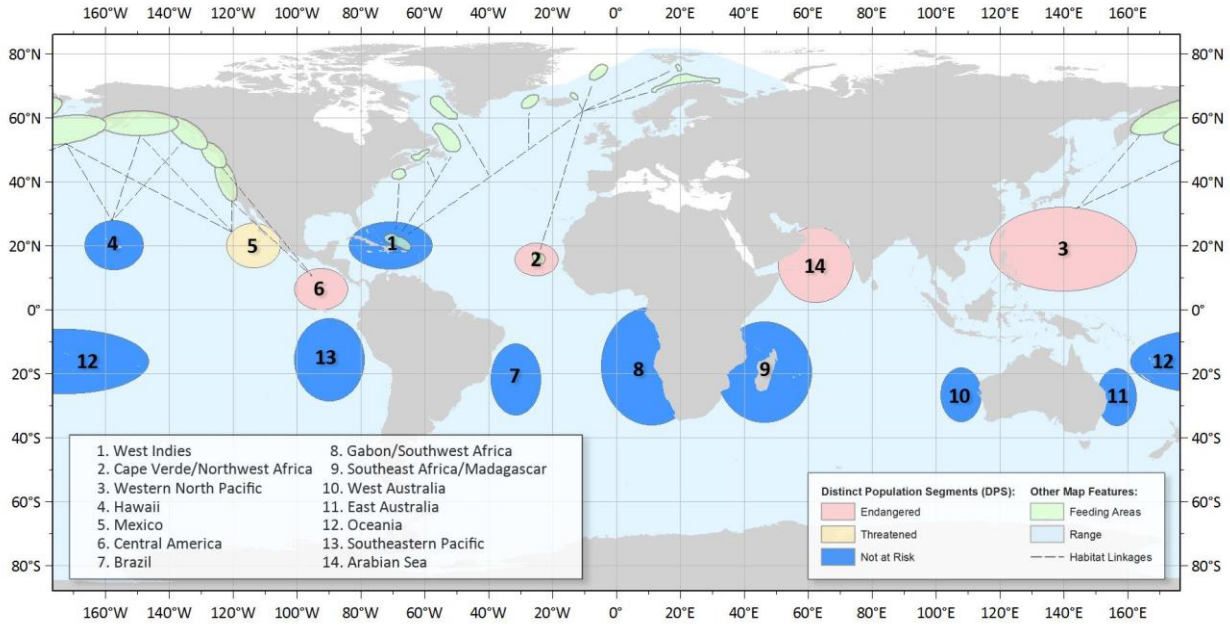
RECOVERY OUTLINE FOR THE CENTRAL AMERICA, MEXICO, AND WESTERN NORTH PACIFIC DISTINCT POPULATION SEGMENTS OF HUMPBACK WHALES

The humpback whale was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969. It retained its endangered listing after the passage of the Endangered Species Act (ESA) in 1973 and was also considered "depleted" under the Marine Mammal Protection Act (MMPA). A recovery plan for the species was published in 1991.

In 2016, NMFS revised the listing status of the humpback whale under the ESA. The globally listed endangered species was divided into 14 distinct population segments (DPSs), the species-level listing was removed, and NMFS listed four DPSs as endangered and one DPS as threatened (81 FR 62260, September 8, 2016). The ESA generally requires recovery plans for listed endangered and threatened species (except where the Secretary finds that such a plan will not promote the conservation of the species), and the DPS listings constitute new listings. NMFS previously determined that a recovery plan would not promote the conservation of the Arabian Sea and Cape Verde Islands/Northwest Africa DPSs (Memorandum for Chris Oliver, Assistant Administrator for Fisheries, from Donna Wieting, Director, Office of Protected Resources (Sep. 12, 2019) (regarding Cape Verde/Northwest Africa DPS); Memorandum for Chris Oliver, Assistant Administrator for Fisheries, from Donna Wieting, Director, Office of Protected Resources (Dec. 11, 2019) (regarding Arabian Sea DPS)). NMFS will develop a DPS-specific recovery plan for the remaining three listed DPSs: the endangered Central America DPS, the threatened Mexico DPS, and the endangered Western North Pacific DPS. Critical habitat was designated for these DPSs in 2021 (86 FR 21082, April 21, 2021).



Map showing locations of the 14 distinct population segments of humpback whales worldwide.

