Ketten *et al.,* 1993; Weilgart, 2007). Other detrimental effects of anthropogenic noise include masking and possible temporary threshold shifts. Masking results from noise interfering with cetacean social communication, which may range greatly in intensity and frequency. Some adjustment in acoustic behavior is thought to occur in response to masking and humpback songs were found to lengthen during LFA sonar activities (Miller *et al.,* 2000). This altered song length persisted 2 hours after the sonar activities stopped (Fristrup *et al.,* 2003). Researchers have also observed diminished song vocalizations in humpback whales during remote sensing experiments 200 km away from the whales' location in the Stellwagen Banks National Marine Sanctuary (Risch *et al.,* 2012). Hearing loss can also possibly be permanent if the sound is intense enough but there is great variability across individuals and other factors making it difficult to determine a standardized threshold.

Excessive noise exposure may be damaging during early individual development, may cause stress hormone fluctuations, and/or may cause whales to leave an area or change their behavior within it (Weilgart, 2007). Some responses are subtle and may occur after the exposure. Humpback whales exposed to underwater explosions and drilling associated with construction activities did not appear to change their behavior in reaction to the surveys but did appear to have reduced orientation abilities. Higher rates of fatal entanglement in fishing gear were observed in the area when whales were exposed to excessive noise, although the cause for this elevated entanglement rate was unclear (Ketten *et al.,* 1993; Todd, 1996). Some studies have found little reaction to noise and indicate potential tolerances to anthropogenic sound over short time and small spatial scales (Croll *et al.,* 2001).

There is likely an important distinction between immediate individual reactions to noise and long-term effects of noise exposure to populations. The cumulative and synergistic effects may be more harmful than studies to date have been able to assess. Though some researchers have argued that habituation to sound may occur, this can easily be confused with hearing loss or individual differences in tolerance levels (Bejder *et al.,* 2006). Scientifically recommended mammal sound exposure levels have been determined and vary depending on the sound source strength and the species of marine mammal(s) present (Southall *et al.,* 2007). NMFS has recently updated guidance for temporary threshold shifts and permanent threshold shifts (see: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*).

The issue of anthropogenic noise has been an area of intensive research but population-level impacts on cetaceans have not been confirmed. There is little definite information regarding, for example, the interruption of breeding and other behaviors or a resulting reduction in population growth or mortality of individuals. Therefore, the BRT considered this to be a low threat for all DPSs.

Collisions between vessels and whales, or ship strikes, often result in life-threatening trauma or death for the cetacean. Impact is often caused by forceful contact with the bow or propeller of the vessel. Ship strikes of humpback whales are typically identified by evidence of massive blunt trauma (fractures of heavy bones and/or hemorrhaging) in stranded whales, propeller wounds (deep slashes or cuts) and fluke/fin amputations on stranded or live whales (*e.g.,* Wiley and Asmutis, 1995).

Laist *et al.* (2001), Jensen and Silber (2003), Vanderlaan and Taggart (2007), and VanWaerebeek and Leaper (2008) compiled information available worldwide regarding documented collisions between ships and large whales (baleen whales and sperm whales). Humpback whales were the second-most commonly reported victims of vessel strikes (following fin whales). Of 292 recorded strikes contained in the Jensen and Silber (2003) database, 44 were of humpback whales. As of 2008, there were more than 143 recorded ship strikes involving humpback whales worldwide (Van Waerebeek and Leaper, 2008); however, the reported number is likely not a full representation of the actual number (particularly in the Southern Hemisphere) as many likely go undetected or unreported (Williams *et al.,* 2011). Reporting of ship strikes is highly variable internationally, with reports required from vessels in the domestic waters of Australia, the United States, and New Zealand but not in other countries. Based on the observations of vessel strike injuries and mortalities, and whale strike mitigation measures described above under *Inadequacy of Existing Regulatory Mechanisms,* the BRT considers the threat of vessel collisions to be low to moderate, depending on region, and generally increasing.

Humpback whales may break through, carry away, or become entangled in fishing gear. Whales carrying gear may die at a later time, become debilitated or seriously injured, or have normal functions impaired, but with no assurance of the incident having been recorded. Of the nations reporting to the IWC between 2003–2008, 64.7 percent (n=11) noted humpback whale by-catch in their waters (Mattila and Rowles, 2010). Whales have been documented carrying gear by fishery observer programs, opportunistic reports, and stranding networks. Some countries (*e.g.,* United States, Canada, Australia, South Africa) have well-developed reporting and response networks that facilitate the collection of information on entanglement frequency and impacts. However, such programs do not guarantee that entanglements are detected; fewer than 10 percent of humpback whale entanglements involving Gulf of Maine humpback whales are reported, despite a strong outreach and response network (Robbins and Mattila, 2004). Furthermore, opportunistic reports that are not screened by experts do not necessarily yield accurate information about events, including gear type, configuration, and original site of entanglement (Robbins *et al.,* 2007b). The likelihood of receiving reports likely varies world-wide due to differences in observer awareness, reporting mechanisms, and possible negative implications for reporting fishermen (Mattila and Rowles, 2010).

A study of gear removed from a subset of whales off the U.S. East Coast showed that 89 percent involved pots/traps or gillnet gear (Johnson *et al.,* 2005). However, a wide range of gear types were represented and every part of the gear was found to be capable of entanglement (Johnson *et al.,* 2005). The authors concluded that any line in the water column poses a potential risk of entanglement to humpback whales. Known gear types removed from, or documented on, entangled whales in Alaska between 1990 and 2013 indicated 32 percent of entanglements were from pot gear, 30 percent from gill net, 24 percent from other net, and 14 percent from a combination of longline, seine, mooring line and marine debris (Jensen *et al.* 2014). This is further supported by the wide range of entangling gear reported in the South Pacific (Neilson, 2006; Lyman, 2009), Newfoundland (Lien *et al.,* 1992), and member nations of the IWC (Mattila and Rowles, 2010).

More than half of the humpback whale entanglements examined off the U.S. East Coast involved entanglements around the tail (Johnson *et al.,* 2005). The mouth and flippers are also known attachment sites, but their frequency is more difficult to assess. Scar-based studies have been developed to systematically study the frequency of non-lethal entanglement involving the tail (Robbins and Mattila, 2001; Robbins and Mattila, 2004). These techniques have been used in the Gulf of Maine (*e.g.,* Robbins and Mattila, 2001; Robbins and Mattila, 2004; Robbins *et al.,* 2009), Southeast Alaska (Neilson *et al.,* 2009), and more broadly across the North Pacific Ocean (Robbins *et al.,* 2007a; Robbins, 2009). All populations studied in this manner to date have detected individuals with entanglement-related injuries. Annual research in the Gulf of Maine since 1997 has shown that a high percentage of individuals exhibit entanglement injuries and that new injuries are acquired at an average annual rate of 12 percent (Robbins *et al.,* 2009). A 2-year study in Southeast Alaska confirmed frequencies of entanglement injuries that were comparable to the Gulf of Maine (Neilson *et al.,* 2009). Research undertaken across the North Pacific as part of the SPLASH project further suggests that entanglement is pervasive, but that interaction rates may be highest among coastal populations (Robbins *et al.,* 2007a; Robbins, 2009).

Both eye-witness reports and scar-based studies suggest that independent juveniles are significantly more likely to become entangled than adults (Robbins, 2009). Calves exhibit a lower frequency of entanglement, likely due to having less time in which to have encountered gear (Neilson *et al.,* 2009). Sex differences in entanglement frequency have been observed in some locations and time intervals (Robbins and Mattila, 2001; Neilson *et al.,* 2009), but these effects have not persisted in longer studies (Robbins and Mattila, 2004).

Entanglement may result in only minor injury, or potentially may significantly affect individual health, reproduction, or survival. In one study, females with entanglement injuries produced fewer calves than females with no evidence of entanglement; such impacts on reproduction are still under investigation (Robbins and Mattila, 2001). Mark-recapture studies of the fate of entangled whales in the Gulf of Maine suggest that juveniles are less likely than adults to survive (Robbins *et al.,* 2008). Observed entanglement deaths and serious injuries in that region are known to exceed what is considered sustainable for the population (Glass *et al.,* 2009). Most deaths likely go unobserved and preliminary studies suggest that entanglement may be responsible for 3–4 percent of total mortality, especially among juveniles (Robbins *et al.,* 2009).

Much more is known about fishing gear entanglement in the Northern Hemisphere than in the Southern Hemisphere. The BRT noted the commercialization of bycatch off Japan, meaning an entangled whale is legally allowed to be killed and sold on the market (Lukoschek *et al.,* 2009). Therefore, entanglement often leads to death for humpback whales in this region. While the number of reported bycaught animals is not large (3–5), the number of reports has been increasing and reports may not reflect the actual number caught. The BRT also noted that the Mexico population has one of the highest scar rates from nets and lines in the North Pacific, indicating a high entanglement rate. Based on this information, the BRT concluded that the severity of the threat of fishing gear entanglements varies depending on region, ranging from low to high.

Climate change has received considerable attention in recent years, with growing concerns about global warming and the recognition of natural climatic oscillations on varying time scales, such as long-term shifts like the Pacific Decadal Oscillation or short-term shifts, like El Niño or La Niña. Evidence suggests that the biological productivity in the North Pacific (Lowry *et al.,* 1988; Quinn and Niebauer, 1995) and other oceans could be affected by changes in the environment. Recent work has found that copepod distribution has shown signs of shifting in the North Atlantic due to climate change (Hays *et al.,* 2005). Increases in global temperatures are expected to have profound impacts on arctic and sub-arctic ecosystems, and these impacts are projected to accelerate during this century (ACIA, 2004; IPCC, 2007).

The IWC has held two workshops on the topic of climate change and cetaceans (IWC, 1997; IWC, 2010a), and the reports of these meetings provide useful summaries on the current state of knowledge on this issue, and on the large uncertainties associated with any projections of impact.

It is generally accepted that cetaceans are unlikely to suffer problems because of changes in water temperature per se (IWC, 1997). Rather, global warming is more likely to effect changes in habitats that in turn potentially affect the abundance and distribution of prey in these areas. Factors such as ocean currents and water temperature may render currently used habitat areas unsuitable and influence selection of migration, feeding, and breeding locations for humpback and other whales. Changes in climate and oceanographic processes may also lead to decreased productivity of, or lead to different patterns in, prey distribution and availability. Such changes could affect whales that are dependent on this prey. While these regional or ocean basin-scale changes may occur, the actual magnitude and resulting impacts are not known.

All cetacean species have undoubtedly lived through considerable variation in climate (including multiple ice ages, and significant warming events) over the course of their evolutionary history. However, there is little knowledge regarding the ways in which cetaceans dealt with climate change in the past. Examination of bones related to Basque whaling in Canada indicate that the range of bowhead whales (*Balaena mysticetus*) in the North Atlantic shifted south during the so-called Little Ice Age in medieval times (McLeod *et al.,* 2008). This almost certainly reflected a shift in the distribution of prey because of habitat and associated productivity changes, and it likely reflects the ability of large whales to adapt and extend their range when necessary.

There are no data on similar historical shifts by humpback whales. Considerable plasticity in the winter distribution of the species is suggested by the fact that the use of Hawaii as a major breeding ground appears to be a relatively recent phenomenon which occurred sometime in the 20th century (Herman, 1979); the reason for such a shift is not known, but it is important to recognize that the humpback's winter distribution is not tied to prey resources or biological productivity, a situation which presumably affords the species with flexibility in its colonization of breeding habitats.

Climate change may disproportionately affect species with specialized or restricted habitat requirements. The best-known example of this involves dependence upon sea ice, which is thought to represent a major problem for polar bears (*Ursus maritimus*), given that the species primarily hunts pagophilic ringed seals (*Phoca hispida*) (Schliebe *et al.,* 2006). This represents a relatively simple and clear-cut example of cause and effect in the climate change debate; unfortunately, the situation for humpback whales and other cetaceans is not nearly as simple, given the complexity of the ecosystems in which they live. Climate change may exacerbate situations in which populations are already small and/or significantly affected by other anthropogenic impacts (such as entanglement or ship strikes). Species which possess little ability to disperse or colonize new habitats will also be particularly vulnerable.

None of these factors apply to humpback whales, with the possible exception of the Arabian Sea population, which is thought to be small and vulnerable to entanglement, shipping-related issues and possibly pollution. Furthermore, the uniquely restricted range of this non-migratory population is currently tied to seasonal monsoon-driven biological productivity in a relatively small region; the impact of climate change on this productivity is unknown, as is the ability of these humpback whales to shift their range as may be needed.

As noted by IPCC (2007), species in general potentially respond in one of three ways to major changes in climate: Redistribution, adaptation, or extinction. Based upon what is known to date, redistribution is the most likely response for most humpback whales. Most large whales, including humpbacks, undertake extensive movements, both during a feeding season and on migration. These broad ranges (which routinely encompass much of an ocean basin), together with the animals' ability to withstand prolonged periods of fasting through utilization of fat reserves in their blubber, potentially provide the whales with a means to adapt their ranges in response to major climate-related spatial shifts in biological productivity, notably by seeking out new habitats. This may in fact already be occurring in some places; humpback whales have recently been observed in the eastern Chukchi and Beaufort Seas (Clarke *et al.,* 2013), north of their usual range; this could represent the beginnings of a response to habitat changes relating to diminishing sea ice in the Arctic, although it might also simply reflect a growing population expanding its range. Prior to extensive whaling, humpback whales appear to have been quite common in at least the western (Russian) Chukchi Sea (Zenkovich, 1954; Tomilin, 1967), and are still observed there today (Clarke *et al.,* 2013).

The BRT determined that the level of the threat of climate change facing the Southern Hemisphere populations was slightly better understood than that facing the Northern Hemisphere populations. Warming waters are thought to be correlated with a decrease in krill production in the Southern Ocean, and this threat is likely to increase. The future negative impact implied by a low threat assignment is dependent on a substantial decrease in krill populations, a subsequent negative impact on prey resource availability to humpback whales, and lack of suitable alternate prey such as fish.

The Southern Ocean is regarded as a relatively simple ecosystem, but even here there are substantial problems in quantifying even the most basic parameters such as prey abundance. Changes in this ecosystem are also driven by cyclic variability on the scale of years to decades (Murphy *et al.,* 2007). Disentangling climate change effects from other forms of variability including periodic physical forcing, requires time series of data that are typically scarce or non-existent in the Southern Ocean (Quetin *et al.,* 2007). The responses of the Southern Ocean ecosystem to climate change are likely to be complex. Sea ice decreases may actually enhance overall primary production but could reduce ice algae production which occurs at a critical time for krill larvae (Arrigo and Thomas, 2004). On the other hand, the location of upwelling of nutrient-rich deep water may change and result in enhanced primary production in areas that are otherwise unfavorable to krill (Prezelin *et al.,* 2000).

The problems in assessing the relatively ''simple'' Southern Ocean illustrate the huge problems involved in predicting future changes in dynamic ecosystems, on scales that range from eddies and fronts to entire ocean basins. Ecosystem models are crude at best. Full ecosystem models involve innumerable parameters, yet data to quantify these—let alone interactions among them—frequently do not exist.

The second IWC climate change workshop (IWC, 2010c) noted that data sets for use in assessing impact and modeling the effects of climate change must have: extensive duration (20–30 years or more of information); good temporal resolution to capture variability on inter-annual and longer scales; and sufficient spatial scale. Although long-term studies of humpback whales exist in various locations in both hemispheres, these are often compromised by issues such as sampling bias, data gaps, and inconsistency of methods; furthermore, parallel data of sufficient resolution on environmental variables are often unavailable. The caveat above regarding the difficulty of disentangling climate change effects from other variables applies equally to determining the reasons for any observed changes in demographic parameters of humpback whales.

It is instructive to compare the conclusions of the two IWC climate change workshops, separated as they were by more than a decade. The report of the 1996 workshop (IWC, 1997) notes that: ''. . . given the uncertainties in modeling climate change at a suitable scale and thus modeling effects on biological processes . . . at present it is not possible to model in a predictive manner the effects of climate change on cetacean populations.'' Thirteen years later, the second workshop came to much the same conclusion (IWC, 2010c), finding that: ''. . . improvements in climate models, as well as models that relate environmental indices to whale demographics and distribution had [sic] occurred. However, all models remain subject to considerable uncertainty.''

The BRT assigned climate change a low threat level to all Southern Hemisphere populations based on current impacts to the populations. The threat posed by climate change to Northern Hemisphere humpback whale populations is very uncertain, but the BRT thought it unlikely that climate change was a major extinction risk factor. Melting and receding ice sheets may open more feeding habitat for humpback whales in the Northern Hemisphere. However, humpback whales in the Northern Hemisphere do not feed primarily in Arctic waters (which are likely to be the most significantly altered by climate change), and the extent to which Arctic habitats may change to support aggregations of prey sought by humpback whales is unknown.

Overall, it is clear that humpback whales worldwide have exhibited considerable resilience despite a whaling history that removed the great majority of animals from most populations. This resilience, together with the species' flexibility in diet and apparent plasticity in its distribution, provides some optimism that humpback whales can adapt to significant environmental changes wrought by global warming. Although we cannot predict how climate change may affect humpback whales in the long term, at present most studied populations appear to be recovering well, and it seems very unlikely that any population will face extinction as a result of climate issues within the foreseeable future. At this time, the record does not support a conclusion that climate change is likely to influence extinction risk to humpback whales in the foreseeable future.

West Indies DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Human population growth and associated coastal development represent potential threats to this DPS in certain areas of the West Indies, as well as in regions of high human population density in the high-latitude feeding range. The major breeding habitats of Silver and Navidad Banks are sufficiently remote from land that direct human impact is for the most part unlikely. The largest concentration of humpback whales in a West Indies habitat that is adjacent to the coast occurs in Samaná Bay, Dominican Republic (Mattila *et al.,* 1994). There, tourism has spurred an increase in coastal development, which has presumably introduced a rise in runoff and effluent discharge into the waters of the bay. To date, there is no evidence of observable impact on the humpback whales that visit the region, but no studies have been conducted; that the whales do not feed in these tropical waters likely decreases their risk from such point source pollution.

As noted above, although whales are found elsewhere in the West Indies, densities outside Dominican Republic waters are relatively low. Much of the additional habitat is in the waters of small islands in the Leeward and Windward groups, where any coastal runoff is likely to be effectively dispersed by highly dynamic water movements driven by frequently strong trade winds.

In some feeding grounds, coastal runoff, vessel traffic and other human activities represent a potential threat to humpback whales from this DPS. This is likely to be most pronounced off the Mid-Atlantic and northeastern United States, and least relevant in remote offshore areas such as Greenland, Labrador and the Barents Sea. A study of contaminants in humpback whales from the Gulf of Maine found elevated levels of polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), and chlordanes (Elfes *et al.,* 2010), although the authors concluded that these likely did not represent a conservation concern.

Extensive oil and gas development and extraction occur in the southern portion of the humpback whale's West Indies range, in the Gulf of Paria off Venezuela, but nothing is known of the impacts of this on the whales (Swartz *et al.,* 2003). Energy exploration and development in this area are expected to increase.

The best documented UME for humpback whales attributable to disease occurred in 1987–1988 in the North Atlantic, when at least 14 mackerel-feeding humpback whales died of saxitoxin poisoning (a neurotoxin produced by some dinoglagellate and cyanobacteria species) in Cape Cod, Massachusetts (Geraci *et al.,* 1989). The whales subsequently stranded or were recovered in the vicinity of Cape Cod Bay and Nantucket Sound, and it is highly likely that other unrecorded mortalities occurred during this event. Such events have been linked to increased coastal runoff. During the first 6 months of 1990, seven dead juvenile (7.6 to 9.1 m long) humpback whales stranded between North Carolina and New Jersey. The significance of these strandings is unknown.

