

National Marine Fisheries Service Memorandum for the Record:
*Management Considerations in Designating Demographically Independent Populations as
Stocks under the Marine Mammal Protection Act*

Memo to Record

To: The Record

From: Chris Yates 7448688
Assistant Regional Administrator, Protected Resources Division,
West Coast Region

YATES.CHRISTOPHER.EDWARD.1087448688
Digitally signed by YATES.CHRISTOPHER.EDWARD.1087448688
Date: 2022.01.03 11:24:53 -08'00'

David Weller
Director, Marine Mammal and Turtle Division, Southwest
Fisheries Science Center

WELLER.DAVID.WILLIAM.1402069666
Digitally signed by WELLER.DAVID.WILLIAM.1402069666
Date: 2022.01.03 12:00:07 -08'00'

Shannon Bettridge
Chief, Marine Mammal and Sea Turtle Division, Office of
Protected Resources

BETTRIDGE.SHANNON.O.1365827920
Digitally signed by BETTRIDGE.SHANNON.O.1365827920
Date: 2022.01.03 15:11:44 -05'00'

Patrick Lynch
Chief, Assessment and Monitoring Division, Office of Science and
Technology

LYNCH.PATRICK.1456951763
Digitally signed by LYNCH.PATRICK.1456951763
Date: 2022.01.03 15:29:13 -05'00'

Date: January 3, 2022

Subject: Evaluation of MMPA Stock Designation for the Central America Distinct Population Segment of humpback whales (*Megaptera novaeangliae*) currently a part of the California/Oregon/Washington humpback whale stock.

Purpose: The National Marine Fisheries Service (NMFS) process for designating stocks under the Marine Mammal Protection Act (MMPA) is described in *Reviewing and Designating Stocks and Issuing Stock Assessment Reports under the Marine Mammal Protection Act* (NMFS 2019). In most cases, if sufficient evidence exists to delineate demographically independent populations (DIPs), they should be designated as stocks and assessed as such in Stock Assessment Reports (SARs). As noted in NMFS (2019), in practice there may be some situations (anticipated to be relatively few) where it would be impractical, or there are insufficient data or analytical tools, to assess and manage a stock at the DIP level (see NMFS (2019) for examples). In addition, when distinct population segments (DPSs) have been established under the Endangered Species Act (ESA), it may be pragmatic to designate a stock comprising more than one DIP of a single DPS.

The purpose of this memorandum is to document the collective consideration by NMFS' Science Center, Regional Office, Office of Protected Resources (OPR), and Office of Science and

Technology (OST) staff of how to designate humpback whale stocks relative to identified DIPs within the endangered Central America DPS defined under the ESA (81 FR 62259). In some cases, this may involve considering stock designation of “units” that have not been definitively delineated as DIPs. For example, when a newly delineated DIP from within an existing stock is being considered for stock designation, the remaining marine mammals in the stock may or may not be understood to constitute one or more DIPs depending on the available data and analyses.

Current Stock Designation(s): The Central America DPS is listed as endangered under the ESA. This DPS is composed of whales that winter or breed along the Pacific coast of Costa Rica, Panama, Guatemala, El Salvador, Honduras, and Nicaragua. At the time of listing, some uncertainty remained regarding the winter range of this DPS, particularly due to limited data available for whales occurring off southern Mexico. However, data collected subsequent to the listing of the Central America DPS indicate that its winter range extends into southern Mexico, at least through the states of Oaxaca and Guerrero and possibly into Colima and Michoacán (Taylor et al. 2021). Whales from this wintering ground feed almost exclusively offshore of California and Oregon in the eastern Pacific, with only a few individuals identified in the northern Washington/southern British Columbia feeding grounds (Calambokidis et al. 2008, Barlow et al. 2011, Wade et al. 2016, Wade 2017, see also Figure 1 in Taylor et al. 2021).

The Central America DPS is part of the California/Oregon/Washington (CA/OR/WA) humpback whale stock under the MMPA. This stock includes two separate feeding groups: (1) a California and Oregon feeding group of whales that includes whales from the endangered Central America and threatened Mexico DPSs defined under the ESA (NOAA 2016a), and (2) a northern Washington and southern British Columbia feeding group that primarily includes whales from the threatened Mexico DPS, but also small numbers of whales from the unlisted Hawai‘i population and endangered Central America DPS (Calambokidis et al. 2008, Barlow et al. 2011, Wade et al. 2016, Wade 2017).

Demographically Independent Populations/Units Under Consideration: Robust data from two strong lines of evidence (movements and genetics) support a finding that the Central America/Southern Mexico-CA/OR/WA (CenAm/SMex-CA/OR/WA) unit of humpback whales meet the DIP definition (Taylor et al. 2021). Similar to the findings of Bettridge et al. (2015), available lines of evidence demonstrate group fidelity to both winter and summer areas. Both photographic identification data and genetic data are consistent with this fidelity. There are no data to suggest further population structure within this unit. This DIP differs from the Central America DPS, as described in the listing of the DPS, in extending the wintering ground to the north based on data gathered in southern Mexico since the SPLASH effort (Taylor et al. 2021).

Relevant Regional Office(s), Science Center(s), and Headquarters Office(s): West Coast Regional Office (WCRO), Southwest Fisheries Science Center (SWFSC), OPR, and OST.

Process by which stock designation was considered: A working group consisting of staff from the OPR, OST, SWFSC, Northwest Fisheries Science Center, Alaska Fisheries Science Center, Pacific Islands Fisheries Science Center, WCRO, Alaska Regional Office, and Pacific Islands Regional Office was convened to assess the available information on the populations of humpback whales in the north Pacific Ocean. A series of six discussions via virtual meeting platform were held from October 22, 2020 through August 24, 2021. Resulting from these discussions and intervening periods of drafting and revision are four NOAA Technical Memoranda that describe the available evidence to support the delineation of DIPs within four identified DPSs in the Pacific Ocean: the Western North Pacific, Hawai'i, Mexico, and Central America DPSs of humpback whales. These Technical Memoranda document the available evidence to delineate DIPs, following the DIP Delineation Handbook (Martien et al. 2019). They draw conclusions regarding the presence of DIPs that can be delineated at this time, and those potential DIPs that may exist within the DPSs but for which the available information is not sufficient or has not been analyzed in such a way as to support the delineation of further DIPs at this time. In the case of the Central America DPS, only one DIP, which corresponds closely with the designated DPS, was identified.

Following the delineation of the CenAm/SMex-CA/OR/WA DIP, a series of virtual meetings with representatives from WCRO, SWFSC, OPR, and OST were held between October and November 2021 to discuss the stock designation recommendation for this DIP. These meetings and discussions form the basis of this Memorandum to the Record.

Questions to Consider for Stock Designation (from NMFS (2019), Section B):

1. Is it feasible to manage each DIP/unit being considered as a single stock? For example:
 - a. Is there an abundance estimate for each DIP/unit that could be used for calculating the PBR level?
 - b. Is there a way to attribute takes to each DIP/unit other than allocating each take to all possible DIPs in the area?
 - c. Are there any other potential analytical or practical barriers that would limit our ability to manage each DIP/unit?

Abundance

There is no current abundance estimate for the Central America DPS; however, recent available data were used to develop an abundance estimate for the current CA/OR/WA stock. In addition, research continues in Central America, southern Mexico, and along the U.S. West Coast to refine available information on abundance and distribution. An initial estimate of the minimum population estimates (N_{min}) could be derived from the Calambokidis and Barlow (2020) and Becker (2020) work on abundance, and Calambokidis (2017) and Wade (2021) work on proportions and distribution. There are also ongoing research projects to estimate the

proportional representation of DPSs in the California, Oregon, Washington, and southern British Columbia feeding areas based on both photo-identification and genetic data. When complete, these projects will provide additional data for use in prorating abundance in these areas. We are not aware of recent information on growth rate specific to the Central America DPS or CenAm/SMex-CA/OR/WA DIP.

Human-caused mortality/serious injury

Similarly, we could use the same distribution and proportion information to apportion HCM/SI to the stock in US waters off of California, Oregon, and Washington.

Other Barriers

No other practical barriers to management of this DIP as a stock were identified.

2. Is there a reason to believe that human-caused serious injury/mortality or threats differ significantly between DIPs/units in the area?

