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To Whom it May Concern

RE: Petition to Classify the North Pacific Humpback Whale Population as a Distinct Population Segment (DPS) and Delist the DPS under the Endangered Species Act

On April 16, 2013, the National Oceanic and Atmospheric Administration (NOAA) received a petition from Hawaii Fishermen's Alliance for Conservation and Tradition, Inc. seeking to re-classify the North Pacific population of humpback whale (*Megaptera novaeangliae*) as a Distinct Population Segment (DPS), and then to subsequently remove this DPS from the Endangered Species list. The petition cites the North Pacific humpback whale's geographical isolation from other humpback populations, as well as apparent increases in the North Pacific humpback whale (NPHBW) stock size, as the major arguments in favor of delisting.

Pacific Whale Foundation feels, however, that the petition does not adequately acknowledge the complexity of the North Pacific humpback whale stock, nor does it critically evaluate the status of the stock in relation to data gaps and current threats. While Pacific Whale Foundation supports the delisting of any and all marine species where peer-reviewed, scientific evaluation provides conclusive evidence that the species in question meets the requirements for delisting, we *do not* feel that in the case of the NPHBW the best available scientific data indicate that delisting is warranted.

Lack of sufficient pre-exploitation population estimates, poor understanding regarding the relationship between humpback stocks within the North Pacific, as well as an inadequate evaluation of threats to humpback whales in relation to recovery plan criteria, instead imply that a decision to delist would be both premature and shortsighted. We believe that, relying on the evidence and conclusions provided by the best available science, the delisting of the NPHBW would prove potentially disastrous for the species' sustained recovery.

Regarding classification of the North Pacific Population of humpback whales as a Distinct Population Segment:

The petitioner first requests that, due to geographical, morphological and genetic differences between North Pacific, South Pacific and Atlantic Ocean humpback whale stocks, the NPHBW population be defined as a distinct population segment. The petitioner goes on to state that the complexity of the North Pacific population "[does not] provide conclusive evidence for further dividing the North Pacific population into distinct segments" (Hawai'i Fishermen's Alliance for Conservation and Tradition, 2013).

Although the humpback whale is found in all major ocean basins, in the Pacific Ocean, the species exhibits what scientists refer to as "antitropical-distribution", where the northern and southern hemisphere populations inhabit tropical waters at different times of the year (Clapham and Mead, 1999; Davies, 1962). For example, while the southern hemisphere population is occupying low latitude, tropical breeding grounds (June to September), the northern hemisphere population is occupying high latitude feeding grounds (both populations move north). The opposite occurs from November to May, when the northern hemisphere population returns to winter breeding grounds in tropical waters, and the southern hemisphere population heads to high latitude feeding grounds (both populations head south). The hemispheric specific feeding and breeding seasons highlights the unlikelihood that individuals from separate hemispheres would exhibit significant rates of interchange. Scientific evidence supports this theory, estimating that the interchange between northern and southern hemisphere humpback whale populations is limited to no more than a few

females per generation (Baker *et al.*, 1993). Humpback populations residing in the North Pacific and Atlantic Oceans are further separated by the North American continent, supporting the conclusion that little interchange is exhibited between the Pacific and Atlantic Ocean humpback populations.

NMFS has recognized these distinctions and, as such, treats the Atlantic, North Pacific and South Pacific populations separately, both in the *Final Recovery Plan for the Humpback Whale* (1991), as well as in the technical memorandum *Global Review of Humpback Whales* (Fleming and Jackson, 2011). The Recovery Plan, for example, specifically acknowledges that the Atlantic and Pacific Oceans “each contain several relatively distinct populations of humpback whales”, and that these “different populations may require different periods of time to [reach stated recovery goals]” (National Marine Fisheries Service, 1991). Biological recovery goals, furthermore, are defined in terms of percentages as opposed to specific numbers, allowing NMFS to evaluate the recovery and merits of delisting of each population independent from one another.

The petitioner’s request to delist the NPHBW population is based primarily on the premise that humpback whales residing in the North Pacific are considered a single, interbreeding and connected stock (aka “DPS”). The best available scientific evidence, however, indicates that the NPHBW population is actually comprised of multiple sub-stocks, leading to the conclusion that the NPHBW should *not*, in fact, be classified and evaluated as a single stock.

The *Global Review of Humpback Whales*, for example, recognizes three humpback whale breeding and calving regions in the North Pacific: the eastern North Pacific, the Hawaiian Islands and the western North Pacific, and notes that the frequency of exchange between the regions is thought to be low (Fleming & Jackson, 2011). Strong fidelity to both feeding and breeding sites has also been observed, but the *Review* points out that the movements between feeding and breeding areas are complex and varied. Nevertheless, an overall pattern of migration has recently emerged: Asia and Mexico/Central America are the dominant breeding areas for whales migrating to feeding areas in lower latitudes and more coastal areas on each side of the Pacific, while the Revillagigedo Archipelago and Hawaiian Islands are the primary winter destinations for whales feeding in the more central and higher latitude areas (Calambokidis *et al.*, 2008).