Additional UMEs occurred in the Gulf of Maine in 2003 (12–15 dead humpback whales on Georges Bank), 2005 (7 in New England), and 2006–7 (minimum of 21 whales), with no cause yet determined but HABs potentially implicated (Gulland, 2006; Waring *et al.,* 2009). In the Gulf of Maine in 2003, a few sampled individuals among 16 humpback whale carcasses were found with saxitoxin and domoic acid (produced by certain species of diatoms, a different type of algae (Gulland, 2006)). The BRT discussed the possible levels of unobserved mortality that may be resulting from HABs and determined that, as the West Indies population had been affected by HABs in the past, it is likely experiencing a higher level of HAB-related mortality than is detected.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Subsistence hunting in the North Atlantic occurs in Greenland and the island of Bequia in St. Vincent and the Grenadines in the Lesser Antilles (Reeves, 2002). Greenland began hunting humpback whales before 1780 (Reeves, 2002). As the take of bowhead whales decreased between the years 1750 and 1850, humpback whales became a more frequent target (Reeves, 2002). Beginning in 1986, the IWC has not granted any catch limit for humpback whales to Denmark on behalf of Greenland, though Greenland reported 14 infractions over the period 1988–2006. In 2010, a catch limit was reinstated, and 27 humpbacks were killed between 2010 and 2012. In 1986, St. Vincent and the Grenadines, on behalf of the native community of Bequia, asked for a humpback catch limit from the IWC, based on its history of artisanal whaling in the community and the small number of whales taken (Reeves, 2002). Bequia currently retains an IWC ''block'' catch limit of up to 24 whales over a 6-year period (2013–2018) (IWC, 2012); they took 4 whales in 2013. While this subsistence hunting kills some West Indies DPS humpback whales in their breeding and feeding grounds, it is not likely contributing significantly to extinction risk of this DPS.

Humpback whales represent a major attraction for tourists in many parts of the world, and in the West Indies their presence supports a large seasonal whale-watching industry in Samaná Bay (Dominican Republic). Although humpback whales can become remarkably habituated to ecotourism-based vessel traffic, whale-watching excursions have the potential to disturb or even injure animals. On feeding grounds such as the Gulf of Maine, where a large whale-watching industry exists, the extreme reaction of habitat displacement has not been observed; this may partly be due to the existence of some guidelines for the operation of whale-watching tours, as well as the fact that the whales are tied to specific areas by a key resource (*i.e.,* food). Since whales do not eat while in sub-tropical waters in winter, they are theoretically far less constrained in their choice of habitat; consequently, if the whales are faced with high enough pressures from noise or other disturbance, they might be able to leave one breeding area and move to another.

It is not clear whether recent anecdotal reports linking a decline in humpback whale abundance in Samaná Bay with increased cruise ship traffic are valid, but the potential exists to drive whales out of a breeding ground. The large number of whale-watching vessels and increasing presence of cruise ships in Samaná Bay suggest that it is very important to assess the effect of this traffic on the behavior and habitat use of the whales there.

Currently, disturbance from whale watching is probably not a major concern for Silver Bank. Although a small number of dive boats operate ''swim-with-whales'' tours there, their activities are regulated by the Dominican Republic government, and are limited to a very small section of the available habitat. There is currently no commercial or recreational activity on Navidad Bank. With the exception of the Gulf of Maine, there is minimal utilization of humpback whales for whale-watching or ecotourism elsewhere in the North Atlantic.

This DPS is exposed to some scientific research activities in waters off the United States, Canada, and West Indies, but at relatively low levels. Adverse population effects from research activities have not been identified, and overall impact is expected to be low and stable.

It is unlikely that overutilization is contributing to the extinction risk of the West Indies DPS.

C. Disease or Predation

There are no recent studies of disease in this population, but also no indication that it is a major risk.

A study of apparent killer whale attacks in North Atlantic humpback whales found scarring rates ranging from 8.1 percent in Norwegian waters to 22.1 percent off western Greenland; scarring rates among whales observed in the West Indies ranged from 12.3 percent to 15.3 percent (Wade *et al.,* 2007). It is clear that most killer whale attacks occur on first-year calves prior to arrival in high-latitudes (Wade *et al.,* 2007). However, this is not regarded as a serious threat to population growth.

D. Inadequacy of Existing Regulatory Mechanisms

A moratorium on oil and gas exploration has been in place in the Mid-Atlantic region since the early 1980s. In March 2010, President Barack Obama announced plans to open the Mid-Atlantic and South Atlantic planning areas to oil and gas exploration. The Federal Government had scheduled a lease sale offshore of Virginia, to take place in 2011. These lease sale plans were cancelled in May 2010 following the Deepwater Horizon oil spill in the Gulf of Mexico. In December 2010, the Secretary of the Interior announced a ban on drilling in Federal waters off the Atlantic coast through 2017. While this ban remains in place, the Bureau of Ocean Energy Management is in the process of issuing a final programmatic environmental impact statement on possible geologic and geophysical activities along the Atlantic Outer Continental Shelf (OCS) from Delaware to midway down Florida's east coast. The PEIS considers the potential acoustic and other impacts of these activities on marine mammals. These activities will provide new data for the next 5-year OCS oil and gas program for the South and Mid-Atlantic OCS and for possible oil and gas leasing in the 2017–2022 period.

In Nova Scotia, oil and gas exploration and development began in 1967. Canadian government estimates show that Nova Scotia's oil and gas resource potential is significant. In Nova Scotia, there are currently two producing offshore natural gas projects, the Sable Offshore Energy Project SOEP and Deep Panuke. In 1988, Canada implemented a moratorium on oil and gas development on Georges Bank, to the southwest of Nova Scotia. In 2010, Canada extended the moratorium, which was set to expire at the end of 2012, until December 31, 2015.

Silver Bank, Navidad Bank, and portions of Samaná Bay have been designated by the Dominican Republic as a humpback whale sanctuary (Hoyt, 2013).

Whalers from the St. Vincent and the Grenadines island of Bequia have a quota from the IWC; most recently, Bequia was given a ''block'' quota of up to 24 whales over a six-year period (2013–2018) (IWC, 2012). The Scientific Committee of the IWC has determined that the allowed quota would have no impact on the growth rate of this population (IWC, 2012).

As noted above, whale-watching activities in the Silver Bank are regulated by the Dominican Republic government, and there is currently no commercial or recreational activity on Navidad Bank.

Under the authority of the ESA and the MMPA, we have issued regulations such as the NMFS right whale ship strike regulations in the U.S. North Atlantic and other regional or local maritime speed zones, and these help reduce the threat of vessel collisions involving humpback whales. The ship collision reduction rule established regulations to limit vessel speeds to no more than 10 knots (18.5 km/hr), applicable to all vessels 65 feet (19.8m) or greater in length in certain locations and at certain times of the year along the east coast of the U.S. Atlantic seaboard (73 FR 60173; October 10, 2008).

In 1999, NMFS and the U.S. Coast Guard established two Mandatory Ship Reporting systems aimed at reducing ship strikes of North Atlantic right whales. When ships greater than 300 gross tons enter two key right whale habitats—one off the northeast United States and one off the southeast United States—they are required to report to a shore-based station. In return, ships receive a message about whales, their vulnerability to ship strikes, precautionary measures the ship can take to avoid hitting a whale, and locations of recent sightings. While these systems were designed to protect right whales specifically, they are expected to also reduce the risk of ship strikes to other large whales, including humpback whales (NMFS, 2008).

On February 18, 2005, the U.S. Coast Guard (USCG) announced a Port Access Route Study (PARS) of Potential Vessel Routing Measures to Reduce Vessel Strikes of North Atlantic Right Whales (70 FR 8312). Potential vessel routing measures were analyzed and considered to adjust existing vessel routing measures in the northern region of the Atlantic Coast, which included Cape Cod Bay, the area off Race Point at the northern end of Cape Cod, and the Great South Channel. As a result of this information, we recommended realigning and amending the location and size of the western portion of the TSS in the approach to Boston, Massachusetts. The TSS was revised in 2007, and the new configuration appeared on nautical charts soon thereafter.

On November 19, 2007, the USCG announced a second PARS to Analyze Potential Vessel Routing Measures to Reduce Vessel Strikes of North Atlantic Right Whales while also Minimizing Adverse Effects on Vessel Operations (72 FR 64968). The study area included approaches to Boston, MA, specifically, a northern right whale critical habitat in the area east and south of Cape Cod, MA, and the Great South Channel, including Georges Bank out to the exclusive economic zone boundary. In the second PARS, the USCG recommended establishing a seasonal Area to be Avoided (ATBA) and amending the southeastern portion of the TSS to make it uniform throughout its length. On behalf of the United States, the USCG submitted a series of proposals to the IMO (see International Maritime Organization discussion above) to modify the TSS and to establish an ATBA, which were subsequently endorsed by the IMO (Silber *et al.,* 2012) and as described in the IMO's publication, ''Ships' Routing'' 2008. In 2009, the TSS was revised and the ATBA was established. This was followed by a notice in the **Federal Register** announcing these changes (75 FR 77529; December 13, 2010) and NMFS added the changes to applicable nautical charts. While the measures are designed specifically for the North Atlantic right whale, they are expected to benefit humpback whales co-occurring in these areas.

In 2007, a program of auto-detection buoys and real-time whale vocalization detection information was incorporated into the Boston TSS as mitigation for liquefied natural gas (LNG) ship strike risk, primarily as a result of an ESA Section 7 consultation with the Maritime Administration. This program, stipulated as a condition of the consultation, was designed to reduce the threat of vessel collisions with right whales and other listed large whale species, including humpback whales in and around the boundaries of Stellwagen Bank National Marine Sanctuary. When right whales are auto-detected in the vicinity, LNG vessels are required to travel at speeds of 10 knots or less, a measure that almost certainly reduces the likelihood of vessel strikes of humpback whales occurring in the area as well.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

The largest potential threats to the West Indies DPS are entanglement in fishing gear and ship strikes; these occur primarily in the feeding grounds, with some documented in the mid-Atlantic U.S. migratory grounds. There are no reliable estimates of entanglement or ship-strike mortalities for most of the North Atlantic. During the period 2003–2007, the minimum annual rate of human-caused mortality and serious injury (from both entanglements and ship collisions) for the Gulf of Maine feeding population averaged 4.4 animals per year (Waring *et al.,* 2009). Off Newfoundland, an average of 50 humpback whale entanglements (range 26–66) was reported annually between 1979 and 1988 (Lien *et al.,* 1988); another 84 were reported entangled in either Newfoundland or Labrador from 2000–2006 (Waring *et al.,* 2009). Not all entanglements result in mortality (Waring *et al.,* 2009). However, all of these figures are likely to be underestimates, as not all entanglements are observed. A study of entanglement-related scarring on the caudal peduncle of 134 individual humpback whales in the Gulf of Maine suggested that between 48 percent and 65 percent had experienced entanglements (Robbins and Mattila, 2001).

Ship strike injuries were identified for 8 percent (10 of 123) of dead stranded humpback whales between 1975–1996 along the U.S. east coast, 25 percent (9 of 36) of which were along mid-Atlantic and southeast states (south of the Gulf of Maine) between Delaware Bay and Okracoke Island North Carolina (Wiley and Asmutis, 1995). Ship strikes made up 4 percent of observed humpback whale mortalities between 2001–2005 (Nelson *et al.,* 2007) and 7 percent between 2005–2009 (Henry *et al.,* 2011) along the U.S. east coast, and the Canadian Maritimes. Among strandings along the mid and southeast U.S. coastline during 1975–1996, 80 percent (8 of 10) of struck whales were considered to be less than 3 years old based on their length (Laist *et al.,* 2001). This suggests that young whales may be disproportionately affected. However, those waters are thought to be used preferentially by young animals (Swingle *et al.,* 1993; Barco *et al.,* 2002). It should be noted that ship strikes do not always produce external injuries and may therefore be underestimated among strandings that are not examined for internal injuries.

Underwater noise can potentially affect whale behavior, although impacts are unclear. Concerns about effects of noise include behavioral disruption, interference with communication, displacement from habitats and, in extreme cases, physical damage to hearing (Nowacek *et al.,* 2007). Singing humpback whales have been observed to lengthen their songs in response to low-frequency active sonar (Miller *et al.,* 2000) and reduce song duration from distant remote sensing (Risch *et al.,* 2012). Hatch *et al.* (2008) conducted a study analyzing commercial vessel traffic in the Stellwagen Bank National Marine Sanctuary and its effect on ambient noise. This study revealed significantly elevated and widespread ambient noise levels due to vessel traffic, but further research is needed to determine the direct impacts to marine mammals.

Because of the low level of human activity on Silver and Navidad Banks, noise is currently not a concern in this area. Samaná Bay, however, already has much vessel activity and therefore has the potential for considerable impact on whales from noise. Noise sources include whale-watching vessels, which approach whales closely and thus presumably create a loud acoustic environment in close proximity to the animals, and cruise ships, which may be more distant but whose size guarantees that, at certain frequencies, noise levels in the bay will be very high. There are also additional sources in the form of container ships or other commercial vessels that enter the bay periodically. Underwater noise levels are expected to increase.

The BRT considered offshore aquaculture to be a low, but increasing, threat to this DPS and competition with fisheries a low threat to this DPS.

Overall population level effects from global climate change for this DPS are not known; nonetheless, any potential impacts resulting from this threat will almost certainly increase. Currently, climate change does not appear to pose a significant threat to the growth of this DPS now or in the foreseeable future.

HABs, vessel collisions, and fishing gear entanglements are likely to moderately reduce the population size and/or the growth rate of the West Indies DPS. All other threats, with the exception of climate change (unknown severity), are considered likely to have no or minor impact on population size or the growth rate of this DPS.

Cape Verde Islands/Northwest Africa DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Habitat conditions for this DPS are poorly known. Some members of the population use the waters around the Cape Verde Islands for breeding and calving, but where the remaining hypothesized fraction goes is unknown. In considering the Cape Verde Islands/Northwest Africa DPS, it was noted that oil spills occur off West Africa, but these levels are thought to be lower than in some other regions and the impact of non-catastrophic spills on humpback whales when they are on the breeding grounds was not considered significant. The threat of energy exploration to the Cape Verde Islands/Northwest Africa population was considered low.

There is little to no information on the impacts of HABs on this DPS.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Because the breeding range of this DPS is largely unknown, the importance of anthropogenic disturbance (from activities such as whale-watching, offshore aquaculture, fishing gear entanglements, and scientific research) to this DPS is largely unknown. At present, threats appear low relative to other populations, but again, much of the distribution of individuals from the Cape Verde Islands/Northwest Africa DPS is unknown. There is no current or planned commercial whaling in this area.

C. Disease or Predation

There is little to no information on the impacts of disease, predation, or parasites on this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the Cape Verde Islands/Northwest Africa DPS were identified.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is little to no information on the impacts of vessel collisions, climate change, or anthropogenic noise on the Cape Verde Islands/Northwest Africa DPS, although each is expected to increase. Competition with fisheries and offshore aquaculture were considered low threats to this DPS.

The threats of HABs, disease, parasites, vessel collisions, fishing gear entanglements, and climate change to this DPS are unknown. All other threats to this DPS are considered likely to have no or minor impact on the population size and/or growth rate.

Western North Pacific DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Humpback whales in the Western North Pacific are at some risk of habitat loss or curtailment from a range of human activities. Confidence in information about, and documentation of, these activities is relatively good, except on the unknown breeding grounds included in this DPS. Given continued human population growth and economic development in most of the Asian region, these threats can be expected to increase.

Coastal development, including shipping, and habitat degradation are potential threats along most of the coast of Japan, South Korea and China. Organochlorines and mercury are found in relatively high levels in most cetaceans along the Asian coast (Simmonds, 2002). Although the threat to the health of this DPS is unknown, the accumulation of these pollutants can be expected to increase over time.

The BRT noted that the Sea of Okhotsk currently has a high level of energy exploration and development, and these activities are likely to expand with little regulation or oversight. The BRT determined that the threat posed by energy exploration to the Okinawa/Philippines DPS it identified is medium, but noted that there was low certainty regarding this since specifics of feeding location (on or off the shelf) are unavailable. If feeding activity occurs on the shelf in the Sea of Okhotsk, energy exploration in this area could impact what is likely one of the most depleted subunits of humpback whales. The threat posed by energy exploration to the Second West Pacific DPS identified by the BRT was unknown.

As above, naturally occurring biotoxins from dinoflagellates and other organisms are known to exist within the range of this DPS, although known humpback whale deaths attributable to biotoxin exposure do not exist in the Pacific. The occurrence of HABs is expected to increase with the growth of various types of human-related activities. The level of confidence in the predicted increase is moderate.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

There are no proposals for scientific, aboriginal/subsistence or commercial hunting of humpback whales in the North Pacific under consideration by the IWC at this time. Some degree of illegal, unreported or unregulated (IUU) exploitation, including 'commercial bycatch whaling,' has been documented in both Japan and South Korea through genetic identification of whale meat sold in commercial markets (Baker *et al.,* 2000; Baker *et al.,* 2006). Genetic monitoring of Japanese markets (1993–2009) identified humpback whale as the source of 17 whale meat products. These are believed to have been killed through direct or indirect fisheries entanglement (Steel *et al.,* 2009). In Japan and Korea, it is legal to kill and sell any entangled whale as long as the take is reported; there is suspicion that this provides an incentive for intentional ''entanglements,'' though the level of such intentional takes is currently unknown (Lukoschek *et al.,* 2009). Some degree of IUU exploitation is also possible in other regions within the range of humpback whales in the Western North Pacific DPS, including Taiwan and the Philippines, given past histories of whaling. The full extent of IUU exploitation is unknown. Official reports of whales taken as bycatch entanglement and destined for commercial markets are considered to be incomplete (Lukoschek *et al.,* 2009). Some poaching is reported to occur in Korean waters and is suspected off Japan (Baker *et al.,* 2002; IWC 2005c), and for this reason the threat of whaling to the Western North Pacific DPS was determined to be medium.

There is some whale-watching and non-lethal scientific research in Japanese waters, primarily in Ogasawara and Okinawa, but this is at low levels and not thought to pose a risk to this DPS.

C. Disease or Predation

The evidence of killer whale attacks on humpback whales in this DPS is low (6–8 percent) relative to other North Pacific humpback whales (Steiger *et al.,* 2008). Certainty in this information is considered moderate and the magnitude is expected to remain stable. There are no reports of disease in this DPS and levels of parasitism are unknown. Trends in the severity of disease and parasitism are also unknown.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the Western North Pacific DPS were identified. A continuing source of potential adverse impacts to humpback whales is interactions with vessels, including whale-watching and fishing vessels. NMFS issued a final rule (66 FR 29502; May 31, 2001) effective in 2001 in waters within 200 nautical miles (370 km) of Alaska, making it unlawful for a person subject to the jurisdiction of the United States to (a) approach within 100 yards (91.4 m) of a humpback whale, (b) cause a vessel or other object to approach within 100 yards (91.4 m) of a humpback whale or (c) disrupt the normal behavior or prior activity of a whale. Exceptions to this rule include approaches permitted by NMFS; vessels which otherwise would be restricted in their ability to maneuver; commercial fishing vessels legally engaged in fishery activities; and state, local and Federal government vessels operating in official duty (50 CFR 224.103(b)). This rule provides some protection from vessel strikes to a portion of Western North Pacific DPS individuals while in their feeding grounds in the Aleutian Islands, though the size and location of the area present some challenge to enforcement. Its effectiveness could be improved through greater general public awareness of the 100-yard (91.4-m) regulation, particularly with regard to ''placing a vessel in path of oncoming humpback . . .'' and ''operate at slow safe speed when near a humpback whale.''