While humpback whales from different DPSs should not be combined into the same stock, per NMFS (2019), it is useful to consider differences between DPSs co-occurring within feeding areas to inform how best to designate stocks for management. The feeding area of the CentAm-CA/OR/WA DIP is shared with animals from the Mexico DPS and, to a lesser extent, with the Hawai'i DPS. The main threats in this area come from fishery interactions and vessel strikes. No available information indicates that these threats differentially affect animals from the CentAm-CA/OR/WA DIP, Mexico DPS, or the Hawai'i DPS within a particular local area. However, there are proportional differences in the distributions of animals from Central America, Mexico, and Hawai'i along the coasts of WA, OR, and CA that could result in significant differences in threats among them as the intensity of different threats may vary along the coast. The CentAm-CA/OR/WA DIP has its highest density in southern California, with a steady decrease in density further north. Several of the largest ports in the country occur on the coast of California, and the Mexico and Central America animals migrate through areas affected by traffic to and from those ports. Central America whales may be more affected by vessel traffic to and from the Ports of Los Angeles and Long Beach due to their higher density in southern California. Similarly, variation in fishery effort, type, and distribution along the coasts of the three States may differentially affect animals within the separate DIPs. In addition, Navy training activities occur in certain areas of the southern California coast and the coasts of Oregon and Washington. Oil and gas development and potential wind energy development are typically in the central California area with other development potential in northern California and Oregon waters.

3. What are the conservation and management benefits and risks of managing each DIP/unit as individual stocks versus together as a single stock?

The CenAm/SMex-CA/OR/WA DIP, which comprises the entire Central America DPS, should be managed as a separate stock in line with the Stock Policy Directive and should not be combined with other DIPs that may occur in that same area as those DIPs correspond with separately recognized DPSs under the ESA.

4. Have DPSs for the species to which the DIPs/units belong been recognized under the ESA? (note from NMFS (2019): NMFS should align stock designations with DPSs established under the ESA unless there is compelling reason not to. For species that are listed under the ESA, only DIPs/units from the same ESA-listed DPS should be combined.)

Yes, the Central America DPS is listed as endangered under the ESA.

5. Do members of the DIP/unit overlap in space and time with members of at least one other DIP/unit of the same species? For migratory marine mammals, the evaluation should focus on overlap in the breeding ground(s). In cases where DPSs have been established under the ESA, the same species here refers to all animals within a single DPS.

The CentAm-CA/OR/WA DIP comprises the entirety of the Central America DPS. Therefore, it does not overlap with any other DIP/unit of the same species (DPS).

Conclusion: Based on the evaluation of the available information, the group consensus was that the delineated CenAm/SMex-CA/OR/WA DIP can be managed as a stock, separated out from the original CA/OR/WA stock of humpback whales, which also includes animals from the Mexico and Hawai'i DPSs of humpback whales. Official stock designation decisions are made by the NMFS Assistant Administrator in final stock assessment reports, following publication of the draft stock assessment reports and consideration of public comment.

References:

- Barlow, J., Calambokidis, J., Falcone, E.A., Baker, C.S., Burdin, A.M., Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D.K., Quinn, T.J., II, Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Wade, P., Weller, D., Witteveen, B.H. and Yamaguchi, M. 2011. Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. *Marine Mammal Science*, 27: 793-818.
- Becker, E.A., Forney, K.A., Miller, D.L., Fiedler, P.C., Barlow, J. and Moore, J.E. 2020. Habitat-based density estimates for cetaceans in the California Current Ecosystem based on 1991- 2018 survey data. NOAA Technical Memorandum NMFS-SWFSC-638.
- Bettridge, S., Baker, C.S., Barlow, J., Clapham, P.J., Ford, M., Gouveia, D., Mattila, D.K., Pace III, R.M., Rosel, P.E., Silber, G.K. and Wade, P.R. 2015. Status review of the humpback whale (*Megaptera novaeangliae*) under the Endangered Species Act. NOAA Technical Memorandum, NMFS-SWFSC-540.

- Calambokidis, J., Falcone, E.A., Quinn, T.J., Burdin, A.M., Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D.K., RojasBracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Weller, D., Witteveen, B.H., Yamaguchi, M., Bendlin, A., Camacho, D., Flynn, K., Havron, A., Huggins, J., and Maloney, N. 2008. SPLASH: Structure of populations, levels of abundance and status of humpback whales in the north Pacific. Cascadia Research. Final report for contract AB133F-03-RP-00078. 57 pp.
- Calambokidis, J., Barlow, J., Flynn, K., Dobson, E., and Steiger, G.H. 2017. Update on abundance, trends, and migrations of humpback whales along the U.S. West Coast. International Whaling Commission Report SC/A17/NP/13.
- Calambokidis, J. and Barlow, J. 2020. Updated abundance estimates for blue and humpback whales along the U.S. West Coast using data through 2018. NOAA Technical Memorandum, NMFS-TM-SWFSC-634.
- Martien, K.K., Lang, A.R., Taylor, B.L., Rosel, P.E., Simmons, S.E., Oleson, E.M., Boveng, P.L., and Hanson, M.B. 2019. The DIP delineation handbook: A guide to using multiple lines of evidence to delineate demographically independent populations of marine mammals. NOAA Technical Memorandum, NMFS-SWFSC-622.
- NMFS 2019. Reviewing and designating stocks and issuing stock assessment reports under the Marine Mammal Protection Act. National Marine Fisheries Service Procedure 02-204-03.
- Wade, P.R., Quinn, T.J., Barlow, J., Baker, C.S., Burden, A.M., Calambokidis, J., Clapham, P.J., Falcone, E.A., Ford, J.K.B., Gabriele, C.M., Mattila, D.K., Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Weller, D., Witteveen, B.H., and Yamaguchi, M. 2016. Estimates of abundance and migratory destination for north Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/66b/IA21.
- Wade, P.R. 2017. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas – revision of estimates in SC/66b/IA21. International Whaling Commission Report SC/A17/NP/11.
- Wade, P. R. 2021. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/68c/IA/03.

Attachments:

- Taylor, B.L., Martien, K.K., Archer, F.I., Audley, K., Calambokidis, J., Cheeseman, T., De Weerd, J., Jordán, A.F., Martínez-Loustalot, P., Ortega-Ortiz, C.D., Patterson, E.M., Ransome, N., Ruvelas, P., Urbán, J. 2021. Evaluation of humpback whales wintering in Central America and southern Mexico as a demographically independent population. NOAA Technical Memorandum NMFS-SWFSC-655.

National Marine Fisheries Service Memorandum for the Record:
*Management Considerations in Designating Demographically Independent Populations as
Stocks under the Marine Mammal Protection Act*

Memo to Record

To: The Record

From: Chris Yates
YATES.CHRISTOPHER.EDWARD.1087448688
HER.EDWARD.1087448688
Date: 2022.01.03 13:30:17 -08'00'

Chris Yates 7448688
Assistant Regional Administrator, Protected Resources Division,
West Coast Region

WELLER.DAVID.WILLIAM.1402069666
WELLER.DAVID.WILLIAM.1402069666
Date: 2022.01.06 07:20:51 -08'00'

David Weller 1402069666
Director, Marine Mammal and Turtle Division,
Southwest Fisheries Science Center

KURLAND.JONATHAN.M.1365896514
KURLAND.JONATHAN.M.1365896514
Date: 2022.01.06 07:26:47 -09'00'

Jon Kurland 1365896514
Assistant Regional Administrator, Protected Resources Division,
Alaska Region

BENGTSON.JOHN.L.1365857675
BENGTSON.JOHN.L.1365857675
Date: 2022.01.06 09:20:15 -08'00'

John L. Bengtson 1365857675
Director, Marine Mammal Laboratory
Alaska Fisheries Science Center

BETTRIDGE.SHANNON.O.1365827920
BETTRIDGE.SHANNON.O.1365827920
Date: 2022.01.06 12:37:15 -05'00'

Shannon Bettridge 1365827920
Chief, Marine Mammal and Sea Turtle Division,
Office of Protected Resources

LYNCH.PATRICK.1456951763
LYNCH.PATRICK.1456951763
Date: 2022.01.06 14:07:05 -05'00'

Patrick Lynch 1456951763
Chief, Assessment and Monitoring Division,
Office of Science and Technology

Date: January 3, 2022

Subject: Evaluation of MMPA Stock Designation for the Mexico Distinct Population Segment of humpback whales (*Megaptera novaeangliae*), currently a part of the California/Oregon/Washington and Central North Pacific (CNP) humpback whale stocks.

Purpose: The National Marine Fisheries Service (NMFS) process for designating stocks under the Marine Mammal Protection Act (MMPA) is described in *Reviewing and Designating Stocks and Issuing Stock Assessment Reports under the Marine Mammal Protection Act* (NMFS 2019). In most cases, if sufficient evidence exists to delineate demographically independent populations (DIPs), they should be designated as stocks and assessed as such in Stock Assessment Reports

(SARs). As noted in NMFS (2019), in practice there may be some situations (anticipated to be relatively few) where it would be impractical, or there are insufficient data or analytical tools, to assess and manage a stock at the DIP level (see NMFS (2019) for examples). In addition, when distinct population segments (DPSs) have been established under the Endangered Species Act (ESA), it may be pragmatic to designate a stock comprising more than one DIP of a single DPS.

