UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, CA 90802-4213

November 8, 2023

Refer to NMFS No:
WCR-2023-02544

Trevor R. Spradlin
Deputy Chief
Marine Mammal and Sea Turtle Conservation Division
Office of Protected Resources

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter for the National Marine Fisheries Service's Proposed Issuance of a Waiver under the Marine Mammal Protection Act to the Makah Tribe and Related Actions

Dear Mr. Spradlin:

On February 21, 2023, the National Marine Fisheries Service (NMFS), West Coast Region (WCR), received a request pursuant to section 7(a)(2) of the Endangered Species Act (ESA) from NMFS's Office of Protected Resources regarding the proposed issuance of a waiver under section 101(a) of the Marine Mammal Protection Act (MMPA) to the Makah Tribe to resume a limited ceremonial and subsistence hunt of Eastern North Pacific (ENP) gray whales (*Eschrichtius robustus*) in the coastal portion of their usual and accustomed (U&A) hunting areas. In their February 21, 2023, request for consultation, NMFS's Office of Protected Resources initially determined that the proposed action may affect the Western North Pacific (WNP) distinct population segment (DPS) of gray whales, which are listed as endangered under the ESA, but did not explicitly determine whether the proposed action was not likely to adversely affect or likely to adversely affect the WNP DPS of gray whales. On September 29, 2023, NMFS's WCR received a revised request for consultation from NMFS's Office of Protected Resources. In that letter, based on further review and analysis, NMFS's Office of Protected Resources revised their request for consultation to clarify the determination that the proposed action may affect but is not likely to adversely affect any ESA-listed species, including the WNP DPS of gray whales, or critical habitat under NMFS' jurisdiction, and requested NMFS's WCR concurrence on this determination. In that letter, NMFS's Office of Protected Resources also clarified that their request for consultation includes promulgating regulations under section 103 of the MMPA, issuing permits governing the hunt over the course of the waiver period under section 104 of the MMPA, and entering into a cooperative agreement with the Tribe under the Whaling Convention Act, if the waiver is granted.

This response to your request was prepared by NMFS WCR pursuant to section 7(a)(2) of the ESA and implementing regulations at 50 CFR 402. On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary

remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the letter of concurrence would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be different.

We have determined--pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence—that all effects of the proposed action are insignificant or discountable, and therefore not likely to adversely affect (NLAA) humpback whale – Mexico DPS (*Megaptera novaeangliae*), humpback whale – Central America DPS (*M. novaeangliae*), fin whale (*B. physalus*), blue whale (*Balaenoptera musculus*), north Pacific right whale (*Eubalaena japonica*), sei whale (*B. borealis*), sperm whale (*Physeter macrocephalus*), Southern Resident killer whale DPS (*Orcinus orca*), Gray whale – western north Pacific DPS (*Eschrichtius robustus*), Guadalupe fur seal, (*Arctocephalus townsendi*), leatherback sea turtle – Pacific DPS (*Dermochelys coriacea*), green sea turtle – east Pacific DPS (*Chelonia mydas*), loggerhead sea turtle – north Pacific DPS, (*Caretta caretta*), olive ridley sea turtle (*Lepidochelys olivacea*), Puget Sound steelhead evolutionarily significant unit (ESU) (*Oncorhynchus mykiss*), upper Columbia River steelhead DPS (*O. mykiss*), middle Columbia River steelhead DPS (*O. mykiss*), lower Columbia River steelhead DPS (*O. mykiss*), Snake River steelhead DPS (*O. mykiss*), upper Willamette River steelhead DPS (*O. mykiss*), Snake River sockeye salmon ESU (*O. nerka*), Ozette Lake sockeye salmon evolutionarily significant unit (ESU) (*O. nerka*), Puget Sound Chinook salmon ESU (*O. tshawytscha*), lower Columbia River Chinook salmon ESU (*O. tshawytscha*), upper Columbia River spring-run Chinook salmon ESU (*O. tshawytscha*), Snake River fall-run Chinook salmon ESU (*O. tshawytscha*), upper Willamette River Chinook salmon ESU (*O. tshawytscha*), Hood Canal summer-run chum salmon ESU (*O. keta*), Columbia River chum salmon ESU (*O. keta*), lower Columbia River coho salmon ESU (*O. kisutch*), southern DPS of eulachon(*Thaleichthys pacificus*), southern DPS of green sturgeon(*Acipenser medirostris*), Puget Sound/Georgia Basin DPS of yelloweye rockfish (*Sebastes ruberrimus*), or Puget Sound/Georgia Basin DPS of bocaccio (*S. paucispinis*), listed as threatened or endangered under the ESA.

NMFS WCR also concludes that all effects of the action are insignificant or discountable, and therefore are NLAA designated critical habitat for humpback whale – Mexico DPS, humpback whale – Central America DPS, Southern Resident killer whale DPS, leatherback sea turtle – Pacific DPS, and the southern DPS of green sturgeon.

NMFS WCR also reviewed the proposed action for potential effects on EFH designated under the MSA (16 U.S.C.1855(b). This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. In this case, NMFS concluded that the action would not adversely affect any EFH. Thus, consultation under the MSA is not required for this action.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the Environmental Consultation Organizer

[https://eco.fisheries.noaa.gov]. A complete record of this consultation is on file at NMFS Protected Resources Division Office, Portland, Oregon.

Background

In 2005, the Makah Indian Tribe requested that NMFS waive the MMPA moratorium on taking marine mammals to allow the Tribe to resume limited hunting of ENP gray whales for ceremonial and subsistence purposes. ENP gray whales were removed from the ESA's list of threatened and endangered species in 1994 after their population rebounded, but remain subject to the MMPA. This request stems from the 1855 Treaty of Neah Bay, which expressly secures the Tribe's right to hunt whales. To authorize Makah gray whale hunting, NMFS must waive the MMPA take moratorium (MMPA § 101(a)(1)(A)), promulgate regulations governing a hunt (MMPA § 103), issue permits (MMPA § 104), and comply with provisions governing aboriginal subsistence whaling under the Whaling Convention Act (16 USC 916 *et seq.*) (WCA).

In 2019, NMFS published a proposed waiver and regulations (84 FR 13604, April 5, 2019) that would allow the Tribe to carry out limited hunting of ENP gray whales for a 10-year period. Waiving the MMPA's moratorium requires formal rulemaking. NMFS convened a hearing on the proposed waiver and regulations, which was held before an Administrative Law Judge (ALJ) in November 2019. On September 23, 2021, the ALJ issued a Recommended Decision, recommending that NMFS issue a waiver and promulgate the proposed regulations, incorporating certain modifications described in the ALJ's Recommended Decision.

Proposed Action

The proposed action described herein is based on NMFS's proposed regulations to govern an ENP gray whale ceremonial and subsistence hunt (84 FR 13604) as modified by the ALJ's September 23, 2021 Recommended Decision, Appendix B (*In re*: Proposed Waiver and Regulations Governing the Taking of Eastern North Pacific Gray Whales by the Makah Tribe, Docket No. 19-NMFS-0001). Under the proposed action, NMFS would issue a waiver and regulations allowing the Makah Tribe to apply for and obtain hunt permits to resume a limited ceremonial and subsistence hunt of ENP gray whales in the coastal portion of their U&A fishing grounds (Figure 1). In addition to waiving the MMPA's take moratorium and promulgating regulations to govern a hunt, the proposed action includes issuing hunt permits to the Tribe and entering into a cooperative agreement with the Tribe under the Whaling Convention Act (16 USC 916 *et seq.*; 50 CFR Part 230).

Description of Hunt and Training Activities

The proposed hunt regulations in the ALJ's Recommended Decision would allow up to 25 ENP gray whales to be struck and 20 to be harvested (i.e., killed and landed) over the 10-year waiver period, with no more than two or three whales killed in a given season. NMFS has adopted the International Whaling Commission's definition of the term 'strike'. A 'strike' is defined as to penetrate with a weapon used for whaling, in this case a harpoon. Unsuccessful strike attempts are defined as the action of throwing a harpoon at a whale without penetrating the skin. The activities also include approaches (i.e., causing a hunting or training vessel to be within 100 yards of a gray whale) to whales during the hunt and hunt training. The training is an important component of the action to ensure the hunt is safe, humane, and efficient. Tribal whalers would be subject to specific training

and certification processes. Training vessels are defined as those not carrying hunting weapons; training approaches as those made by training vessels; and a training harpoon throw as the use of a blunted spear-like device that is incapable of penetrating a whale's skin.

Hunting and training specifications:

- During winter/spring hunts (December 1 - May 31), a maximum of three whales may be struck regardless of whether or not they are landed. During summer/fall hunts (July1 – October 31), a maximum of two whales may be struck but only if the first whale is lost (i.e., struck but not landed).
- During winter/spring hunts, the Tribe could only strike one whale in a 24-hour period as a precaution against striking multiple Western North Pacific (WNP) gray whales that might be traveling together in a group. In the very unlikely event the Tribe struck a WNP whale, all hunting would cease unless and until NMFS determined that measures were taken to ensure that no additional WNP gray whales would be struck during the remainder of the waiver period.
- No more than 16 whales from the Pacific Coast Feeding Group (PCFG)[1] may be struck over the 10-year waiver period, and no more than eight of these whales can be females.
- Hunting would be prohibited if the current or forecasted abundance of the PCFG falls below 192 whales, or if its minimum abundance falls below 171 whales. Hunting could resume once the most recent or forecasted abundance, and minimum abundance, increase above their respective thresholds.
- Based on the ALJ's recommendation and under the preferred alternative in the draft supplemental environmental impact statement, we evaluated three thresholds for the ENP population abundance below which a hunt would not be permitted. We also evaluated the alternative without including a low abundance threshold. To be conservative, our evaluation here considers the hunt without an ENP low abundance threshold.
- Limits would be set on the number of approaches and unsuccessful strike attempts, including those associated with training activities as follows: no more than 353 ENP gray whales approached each calendar year, of which no more than 142 could be from the PCFG.
- Training activities (approaches and training harpoon throws) could occur in any month in winter/spring hunt years and during the hunt season in summer/fall hunt years (July through October). Training harpoon throws are counted against the unsuccessful strike attempt limit.
- Prohibitions would include clear restrictions on striking or approaching a calf or any whale accompanied by a calf.

While the proposed hunt regulations do not specify the type of vessels the Makah Tribe could use for hunt activities, the Tribe's request for a waiver stated that the Tribe would use both traditional and

[1] A feeding aggregation of the ENP stock known as the "Pacific Coast Feeding Group" (PCFG) may also be taken during a hunt, and because NMFS has determined that the PCFG may warrant consideration as a stock in the future (Carretta et al., 2017).

modern methods for hunting whales to balance the preservation of traditional cultural methods with safety and the need for increased hunting efficiency. The Tribe's request includes hunting whales from one or two sea-going canoes that are at least 30 ft. Each canoe would be manned by an eight-person whaling crew, and would include a harpooner and paddlers. One or more chase boats would accompany the canoes and either the canoe or chase boat would carry the whaling captain. Each chase boat would be manned by a pilot, diver, rifleman, backup harpooner, and at least one other crew member serving as a safety officer. Each chase boat would be equipped with a navigation system capable of fixing the vessel's position on the water. If neither chase boat had an engine capable of safely towing an adult gray whale to shore, there would be an additional vessel with that capability.

Primary hunting weapons (toggle-point harpoons) are those used to initially strike and secure (and potentially kill) the whale. The harpooner would use one or more harpoons to make the first strike on the gray whale. When the harpoon is thrust into a whale, the point twists horizontally (toggles) under the animal's skin. Each harpoon would be secured to a rope with float(s) attached. Pulling on the attached line secures the harpoon to the whale. If a harpoon strikes and affixes the toggle point and floats to the whale with the harpoon line attached, the rifle operator in the chase boat would shoot it at close range with a high-powered, .50-caliber rifle with the intent of killing the whale with a shot to its central nervous system. A diver would attempt to sew the dead whale's mouth shut to prevent the whale from sinking.

For the 10-year waiver period, there would be up to five winter/spring hunting seasons and five summer/fall hunting seasons. Ocean and weather conditions impact the number of days during which hunt-related activities may take place. Based on the analysis in in the draft environmental impact statement (DEIS) (NMFS 2015) and the supplemental draft environmental impact statement (SDEIS) (NMFS 2022), this amounts to up to 300 days of hunting and hunting-related activities in winter/spring hunts (60 hunting days per year times 5 years) and up to 70 days of hunting-related activities in summer/fall hunts (14 hunting days per year times 5 years) during the waiver period. This results in an average of 37 hunting days per year over the 10-year waiver period. As described in the DEIS (NMFS 2015) and the SDEIS (NMFS 2022) there would be 16 rifle shots for each harvested whale. Therefore, we estimate that the Tribe would fire up to 48 shots fired in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season.

Following a successful kill, the whaling crew would secure the whale with a line and tow it to a beach (mostly likely on the Makah Reservation), where tribal members could participate in celebrations and butchering, and tribal and/or NMFS' biologists would measure and photograph the whale and take samples of tissues for scientific analyses. Most of the whale products from the beached whale would be removed within 24 hours, including the tissue samples collected by biologists.

Timing and Duration of the Proposed Action

The proposed action would be limited in duration to 10 years and would restrict hunting to alternating seasons each year. Winter/spring hunts would occur from December 1 through May 31, and summer/fall hunts would occur from July 1 through October 31. Only one hunt season would be authorized each year; however, the winter/spring hunts may start in the same calendar year as a summer/fall hunt. This results in a 1-month gap (November) between the end of a summer/fall hunt and the start of a winter/spring hunt, and a 13-month gap between the end of a winter/spring hunt

and the start of the next summer/fall hunt. Hunting would then cease until July 1 of the following calendar year, resulting in a 13-month gap between the end of a winter/spring hunt season and the beginning of a summer/fall hunt season.

The number of days spent hunting during winter hunt years is likely to be restricted by ocean and weather conditions. We estimate that hunting and training activities could take place on up to 60 days in winter/spring hunt years, with the majority of those days (43) taking place in March through May when conditions are more favorable. Summer/fall hunting activities are less likely to be restricted by ocean and weather conditions, however hunting would cease after the strike limit was reached. The maximum anticipated number of days it would take to locate and strike a known male PCFG whales is 7 days[2]. Therefore, hunting could take place on up to an anticipated maximum of 14 days in summer hunt years.

Potential Number of Strikes, Approaches, and Shots Fired

The proposed waiver places limits on the number of strikes, unsuccessful strike attempts, and approaches of gray whales within 100 yards that the tribe may take each year. Unsuccessful strike attempts are defined as the action of throwing a harpoon at a whale without penetrating the skin. The tribe is limited to three strikes in winter/spring hunt years and two strikes in summer/fall hunt years, if the first strike results in a struck and lost whale, meaning the struck whale is not landed. The number of whales subjected to unsuccessful strike attempts would be limited to 18 in winter hunt years and 12 in summer hunt years. The tribe would be limited to 353 approaches of gray whales in any calendar year.

We estimate there would be up to 16 rifle shots for each harvested whale. In winter/spring hunts, we estimate up to 48 shots fired (16 shots times three whales harvested) per year. In summer/fall hunts, only one whale may be harvested; however, two whales may be pursued and struck if the first whale is struck and lost. In summer/fall hunts, we estimate up to 32 shots fired (16 shots times two whales) per year. However, not all of these shots would occur if (1) the first whale is harvested or (2) it was struck and lost and able to evade hunters quickly and not elicit all of the estimated shots. Therefore, we estimate that the Tribe would fire up to 48 shots fired in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season.