Within these breeding and feeding areas, scientists have determined that there exist a number of discrete humpback whale aggregations. In the case of the humpback whale feeding aggregation off of Kodiak Island, for example, a relatively large local population, combined with a low exchange rate, indicates that this feeding aggregation likely forms a discrete population unit (Waite *et al.*, 1999). Findings from the Structure of Populations, Levels of Abundance, and Status of Humpback Whales (SPLASH) further suggest that there is yet an undiscovered breeding area in the North Pacific, as whales from the Aleutian Islands and the Bering Sea were not well represented in the samples from any breeding area (Calambokidis *et al.*, 2008).

In reviewing the best scientific evidence, Fleming and Jackson (2011) conclude **“it is very clear that a great deal of structural complexity exists within the North Pacific and that it does not contain a single panmictic population [of humpback whales]”**(Fleming and Jackson, 2011).

It is thus scientifically accepted that a certain level of population discreteness exists among the humpback whales of the North Pacific Ocean, and that humpback whales residing in the North Pacific cannot be considered a single, interbreeding and connected stock. These conclusions, furthermore, discredit the validity of classifying and/or managing the entire North Pacific humpback whale population as a single, Distinct Population Segment.

Pacific Whale Foundation instead proposes that population recovery goals be evaluated based on distinct feeding and breeding aggregations, and that the process of considering all humpback whales in the North Pacific Ocean as a single unit be discontinued.

Regarding the delisting of the North Pacific Humpback Whale, based on population size:

The leading reference with regards to pre-exploitation population sizes and commercial whaling impacts on humpback whales in the North Pacific is a report entitled *The humpback whale in the North Pacific: distribution, exploitation, and numbers* (Rice, 1978). While providing a basis for evaluating humpback whale status in the late 1970's, this report is at the point of being seriously outdated, and has also confusingly led to differing conclusions regarding the "recovery" of humpback whales in the North Pacific.

Petitioners, for example, argue that the tenfold increase in the number of humpback whales in the North Pacific since the cessation of commercial whaling supports delisting. Prior to commercial whaling, the petition cites Rice, 1978, and states that an estimated 15,000 humpback whales resided in the North Pacific. In contrast, Fleming and Jackson (2011) declare that an estimated 28,000 humpback whales were removed from the North Pacific in the 20th century, also citing Rice, 1978. Unfortunately Pacific Whale Foundation was not able to obtain a copy of the Rice, 1978 report, and was thus unable to draw any definitive conclusions regarding pre-exploitation levels based on the report alone. The point should be made, however, that without an agreed upon and established historic population baseline, it is impossible to determine if humpback whales in the North Pacific qualify for delisting.

Pacific Whale Foundation would like to further point out, that the 2011 Fleming and Jackson report, funded by NOAA and NMFS, concluded that:

Though there is no comprehensive assessment of the impact of whaling and the number of individuals removed, it appears clear that in most regional feeding and breeding areas, numbers remain lower than pre-exploitation abundances (Fleming & Jackson, 2011).

In addition, some geographic areas where humpback whales used to be observed do not appear to have been recolonized (Gregr *et al.*, 2000).

It was also concluded that despite observed positive population trends over the past decade, the California-Oregon population likely remains well below pre-exploitation size (Fleming and Jackson, 2011).

The severity of depletion of certain North Pacific stocks is, moreover, completely ignored by the petition to delist, which makes no reference to the fact that whaling ceased in the Ryukyu Islands in 1961 because of a shortage of whales, or offshore of Taiwan and Ogasawara in the 1940's due to depleted stocks (Darling and Mori, 1993). The extent to which these stocks have recovered is currently unknown.

Pacific Whale Foundation does not believe that the current scientific evidence supports the removal of any portion of the North Pacific Humpback Whale (NPHBW) population from the Endangered Species list. While the humpback whales in the North Pacific have exhibited a basin-wide population increase over the past 50 years, estimates of the population's present and past abundance, as well as historical environmental carrying capacity, are uncertain, and with regards to some feeding and breeding subsets, unknown. The Recovery Plan acknowledges that even its own goal of achieving a population size equal to at least 60% of the historical environmental carrying capacity is difficult to evaluate because of the lack of an accepted pre-

whaling population baseline (National Marine Fisheries Service, 1991). Until historic population numbers can be confidently estimated, current population studies can only ensure a positive or negative population trend, and cannot ensure that the population has in fact successfully met stipulated recovery criteria. This inability to acceptably set a long-term population recovery goal should alone be evidence enough that careful analysis of pre-exploitation humpback abundance should be undertaken before delisting is even remotely considered.