The purpose of this memorandum is to document the collective consideration by NMFS' Science Center, Regional Office, Office of Protected Resources (OPR), and Office of Science and Technology (OST) staff of how to designate humpback whale stocks relative to identified DIPs within the threatened Mexico DPS defined under the ESA (81 FR 62259). In some cases, this may involve considering stock designation of "units" that have not been definitively delineated as DIPs. For example, when a newly delineated DIP from within an existing stock is being considered for stock designation, the remaining marine mammals in the stock may or may not be understood to constitute one or more DIPs depending on the available data and analyses.

Current Stock Designation(s): The Mexico DPS is described as whales that breed or winter along the Pacific coast of mainland Mexico and in the Revillagigedo Archipelago, transit along Baja California, or feed in the North Pacific Ocean, primarily off California and Oregon, northern Washington-southern British Columbia, northern and western Gulf of Alaska and East Bering Sea (50 CFR 223.102(e)). As indicated by this description, the Mexico DPS feeds across a broad geographic range from California to the Kamchatka Peninsula, with concentrations in the California-Oregon, northern Washington-southern British Columbia, northern and western Gulf of Alaska, and Bering Sea feeding grounds, though the feeding ground destinations differ between animals that winter off mainland Mexico versus Revillagigedo (Calambokidis et al. 2008, Wade 2017, Titova et al. 2018, 2019, see also Figure 1 in Martien et al. 2021).

Whales included in the Mexico DPS are included in two currently recognized stocks - the California/Oregon/Washington (CA/OR/WA) humpback whale stock and the Central North Pacific stock. The CA/OR/WA stock includes two separate feeding groups: (1) a California and Oregon feeding group, which includes whales from the endangered Central America DPS as well as the Mexico DPS, and (2) a northern Washington and southern British Columbia feeding group that primarily includes whales from the Mexico DPS, but also small numbers of whales from the ESA-non-listed Hawai'i and the ESA-endangered Central America DPSs (Calambokidis et al. 2008, Barlow et al. 2011, Wade et al. 2016, Wade 2017).

The Central North Pacific stock includes humpback whales that utilize summer feeding areas in Alaskan waters that have migrated from wintering areas used by the Mexico DPS and the Hawai'i DPS. Whales from the endangered Western North Pacific DPS and the Western North Pacific stock also occur within the summer feeding areas in Alaska. In addition, the Central

North Pacific stock includes all whales that utilize wintering areas around the Hawaiian Archipelago, regardless of their summer migratory destination.

Demographically Independent Populations/Units Under Consideration:

Martien et al. (2021) delineate two units within the Mexico DPS: one is a DIP composed of whales that winter in the waters off mainland Mexico (MMex) and summer off of the contiguous U.S. west coast (referred to here as the MMex-CA/OR/WA DIP). The Mexico DPS also includes whales that winter in mainland Mexico and the Revillagigedo Archipelago and that feed in more northerly waters (mainly in Alaska and to a lesser extent in Russia). Those whales are referred to as the Mexico-Northern Pacific unit (Mex-NPac). As discussed in Martien et al. (2021), the information available regarding the Mex-NPac unit suggests it may contain multiple DIPs, but the information was insufficient or unavailable to delineate DIPs within this unit using the guidance of the DIP Delineation Handbook (Martien et al. 2019).

Relevant Regional Office(s), Science Center(s), and Headquarters Office(s): West Coast Regional Office (WCRO), Alaska Regional Office (AKRO), Southwest Fisheries Science Center (SWFSC), Alaska Fisheries Science Center (AFSC), OPR, and OST.

Process by which stock designation was considered: A working group consisting of staff from the OPR, OST, SWFSC, Northwest Fisheries Science Center, AFSC, Pacific Islands Fisheries Science Center, WCRO, AKRO, and Pacific Islands Regional Office was convened to assess the available information on the populations of humpback whales in the north Pacific Ocean. A series of six discussions via virtual meeting platform were held from October 22, 2020 through August 24, 2021. Resulting from these discussions and intervening periods of drafting and revision are four NOAA Technical Memoranda that describe the available evidence to support the delineation of DIPs within four identified DPSs in the Pacific Ocean: the Western North Pacific, Hawai'i, Mexico, and Central America DPSs of humpback whales. These Technical Memoranda document the available evidence to delineate DIPs, following the DIP Delineation Handbook (Martien et al. 2019). They draw conclusions regarding the presence of DIPs that can be delineated at this time, and those potential DIPs that may exist within the DPSs but for which the available information is not sufficient or has not been analyzed in such a way as to support the delineation of further DIPs at this time. In the case of the Mexico DPS, only the MMex-CA/OR/WA DIP can be delineated at this time. The remaining Mex-NPac unit whales may comprise one or more DIPs, which cannot be delineated at this time.

Following the delineation of the MMex-CA/OR/WA DIP and the description of the Mex-NPac unit, a series of virtual meetings with representatives from WCRO, AKRO, SWFSC, AFSC, OPR, and OST were held between October and December 2021 to discuss stock designation recommendations relative to the two identified units. These meetings and discussions form the basis of this Memorandum to the Record.

Questions to Consider for Stock Designation (from NMFS (2019), Section B):

1. Is it feasible to manage each DIP/unit being considered as a single stock? For example:
 - a. Is there an abundance estimate for each DIP/unit that could be used for calculating the PBR level?
 - b. Is there a way to attribute takes to each DIP/unit other than allocating each take to all possible DIPs in the area?
 - c. Are there any other potential analytical or practical barriers that would limit our ability to manage each DIP/unit?

It is feasible to manage each DIP or unit as a single stock. Though there are challenges associated with estimating both current abundance and human-caused mortality/serious injury (HCM/SI), they would not be lessened by combining the entire Mexico DPS into a single stock. In addition, because the animals from this DPS overlap with animals from other DPSs everywhere they occur in U.S. waters, all approaches to estimating abundance and HCM/SI for the DPS or DIPs/units within it will involve prorating estimates from each feeding area.

Abundance

There is no current abundance estimate for the entire DPS; however, recent available data were used to develop an abundance estimate for the current CA/OR/WA stock (Calambokidis and Barlow 2020). Those data can be prorated across wintering grounds using the movement probabilities in Wade (2021) and Calambokidis et al. (2017) to produce an abundance estimate for the MMex-CA/OR/WA DIP or possibly using other mark-recapture approaches. There are also ongoing research projects to estimate the proportional representation of DPSs in the California, Oregon, Washington, and southern British Columbia feeding areas based on both photo-identification and genetic data. When complete, these projects will provide additional data for use in prorating abundance in these areas.

There are no recent abundance estimates available for the entire Mex-NPac unit. An estimate of the abundance of the unit could be made using the information in Wade (2021) by summing the abundance of the feeding areas where the Mex-NPac unit occurs, and prorating that abundance to different DPSs based on the estimated movement probabilities. Mark-recapture estimates from the Revillagigedos, plus mark-recapture estimates from mainland Mexico, prorated by winter-to-summer movement probabilities, could be used. In addition, other line-transect survey data collected in the Gulf of Alaska in 2021 or the International Whaling Commission POWER survey could be considered.

There is a recent abundance estimate for the portion of the Southeast Alaska/Northern British Columbia (SEAK/NBC) feeding area that occurs in Canadian waters (Wright et al. 2021), and there are data available for estimating abundance in Southeast Alaska. There are also ongoing

projects that would enable proration of those estimates to the Mexico DPS and Hawai'i DPSs based on both photo-identification and genetic data. The results of those studies could produce a current estimate of the abundance of the SEAK/NBC portion of the Mex-NPac unit in the near future. Similar projects could be used to estimate current abundance of the remainder of the Mex-NPac unit, but none are planned at this time.

Human-caused mortality/serious injury

Because the MMex-CA/OR/WA DIP and Mex-NPac unit have largely non-overlapping feeding area distributions, HCM/SI of the Mexico DPS that occurs in feeding areas can be apportioned to the two units based solely on location, though there is a small chance of a Mex-NPac whale being impacted in the MMex-CA/OR/WA DIP feeding area during migration. The greater challenge in estimating HCM/SI is with apportioning it between DPSs (i.e., determining HCM/SI to be of the Mexico DPS in the first place). As with abundance, this challenge exists whether the MMex-CA/OR/WA DIP and Mex-NPac unit are managed separately or as a single stock.

HCM/SI that occurs within U.S. waters can be apportioned to the MMex-CA/OR/WA DIP or Mex-NPac unit using the location of the HCM/SI and the movement probability estimates from Wade (2021). As with proration of abundance, apportionment of HCM/SI will be improved once the results of ongoing photo-identification and genetic projects are available. In some cases, it will be possible to assign impacted animals to a DIP/unit photographically or genetically, assuming a tissue sample or photo-identification quality photo is obtained of the impacted animal.