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Humpback whales in the Western North Pacific DPS are likely to be exposed to relatively high levels of underwater noise resulting from human activities that may include commercial and recreational vessel traffic, and military activities. Overall population-level effects of exposure to underwater noise are not well established, but exposure is likely chronic and at relatively high levels. As vessel traffic and other activities are expected to increase, the level of this threat is expected to increase. The level of confidence in this information is moderate.

The likely range of the Western North Pacific DPS includes some of the world's largest centers of human activities and shipping. Although reporting of ship strikes is requested in the Annual Progress reports to the IWC, reporting by Japan and Korea is likely to be poor. A reasonable assumption, although not established, is that shipping traffic will increase as global commerce increases; thus, a reasonable assumption is that the level of the threat will increase. The threat of ship strikes was therefore considered to be medium for the Okinawa/Philippines portion of this DPS and unknown for the Second West Pacific portion of this DPS.

The BRT discussed the high level of fishing pressure in the region occupied by the Okinawa/Philippines population (a small humpback whale population). Although specific information on prey abundance and competition between whales and fisheries is not known in this area, overlap of whales and fisheries has been indicated by the bycatch of humpback whales in set-nets in the area. The BRT determined that competition with fisheries is a medium threat for this DPS, given the high level of fishing and small humpback whale population.

The Fisheries Agency of Japan considers whales to be likely competitors with some fisheries, although direct evidence of these interactions is lacking for humpback whales in the region (other than net entanglement). Whales along the coast of Japan and Korea are at risk of entanglement related mortality in fisheries gear, although overall rates of net and rope scarring are similar to other regions of the North Pacific (Brownell *et al.,* 2000). The threat of mortality from any such entanglement is high, given the incentive for commercial sale allowed under Japanese and Korean legislation (Lukoschek *et al.,* 2009). The reported number of humpback whale entanglements/deaths has increased for Japan since 2001 as a result of improved reporting, although the actual number of entanglements may be underrepresented in both Japan and Korea (Baker *et al.,* 2006). The level of confidence in understanding the minimum magnitude of this threat is medium for the Okinawa/Philippines portion of this DPS and low for the Second West Pacific portion of this DPS, given the unknown wintering grounds and primary migratory corridors.

Overall population level effects from global climate change are not known; nonetheless, any potential impacts resulting from this threat will almost certainly increase. The level of confidence in the magnitude of this threat is poor.

In summary, energy development, whaling, competition with fisheries, and vessel collisions are considered likely to moderately reduce the population size or the growth rate of the Okinawa/ Philippines portion of the DPS, and fishing gear entanglements are considered likely to seriously reduce its population size or growth rate. Other threats are considered likely to have no or minor impact on population size and/ or the growth rate, or are unknown, for the Western North Pacific DPS. In general, there is great uncertainty about the threats facing the Second West Pacific portion of this DPS.

Hawaii DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Other than its Hawaiian Islands breeding area, the Hawaii DPS inhabits some of the least populated areas in the United States (Alaska) and Canadian (Northern British Columbia) coastal waters. Coastal development, which may include such things as port expansion or waterfront development, occurs in both the United States and Canada; runoff from coastal development in Hawaii and continued human population growth are potential threats. Confidence in information about, and documentation of, these activities and their impacts is moderate. Given continued human population growth in the region, the threat can be expected to increase.

This DPS had the lowest levels of DDTs, PCBs, and PBPEs observed for North Pacific humpback whales sampled on all their known feeding grounds except Russia, between 2004 and 2006; in particular, levels were lower than observed in humpback whales from the U.S. West Coast, as well as the North Atlantic's Gulf of Maine (Elfes *et al.,* 2010). The levels observed in all areas are considered moderate and not expected to have a significant effect on population growth (Elfes *et al.,* 2010). Confidence in this information is moderate, but the trend is unknown.

In March 2010, Interior Secretary Salazar and President Obama announced a landmark decision to cancel a lease sale scheduled for 2011 (in the 5.6 million acre block in Bristol Bay, southeastern Bering Sea), and to reinstate protection for the region until 2017. However, if exploration and drilling were authorized after 2017, it would represent a potential threat to this DPS in its feeding grounds.

Naturally occurring biotoxins from dinoflagellates and other toxins exist within the range of this DPS. Although humpback whale mortality as a result of exposure has not been documented in this DPS, it has been reported from other feeding grounds, so it is considered a possibility. HAB occurrence is expected to increase with the growth of various types of human-related activities, and with increasing water temperatures. The level of confidence in exposure to HABs and in these assertions is moderate.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

There are no planned commercial whaling activities in this DPS' range; however, modest aboriginal hunting has been proposed in British Columbia (Reeves, 2002). Certainty in this information is considered relatively high and the magnitude is expected to remain stable.

This DPS is exposed to whale-watching activities in both its feeding and breeding grounds, but at medium (Hawaii and Alaska) to low levels (British Columbia). Adverse population effects from whale-watching have not been documented, and overall impact of whale-watching is expected to be low and stable.

This DPS is exposed to some scientific research activities in both U.S. and Canadian waters, but at relatively low levels. Adverse population effects from research activities have not been identified, and overall impact is expected to be low and stable.

C. Disease or Predation

Evidence of killer whale attacks (15–20 percent) in the humpback whales found in Hawaiian waters is moderate (Steiger *et al.,* 2008) and lower for Alaska and Canada. This is not regarded as a serious threat to population growth. Shark predation likely occurs as well, although evidence suggests the primary targets are the weak and unhealthy. Certainty in this information is considered relatively high and the magnitude is expected to remain stable.

There are no known reports of unusual disease or mass mortality events for this DPS. Trends may increase slightly in response to other stressors, such as warming oceans and other stressors that may compromise immune systems.

Levels of parasitism in this population are not well known, although approximately 2/3 of humpback whales in Hawaii show some evidence of permanent, raised skin lesions, which may be a reaction to an as yet unknown parasite (Mattila and Robbins, 2008). However, there is no evidence that these ''bumps'' impact health or reproduction, or cause mortality. Trends in the severity of this threat are unknown.

D. Inadequacy of Existing Regulatory Mechanisms

There has been a moratorium on offshore oil drilling in the waters of Northern British Columbia since 1972, but there has also been a recent proposal to lift the ban, driven largely by local government (British Columbia Energy Plan, 2007). If so, this potential threat could increase in this portion of the habitat.

A continuing source of potential adverse impacts to humpback whales is interactions with vessels, including whale-watching and fishing vessels. Under the authorities of section 11(f) of the ESA and section 112(a) of the MMPA, NMFS issued a final rule (66 FR 29502; May 31, 2001) effective in 2001 in waters within 200 nautical miles (370 km) of Alaska, making it unlawful for a person subject to the jurisdiction of the United States to (a) approach within 100 yards (91.4 m) of a humpback whale, (b) cause a vessel or other object to approach within 100 yards (91.4 m) of a humpback whale or (c) disrupt the normal behavior or prior activity of a whale (50 CFR 224.103(b)). Exceptions to this rule include approaches permitted by NMFS; vessels which otherwise would be restricted in their ability to maneuver; commercial fishing vessels legally engaged in fishery activities; and state, local and Federal government vessels operating in official duty. This rule provides some protection from vessel strikes to Hawaii DPS individuals while in their feeding grounds, though its effectiveness could be improved by a greater enforcement presence and greater general public awareness of the 100-yard (91.4-m) regulation, particularly with regard to ''placing a vessel in path of oncoming humpback . . .'' and ''operate at slow safe speed when near a humpback whale.''

Vessel approach regulations are also in place for humpback whales in Hawaiian waters (50 CFR 224.103(a)). These are similar to the Alaska regulations, with an additional prohibition against operating any aircraft within 1,000 feet (300 m) of any humpback whale. The regulations were adopted in 1987 under authority of the ESA and later amended to delete a provision that was inconsistent with the MMPA. See 52 FR 44,912 (November 23, 1987); 60 FR 3,775 (January 19, 1995) (deleting 223.31(b) as mandated by Section 17 of the MMPA Amendments of 1994, Public Law 103–238, because the MMPA provided that approach to 100 yards (91.4 m) is legal, whereas the regulatory provision had allowed approach only to within 300 yards (274.3 m) in cow/calf areas).

As noted above under Section 4(a)(1) Factors Applicable to All DPSs, the Hawaiian Islands Humpback Whale National Marine Sanctuary was established primarily to provide protections to a key North Pacific humpback whale breeding/nursery area, and therefore, it should contribute to reducing the extinction risk of the Hawaii DPS of the humpback whale. Among the regulations in effect in the sanctuary are approach regulations substantially similar to those at 50 CFR 224.103(a) (See 15 CFR 922.184). Although substantially similar, the approach regulations effective in the sanctuary protect humpback whales in a narrower geographic range than do the current ESA approach regulations. Because these regulations apply only within the sanctuary, we seek public comment on whether the sanctuary protections would be sufficient for the protection of humpback whales from vessel interactions throughout the Hawaiian Islands, recognizing that the existing approach regulations at 50 CFR 224.103(a), which were adopted under authority of the ESA only, would no longer be applicable and would need to be removed if this rule becomes final and the Hawaii DPS of humpback whales is not listed under the ESA (See **ADDRESSES**). Commenters should consider the impacts of the Office of National Marine Sanctuaries' recent proposal to expand the sanctuary boundaries and strengthen the approach provisions (80 FR 16224, 16227, 16238; March 26, 2015).

In Canada, humpback whales are managed by the Department of Fisheries and Oceans (DFO) and legally protected through the Marine Mammal Regulations under the Fisheries Act, 1985. These regulations make it an offense to disturb, kill, fish for, move, tag, or mark marine mammals (ss. 5, 7,

11) without a valid license. In 2003, the North Pacific humpback whale population status was assessed as ''threatened'' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and in 2005 the population was listed as ''threatened'' under Canada's Species at Risk Act (SARA), affording it legal protection (it is an offense to kill, harm, harass, capture or take a listed species (Section 32(1)). The population's status was re-assessed as ''special concern'' in 2011 by COSEWIC. Following public consultation regarding the reclassification of the species, the DFO has referred the assessment of ''special concern'' back to COSEWIC for further consideration, and the SARA status of North Pacific humpback whale remains unchanged at the publication of the 2013 Recovery Strategy (Fisheries and Oceans Canada. 2013). Should the SARA status of humpback whales remain unchanged, an action plan to implement the 2013 recovery strategy will be completed within 5 years of its final posting on the Species at Risk Public Registry. Hawaii DPS whales should benefit from any protections afforded by SARA when they are in British Columbia feeding grounds.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is suspected interaction with the herring fishery in Southeast Alaska, but impacts to humpback whales are considered to be modest; the level of certainty in this information is moderate and currently under study, and impacts are considered stable because the herring fishery is regulated. Humpback whales may compete with fisheries in British Columbia as well, as they also have a herring fishery, as well as a ''krill'' fishery.

Currently, two modest offshore aquaculture sites are located in Hawaii, and their placement overlaps with humpback whale habitat. However, there have been no known fatal interactions, and indirect impacts from food, waste, or medicines being provided to the cultivated species are likely to be low, as humpback whales do not feed in Hawaii. The level of certainty in this information is high. However, if these and other operations expand to areas of high use by the whales, at a minimum they could physically exclude humpback whales from some of their preferred habitat. Deep-water, finfish aquaculture in Alaska is currently prohibited. However, some shellfish and herring ''pond'' aquaculture and salmon hatchery pens exist close to shore. There are no known fatal encounters with this type of aquaculture in Alaska; however, there are documented cases of humpback whales becoming entangled in herring ''pond'' and other aquaculture gear in British Columbia (Baird, 2003). There have been proposals to allow finfish aquaculture in Alaska, which would increase the threat from this activity in this portion of the DPS' range; however, Alaska State policy is 100 percent against this. The indirect impacts of aquaculture (*e.g.,* on health and abundance of prey from disease or possibly habitat disruption from poor siting) are not well known, but the BRT did not consider these effects to be substantial and rated aquaculture as a low threat. We are unaware of humpback whale entanglement involving aquaculture in Hawaii or in Alaska. However, given decreasing catches of wild fish stocks, and resulting strong incentives to expand aquaculture in Hawaii, the threat to the Hawaii DPS posed by aquaculture is likely to increase.

This DPS is likely exposed to moderate levels of underwater noise resulting from human activities, which may include, for example, commercial and recreational vessel traffic, pile driving from coastal construction, and activities in Naval test ranges. Overall population-level effects of exposure to underwater noise are not well established, but exposure is likely chronic. As vessel traffic and other activities are expected to increase, the level of this threat is expected to increase. The level of confidence in this information is moderate.

The range of this DPS includes some centers of human activities in both Canadian and U.S. waters. Reports of vessel collisions in Hawaii have increased since 2003, when an extensive educational campaign and hotline number were initiated; however the percentage of these that result in fatality is unknown. Numerous collisions have also been reported from Alaska and British Columbia (where shipping traffic has increased 200 percent in 20 years) (Neilson *et al.,* 2012). According to a summary of Alaska ship strike records, an average of 5 strikes a year was reported from 1978–2011 (Neilson *et al.,* 2012). However, effects in Alaska may be mitigated by the vessel approach regulations discussed above (66 FR 29502; May 31, 2001; 50 CFR 224.103) and by NMFS outreach to the cruise ship industry to share information about whale siting locations.

The level of certainty in this information is high. Humpback whale carcasses have been reported in many areas of Alaska, but given the isolated nature of some of these areas, necropsies are not always possible to determine cause of death. In addition, many carcasses likely go unreported, thus ship strike numbers should be considered minimum estimates. A reasonable assumption is that the level of the threat will increase in proportion with increases in global commerce. Although 5–10 ship strikes are reported per year in Hawaii and the actual number of ship strikes is estimated to be potentially one order of magnitude greater than this (Lammers *et al.,* 2003), the BRT still considered this threat level to be minimal, given the very large population size, fast rate of growth observed in this DPS, the vessel approach regulations in Alaska, and NMFS outreach to the cruise ship industry.

Recent studies of characteristic wounds and scarring indicate that this DPS experiences a high rate of interaction with fishing gear (20–71 percent), with the highest rates recorded in Southeast Alaska and Northern British Columbia (Neilson *et al.,* 2009). However, these rates represent only survivors. Fatal entanglements of humpback whales in fishing gear have been reported in all areas, but, given the isolated nature of much of their range, observed fatalities are almost certainly under-reported and should be considered minimum estimates. Recent studies in another humpback whale feeding ground, which has similar levels of scarring, estimate that the actual annual mortality rate from entanglement may be as high as 3.7 percent (Angliss and Outlaw, 2008). There is a high level of certainty with regard to this information. The threat is considered to be medium.

Overall population level effects from global climate change are not known; nonetheless, any potential impacts resulting from this threat will almost certainly increase. Climate change was not considered to be a major risk to this DPS currently, however. The level of confidence in the magnitude of this threat is low.

In summary, fishing gear entanglement is considered to be a medium threat to the Hawaii DPS. All other threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown but assumed to be minor (based largely on the current abundance and population growth trend) for the Hawaii DPS.

Mexico DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Breeding locations used by the Mexico DPS (and migratory routes to get to aggregation areas) are adjacent to large human population centers. The DPS may, therefore, be exposed to adverse effects from a number of human activities, including fishing activities (possible competition with fisheries), effluent and runoff from human population centers as coastal development increases, activities associated with oil and gas development, and a great deal of vessel traffic.

Southern California humpback whales were found to have the highest levels of DDT, PCBs, and PBDEs of all North Pacific humpback whales sampled on their feeding grounds (Elfes *et al.,* 2010). The DDT levels detected were greater than those found in the typically more contaminated Gulf of Maine humpback whales, possibly due to the historical dumping of DDT off Palos Verdes Peninsula (Elfes *et al.,* 2010). It is not possible to state unequivocally if population level impacts occur as a result of these contaminant loads, but Elfes *et al.* (2010) suggested the levels found in humpback whales are unlikely to have a significant impact on their persistence as a population.

There are currently numerous active oil and energy leases and offshore oil rigs off the U.S. west coast. Offshore LNG terminals have been proposed for California and Baja California. The feeding grounds for this DPS are therefore an active area with regard to energy exploration and development. However, there are no plans at present to open the West Coast to further drilling. Alternative energies, such as wind and wave energy, may be developed in the future in this region. Currently, the threat posed to this DPS by energy exploration and development is low, and is considered stable.

Naturally occurring biotoxins from dinoflagellates and other organisms are known to exist within the range of this DPS, though there are no records of known humpback whale deaths attributable to biotoxin exposure in the Pacific. The occurrence of HABs is expected to increase with nutrient runoff associated with the growth of various types of human-related activities. The level of certainty in the impacts of exposure to HABs is moderate.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

No whaling currently occurs in this DPS' range.

The Mexico humpback whale DPS is exposed to some whale watching activities in both U.S. and Mexican waters, but at low levels. Adverse effects from whale watching have not been documented, and overall impact of whale watching is expected to be low and stable.

This DPS is exposed to some scientific research activities in both U.S. and Mexican waters, but at relatively low levels. Adverse effects from research activities have not been identified, and overall impact is expected to be low and stable.

C. Disease or Predation

With regard to natural mortality of individuals in the Mexico DPS, humpback whales in the California feeding area had a higher incidence of rake marks attributed to killer whale attacks (20 percent) than in other feeding areas (Steiger *et al.,* 2008). The BRT noted that 44 percent of all flukes photographed from the Mexico humpback whale DPS are scarred with killer whale tooth rakes. Most of the attacks are thought to occur on calves in breeding/calving areas, and levels observed in the California group likely result from a propensity for killer whale attacks in Mexican breeding areas (Steiger *et al.,* 2008). Though a factor in the ensured longevity of this DPS, it does not appear to be preventing population recovery (Steiger *et al.,* 2008). The threat of predation was therefore ranked as low or unknown for all DPSs.

There is little to no information on the impacts of disease or parasites on the Mexico DPS.

D. Inadequacy of Existing Regulatory Mechanisms

Under Mexican law, all marine mammals are listed as ''species at risk'' and are protected under the General Wildlife Law (2000). Amendments to the General Wildlife Law to address impacts to whales by humans include: Areas of refuge for aquatic species; critical habitat being extended to aquatic species (including cetaceans); prohibition of the import and export of marine mammals for commercial purposes (enacted in 2005); and protocol for stranded marine mammals (2011). Mexican Standard 131 on whale watching includes avoidance distances and speeds, limits on number of boats, and protection from noise (no echo sounders). Two protection programs for humpback whales (regional programs for protection) have been proposed for the regions of Los Cabos and Banderas Bay (Bahia de Banderas).

NMFS issued a final rule (66 FR 29502; May 31, 2001) effective in 2001 in waters within 200 nautical miles (370 km) of Alaska, making it unlawful for a person subject to the jurisdiction of the United States to (a) approach within 100 yards (91.4 m) of a humpback whale, (b) cause a vessel or other object to approach within 100 yards (91.4 m) of a humpback whale, or (c) disrupt the normal behavior or prior activity of a whale. Exceptions to this rule include approaches permitted by NMFS; vessels which otherwise would be restricted in their ability to maneuver; commercial fishing vessels legally engaged in fishery activities; state, local and Federal government vessels operating in official duty; and the rights of Alaska Natives. As is true for the Hawaii DPS, this rule provides some protection from vessel strikes to Mexico DPS individuals while in their feeding grounds.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

This DPS is likely exposed to relatively high levels of underwater noise resulting from human activities. These may include, for example, commercial and recreational vessel traffic, and activities in U.S. Navy test ranges. The overall population-level effects of exposure to underwater noise are not well-established, but exposure is likely chronic and at relatively high levels. As vessel traffic and other activities are expected to increase, the level of this threat is expected to increase. The level of confidence in this information is moderate.