This outline is meant to serve as an interim guidance document to direct recovery efforts, including recovery planning, for the Central America, Mexico, and Western North Pacific DPSs of the humpback whale until a full recovery plan is developed and approved. An interim strategy for recovery is presented here, as are recommended high priority actions to stabilize and recover the DPSs. The recovery outline is intended primarily for internal use by NMFS as a pre-planning document. Formal public participation will be invited upon the release of the draft recovery plan for these DPSs.

Species Name: Humpback whale, *Megaptera novaeangliae*

Species Range: North Pacific Ocean

Recovery Priority Number: Central America DPS (2C); Western North Pacific DPS (7C); Mexico DPS (4C)

Listing Status: Central America DPS (Endangered); Western North Pacific DPS (Endangered); Mexico DPS (Threatened)

NMFS Lead Regional Office or Headquarters: Headquarters, Office of Protected Resources

Lead Contact: Caroline Good, 301-427-8445, Caroline.Good@noaa.gov

BACKGROUND

Type and Quality of Available Information to Date:

Available information on the biology, life history, range, and habitat preferences of the humpback whale is described in the status review (Bettridge et al. 2015) and the final rule revising the species-wide listing under the ESA (81 FR 62260, September 8, 2016). Additional information on these three DPSs can be found in the critical habitat designation final rule (86 FR 21082, April 21, 2021) and in three NOAA Technical Memoranda (Martien et al. 2021; Taylor et al. 2021; Oleson et al. 2022).

The most significant uncertainties with respect to the identification of recovery criteria and actions include limited information regarding:

- Recent DPS-specific abundance estimates and trends for the Mexico and Western North Pacific DPSs
- Substructure of demographically independent populations within the Mexico and Western North Pacific DPSs
- Location of and threats in the wintering and feeding grounds and migratory areas in the Western North Pacific; many areas have not been surveyed in recent years
- Recent information on the proportional representation of DPSs on the feeding grounds where they overlap to inform proration of abundance and the level of human impact each DPS experiences (e.g., from entanglement in fishing gear and vessel strike)
- Impacts of potential threats including competition with fisheries, chronic exposure to anthropogenic sound, offshore energy development, harmful algal blooms, and climate change for all three DPSs

Life History:

Humpback whales are baleen whales of the family Balaenopteridae. They are found in all oceans; however, the species has been divided into 14 DPSs (81 FR 62260, September 8, 2016), and humpback whales in the North Pacific, North Atlantic, and Southern hemisphere may be considered separate subspecies (Jackson et al. 2014). Humpback whales are generally highly migratory and exhibit strong, maternally-directed site fidelity to their feeding and wintering areas (Calambokidis et al. 2008; Barlow et al. 2011); they spend spring, summer, and fall feeding in temperate or high-latitude areas and migrate to the tropics in the winter to calve. While breeding is thought to primarily occur on the wintering grounds, it may also occur during migration. On the feeding grounds, humpback whales have a diverse diet primarily consisting of euphausiids and small pelagic schooling fishes (Clapham et al. 1997). On the wintering grounds, humpback whales subsist on stored fat. Multiple males compete for individual females, exhibit competitive behavior, and may use

song to attract females or establish dominance (Clapham 1996; Tyack 1981; Darling and Bérubé 2001; Darling et al. 2006).

Limiting Life History Characteristics:

Pre-whaling abundance of humpback whales in the North Pacific was estimated to be around 15,000 individuals (Rice 1978). Commercial whaling led to the overexploitation and depletion of humpback whales worldwide, with an estimated 28,000 whales taken from the North Pacific alone (Rice 1978). When non-subsistence hunting was banned in the North Pacific in 1966, the population may have been reduced to as few as 1,000 individuals (Rice 1978; National Marine Fisheries Service 1991).

The ability of humpback whales to recover from threats impacting their abundance and reproductive rate is limited by a slow growth rate, long gestation periods, high maternal investment in offspring, and low fecundity. Humpback whales reach sexual maturity at approximately 5-11 years of age, although this varies between populations (Clapham 1992; Gabriele et al. 2007; Robbins 2007), and calving intervals can range from 1-5 years, with 2-3 years being the most common (Wiley and Clapham 1993; Steiger and Calambokidis 2000). The average generation time is approximately 21.5 years (Taylor et al. 2007). Their annual population growth rate is estimated to range from 0 to 12.5% depending on the temporal and spatial extent of the study (Baker et al. 1992; Barlow and Clapham 1997; Steiger and Calambokidis 2000; Clapham et al. 2003; Calambokidis et al. 2008).