Other Barriers

Some of the available data for estimating abundance and HCM/SI of both the Mexico DPS and the Mex-NPac unit within it are over 15 years old. The available data for prorating or apportioning HCM/SI of the MMex-CA/OR/WA DIP are also based on the same older datasets even though we have more recent abundance information. Ongoing projects should provide more current estimates of abundance and movement probabilities in the near future. However, because these data are needed regardless of whether the MMex-CA/OR/WA DIP and Mex-NPac unit are managed as separate stocks, they do not present an impediment to managing them separately. We do have current information on levels of HCM/SI to which we can apply apportioning rates.

2. Is there a reason to believe that human-caused serious injury/mortality or threats differ significantly between DIPs/units in the area?

The same basic types of threats affect each DIP/unit within every feeding area (fishery entanglements, vessel strikes, ocean noise, for example) but may differ in their intensity between areas. While the most recent SARs for the CNP and CA/OR/WA stocks (both of which contain animals from the Mexico DPS) reflect similar levels of human-caused mortality and serious

injuries, coastal vessel activity off the U.S. West Coast may be significantly higher than off of Alaska and other areas on the basis of human population size and the major ports in Washington and California. Similarly, fishery intensity may differ as well. Despite these threats along the U.S. West Coast, the humpback whale populations have been increasing at rates of approximately 7 percent per year over the last decade (Calambokidis and Barlow 2020). We do not have similar trend information for the Mex-NPac unit portion of the CNP stock, however. This difference in available information for management is a consideration in the recommendation to manage the MMex-CA/OR/WA DIP as a separate stock from the remainder of the Mexico DPS.

While humpback whales from different DPSs should not be combined into the same stock, per NMFS (2019), it is useful to consider differences between DPSs co-occurring within feeding areas to inform how best to designate stocks for management. The feeding area of the MMex-CA/OR/WA DIP is shared with animals from the Central America DPS and Hawai'i DPS. The main threats in this area come from fishery interactions and vessel strikes. No available information indicates that these threats differentially affect one DIP/unit or DPS over another within the same local area. However, there are proportional differences in the distributions of animals from Mexico, Central America, and Hawai'i along the coasts of WA, OR, and CA that could result in significant differences in threats among them. Animals from Central America are found predominantly in southern California, whereas the density of the MMex-CA/OR/WA DIP peaks in northern California and southern Oregon (Calambokidis et al. 2017). Several of the largest ports in the country occur on the coast of California and the Mexico and Central America animals migrate through and feed in areas affected by traffic to and from those ports. Central America whales may be more affected by vessel traffic to and from the Ports of Los Angeles and Long Beach than are animals from the MMex-CA/OR/WA DIP due to their different densities along the coast. Similarly, variation in fishery effort, type, and distribution along the coasts of the three States may differentially affect animals within the separate DIPs. In addition, Navy training activities occur in certain areas off the southern California coast and the coasts of Oregon and Washington. Oil and gas development and potential wind energy development are typically in the central California area with other development potential in northern California and Oregon waters.

3. What are the conservation and management benefits and risks of managing each DIP/unit as individual stocks versus together as a single stock?

The Mexico DPS is ESA-listed as threatened, which conveys “strategic” status on the stock(s) under the MMPA. Designating two stocks, one comprising the MMex-CA/OR/WA DIP and the other the remaining Mex-NPac unit, would allow us to assess and manage threats and activities specifically within the one known DIP of the listed DPS. This is particularly important given the ESA-listing status of this DPS and that the available information indicates that the DIP

abundance may be a relatively small portion (~25 to 30 percent) of the overall DPS abundance. Assessments of threats across a single stock comprising the DPS as a whole could result in negative conservation outcomes for the DIP.

4. Have DPSs for the species to which the DIPs/units belong been recognized under the ESA? (note from NMFS (2019): NMFS should align stock designations with DPSs established under the ESA unless there is compelling reason not to. For species that are listed under the ESA, only DIPs/units from the same ESA-listed DPS should be combined.)

Yes, the Mexico DPS of humpback whales is listed as threatened under the ESA.

5. Do members of the DIP/unit overlap in space and time with members of at least one other DIP/unit of the same species? For migratory marine mammals, the evaluation should focus on overlap in the breeding ground(s). In cases where DPSs have been established under the ESA, the same species here refers to all animals within a single DPS.

For humpback whale DPSs, while there is fidelity to wintering grounds (the preferred term versus breeding grounds due to uncertainty in where breeding actually occurs) and overlap with other members of the same species (DPS) on those grounds, we focus on fidelity to summer feeding grounds for identifying DIPs. Maternal fidelity to summer feeding grounds, and fidelity to those same areas by subsequent generations, is a strong basis for these DIP delineations (Martien et al. 2021). Because interbreeding on the wintering ground only results in the exchange of genetic material between the MMex-CA/OR/WA DIP and the Mex-NPac unit, not the exchange of animals, it has no impact on the demography of either DIP/unit. Thus, overlap with other animals from the Mexico DPS on the wintering ground is not treated as compelling to the DIP question. While on specific feeding grounds, animals from multiple DPSs mix; however, the MMex-CA/OR/WA DIP and Mex-NPac do not overlap on the feeding grounds.

Conclusion: In this memo, we evaluate the available information and management considerations of managing the humpback whales that comprise the threatened Mexico DPS as one or more stocks under the MMPA including the conservation and management benefits and risks. Our evaluation of the available information and management considerations indicates that managing this ESA-listed DPS of humpback whales as two MMPA stocks provides greater potential conservation benefits than managing a stock that is equivalent to the entire DPS.

Based on the evaluation of the information presented in Martien et al. (2021), consideration of the questions posed above, and an evaluation of whether there was a compelling reason not to designate the MMex-CA/OR/WA DIP and the Mex-NPac unit together as a single stock, consensus was reached to recommend the designation of two stocks that together comprise the Mexico DPS of humpback whales: the MMex-CA/OR/WA stock and the Mex-NPac stock,

rather than a single stock analogous to the DPS. As further information and analyses become available in the future, these stock designation recommendations may be revisited. Official stock designation decisions are made by the NMFS' Assistant Administrator in final stock assessment reports, following publication of the draft stock assessment reports and consideration of public comment.

References:

- Barlow, J., Calambokidis, J., Falcone, E.A., Baker, C.S., Burdin, A.M., Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D.K., Quinn, T.J., II, Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Wade, P., Weller, D., Witteveen, B.H. and Yamaguchi, M. 2011. Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. *Marine Mammal Science*, 27: 793-818.
- Calambokidis, J., Falcone, E.A., Quinn, T.J., Burdin, A.M., Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D.K., Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Weller, D., Witteveen, B.H., Yamaguchi, M., Bendlin, A., Camacho, D., Flynn, K., Havron, A., Huggins, J., and Maloney, N. 2008. SPLASH: Structure of populations, levels of abundance and status of humpback whales in the north Pacific. *Cascadia Research*. Final report for contract AB133F-03-RP-00078. 57 pp.
- Calambokidis, J., Barlow, J., Flynn, K., Dobson, E., and Steiger, G.H. 2017. Update on abundance, trends, and migrations of humpback whales along the U.S. West Coast. *International Whaling Commission Report SC/A17/NP/13*.
- Calambokidis, J. and Barlow, J. 2020. Updated abundance estimates for blue and humpback whales along the U.S. West Coast using data through 2018. *NOAA Technical Memorandum, NMFS-TM-SWFSC-634*.
- Martien, K.K., Lang, A.R., Taylor, B.L., Rosel, P.E., Simmons, S.E., Oleson, E.M., Boveng, P.L., and Hanson, M.B. 2019. The DIP delineation handbook: A guide to using multiple lines of evidence to delineate demographically independent populations of marine mammals. *NOAA Technical Memorandum, NMFS-SWFSC-622*.
- NMFS. 2019. Reviewing and designating stocks and issuing stock assessment reports under the Marine Mammal Protection Act. *National Marine Fisheries Service Procedure 02-204-03*.
- Titova, O.V., Filatova, O.A., Fedutin, I.D., Ovsyanikova, E.N., Okabe, H., Kobayashi, N., Acebes, J.M.V., Burdin, A.M. and Hoyt, E. 2018. Photo-identification matches of humpback whales (*Megaptera novaeangliae*) from feeding areas in Russian Far East seas and breeding grounds in the North Pacific. *Marine Mammal Science*, 34: 100-112.
- Titova, O.V., Filatova, O.A., Fedutin, I.D., Krinova, L.S., Burdin, A.M., Hoyt, E. 2019. Movements of humpback whales (*Megaptera novaeangliae*) between feeding aggregations in the Far Eastern seas and the migration links with breeding grounds. *Marine Mammals of the Holarctic* 1: 322-3277.