Of the 17 records of stranded whales in Washington, Oregon, and California in the NMFS stranding database, three involved fishery interactions, two were attributed to vessel strikes, and in five cases the cause of death could not be determined (Carretta *et al.,* 2010). Specifically, between 2004 and 2008, 14 humpback whales were reported seriously injured in commercial fisheries offshore of California and two were reported dead. The proportion of these that represent the Mexican breeding population is unknown. Fishing gear involved included gillnet, pot, and trap gear (Carretta *et al.,* 2010). Between 2004 and 2008, there were two humpback whale mortalities resulting from ship strikes reported and eight ship strike attributed injuries for unidentified whales in the California-Oregon-Washington stock as defined by NMFS, and some of these may have been humpback whales (Carretta *et al.,* 2010). The Mexico DPS is known to also use Alaska and British Columbia waters for feeding (Calambokidis *et al.,* 2008). Numerous collisions have been reported from Alaska and British Columbia (where shipping traffic has increased 200 percent in 20 years) (Neilson *et al.,* 2012). According to a summary of Alaska ship strike records, an average of 5 strikes a year was reported from 1978–2011 (Neilson *et al.,* 2012). However, effects in Alaska may be mitigated by the vessel approach regulations discussed above (66 FR 29502; May 31, 2001) and by NMFS outreach to the cruise ship industry to share information about whale siting locations.

Overall population level effects from global climate change are not known; nonetheless, any potential impacts resulting from this threat will almost certainly increase. The BRT concluded that currently climate change is not a risk to the DPS, but the level of confidence in the magnitude of this threat is poor.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Mexico DPS, with the following exception: Fishing gear entanglements are considered likely to moderately reduce the population size or the growth rate of the Mexico DPS.

Central America DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Human population growth and associated coastal development, including port expansions and the presence of water desalinization plants, are some of the potential threats to the Central America DPS. The presumed migratory route for this DPS lies in the coastal waters off Mexico and includes numerous large and growing human population centers from Central America north along the Mexico and U.S. coasts. The California and Oregon feeding grounds are the most ''urban'' of all the North Pacific humpback whale feeding grounds, resulting in relatively constant anthropogenic exposure for the individuals of this DPS. However, the high degree of coastal development is not preventing the increase of humpback whales in this area, and it is considered to be a low level threat.

Associated with this proximity to urban areas is a high level of exposure to man-made contaminants. Elevated levels of DDTs, PCBs, and PBPEs have been observed in ''southern California'' humpback whales; levels were higher than observed in humpback whales from the North Atlantic's Gulf of Maine feeding ground (Elfes *et al.,* 2010). These levels may be linked to historical dumping of DDTs off the Palos Verdes Peninsula, CA (Elfes *et al.,* 2010). However, the levels observed are not expected to have a significant effect on population growth (Elfes *et al.,* 2010). DDT and PCB levels are likely to decrease in feeding areas because use of these chemicals has been banned in the United States, but PBDEs may still be increasing.

Energy exploration and development activities are present in this DPS' habitat range. There are currently numerous active oil and energy leases and offshore oil rigs off the U.S. west coast. Offshore LNG terminals have been proposed for California and Baja California. The feeding grounds for this DPS are therefore an active area with regard to energy exploration and development. However, there are no plans at present to open the West Coast to further drilling. Alternative energies, such as wind and wave energy, may be developed in the future in this region. Currently, the threat posed to this population by energy exploration and development is low, and is considered stable.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Whale-watching tourism and scientific research occur, at relatively low levels, on both the feeding and breeding grounds of the Central America DPS as well as along the migratory route. Whale-watching is highly regulated in U.S. waters. Many Central American countries also have whale-watching guidelines and regulations in the breeding ground of this population. Whale-watching is therefore not considered a threat to this population. Scientific research activities such as observing, collecting biopsies, photographing, and recording underwater vocalizations of whales occurs throughout this DPS' range, though no adverse effects from these events have been recorded.

No whaling currently occurs in this DPS' range.

C. Disease or Predation

There is little information on the impacts of disease, parasites or algal blooms on the Central America DPS. HABs of dinoflagellates and diatoms exist within the feeding range of this DPS, but there have been no records of humpback whale deaths as a result of exposure. The occurrence of HABs is expected to increase with the growth of various types of human-related activities but does not pose a threat to this population currently.

Though the occurrence and impacts of predation on humpback whales is not well understood, some evidence of killer whale and shark attacks exists for this DPS. Evidence of killer whale attacks is relatively high in California waters, with 20 percent of humpback whales showing scars from previous attacks (Steiger *et al.,* 2008). Scars from attacks are believed to have originated in the winter when whales are in Mexican and Central American waters. However, this is not regarded as a serious threat to population growth. Shark predation likely occurs as well, though it is not known to what degree; it does not appear to be adversely impacting this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the Central America DPS were identified.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is no evidence to suggest that competition with fisheries poses a threat to this DPS. Humpback whales in southern and central California feed on small schooling fish, including sardine, anchovy, and herring, all of which are commercially harvested species. In addition, they also feed on krill, which are not harvested off the U.S. west coast. Humpback whales are known to be foraging generalists. Although their piscivorous prey is subject to naturally- and anthropogenically-mediated fluctuations in abundance, there is no indication that fishery-related takes are substantially decreasing their food supply.

This DPS is likely exposed to relatively high levels of underwater noise resulting from human activities, including commercial and recreational vessel traffic, and activities in U.S. Navy test ranges. Exposure is likely chronic and at relatively high levels. It is not known if exposure to underwater noise affects humpback whale populations, and this threat does not appear to be significantly impacting current population growth.

Vessel collisions and entanglement in fishing gear pose the greatest threat to this DPS. Especially high levels of large vessel traffic are found in this DPS' range off Panama, southern California, and San Francisco. Several records exist of ships striking humpback whales (Carretta *et al.,* 2008; Douglas *et al.,* 2008), and it is likely that not all incidents are reported. Two deaths of humpback whales were attributed to ship strikes along the U.S. West Coast in 2004–2008 (Carretta *et al.,* 2010). Ship strikes are probably underreported, and the level of associated mortality is also likely higher than the observed mortalities. Vessel collisions were determined to pose a medium risk (level 2) to this DPS, especially given the small population size. Shipping traffic will probably increase as global commerce increases; thus, a reasonable assumption is that the level of ship strikes will also increase.

Between 2004 and 2008, 18 humpback whale entanglements in commercial fishing gear off California, Oregon, and Washington were reported (Carretta *et al.,* 2010), although the actual number of entanglements may be underreported. Effective fisheries monitoring and stranding programs exist in California, but are lacking in Central America and much of Mexico. Levels of mortality from entanglement are unknown and do vary by region, but entanglement scarring rates indicate a significant interaction with fishing gear.

Currently there is no aquaculture activity on the feeding grounds of this DPS, though migrating individuals may encounter some aquaculture operations in coastal waters off Mexico. Humpback whales in this DPS are not considered to be adversely affected by aquaculture.

Overall population level effects from global climate change are not known; nonetheless, any potential impacts resulting from this threat will almost certainly increase. Humpback whales feeding off southern and central California have a flexible diet that includes both krill and small pelagic fishes. Acidification of the marine environment has been documented to impact the physiology and development of krill and other calcareous marine organisms, which may reduce their abundance and subsequent availability to humpback whales in the future (Kurihara, 2008). However, the diet flexibility of humpback whales in this region may give this DPS some resilience to a climate change effect on their prey base compared to Southern Hemisphere humpback whales that have a more narrow krill-based diet. Currently, climate change does not pose a significant threat to the growth of this DPS.

In summary, vessel collisions and fishing gear entanglements are considered likely to moderately reduce the population size or the growth rate of the Central America DPS. All other threats are considered likely to have no or minor impact on population size and/or the growth rate, or are unknown for the Central America DPS.

Brazil DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Human population growth and associated coastal development represent potential threats to coastal populations of humpback whales. These can take many forms, including chemical pollution, increase in ship traffic and underwater noise levels. The coast of Brazil has experienced various levels of human development within the range of humpback whales. These are of greater intensity along the northeastern coast of the country (between 5° and 12° S), where large human settlements are found (the three main cities—Salvador, Recife and Natal—have 1–3 million inhabitants and have observed population increases of 3 percent per year since the early 1970s) (Instituto Brasileiro de Geografia e Estatística, 2010). Such population growth has resulted in a substantial rise in effluent discharge in coastal areas used by humpback whales during the breeding season. The stretch of the coast where the largest concentration of humpback whales is found (Abrolhos Bank, 16°–18° S) has not had the same level of human growth and is relatively pristine compared to areas farther to the north.

There is no evidence that human population growth has had any major direct impact on western South Atlantic humpback whales. In fact, the Brazil DPS has shown strong signs of recovery in the same period in which human growth occurred adjacent to the breeding grounds. Shifts in habitat use and abundance may have occurred on a local basis, but no studies have been conducted to assess these changes. Effects of chemical pollution are largely minimized because these whales do not feed in the tropical wintering grounds. The feeding grounds of this DPS are located in relatively remote offshore areas in the Southern Ocean where human activities have been minimal. While potential impacts are unknown, they are probably small in these areas. The current threat of coastal development to this population was ranked as low, but is considered to be increasing.

The construction of new ports along the coast of Brazil has been stimulated by the country's recent economic growth as well as the rapid development of the oil and gas industry. Therefore, a resultant increase in ship traffic will likely increase the probability of ship strikes and possibly result in greater humpback whale mortality off Brazil. The threat posed by energy exploration and development was ranked low but increasing.

The effects of contaminants on this population are unknown. The occurrence of HABs is expected to increase with increased run-off and nutrient input from human-related activities; however, HABs do not pose a threat to this population currently.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

A seasonal humpback whale-watching industry exists in some parts of the wintering grounds off Brazil. In the Abrolhos Bank, the area of greatest humpback whale concentration, whale-watching is usually associated with other tourist activities. The Bank contains large coral reef formations, and the associated biological diversity makes this region an important diving/snorkelling center. Despite great potential, expansion of whale-watching in this region is difficult because of poor tourism infrastructure and because whales are far away from the coast relative to other areas (Cipolotti *et al.,* 2005).

A more established whale-watching industry operates farther to the north, near Praia do Forte and Salvador. Most whale watching tours in Bahia State depart from Praia do Forte (Hoyt and Iníguez, 2008). In other parts of the humpback wintering grounds (*e.g.,* Ilhéus, Itacaré, Porto Seguro), whale-watching can occur in an opportunistic fashion. Often, fishermen are hired to take groups of tourists to see whales, but these are unregulated and occasional. Because of the relatively small scale, whale-watching activities possibly cause limited, if any, impact on the Brazil DPS of the humpback whale. This threat is considered low.

There is currently no commercial whaling in this region.

This humpback whale DPS is exposed to scientific research activities, but adverse effects from research activities have not been identified, and overall impact is expected to be low and stable.

C. Disease or Predation

There are studies of disease in the Brazil DPS of the humpback whale, but no indication that it presents a risk to the DPS. Stranded whales have shown different types of bone pathologies (Groch *et al.,* 2005), but the incidence of these pathologies are not well known.

A recent increase in humpback whale mortality has occurred along the coast of Brazil. The number of carcasses seen floating at sea or found ashore in 2010

(96 individuals) was nearly 3 times the average for the period 2002–2009 (29.5 individuals). Mortalities dropped in 2011 (39), but they have increased in subsequent years (47 in 2012; 51 in 2013; 55 to date in 2014, with not many more expected for the rest of 2014) (Milton Marcondes, Humpback Whale Institute Brazil, pers. comm., 2014). The causes for this increased mortality are not well understood and are under investigation (Humpback Whale Institute Brazil, unpublished data). However, while mortalities are high, they are not unusually high. Despite these mortalities, the DPS appears to continue to increase in abundance.

Killer whales appear to be one of the main predators of humpback whales, especially of calves and immature individuals (Clapham, 2000). While predation can represent an important source of neonatal/juvenile mortality (Steiger *et al.,* 2008), no studies have been conducted to assess its effects on this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

Diving with whales is prohibited by Federal law in Brazil, but opportunistic whale-watching occurs during diving trips (Morete *et al.,* 2003). Most whale-watching operations are concentrated within the Abrolhos National Park and therefore are highly controlled. The maximum number of boats allowed within the park is 15 (Hoyt, 2000).

E. Other Natural or Manmade Factors Affecting Its Continued Existence

The threats posed by offshore aquaculture and competition with fisheries were considered low for the Brazil DPS of humpback whales.

Entanglements in various types of fishing nets have been increasing in the wintering areas (Zerbini and Kotas, 1998), but there is no current estimate of mortality. Reports from fishermen indicate that a large proportion of entanglements are comprised of calves (Zerbini and Kotas, 1998). In the past 20 years, the number of entanglement cases observed or reported has increased substantially as has the proportion of whales seen in wintering grounds, with evidence (*e.g.,* scars) of entanglement in fishing gear (Siciliano, 1997; Groch *et al.,* 2008)). Interactions of humpback whales with fisheries have been observed throughout the wintering ground, and they seem to be increasing as the population grows and re-occupies new or historical habitats. However, there is currently no assessment on the proportion of entanglements resulting in mortality and no estimates of fishery-related mortality for this DPS. The threat of entanglements was considered low but increasing.

Ship collisions are a well-known cause of mortality in humpback whales (Laist *et al.,* 2001), but their incidence among humpback whales in the Brazil DPS is not well known. Reports of collisions with whales have been provided by fishermen and recreational boaters. In addition, photographic/physical evidence of ship strikes has been recorded throughout the wintering grounds off Brazil (*e.g.,* Marcondes and Engel, 2009). These events have been increasing and seem to be correlated with population recovery, but their conservation implications require further studies (Bezamat *et al.,* 2014). In areas of high whale density (*e.g.,* the Abrolhos Bank), collisions between whales and fishing boats have resulted in permanent damage to the boats. The fate of whales involved in these accidents is not known (Andriolo, unpublished data). Ship strikes were considered a low, but increasing, threat to this DPS of humpback whales.

The increase in coastal development and ship traffic, the construction of new ports and the expansion of offshore oil and gas extraction have resulted in a rise of underwater noise levels along the breeding range of humpback whales. Concerns about effects of noise include disruption of behavior, interference with communication, displacement from habitats and, in extreme cases, physical damage to hearing (Nowacek *et al.,* 2007). Few studies have been carried out to assess whether and how an increase in noise levels has impacted the Brazil DPS. Research conducted in Abrolhos Bank (Sousa-Lima and Clark, 2008; Sousa-Lima and Clark, 2009) showed that the number of singing whales diminished in the presence of low-frequency boat noise and that singing whales stopped calling and changed direction of movement if the sound source was within 7.5km on average. Anthropogenic noise was considered a low, but increasing, threat to the Brazil DPS of humpback whales.

Climate change may impact the Brazil DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), and krill is the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not well known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under *Section 4(a)(1) Factors Applicable to All DPSs,* the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase, but not in the foreseeable future.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Brazil DPS.

Gabon/Southwest Africa DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

For humpback whales using the waters of central western Africa, expanding offshore hydrocarbon extraction activity now poses an increasing threat (Findlay *et al.,* 2006). The degree to which humpback whales are affected by offshore hydrocarbon extraction activity is not known, but it is believed that long-term exposure to low levels of pollutants and noise, as well as the drastic consequences of potential oil spills, could have conservation implications.

The Gulf of Guinea region suffers from pollution and habitat degradation, both from major coastal cities (Lagos, Accra, Libreville, Porto-Nevo) that dispense raw sewage and untreated toxic waste into the marine environment (United Nations Environment Programme, 1999), and from unregulated foreign trawling and oil and gas developments (Chidi Ibe, 1996). The practice of mining construction materials from the near-shore coastal zone (*e.g.,* sand and gravel) is also common in this region, which contributes to habitat degradation (Chidi Ibe, 1996). The threat of coastal development is considered low, but increasing.

Certain naturally occurring biotoxins from dinoflagellates and other organisms may exist within the range of this DPS, although humpback whale deaths as a result of exposure have not been documented in this DPS. The occurrence of HABs is expected to increase with the growth of various types of human-related activities. The level of confidence in the predicted increase is moderate.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

No commercial whaling occurs in this DPS' range.

A small hunt, not regulated by the IWC, is also thought to exist in the Gulf of Guinea at the island of Pagalu (Aguilar, 1985; Reeves, 2002). No information exists on the fishery since 1975, but as of 1970, whales were still being taken in the area. This hunt would affect the Gabon/Northwest Africa DPS in the breeding grounds, but we have no information to indicate that it contributes significantly to the extinction risk of the DPS. If there is an aboriginal hunt at Pagalu, it is estimated to be 3 or less individuals per year.

Whale-watching in the Gulf of Guinea region is small in scale, with small humpback whale-watching industries documented in Benin, Gabon, São Tomé and Príncipe (O'Connor *et al.,* 2009). Whale-watching in South Africa is mainly focused on right whales, with humpback whales watched opportunistically. Boat-based whale-watching has grown 14 percent in the last decade, and is concentrated in the western Cape region; South Africa now numbers among the top ten destinations for whale-watching worldwide (O'Connor *et al.,* 2009). Whale-watching in Namibia is primarily focused on dolphins, and has seen 20 percent growth since 2008. The threat posed to this DPS by whale-watching is considered low.

This humpback whale DPS is exposed to scientific research activities, but adverse effects from research activities have not been identified, and overall impact is expected to be low and stable.

C. Disease or Predation

There are no reports of disease in this DPS and levels of parasitism are unknown. Predation likely occurs, though it is not known to what degree but it does not appear to be adversely impacting this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

There are regulations in place for all whale-watching activity in South Africa (Carlson, 2007).

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is no known/reported competition with fisheries to the Gabon/Southwest Africa DPS; this threat is therefore considered low and stable. The threat of offshore aquaculture is considered low.

Certain potential and real effects on cetaceans and other fauna are expected to increase due to the growth of industry activities, including noise disturbance from seismic surveys (Richardson *et al.,* 1995). Changes in their behavioral patterns or displacement from migratory, mating, and especially important calving and nursing habitats could impact reproductive success and calf survival during critical stages of development.

Rapid increases in shipping and port construction throughout the Gulf of Guinea (Van Waerebeek *et al.,* 2007) are likely to increase the risks of ship strikes for humpback whales. Whales are reported as stranding in Benin, with wounds suspected as originating from ship strikes (Van Waerebeek *et al.,* 2007). There are no dedicated stranding networks in the region, and ship strikes with oil tankers and other vessels have not been documented. Collisions with vessels are not likely to be a major threat considering the size of the DPS.

There are entanglement risks for humpback whales in these regions, including a growing commercial shrimp industry off Gabon (Walsh *et al.,* 2000), and an expansion in unregulated fishing by foreign fleets in Gulf of Guinea waters (Collins, pers. comm.; Chidi Ibe, 1996; Brashares *et al.,* 2004). Entanglement in fishing gear occurs, but it is not likely to be a major threat considering the size of the DPS.

Climate change may impact the Gabon/Southwest Africa DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), and krill is the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under Section 4(a)(1) Factors Applicable to All DPSs, the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Gabon/Southwest Africa DPS, with the exception of energy exploration posing a moderate threat throughout the west coast of Africa.

Southeast Africa/Madagascar DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Human populations are growing rapidly in coastal areas in Madagascar and East Africa, which may contribute, generally, to humpback whale habitat degradation and related negative influences.