The proposed waiver also makes provisions for training activities. Training activities include approaches of gray whales and training harpoon throws using a blunt-tipped harpoon. These activities can take place during any month in winter-hunt years, but would be limited to the hunt season in summer-hunt years. Training harpoon throws are counted against the unsuccessful strike attempt limit.

Whale Product Use and Distribution

Members of the Makah tribe would also be permitted to possess, transport, share, and barter nonedible whale products, such as bone and baleen, with other tribal members both within and outside the reservation borders. Handicrafts made from these nonedible products could also be shared, offered for sale, and bartered with both members and non-members, with a permanent,

[2] J. Scordino, Pers. Comm., Makah Tribe Marine Mammal Biologist, July 31, 2013.

distinct marking approved by the Makah Tribal Council and a certificate of authenticity if such products are to be taken outside the reservation boundaries. Enrolled members of the Makah Indian Tribe would be permitted to possess, consume, and transport edible whale products such as meat and blubber within and outside the tribe's reservation borders. They would also be permitted to share and barter these products with other tribal members. Tribal members would be permitted to share these products with non-members within the reservation boundaries or at the tribal member's residence, should they reside outside the reservation. Tribal members could also share edible products with non-members at tribal or intertribal gatherings sanctioned by the Makah Tribal Council in quantities under two pounds per person attending the gathering.

Tribal Measures

Tribal whalers would be subject to training and certification processes overseen by the Makah Whaling Commission or Makah Fisheries Management Department. The proposed regulations recognize training as an important component of the management of a tribal hunt. They go on to clarify training-related elements (e.g., training vessels are defined as those not carrying hunting weapons; training approaches as those made by training vessels; and a training harpoon throw as the use of a blunted spear incapable of penetrating a whale's skin).

Action Area

"Action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the proposed action includes the Makah Tribe's usual and accustomed hunting areas (U&A) off the coast of Washington State and in the western portion of the Strait of Juan de Fuca (Figure 1), as adjudicated by the Western District Court of Washington in *United States v. Washington* (1974 and 1985). The Tribe proposes to limit hunt activities to the coastal and nearshore portions of their U&A (Figure 1), however whales killed in the coastal and nearshore portions of the U&A may be towed into the Strait portion of the U&A to be butchered. Due to the localized nature and the short duration of any potential disturbance resulting from hunt-related events (including training and scouting), we expect the effects of the proposed action discussed below on ESA-listed species to be confined to the Makah Tribe's U&A.

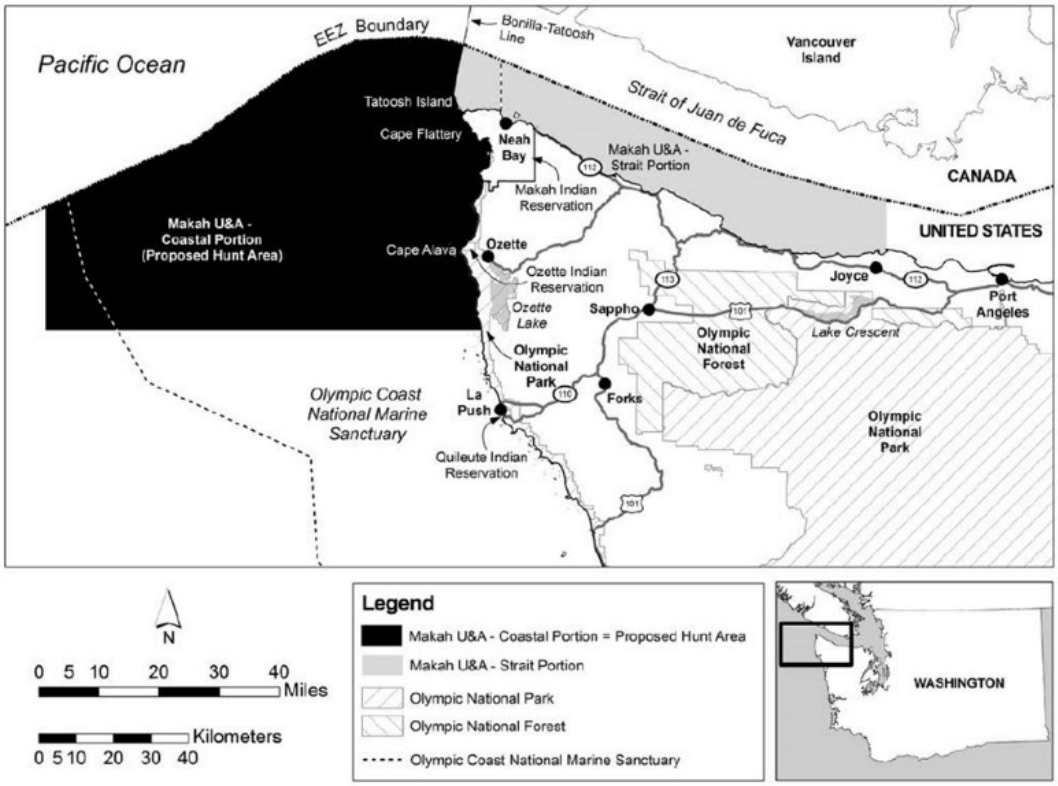

Figure 1. Map of the action area. The black area depicts the Makah Tribe's coastal portion of their U&A where hunting could take place. The gray area in the Strait of Juan de Fuca depicts the Tribe's Strait portion of their U&A where towing activities could take place from the hunt area into Neah Bay.

Species and Designated Critical Habitat that may be affected by the Proposed Action

This section identifies the ESA-listed species that potentially occur within the action areas that may be affected by the proposed action. It then summarizes the biology and ecology of those species that may be affected by the proposed action, and details information on their life histories in the action areas if known. The ESA-listed species potentially occurring within the action areas are given in Table 1, along with their regulatory status. The species and critical habitat information summarized herein is based on the most recent available information including from the 5-year status reviews, recovery plans, and stock assessment reports.

Table 1. Endangered Species Act-listed species and designated critical habitat that may be affected by the proposed action.

Species	ESA Status	Critical Habitat	Listing/ Designation Dates	Status Review	Recovery Plan
Marine Mammals					
Humpback Whale – Mexico DPS (*Megaptera novaeangliae*)	Threatened	No	12/2/70 (35 FR 18319); 9/8/2016 (81 FR 62259)	3/2015	11/1991

Humpback Whale – Central America DPS (*M. novaeangliae*)	Endangered	Yes	12/2/1970 (35 FR 18319); 9/8/2016 (81 FR 62259); 4/21/2021 (86 FR 21082)	3/2015	11/1991
Fin whale (*B. physalus*)	Endangered	No – None designated	12/2/1970 (35 FR 18319)	2/13/2019	7/30/2010
Blue whale (*Balaenoptera musculus)*	Endangered	No – None designated	12/2/1970 (35 FR 18319)	11/09/2020	11/05/2020
North Pacific right whale (*Eubalaena japonica*)	Endangered	No	12/2/1970 (35 FR 18319); 3/6/2008 (73 FR 12024)/ 7/6/06 (71 FR 38277); 4/8/08 (73 FR 19000)	2/21/2018	6/13/2013
Sei whale (*B. borealis*)	Endangered	No – None designated	12/2/1970 (35 FR 18319)	8/30/2021	12/2011
Sperm whale (*Physeter macrocephalus*)	Endangered	No – None designated	12/2/1970 (35 FR 18319)	6/03/2015	12/21/2010
Southern Resident killer whale (*Orcinus orca*)	Endangered	Yes	11/18/05 (70 FR 69903)/ 11/29/06 (71 FR 69054)	12/28/2021	1/17/2008
Western North Pacific Gray whale (*Eschrichtius robustus*)	Endangered	No – None designated	12/2/1970 (35 FR 18319); 6/16/1994 (59 FR 31094)	3/27/23	N/A
Guadalupe fur seal (*Arctocephalus townsendi*)	Threatened	No – None designated	1/15/1986 (50 FR 51252)	7/12/2021	N/A
Sea Turtles					
Leatherback sea turtle – Pacific DPS (*Dermochelys coriacea*)	Endangered	Yes	6/2/1970 (35 FR 8491)/ 9/26/78 (43 FR 43688); 3/23/79 (44 FR 17710); 1/26/12 (77 FR 4169)	2020	1/12/1998
Green sea turtle – East Pacific (*Chelonia mydas*)	Threatened	No	7/28/78 (43 FR 32800); 4/6/16 (81 FR 20057)/ 9/2/98 (63 FR 46693)	3/2015	1/12/1998

Loggerhead sea turtle – North Pacific DPS (*Caretta caretta*)	Endangered	No	7/28/78 (43 FR 32800); 9/22/11 (76 FR 58868)/ 7/10/14 (79 FR 39855)	4/07/2020	12/23/1997
Olive ridley sea turtle *(Lepidochelys olivacea*)	Endangered/ Threatened[2]	No – None designated	7/28/78 (43 FR 32800)	6/18/2014	1/12/1998
Fish					
Puget Sound Steelhead (*Oncorhynchus mykiss*)	Threatened	N/A – None designated in action area	5/11/07 (72 FR 26722)/ 2/24/16 (81 FR 9252)	4/6/2017	12/30/2019
Upper Columbia River Steelhead (*O. mykiss*)	Endangered	N/A – None designated in action area	8/14/97 (62 FR 43937) /9/2/05 (70 FR 52629)	8/16/2022	8/01/2017
Middle Columbia River Steelhead (*O. mykiss*)	Threatened	N/A – None designated in action area	3/25/99 (64 FR 14517)/ 9/2/05 (70 FR 52629)	8/16/2022	11/30/2009
Lower Columbia River Steelhead (*O. mykiss*)	Threatened	N/A – None designated in action area	3/19/98 (63 FR 13347)/ 9/2/05 (70 FR 52629)	10/21/2022	6/01/2013
Snake River Steelhead (*O. mykiss*)	Threatened	N/A – None designated in action area	8/18/97 (62 FR 43937)/ 9/2/05 (70 FR 52629)	3/29/2016	11/30/2017
Upper Willamette River Steelhead (*O. mykiss*)	Threatened	N/A – None designated in action area	3/25/99 (64 FR 14517)/ 9/2/05 (70 FR 52629)	4/26/2016	8/05/2011
Snake River Sockeye Salmon (*O. nerka*)	Endangered	N/A – None designated in action area	11/20/21 (56 FR 58619)/ 12/28/93 (58 FR 68543)	8/16/2022	6/08/2015
Ozette Lake Sockeye Salmon (*O. nerka*)	Threatened	N/A – None designated in action area	3/25/99 (64 FR 14528/ 9/2/05 (70 FR 52630)	10/21/2022	5/04/2009
Puget Sound Chinook salmon (*O. tshawytscha*)	Threatened	N/A – None designated in action area	3/24/99 (64 FR 14308))/ 9/2/05 (70 FR 52629)	4/06/2017	1/19/2007

Lower Columbia River Chinook salmon (*O. tshawytscha*)	Threatened	N/A – None designated in action area	3/24/99 (64 FR 14308)/ 9/2/05 (70 FR 52629)	10/21/2022	6/01/2013
Upper Columbia River Spring-Run Chinook salmon (*O. tshawytscha*)	Endangered	N/A – None designated in action area	3/24/99 (64 FR 14308)/ 9/2/05 (70 FR 52629)	8/16/2022	8/01/2017
Snake River Fall-Run Chinook salmon (*O. tshawytscha*)	Threatened	N/A – None designated in action area	4/22/92 (57 FR 14653)/ 12/28/93 (58 FR 68534)	8/16/2022	11/01/2017
Upper Willamette River Chinook salmon (*O. tshawytscha*)	Threatened	N/A – None designated in action area	3/24/99 (64 FR 14308)/ 9/2/05 (70 FR 52629)	4/26/2016	8/05/2011
Hood Canal Summer-Run Chum Salmon (*O. keta*)	Threatened	N/A – None designated in action area	6/28/05 (70 FR 37160)/ 9/2/05 (70 FR 52629)	4/06/2017	11/15/2005 5/16/2017
Columbia River Chum Salmon (*O. keta*)	Threatened	N/A – None designated in action area	3/25/99 (64 FR 14508)/ 9/2/05 (70 FR 52629)	10/21/2022	6/01/2013
Lower Columbia River Coho Salmon (*O. kisutch*)	Threatened	N/A – None designated in action area	6/28/05 (70 FR 37160)/ 2/24/16 (81 FR 9252)	10/21/2022	6/01/2013
Eulachon (*Thaleichthys pacificus*)	Threatened	N/A – None designated in action area	3/18/10 (75 FR 13012)/ 10/20/11 (76 FR 65324)	7/28/22	9/6/17
Green Sturgeon (*Acipenser medirostris*)	Threatened	Yes	4/7/06 (71 FR 17757)/ 10/9/09 (74 FR 52300)	11/01/2021	8/21/2018
Yelloweye Rockfish (*Sebastes ruberrimus*)	Threatened	N/A – None designated in action area	4/28/10 (75 FR 22276)/ 11/13/14(79 FR 68041)	4/1/2016	10/13/2017
Bocaccio (*S. paucispinis*)	Endangered	N/A – None designated in action area	4/28/10 (75 FR 22276)/ 11/13/14(79 FR 68041)	4/1/2016	10/13/2017

WHALES

Humpback Whale - Mexico Distinct Population Segment DPS

In 2015, NMFS completed a global status review of humpback whales (Bettridge et al. 2015) and, in 2016, revised the ESA listing to identify 14 DPSs (81 FR 62259, 09/08/2016). Of these, four populations are listed as endangered (Central America, Western North Pacific, Arabian Sea, and Cape Verde Islands/Northwest Africa) and one as threatened (Mexico) (81 FR 62259, 09/08/2016). The threatened Mexico population breeds along the Pacific coast of Mexico and the Revillagigedo Islands; it feeds across a broad range from California to the Aleutian Islands (81 FR 62259, 09/08/2016). The Mexico DPS has been estimated to have an abundance of about 2,913 whales based on data collected in 2004-2006 (CV= 0.066, Wade 2021).

Humpback whales filter-feed on small crustaceans (mostly krill) and small fish. Physical features facilitate formation of near-surface aggregations of humpback prey species (Tynan et al. 2005, Santora et al. 2011) and are, thus, likely to also influence humpback whale distributions (Bettridge et al. 2015). For example, extensive aerial surveys conducted off the coasts of Washington and Oregon from April 1989 to October 1990, indicated that the whales were particularly clustered along the southern edge of Heceta Bank off of Oregon and in the steeply sloped waters associated with submarine canyons off of Washington (Astoria, Grays, and Nitinat Canyons) (Green et al. 1992).

Within U.S. waters, the range occupied by the Mexico humpback whale DPS at the time of listing was derived from photo-identification data and genetic data from whales sampled over multiple seasons on the breeding and feeding grounds and, in particular, from results of the SPLASH study (Bettridge et al. 2015). Those that were photo-identified in the wintering/breeding areas for this DPS (i.e., Mexico mainland, Baja California, and the Revillagigedo Islands, n=1,868 distinct photo-identified whales) were matched to whales in all five of the major feeding areas in, or partially in, U.S. waters, including the California/Oregon feeding area (n=105 whales) and northern Washington/southern British Columbia (n=27 whales) (Barlow et al. 2011, NMFS 2020). Whales from this DPS, and specifically those whales' photo-identified along the Pacific coast of mainland Mexico, were sighted in highest numbers during the SPLASH surveys off the coast of California and Oregon (97 of 164 total matches), suggesting that this is their primary foraging destination (Calambokidis et al. 2008, Barlow et al. 2011, NMFS 2020) This DPS has also been documented within the Salish Sea (Calambokidis et al. 2017). Sightings of humpback whales in general have increased dramatically in the Salish Sea from 1995 to 2015, and at least 11 whales from this DPS have been matched to those sighted within this area (Calambokidis et al. 2017). Overall, the available data demonstrate that the Mexico DPS is broadly distributed within U.S. waters (Bettridge et al. 2015). As described in more detail in the DEIS (NMFS 2015), humpbacks are generally seen off the coast of Washington from May to November, although they have also been seen earlier in the spring and later in the winter, with the highest numbers in June and July.