Despite being a highly mobile species, humpback whales may be constrained by the high level of site fidelity they exhibit to both wintering and feeding areas. Although there is not typically an exchange of individuals between groups of whales that share the same wintering and feeding area (migratory group), interbreeding and exchange of genetic material between groups likely occurs (Martien et al. 2021; Darling et al. 2022).

Primary Threats:

As discussed in the status review (Bettridge et al. 2015), commercial whaling led to the initial depletion of humpback whales worldwide. Although commercial whaling no longer occurs in the North Pacific, humpback whales continue to face a variety of threats, many of which are associated with high levels of uncertainty and are expected to increase in the future. These factors were ranked as a medium to high risk and are thought to pose the greatest threat to these DPSs:

<u>Mexico DPS</u>

- Unknown abundance trend
- Entanglement in fishing gear

Central America DPS

- Low abundance and unknown trend
- Vessel strike
- Entanglement in fishing gear

Western North Pacific DPS

- Low abundance and unknown trend
- Poaching/bycatch
- Competition with fisheries
- Offshore energy exploration and development
- Vessel strike
- Entanglement in fishing gear

New information has become available since the publication of the status review and the final listing rule. At the time of publication, the potential for competition with fisheries in U.S. waters was recognized, but there was no evidence that fishery-related takes substantially decreased the humpback whale food supply (Bettridge et al. 2015; 86 FR 21082, April 21, 2021). Recent work suggests that forage fish fisheries on the U.S. West Coast may negatively impact baleen whales, though there is high uncertainty and many caveats to this work (Kaplan et al. 2013; Koehn et al. 2017).

A marine heatwave from 2014 to 2016 raised concerns about the indirect impacts of climate change and future interactions between multiple threats. The heatwave pushed some prey species, like anchovies, closer to shore (Santora et al. 2020). This subsequently shifted whale distribution and increased whale foraging in nearshore waters where there is more overlap with commercial and recreational fixed-gear fisheries, including that for Dungeness crab. At the same time, there was a change in fishing effort in central California due to a harmful algal bloom at the start of the Dungeness crab fishery season (Santora et al. 2020; Saez et al. 2021). The delay at the start of the Dungeness fishing season in the fall increased fishing effort in the spring, which coincided with the arrival of humpback whales (Saez et al. 2021). These factors resulted in increased exposure of humpback whales to fishing gear and caused significantly more entanglements in the region.

In Southeast Alaska, the marine heatwave caused dramatic changes in population dynamics (Gabriele et al. 2022). The Glacier Bay National Park and Preserve long-term dataset (1985-2020) indicates sharp declines in humpback whale survival and reproductive success coinciding with the marine heatwave. The main driver of these declines is thought to be changes to prey availability and quality, and subsequent food limitation.

In the status review, Bettridge et al. (2015) stated that although there were no plans to open the U.S. West Coast to further drilling for oil or gas, alternative energies, such as wind and wave energy, may be developed in the future. Since that time, the Biden administration has announced its goal of deploying 30 gigawatts of offshore wind energy by 2030. To do this, the Departments of Interior, Defense, and the State of California declared their intention to open the California coast to offshore wind development, identifying two sites in central and northern California for potential floating offshore wind farms.

Current Biological Status of the Species:

Recent estimates of humpback whale abundance in the North Pacific range from 16,293 to 21,808 (CV=0.04; Calambokidis et al. 2008; Barlow et al. 2011; Wade 2021) with an estimated basin-wide annual growth rate of 6.8% from 1966 to 2006 (Calambokidis et al. 2008). As described by Calambokidis et al. (2008), estimates of humpback whales in feeding areas along the U.S. West Coast, southern British Columbia, southeast Alaska, the Aleutian Islands and Alaska peninsula all appear to have increased in recent decades.