Until recently, oil and gas reserves in east Africa were largely unexplored. However, recently, a number of offshore seismic oil and gas surveys have been conducted in Mozambique, Tanzania, Madagascar and the Seychelles. As a result, drilling is now either underway or planned in all of these regions (Frynas, 2004; Findlay *et al.,* 2006). As noted elsewhere, such activity brings threats of increased underwater noise from the exploration and development phases themselves, and increased vessel activity; the possibility of an oil spill; possible habitat degradation from such things as drill spoils and dredging; and vessel collisions. In Madagascar, offshore development has been concentrated on the northwest coast; in Mozambique it is concentrated in the Mozambique Basin, Zambezi delta region, while development in Tanzania has been most focused on coastal Zanzibar. Humpback whales occur seasonally in all of these regions.

Levels of exposure of humpback whales in this region to various pollutants are not known, nor is the occurrence of HABs. Trends in the extent of this threat likewise are not known.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Whale-watching activities are growing rapidly in waters off Mozambique; yet, these are poorly regulated (O'Connor *et al.,* 2009). Most of these activities are locally based and involve motorized boats, recreational fishing boats, and dive boats. Whale-watching in South Africa is mainly focused on right whales, although the industry at St

Lucia in KwaZulu Natal province is focused on southwestern Indian Ocean humpback whales. Recent political instability in Madagascar has limited the growth rate of whale-watching activities in this region, although growth between 1998–2008 was still estimated at about 15 percent, with the main industry focused on humpback whales frequenting the Ile Ste Marie/Antongil Bay region, and over 14,000 tourists participating in whale watch tours by 10–15 operators in 2008 (O'Connor *et al.,* 2009). Whale watch tourism in Mayotte is small-scale, but has expanded rapidly, from no industry in 1998 to 10,000 annual whale watchers in 2008 (O'Connor *et al.,* 2009), with a focus on a range of cetacean species. In Mauritius large cetacean watching is a minimal component of the whale watch industry and is therefore unlikely to have much impact (O'Connor *et al.,* 2009). An industry for watching humpback whales in Mauritius commenced in 2008 (Fleming and Jackson, 2011).

No commercial whaling occurs in this DPS' range. This humpback whale DPS is exposed to scientific research activities, but at low levels. Adverse effects from research activities have not been identified, and overall impact is expected to be low and stable.

C. Disease or Predation

There is little to no information on the impacts of disease, parasites, or predation on this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

Apparently, there are no local, national, or regional measures in place or contemplated to reduce the impact of habitat-related threats.

There is a voluntary code of conduct for operators of whale-watching boats in waters off Mozambique, but at present this is poorly upheld and no formal regulations or enforcement are currently in place (O'Connor *et al.,* 2009). The whale-watching industry off Madagascar has recently developed some guidelines for the protection of humpback whales, which were passed as legislation in 2000 with local regulations for Ile Sainte Marie (Fleming and Jackson, 2011) and Antongil Bay (Journal Officiel de la Republique de Madagascar, 2000). In the Mascarene Islands, the expanding whale-watching industry in La Réunion (3,000 tourists estimated in 2008) is currently unregulated. There are regulations in place for all whale-watching activity in South Africa (Carlson, 2007).

Fishing activities are prohibited in localized marine protected areas in Mayotte, Moheli (in the Comoros Archipelago), Madagascar (northeast coast), Aldabra (under protection as a UNESCO World Heritage Site) and the coastal region between Southern Mozambique and South Africa, so entanglement in fishing gear should not be a problem in these areas.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Little is known/reported on interaction of humpback whales in this DPS with fisheries, nor are there any current or planned offshore aquaculture sites in the region. These threats are therefore considered low and stable.

Information regarding fisheries and other activities is limited. Kiszka *et al.* (2009) and Razafindrakoto *et al.* (2008) provided summaries of humpback whale entanglement and strandings based on interviews with artisanal fishing communities. Substantial gillnet fisheries have been reported in the near-shore waters of the coasts of mainland Africa and Madagascar; and to a lesser extent in the Comoros Archipelago, Mayotte and Mascarene Islands, where such practices are hindered by coral reefs and a steep continental slope bathymetry (Kiszka *et al.,* 2009). Stranding reports and observations from Tanzania and Mozambique have mostly implicated gillnets, with most Madagascan entanglements associated with long-line shark fishing (Razafindrakoto *et al.,* 2008). In Mayotte, humpback whales have been observed with gillnet remains attached to them (Kiszka *et al.,* 2009), although no fatalities have yet been documented. Industrial fishing operations, including longlines and drift longlines on fish aggregation devices, purse seine and midwater trawling, occur in waters off Mauritius. The extent of bycatch and entanglement in these waters is unknown (Kiszka *et al.,* 2009). Strandings and bycatch data from 2001–2005 from South Africa indicated an estimated 15 humpback whales entangled in shark nets (large-mesh gillnets) in KwaZulu Natal province (only one death), while nine stranded whales were reported from the south and east coasts (IWC, 2002b; IWC, 2003; IWC, 2004b; IWC, 2005b; IWC, 2006b).

The range of this DPS includes some growing centers of human activities. Although there are no known records of ship struck humpback whales in this region, the amount of vessel traffic suggests this is probably a low-level threat. However, a reasonable assumption is that the amount of vessel traffic, and the level of the threat, is likely to increase as commercial shipping, recreational boating, and whale-watching, oil and gas exploration and development, and fishing activities increase.

This DPS is likely exposed to relatively high levels of underwater noise resulting from human activities, including, for example, commercial and recreational vessel traffic, and activities related to oil and gas exploration and development. Overall population-level effects of exposure to underwater noise are not well established, but exposure is likely chronic and at moderate levels. As vessel traffic and other activities are expected to increase, the level of this threat is expected to increase. The level of confidence in this information is moderate.

Climate change may impact the Southeast Africa/Madagascar DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), and krill is the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under Section 4(a)(1) Factors Applicable to All DPSs, the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Southeast Africa/Madagascar DPS, with the exception of fishing gear entanglements posing a moderate threat to the DPS.

West Australia DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The threat posed by energy development to the Western Australia population was considered medium because of the substantial number of oil rigs and the amount of energy exploration activity in the region inhabited by the whales (indicator CO–26 in (Beeton *et al.,* 2006)). Additionally, there are proposals for many more oil platforms to be built in the near future, which are highly likely to be executed (Department of Industry and Resources, 2008).

Coastally populated areas are increasing rapidly, and while the threat associated with coastal development is currently considered low, it is expected to increase. Although contaminant levels in humpback whales in this region are unknown, the threat level was considered low given what is known of contaminant levels in other populations.

There have been no records of humpback whale deaths as a result of exposure to HABs in this DPS, thus the threat is considered low.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

No whaling occurs in this DPS' range.

Whale-watching tourism and scientific research occur, at relatively low levels, throughout this DPS' range. Therefore, these threats are considered low.

C. Disease or Predation

There are no recent studies of disease or parasitism in this DPS, but there are no indications that they represent a substantial threat to the DPS.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the West Australia DPS were identified.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Competition with fisheries is considered a low threat to humpback whales off the coast of Western Australia due to the lack of spatial and temporal overlap with fisheries and whales. The threat of offshore aquaculture is considered low, but aquaculture activities may be increasing in this region. In the Southern Hemisphere, humpback whales feed almost entirely on krill (*Euphausia superba*). There is a regulated commercial harvest of krill, but harvest levels are currently small and there is no evidence that this threatens the food supply of humpback whales (Everson and Goss, 1991; Nicol *et al.,* 2008).

Coastally populated areas are increasing rapidly, with associated development of ports bringing increased risks of ship strikes. All ship strikes in Commonwealth waters must be reported by law, and a summary of these has been provided to the IWC annually since 2006. Since this time there has only been one report concerning a possible humpback ship strike in Western Australian waters (IWC, 2009b). The threat of ship strikes in Western Australia is considered low, but likely increasing.

There are 25 records of humpback whale entanglement events between 2003 and 2008 in this region, with western rock lobster fishing gear most frequently implicated (Doug Coughran, pers comm.; IWC, 2004a; IWC, 2005a; IWC, 2006a; IWC, 2007c; IWC, 2008). A rise in marine fishing debris has also been reported for the region (Environment Western Australia, 2007), which suggests that there may be an increasing risk of entanglement.

Climate change may impact the West Australia DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under *Section 4(a)(1) Factors Applicable to All DPSs,* the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the West Australia DPS, with the exception of energy exploration posing a moderate threat throughout Western Australia.

East Australia DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Whales migrating southward to the feeding grounds, as well as a portion of those migrating north, follow the east coast of Australia, and many or most are confined to a narrow corridor near the coast (Bryden, 1985; Noad *et al.,* 2008) passing several large cities. Increasing coastal development is possible in these areas, but they represent a minor portion of the total migratory route. As with coastal development, sources of pollution for the east Australia DPS are concentrated in a few locations along the migratory route. The breeding area for this DPS is primarily within the Great Barrier Reef Marine Park (Chittleborough, 1965; Simmons and Marsh, 1986), which has a comprehensive set of state and Federal protection laws. However, during tropical floods, farmland runoff may bring significant quantities of pollutants (pesticides, fertilizers) down several rivers that empty into the Great Barrier Reef area (Haynes and Michalek-Wagnera, 2000). To date there are no known documented impacts of contaminants on humpback whale survival and fecundity. Oil and gas production occurs in Bass Strait (Australian Government, 2006), a region used by some whales of this DPS as they migrate to feeding grounds. Overall, these threats were considered to pose a low risk to this DPS.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Anthropogenic disturbance of this DPS occurs primarily on the breeding ground. Whale-watching tourism in eastern Australia (Queensland) has seen an annual average growth rate of 8.5 percent since 1998 (this includes boat and land-based operations and both whale- and dolphin-watching trips; O'Connor *et al.,* 2009). In New South Wales, boat-based whale- and dolphin-watching has seen a 2.6 percent increase between 2003 and 2008.

Scientific research activities on this DPS occur at the feeding grounds, breeding grounds and along the migratory route. Photo-identification studies, biopsy efforts and other field studies do exist. However, adverse effects from research activities have not been documented and threats are considered low. Finally, scientific whaling proposed by Japan in the Antarctica feeding grounds would occur in areas where the East Australia DPS is known to feed (Nishiwaki *et al.,* 2007).

However, at this time no whaling in these feeding grounds is occurring.

C. Disease or Predation

There is little to no information on the impacts of disease, parasites or predation on this DPS. Evidence for killer whale interaction is documented, and 17 percent of photo-identified humpback whales in East Australia show scarring on their flukes, most of which is consistent with interactions with killer whales (Naessig and Lanyon, 2004). There is no evidence to suggest that this level of predation is outside the norm for the DPS. Given the population size and current growth rate, disease, predation and parasitism seem unlikely to pose a significant threat to this DPS.

D. Inadequacy of Existing Regulatory Mechanisms

Oil and gas exploration and drilling are prohibited within the Great Barrier Reef Marine Park.

Queensland has a substantial whale-watching management program (O'Connor *et al.,* 2009), including restricting access to areas deemed essential for humpback conservation, and Australia has national whale-watching guidelines. With these regulations in place, the BRT considered the threat level from whale-watching to be low.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is no published information on negative impacts of offshore aquaculture, competition with fisheries, or HABs on this DPS. In the Southern Hemisphere, humpback whales feed almost entirely on krill (*Euphausia superba*). There is a regulated commercial harvest of krill, but harvest levels are currently small and there is no evidence that this threatens the food supply of humpback whales (Everson and Goss, 1991; Nicol *et al.,* 2008).

Vessel collisions and entanglement in fishing gear pose the greatest anthropogenic risks to the East Australia DPS. Thirteen ship-strike incidents and five deaths have been reported between 2003 and 2008 (summarized in Fleming and Jackson, 2011) and an additional ship-strike was recorded in 2009 with the whale being seriously injured (IWC, 2010a). Both fishing vessels and commercial vessels have been involved in these incidents. Given the probable increase in fishing, tourism and commercial shipping, the threat is likely to increase. Entanglements are regularly reported along the east coast of Australia and 57 entanglements have been documented between 2003–2008, with 13 confirmed deaths (Fleming and Jackson, 2011). In addition, six humpback whales were entangled in shark control nets and released in 2009 (IWC, 2010b). These totals are likely underestimates as not all entanglements are reported and some are not identified to species. The majority were recorded in shark nets and occurred along the migratory route (Fleming and Jackson, 2011). Although not insignificant, given the population size and estimated growth rate, the threat level posed by these factors is considered low. Anthropogenic noise is also a possible threat to this DPS. There are several commercial shipping routes through the Great Barrier Reef breeding ground and along the coastal migratory route that likely result in some underwater noise exposure. Migration through Bass Strait would also expose whales to energy exploration and production noise. There is no information concerning exposure of whales to underwater military activities.

Climate change may impact the East Australia DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under *Section 4(a)(1) Factors Applicable to All DPSs,* the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the East Australia DPS.

Oceania DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Surface run-off from nickel strip mines causes habitat degradation and pollution of lagoons in New Caledonia, which is one of the largest producers of nickel globally, yet the effect on the surrounding marine environment has been poorly monitored (*e.g.,* de Forges *et al.,* 1998; Labrosse *et al.,* 2000; Metian *et al.,* 2005). The threat to humpback whales in Oceania from coastal development and contaminants was considered low overall.

The BRT considered the threats of energy exploration and development and offshore aquaculture to the Oceania population to be low but increasing, due to the expected growth of these activities over the next several decades.

The level of threat posed by HABs to humpback whales in Oceania is unknown.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Some local whaling of humpback whales was carried out in French Polynesia (Rurutu), the Cook Islands and Tonga during the 20th century (Reeves, 2002), but this has ceased since 1960 at Rurutu (Poole, 2002), and since 1978 elsewhere (IWC, 1981). It does not appear that Tonga hunted whales before Europeans arrived in the region in the 19th century (Reeves, 2002). Tonga was used as a provisioning station for whaling vessels from the Northern Hemisphere while they operated in the South Pacific. Tongans then began conducting shore-based whaling in the late 1880s or early 1900s, and increasing demand prompted new boats and whalers to enter the growing industry (Reeves, 2002). Catch rates (whales landed) were estimated at 10–20 whales/year for the 1950s and 1960s and at least 3–8 whales/year for the mid-1970s (Reeves, 2002). In 1979, the Tonga Whaling Act was passed after a Royal Decree in 1978, prohibiting the catch of whales on what was originally designated as a temporary basis pending an assessment of the population by the IWC (Keller, 1982; Reeves, 2002; Kessler and Harcourt, 2012). However, no whaling has been carried out in Tonga since then. It is possible that this hunt was contributing significantly to the extinction risk of the Oceania DPS, but since no whaling has occurred there since 1979, it is no longer contributing to the DPS' extinction risk.

Humpback whales are under threat from unregulated scientific whaling in the Antarctic waters directly to the south of Oceania. None have been taken to date, but an annual catch of 50 humpback whales was proposed by Japan in the 2007/2008 season (Nishiwaki *et al.,* 2007), as part of its JARPA II research program. This has been held in abeyance while Japan considers that progress is being made by the IWC in its meetings on the ''Future of the IWC.'' It is unlikely that the proposed take of humpback whales will be reinstated in the foreseeable future; in fact, Japan submitted its research proposal for the Antarctic on November 19, 2014, and it did not include any humpback whales (Government of Japan, 2014).

Whale-watching tourism exists in all four of the principal survey sites in Oceania, with strong growth in the last decade. There is no boat-based, dedicated whale watching industry in American Samoa at present. Humpback whales have been at particular risk from excessive boat exposure through whale watching in the Southern Lagoon of New Caledonia, where there are currently 24 working operators. Levels of exposure have been unusually high (peaking during weekend periods), with boats at a distance of less than 100m from calves 40 percent of the time and each whale exposed to an average of 3.4 boats for 2 hours daily (Schaffar and Garrigue, 2008). In 2008, commercial tour operators voluntarily signed a code of conduct, and subsequent compliance with this code has significantly reduced the level of daily exposure to boats (South Pacific Whale Research Consortium, 2009). Whale watching and other recreational or research-related activities were deemed by the BRT to pose a low level of threat in this region.

C. Disease or Predation

Mattila and Robbins (2008) reported raised skin lesions along the dorsal flanks of humpback whales in American Samoa. The lesions differ morphologically from the 'depressed' lesions caused by cookie cutter sharks and appear to persist for long periods on the skin, rather than either erupting or healing. There are no reports of these lesions in whaling records, suggesting that this phenomenon is recent. The cause of these lesions is currently unknown (Mattila and Robbins, 2008), but they are not considered a threat to the population.

D. Inadequacy of Existing Regulatory Mechanisms

Whale sanctuaries (local waters where whaling is prohibited) have since been declared in the Exclusive Economic Zones of French Polynesia, Cook Islands, Tonga, Samoa, American Samoa, Niue, Vanuatu, New Caledonia and Fiji (Hoyt, 2005), while whales are protected in New Zealand waters under the New Zealand Marine Mammal Protection Act.

Whale watching guidelines are in place in Tonga and New Caledonia, while boat-based whale watching in the Cook Islands, Samoa and Niue is minimal (O'Connor *et al.,* 2009).

E. Other Natural or Manmade Factors Affecting Its Continued Existence

There is little information available from the South Pacific regarding entanglement with fishing gear; two humpback whales have been observed in Tonga entangled in rope in one instance and fishing net in another (Donoghue, pers. comm.). One humpback mother (with calf) was reported entangled in a longline in the Cook Islands in 2007 (South Pacific Whale Research Consortium, 2008). Entanglement scars have been seen on humpback whales in American Samoa, but there are not enough data to determine an entanglement rate. Available evidence suggests that entanglement is a potential concern in regions where whales and stationary or drifting gear in the water overlap (Mattila *et al.,* 2010). The threat of entanglements was ranked low for the Oceania population.

There is little information available from the South Pacific regarding ship strikes. This threat was ranked low but is expected to increase as vessel activity in the region increases. Similarly, this DPS is likely exposed to moderate levels of underwater noise resulting from human activities, which may include, for example, commercial and recreational vessel traffic. Overall population-level effects of exposure to underwater noise are not well established, but as vessel traffic and other activities are expected to increase, the level of this threat is expected to increase.

In the Southern Hemisphere, humpback whales feed almost entirely on krill (*Euphausia superba*). There is a regulated commercial harvest of krill, but harvest levels are currently small and there is no evidence that this threatens the food supply of humpback whales (Everson and Goss, 1991; Nicol *et al.,* 2008). The threat of competition with fisheries was considered low for the Oceania DPS.

Climate change may impact the Oceania DPS of humpback whales in multiple ways. Sea level rise, ocean warming and ocean acidification may all negatively impact the reef system, which provides shallow, protected waters for breeding. Ocean acidification also has a documented impact on krill growth and development (Kurihara, 2008), the primary prey item for Southern Hemisphere humpback whales. Krill are tightly associated with sea ice (Brierley *et al.,* 1999; Brierley *et al.,* 2002), and decreasing sea ice may negatively impact krill abundance and/or distribution. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under *Section 4(a)(1) Factors Applicable to All DPSs,* the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Oceania DPS.

Southeastern Pacific DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Human population growth and associated coastal development, including port development, disruption and possible partitioning of the marine habitat and increased turbidity in coastal waters, are potential threats to the Southeastern Pacific DPS. The presumed migratory route for this population lies in the coastal waters off Costa Rica, Panama, Colombia, Ecuador, Peru, and Argentina and includes some large human population centers in both Central and South America. Currently, the high degree of coastal development in this DPS' habitat is not substantially affecting the DPS' size or growth rate, and it is considered to be a low-level threat.

Little has been published regarding contaminant levels in this region. However, while levels of DDTs, PCBs, and PBPEs are typically lower in Southern Hemisphere feeding areas than off the east or west coasts of the United States, little research has been done to confirm lower contaminant levels among Southern Hemisphere whales (Fleming and Jackson, 2011). DDT and PCB levels are likely to decrease in feeding areas because use of these chemicals has been banned in many countries, but PBPE use may still be increasing. Man-made contaminants are not considered to be a significant threat to this population.