NMFS has evaluated the stock structure of humpback whales under the MMPA and revised the current stock definition in the stock assessment reports (Carretta et al. 2023; Young et al. 2023). There are two humpback whale stocks recognized in the North Pacific region stock assessment reports and one in the Alaska stock assessment reports that occur in the action area: (1) the Central America/Southern Mexico – California-Oregon-Washington (CA-OR-WA) stock, (2) the Mainland

Mexico – CA-OR-WA stock, and (3) the Hawai'i stock. Members of the threatened Mexico DPS are also found in the Mainland Mexico – CA-OR-WA and Hawai'i stocks.

Mainland Mexico – CA-OR-WA stock humpback whales winter in Nayarit, Jaliso, Colima, and Michoacán, while their main summering areas include U.S. and Canadian West Coast waters from Calfornia to Alaska. This is the humpback whale stock that most commonly occurs in the action are during the summer (Wade 2021). Curtis et al. (2022) estimate the abundance of the Mainland Mexico – CA-OR-WA as the difference between the number of whales wintering in southern Mexico and Central America (i.e. the whales that make up the Central America/Southern Mexico – CA-OR-WA stock) and a recent estimate of total abundance of humpback whales in the U.S. West Coast EEZ from mark-recaprute data (Calambokidis and Balrow 2020). This yields an abundance estimate of 3,477 animals (CV=1.01). This may be an underestimate, as Calambokidis and Barlow (2020) did not include photographs of humpback whales off the coast of Washington, however there is movement of these whales between Washington, Oregon, and California. Therefore, the estimate likely does include those individuals (Carretta et al. 2023). The minimum population estimate for this stock is 3,185 whales, with a PBR of 65 whales per year (Carretta et al. 2023).

The Hawai'i stock is composed of the combination of the Hawai'i – Southeast Alaska/Northern British Columbia DIP and the Hawai'i—North Pacific unit (Young et al. 2023). Whales in the Hawai'i – Southeast Alaska/Northern British Columbia DIP winter off Hawai'i and summer in Southeast Alaska and Northern British Columbia (Wade 2021). There are a small number of individuals that migrate between Hawai'i and Southern British Columbia/Washington, but it is unclear which unit within the stock these whales belong to (Wade 2021). The best current estimate of abundance for this stock is 11,278 (CV=0.56) with a minimum abundance estimate of 7,265 whales and a PBR of 127 whale per year (Young et al. 2023).

Critical Habitat – Specific areas designated as critical habitat for the Mexico DPS of humpback whales contain approximately 116,098 nmi^2 of marine habitat in the North Pacific Ocean, including areas within portions of the eastern Bering Sea, Gulf of Alaska, and California Current Ecosystem. Off Washington, the nearshore boundary is defined by the 50-m isobath, and the offshore boundary is defined by the 1,200-m isobath relative to mean lower low water (MLLW). Critical habitat also includes waters within the U.S. portion of the Strait of Juan de Fuca to an eastern boundary line at Angeles Point at 123° 33′ W (50 CFR 226.227).

Humpback Whale - Central America DPS

As described above, NMFS identified 14 DPSs of humpback whales, including the Central American DPS which is listed as endangered (81 FR 62259, 09/08/2016). The Central American population breeds along the Pacific coast of Central America; the population feeds off the west coast of the United States and southern British Columbia (81 FR 62259, 09/08/2016). Whales from this DPS have been observed within foraging grounds along the coasts of California, Oregon, and Washington, and are expected to occur in the action area (Barlow et al. 2011; NMFS 2020). It is estimated that most Central America DPS whales use California-Oregon waters for feeding [National Oceanic and Atmospheric Administration (NOAA) 2016, Wade et al. 2016, Wade 2021].

The Central America DPS has been most recently estimated to include about 755 whales (CV = 0.242) (Wade 2021). The Central America-Southern Mexico- CA-OR-WA stock includes whales from Central America DPS. The primary wintering area for the Central America/Southern Mexico – CA-OR-WA stock includes the Pacific coasts of Nicaragua, Honduras, El Salvador, Guatemala, Panama, Costa Rica, Michoacán, and Colima. Individuals from this stock are primarily found in California and Oregon in the summer season, with only a few sightings in the Washington/southern British Columbia feeding areas (Carretta et al. 2023). Curtis et al. (2022) estimate the size of the stock at 1,496 (CV=0.171) with a minimum abundance estimate of 1,284 whales using photographic capture-recapture methods between 2019 and 2021. This is almost double the 2004-2006 estimate that excludes whales from southern Mexico (Wade 2021). The PBR for this stock is estimated to be 5.2 whales per year (Carretta et al. 2023).

Critical Habitat – Specific areas designated as critical habitat for the Central America DPS of humpback whales contain approximately 48,521 nmi^2 of marine habitat in the North Pacific Ocean within the portions of the California Current Ecosystem off the coasts of Washington, Oregon, and California. Off Washington, the nearshore boundary is defined by the 50-meter (m) isobath, and the offshore boundary is defined by the 1,200-m isobath relative to MLLW. Critical habitat also includes waters within the U.S. portion of the Strait of Juan de Fuca to an eastern boundary line at Angeles Point at 123° 33′ W (50 CFR 226.227).

Fin Whale

Fin whales listed as endangered throughout their range (35 Fed. Reg. 8491, June 2, 1970). Three stocks are generally recognized off the west coast of the United States: the California/Oregon/Washington stock, the Hawaii stock, and the Northeast Pacific (Alaska stock) (Carretta et al. 2023). The California/Oregon/Washington stock occurs in the action area. Fin whales from this stock are year-round residents off the coast of California; they summer off the Oregon coast and may pass by the Washington coast. They are a pelagic species, seldom found in waters shallower than 656 ft. (200 m). Fin whales in the northern hemisphere typically feed on small schooling fish, planktonic crustaceans, small squid, and zooplankton (Aguilar 2002; Nowak 2003). The best estimate of the California/Oregon/Washington stock is 11,065 individuals with a minimum population estimate of 7,970 individuals and a PBR of 80 whales per year (Carretta et al. 2023). There is strong evidence that the population increased between 1991 and 2018 (Carretta et al. 2023). Based on the Oregon sightings near Washington, it is possible that relatively small numbers of fin whales in the action area.

Blue Whale

Blue whales are listed as endangered under the ESA (35 Fed. Reg. 8491, June 2, 1970) throughout their range. The revised recovery plan defines nine blue whale management units, including the eastern North Pacific population (NMFS 2020a). The current global mature population size is uncertain, but estimated to be in the range of 5,000-15,000 mature individuals (NMFS 2020a). Although still depleted compared to historical abundance, blue whale populations around the world show signs of growth.

Two stocks of blue whales identified through the SARs occur in the U.S. Pacific waters: The Central North Pacific stock (formerly the Western North Pacific (formerly Hawaiian stock) and the eastern

North Pacific stock (formerly California/Mexico stock) (Carretta et al. 2023). The eastern North Pacific stock feeds off the west coast of the United States in summer and fall, and most of the stock is believed to migrate south to spend the winter and spring off Baja California, the Gulf of California, and on the Costa Rica Dome (Carretta 2022). Nine important feeding areas have been identified off the California coast (Calambokidis et al. 2015). In fall, blue whales migrate northward along the North American coast to secondary feeding areas off Oregon/Washington and further north. The blue whale's diet is composed almost exclusively of krill (euphausiids) (Nowak 2003; Sears 2002).

There appears to be a northward shift based on increasing numbers of blue whales found in Oregon and Washington waters during line transect surveys (Carretta et al. 2023). The best estimate of the eastern North Pacific blue whale stock is 1,898 individuals with a minimum population estimate of 1,767 individuals and a PBR of 7 whales per year (Carretta et al. 2023). There may be evidence of a population size increase in the eastern North Pacific blue whale stock since the 1990s, but a formal trend analysis is lacking and the current population trend is unknown (Carretta et al. 2023). Based on sightings and satellite tracking data (Hansen et al. 2017; Calambokidis and Barlow 2020; OBIS-SEAMAP, accessed 02/04/2023), we expect blue whales to be rare in the action area.

North Pacific Right Whale

North Pacific right whales are listed as an endangered species under the ESA (35 Fed. Reg. 8491, June 2, 1970; 71 FR 38277, June 6, 2006). North Pacific right whales are considered to exist in two populations based on geographic distribution: eastern and western North Pacific (Brownell et al. 2001, NMFS 2017). The range of eastern North Pacific right whales is believed to encompass the Gulf of Alaska and the Bering Sea, while the western population ranges from near the Commander Islands, the coast of Kamchatka, along the Kuril Islands, and in the Sea of Okhotsk (NMFS 2017).

The available data on North Pacific right whales is limited. Since 1950, there have been at least three sightings from Washington, fourteen from California, two from Baja California, Mexico, and three from Hawaii (Brownell et al. 2001). No right whales were seen off Washington during ship surveys from 1995 to 2012 (Calambokidis et al. 2004; Oleson et al. 2009; Jeffries et al. 2012). Right whales generally feed on zooplankton, including copepods, near the coast and continental shelf edge. Wade et al. (2011) produced an estimate of 31 right whales in the Bering Sea. The minimum estimate of abundance, based on Wade et al. (2011) is 26 with a PBR of 0.05 (Carretta et al. 2023) based on the photo-identification estimate of 31 whales (Wade et al. 2011). Due to a low resighting rate and the extremely low population size, no estimate of trend in abundance is available for the eastern North Pacific population (Carretta et al. 2023). Information on distribution and abundance from the western stock is limited, and its status is currently unknown. The population estimate for the western stock is likely in the low hundreds (Brownell et al. 2001, NMFS 2017). North Pacific right whales would be rare in the action area.

Sei Whale

Sei whales are listed as endangered throughout their range under the ESA (35 Fed. Reg. 8491, June 2, 1970). They are rare off California, Oregon, and Washington (Carretta et al. 2023). Sei whales are primarily found offshore in deeper water and are not associated with coastal waters (Carretta et al. 2023). They feed primarily copepods and amphipods, but also take euphausiids and small fish

(Nowak 2003). While NMFS acknowledges that the MMPA stock structure does not align with the ESA-listed entity for sei whales, the MMPA SARS contains the best available demographic information for sei whales in U.S. waters (NMFS 2021). The best estimate of abundance for California, Oregon, and Washington waters is 519 individuals with a minimum population estimate of 374 individuals and a PBR of 0.75 whales per year (Carretta et al. 2023). The best available information indicates that sei whales are rare in the action area.

Sperm Whale

The sperm whale is listed as endangered throughout its range (35 Fed. Reg. 8491, June 2, 1970). Sperm whales are widely distributed in the pelagic regions of the North Pacific Ocean where they prey on deepwater squid (Gosho et al. 1984). Sperm whales breed in the lower latitudes (south of 40°N) in winter and then migrate northward to summer feeding areas. Whitehead (2002) estimated sperm whale abundance to be approximately 300,000-450,000 worldwide. These estimates are based on extrapolating surveyed areas to un-surveyed areas and thus, are not necessarily accurate; however, without a systematic survey design, these are probably the best available and most current estimates of global sperm whale abundance (NMFS 2015b). For the MMPA stock assessment reports, sperm whales within the Pacific U.S. Exclusive Economic Zone (EEZ) are divided into three discrete, non-contiguous areas: 1) California, Oregon and Washington waters, 2) waters around Hawaii, and 3) Alaska waters (Carretta 2020). The most recent estimate of abundance for the California/Oregon/Washington stock is 1,997 individuals; the minimum population estimate is 1,270 animals with a PBR of 2.5 whales per year. The population appears to be stable (Carretta et al. 2023). The best available information indicates that sperm whales are rare in the action area.

Southern Resident Killer Whale

The Southern Resident killer whale DPS was listed as endangered under the ESA in 2005 (70 FR 69903, November 18, 2005) and a recovery plan was completed in 2008 (NMFS 2008). A 5-year review under the ESA completed in 2021 concluded that Southern Resident killer whales should remain listed as endangered and includes recent information on the population, threats, and new research results and publications (NMFS 2021b).

Southern Resident killer whales consists of three pods (J, K, and L) and inhabit coastal waters off Washington, Oregon, and Vancouver Island and are known to travel as far south as central California and as far north as Southeast Alaska (NMFS 2008; Hanson et al. 2013; Carretta et al. 2023). During the spring, summer, and fall months, Southern Resident killer whales spend a substantial amount of time in the inland waterways of the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound (Bigg 1982; Ford et al. 2000; Krahn et al. 2002; Hauser et al. 2007; NMFS 2021a; Ettinger et al. 2022). By late fall, all three pods are seen less frequently in inland waters. Although seasonal movements are somewhat predictable, there can be large inter-annual variability in arrival time and days present in inland waters from spring through fall, with late arrivals and fewer days present in recent years (NMFS 2021b; Ettinger et al. 2022). In recent years, several sightings and acoustic detections of Southern Resident killer whales have been obtained off the Washington, Oregon, and California coasts in the winter and spring (Hanson et al. 2010; Hanson et al. 2013, Hanson et al. 2017, Emmons et al. 2021, NMFS 2021a). Satellite-linked tag deployments have also provided more data on Southern Resident killer whale movements in the winter indicating that K and L pods use the coastal waters along Washington, Oregon, and California during non-summer months

(Hanson et al. 2017; NMFS 2021c), while J pod occurred frequently near the western entrance of the Strait of Juan de Fuca but spent relatively little time in other outer coastal areas.

At the time of the 2022 population census, there were 73 Southern Resident killer whales counted in the population (CWR 2022). The abundance estimate for this stock of killer whales is a direct count of individually identifiable animals. This estimate therefore serves as both a best estimate of abundance and a minimum estimate of abundance. Thus, the minimum population estimate (Nmin) for the Eastern North Pacific Southern Resident stock of killer whales is 73 animals. This DPS is expected to occur in the action area.

Critical Habitat – In November 2006, NMFS designated critical habitat for the Southern Resident killer whales (71 Fed. Reg. 69054, November 29, 2006). This designation includes approximately 2,500 square miles of Puget Sound, including the entire U.S. portion of the Strait of Juan de Fuca. Areas with water less than 20 feet deep are not included in the designation.

In September 2021, NMFS revised the critical habitat designation for the Southern Resident killer whale DPS by designating coastal critical habitat areas along the U.S. West Coast (86 FR 41668, August 2, 2021). The revision added to the existing critical habitat approximately 15,910 square miles of marine waters between the 6.1-meter and 200-meter depth contours from the U.S.-Canada border to Point Sur, California.

Gray Whales - Western North Pacific Gray Whale DPS

NMFS has delineated two gray whale stocks in the North Pacific Ocean. Significant mitochondrial and nuclear genetic differences have been found between whales generally found in the WNP and those in the ENP (LeDuc et al., 2002, Lang et al. 2010, Lang et al., 2011). The ENP population ranges from wintering areas in Baja California, Mexico, to feeding areas in the Bering, Beaufort, and Chukchi Seas. An exception to this generality is the relatively small number (hundreds) of ENP whales that summer and feed along the Pacific coast between Kodiak Island, Alaska, and northern California (Weller et al., 2013). These whales are collectively called the PCFG. The International Whaling Commission (IWC) has defined PCFG whales as individuals observed between 1 June and 30 November from 41°N to 52°N in two or more years (IWC, 2012), and NMFS has adopted this definition in recent assessments (Weller et al., 2013). Also, some WNP gray whales have been documented in the ENP at certain times of year.