Mexico DPS

The Mexico DPS spends winters along the Pacific coast of mainland Mexico and in the Revillagigedo Archipelago, transits along the coast of Baja California, and spends summers feeding throughout the North Pacific from California to the Kamchatka Peninsula in Russia (Calambokidis et al. 2008; Titova et al. 2018; Titova et al. 2019; Wade 2021). Movement and genetics data suggest the existence of further population structure within this DPS (Martien et al. 2021). There is currently no abundance estimate for this DPS, although an estimated 3,477 (CV=0.101) whales from the Mexico DPS feed off the U.S. West Coast (Calambokidis and Barlow, 2020; Curtis et al. 2022). While the current trend is unknown, Calambokidis and Barlow (2020) reported an approximate 8.2% annual growth rate from 1989-2018 for humpback whales off California and Oregon waters, where whales from the Mexico and Central America DPSs overlap.

Central America DPS

The Central America DPS spends winters off the coast of Central America from Panama to southern Mexico, as far north as Michoacán and Colima (Taylor et al. 2021). This DPS primarily spends summer off California and Oregon, with the highest density of whales in southern California, although some individuals feed off the coast of Washington and southern British Columbia (Calambokidis et al. 2008; Barlow et al. 2011; Wade 2021). Movement and genetics data do not suggest further population structure within this DPS (Taylor et al. 2021). Curtis et al. (2022) estimated the abundance of this DPS to be 1,496 (CV=0.171) whales with an estimated annual growth rate of 1.6% (SD=2.0%).

Western North Pacific DPS

The Western North Pacific DPS has known wintering grounds near the Philippines, off Okinawa and Ogasawara in Japan, and off the Mariana Archipelago. Whales in the Philippines/Okinawa wintering grounds primarily spend summers in the waters off mainland Russia, while whales from the Mariana Archipelago and Ogasawara primarily spend summers in the Commander Islands and Bering Sea (Hill et al. 2020). Data collected from 2004-2006 estimated the abundance of this DPS to be 1,084 (CV=0.088) individuals (Calambokidis et al. 2008; Wade 2021). Whaling records and historical sightings, however, suggest the wintering areas extended from the South China Sea to the Philippines and included waters around Japan, the Korean peninsula, the Mariana Archipelago, and the Marshall Islands (Rice 1998; McGowen et al. 2021), and many of these areas, including the Mariana Archipelago, were not surveyed during the 2004-2006 study. The annual growth rate for this DPS has been estimated to be 6.9% (Calambokidis et al. 2008), but this estimate is likely biased upward due to differences in survey area over time.

Conservation Efforts to Date:

United States

Humpback whales and their habitats receive protections under several laws, regulations, and policies in the U.S. including the ESA, MMPA, and the Outer Continental Shelf Lands Act. Critical habitat for the Central America, Mexico, and Western North Pacific distinct population segments was designated under the ESA in 2021. Seven feeding areas on the U.S. West Coast and six feeding areas in Alaska also have been identified as Biologically Important Areas (Calambokidis et al. 2015; Ferguson et al. 2015a; Ferguson et al. 2015b); these areas are currently being updated.

Efforts to reduce the risk of vessel strike to humpback and other large whales on the U.S. West Coast and in Alaska include amended Traffic Separation Schemes in San Francisco Bay and the Santa Barbara Channel and National Park Service restrictions on vessel presence, operating conditions, and speed in Glacier Bay. National Marine Sanctuaries have also implemented voluntary, seasonal vessel speed restrictions.

Efforts to reduce the risk of entanglement in fishing gear are also ongoing. The National Observer Program collects data on marine mammal bycatch in commercial fisheries to help estimate human-caused mortality and serious injury. Stakeholder working groups were convened in California, Oregon, and Washington to reduce large whale entanglements in Dungeness crab fishing gear. There are Large Whale Entanglement Response Programs housed in the Protected Resources Divisions within the West Coast Region and Alaska Region. The U.S. also implemented Import Provisions under the MMPA that aim to reduce marine mammal bycatch associated with international commercial fishing operations.

Mexico and Central America

Mexico and several Central American countries have implemented measures to protect humpback whales. For example, Mexican Standard 131 established responsible whale watching guidelines including approach distances and speeds, limits on the number of vessels and time allowed near whales, and protection from noise. Panama has similar whale watching regulations (Resolución No. DM-0530-2017). Mexico also has established several protected natural areas that provide benefits to humpback whale conservation and management.

Canada

In Canada, humpback whales that feed along the west coast of British Columbia are listed as threatened under the Species at Risk Act. Critical habitat was designated in areas that support feeding, foraging, resting, and socializing, and a recovery strategy was published in 2013.