- Wade, P.R., Quinn, T.J., Barlow, J., Baker, C.S., Burden, A.M., Calambokidis, J., Clapham, P.J., Falcone, E.A., Ford, J.K.B., Gabriele, C.M., Mattila, D.K., Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Weller, D., Witteveen, B.H., and Yamaguchi, M. 2016. Estimates of abundance and migratory destination for north Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/66b/IA21.
- Wade, P.R. 2017. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas – revision of estimates in SC/66b/IA21. International Whaling Commission Report SC/A17/NP/11.
- Wade, P. R. 2021. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/68c/IA/03.
- Wright, B.M., Nichol, L.M., Doniol-Valcroze, T. 2021. Spatial density models of cetaceans in the Canadian Pacific estimated from 2018 ship-based surveys. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat Research Document 2021/049.

Attachments:

- Martien, K.K., Taylor, B.L., Archer, F.I., Audley, K., Calambokidis, J., Cheeseman, T., De Weerd, J., Jordán, A.F., Martínez-Loustalot, P., Ortega-Ortiz, C.D., Patterson, E.M., Ransome, N., Ruvelas, P., Urbán, J., Villegas-Zurita, F. 2021. Evaluation of Mexico Distinct Population Segment of humpback whales as units under the Marine Mammal Protection Act. NOAA Technical Memorandum NMFS-SWFSC-658

National Marine Fisheries Service Memorandum for the Record:
*Management Considerations in Designating Demographically Independent Populations as
Stocks under the Marine Mammal Protection Act*

Memo to Record

To: The Record

From:

KURLAND.JONATHAN.M.1365896514
Digitally signed by
KURLAND.JONATHAN.M.1365896514
Date: 2022.01.03 11:45:11 -09'00'

Jon Kurland
Assistant Regional Administrator, Protected Resources Division,
Alaska Region

BENGTSON.JOHN.L.1365857675
Digitally signed by
BENGTSON.JOHN.L.1365857675
Date: 2022.01.04 15:35:49 -08'00'

John L. Bengtson
Director, Marine Mammal Laboratory
Alaska Fisheries Science Center

GARRETT.ANN.M.1365883323
Digitally signed by
GARRETT.ANN.M.1365883323
Date: 2022.01.05 12:38:38 -10'00'

Ann Garrett
Assistant Regional Administrator, Protected Resources Division,
Pacific Islands Region

LITTNAN.CHARLES.L.JR.1100552074
Digitally signed by
LITTNAN.CHARLES.L.JR.1100552074
Date: 2022.01.10 08:56:16 -10'00'

Charles Littnan
Director, Protected Species Division
Pacific Islands Fisheries Science Center

BETTRIDGE.SHANNON.O.1365827920
Digitally signed by
BETTRIDGE.SHANNON.O.1365827920
Date: 2022.01.10 14:01:25 -05'00'

Shannon Bettridge
Chief, Marine Mammal and Sea Turtle Division,
Office of Protected Resources

LYNCH.PATRICK.1456951763
Digitally signed by
LYNCH.PATRICK.1456951763
Date: 2022.01.10 14:42:14 -05'00'

Patrick Lynch
Chief, Assessment and Monitoring Division,
Office of Science and Technology

Date: January 3, 2022

Subject: Evaluation of MMPA Stock Designation for the Hawai'i Distinct Population Segment of humpback whales (*Megaptera novaeangliae*), currently a part of the central North Pacific humpback whale stock.

Purpose: The National Marine Fisheries Service (NMFS) process for designating stocks under the Marine Mammal Protection Act (MMPA) is described in *Reviewing and Designating Stocks and Issuing Stock Assessment Reports under the Marine Mammal Protection Act* (NMFS 2019). In most cases, if sufficient evidence exists to delineate demographically independent populations

(DIPs), they should be designated as stocks and assessed as such in Stock Assessment Reports (SARs). As noted in NMFS (2019), in practice there may be some situations (anticipated to be relatively few) where it would be impractical, or there are insufficient data or analytical tools, to assess and manage a stock at the DIP level (see NMFS (2019) for examples). In addition, when distinct population segments (DPSs) have been established under the Endangered Species Act (ESA), it may be pragmatic to designate a stock comprising more than one DIP of a single DPS.

The purpose of this memorandum is to document the collective consideration by NMFS' Science Center, Regional Office, Office of Protected Resources (OPR), and Office of Science and Technology (OST) staff of how to designate humpback whale stocks relative to identified DIPs within the Hawai'i DPS defined under the ESA (81 FR 62259). In some cases, this may involve considering stock designation of "units" that have not been definitively delineated as DIPs. For example, when a newly delineated DIP from within an existing stock is being considered for stock designation, the remaining marine mammals in the stock may or may not be understood to constitute one or more DIPs depending on the available data and analyses.

Current Stock Designation(s): The current stock that most closely aligns with the unit and DIP under consideration is the Central North Pacific stock, which roughly aligns with the Hawai'i DPS. The winter distribution of the Central North Pacific stock is primarily in the Hawai'ian archipelago. In the Structure of Populations, Levels of Abundance and Status of Humpback whales (SPLASH) study (Calambokidis et al. 2008), sampling during the winter seasons of 2004, 2005, and 2006 occurred on Kauai, Oahu, Penguin Bank (off the southwest tip of the island of Molokai), Maui, and the island of Hawai'i (the Big Island). Interchange within Hawai'i was extensive. Although most of the Hawai'i identifications came from the Maui sub-area, identifications from the Big Island and Kauai at the eastern and western end of the region showed a high rate of interchange with Maui.

In summer, the majority of whales from the Central North Pacific stock are found in the Aleutian Islands, Bering Sea, Gulf of Alaska, and Southeast Alaska/northern British Columbia. High densities of humpback whales are found in the eastern Aleutian Islands, particularly along the northern side of Unalaska Island, and along the Bering Sea shelf edge and break to the north towards the Pribilof Islands. Small numbers of humpback whales are known from a few locations not sampled during the SPLASH study, including northern Bristol Bay and the Chukchi and Beaufort seas. In the Gulf of Alaska, high densities of humpback whales are found in the Shumagin Islands, south and east of Kodiak Island, and from the Barren Islands through Prince William Sound. Although densities in any particular location are not high, humpback whales are also found in deep waters south of the continental shelf from the eastern Aleutians through the Gulf of Alaska. Relatively high densities of humpback whales occur throughout much of Southeast Alaska and northern British Columbia.

Demographically Independent Populations/Units Under Consideration: Based on the best available data, as described in Wade et al. (2021), evidence suggests that the Hawai'i DPS contains at least two units: the Hawai'i-southeast Alaska/northern British Columbia DIP (Hawai'i-SEA/NBC DIP) and the Hawai'i-North Pacific unit (Hawai'i-NorPac unit). There are also a small number of whales that migrate between Hawai'i and Southern BC and Washington State. However, given their small numbers, they have not been described separately. The population structure for the DIPs/units that were described are summarized below.

Hawai'i-SEA/NBC DIP

Data from two strong lines of evidence (movements and genetics) suggest that the Hawai'i-SEA/NBC unit of whales (the whales that migrate between those locations) meet the definition of a DIP (Wade et al. 2021). SEA and NBC were significantly different in mtDNA from all other summer feeding areas except each other. There was also substantial interchange seen between those two areas from photographic identifications, and both areas have nearly identical winter migratory destinations, which are primarily Hawai'i with a small percentage migrating to Mexico, but none to other winter locations.

Hawai'i-NorPac unit

Movement data also show a strong migratory connection between Hawai'i and the other regions within Alaska, with relatively little interchange of individuals between areas, suggesting there may be multiple DIPs within the rest of Alaska. However, the currently available genetic data are not particularly useful because of the mixture of whales from the Mexico and Western North Pacific DPSs in the Alaska summer areas. Given that, for now, the group of whales that migrate between Russia, western Alaska (Bering Sea and Aleutian Islands), and central Alaska (Gulf of Alaska excluding Southeast Alaska), and Hawai'i can be referred to as the Hawai'i-Northern Pacific (NorPac) unit, with the understanding that it includes all humpback whales in Russia, the Bering Sea, the Aleutian Islands, and the Gulf of Alaska (excluding Southeast Alaska) that migrate to Hawai'i. The Hawai'i-NorPac unit may be a DIP, or (as mentioned above) a collection of DIPs that cannot be distinguished yet because the appropriate analyses and perhaps data are not yet available.

Relevant Regional Office(s), Science Center(s), and Headquarters Office(s): Alaska Regional Office (AKRO), Alaska Fisheries Science Center (AKRO), Pacific Islands Regional Office (PIRO), Pacific Islands Fisheries Science Center (PIFSC), OPR, and OST.