Abundance and Recruitment

The current abundance of WNP gray whales is 290 whales (Table 2). Before commercial whaling, at least 1,500 whales were thought to be part of the western population.

Table 2. Population estimates and limits for Western North Pacific gray whales.

Parameter	WNP Gray Whale DPS
Recent Abundance	290 whales (271-311) (Carretta et al. 2023, NMFS 2023)
Minimum Population Estimate (Nmin)	271 whales (Cooke 2017)
Recent Trend	Increasing at 2-5% per year (Carretta et al. 2023)
Recruitment	Average of 7 calves/year for 1995-2012; calf production index for 2019 = 6.9 % (Burdin et al. 2019)

Western North Pacific (Korean) gray whales are listed as endangered under the ESA (35 FR 8491, June 2, 1970; 59 FR 31094, June 16 1994). WNP gray whales are considered to be gray whales that spend all or part of their lives in the western North Pacific in the waters of Vietnam, China, Japan, Korea (Republic of Korea and/or Democratic People's Republic of Korea), or the Russian Far East, including southern and southeastern Kamchatka but not necessarily areas north of 55°N in eastern Kamchatka (NMFS 2023). This definition is consistent with that used in the IUCN/IWC Western Gray Whale Conservation Management Plan and with how the WNP gray whale subpopulation has been evaluated by the IUCN (Cooke et al. 2018). The animals that feed in the western North Pacific, including those whales found off Sakhalin and southeastern Kamchatka, represent the only large feeding concentration of gray whales in the western North Pacific, and their numbers remain small (171 to 214 age 1+ years; Cooke et al. 2019). While modern sightings of gray whales in Japanese waters are not common, they have increased slowly in recent years, especially off the Pacific coast (Nakamura et al. 2019). However, very few contemporary records of gray whales in other regions of the western North Pacific exist, with only two records from Chinese waters since 1996 (Zhao 1997; Zhu 2012). A Surveillance Towed Array Sensor System (SURTASS) vessel operated by the United States Navy in the East China Sea recorded a unique acoustic signature in 2011 that was identified as a probable WNP gray whale; however, the species identification has yet to be verified (Gagnon 2016; IWC 2017). From 2011 to 2016, the Integrated Undersea Surveillance System Marine Mammal Monitoring program regularly detected acoustic signatures from WNP gray whales in the East China Sea when a SURTASS vessel was present from September through March (Gagnon 2016). No verified records of gray whales in Korean waters have been detected since 1977 (Park 1995; Kim et al. 2013).

While the pre-exploitation abundance of WNP gray whales is unknown, some have estimated that the population contained between 1,500 and 10,000 (Yablokov and Bogoslovskaya 1984) and up to approximately 25,000 (Cooke et al. 2019) individuals before commercial whaling. Mark-recapture analysis of photo-identification data collected on the Sakhalin Island feeding ground provided the first post-exploitation estimates of the abundance of WNP gray whales. It indicated that fewer than 100 whales used the feeding ground between 1997 and 2003 (Bradford et al. 2008). More recently, an assessment using a stage-structured individual-based population model estimated that the number

of whales, excluding calves, using the combined Sakhalin-southeastern Kamchatka area in 2016 was 320-410 whales, with the abundance increasing at annual rates of 2-5% during recent years (Cooke 2018). Approximately 130-170 of those whales were estimated to feed predominantly off Sakhalin Island (Cooke 2017).

Recent satellite tagging data, genetic, and photo-identification matches between Sakhalin, Canada, the United States, and Mexico have identified 60 whales known to travel between the eastern and western North Pacific (Lang 2010; Weller et al. 2012; Mate et al. 2015; Urbán et al. 2019; Martinez-Aguilar et al. 2022). This raises questions about the proportion of WNP gray whales that remain in the western North Pacific year-round. Based on population modeling that incorporated data on known movements of WNP gray whales into the eastern North Pacific, Cooke et al. (2019) concluded that 45-80% of Sakhalin whales migrate to the eastern North Pacific in the winter. This finding indicates that at least 20%, and perhaps more, of the whales migrate elsewhere, presumably to wintering areas off the Asian coast. Thus, the number of WNP gray whales remaining in the western North Pacific year-round is likely small (possibly fewer than 50 whales, WGWAP 2018), making these whales more vulnerable than previously thought (Weller et al. 2012).

Based on the positive growth rates and estimates that the number of mature WNP gray whales now is greater than 50, the IUCN down listed the WNP gray whale from Critically Endangered to Endangered status in 2018 (Cooke et al. 2018).

Distribution

WNP gray whales have been found off both coasts of Japan, but sightings are uncommon. From 1955 to April 2018, only 31 records of gray whales were reported (Nakamura et al. 2019). Most of the records were from the Pacific coast of Japan, with only a few (n=6) reports from the Sea of Japan. The lack of frequent sightings off Japan may reflect true absence but may also reflect limited search effort (Weller et al. 2016). While still rare, the frequency with which gray whales are reported off Japan has increased in recent years, with ten records, some of which included the same individual, reported in 2015 or later (Nakamura et al. 2017, 2019). A female gray whale that died in a Japanese set net off the Pacific coast of Honshu, Japan in 2007 was identified as a whale observed off Sakhalin Island (Weller et al. 2008). This photographic match was the first to show that whales on the summer feeding grounds off Sakhalin are found 1,500 km (932 mi) south within a migratory corridor. In addition, Weller et al. (2016) determined the migratory movement of one gray whale that moved back and forth from Sakhalin Island and the Pacific coast of Honshu, Japan during 2014 to 2016. This individual was first observed as a calf with its mother off Sakhalin Island during the summer of 2014, then observed off Japan from March through May of 2015, back in Sakhalin during the summer of 2015, and then off Japan in January through February of 2016. The March to May sightings corresponds with the timing of ENP gray whale northbound migrations in the spring from Mexico wintering grounds to Bering Sea feeding grounds, while the January and February sightings correspond with the timing of the ENP gray whales' southbound migrations in the winter to Mexico. These records support a migratory link between the summer Sakhalin feeding grounds and the suspected wintering area(s) somewhere off the coast of Asia (Weller et al. 2016). Data reported from the U.S. Navy SURTASS vessel would further support this migratory link, should the acoustic signatures detected in the East China Sea from September through March be verified as WNP gray whale vocalizations. The 55 Hertz sweeps detected by the towed acoustic array have included up to

eleven individuals in a two-hour period, moving south in the fall and north in the spring, consistent with a seasonal migration pattern (Gagnon 2016).

Tagging, photo-identification, and genetic studies show that some whales identified in the WNP off Russia have been observed in the ENP, including coastal waters of Canada, the United States, and Mexico (Lang 2010; Mate et al. 2011; Weller et al. 2012; Urbán et al. 2013; Mate et al. 2015; Urbán et al. 2019, Martinez-Aguilar et al. 2022). In combination, these studies have documented 60 gray whales observed in both the WNP and ENP. Despite this geographic overlap, significant mtDNA and nDNA differences are found between whales in the WNP and those summering in the ENP (LeDuc et al. 2002; Lang et al. 2010a; Carretta et al. 2023).

Genetic Information

Genetic studies using both mitochondrial and microsatellite markers[3] have found statistically significant differences between the two populations (LeDuc et al. 2002; Meschersky et al. 2015; Lang et al. 2021; Brüniche-Olsen et al. 2021). Lang et al. (2021) noted that the significant but low level of differentiation may reflect recent divergence of the two populations as well as some limited degree of interchange between them. Analysis of nuclear Single Nucleotide Polymorphisms (SNPs) showed evidence of apparent ENP admixture in some of the individuals sampled off Sakhalin Island, Russia, as well as those sampled in the Mexican wintering lagoons, although comparison of SNP allele frequencies revealed significant genetic differences between the two locations. Although some have speculated that the observed movements of whales between the WNP and ENP signifies a lack of gray whale population structure (Bickham et al. 2013), the results of the aforementioned genetic comparisons represent the best available science and clearly demonstrate that significant mitochondrial and nuclear genetic differences exist between whales sampled in the ENP and those sampled on the feeding ground off Sakhalin Island in the WNP (Lang et al. 2021).

In addition, there is emerging evidence for possible substructure within the ENP population, specifically a PCFG that exhibits seasonal fidelity to feeding grounds off the west coast. After reviewing results from photo-identification, telemetry, and genetic studies available in 2010 (i.e., Calambokidis et al. 2010; Mate et al. 2010; Frasier et al. 2011), the IWC agreed that the hypothesis of the PCFG[4] being a demographically distinct feeding group was plausible and warranted further investigation (IWC 2011a). Research by Lang et al. (2014) provided further support for recognizing the PCFG as a distinct feeding aggregation. These researchers compared genetic markers from whales in the southern (i.e., in the seasonal PCFG range) and northern feeding areas (north of the Aleutians, principally near Chukotka, Russia and Barrow, Alaska). They found that samples from whales demonstrating site fidelity to the southern feeding area (i.e., whales sighted over 2 or more years) had mtDNA patterns that were marginally but significantly different from whales sampled in northern feeding areas, which included samples collected off Chukotka, Russia. However, no significant differences were found when microsatellite allele frequencies were compared between whales representing the PCFG and those sampled on northern feeding areas or the Mexican

[3] Mitochondrial DNA (commonly referred to as mtDNA) is maternally inherited and provides information about historic gene flow of females only. Microsatellites are short segments of nuclear DNA inherited from both parents and reflect gene flow of both males and females.

[4] The PCFG is defined by the IWC as follows: gray whales observed between June 1 to November 30 within the region between northern California and northern Vancouver Island (from 41°N to 52°N) and photo-identified within this area during 2 or more years (IWC 2011a; IWC 2011b; IWC 2011c).

wintering lagoons (D'Intino et al. 2013; Lang et al. 2014). These genetic studies concluded that 1) structure is present among gray whales using different feeding areas, 2) matrilineal fidelity plays a role in creating such structure, and 3) individuals from different feeding areas may interbreed.

PINNIPEDS

Guadalupe Fur Seal

Guadalupe fur seals are listed as threatened under the ESA. Their breeding grounds are almost entirely on Guadalupe Island, off the Pacific coast of Mexico, with recent re-colonization of the islands comprising the San Benito Archipelago. A small number of Guadalupe fur seals have also been reported on the northern Channel Islands off California. They primarily feed at night on coastal and pelagic squid, and small pelagic fish. In the North Pacific, the Guadalupe fur seal is found in waters along the west coast of North America from central Mexico (Ortega-Ortiz et al. 2019) to southern British Columbia, Canada (Norris et al. 2017; Norris and Elorriaga-Verplancken 2019), with rare sightings in Alaska (Lambourn et al. 2012). Guadalupe fur seals are not common along the West Coast of the United States as far north as the action area, but immature animals strand on beaches in Washington State. In addition, tracks of tagged animals show migration into waters off Washington (Norris et al. 2017).

The most recent estimate of population size is based on pup count data collected in 2013 and a range of correction factors applied to pup counts to account for uncounted age classes and pre- census pup mortality (García-Aguilar et al. 2018). Using two different. total population size-to-pup count ratios, the abundance estimates for Guadalupe fur seals at Guadalupe Island were 34,187 individuals (range 31,019- 38,043) and 43,954 individuals (39,882-48,912), respectively.

Using the lower bound of the estimate, the minimum population estimate is 31,019 individuals. PBR is 1,062 Guadalupe fur seals per year. The vast majority of this PBR would apply towards incidental mortality in Mexico as most of the population occurs outside of U.S. waters. However, a proration factor for calculating a PBR in U.S. waters is not available (Carretta et al. 2023). Guadalupe fur seal census counts have an increasing trend (Carretta et al. 2023). The best available information indicates that Guadalupe fur seals are rare in the action area.

SEA TURTLES

Leatherback sea turtle

In 2020, U.S. FWS and NMFS (Services) announced a 12 month-finding on a petition to identify DPSs of the leatherback sea turtles. The Services concluded that seven populations would meet the discreteness and significance criteria for recognition as DPSs and that all seven DPSs would meet the definition for endangered species. As the species was already listed as endangered throughout its range, the Services determined that the listing of DPSs was not warranted and maintained the global listing (85 FR 48332, 08/10/2020).

Two populations that met the criteria for DPS designation were the West and East Pacific populations. The status review team defined the East Pacific DPS as leatherback turtles originating from the East Pacific Ocean. This population nests primarily in Central America and forages coastal

and pelagic waters of the southeastern Pacific Ocean. They are not expected to be in the action area. The status review team defined the West Pacific DPS as leatherback turtles originating from the West Pacific Ocean, with the following boundaries: south of 71° N, north of 47° S, east of 120° E, and west of 117.124° (NMFS and U.S. FWS 2020).

The West Pacific DPS nests throughout four countries with a broad, diverse foraging range (NMFS and U.S. FWS 2020b). Leatherback sea turtles' diet consists almost exclusively of jellyfish. The population of leatherback sea turtles off Washington is difficult to quantify, but the data suggest that an unknown number of sea turtles annually forage in Washington waters. There have been occasional opportunistic sightings (78 from 1975-2013) and sightings during surveys (14 in surveys conducted between 1989 and 1992). Sighting and stranding records occur from May through October (Sato 2017). Leatherback sea turtles are expected to be rare in the action area.

Critical Habitat – Critical habitat was designated for leatherback turtles in 2012 (77 Fed. Reg. 4170, January 26, 2012).

Green sea turtle

In April 2016, NMFS and U.S. FWS revised the listing of green sea turtles, identifying 11 DPSs. The East Pacific DPS, which occurs off the west coast of the United States, is listed as threatened. The range of the DPS extends from 41° N. southward along the Pacific coast of the Americas to central Chile (40° S.) and westward to 142° W. and 96° W., respectively (81 FR 20082, April 6, 2016). The Makah U&A is bounded on the south by 48° 02'15" latitude. While this is north of the area defined as the DPS, green sea turtles have stranded in Washington State. Green sea turtles are expected to be rare in the action area.

Loggerhead sea turtle

Loggerhead turtles are found worldwide with nine DPSs listed under the ESA. The North Pacific DPS of loggerhead sea turtles is listed as threatened. The loggerhead is primarily carnivorous and feeds on a variety of crabs, jellyfish, shellfish, and sponges. The North Pacific Ocean DPS nests only on the coasts of Japan. Loggerhead turtles hatching on Japanese beaches undertake extensive developmental migrations with some turtles reaching the vicinity of Baja California in the eastern Pacific (Uchida and Teruya 1988, Bowen et al. 1995, Peckham et al. 2007). After spending years foraging in the central and eastern Pacific, loggerheads return to their natal beaches for reproduction (Resendiz et al. 1998, Nichols et al. 2000) and remain in the western Pacific for the remainder of their life (Iwamoto et al. 1985, Bowen et al. 1995, Sakamoto et al. 1997, Hatase et al. 2002). Based on data from Martin et al. (2020), the extrapolated 2015 total nesting abundance for the entire DPS is approximately 8,733 nesting females (NMFS and U.S. FWS 2020c). The most recent review of the status indicates that Western North Pacific loggerhead nesting increased from 1999 to 2012. Data from 2012-2015 demonstrate a short-term decline (Martin et al. 2020), which may reflect natural variations. (NMFS and U.S. FWS 2020c). Loggerhead sea turtles are expected to be rare in the action area.

Olive ridley sea turtle

The olive ridley sea turtle is listed as threatened. In the Pacific, large nesting populations occur in Mexico and Costa Rica. No nesting occurs in the United States. The olive ridley is mainly a pelagic (open ocean) sea turtle. In the Eastern Pacific, olive ridleys occur from Southern California to Northern Chile. However, olive ridleys have stranded in Washington State. Therefore, we are considering them here. Olive ridley turtles are expected to be rare in the action area.