Energy exploration and development activities are present in this DPS' habitat range. Oil and gas production is currently increasing in the Gulf of Guayaquil, Ecuador (Félix and Haase, 2005). A large number of oil tankers transit through the Straits of Magellan yearly, a notoriously difficult route to navigate. At least one oil spill has resulted from a ship running aground there (Morris, 1988). Energy development is likely to expand if oil and gas reserves are discovered in other locations, but it does not pose a threat to this population now or in the foreseeable future.

HABs of dinoflagellates and diatoms exist within the feeding range of this DPS, but there have been no records of humpback whale deaths as a result of exposure in this area. The occurrence of HABs is expected to increase with increased run-off and nutrient input from human-related activities; however, HABs do not pose a threat to this DPS now or in the foreseeable future.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Whale-watching tourism and scientific research occur, at relatively low levels, throughout this DPS' range. Whale-watching tourism occurs along all of the South and Central American countries bordering the habitat of this DPS. Whale-watching industry growth has been significant and approximately half of these countries have whale-watching guidelines in place (Hoyt and Iníguez, 2008). Though some change in behavior of whales near tourism boats has been noted, whale-watching does not pose a threat to this DPS currently. Scientific research activities such as observation, biopsying, photographic studies and recording of underwater vocalizations of whales occur in both the breeding and feeding habitats and along this DPS' migratory route, though no adverse effects from these events have been recorded.

No whaling occurs in this DPS' range.

C. Disease or Predation

There is little information available on the impacts of disease or parasitism on this DPS.

Predation does not appear to be a current threat to this DPS. Killer whale attacks on humpback whales have been observed in this region, and scarring from killer whale and potentially false killer whale and shark attacks has been documented from photographic catalogues (Flórez-González *et al.,* 1994; Scheidat *et al.,* 2000; Félix and Haase, 2001). The scarring rate is lower than in some other DPSs.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the Southeastern Pacific DPS were identified.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

In the Southern Hemisphere, humpback whales feed almost entirely on krill (*Euphausia superba*). There is a regulated and growing commercial krill fishery, but harvest levels are currently small and there is no evidence that this threatens the food supply of humpback whales (Everson and Goss, 1991; Nicol *et al.,* 2008).

Aquaculture activities are high in waters of Argentina and Chile, but the impact of these activities on this DPS of humpback whales has not been documented and is likely low if few whales use these inland areas. Entanglement was determined to pose a medium threat to this DPS based on stranding and entanglement observations and spatial and temporal overlap with aquaculture activities.

This DPS is likely exposed to relatively high levels of underwater noise resulting from human activities, including commercial and recreational vessel traffic, and activities in naval test ranges, and these levels are expected to increase. Especially high levels of large vessel traffic are found off Panama (over 12,000 ship transits annually) and in the Magellan Straits. Naval exercises occur around much of the South American coast annually. It is not known if underwater noise exposure affects humpback whale populations, but this does not currently appear to pose a significant threat to this DPS.

No ships have reported striking humpback whales in this region, but incidents may be under-reported, and stranding reports indicate some contribution from vessel collisions (Capella Alzueta *et al.,* 2001; Castro *et al.,* 2008). Shipping traffic will probably increase as global commerce increases; thus, a reasonable assumption is that the level of vessel collisions will increase. Currently, ship strikes are considered a low level threat to this DPS.

Entanglement in fishing gear poses the most significant risk to this DPS. The majority of entanglements involve gillnets and purse seines (Félix *et al.,* 1997; Capella Alzueta *et al.,* 2001; Alava *et al.,* 2005; Castro *et al.,* 2008). The artisanal fishing fleet in Ecuador numbers over 15,000 vessels. Scarring rates indicate that close to one third of all observed animals have experienced some level of entanglement (Alava *et al.,* 2005). These scarring rates are similar to those observed off the northeast coast of the United States. Less research effort in the Southeast Pacific region compared to the northeast coast of the United States suggests that this reported scarification rate may even be an underestimate of the actual level of entanglement occurring in the Southeast Pacific. The number of dead and entangled whales off Colombia has increased over the last two decades (Capella Alzueta *et al.,* 2001). Calves comprise over half of all observed entanglement events, a disproportionate value in light of the calf to adult ratio in the DPS (Engel *et al.,* 2006; Neto *et al.,* 2008).

Humpback whales in the Southern Hemisphere feed almost entirely on krill (*Euphausia superba*) and acidification of the marine environment has been documented to impact the physiology and development of krill and other calcareous marine organisms, potentially reducing their abundance and subsequent availability to humpback whales in the future. The life cycle of *Euphausia superba* is tied to sea ice, making this prey species vulnerable to warming effects from climate change. Decreases in krill abundance have been observed around the Antarctic Peninsula (Atkinson *et al.,* 2004). Overall population level effects from global climate change and anthropogenic noise are not known and the threat was ranked low, based on the premise that krill would need to be substantially reduced in order to put humpback whales at risk of extinction. As discussed above under *Section 4(a)(1) Factors Applicable to All DPSs,* the BRT did not think the linkage between climate change and future krill production was sufficiently well understood to rate it as moderate or high risk. Nonetheless, any potential impacts resulting from these threats will almost certainly increase.

In summary, fishing gear entanglements are likely to moderately reduce the population size or the growth rate of the Southeastern Pacific DPS, and all other threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown for the Southeastern Pacific DPS.

Arabian Sea DPS

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

The BRT determined that the threat posed by energy exploration to the Arabian Sea DPS should be classified as high, given the small population size and the present levels of energy activity. A catastrophic event similar to that of the Deepwater Horizon Oil Spill in the Gulf of Mexico could be devastating to this DPS, especially in light of the year-round presence of humpback whales in this area.

The effect of pollutants on cetaceans is a concern in the region, as the Arabian Sea is a center of intense human activity with poor sea circulation, so pollutants can persist for long periods (Minton, 2004). Since the 1970s, the coastal and marine infrastructure in Oman has developed at a rapid rate, with over 80 percent of the population now living within 13 miles from the coast, and expanding development of oil and gas resources and fishing fleets (Minton, 2004). The threats from coastal development and contaminants are ranked low but increasing.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

This humpback whale DPS is exposed to minimal scientific research and whale-watching activities. The adverse effects from these activities have not been identified, and overall impact is expected to be low and stable.

No commercial whaling occurs in this DPS' range, although 238 humpback whales were illegally killed in the Arabian Sea by the USSR in 1966 (Mikhalev, 1997).

C. Disease or Predation

Liver damage was detected in 68.5 percent of necropsied humpback whales in this area during Soviet whaling in 1966, with degeneration of peripheral liver sections, cone-shaped growths up to 20 cm in diameter and blocked bile ducts (Mikhalev, 1997). While this pathology was consistent with infection by trematode parasites, none were identified during necropsy, and the causes of this liver damage remain unknown.

Poisonous algal blooms and biotoxins have been implicated in some mass fish, turtle, and possibly cetacean, mortality events on the Oman coast, although no events have yet been known to include humpback whales. Coastal run-off from industrial activities is likely to be increasing rapidly, while regular oil spills in shipping lanes from tankers also contribute to pollution along the coast (*e.g.,* Shriadah, 1999). Tattoo skin lesions were observed in 26 percent of photo-identified whales from Oman (Baldwin *et al.,* 2010). While not thought to be a common cause of adult mortality, it has been suggested that tattoo skin disease may differentially kill neonates and calves that have not yet gained immunity (Van Bressem *et al.,* 2009). The authors also suggested that this disease may be more prevalent in marine mammal populations that experience chronic stress and/or are exposed to pollutants that suppress the immune system.

D. Inadequacy of Existing Regulatory Mechanisms

No regulatory mechanisms specific to the Arabian Sea DPS were identified.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

The primary prey of humpback whales in Oman (*Sardinella* sp.) is also consumed by tuna and other commercial pelagic fish targeted by gillnet fisheries, but the severity of the threat of competition with fisheries is unknown.

The BRT did not have information about offshore aquaculture activities in the Arabian Sea.

Humpback whales in the Arabian Sea are exposed to a high level of vessel traffic (Baldwin, 2000; Minton, 2004; Kaluza *et al.,* 2010), so the threat of ship strikes was considered medium for this small DPS.

This DPS is likely exposed to relatively high levels of underwater noise resulting from human activities, including, for example, commercial and recreational vessel traffic, and activities related to oil and gas exploration and development. Overall population-level effects of exposure to underwater noise are not well-established, but exposure is likely chronic and at moderate levels. As vessel traffic and other activities are expected to increase, the level of this threat is expected to increase.

There is high fishing pressure in areas off Oman where humpback whales are sighted. Eight live humpback whale entanglement incidents were documented between 1990 and 2000, involving bottom set gillnets often with weights still attached and anchoring the whales to the ocean floor (Minton, 2004). Minton *et al.* (2010b) examined peduncle photographs of humpback whales in the Arabian Sea and concluded that at least 33 percent had been entangled in fishing gear at some stage. The threat of fishing gear entanglements in the Arabian Sea is considered high and increasing.

The threat posed by climate change to the Arabian Sea DPS of the humpback whale was determined to be slightly higher than to the other DPSs and was assigned medium threat level. This higher threat level is based on the more limited movement of this DPS that both breeds and feeds in the Arabian Sea. Changing climatic conditions may change the monsoon-driven upwelling that creates seasonal productivity in the region. While Northern Hemisphere individuals may be able to adapt to climatic changes by moving farther north, Arabian Sea individuals have less flexibility for expanding their range to cooler regions.

Evidence that this DPS has undergone a recent genetic bottleneck and is currently at low abundance (Minton *et al.,* 2010b) suggests that there may be an additional risk of impacts from increased inbreeding (which may reduce genetic fitness and increase susceptibility to disease). At low densities, populations are more likely to suffer from the ''Allee'' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density.

In summary, the Arabian Sea DPS faces unique threats, given that the whales do not migrate, but instead feed and breed in the same, relatively constrained geographic location. Energy exploration and fishing gear entanglements are considered likely to seriously reduce the population's size and/or growth rate, and disease, vessel collisions, and climate change are likely to moderately reduce the population's size or growth rate.

Ongoing Conservation Efforts

When considering the listing, reclassification, or delisting of a species, section 4(b)(1)(A) of the ESA requires us to consider efforts by any State, foreign nation, or political subdivision of a State or foreign nation to protect the species. Such efforts would include measures by Native American tribes and organizations, local governments, and private organizations. Also, Federal, tribal, state, and foreign recovery actions (16 U.S.C. 1533(f)), and Federal consultation requirements (16 U.S.C. 1536) constitute conservation measures. We must evaluate any conservation efforts that have not yet been implemented or have not yet been shown to be effective under the joint NMFS/FWS Policy on the Evaluation of Conservation Efforts (PECE) (68 FR 15100; March 28, 2003). For these efforts, we must evaluate the certainty of implementing the conservation efforts and the certainty that the conservation efforts will be effective on the basis of whether the effort or plan establishes specific conservation objectives, identifies the necessary steps to reduce threats or factors for decline, includes quantifiable performance measures for the monitoring of compliance and effectiveness, incorporates the principles of adaptive management, and is likely to improve the species' viability at the time of the listing determination.

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) is an intergovernmental treaty which requires range states to protect migratory species including humpback whales where they occur, conserve or restore habitats, mitigate obstacles to migration, and control other endangering factors. The humpback whale is listed in Appendix I of the CMS (species in danger of extinction throughout all or a significant portion of their range). Parties to CMS are required to prohibit take of Appendix I species. The CMS has developed binding Agreements and nonbinding Memoranda of Understanding (MOU). An MOU for the Conservation of Cetaceans and their Habitats in the Pacific Islands Regions became effective in 2006 and offers a level of protection to the Southern Hemisphere populations of humpback whales and their habitats in this region. The CMS Agreements on the Conservation of (a) Small Cetaceans in the Baltic, North East Atlantic, Irish and North Seas (29.03.1994) and (b) Cetaceans of the Black Seas, Mediterranean and Contiguous Atlantic Area are not designed specifically for the humpback whale but may provide incidental protection to the species.

The Bern Convention on the Conservation of European Wildlife and Habitats is a regional European treaty on conservation of wild flora and fauna and their natural habitats and calls for signatories to provide special protection for fauna species listed in Appendix II and III to the convention. The convention is a binding agreement for participating parties, and its aim is to ensure conservation by means of cooperation, including efforts to protect migratory species. The Parties promote national policies and education for the conservation of nature and the integration of conservation into environmental policies. The humpback whale is listed in Appendix II—fauna species to be strictly protected—which prohibits deliberate capture and killing, damage to or destruction of breeding sites, deliberate disturbance of animals during breeding and rearing, and the possession of and internal trade in these animals alive or dead (Council of Europe's Bern Convention, 2013).

The provisions of the Council of the European Union (EU) Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora (EU Habitats Directive) are intended to promote the conservation of biodiversity in EU member countries. EU members meet the habitat conservation requirements of the network known as Natura 2000. Humpback whales are listed in Annex IV of the convention, which identifies species determined to be in need of strict protection across the European region. Twenty-seven member states work with the same legislative framework to protect species. Actions originating from the EU Habitats Directive that may provide protection to humpback whales in the region include (a) coordinated development of a European Red List of species threatened at the European level (parallel with the IUCN listings); (b) guidance documents on the protection of species listed under the Directive, and on the development of a network of conservation areas in the offshore marine environment and (c) species assessment reports. While not regulatory in nature, these actions are designed to reduce threats and provide a conservation benefit to the Atlantic humpback whales.

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established in 1982 with 25 member countries. Its objective is the conservation of Antarctic marine life, particularly krill and the Antarctic marine ecosystems that depend on krill. The Commission manages fisheries for Antarctic krill and several finfish species with the goal of ensuring long-term sustainability and existing ecological relationships.

Numerous additional international or regional treaties, conventions and agreements offer some degree of protection for humpback whales and their habitat (reviewed by Hoyt, 2011).

In addition to IWC regulations discussed above under the Section 4(a)(1) factors, the IWC co-ordinates and funds conservation work on many species of cetaceans. This includes work to reduce the frequency of ship strikes, to co-ordinate disentanglement events, and to establish Conservation Management Plans for key species and populations. Recently, the IWC has adopted a Strategic Plan for Whale Watching so as to facilitate the further development of this activity in a way which is responsible and consistent with international best practice (*http://iwc.int/history-and-purpose,* accessed February 10, 2014). It is too early to evaluate the effectiveness of this plan under the PECE, but since the impact of whale-watching on all of the humpback whale DPSs is considered to be negligible, even if this plan proves to be extremely effective in reducing impacts of whale-watching on humpback whales, we would not likely conclude that this plan would make the difference between endangered and threatened status or between threatened and not warranted status for any of the humpback whale DPSs.

At this time, we are not aware of any other formalized conservation efforts for humpback whales that have yet to be implemented, or which have recently been implemented but have yet to show their effectiveness in removing threats to the species. Therefore, we do not need to evaluate any other conservation efforts under the PECE.

Rationale for Revising the Current Global Listing and Replacing It With Listings of DPSs

As explained throughout this proposed rule, we have determined that, based on the best currently available scientific and commercial information including the BRT's recommendations and consideration of the uncertainty involved in its recommendation to identify the Okinawa/Philippines and Second West Pacific populations as separate DPSs, the humpback whale should be recognized under the ESA as a set of 14 separate DPSs. Based on a comprehensive status review and our analysis of demographic factors and the Section 4(a)(1) factors, we have concluded that some of the DPSs qualify as endangered species, some qualify as threatened species, and some do not qualify for listing. Our proposed action here is prompted both by our own review, begun in 2009, and the two delisting petitions we received.

Our proposed determinations are based on the best available scientific and commercial information pertaining to the species throughout its range and within each DPS. In this proposed rule, we are identifying 14 DPSs, making listing determinations for each of these DPSs, and proposing to revise the current listing to reflect the new determinations. We find that the purposes of the ESA would be furthered by managing this wide-ranging species as separate units under the DPS authority, in order to tailor protections of the ESA to those populations that warrant protection. Based on a review of the demographics of these DPSs and the five factors contained in ESA section 4(a)(1), we find that the best available science no longer supports a finding that the species is an ''endangered species'' throughout its range. We propose to revise the listing for the humpback whale by removing the current species-wide listing and in its place listing 2 DPSs as threatened and 2 as endangered. Ten DPSs are not being proposed for listing because their current status does not warrant listing. Since these DPSs are not currently listed as separate entities, we are proposing to replace the existing listing of the species with separate listings for those DPSs that warrant classification as threatened or endangered, rather than ''delisting'' those DPSs that do not warrant such classification under our regulations (50 CFR 424.11(d)). However, the effect of our proposed action, if finalized, will be that the protections of the ESA will no longer apply to these 10 DPSs. We note that we have previously reclassified a species into constituent populations and revised the listing to remove one population from the list or assign different statuses to the different populations (*e.g.,* identifying western and eastern populations of the gray whale and removing the eastern one from the endangered species list (59 FR 31094; June 16, 1994); identifying western and eastern DPSs of the Steller sea lion, which had been listed as threatened, and listing the western DPS as endangered (62 FR 24345; May 5, 1997)).

The ESA gives us authority to make these listing determinations and to revise the lists of endangered and threatened species to reflect these determinations. Section 4(a)(1) of the ESA authorizes us to determine by regulation whether ''any species,'' which is expressly defined to include species, subspecies, and DPSs, is endangered or threatened based on certain factors. Review of the status of a species may be commenced at any time, either on our own initiative through a status review or in connection with a 5-year review under Section 4(c)(2), or in response to a petition. A DPS is not a scientifically recognized entity, but rather one that is created under the language of the ESA and effectuated through our 1996 DPS Policy. We have some discretion to determine whether a species should be reclassified into DPSs and what boundaries should be recognized for each DPS. At the conclusion of the listing review process, Section 4(c)(1) gives us authority to update the lists of endangered species and threatened species to conform to our most recent determinations. This can include revising the lists to remove a species from the lists or reclassifying the listed entity.

Neither the ESA nor our regulations explicitly prescribe the process we should follow where the best available scientific and commercial information indicates that the listing of a taxonomic species should be updated and revised into listings of constituent DPSs. To the extent it may be said that the statute is ambiguous as to precisely how the updated listings should replace the original listing in such circumstances, we provide our interpretation of the statutory scheme. The purposes of the statute are furthered in certain situations where the agency has determined that it is appropriate to revise a rangewide listing in order to ensure that the current lists of endangered and threatened species comport with the best available scientific and commercial information. For example, updating a listing may further the statute's purpose of recognizing when the status of a listed species has improved to the point that fewer protections are needed under the ESA, allowing for appropriately tailored management for the populations that do not warrant listing and for those remaining populations that do. Where a species, subspecies, or DPS no longer needs protection of the ESA, removing those protections may free resources that can be devoted to the protection of other species. Conversely, disaggregating a listing into DPSs can also sometimes lead to greater protections if one or more constituent DPSs qualify for reclassification to endangered.

There is no practicable alternative to simultaneously recognizing the newly identified DPSs and proposing to assign them the various statuses of threatened, endangered, or not warranted for listing to replace the original taxonomic species listing. It would be nonsensical and contrary to the statute's purposes and the best available science requirement to attempt to first separately list all the constituent DPSs; the best available scientific and commercial information would not support listing all of the DPSs now in order to delist some of them subsequently. Nor would it make sense to attempt to first ''delist'' the species-level listing in order to then list some of the constituent DPSs. Where multiple DPSs qualify for listing as endangered or threatened, it would inherently thwart the statute's purposes to remove protections of the ESA from all members of the species even temporarily. The approach we are proposing ensures a smooth transition from the current taxonomic species listing to the future listing of certain specified DPSs.