Asia and Pacific Islands

The Russian Cetacean Habitat Project is conducting humpback whale research in Russian feeding areas (e.g., Titova et al. 2018). The main objective of this project is to define the critical habitat of whale species in the waters of the Russian Far East.

International Agreements

The International Whaling Commission implemented a commercial whaling moratorium in 1986. There are no proposals for scientific, aboriginal/subsistence, or commercial hunting of humpback whales in the North Pacific being considered at this time. The Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as CITES, prohibits international trade of humpback whales and their parts except in exceptional circumstances. The International Maritime Organization, a branch of the United Nations, has helped re-route vessels and establish "Areas to be Avoided" and Traffic Separation Schemes to reduce the risk of vessel strike to large whales.

INTERIM RECOVERY PROGRAM

Interim Recovery Strategy:

Until an updated recovery plan has been finalized, the interim recovery program will focus on:

- Management activities that continue to protect humpback whales and their critical habitat

- Management activities that reduce medium and high risk threats to humpback whales, including vessel strike and entanglement in fishing gear
- Research activities to fill critical information gaps necessary to inform management actions
- Education and outreach activities to engage ocean users and to promote public involvement in humpback whale research and recovery

Action Plan:

Management Activities

- Maintain existing laws and regulations that protect humpback whales
    - Continue prohibition on commercial hunting of humpback whales
- Maintain and enhance habitats used by humpback whales
    - Identify and minimize possible adverse impacts of human activities and pollution on important habitat and prey
    - Review section 7 consultations that occurred prior to the designation of critical habitat. Request reinitiation of consultation if the effects of an action that may affect humpback whale critical habitat were not previously considered
- Identify and reduce direct human-related injury and mortality, including from vessel strike and entanglement in fishing gear
- Promote measures to protect humpback whales and their habitats in foreign waters by working with international partners to identify and mitigate threats, improve enforcement and compliance with existing regulations, create marine protected areas, and promote responsible viewing guidelines

Research and Monitoring Activities

- Improve understanding of the distribution, abundance, trends, and threats faced by all three DPSs
    - Update the data used to estimate abundance and proportional representation of DPSs on the feeding grounds
    - Prorate the level of human impact (e.g., from entanglement in fishing gear or vessel strike) to each DPS on the feeding grounds
- Monitor humpback whale habitat use, prey distribution, and interaction with human activity on the feeding grounds
- Develop and implement a health assessment program to understand if and what factors may be negatively affecting humpback whale health, reproduction, and survival

- Conduct research to better understand the links between oceanographic parameters, climate change, and population level effects on humpback whales
- Gather information on dead or distressed marine mammals through the MMPA Marine Mammal Health and Stranding Response Program to monitor threats to humpback whales

Education and Outreach

- Develop educational materials in support of Recovery Plan objectives
- Share information on humpback whales with stakeholder groups such as offshore energy developers, fishing, maritime, and marine operations communities
- Promote the use of citizen science projects, such as Happywhale and Whale Alert

PRELIMINARY STEPS FOR RECOVERY PLANNING

Recovery Plan Development

NMFS will develop a 3-part recovery plan for all three DPSs. A small group of individuals within NMFS with expertise on the species will develop and write the recovery plan. NMFS Office of Protected Resources will coordinate the overall recovery planning with support from subject matter experts from NMFS Pacific Islands, Alaska, and West Coast regional offices and sciences centers.

Stakeholder Involvement

Given recent opportunities for stakeholder engagement during the species-wide ESA listing revision, the critical habitat designation processes, and the ongoing MMPA stock revision process, NMFS will consider and incorporate information received through these processes in the development of this recovery plan and will consult with subject matter experts as needed. In the *Federal Register* notice of intent to begin the recovery planning process, NMFS requested submission of information on the status, threats, and recovery of the Central America, Mexico, and Western North Pacific DPSs of humpback whales. All information received will be considered in the development of a draft recovery plan. Once a draft plan has been developed, it will be peer reviewed and available for public comment.

Anticipated Recovery Planning Milestones

- Spring 2022: Publish in the Federal Register a notice of intent to begin the recovery planning process, assemble a working group of internal experts to develop the plan, finalize a recovery outline, and begin to draft the recovery plan

- Fall 2022: Complete draft recovery plan, publish notice in the Federal Register for peer review and public comment
- Winter 2022/Spring 2023: Address public comments, finalize recovery plan

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