FISH

Puget Sound Steelhead

This threatened DPS comprises 32 populations, including naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from rivers flowing into Puget Sound from the Elwha River (inclusive) eastward, including rivers in Hood Canal, South Sound, North Sound and the Strait of Georgia, as well as steelhead from six artificial propagation programs. Adults migrate from the ocean to spawn in freshwater lakes and streams, where their offspring hatch and rear prior to migrating back to the ocean to forage until maturity. Individuals from the Puget Sound steelhead DPS are found in most larger tributaries with access to Puget Sound and the eastern Strait of Juan de Fuca. We therefore expect Puget Sound steelhead to be present in the Strait and coastal portions of the action area.

Upper Columbia River Steelhead

The upper Columbia steelhead DPS includes all naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Columbia River and its tributaries upstream of the Yakima River to the U.S.-Canada border, as well as steelhead from six artificial propagation programs: the Wenatchee River Program; Wells Hatchery Program (in the Methow and Okanogan Rivers); Winthrop National Fish Hatchery Program; Omak Creek Program; and the Ringold Hatchery Program (79 FR 20802). Juvenile steelhead in the Columbia Basin typically spend one to five years rearing in freshwater before migrating to the ocean. Most adult Upper Columbia steelhead return to their spawning areas after one to two years at sea. Maturing Columbia River steelhead can be found off the coast of Northern British Columbia and west into the North Pacific Ocean (Busby et al. 1996). Because these spawning areas located in the interior portion of Washington are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only steelhead that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Upper Columbia steelhead to be present in the coastal portion of the action area.

Middle Columbia River Steelhead

The middle Columbia River steelhead DPS includes all naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Columbia River and its tributaries upstream of the Wind and Hood Rivers to and including the Yakima River, however it excludes such fish originating from the Snake River basin. This DPS also includes steelhead from four artificial propagation programs: the Touchet River Endemic Program; Yakima River Kelt Reconditioning Program; Umatilla River Program; and the Deschutes River Program. Juvenile

steelhead in the Columbia Basin typically spend one to five years rearing in freshwater before migrating to the ocean. Most adult middle Columbia river steelhead return to their spawning areas after one to two years at sea. Maturing Columbia River steelhead can be found off the coast of Northern British Columbia and west into the North Pacific Ocean (Busby et al. 1996). Because these spawning areas located in the interior portion of Washington and Oregon are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only steelhead that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Middle Columbia steelhead to be present in the coastal portion of the action area.

Lower Columbia River Steelhead

The lower Columbia River steelhead DPS includes all naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from rivers between the Cowlitz and Wind Rivers (inclusive) and the Willamette and Hood River (inclusive), however it excludes such fish originating from the upper Willamette River basin and above Willamette Falls. This DPS also includes steelhead from eight artificial propagation programs. Juvenile steelhead in the Columbia Basin typically spend one to five years rearing in freshwater before migrating to the ocean. Most adult upper Columbia steelhead return to their spawning areas after one to two years at sea. Maturing Columbia River steelhead can be found off the coast of Northern British Columbia and west into the North Pacific Ocean (Busby et al. 1996). Because these spawning areas located in the interior portion of Washington and Oregon are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only steelhead that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Lower Columbia steelhead to be present in the coastal portion of the action area.

Snake River Steelhead

The Snake River steelhead DPS includes all naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Snake River basin, including steelhead from six artificial propagation programs: the Tucannon River Program; Dworshak National Fish Hatchery Program; East Fork Salmon River Natural Program; Little Sheep Creek/Imnaha River Hatchery Program; Salmon River B-run Program; and the South Fork Clearwater (Clearwater Hatchery) B-run Program. Snake River steelhead spend one to three years in marine waters before returning to their natal stream to spawn at four to five years of age. There is little known about their life in the ocean; however, Snake River steelhead distribute themselves in a broad band across the North Pacific, with most fish found between 40° N and 50° N latitude and from the North American Coast to 165° W (west of the date line) (Myers et al. 1996). Because their spawning areas located in the interior portion of Washington, Oregon, and Idaho are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only steelhead that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Snake River steelhead to be present in the coastal portion of the action area.

Upper Willamette River Steelhead

This threatened DPS includes naturally spawned anadromous winter-run steelhead originating below natural and manmade impassable barriers from the Willamette River and its tributaries upstream of Willamette Falls, to and including the Calapooia River. Juvenile steelhead rear in headwater tributaries and upper portions of the subbasin for one to four years (most often two years) before migrating downstream into the ocean. Upper Willamette steelhead typically forage in the ocean for one to four years (most often two years) and during this time are through to migrate north to Canada and Alaska and into the North Pacific including the Alaska Gyre (Myers et al. 2006; ODFW and NMFS 2011). Upper Willamette steelhead spawn in rivers and tributaries in Oregon State. Therefore, the only steelhead that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Upper Willamette steelhead to be present in the coastal portion of the action area.

Snake River Sockeye Salmon

This endangered ESU includes all naturally spawned anadromous and residual sockeye salmon originating from the Snake River basin, as well as sockeye salmon from the Redfish Lake Captive Broodstock Program and the Snake River Sockeye Hatchery Program. Snake River sockeye are reared in freshwater lakes for one to three years before beginning their migration to the ocean through the Salmon, Snake, and Columbia Rivers, Columbia estuary and plume, out to the ocean. Adults spend one to three years in the ocean before returning to their natal streams to spawn. Because these spawning areas located in the interior portion of Washington, Oregon, and Idaho are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only sockeye that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Snake River sockeye salmon to be present in the coastal portion of the action area.

Ozette Lake Sockeye Salmon

This threatened ESU includes naturally spawned sockeye salmon originating from the Ozette River and Ozette Lake and its tributaries, as well as sockeye salmon from two artificial propagation programs. Because this lake and associated spawning rivers are located in the western interior of Washington and have no direct connection to the interior waters of Washington State, the only sockeye salmon that would be present in the action area from this ESU are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Lake Ozette ESU sockeye salmon to be present in the coastal portion of the action area.

Puget Sound Chinook Salmon

The Puget Sound Chinook salmon ESU is comprised of 22 populations distributed over five geographic areas, from rivers and streams flowing into Puget Sound from the Elwha River eastward, including rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia, as well as Chinook salmon from 26 artificial propagation programs. Like all Pacific salmon, Chinook are anadromous, hatching in freshwater streams and rivers, migrating to the ocean to feed and grow, and

returning to their natal rivers to spawn. We therefore expect that Puget Sound Chinook salmon to be present in the Strait and coastal portions of the action area.

Lower Columbia River Chinook Salmon

The lower Columbia River Chinook salmon ESU is comprised of 32 independent populations that spawn in the Columbia River and its tributaries from its mouth at the Pacific Ocean upstream to a transitional point between Washington and Oregon east of the Hood River and the White Salmon River, and includes the Willamette River to Willamette Falls, Oregon, exclusive of spring-run Chinook in the Clackamas River, as well as Chinook from 15 artificial propagation programs. Because their spawning areas located in the interior portion of Washington and Oregon are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only Chinook salmon that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Lower Columbia River Chinook salmon to be present in the coastal portion of the action area.

Upper Columbia River spring-run Chinook Salmon

This endangered ESU includes naturally spawning spring-run Chinook salmon originating from Columbia River tributaries upstream of Rock Island Dam and downstream of Chief Joseph Dam (excluding the Okanogan River subbasin), as well as spring-run Chinook salmon from six artificial propagation programs: the Twisp River program; Chewuch River Program; Methow Program; Winthrop National Fish Hatchery Program; Chiwawa River Program; and the White River Program (79 FR 20802). Juvenile spring-run Chinook spend a year in freshwater before migrating to saltwater in the spring of their second year of life. Most Upper Columbia spring-run Chinook return as adults after two or three years in the ocean. Because their spawning areas located in the interior portion of Washington, and Oregon are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only Chinook salmon that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Upper Columbia River spring-run Chinook salmon to be present in the coastal portion of the action area.

Snake River fall-run Chinook Salmon

This threatened ESU includes naturally spawned fall-run Chinook salmon originating from the mainstem Snake River below Hells Canyon Dam and from the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River sub-basins, as well as Chinook salmon from four artificial propagation programs: the Lyons Ferry Hatchery Program; Fall Chinook Acclimation Ponds Program; Nez Perce Tribal Hatchery Program; and Idaho Power Program. Because their spawning areas located in the interior portion of Washington, Oregon, and Idaho are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only Chinook salmon that would be present in the action area from this DPS are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Snake River fall-run Chinook salmon to be present in the coastal portion of the action area.

Upper Willamette River Chinook Salmon

This threatened ESU comprises seven populations, naturally spawned spring-run Chinook originating from the Clackamas River and from the Willamette River and its tributaries above Willamette Falls, as well as spring-run Chinook salmon from six artificial propagation programs. Because these spawning rivers are located in the northern interior portion of Oregon and have no direct connection to the interior waters of Washington State, the only Chinook salmon that would be present in the action area from this ESU are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Upper Willamette River Chinook salmon to be present in the coastal portion of the action area.

Lower Columbia River Coho Salmon

T This threatened ESU comprises 24 populations, including naturally spawned coho salmon originating from the Columbia River and its tributaries downstream from the Big White Salmon and Hood Rivers (inclusive) and any such fish originating from the Willamette River and its tributaries below Willamette Falls, as well as coho salmon from 21 artificial propagation programs. As anadromous fish, coho migrate to the ocean for their adult lives before returning to their freshwater natal streams to spawn. Because the ESU's spawning rivers are located in Oregon and have no direct connection to the interior waters of Washington State, the only coho salmon that would be present in the action area from this ESU are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect lower Columbia River Coho salmon to be present in the coastal portion of the action area.

Hood Canal Summer-Run Chum Salmon

This threatened ESU includes naturally spawned summer-run chum salmon originating from Hood Canal and its tributaries as well as from Olympic Peninsula rivers between Hood Canal and Dungeness Bay (inclusive), as well as summer-run chum salmon from four artificial propagation programs. Chum salmon seek shelter in shallow protected estuarine habitats such as tidal rivers and salt marshes during their juvenile phase. Around the age of 5 months old, they make their way to the open ocean to live out their life migrating the northern Pacific until they return to their natal rivers, spawn and die (NMFS 2013). Before entering the ocean, these salmon spend a short period of their juvenile life in their natal freshwater stream, feeding on insects and other freshwater invertebrates. Once they have moved to the ocean, chum salmon inhabit much of the North Pacific. Because Hood Canal and associated spawning rivers have direct connections to the interior waters of Washington State, it is expected that Hood Canal summer-run chum would be commonly found migrating within action area waters throughout the year. We therefore expect Hood Canal summer-run chum salmon to be present in both the Strait and coastal portions of the action area.

Columbia River Chum Salmon

This threatened ESU includes naturally spawned chum salmon originating from the Columbia River and its tributaries in Washington and Oregon, as well as three artificial propagation programs: the Grays River Program; Washougal River Hatchery/Duncan Creek Program; and Big Creek Hatchery Program. Columbia River chum fry migrate promptly downstream to estuarine habitat for rearing, spending very little time in their natal streams after emerging. Juveniles rear in the Columbia River

estuary for several months before making their long-distance migration to the North Pacific and Bering Sea, where they will remain for two to six years, with most adults returning to the Columbia River at four years of age (ODFW 2010, NMFS 2013). Because these spawning rivers located in Oregon and the southern interior portion of Washington State are accessed via the Columbia River and not Puget Sound and the Strait of Juan de Fuca, the only chum salmon that would be present in the action area from this ESU are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Columbia River chum salmon to be present in the coastal portion of the action area.

Lower Columbia River Coho Salmon

This threatened ESU comprises 24 populations, including naturally spawned coho salmon originating from the Columbia River and its tributaries downstream from the Big White Salmon and Hood Rivers (inclusive) and any such fish originating from the Willamette River and its tributaries below Willamette Falls, as well as coho salmon from 21 artificial propagation programs. As anadromous fish, coho migrate to the ocean for their adult lives before returning to their freshwater natal streams to spawn. Because the ESU's spawning rivers are located in Oregon and have no direct connection to the interior waters of Washington State, the only coho salmon that would be present in the action area from this ESU are likely to be individuals that have moved into the Pacific Ocean to reside before returning to their native stream to spawn. We therefore expect Lower Columbia River coho salmon to be present in the coastal portion of the action area.

Eulachon

Eulachon are endemic to the northeastern Pacific Ocean; they range from northern California to southwest and south-central Alaska and into the southeastern Bering Sea. The southern DPS of eulachon is comprised of fish that spawn in rivers south of the Nass River in British Columbia to, and including, the Mad River in California. Adult eulachon spawning typically occurs in the lower reaches of larger rivers fed by snowmelt, and takes place over sand, coarse gravel, or mineral grains. Eulachon eggs attach to small sediment particles (sand and mineral grains); eggs incubate and develop while being actively carried downstream by river currents via "mobile incubation" or "tumble incubation." Eggs hatch in 30 to 40 days depending on water temperatures. Newly hatched larvae are transparent and are transported downstream by spring freshets, and are dispersed by estuarine, tidal, and ocean currents into the estuary-nearshore environment. However, larval eulachon may remain in low salinity, surface waters of estuaries for several weeks or longer before entering the ocean (Hay and McCarter 2000). Once larval eulachon enter the ocean they eventually move from shallow nearshore areas to deeper areas over the continental shelf, typically in waters 66 to 292 feet deep (Hay and McCarter 2000), and sometimes as deep as 597 feet (Barraclough 1964). Eulachon typically spend 2–5 years in saltwater before returning to freshwater to spawn from late winter through spring, spending 95 to 98 percent of their lives at sea (Hay and McCarter 2000). We therefore expect eulachon to be present in the Strait and coastal portions of the action area.

Green sturgeon

The southern DPS of green sturgeon are long-lived, anadromous fish that occur along the west coast of North America from Mexico to the Bering Sea. The southern DPS consists of all naturally-spawned populations of green sturgeon originating from coastal watersheds south of the Eel River

(Humboldt County), California. Green sturgeon reach maturity at around 15 years and can live to be 60 to 70 years old. They may spawn several times in their lives, returning to their natal rivers every 3 to 5 years. Adult green sturgeon spend most of their lives in the coastal marine environment migrating long distances. Subadult green sturgeon leave the San Francisco Bay Delta Estuary and primarily swim north along the Pacific Coast, typically occupying depths of 20 to 70 m in marine habitats (Miller et al. 2020, Huff et al. 2011). We therefore expect green sturgeon to be present in the Strait and coastal portions of the action area.

Critical Habitat – Critical habitat for the southern DPS of green sturgeon has been designated in marine waters along the U.S. West Coast from Monterey Bay, California north to Cape Flattery, Washington, including the Strait of Juan de Fuca, to its U.S. boundary, within 360 feet depth (74 FR 52300, October 9, 2009).

Yelloweye Rockfish

Yelloweye rockfish range from northern Baja California to the Aleutian Islands, Alaska, but are most common from central California northward to the Gulf of Alaska. The threatened Puget Sound/Georgia Basin DPS is the only listed DPS of yelloweye rockfish that has the potential of being found within the action area. The Puget Sound/Georgia Basin DPS includes all waters of Puget Sound, the Strait of Juan de Fuca east of Victoria Sill, and south of the North Strait of Georgia. Larval rockfish occupy open waters of Puget Sound, generally in the upper water column (Waldron 1972, Weis 2004, Greene and Godersky 2012). Juveniles and subadults tend to be more common than adults in shallower water, and are associated with rocky reefs, kelp canopies, and artificial structures, such as piers and oil platforms. Adults generally move into deeper water as they increase in size and age, but usually exhibit strong site fidelity to rocky bottoms and outcrops. We expect Puget Sound/Georgia Basin yelloweye rockfish to be present in the Strait portion of the action area.