After we consider public comment, if we publish a final rule that has the effect of removing specified DPSs from the endangered species list, we will continue to monitor the status of the entire range of the humpback whale. For any DPSs that are listed, monitoring is as a matter of course, pursuant to the obligation to periodically review the status of these species (ESA Section 4(c)(2)). In addition, we will undertake monitoring of any DPSs that are not listed as a result of their improved status (ESA Section 4(g)).

Conclusions on the Status of Each DPS Under the ESA

Based on the BRT's DPS conclusions (with the exception that we combined the Okinawa/Philippines and Second West Pacific populations identified by the BRT into the Western North Pacific DPS), the BRT's assessment of the demographic and ESA section 4(a)(1) factors, and our evaluation of ongoing conservation efforts, we make the following listing determinations.

Endangered DPSs

We conclude that 2 humpback whale DPSs are in danger of extinction throughout their ranges: The Cape Verde Islands/Northwest Africa DPS and the Arabian Sea DPS.

Little is known about the total size of the Cape Verde Islands/Northwest Africa DPS, and its trend is unknown. For the Cape Verde Islands/Northwest Africa DPS, the threats of HABs, disease, parasites, vessel collisions, fishing gear entanglements and climate change are unknown. All other threats to this DPS are considered likely to have no or minor impact on the population size and/or growth rate. The BRT distributed 32 percent of its likelihood points for this DPS to the ''high risk of extinction'' category, 43 percent to the ''moderate risk of extinction'' category, and 25 percent to the ''not at risk of extinction'' category. We have no reason to believe that this DPS' status has improved since humpback whales within the range of this DPS were listed as endangered. Because of the high likelihood that the abundance of this DPS is low and the considerable uncertainty regarding the risks of extinction of this DPS due to a general lack of data, we propose to retain the Cape Verde Islands/Northwest Africa DPS on the list of endangered species at 50 CFR 224.101.

The estimated abundance of the Arabian Sea DPS is less than 100, but its entire range was not surveyed, so it could be somewhat larger. Its trend is unknown. The Arabian Sea DPS faces unique threats, given that the whales do not migrate, but instead feed and breed in the same, relatively constrained geographic location. Energy exploration and fishing gear entanglements are considered likely to seriously reduce the population's size and/or growth rate, and disease, vessel collisions and climate change are likely to moderately reduce the population's size or growth rate. The BRT distributed 87 percent of its likelihood points for the Arabian Sea DPS in the ''at high risk of extinction'' category. We agree with the BRT that the Arabian Sea DPS is at a high risk of extinction, and therefore, we propose to retain the Arabian Sea DPS on the list of endangered species at 50 CFR 224.101.

Threatened DPSs

We conclude that 2 other DPSs are likely to become in danger of extinction in the foreseeable future throughout their ranges: The Western North Pacific DPS and the Central America DPS. As noted above, in making this determination, we applied the same 60-year timeframe as the BRT assumed for the foreseeable future.

The abundance of the Western North Pacific DPS is thought to be about 1,100 individuals or more, with unknown trend. All threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown, with the following exceptions: Energy development, whaling, competition with fisheries, and vessel collisions are considered likely to moderately reduce the population size or the growth rate of the Okinawa/Philippines portion of this DPS. Fishing gear entanglements are considered likely to seriously reduce the population size or the growth rate of the Okinawa/Philippines portion of this DPS. In general, there is great uncertainty about the threats facing the Second West Pacific portion of this DPS. The BRT distributed 36 percent of its likelihood points for the Okinawa/Philippines portion of the DPS in the ''high risk of extinction'' category and 44 percent in the ''moderate risk of extinction'' category, with only 21 percent of the points in the ''not at risk of extinction'' category. The distribution of likelihood points among the risk categories indicates uncertainty. There was also considerable uncertainty regarding the risk of extinction of the Second West Pacific portion of this DPS, with 14 percent of the points in the ''high risk of extinction'' category, 47 percent in the ''moderate risk of extinction'' category, and 39 percent in the ''not at risk of extinction'' category. The majority of likelihood points were in the ''moderate risk of extinction'' category for both portions of the Western North Pacific DPS. Given the relatively low population size of the Western North Pacific DPS (estimated to be less than 2,000), the moderate reduction of its population size or growth rate likely from energy development, whaling, competition with fisheries, and vessel collisions, the serious reduction of its population size or growth rate likely from fishing gear entanglements, the fact that the majority of the BRT's likelihood points were in the ''moderate risk of extinction'' category for both portions of the DPS, and the considerable uncertainty associated with this, we propose to add the Western North Pacific DPS to the list of threatened species at 50 CFR 223.102.

The abundance of the Central America DPS is thought to be about 500 individuals with unknown trend. All threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown, with the following exceptions: Vessel collisions and fishing gear entanglements are considered likely to moderately reduce the population size or the growth rate of the Central America DPS. The BRT distributed 28 percent of its likelihood points for the Central America DPS in the ''high risk of extinction'' category, 56 percent in the ''moderate risk of extinction'' category, and 16 percent in the ''not at risk of extinction'' category, but the distribution of votes among the risk categories indicates uncertainty. Given the relatively low population size (estimated to be about 500), the moderate reduction of its population size or growth rate likely from vessel collisions and fishing gear entanglement, the fact that the majority of the BRT's likelihood points were in the ''moderate risk of extinction'' category, and the high uncertainty associated with this, we propose to add the Central America DPS to the list of threatened species at 50 CFR 223.102.

Pursuant to the second sentence of section 4(d) of the ESA, we propose to extend the prohibitions of Section 9(a)(1)(A) through 9(a)(1)(G) of the ESA (16 U.S.C. 1538) relating to endangered species to the Western North Pacific and Central America DPSs of the humpback whale.

DPSs Not Warranted for Listing Under the ESA

Finally, we conclude that 10 DPSs are neither in danger of extinction throughout all or a significant portion of their ranges nor likely to become so in the foreseeable future: West Indies, Hawaii, Mexico, Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific DPSs. When the BRT first reached its conclusions regarding whether any portions of the ranges of these DPSs were significant, NMFS and the FWS had not yet finalized the SPOIR policy. The draft SPOIR policy that the BRT followed differed from the final SPOIR policy in that a portion of the range of a species was considered ''significant'' if the portion's contribution to the viability of the species was so important that, without that portion, the species would be in danger of extinction throughout all of its range. The difference between the draft and final policies is the threshold at which we determine whether a portion is significant. Under the final SPOIR policy the hypothetical loss of the portion being considered would only need to result in the species being threatened throughout its range instead of endangered throughout its range to be considered significant. Before finalizing its report, the BRT was provided with a draft of the final SPOIR policy, which included this lower threshold of ''threatened'' for determining whether a portion is significant. Based on the revised SPOIR policy, the BRT revisited its SPOIR determinations and concluded for all DPSs that were at low or no risk of extinction, ''The ''significant portion of its range'' analyses under the final policy would not have resulted in different conclusions from the analyses conducted under the draft policy.''

In the North Atlantic, the abundance of the West Indies DPS is much greater than 2,000 individuals and is increasing moderately. The threats of HABs, vessel collisions, and fishing gear entanglements are likely to moderately reduce the population size and/or the growth rate of the West Indies DPS. All other threats, with the exception of climate change (unknown severity), are considered likely to have no or minor impact on population size or the growth rate of this DPS. The BRT distributed 82 percent of its likelihood points for the West Indies DPS to the ''not at risk of extinction'' category and 17 percent to the ''moderate risk of extinction'' category. Given the large population size (>2,000), moderately increasing trend, and the high percentage of likelihood points allocated to the ''not at risk of extinction'' category, we conclude that, despite the moderate threats of HABs, vessel collisions, and fishing gear entanglements and unknown severity of climate change as a threat, the West Indies DPS is not in danger of extinction throughout its range or likely to become so in the foreseeable future throughout its range.

Next, per the SPOIR Policy, we need to determine whether the West Indies DPS is in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range. The BRT noted that there are some regional differences in threats for the West Indies DPS, but it was unable to identify portions of the DPS that both faced particularly high threats and were so significant to the viability of the DPS as a whole that, if lost, would result in the remainder of the DPS being at high risk of extinction. We agree with the BRT's conclusions and conclude that there are no portions of the DPS that face particularly high threats and are so significant to the viability of the DPS that, if lost, the DPS would be in danger of extinction or likely to become so in the foreseeable future. Therefore, we conclude that the DPS is not in danger of extinction in a significant portion of its range, nor likely to become so in the foreseeable future.

We conclude that the West Indies DPS is not endangered or threatened throughout all or a significant portion of its range, and, therefore, we do not propose to list the West Indies DPS as a threatened or endangered species.

In the North Pacific, the abundances of the Hawaii and Mexico DPSs are much greater than 2,000 individuals and are thought to be increasing moderately. All threats are considered likely to have no or minor impact on population size and/or the growth rate of these two DPSs or are unknown, with the following exceptions: Fishing gear entanglements are considered likely to moderately reduce the population size or the growth rate of the Hawaii and Mexico DPSs. The BRT distributed 98 percent and 92 percent of its likelihood points for the Hawaii and Mexico DPSs, respectively, to the ''not at risk of extinction'' category. Given the large population size (>2,000), moderately increasing trend, and high percentage of likelihood points allocated to the ''not at risk of extinction'' category for both the Hawaii and Mexico DPSs, we conclude that, despite the moderate threat of fishing gear entanglements, the Hawaii and Mexico DPSs are not in danger of extinction throughout their ranges or likely to become so in the foreseeable future.

Next, per the SPOIR Policy, we need to determine whether the Hawaii and Mexico DPSs are in danger of extinction or likely to become so in the foreseeable future in a significant portion of their ranges. The BRT noted that there are some regional differences in threats for the Hawaii DPS, but it was unable to identify portions of the DPS that both faced particularly high threats and were so significant to the viability of the DPS as a whole that, if lost, would result in the remainder of the DPS being at high risk of extinction. The BRT noted that there also are some regional differences in threats for the Mexico DPS, and some evidence for minor substructure within the DPS due to multiple breeding locations associated with somewhat distinctive feeding grounds. However, the BRT was unable to identify portions of the DPS that faced particularly high threats compared to other portions of the DPS or that appeared to be at high risk of extirpation. We agree, and we conclude that no portions of either DPS face particularly high threats and are so significant to the viability of the DPS that, if lost, the DPSs would be in danger of extinction, or likely to become so in the foreseeable future. Therefore, we conclude that neither DPS is in danger of extinction in a significant portion of its range, or likely to become so in the foreseeable future.

We conclude that the Hawaii and Mexico DPSs are not endangered or threatened throughout all or a significant portion of their ranges, and we therefore do not propose to list the Hawaii and Mexico DPSs as a threatened or endangered species.

In the Southern Hemisphere, all seven DPSs are thought to be greater than 2,000 individuals in population size. The Brazil DPS is increasing either rapidly or moderately. The trend of the Gabon/Southwest Africa DPS is unknown. The trend of the Southeast Africa/Madagascar DPS is thought to either be increasing or stable. The trend of the Oceania DPS is unknown. The West Australia and East Australia DPSs are both large and increasing rapidly. The Southeastern Pacific DPS is thought to either be increasing or stable. In the Southern Hemisphere, all threats are considered likely to have no or minor impact on population size and/or the growth rate or are unknown, with the exception of energy exploration posing a moderate threat to the West Australia and Gabon/Southwest Africa DPSs, and fishing gear entanglements posing a moderate threat to the Southeastern Pacific, Southeast Africa/Madagascar, and Oceania DPSs. The BRT distributed at least 93 percent of their likelihood points to the ''not at risk of extinction'' category for six DPSs in the Southern Hemisphere (Brazil, Gabon/Southwest Africa, and Southeast Africa/Madagascar, West Australia, East Australia, and Southeastern Pacific DPSs), thus indicating a high certainty in its voting. For the Oceania DPS, the BRT distributed 68 percent of its points to the ''not at risk of extinction'' category, indicating moderate certainty, and 29 percent of its points to the ''moderate risk of extinction'' category, indicating some support. None of the factors that may negatively impact the status of the humpback whale appear to pose a threat to recovery, either alone or cumulatively, for these DPSs. Given the large population sizes (>2,000) for all seven DPSs, the fact that none of these DPSs is known to be decreasing in population size and some are increasing, the high percentage of (or, in the case of the Oceania DPS, the majority of) likelihood points allocated to the ''not at risk of extinction'' category, and the high certainty associated with six of these extinction risk estimates and moderate certainty associated with the extinction risk estimate for the Oceania DPS, we conclude that none of these seven DPSs are at risk of extinction throughout all of their ranges now or in the foreseeable future.

Next, per the SPOIR Policy, we need to determine whether any of these DPSs are in danger of extinction or likely to become so in the foreseeable future in a significant portion of their ranges. The BRT was unable to identify portions of the Brazil, Southeast Africa/Madagascar, West Australia, East Australia, and Southeastern Pacific DPSs that both faced particularly high threats and were so significant to the viability of the DPSs as a whole that, if lost, would result in the remainder of the DPSs being at high risk of extinction. We agree, and we also conclude that no portions of these DPSs face particularly high threats and are so significant to the viability of the DPSs that, if lost, any DPS would be in danger of extinction, or likely to become so in the foreseeable future. Therefore, we conclude that the Brazil, Southeast Africa/Madagascar, West Australia, East Australia, and Southeastern Pacific DPSs are not threatened or endangered in a significant portion of their ranges.

The BRT concluded that there was some evidence for population substructure within the Gabon/Southwest Africa DPS, based on an extensive breeding range with some significant genetic differentiation among breeding locations (Rosenbaum *et al.,* 2009). However, the BRT was unable to identify any portions of the DPS that both faced particularly high threats and were so significant to the viability of the DPS as a whole that, if lost, would result in the remainder of the DPS being at high risk of extinction. We agree, and we also conclude that no portions of this DPS face particularly high threats and are so significant to the viability of the DPS that, if lost, the DPS would be in danger of extinction, or likely to become so in the foreseeable future. Therefore, we conclude that the Gabon/Southwest Africa DPS is not threatened or endangered in a significant portion of its range.

The BRT noted that the Oceania DPS has potentially somewhat greater substructure than most other humpback whale DPSs due to its extended breeding range, though a lack of strong genetic structure indicates there are likely to be considerable demographic connections among these areas. Some threats, such as whale watching in the Southern Lagoon of New Caledonia, appear to be localized. Nonetheless, the BRT was unable to identify any specific areas where threats were sufficiently severe to be likely to cause local extirpation. We agree, and we also conclude that no portion of this DPS faces particularly high threats and is so significant to the viability of the DPS that, if lost, the DPS would be in danger of extinction, or likely to become so in the foreseeable future. Therefore, we conclude that the Oceania DPS is not threatened or endangered in a significant portion of its range.

We conclude that none of the seven DPSs in the Southern Hemisphere are endangered or threatened throughout all or a significant portion of their ranges, and we therefore do not propose to list the Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific DPSs as endangered or threatened species.

Monitoring Plan

We will work with the states and countries within the range of the ten DPSs that we do not propose for listing (which has the effect of removing them from the endangered species list) to develop a plan for continuing to monitor the status of these DPSs. The objective of the monitoring plan will be to ensure that necessary recovery actions remain in place and to ensure the absence of substantial new threats to the DPSs' continued existence. In part such monitoring efforts are already an integral component of ongoing research, existing stranding networks, and other management and enforcement programs implemented under the MMPA. These activities are conducted by NMFS in collaboration with other Federal and state agencies, the Western Pacific Fishery Management Council, North Pacific Fishery Management Council, the New England Fishery Management Council, university affiliates, and private research groups. As noted in Bettridge *et al.* (2015), many regulatory avenues already in existence provide for review of proposed projects to reduce or prevent adverse effects to humpback whales and for post-project monitoring to ensure protection to humpback whales, as well as penalties for violation of the prohibition on unauthorized take under the MMPA for all DPSs that occur in U.S. waters or by U.S. persons or vessels on the high seas. However, the addition and implementation of specific Monitoring Plans will provide an additional degree of attention and an early warning system to ensure that constructively removing these ten DPSs from the endangered species list will not result in the re-emergence of threats to the DPSs.

Description of Proposed Regulatory Changes

To implement this proposed action we propose to replace the humpback whale listing on the endangered species list at 50 CFR 224.101 with the Cape Verde Islands/Northwest Africa and Arabian Sea DPSs of the humpback whale and add the Western North Pacific and Central America DPSs of the humpback whale to the list of threatened species at 50 CFR 223.102.

Prohibitions and Protective Measures

Section 9 of the ESA prohibits certain activities that directly or indirectly affect endangered species. These prohibitions apply to all individuals, organizations and agencies subject to U.S. jurisdiction. Section 4(d) of the ESA directs the Secretary of Commerce (Secretary) to implement regulations ''to provide for the conservation of [threatened] species'' that may include extending any or all of the prohibitions of section 9 to threatened species. Section 9(a)(1)(g) also prohibits violations of protective regulations for threatened species implemented under section 4(d). We are proposing to extend all of the prohibitions of section 9(a)(1) in protective regulations issued under the second sentence of section 4(d) for the Western North Pacific and Central America DPSs of the humpback whale. No special findings are required to support extending Section 9 prohibitions for the protection of threatened species. See *In re Polar Bear Endangered Species Act Listing and 4(d) Rule Litigation,* 818 F.Supp.2d 214, 228 (D.D.C. 2011); *Sweet Home Chapter of Cmties. for a Great Oregon* v. *Babbitt,* 1 F.3d 1, 8 (D.C. Cir.1993), modified on other grounds on reh'g, 17 F.3d 1463 (D.C. Cir. 1994), rev'd on other grounds, 515 U.S. 687 (1995).

Sections 7(a)(2) and (4) of the ESA require Federal agencies to consult or confer with us to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species or a species proposed for listing, or to adversely modify critical habitat or proposed critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us. Examples of Federal actions that may affect the Cape Verde Islands/Northwest Africa, Western North Pacific, and Central America DPSs of the humpback whale include permits and authorizations for shipping, fisheries, oil and gas exploration, and toxic waste and other pollutant discharges, if they occur in U.S. waters or the high seas.

Sections 10(a)(1)(A) and (B) of the ESA provide us with authority to grant exceptions to the ESA's section 9 ''take'' prohibitions. Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) for scientific purposes or to enhance the propagation or survival of a listed species. The type of activities potentially requiring a section 10(a)(1)(A) research/enhancement permit include scientific research that targets humpback whales, including the importation of non-U.S. samples for research conducted in the United States. Section 10(a)(1)(B) incidental take permits are required for non-Federal activities that may incidentally take a listed species in the course of an otherwise lawful activity.

Identification of Those Activities That Would Constitute a Violation of Section 9 of the ESA

On July 1, 1994, NMFS and the FWS issued an *Interagency Cooperative Policy for Endangered Species Act Section 9 Prohibitions* (59 FR 34272). The intent of this policy is to increase public awareness of the effect of our ESA listing on proposed and ongoing activities within the species' range. We will identify, to the extent known at the time of the final rule, specific activities that will be considered likely to result in violation of section 9, as well as activities that will not be considered likely to result in violation. Because the Cape Verde Islands/Northwest Africa and Arabian Sea DPSs occur outside of the jurisdiction of the United States, we are presently unaware of any activities that could result in violation of section 9 of the ESA for these DPSs; nevertheless, the possibility for violations exists (for example, import into the United States). Activities that we believe could result in violation of section 9 prohibitions against ''take'' of the Western North Pacific and Central America DPSs of the humpback whale include: (1) Unauthorized harvest or lethal takes of humpback whales in the Western North Pacific and Central America DPSs by U.S. citizens; (2) in-water activities conducted by U.S. citizens that produce high levels of underwater noise, which may harass or injure humpback whales in the Western North Pacific and Central America DPSs; (3) U.S. fisheries that may result in entanglement of humpback whales in the Western North Pacific and Central America DPSs; (4) vessel strikes from U.S. ships operating in U.S. waters or on the high seas; and (5) discharging or dumping toxic chemicals or other pollutants by U.S. citizens into areas used by humpback whales from the Western North Pacific and Central America DPSs.