As an interim goal, NMFS recommended that humpback whale populations double in size over the next twenty years, a milestone that would be evidence of meaningful progress (National Marine Fisheries Service, 1991). At the time of the Recovery Plan's completion, the NPHBW population (basin-wide) was estimated, at a minimum, to number between 1,113 to 1,701 individuals (Darling and Morowitz, 1986). Most recent population estimates indicate that the basin-wide NPHBW population now numbers around 21,000 individuals (Calambokidis *et al.*, 2008). In a comparison of these two population estimates, it is obvious that in the past twenty years, the NPHBW, on an ocean-basin scale, has achieved the interim goal of doubling population size.

Two points deserve to be made, however. First, as previously stated, basin-wide population estimates do not properly account for the complexity and discreteness of different feeding and breeding area humpback whale stocks. Consider, for example, the humpback feeding aggregation offshore of Kodiak Island, a group that is likely to be considered "discrete" (Waite, 1999). The Kodiak Island humpback population is estimated to have reached a low of 27 individuals in 1938 from a pre-exploitation population of 343 individuals, with a current population estimated at 157 individuals (Witteveen *et al.*, 2004). To meet the NMFS recovery goal of a population size of at least 60% of the historical environmental carrying capacity, the humpback population offshore of Kodiak Island would need to number, at a minimum, 205 individuals. Most recent population estimates, therefore, indicate that the Kodiak Island population has met the interim goal, but not met recovery criteria stipulated for delisting. On the other hand, most recent studies estimate 6,000-14,000 individuals for the Aleutians and Bering Sea feeding area combined (Calambokidis *et al.*, 2008). Pre-exploitation population numbers for these areas have not been estimated, but if in fact recent population estimates indicated that these feeding aggregations met the recovery criteria, would this trigger the automatic delisting of other discrete feeding aggregations, even if the best available science indicated that these other groups (*e.g. Kodiak Island*) may not meet delisting criteria?

Secondly, the interim goal was merely a yardstick by which NMFS chose to coarsely evaluate if the population was showing initial signs of recovery. This goal was not, contrary to some beliefs, specified criteria for delisting (National Marine Fisheries Service, 1991).

There is no doubt that since the cessation of commercial whaling in the North Pacific, humpback whale stocks have increased. However the extent to which these stocks have increased, as compared to pre-exploitation abundance numbers, is neither known nor agreed upon by scientists. Surely there is no way by which NMFS could seriously consider delisting a species in which baseline abundance levels have not been established.

Threats

Pacific Whale Foundation furthermore maintains that threats to humpback whales, in all ocean basins, have only increased since the moratorium on commercial exploitation of humpback whales was passed in 1966. The impact of threats such as ship strikes, underwater noise pollution, ocean acidification, changes in prey

population dynamics, habitat loss and destruction and entanglement in fishing gear on the recovery of the NPHBW population remain poorly understood.

Data, furthermore, indicates that collisions of humpbacks and ships appear to be increasing in important breeding areas such as Hawaii (Lammers *et al.*, 2003). Available evidence also suggests that ship strikes are increasing in Alaska (Gabriele *et al.*, 2007), and a recent assessment found that 78% of whales in northern Southeastern Alaska had been non-lethally entangled in fishing gear (Neilson *et al.*, 2009). Humpbacks off Southern California and Asia are known to have high levels of DDT, PCBs and other persistent organic pollutants (Elfes *et al.*, 2010). Even though Elfes (2010) suggests that POP levels found in humpbacks are unlikely to have a significant impact on their persistence as a population, it is relevant to note that the overall understanding of population-level effects of pollutants on marine mammals is not well understood.

Climate change is also expected to impact marine ecosystems. While scientists do not fully understand how the ocean ecosystems may react to changes in ocean chemistry and temperature, it should be noted that these changes could have a significant impact on humpback food distribution and availability. Just because we do not fully understand the implications of climate change on humpback populations, however, does not mean that we merely ignore their potential repercussions.

Conclusions

The lack of understanding with regards to:

1. historic humpback whale population levels in the North Pacific;
2. genetic diversity within the North Pacific Humpback population); and
3. the impact of increasing threats to humpback whale recovery, indicate the obvious prematurity of delisting.

In 2009, NMFS initiated an ESA status review of the humpback whales. The status review has yet to be completed, but the findings are likely to shed new light onto the overall population status of the NPHBW. Pacific Whale Foundation also feels that now, more than ever, the Hawaiian Islands Humpback Whale National Marine Sanctuary should assume a leadership role in drafting a comprehensive management plan for Sanctuary waters that will assist in ensuring the species' lasting survival. A comprehensive ESA status review, coupled with an updated and comprehensive Sanctuary management plan, should be completed prior to any discussion of species delisting.

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