Bocaccio

The Puget Sound/Georgia Basin Bocaccio range from Punta Blanca, Baja California, to the Gulf of Alaska off the Krozoff and Kodiak Islands. They are most common between Oregon and northern Baja California. The Puget Sound/Georgia Basin DPS includes all waters of Puget Sound, the Strait of Juan de Fuca east of Victoria Sill, and south of the North Strait of Georgia. Larval rockfish occupy open waters of Puget Sound, generally in the upper water column (Waldron 1972, Weis 2004, Greene and Godersky 2012). Larval and pelagic juvenile rockfish eventually move from the pelagic environment and associate with benthic environments. As adults, rockfish generally inhabit relatively deep waters with steep and complex bathymetry (Gaines and Roughgarden 1987, Johnson et al. 2003, Love et al. 1991, Love et al. 2002). We expect bocaccio to be present in the Strait portion of the action area.

ENDANGERED SPECIES ACT

Effects of the Proposed Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b). When evaluating whether the proposed action is not likely to adversely affect listed species or critical habitat, NMFS considers whether the effects are expected to be completely beneficial, insignificant, or discountable. Completely beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Effects are considered discountable if they are extremely unlikely to occur.

Considering the wide-ranging variability in life history strategies, e.g., recruitment variation, ocean migratory routes, migration timing, oceanic diel vertical movement patterns; long-lived species, short-lived species; trophic interactions; etc., of these species; the range of exposure-effect-response probabilities by each species; we organized the effects analysis by taxa with similar exposure-response-consequence potential:

(1) As WNP gray whales cannot be distinguished from ENP gray whales in real-time and require either genetic or photo-identification to ascertain stock relationship, we analyzed the possibility of the proposed action to cause physiological, behavioral, or reproductive effects to WNP gray whales from training and hunting activities, as well as the possibility that the Tribe may accidentally strike or shoot a WNP gray whale during hunting activities in the winter/spring hunt seasons.

    As the proposed action would be directed at ENP gray whales, the possibility that the Tribe may inadvertently strike (toggle-point harpoon) or attempt to strike (blunt-end spears incapable of penetrating a whale's skin) or attempt to hit, or shoot or attempt to shoot a humpback whale, fin whale, blue whale, north Pacific right whale, sei whale, sperm whale, or a Southern Resident killer whale with a harpoon/spear is highly improbable as the physical characteristics of humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales makes them distinguishable from gray whales, and therefore, discountable, and will not be considered further.

    Consequently, for humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales, we analyzed the possibility of the proposed action to cause physiological, behavioral, or reproductive effects to these whales from training and hunting activities in the winter/spring and summer/fall hunt seasons.

(2) For Guadalupe fur seals, we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects to fur seals from training and hunting activities in the winter/spring and summer/fall hunt seasons.

(3) For sea turtles, we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects to these turtles from training and hunting activities in the winter/spring and summer/fall hunt seasons.

(4) For salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects from training and hunting activities in the winter/spring and summer/fall hunt seasons.

Marine Mammals – WNP Gray Whales

For purposes of the WNP gray whale analysis, we examined the Tribe's training and hunting activities during winter/spring-hunt seasons (December 1 – May 31) when WNP gray whales **are** expected to occur in the action area. We did not further examine the Tribe's training and hunting activities during the summer/fall-hunt seasons (July 1 – October 31) as the available evidence indicates that WNP gray whales **are not** expected to occur on the action area in the summer/fall hunt seasons (NMFS 2022), and therefore any effects to WNP gray whales during this time are extremely unlikely to occur and are discountable.

We estimate the number of days with hunting, scouting, and training activities in the winter/spring hunt seasons based on the anticipated number of days with favorable ocean conditions required for conducting such activities and the probability of sighting one or more gray whales in the action area (NMFS 2022). From December through May, there are 42.5 days in which ocean conditions might allow hunting, training, and scouting activities to take place, and when whale might be expected to be present in the action area. Of these days, 33.2 would likely occur in March through May, when ocean and weather conditions are more favorable for hunt-related activities. The remaining 9.3 days would occur from December through February, when conditions are less favorable. While it is more probable that hunting would only take place on 33.2 days during the winter/spring hunts, we instead use the 42.5-day as an upper end estimate in our analysis (NMFS 2022). There are an additional 17.9 days in the winter/spring hunt season (7.8 days from December through February and 10.1 days from March through May) in which ocean conditions could allow for scouting and training activities using motorized vessels, but gray whales are not expected to be present and therefore hunting is not likely to take place (NMFS 2022). Thus, we anticipate up to 60 days of training and hunting-related activities in winter/spring hunt seasons when weather and ocean conditions are more favorable for hunting, scouting, and training activities (NMFS 2022).

For each day of training and hunting, the best available data suggests that ENP gray whales are far more likely than WNP gray whales to be approached by the Tribe in the Makah U&A. There are an estimated 14,526 ENP gray whales (Eguchi et al. 2023) compared to an estimated 290 WNP gray whales (Carretta et al. 2023). And, the gray whale survey data for the years 2011-2015 (Table 3 and Table 4) suggests that the greatest likelihood of the Tribe approaching a gray whale in the Makah's U&A in the winter/spring hunt seasons occurs within three miles of shore, i.e., the inner portion of the nearshore hunt zone. Thus, as a practicable matter, the likelihood that the Tribe, using sea-going

canoes and small powerboats, would approach, hit (with a blunt-end spear), strike (with a toggle-point harpoon), or shoot a WNP gray whale during their migration, south or north, during training and hunting activities in the Makah's U&A is extremely unlikely to occur.

We based the effects analysis of the Tribe's training and hunting activities considered herein on WNP gray whales on the best available scientific information on WNP gray whales, ENP and PCFG gray whales, including the information/data in the DEIS (NMFS 2015), the SDEIS (NMFS 2022), the Biological Report on the ENP Gray Whale Stock (NMFS 2019), the 2023 ENP gray whale abundance estimates (Eguchi et al. 2023), the 2023 WNP gray whale 5-year review (NMFS 2023), the 2023 DPS analysis of western North Pacific gray whales (Weller et al. 2023)[5], and the practical constraints of conducting training and whale hunting activities in the eastern North Pacific Ocean in the winter and spring (see reference section for full list of citations).

The above-mentioned information was then used as a means to contextualize the exposure-effect probabilities of the Tribe's training and hunting activities. In doing so, we illustrate that the likelihood of WNP gray whales being exposed to the effects of the proposed action are extremely unlikely to occur in a given winter/spring hunt season or over the 10-year waiver period based on the merits of the evidence considered in our effects analysis.

The following lines of evidence were used to support the conclusions in our effects analysis regarding the effects of the proposed action on WNP gray whales.

1. Observations of gray whales in the nearshore hunt zone (NOAA-NMFS-2012-0104).

Beginning in 2011, the Tribe conducted surveys following two general routes through the Makah ocean U&A. The first route traveled southbound between one and three miles from shore and northbound five miles from shore. The Tribe also conducted surveys in a "sawtooth" pattern, extending out to sea some seven to eight miles and returning to nearshore. This same pattern was repeated several times between Tatoosh Island and Sea Lion Rock. The results of these surveys show that from 2011 through 2014, only 30% of the gray whales sighted in the Tribe's surveys were present greater than five miles from shore during the December through May time period. Including 2015 sightings, where a large number (>100) of gray whales were sighted in the vicinity of Tatoosh Island (i.e., less than two miles from shore), the percentage of whales sighted in the past five years (2011-2015) greater than five miles from shore would be approximately 15%. The data suggests that the greatest probability of sighting a whale during this time period occurs within three miles of shore. These data demonstrate that it will be more difficult to find gray whales greater than five miles from shore in the winter and spring. In two of the years, no whales were sighted greater than five miles from shore, and in no years were whales sighted this distance from shore during May when weather conditions are more likely to be favorable.

[5] On October 16, 2023, NMFS's Office of Protected Resources issued a memorandum entitled "Occurrence and Distribution of Eastern North Pacific and Western North Pacific Populations of Gray Whales in the North Pacific Ocean." The Memorandum is intended to provide broad, general recommendations for conducting section 7 analyses relating to WNP gray whales throughout the North Pacific Ocean. The Memorandum specifically notes it is not applicable to the proposed action at issue here. As noted above, the WNP analysis provided in this document is based on the best available scientific information, including information specific to the proposed action, the action area, and the presence and movement of WNPs. For these reasons, we are relying on the specific analysis contained in this letter and not the generalized recommendations of the Memorandum.

Including 2015 sightings, where a large number (>100) of gray whales were sighted in the vicinity of Tatoosh Island (i.e., less than two miles from shore), the percentage of whales sighted in the past five years (2011-2015) greater than five miles from shore would be approximately 15% (Table 3). The survey data suggests that the greatest probability of the Tribe approaching a gray whale in the Makah's U&A in the winter/spring hunt seasons occurs within three miles of shore, i.e., inner portion of the nearshore hunt zone.

Table 3. Number of gray whales observed by year by distance from shore (Dec-May, 2011-2015) NOAA-NMFS-2012-0104.

Miles	2011	2012	2013	2014	2015	Total
0-1	5	5	3	5	78	96
1-2	1	7	13	0	109	130
2-3	2	23	17	0	0	42
3-4	0	8	2	0	2	12
4-5	0	6	3	0	4	13
5-6	0	0	7	0	4	11
6-7	0	7	18	0	0	25
7-8	0	5	5	0	6	16

These data demonstrate that it will be more difficult to find gray whales greater than five miles from shore in the winter and spring. In two of the years, no whales were sighted greater than five miles from shore (Table 3), and in no years were whales sighted this distance from shore during May when weather conditions are more likely to be favorable (Table 4).

Table 4. Number of gray whales observed by month by distance from shore (2011-2015) NOAA-NMFS-2012-0104.

Miles	January	February	March	April	May	Total
0-1	0	0	0	73	23	96
1-2	0	2	3	118	7	130
2-3	0	0	2	16	24	42
3-4	3	5	4	0	0	12
4-5	3	7	1	2	0	13
5-6	3	0	8	0	0	11
6-7	0	0	18	7	0	25
7-8	6	0	10	0	0	16

2. WNP gray whale distribution in the Makah U&A.

Based on the records provided in Lang 2010, Weller et al. 2012, Mate et al. 2015, Urbán et al. 2019, and Martinez-Aguilar et al. 2022, 60 individual WNP gray whales have been identified in both the eastern and western North Pacific (including Sakhalin Island and/or southeast Kamchatka). Forty-eight individuals were recorded in one or more of the Mexican wintering lagoons. Sixteen individuals

have been recorded along the ENP migratory route; this number includes four individuals that were also seen in the lagoons. Of the individuals recorded on the ENP migratory route, seven have been photographed and/or genetically sampled off California, six were photographed near Barkley Sound, Vancouver Island, in the Pacific NW; and one was photographed in an unspecified area of the Pacific NW[6]. Of the three tagged whales, one was tracked as far east and south as the Gulf of Alaska; one made the full migration from Sakhalin to Mexico (southward migration), and back to Sakhalin (northward migration); and one (which was also photographed off Barkley Sound) migrated as far south as the Oregon coast. Only these latter two tagged whales have verified records while migrating through the Makah U&A (Figure 2). Thus, despite significant research efforts and thousands of recorded observations of gray whales in the Makah U&A over the years, no WNP gray whales have been documented in the nearshore waters of the Makah U&A (5 miles or less from shore).

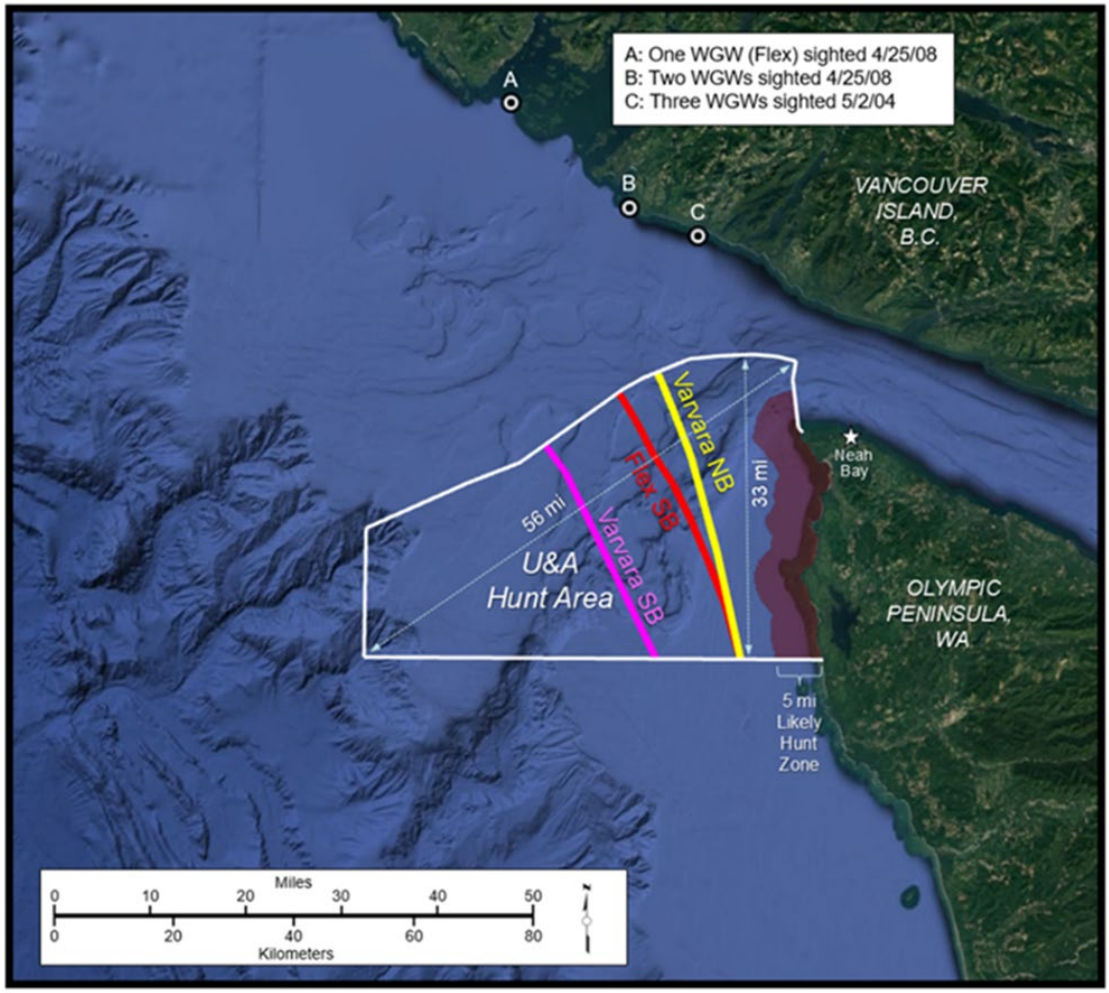

Figure 2. WNP gray whale sightings relative to the Makah U&A hunt area. Tracks for Flex (southward migration) and Varvara (northward migration) are estimated from previous satellite tag locations, trajectories, and movements of other gray whales in the area (NMFS 2019).

[6] Based on photo-evidence from Cascadia Research Collective and Koen Broker - email from Dave Weller, NMFS, to Robert Anderson, NMFS on June 30, 2023.