We expect, based on the best available information, the following actions will not result in a violation of section 9: (1) Federally funded or approved projects for which ESA section 7 consultation has been completed and necessary mitigation developed, and that are conducted in accordance with any terms and conditions we provide in an incidental take statement accompanying a biological opinion; and (2) takes of humpback whales in the Western North Pacific and Central America DPSs that have been authorized by NMFS pursuant to section 10 of the ESA. These lists are not exhaustive. They are intended to provide some examples of the types of activities that we might or might not consider as constituting a take of humpback whales in the Western North Pacific and Central America DPSs.

Effects of This Rulemaking

Conservation measures provided for species listed as endangered or threatened under the ESA include recovery actions (16 U.S.C. 1533(f)); concurrent designation of critical habitat, if prudent and determinable (16 U.S.C. 1533(a)(3)(A)); Federal agency requirements to 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 critical habitat should it be designated (16 U.S.C. 1536); and prohibitions on taking (16 U.S.C. 1538). Recognition of the species' plight through listing promotes conservation actions by Federal and state agencies, foreign entities, private groups, and individuals. The main effects of the proposed listings are prohibitions on take, including export and import. If this proposed rule is finalized, the provisions discussed above will no longer apply to the DPSs that are in effect removed from the endangered species list.

The MMPA provides substantial protections to all marine mammals, such as humpback whales, whether they are listed under the ESA or not. In addition, the MMPA provides heightened protections to marine mammals designated as ''depleted'' (*e.g.,* no take waiver, additional restrictions on the issuance of permits for research, importation, and captive maintenance), including humpback whales. Section 3(1) of the MMPA defines ''depleted'' as ''any case in which'': (1) The Secretary ''determines that a species or population stock is below its optimum sustainable population''; (2) a state to which authority has been delegated makes the same determination; or (3) a species or stock ''is listed as an endangered species or a threatened species under the [ESA]'' (16 U.S.C. 1362(1)). Section 115(a)(1) of the MMPA establishes that ''[i]n any action by the Secretary to determine if a species or stock should be designated as depleted, or should no longer be designated as depleted,'' such determination must be made by rule, after public notice and an opportunity for comment (16 U.S.C. 1383b(a)(1)). It is NMFS' position that a marine mammal species automatically gains ''depleted'' status under the MMPA when it is listed under the ESA. In the absence of an ESA listing, NMFS follows the procedures described in section 115(a)(1) to designate a marine mammal species as depleted when the basis for its depleted status is that it is below its optimum sustainable population. This interpretation was recently confirmed by the United States Court of Appeals for the D.C. Circuit. See *In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litigation,* 720 F.3d 354 (D.C. Cir. 2013). Humpback whales are currently designated as ''depleted'' under the MMPA because of the species' ESA listing. NMFS has not separately determined that the humpback whale species is depleted on the basis that it is below its optimum sustainable population.

NMFS is currently evaluating what result sections 3(1) and 115(a)(1) of the MMPA require when a species that holds depleted status solely because of its ESA listing is found to no longer warrant ESA listing. Thus, we are currently reviewing whether any DPS of the humpback whale that is not listed under the ESA after a final rule is published would automatically lose depleted status under the MMPA, or whether the agency must undertake additional analysis and complete additional procedures before a change in depleted status may occur. We seek comments from the public regarding different options for construing the relevant provisions of these statutes in harmony and will consider all viable alternatives (see **ADDRESSES**).

This rule also has implications for the approach regulations currently at 50 CFR 224.103(a) and (b), discussed previously. With regard to the regulations in effect in Hawaii (224.103(a)), the delisting of the Hawaii DPS, if finalized, would remove the ESA basis for promulgation of that rule. However, the substantially similar protections in effect within the Hawaiian Islands Humpback Whale National Marine Sanctuary, at 15 CFR 922.184, may provide sufficient protection for the species. We note that the Office of National Marine Sanctuaries has recently proposed to, among other things, expand the sanctuary boundaries and strengthen the protections from approaching vessels (80 FR 16224, 16238; March 26, 2015). We plan to propose, through separate rulemaking, to remove the approach regulations at § 224.103(a) because those regulations are specific to endangered species. If additional protection is determined necessary, we may undertake separate rulemaking pursuant to the MMPA. We request public comment on this issue.

With regard to the regulations in effect in Alaska (224.103(b)), the impacts of this proposed rule are different. When the Alaska provisions were adopted, we cited Section 112(a) of the MMPA in addition to Section 11(f) of the ESA as authority (16 U.S.C. 1382(a); 16 U.S.C. 1540(f)). However, because the humpback whale was listed throughout its range as endangered, the rule was codified only in Part 224 of the ESA regulations (which applies to ''Endangered Marine and Anadromous Species''). The reclassification of the Western North Pacific DPS to threatened, if finalized, would require relocating the provisions from Part 224 to Part 223 (which applies to ''Threatened Marine and Anadromous Species''). By separate rulemaking, we plan to propose to relocate these provisions to a new section, 223.214 in order to continue the protection of the threatened humpback whales in Alaska, because these provisions have been in effect for 14 years and are important in light of the potential impacts posed by the whalewatching industry, recreational boating community, and other maritime users. We would simultaneously delete current 50 CFR 224.103(b). In the separate rulemaking, we also plan to propose to set out these provisions in Part 216 of Title 50 of the

Code of Federal Regulations for the protection of all humpback whales that may occur or transit through the waters surrounding Alaska, to reflect that these provisions were adopted under the MMPA as well as the ESA and are an important source of protection for these marine mammals. We seek public comment on this issue as well.

Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing a minimum peer review standard. The intent of the peer review policies is to ensure that listings are based on the best scientific and commercial data available. The BRT enlisted the help of the Marine Mammal Commission (MMC) to coordinate scientific peer review of the June 2012 draft of its status review report. The MMC received comments from five reviewers and these reviews were provided, without attribution, to the BRT. The BRT addressed all peer review comments in the final status review report (Bettridge *et al.,* 2015) being released with the publication of this 12-month finding/proposed rule. We conclude that these experts' reviews satisfy the requirements for ''adequate [prior] peer review'' contained in the Bulletin (sec. II.2.).

Critical Habitat

Section 3 of the ESA (16 U.S.C. 1532(5A)) defines critical habitat as ''(i) the specific areas within the geographical area occupied by the species, at the time it is listed . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species.'' Section 3 of the ESA also defines the terms ''conserve,'' ''conserving,'' and ''conservation'' to mean ''to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary'' (16 U.S.C. 1532(3)).

Section 4(a)(3)(A)(i) of the ESA requires that, to the maximum extent practicable and determinable, critical habitat be designated concurrently with the listing of a species. Designation of critical habitat must be based on the best scientific data available, and must take into consideration the economic, national security, and other relevant impacts of specifying any particular area as critical habitat (16 U.S.C. 1533(b)(2)). Once critical habitat is designated, section 7 of the ESA requires Federal agencies to ensure that they do not fund, authorize, or carry out any actions that are likely to destroy or adversely modify that habitat (16 U.S.C. 1536(a)(2)). This requirement is in addition to the section 7 requirement that Federal agencies ensure their actions do not jeopardize the continued existence of the species.

In determining what areas qualify as critical habitat, 50 CFR 424.12(b) requires that NMFS ''consider those physical or biological features that are essential to the conservation of a given species including space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historical geographical and ecological distribution of a species.'' The regulations further direct NMFS to ''focus on the principal biological or physical constituent elements . . . that are essential to the conservation of the species,'' and specify that the ''known primary constituent elements shall be listed with the critical habitat description.'' The regulations identify primary constituent elements (PCEs) as including, but not limited to: ''roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.''

The ESA directs the Secretary of Commerce to consider the economic impact, the national security impacts, and any other relevant impacts from designating critical habitat, and under section 4(b)(2), the Secretary may exclude any area from such designation if the benefits of exclusion outweigh those of inclusion, provided that the exclusion will not result in the extinction of the species. At this time, critical habitat for the humpback whales in the Western North Pacific and Central America DPSs is not determinable. We will propose critical habitat for the Western North Pacific and Central America DPSs of the humpback whale in a separate rulemaking if we determine that it is prudent to do so. To assist us with that rulemaking, we specifically request information to help us identify the essential features of this habitat, and to what extent those features may require special management considerations or protection, as well as the economic activities within the range of the Western North Pacific and Central America DPSs that could be impacted by critical habitat designation. 50 CFR 424.12(h) specifies that critical habitat shall not be designated within foreign countries or in other areas outside U.S. jurisdiction. Therefore, we request information only on potential areas of critical habitat within the United States or waters within U.S. jurisdiction.

Because the known distribution of the humpback whales in the Cape Verde Islands/Northwest Africa and Arabian Sea DPSs occurs in areas outside the jurisdiction of the United States, no critical habitat will be designated for these DPSs.

Public Comments Solicited

Relying on the best scientific and commercial information available, we exercised our best professional judgment in developing this proposal to divide the humpback whale into 14 DPSs, retain the Cape Verde Islands/ Northwest Africa and Arabian Sea DPSs on the list of endangered species at 50 CFR 224.101, add the Western North Pacific and Central America DPSs to the list of threatened species and extend all section 9 prohibitions to these DPSs, and remove the other 10 DPSs (West Indies, Hawaii, Mexico, Brazil, Gabon/ Southwest Africa, Southeast Africa/ Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific) from the endangered species list at 50 CFR 224.101. To ensure that the final action resulting from this proposal will be as accurate and effective as possible, we solicit comments and suggestions concerning this proposed rule from the public, other concerned governments and agencies, Indian tribal governments, Alaska Native tribal governments or organizations, the scientific community, industry, and any other interested parties. Comments are encouraged on this proposal as well as on the status review report (See **DATES** and **ADDRESSES**). Comments are particularly sought concerning:

(1) The identification of 3 subspecies of humpback whale comprised of 14 DPSs;

(2) The current population status of identified humpback whale DPSs;

(3) Biological or other information regarding the threats to the identified humpback whale DPSs;

(4) Information on the effectiveness of ongoing and planned humpback whale conservation efforts by countries, states, or local entities;

(5) Activities that could result in a violation of section 9(a)(1) of the ESA if such prohibitions are applied to the Western North Pacific and Central America DPSs;

(6) Whether any DPS of the humpback whale that is not listed under the ESA in a final rule would automatically lose depleted status under the MMPA, or, if not, what analysis and process is required by the MMPA before a change in depleted status may occur. We seek comments regarding different options for construing the relevant provisions of these statutes in harmony;

(7) Whether approach regulations should be promulgated under the MMPA for the protection of the Hawaii DPS of the humpback whale, since if this rule becomes final, that DPS will no longer be listed under the ESA, or whether current protections in effect in the Hawaiian Islands Humpback Whale National Marine Sanctuary (at 15 CFR 922.184) are sufficient for the protection of the species from vessel interactions. Commenters should consider the impact of the recent proposal by NOAA's Office of National Marine Sanctuaries to expand the sanctuary boundaries and strengthen the approach regulations (80 FR 16224; March 26, 2015);

(8) Whether approach regulations in effect for the protection of humpback whales in Alaska, currently set forth at 50 CFR 224.103(b), should be relocated to Part 223 (which applies to threatened species) for the continuing protection of the Western North Pacific DPS, and whether these regulations should also be set out in 50 CFR 216 as MMPA regulations for the protection of all humpback whales occurring in that area in light of the fact that the MMPA was one of the original authorities cited in promulgating the regulation;

(9) Information related to the designation of critical habitat, including identification of those physical or biological features which are essential to the conservation of the Western North Pacific and Central America DPSs of humpback whale and which may require special management consideration or protection;

(10) Economic, national security, and other relevant impacts from the designation of critical habitat for the Western North Pacific and Central America DPSs of humpback whale; and

(11) Research and other activities that would be important to include in post-delisting monitoring plans for the West Indies, Hawaii, Mexico, Brazil, Gabon/Southwest Africa, Southeast Africa/Madagascar, West Australia, East Australia, Oceania, and Southeastern Pacific DPSs.

You may submit your comments and materials concerning this proposal by any one of several methods (see **ADDRESSES**). We will review all public comments and any additional information regarding the status of the identified DPSs of the humpback whale and will complete a final determination within 1 year of publication of this proposed rule, as required under the ESA. Final promulgation of the regulation(s) will consider the comments and any additional information we receive, and such communications may lead to a final regulation that differs from this proposal.

Public Hearings

During each public hearing, a brief opening presentation on the proposed rule will be provided before accepting public testimony. Written comments may be submitted at the hearing or via the Federal e-Rulemaking Portal (see **ADDRESSES**) until the scheduled close of the comment period on July 20, 2015. In the event that attendance at the public hearings is large, the time allotted for oral statements may be limited. Oral and written statements receive equal consideration. There are no limits on the length of written comments submitted to us.

Public Hearing Schedule

The dates and locations for the four hearings are as follows:

1. Honolulu: May 6, 2015, from 6:00 p.m. to 8:00 p.m. at the Japanese Cultural Center, Manoa Ballroom, 2454 South Beretania Street, Honolulu, HI 96826, with an informational open house beginning at 5:30 p.m. Parking is available at the Japanese Cultural Center for $5.
2. Juneau: May 19, 2015, 5 p.m. to 8 p.m. at the Centennial Hall, Hickel Room, 101 Egan Drive, Juneau, AK.
3. Plymouth: June 3, 2015, 6 p.m. to 8:30 p.m., Plymouth Public Library, 132 South Street, Plymouth, MA.
4. Virginia Beach: June 9, 2015, 5 p.m. to 6:30 p.m., at the Hilton Virgina Beach Oceanfront, 3001 Atlantic Ave, Virginia Beach, VA. This will be in conjunction with the Mid-Atlantic Fishery Management Council's meeting being held during the same week.

Special Accommodations

These hearings are physically accessible to people with disabilities. Requests for sign language interpretation or other accommodations should be directed to Marta Nammack (see **ADDRESSES**) as soon as possible, but no later than 7 business days prior to the hearing date.

Classification

National Environmental Policy Act (NEPA)

The 1982 amendments to the ESA, in section 4(b)(1)(A), restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation* v. *Andrus,* 657 F. 2d 829 (6th Cir. 1981), we have concluded that NEPA does not apply to ESA listing actions. (See NOAA Administrative Order 216–6.) We are currently reviewing whether any other aspect of this proposed rule will require NEPA analysis.

Executive Order (E.O.) 12866, Paperwork Reduction Act, and Regulatory Flexibility Act

This rule is exempt from review under E.O. 12866. This proposed rule does not contain a collection of information requirement for the purposes of the 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 analyses required by the Regulatory Flexibility Act are not applicable to the listing process.

E.O. 13132, Federalism

E.O. 13132 requires agencies to take into account any federalism impacts of regulations under development. It includes specific directives for consultation in situations where a regulation will preempt state law or impose substantial direct compliance costs on state and local governments (unless required by statute). Neither of those circumstances is applicable to this proposed rule; therefore this action does not have federalism implications as that term is defined in E.O. 13132.

E.O. 13175, Consultation and Coordination With Indian Tribal Governments

The longstanding and distinctive relationship between the Federal and tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and co-management agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the Federal government. This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. E.O. 13175—Consultation and Coordination with Indian Tribal Governments—outlines the responsibilities of the Federal Government in matters affecting tribal interests. Section 161 of Public Law 108–199 (188 Stat. 452), as amended by section 518 of Public Law 108–447 (118 Stat. 3267), directs all Federal agencies to consult with Alaska Native tribes or organizations on the same basis as Indian tribes under E.O. 13175.

We intend to coordinate with tribal governments and native corporations which may be affected by the proposed action. We will provide them with a copy of this proposed rule for review and comment, and offer the opportunity to consult on the proposed action.

List of Subjects

50 CFR Part 223

Endangered and threatened species, Exports, Imports, Transportation.

50 CFR Part 224

Endangered and threatened species.

Dated: April 15, 2015.

Samuel D. Rauch, III,

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

For the reasons set out in the preamble, 50 CFR parts 223 and 224 are proposed to be amended as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 223 continues to read as follows:

Authority: 16 U.S.C. 1531 1543; subpart B, § 223.201–202 also issued under 16 U.S.C. 1361 *et seq.;* 16 U.S.C. 5503(d) for § 223.206(d)(9).

■ 2. In § 223.102, in paragraph (e), the table is amended by adding entries for ''Whale, humpback (Central America DPS)'' and ''Whale, humpback (Western North Pacific DPS)'' under MARINE MAMMALS in alphabetical order by Common Name to read as follows:

§ 223.102 Enumeration of threatened marine and anadromous species.

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(e) * * *

Species[1]			Citation(s) for listing determination(s)	Critical habitat	ESA Rules
Common name	Scientific name	Description of listed entity			
Marine Mammals					
*	*	*	*	*	*
Whale, humpback (Central America DPS).	*Megaptera novaeangliae*.	Humpback whales that breed along the Pacific coast of Costa Rica, Panama, Guatemala, El Salvador, Honduras, and Nicaragua in the eastern North Pacific Ocean or feed almost exclusively offshore of California and Oregon in the eastern North Pacific Ocean, with some feeding off northern Washington/southern British Columbia.	[*Insert **Federal Register** page where the document begins*], April 21, 2015.	NA	223.213
Whale, humpback (Western North Pacific DPS).	*Megaptera novaeangliae*.	Humpback whales that breed or winter in the area of Okinawa and the Philippines in the Kuroshio Current (as well as unknown breeding grounds in the Western North Pacific Ocean), transitthe Ogasawara area, or feed in the North Pacific Ocean, primarily in the West Bering Sea and off the Russian coast and the Aleutian Islands.	[*Insert **Federal Register** page where the document begins*], April 21, 2015.	NA	223.213 223.214
*	*	*	*	*	*

[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).
[2] Jurisdiction for sea turtles by the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, is limited to turtles while in the water.

■ 3. Add § 223.213 to subpart B to read as follows:

§ 223.213 Western North Pacific and Central America distinct population segments (DPSs) of the humpback whale.

Prohibitions. The prohibitions of section 9(a)(1)(A) through 9(a)(1)(G) of the ESA (16 U.S.C. 1538) relating to endangered species shall apply to the Western North Pacific DPS and the Central America DPS of the humpback whale listed in § 223.102(e).

PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

■ 4. 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.*

■ 5. In § 224.101, in the table in paragraph (h), revise the entry for ''Whale, humpback'' to read as follows:

§ 224.101 Enumeration of endangered marine and anadromous species.

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(h) * * *

Species[1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
Marine Mammals					
* * * * * * *					
Whale, humpback (Arabian Sea DPS).	*Megaptera novaeangliae*.	Humpback whales that breed or feed in the Arabian Sea.	[*Insert **Federal Register** page where the document begins*], April 21, 2015.	NA	NA
Whale, humpback whale (Cape Verde Islands/Northwest Africa DPS).	*Megaptera novaeangliae*.	Humpback whales that breed in waters surrounding the Cape Verde Islands in the Eastern North Atlantic Ocean, as well as an undetermined breeding area in the eastern tropical Atlantic (possibly Canary Current) or feed along the Iceland Shelf and Sea and the Norwegian Sea.	[*Insert **Federal Register** page where the document begins*], April 21, 2015.	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).

[2] Jurisdiction for sea turtles by the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, is limited to turtles while in the water.

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