Process by which stock designation was considered: A working group consisting of staff from OPR, OST, Southwest Fisheries Science Center, Northwest Fisheries Science Center, AFSC, PIFSC, West Coast Regional Office, AKRO, and PIRO was convened to assess the available information on the populations of humpback whales in the north Pacific Ocean. A series of six discussions via virtual meeting platform were held from October 22, 2020 through August 24,

2021. Resulting from these discussions and intervening periods of drafting and revision are four NOAA Technical Memoranda that describe the available evidence to support the delineation of DIPs within four identified DPSs in the Pacific Ocean: the Western North Pacific, Hawai'i, Mexico, and Central America DPSs of humpback whales. These Technical Memoranda document the available evidence to delineate DIPs, following the DIP Delineation Handbook (Martien et al. 2019). They draw conclusions regarding the presence of DIPs that can be delineated at this time, and those potential DIPs that may exist within the DPSs but for which the available information is not sufficient or has not been analyzed in such a way as to support the delineation of further DIPs at this time.

Following the delineation of the Hawai'i-SEA/NBC DIP and the description of the Hawai'i-NorPac unit, a series of virtual meetings with representatives from AKRO, Alaska AKRO, PIRO, PIFSC, OPR, and OST were held between October and December 2021 to discuss stock designation recommendations relative to the two identified units. These meetings and discussions form the bases of this Memorandum to the Record.

Questions to Consider for Stock Designation (from NMFS (2019), Section B):

1. Is it feasible to manage each DIP/unit being considered as a single stock? For example:
 - a. Is there an abundance estimate for each DIP/unit that could be used for calculating the PBR level?

Yes. However, there are several limitations to the available abundance estimates for Alaskan waters. There is an abundance estimate for Hawai'i expected to be finalized and published soon. We do have estimates for subsections of SEA/NBC. However, these vary in the geographic range, method (mark-recapture versus density estimates) and the timeframe in which the data were collected. Furthermore, all of the estimates that we have for SEA from SPLASH data come from the Wade papers (Wade et al. 2016, Wade 2017, and Wade 2021) and are old (2004-2006). These estimates use the same data inputs, though have differences in the way the models were run that impact the way survival is handled (estimated or fixed) and other modeling parameters. The most important parameters for management of whales that winter in Hawai'i had broad variability between model and report version iterations. These variations are particularly dramatic for southeast Alaska and AI/BS. However, this level of variation between model iteration is not as prevalent for other areas in the Wade analyses suggesting that those estimates may be more robust and more reliable for management of humpback whales in other areas.

- b. Is there a way to attribute takes to each DIP/unit other than allocating each take to all possible DIPs in the area?

In summering areas, yes, however this would be more difficult and less reliable in wintering areas.

Takes of the Hawai'i DPS in Alaska could be assigned to the DIP or unit simply based on the location of the take report because they do not overlap geographically in the feeding areas. The greater challenge is with assigning takes between DPSs in Alaska (i.e., determining take to be of the Hawai'i DPS in the first place). Takes in Hawai'i would be more complicated and difficult to allocate because there is no known spatial structuring in the wintering area and there is no way to distinguish whale DIPs/units in Hawai'i without identifying a specific individual with a known summering destination (e.g., from sighting history or genetic recapture data). While this might be possible in some cases, such as stranding, it is far less likely for other take reports, such as for fisheries interactions. Therefore, the only information we have are the probabilities of movement from Wade (2021) that uses older SPLASH data. These could be used as a proration/apportioning basis between the DIPs/units, acknowledging that they are from older data.

Both the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit spatially overlap with at least one other DIP or unit from another DPS on summer feeding areas. Regardless of whether the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit are managed as separate stocks or together as a single stock, takes on the summer feeding areas will need to be apportioned to all applicable DIPs/units. The apportioning would be informed by Wade's (2021) movement probabilities.

c. Are there any other potential analytical or practical barriers that would limit our ability to manage each DIP/unit?

Yes. There is no current estimate of abundance for the Hawai'i-NorPac unit and it would be challenging to estimate one with the data currently available. In addition, there is no recent estimate of the ratio of each DIP/unit in Hawai'i that would allow us to confidently apportion take from this area or extrapolate the wintering abundance estimates to the summering areas. The best available data are from 2004-2006. Finally, there is no information on the spatial distribution (if any) between the DIP/unit in Hawai'ian waters.

2. Is there a reason to believe that human-caused serious injury/mortality or threats differ significantly between DIPs/units in the area?

No. There is no indication of threats differing between the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit. Both units face threats of human-caused M/SI from entanglements in

fishing gear and other non-fishing gear suspended in the water and from vessel strike. The probability of a specific threat may vary subtly between subregions within Alaska due to variation in fishing and other human activity and/or whale concentration, but is unlikely to vary significantly between the DIPs/units as a whole. For example, northern southeast Alaska has more overlap in humpback whale distribution and salmon drift gillnet fishing than other areas in Alaska. However, there are gillnet fisheries throughout the State and humpback whales face risk of gillnet entanglement in several fisheries in other parts of Alaska. Likewise, there are areas in the Bering Sea and Aleutian Islands that have more fishing-associated vertical lines in the water than other parts of Alaska, but this threat exists throughout all of Alaskan waters.

Further, both the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit are affected by broad oceanographic conditions that impact prey availability and we have no reason to believe that these impacts are focused in one unit or the other. For example, during the 2014-2016 marine heat wave in the Gulf of Alaska, prey was affected and humpback whale numbers and distribution were impacted (Neilson and Gabriele 2021; NMFS unpublished data). This was documented most thoroughly in Glacier Bay National Park and Preserve (summer grounds for the Hawai'i-SEA/NBC DIP) and Prince William Sound (summer ground for the Hawai'i-NorPac unit).

Because both the DIP and unit share a wintering area in Hawai'i, and we have no indication that there is any segregation between them in Hawai'ian waters, the human-caused threats are the same for both the DIP and unit in the wintering area.

3. What are the conservation and management benefits and risks of managing each DIP/unit as individual stocks versus together as a single stock?

The Hawai'i DPS of humpback whales was found to not warrant listing under the ESA and as such, there are overall fewer management concerns as compared to some of the other humpback DPSs that are listed (e.g., Mexico DPS). Further, we have no indication of varied threat levels between the DIP/unit. We do not have reason to suspect that evaluating risks at a finer scale would bring conservation benefits. However, as data allow, DIP/unit-specific data can be provided in the SAR and used to track any unforeseen issues that could be disproportionately affecting a DIP/unit within the stock. Also important to note is that the estimated proportions indicate that the Hawai'i-SEA/NBC DIP within the DPS consists of the majority of the overall DPS abundance. This suggests that there are not likely to be DIP-level issues/threats that are being masked by a larger management unit that includes the remaining portion.

4. Have DPSs for the species to which the DIPs/units belong been recognized under the ESA? (note from NMFS (2019): NMFS should align stock designations with DPSs established under

the ESA unless there is compelling reason not to. For species that are listed under the ESA, only DIPs/units from the same ESA-listed DPS should be combined.)

Yes. The Hawai'i DPS was identified during the recent revised listing of humpback whales and it did not warrant listing.

5. Do members of the DIP/unit overlap in space and time with members of at least one other DIP/unit of the same species? For migratory marine mammals, the evaluation should focus on overlap in the breeding ground(s). In cases where DPSs have been established under the ESA, the same species here refers to all animals within a single DPS.

In Hawai'i, the two DIP/units overlap, and no data to date have shown use of distinct areas by the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit in the Hawai'ian Islands. There are no DIPs/units from other DPSs that occur in Hawai'i. However, for humpback whale DPSs, maternal fidelity to summer feeding grounds, and fidelity to those same areas by subsequent generations, is a strong basis for DIP delineations. Because interbreeding on the wintering ground only results in the exchange of genetic material between the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit, not the exchange of animals, it has no impact on the demography of either DIP/unit. Thus, overlap with other animals from the Hawai'i DPS on the wintering ground is not treated as compelling to the DIP question. In Alaska, the Hawai'i-SEA/NBC DIP and the Hawai'i-NorPac unit have low levels of exchange between one another and overlap with whales from other DPSs throughout Alaskan waters.

Conclusion: The Hawai'ian wintering area consists of at least two DIPs. One DIP (Hawai'i-SEA/NBC) and one unit (Hawai'i-NorPac) have been described. After careful analysis, we could not establish any conservation and management benefits to designating the DIP and unit as separate stocks under the MMPA. Therefore, we recommend that the Hawai'i DPS whales be designated as one analogous stock under the MMPA. Designating the Hawai'i DPS as a single stock is pragmatic and allows for a more consistent approach between the ESA and MMPA by having the stock under the MMPA being the same as the DPS under the ESA for post-delisting monitoring. As further information and analyses become available in the future, this stock designation recommendation may be revisited. Official stock designation decisions are made by the NMFS' Assistant Administrator in final stock assessment reports, following publication of the draft stock assessment reports and consideration of public comment.