3. In a letter to NMFS from the Makah Tribe on the 2015 DEIS regarding the offshore hunt, the Tribe stated that:

   The Tribe does not consider the offshore hunt to be a viable hunt for several reasons. Recent surveys by the Tribe's marine mammal biologist out to eight miles from shore indicate that gray whales are far less available during the winter and spring at distances greater than five miles than they are closer to shore [i.e., the nearshore hunt zone (Table 3 and Table 4)].

4. Summary of the previous gray whale training and hunting activities conducted by the Makah Tribe in the action area for the years 1998, 1999, and 2000.
   - During the 1998 training exercises and the 1999 to 2000 Makah whale hunts, all hunts occurred in late April and May (Table 5), when weather and seas generally begin to improve in the Makah U&A (NMFS 2015);
   - On May 11, 1999, the Makah suspended one of their 4 days of hunting for that year after less than 2 hours of hunting because of inclement weather conditions (Gosho 1999; NMFS 1999, as cited in NMFS 2015);
   - During the fall/winter of 1999/2000, the Makah Tribal Council did not issue any whaling permits because weather conditions were unsuitable (NMFS 2015);
   - The Tribe's 1999-2000 gray whale hunts occurred within 1 mile of shore.

Table 5. Makah gray whale hunting activity from April 17, 2000 through May 29, 2000 (Gearin and Gosho, 2000).

Date	Estimated Total ENP Gray Whales in the Vicinity	Time	Estimated Number of ENP Gray Whales Approached	Attempted Strikes
4/17/2000	30	0651-1600	8	0
4/20/2000	30	0556-1600	18	1
5/06/2000	8	0705-1400	3	0
5/07/2000	17	0625-1530	7	0
5/10/2000	10	0647-1330	5	1
5/12/2000	10	0627-1235	10	1
5/29/2000	8	0700-1245	7	0
Total – 7 Days	113	52 Hours	58	3

Over a period of 42 days, there were a total of 113 gray whales in the vicinity of the Makah gray whale hunts (all hunts occurred less than one mile from shore in the Makah's U&A). The Tribe spent a total of 52 hours whaling over 7 days, approached 58 gray whales, and threw 3 harpoons. No gray whales were struck with a harpoon (the third harpoon may have grazed the whale, but the harpoon did not implant or detach). This account of the Tribe's prior whaling activities helps to illustrate that even when gray whales are actively pursued and approached by the Tribe, that striking a whale, especially in ocean-going canoes and with traditional hand harpoons, has a low probability of success.

5. In the DEIS (NMFS, 2015) we note that, due to severe weather, ocean conditions, and shorter periods of daylight, Makah whale hunts would likely occur within 5 miles of shore (nearshore hunt zone, Figure 2) during winter/spring-hunt seasons.

6. Gray Whale Migratory Movements in the Makah's U&A.

a. Sightings of WNP gray whales (Figure 2), based on satellite tag locations, trajectories, and movements of gray whales in the action area, suggest that WNP gray whales migrating in the eastern North Pacific travel relatively rapidly and well beyond the nearshore hunt zone (Figure 2). Two of these sightings involve satellite-tagged WNP gray whales known to have migrated through the Makah U&A (NMFS 2019). One WNP gray whale 'Flex' was tracked heading southward at 4.3 miles/hour, and the other WNP gray whale 'Varvara' was tracked heading southward at 3.4 miles/hour, and northward at 4.6 miles/hour (NMFS 2019). Unpublished data obtained from these researchers (NMFS 2019) indicate that both whales likely travelled through the Makah U&A hunt area in about 7 to 8 hours at a distance of 7-25 miles from shore. These travel time and speed estimates yield track lengths of 28-34 miles, which is similar to the nearshore and largest north-south dimension of the Makah U&A of 33 miles (Figure 3). These sightings data suggest that WNP gray whales migrate well beyond the nearshore hunt zone, significantly reducing the possibility that the Tribe would approach WNP gray whales during their migration, south or north, during training and hunting activities taking place in the nearshore hunt zone.

b. A number of researchers (e.g., Wilke and Fiscus, 1961; Pike, 1962; Darling, 1984; Calambokidis et al., 2004, 2009, as cited in NMFS 2019) have observed that migrating ENP gray whales in the vicinity of the Makah U&A travel a roughly north-south track along the coasts of Washington and Vancouver Island (Figure 3). Although there is considerable variability in these sightings (Pike, 1962; Green et al., 1992; Green et al., 1995, as cited in NMFS 2019), the best available information suggests that the vast majority of ENP gray whales in the action area are located within 3.1 miles of shore (Scordino et al. 2013; P. Gearin, NOAA Fisheries Research Biologist, pers. comm., May 5, 2014, as cited in NMFS 2019).

c. *Fall/Winter – Southward Migration*

Most ENP gray whales migrate south out of Arctic feeding grounds sometime around mid-October to November, and some have been seen off the coast of Chukotka as late as mid-December (Rugh et al., 2001).

Shelden et al. (2000) reported observations of gray whales off the coast of Washington and in the Strait of Juan de Fuca near Port Angeles in early to mid-November. Using data from surveys at other locations, along with measured travel speeds of migrating ENP gray whales, Rugh et al. (2001) calculated January 5 as the peak of the southward migration past Tatoosh Island (Figure 1).

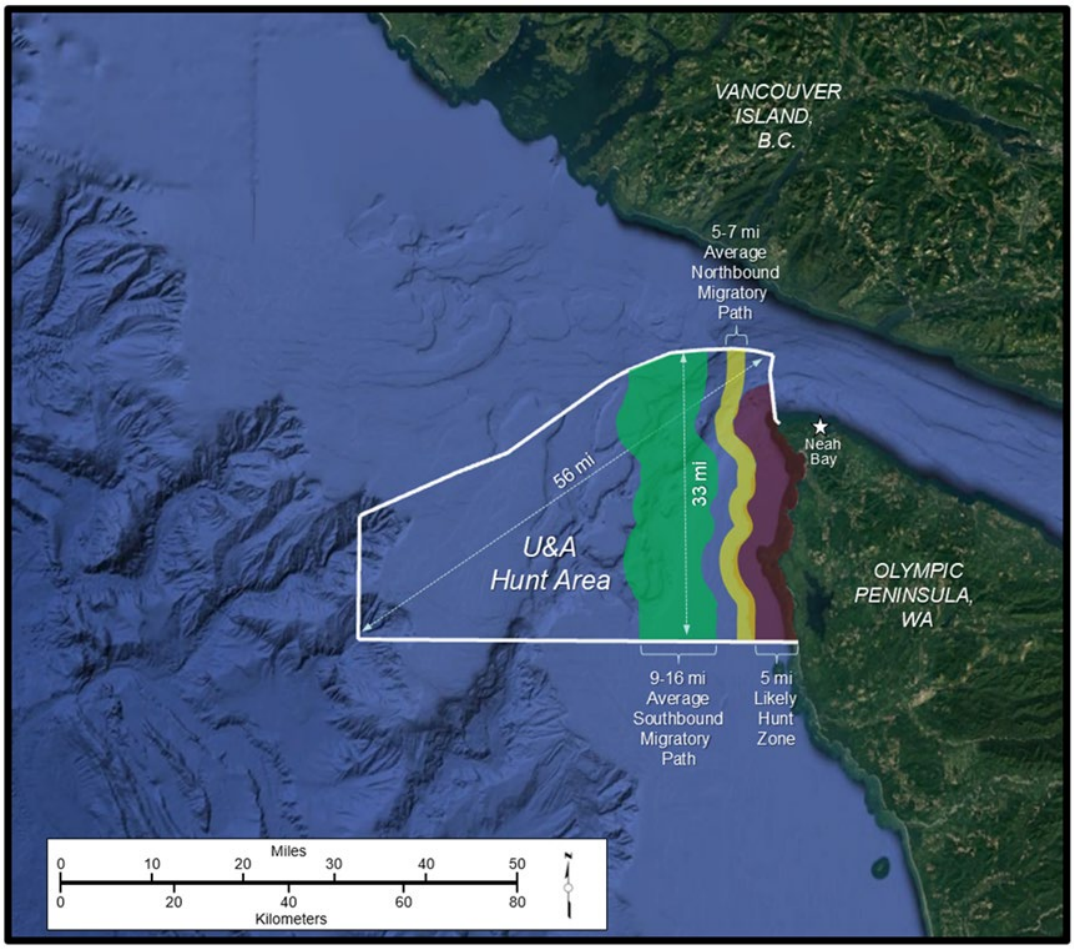

Figure 3. Generalized location of typical north- and south-bound migratory paths for ENP gray whales relative to the Makah U&A hunt area and the likely nearshore hunting zone (NMFS 2019).

d. *Spring Northward Migration*

The first phase of the northward migration begins in mid- and late February (Swartz et al. 2006), and the final phase of the migration is primarily female-calf pairs that are the last to leave the wintering areas, departing between late March and May and generally arriving in their summer feeding range from May to June (Swartz et al. 2000; Swartz et al. 2006). Taking both migration phases into account, northbound whales of all ages and both sexes are present off the Washington coast from late February through June (and into summer and fall for whales summering in that area). There are no direct observations that establish the specific timing or arrival for either phase of the northward ENP gray whale migration through the action area, nor are there any published estimates based on observations from other areas as is available in Rugh et al. (2001) for the southward migration.

e. *Migratory Distribution Relative to Shore*

During the migration, the distribution of ENP gray whales relative to shore varies based on: (a) environmental conditions such as bottom topography, climate, and water depth; (b) seasonal timing and migration phase; and (c) use of the migratory corridor (such as feeding, social-sexual behavior, or migrating). Generally, gray whales migrate closer to shore where the continental shelf is narrow, and are distributed farther offshore where the continental shelf is broader (Shelden et al. 2004). There is also some evidence suggesting that northbound whales travel closer to shore during spring than do southbound whales in fall and winter (Herzig and Mate 1984; Green et al. 1995; Calambokidis et al. 2009). During the 1999 and 2000 Makah hunts (in April and May), gray whales were sighted or pursued an average of 1.0 mile from shore (Gosho 1999; Gearin and Gosho 2000, as cited in NMFS 2015).

Although there is considerable variability in these sightings, the best available information suggests that northbound ENP gray whales migrate an average 5 to 7 miles offshore, and southbound ENP gray whales migrate an average of 9 to 16 miles offshore in the Makah's U&A.

In summary, the Makah training and hunting activities are expected to occur within 5 miles of shore – the nearshore hunt zone, which aligns with the northbound ENP gray whale migratory pathway, versus the northbound or southbound WNP gray whale migratory pathway (Figure 2), and the best available data suggests the WNP gray whales spend only a very limited amount of time in the Makah U&A, migrating rapidly through the action area. Furthermore, for each day of hunting, the best available data suggests that ENP gray whales are far more likely than WNP gray whales to be approached by the Tribe in the Makah U&A, as there are 14,526 ENP gray whales (Eguchi et al., 2023) compared to 290 WNP gray whales (Carretta et al. 2023). Thus, as a practicable matter, the likelihood that the Tribe would approach (using sea-going canoes and small powerboats), hit (with a blunt-end spear), strike (with a toggle-point harpoon), or shoot a WNP gray whale during their migration, south or north, during training and hunting activities in the Makah's U&A is extremely unlikely to occur.

Effects of the proposed action on WNP Gray Whales

The effect pathways on WNP gray whales considered herein include: vessel traffic, vessel approaches, vessel noise, vessel strikes, water quality and ecosystem-related-related effects; training harpoon hits and unsuccessful hits (blunt-end spears incapable of penetrating a whale's skin), harpoon hits, harpoon strikes (toggle-point harpoons capable of penetrating a whale's skin), and gunfire noise and shots[7].

[7] We did not further examine the Tribe's training and hunting activities during the summer/fall-hunt seasons (July 1 – October 31) as the available evidence indicates that WNP gray whales **are not** expected to occur on the action area in the summer/fall hunt seasons (NMFS 2022), and therefore any effects to WNP gray whales during this time are extremely unlikely to occur and are discountable.

Effects of Vessel Operations on WNP gray whales

Vessel Operations

For the 10-year waiver, there would be five winter/spring hunting seasons (NMFS 2022)[8]. This amounts to 300 days of training and hunting-related activities in winter/spring hunts during the waiver period (60 days of hunting-related activities per year times 5 years), and 70 days of hunting-related activities in summer/fall hunts (14 hunting days per year times 5 years). Thus, there could be an average of 37 hunting days per year over the waiver period (370 total hunting days divided by 10 years).

Vessel Traffic - Training and hunting activities would result in an incremental increase in vessel transits (sea-going canoes and small powerboats) in the action area above baseline levels in winter-hunt years from December 1 through May 31 (NMFS 2022).

Vessel Noise - The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[9] at open throttle, and at a frequency of 0.135 to 1.2 kHz, which is within the hearing range of WNP gray whales of 0.01-5 kHz.

Water Quality and Ecosystem-Related Effects – Potential water quality and ecosystem-related effects of the proposed action to WNP gray whales include oil spills, whale towing, and removal of ENP gray whales from the environment.

Vessel Operations - For purposes of this analysis, an approach is defined as a training or hunting vessel that is within 100 yards of a gray whale, and a vessel strike is defined as a vessel that physically comes into contact with a gray whale. The Tribe would be limited to no more than 353 gray whale approaches[10] (including both hunting and training approaches) per year over the 10-year waiver period. For purposes of the WNP gray whale analysis, we estimate that that there could be 42.5 days of canoe-based hunting during winter/spring hunt seasons (NMFS 2022). Of these 42.5 days, 33.2 would likely occur in March through May, when ocean and weather conditions are more favorable for hunting. The remaining 9.3 days would occur from December through February, when conditions could prohibit any hunting. While it is more probable that hunting would only take place on 33.2 days during the winter/spring hunts, we instead use the 42.5-day as an upper end estimate in our analysis (NMFS 2022). In addition to the number of days in which a canoe-based hunt could occur, there may be days when a motorized vessel is used to scout for whales. As such, we estimate that there could be as 43.3 scouting days from March through May, and 17.1 days from December through February (NMFS 2022). Thus, we anticipate up to 60 days of training and hunting-related activities in winter/spring hunt seasons when weather and ocean conditions are more favorable for training and hunting activities (NMFS 2022).

[8] And five summer/fall hunting seasons.
[9] Based on the range of broadband source levels of one 150 horsepower outboard motor (Powerboats Reports, 2006).
[10] The proposed waiver places limits on the number of strikes, unsuccessful strike attempts, and approaches of ENP gray whales within 100 yards that the tribe may take each year.

The increase in vessel transits, vessel noise, vessel approaches, risks of vessel strikes, or water quality and ecosystem-related impacts are unlikely to have any discernable adverse physiological (e.g., increases in stress hormones, energy loss), behavioral (e.g., startle response, changes in surfacing, diving, orientation, vocalizations, and increased transit time through the action area), or reproductive (e.g., mating success[11]) effects on WNP gray whales in the action area over the 10-year waiver period as the likelihood of WNP gray whales being exposed to vessel-related effects by the Tribe are extremely unlikely to occur and discountable based on the following lines of evidence.

- **Vessel Traffic** – The minor increase in vessel transits (sea-going canoe and motorized chase boats – totaling 300 events over the 10-year waiver period) would represent less than one half of one percent of an increase in the overall average vessel transits in the action area (Figure 1) relative to the thousands of vessels that transit through the action area in a given year[12]. Given the remote possibility of WNP gray whales in the nearshore hunt zone portion of the action area where training and hunting activities are expected to take place in the winter/spring hunt seasons, we do not, based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A, expect vessels used for training or hunting activities to approach WNP gray whales, as we do not expect WNP gray whales to co-occur in the nearshore hunt zone during the Tribe's training or hunting activities. Therefore, the likelihood of the Tribe approaching WNP gray whales during training or hunting activities in a given winter/spring-hunt season or over the 10-year waiver period is extremely unlikely to occur, and thus effects, such as startle responses, avoidance, or physiological stress responses, are discountable.