References:

Calambokidis, J., Falcone, E.A., Quinn, T.J., Burdin, A.M, Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D.K., RojasBracho, L., Straley, J.M., Taylor, B.L., Urbán, J. Weller, D., Witteveen, B.H., Yamaguchi, M. Bendlin, A., Camacho, D., Flynn, K., Havron, A., Huggins, J., and Maloney, N. 2008. SPLASH: Structure of populations,

- levels of abundance and status of humpback whales in the north Pacific. Cascadia Research. Final report for contract AB133F-03-RP-00078. 57 pp.
- Martien, K.K., Lang, A.R., Taylor, B.L., Rosel, P.E., Simmons, S.E., Oleson, E.M., Boveng, P.L., and Hanson, M.B. 2019. The DIP delineation handbook: A guide to using multiple lines of evidence to delineate demographically independent populations of marine mammals. NOAA Technical Memorandum, NMFS-SWFSC-622.
- Neilson, J.L., and Gabriele, C.M. 2021. Glacier Bay and Icy Strait humpback whale population monitoring: 2020 Update. National Park Service Resource Brief, Gustavus, Alaska.
- NMFS. 2019. Reviewing and designating stocks and issuing stock assessment reports under the Marine Mammal Protection Act. National Marine Fisheries Service Procedure 02-204-03.
- NMFS. Principal Investigators: John Moran and Jan Straley. (*unpublished data*) Long-term monitoring of humpback whale predation on Pacific herring in Prince William Sound. Funded by Exxon Valdez Oil Spill Trustee Council- 21120114-O. Summary available at: <https://gulfwatchalaska.org/monitoring/pelagic-ecosystem/humpback-whales/>
- Wade, P.R., Quinn, T.J., Barlow, J., Baker, C.S., Burden, A.M., Calambokidis, J., Clapham, P.J., Falcone, E.A., Ford, J.K.B., Gabriele, C.M., Mattila, D.K., Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urbán, J., Weller, D., Witteveen, B.H., and Yamaguchi, M. 2016. Estimates of abundance and migratory destination for north Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/66b/IA21.
- Wade, P.R. 2017. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas – revision of estimates in SC/66b/IA21. International Whaling Commission Report SC/A17/NP/11.
- Wade, P. R. 2021. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas. International Whaling Commission Report SC/68c/IA/03.

Attachments:

- Wade, P. R., Oleson, E.M., N. C. Young, N.C. 2021. Evaluation of Hawaiian Distinct Population Segment of Humpback Whales as units under the Marine Mammal Protection Act. NOAA-TM-NMFS-AFSC-430, 31 p.

National Marine Fisheries Service Memorandum for the Record:
*Management Considerations in Designating Demographically Independent Populations as
Stocks under the Marine Mammal Protection Act*

Memo to Record

To: The Record

From: GARRETT.ANN
Ann Garrett .M.1365883323
Assistant Regional Administrator, Protected Resources Division,
Pacific Islands Region

LITTNAN.CHARLE
Charles Littnan S.L.JR.1100552074
Director, Protected Species Division
Pacific Islands Fisheries Science Center

KURLAND.JONATHAN.M.1365896514
Jon Kurland AN.M.1365896514
Assistant Regional Administrator, Protected Resources Division,
Alaska Region

BENGTSON.JOHN.L.1365857675
John L. Bengtson N.L.1365857675
Director, Marine Mammal Laboratory
Alaska Fisheries Science Center

BETRIDGE.SHANNON.O
Shannon Bettridge M.1365827920
Chief, Marine Mammal and Sea Turtle Division,
Office of Protected Resources

LYNCH.PATRICK.DANIEL.1456951763
Patrick Lynch ANIEL.1456951763
Chief, Assessment and Monitoring Division,
Office of Science and Technology

Date: February 28, 2022

Subject: Evaluation of MMPA Stock Designation for the Philippines/Okinawa-Northern Pacific and the Mariana/Ogasawara-North Pacific Units within the Existing Western North Pacific Stock/Distinct Population Segment of humpback whales (*Megaptera novaeangliae*).

Purpose: The National Marine Fisheries Service (NMFS) process for designating stocks under the Marine Mammal Protection Act (MMPA) is described in *Reviewing and Designating Stocks and Issuing Stock Assessment Reports under the Marine Mammal Protection Act* (NMFS 2019). In most cases, if sufficient evidence exists to delineate demographically independent populations (DIPs), they should be designated as stocks and assessed as such in Stock Assessment Reports

(SARs). As noted in NMFS (2019), in practice there may be some situations (anticipated to be relatively few) where it would be impractical, or there are insufficient data or analytical tools, to assess and manage a stock at the DIP level (see NMFS (2019) for examples). In addition, when distinct population segments (DPSs) have been established under the Endangered Species Act (ESA), it may be pragmatic to designate a stock comprising more than one DIP of a single DPS.

The purpose of this memorandum is to document the collective consideration by NMFS' Science Centers, Regional Offices, Office of Protected Resources (OPR), and Office of Science and Technology (OST) staff of how to designate humpback whale stocks relative to identified units within Western North Pacific (WNP) DPS defined under the ESA (81 FR 62259). In some cases, this may involve considering stock designation of "units" that have not been definitively delineated as DIPs. For example, when a newly delineated DIP from within an existing stock is being considered for stock designation, the remaining marine mammals in the stock may or may not be understood to constitute one or more DIPs depending on the available data and analyses. In the case of the WNP DPS, this involves considering stock designation of at least two "units" that have not been definitively delineated as DIPs.

Current Stock Designation(s): Currently, the MMPA and ESA both identify a single WNP stock and DPS, respectively, mostly comprising the same humpback whales. Under the MMPA designation, the WNP stock is described as consisting of breeding/winter populations off Asia that migrate primarily to Russia and the Bering Sea/Aleutian Islands for feeding/summering (Muto et al. 2021). Under the ESA, the WNP DPS is described as those 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), transit the Ogasawara area, or feed in the North Pacific Ocean, primarily in the Western Bering Sea, and off the Russian coast and the Aleutian Islands (50 CFR 224.101(h)).

Demographically Independent Populations/Units Under Consideration: The 2015 Humpback whale status review identified two putative DPSs in the WNP region, the Okinawa/Philippines DPS and the "Second West Pacific DPS," which has an unknown breeding location, based on sightings in the Aleutian Island feeding grounds not linked to other breeding populations (Bettridge et al. 2015). However, given the uncertainty about the location of the other breeding grounds, and the potential use of a common migratory corridor or route by the known group and the unknown group, these groups do not meet the criteria for recognizing a DPS under the ESA (*See* 61 FR 4722, February 7, 1996) and were ultimately combined into a single WNP DPS in the final ESA listing of humpback whales in 2016 (81 FR 62260, September 8, 2016).

NMFS evaluated the WNP DPS and found strong evidence that it comprises multiple DIPs (Oleson et al. 2022). At present two units can be defined that generally correspond to the two

putative DPSs identified in the 2015 status review: the Phil/OK-NorthPac unit that winters near the Philippines and Okinawa and summers primarily off the Russian mainland, and the Mariana/Ogasawara-NPac unit that winters off the Mariana Archipelago and other unidentified areas and summers off the Commander Islands and other feeding grounds off the Russian coast in the Bering Sea. Further units or DIPs within these two units may exist, but evidence is not sufficient at this point to further refine the structure.

Relevant Regional Office(s), Science Center(s), and Headquarters Office(s): Pacific Islands Regional Office (PIRO), Pacific Islands Fisheries Science Center (PIFSC), Alaska Regional Office (AKRO), Alaska Fisheries Science Center (AFSC), OPR, and OST.

Process by which stock designation was considered: A working group consisting of staff from OPR, OST, Southwest Fisheries Science Center (SWFSC), Northwest Fisheries Science Center, AFSC, PIFSC, West Coast Regional Office (WCRO), AKRO, and PIRO was convened to assess the available information on the populations of humpback whales in the north Pacific Ocean. A series of six discussions via virtual meeting platform were held from October 22, 2020 through August 24, 2021. Resulting from these discussions and intervening periods of drafting and revision are four NOAA Technical Memoranda that describe the available evidence to support the delineation of DIPs within four identified DPSs in the North Pacific Ocean: the Western North Pacific, Hawai'i, Mexico, and Central America DPSs of humpback whales. These Technical Memoranda document the available evidence to delineate DIPs, following the DIP Delineation Handbook (Martien et al. 2019). They draw conclusions regarding the presence of DIPs that can be delineated at this time, and those potential DIPs that may exist within the DPSs but for which the available information is not sufficient or has not been analyzed in such a way as to support the delineation of further DIPs at this time. In the case of the WNP DPS, two units have been identified that have not yet been delineated as DIPs.

Following the description of the Phil/OK-NorthPac and the Mariana/Ogasawara-NPac units, a series of virtual meetings with representatives from PIFSC, PIRO, AFSC, AKRO, OPR, and OST were held between October and December 2021 to discuss stock designation recommendations relative to the two identified units. These meetings and discussions form the bases of this Memorandum to the Record.

Questions to Consider for Stock Designation (from NMFS (2019), Section B):

1. Is it feasible to manage each DIP/unit being considered as a single stock? For example:
 - a. Is there an abundance estimate for each DIP/unit that could be used for calculating the PBR level?
 - b. Is there a way to attribute takes to each DIP/unit other than allocating each take to all possible DIPs in the area?

- c. Are there any other potential analytical or practical barriers that would limit our ability to manage each DIP/unit?

Given the lack of data on distribution and movements of the two identified units within the DPS, as well as lack of current abundance estimates for either unit, it would be very challenging to effectively manage the units as separate stocks at this time.

- a. The stock assessment for WNP humpback whales presently uses the estimates generated from the Structure of Populations, Levels of Abundance and Status of Humpback whales (SPLASH) study (Calambokidis et al. 2008) dataset, collected in 2004-2006. Data collection during SPLASH focused on Asian wintering areas and Russian feeding areas, and as such, represent only a portion of the known range of this DPS. In particular, those whales now known to occur in the Mariana Archipelago were not surveyed during SPLASH. Several ongoing collaborations may soon provide more recent and comprehensive abundance estimates for Japanese and Philippines waters, and these estimates could be used to formulate an estimate for the Phil/OK-NorthPac unit. Significant additional survey effort within the Mariana Archipelago is required to develop a reliable abundance estimate for that wintering area, though abundance estimates for Ogasawara may serve as a reasonable Nmin for the Mariana/Ogasawara-NPac unit if whales from the Philippines-Okinawa unit can be accounted for.
 - b. It may be possible to attribute take to units depending on where the take occurred. Proration approaches could be used for apportioning take in those regions used by both units. If take occurred in the wintering areas, attributing take to the impacted unit would likely be possible given that the two units primarily use separate wintering areas. There are few reliable reporting mechanisms for fisheries interactions with cetaceans in the Mariana Archipelago and elsewhere in the broader WNP, such that take in this wintering area will be under-reported whether the units are managed together or separately. If take occurred in transit areas, identifying the affected unit could be challenging given the common migratory pathway of the units past Ogasawara, and the unknown migratory corridor or routes for the units between Japan and the feeding areas. If take occurred in the feeding area, it would need to be prorated between the units based on the take location and movement rates between the feeding and wintering areas, data that are presently not available for the full DPS.
 - c. Additional analytical and practical barriers include determining abundance for the Mariana/Ogasawara-NPac unit in particular, given challenges in accessing the area during the winter months when the whales are present and our incomplete understanding of distribution/range of the units.
2. Is there a reason to believe that human-caused serious injury/mortality or threats differ significantly between DIPs/units in the area?

Human-caused injury and mortality for the units is likely similar in U.S. and Russian summer/feeding areas, as the feeding ranges and human activities in those areas are similar and physically close enough that fishery threats are likely similar. In the wintering areas, the scale of human-caused injury and mortality may differ. The Phil/OK-NorthPac wintering areas overlap with more populated areas and so threats from fishery interactions, entanglements, ocean noise, vessel strike, etc. are likely higher. The Mariana/Ogasawara-NPac unit winters in relatively more remote areas, so the same threats may exist, but likely on a lesser scale.

3. What are the conservation and management benefits and risks of managing each DIP/unit as individual stocks versus together as a single stock?

The WNP DPS is listed as endangered under the ESA, which conveys “strategic” status on the stock(s) under the MMPA. Splitting the current WNP stock, which consists of animals from the WNP DPS, into two stocks under the MMPA might allow more focused management under the MMPA on the unit that occurs predominantly in U.S. waters (the Mariana/Ogasawara-NPac unit). However, lack of data on distribution and movement of the DPS, stock, and individual units and uncertainty on the percentage of time individuals from each unit spend in U.S. waters presents a significant challenge for managing the two units as separate stocks. We presently do not have unit-level abundance estimates. In particular there is difficulty in obtaining abundance for the Mariana/Ogasawara-NPac unit, though in future years obtaining PBR for this unit may be possible. The DPS-wide estimate is also incomplete as it accounts only for those animals in the surveyed Russian, Japan, and Philippines areas during SPLASH. Given the lack of information and great amount of uncertainty on this DPS, there is no clear conservation benefit to splitting the WNP stock into two stocks at this time. Research partnerships and international collaborations on this DPS are still evolving, which will better inform potential future splitting of the WNP stock as appropriate.

4. Have DPSs for the species to which the DIPs/units belong been recognized under the ESA? (note from NMFS (2019): NMFS should align stock designations with DPSs established under the ESA unless there is compelling reason not to. For species that are listed under the ESA, only DIPs/units from the same ESA-listed DPS should be combined.)

Yes, the WNP DPS of humpback whales is listed as endangered under the ESA.

5. Do members of the DIP/unit overlap in space and time with members of at least one other DIP/unit of the same species? For migratory marine mammals, the evaluation should focus on overlap in the breeding ground(s). In cases where DPSs have been established under the ESA, the same species here refers to all animals within a single DPS.

The Phil/OK-NorthPac unit and the Mariana/Ogasawara-NPac unit overlap spatially during seasonal migrations. The Mariana/Ogasawara-NPac unit overlaps to some extent with the Hawaii and Mexico DPSs in the summer/feeding areas in the Aleutians and Bering Sea and around the Commander Islands and Russian coast. The Phil/OK-NorthPac unit also has some overlap, primarily with the Mexico-NPac unit in the summer/feeding areas. Available data suggest the wintering areas of the two units are discrete, though the full range of both wintering and summering areas is presently unknown, as is the amount of time spent in U.S. waters.

Conclusion: The available data suggest there are at least two units within the WNP stock, which consist of animals from the WNP DPS. However, much is still unknown about this stock. While international partnerships and collaborations have grown significantly in recent years, and are increasingly providing new information on this stock, at this time there is no clear conservation benefit to splitting the WNP stock and DPS into two MMPA stocks, one composed of the Phil/OK-NorthPac unit and the other of the Mariana/Ogasawara-NPac unit. Furthermore, designating multiple stocks within the WNP stock and DPS based on the available, limited data, when data currently being gathered will almost certainly shed more light on population structure, would be premature, and could potentially limit our ability to manage the DPS and stocks appropriately. Uncertainty on the percentage of time individuals from the respective units spend in U.S. waters would present a challenge for management efforts if the WNP stock were split into multiple stocks. In addition, while the current abundance estimate for the entire WNP DPS is based on relatively old and incomplete data, without unit-level abundance estimates, Nmin, or PBR, our management of the units and the DPS as a whole would be hindered if the stock were split into two stocks. Finally, we have no reason to believe the two units face different threats in summer/feeding areas, and we have very little data on human-caused mortality and serious injury in their wintering areas. Thus, splitting the WNP stock and DPS into two MMPA stocks would not provide a conservation benefit at this time in this regard. Because of these factors, at this time, we do not find a management or conservation benefit to managing each unit as a separate stock. As further information and analyses become available in the future, these stock designation recommendations may be revisited. Official stock designation decisions are made by the NMFS' Assistant Administrator in final stock assessment reports, following publication of the draft stock assessment reports and consideration of public comment.

References:

- Bettridge, S., Baker, C.S., Barlow, J., Clapham, P.J., Ford, M., Gouveia, D., Mattila, D.K., Pace III, R.M., Rosel, P.E., Silber, G.K. and Wade, P.R. 2015. Status review of the humpback whale (*Megaptera novaeangliae*) under the Endangered Species Act. NOAA Technical Memorandum, NMFS-SWFSC-540.
- Muto, M. M., Helker, V.T., Delean, B.J., Young, N.C., Freed, J.C., Angliss, R.P., Friday, N.A., Boveng, P.L, Breiwick, J.M., Brost, B.M., Cameron, M.F., Clapham, P.J., Crance, J.L., Dahle, S.P., Dahlheim, M.E., Fadely, B.S., Ferguson, M.C., Fritz, L.W., Goetz, K.T., Hobbs, R.C., Ivashchenko, Y.V., Kennedy, A.S., London, J.M., Mizroch, S.A., Ream,

R.R., Richmond, E.L., Sheldon, K.E.W., Sweeney, K.L., Towell, R.G., Wade, P.W., Waite, J.M., Zerbini, A.N. 2021. Alaska marine mammal stock assessments, 2020. NOAA Technical Memorandum, NMFS-AFSC-421.

Martien, K.K., Lang, A.R., Taylor, B.L., Rosel, P.E., Simmons, S.E., Oleson, E.M., Boveng, P.L., and Hanson, M.B. 2019. The DIP delineation handbook: A guide to using multiple lines of evidence to delineate demographically independent populations of marine mammals. NOAA Technical Memorandum, NMFS-SWFSC-622.

Attachments:

Oleson, E.M., Wade, P.R., Young, N.C.. 2022. Evaluation of the western North Pacific distinct population segment of humpback whales as units under the Marine Mammal Protection Act. NOAA Technical Memorandum, NMFS-PIFSC-124.