- **Vessel Noise** – The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[13] at open throttle, and at a frequency of 0.135 to 1.2 kHz, which is within the hearing range of WNP gray whales of 0.01-5 kHz. However, underwater sound pressure levels for disturbance to marine mammals are: broadband 160 dB root-mean-square sound pressure level (RMS) re 1µPa for impulse sound, and 120 dB RMS re 1µPa for continuous sound (NMFS 2018), which is higher than broadband source levels associated with the small powerboat the Tribe would use. Given the remote possibility of WNP gray whales in the nearshore hunt zone portion of the action area where training and hunting activities are expected to take place in the winter/spring hunt seasons, we do not, based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A, expect vessels used for training or hunting activities to approach WNP gray whales, as we do not expect WNP gray whales to co-occur in the nearshore hunt zone during the Tribe's training or hunting activities. Therefore, the likelihood of underwater sound pressure levels affecting WNP gray whales during training or

[11] Assumes that WNP gray whales breed during their migration in the NW Pacific Ocean.
[12] A study of 2018 AIS data by the Department of Ecology found that 12,683 vessel transits were recorded at the mouth of the Strait of Juan de Fuca in that year alone (Ecology 2021).
[13] Based on the range of broadband source levels of one 150 horsepower outboard motor.

hunting activities in a given winter/spring-hunt season or over the 10-year waiver period is discountable.

- **Vessel Strikes** – Vessels used for training and activities would be small vessels (sea-going canoe and small powerboats) and would be traveling at slow speeds, and during training and hunting activities, motorized vessels would be traveling at speeds similar to the sea-going canoe. However, given the remote possibility of WNP gray whales in the nearshore hunt zone portion of the action area where training and hunting activities are expected to take place in the winter/spring hunt seasons, we do not, based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A, expect vessels used for training or hunting activities to approach WNP gray whales, as we do not expect WNP gray whales to co-occur in the nearshore hunt zone during the Tribe's training or hunting activities, and we do not expect motorized vessels used for training or hunting activities to strike a WNP gray whale. Therefore, the likelihood of a vessel striking a WNP gray whale during training or hunting activities in a given winter/spring-hunt season or over the 10-year waiver period is discountable.

- **Water Quality (spills)** - If any spill occurred[14], effects would be minor and short-lived, even if they occurred in a semi-contained area such as Neah Bay. The volume of fuel or other contaminants carried by any hunt-related vessels would be miniscule compared to the volume of water in any potential receiving waters (e.g. Neah Bay, Strait of Juan de Fuca, and the Pacific Ocean). A spill of fuel or similar fluids would not mix with water, but would form a thin layer on the surface, continually spreading while it evaporated, broke apart, was hydrolyzed by ultraviolet light, and was decomposed by bacteria. This would probably occur over hours or days. The introduction of hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a small increase in the likelihood of an oil spill occurring. For the reasons described above, in the unlikely event that a spill does occur during the course of the hunt, we would expect the impacts to be short in duration and small in geographic scope.

- **Water Quality (hunting/butchering)** – Impacts to water quality could also come from whale hunting and butchering activities, which could produce two broad classes of potential contaminants: organic material (e.g., blood, lymph, and digestive tract contents) and bioaccumulated contaminants (e.g., PCBs, DDT). During a successful whale hunt, the initial strike and kill would be expected to release substantial amounts of organic matter, which would continue to leak out of the carcass as it is hauled to the beach and butchered on shore. The likely effects of this material would be attraction of predators to the blood scent, avoidance of blood by common prey fish species, and secondary effects of decreased dissolved oxygen associated with the breakdown of the organic material by marine bacteria. These effects would extend over a relatively short period (likely several hours) and would have a very low probability of affecting the immediate marine environment in any detectable manner for more than a day or two.

[14] No spills were reported in the 1999 and 2000 Makah hunts.

- **Water Quality (carcass disposal)** – If the unused portions of the carcass were towed out to sea for post-harvest disposal, some bioaccumulated contaminants might be released into the marine ecosystem. The amount of toxins released from a flensed carcass, however, would be substantially less than the amount from a whale that died and decomposed entirely at sea. Given the size of the ocean area in which carcasses would be disposed, the removal of most of the blubber from carcasses prior to disposal, and the likely death and decomposition of some whales in the area naturally, the expected impact to the marine environment from carcass disposal would be negligible in any given year or over a period of years.

- **Disturbance (whale towing)** - Whales that are killed in the course of a hunt by the Makah Tribe will be towed to shore using a motorized support vessel. Towing whale carcasses could result in a minor physical disturbance to other animals in the water column or near landing beaches. The Tribe would be expected to land (and therefore tow) up to 3 whales in winter/spring hunt years and up to 1 whale in summer/fall hunts years, or up to 2 whales per year on average over the course of the 10-year waiver period. Given the remote possibility of WNP gray whales in the nearshore hunt zone portion of the action area where towing activities are expected to take place in the winter/spring hunt seasons, we do not, based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, expect vessels towing whales to approach WNP gray whales. Therefore, the likelihood of physical disturbance to WNP gray whales from towing activities in a given winter/spring hunt year or over the 10-year waiver period is discountable.
- **Ecosystem (removal of gray whales)** - The proposed waiver would allow for the removal of up to 25 ENP gray whales from the marine ecosystem over a 10-year period. Gray whales killed during the hunt are likely to be transiting through the action area during their annual migration to or from their Arctic feeding grounds, or feeding in the action area. Transiting gray whales are less likely to have an impact on the environment through which they are traveling, however feeding gray whales play a more significant role in the local ecosystem. If the consumption of pelagic prey by gray whales represented a significant factor in determining zooplankton species abundance or plays a significant role in structuring planktonic communities, it would be possible that the abundance, species composition, and spatial distribution of pelagic organisms could be altered if whales were harassed in or removed from the action area (NMFS 2015). The amount of ecological change induced by a whale hunt would depend on the relative change in whale presence and prey consumption, as well as the importance of whale prey consumption relative to oceanographic/climatic processes in determining the dynamics of zooplankton species assemblages in the action area. In this case, however, the consumption of pelagic prey by gray whales is not likely a significant factor in structuring pelagic communities relative to the highly variable and energetic oceanographic and climatic processes characteristic of the action area. Oceanographic processes in the action area are generally large in scale, with ocean circulation driven by a major eastern boundary current system, the California Current System (NMFS 2015). Assuming that gray whales do play a substantial role in structuring pelagic communities, the potential reduction in the few numbers of whales over the 10-year period is not expected to result in any detectable ecological effects, as the number of whales potentially removed is substantially smaller than the observed levels of interannual variability in whale abundance within the action area.

Given the remote possibility of WNP gray whales in the nearshore hunt zone where training and hunting activities are expected to take place in the winter/spring hunt seasons, we do not expect WNP gray whale to be exposed to temporary and minimal water quality, disturbance, and ecosystem-related effects described in the last five bullets, as we do not expect WNP gray whales to co-occur in the nearshore hunt zone where these effects would potentially occur as a result of the Tribe's training or hunting activities. Therefore, the likelihood of WNP gray whales being exposed to water quality, disturbance, and ecosystem-related effects during training or hunting activities in a given winter/spring-hunt season or over the 10-year waiver period is discountable.

Effects of Training Activities (Training Harpoons) on WNP gray whales

In addition to vessel operations described above, training activities would also include the use of training harpoons (blunt-end spears incapable of penetrating a whale's skin). Training activities (approaches and training harpoon throws) could occur in any month in winter/spring hunt seasons when WNP gray whales are likely, albeit intermittently, and in very low numbers, to transit the action area. Training harpoon throws are counted against the unsuccessful strike attempt limit (NMFS 2022). Unsuccessful strike attempts would be limited to 18 during winter/spring hunt years.

- For training activities, the Tribe would use traditional hand harpoons, which are blunt-end spears incapable of penetrating a whale's skin, and therefore incapable of causing physical injury to a whale, and are heavy and cumbersome implements which can be thrown only 15 to 20 feet (Durham 1973), requiring the Tribe to be in close proximity to a gray whale to hit one with a training harpoon.
- The Tribe would be limited to a total of 353 gray whale approaches, and 18 harpoon attempts (training and hunting combined) in a given winter/spring-hunt season, and 90 harpoon attempts (training and hunting combined) in winter/spring hunt seasons over the 10-year waiver period; although we estimate that hunting and training activities could take place on up to 60 days in winter/spring hunt years, with the majority of those days (43) taking place in March through May when weather and ocean conditions are more favorable for training and hunting activities (NMFS 2022), significantly minimizing the number of potential approaches and harpoon attempts. Furthermore, we do not expect the Tribe to hit a WNP gray whale with a training harpoon — as we do not expect WNP gray whales to co-occur in the nearshore hunt zone based on the rare and intermittent presence of WNP gray whales in the action area during training and hunting activities, and the low probability that for any given approach with a gray whale that it might be a WNP gray whale. Therefore, the likelihood of the Tribe approaching WNP gray whales during training or hunting activities in a given winter/spring-hunt season or over the 10-year waiver period are extremely unlikely to occur, and thus any effects to WNP gray whales, such as startle responses, avoidance, or physiological stress responses, are discountable.

Summary - Effects of Vessel Operations and Training Harpoons

During training and hunting activities, conducted in winter/spring-hunt seasons, WNP gray whales are likely to be intermittently present in very low numbers as they transit the action area, although we do not expect WNP gray whales to be present in the nearshore hunt zone portion of the action area, based on the evidence in the preceding section on WNP gray whale distribution in the Makah

U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A, where training and hunting activities are expected to take place in the winter/spring hunt seasons. As such, we do not expect WNP gray whales and training and hunting activities conducted by the Tribe to co-occur in space and time in any given winter/spring-hunt season over the 10-year waiver period. Therefore, we do not expect the duration, frequency, or intensity of the above-mentioned effects, individually or together, to occur on WNP gray whales during training and hunting activities as all such effects would be extremely unlikely to be experienced by WNP gray whales, and are therefore discountable.

Effects of Hunting Activities on WNP gray whales

In addition to the above-mentioned analysis regarding the effects of vessel operations and training harpoons on WNP gray whales, hunting activities carried out by the Tribe would include additional activities with the potential to affect WNP gray whales that training activities do not. Hunting activities would also include the use of toggle-point harpoons (harpoons capable of penetrating a whale's skin) and firearms. Therefore, we considered the possibility that the Tribe may strike[15] and shoot[16] a WNP gray whale; as well as the effects of sound pressure levels generated from the use of firearms.

Toggle-Point Harpoons – For hunting activities in the action area in winter/spring hunt seasons, we do not expect the Tribe to strike a WNP gray whale as we do not expect WNP gray whales to co-occur in space and time in any given winter/spring-hunt season over the 10-year waiver period based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A. As such, we find that the collective body of evidence considered herein, in particular lines of evidence 1 through 6 discussed above, disaffirms the possibility that the Tribe would strike a WNP gray whale during their migration, south or north, during hunting activities in the nearshore hunt zone in the Tribe's U&A. Therefore, we find the likelihood that the Tribe would strike a WNP gray whale with a harpoon during their migration, south or north, during hunting activities to be discountable.

Effects of Firearms – Based on the evidence in the preceding section on WNP gray whale distribution in the Makah U&A, the 1998-2000 gray whale training and hunting activities conducted by the Makah Tribe, and gray whale migratory movements in the Makah's U&A, we do not expect WNP gray whales and training and hunting activities conducted by the Tribe to co-occur in space and time. Therefore, we find the likelihood that exposure to (changes in sound pressure levels) and effects from (shooting WNP gray whales) the use of firearms by the Tribe to WNP gray whales during their migration, south or north, during hunting activities to be discountable.

[15] If it is determined that the Tribe struck a WNP whale, all hunting would cease unless and until NMFS determined that measures were taken to ensure that no additional WNP gray whales would be struck during the remainder of the waiver period.

[16] We assume that if the Tribe strikes a gray whale, and that whale does not break the harpoon line, that that whale would also be shot in order to kill the whale.

Quantitative analysis on the likelihood of the Tribe striking a WNP gray whale

Introduction

Observations of gray whales identified in the WNP migrating to areas off the coast of North America (Alaska to Mexico) raised concern about placing the WNP population at potential risk of being harmed or killed incidental to the ENP gray whale hunt proposed by the Makah Indian Tribe off northern Washington, USA (IWC, 2012). Given the ongoing concern about the conservation of the WNP population, in 2011 the Scientific Committee of the International Whaling Commission (IWC) emphasized the need to evaluate the probability of a WNP gray whale being encountered or killed during aboriginal hunts for ENP gray whales (IWC, 2012). Following recommendations of the Scientific Committee of the IWC, analyses were conducted to estimate such probability in the context of the Makah Tribe's hunt proposal (Moore and Weller, 2013). The Tribe's proposed hunt was analyzed in detail by the IWC's Scientific Committee from 2010 through 2013, and the IWC concluded that the hunt satisfied the conservation standards of the IWC.

In addition to the 2013 analysis, NOAA's Southwest Fisheries Science Center conducted additional quantitative analyses in Moore et al. (2018), Moore et al. (2019), and Moore et al. (2023) [17] for use as evidence in the MMPA waiver proceeding to inform potential management measures intended to further reduce the risk of training and hunt activities causing impacts to WNPs, and to estimate the probability of striking (i.e., killing or seriously injuring) a WNP whale during the Makah hunt.

Here we provide a summary of the assumptions, types of data, parameters, an overview of the models used in the analyses, and the modeled results of the probability of the Tribe approaching, hitting or striking (i.e. killing or seriously injuring) a WNP gray whale in a given winter/spring hunt season.

Assumptions, data, and parameters

- The 24-year gray whale sightings data used in Moore et al. (2023) does not include WNP gray whale sightings, satellite tag locations, trajectories, and movements in the Makah U&A. Rather, the analysis is based on the most recent WNP abundance estimates and the proportion of WNP gray whales migrating with ENP gray whales. The analysis assumes that WNP whales are homogenously mixed with ENP whales during migration, and assumes that a high proportion of WNP whales transit through the Makah U&A, even though so few have actually been recorded there;
- As a precaution, the analysis in Moore et al. (2023) assumed that the probability of the Tribe striking a WNP gray whale verses an ENP gray whale has an equal chance anywhere in the Tribe's U&A, as opposed to the likelihood that the Tribe would conduct training and hunting activities in nearshore hunting zone;
- As a precaution, the analysis in Moore et al. (2023) assumed that the full annual limit of 353 gray whale approaches would occur in a given winter/spring hunt season, as opposed to a

[17] The 2023 NMFS Technical Memorandum is an updated version of the previous NMFS Technical Memoranda (Moore and Weller 2013, 2018, 2019).

portion of the allowable approaches occurring in the summer/fall hunt seasons, when weather and ocean conditions are more favorable for training and hunting activities;

- As a precaution, the analysis in Moore et al. (2023) assumed that the Tribe would achieve the maximum of harpoon attempts (training and hunting) of 18 and 90 for a given winter/spring hunt season and over the 10-year waiver period, respectively, as opposed to occurring in any month during winter/spring and summer/falls hunt seasons;
- The likelihood of hitting or striking a WNP gray whales is overestimated if fewer total whales are hit or struck than allowed, or if WNP gray whales use a different migration corridor, and in so doing, would be less likely to travel through the action area (Moore et al., 2023).
- The sightings data used by Moore et al. (2023) to conduct these analyses are based on the gray whale surveys in Harris et al. (2022). Of 417 unique whales sighted in the region before June 1 (i.e., during migration), 113 (27.1%) were also observed at least once after June 1 and thus potentially PCFG animals. 102 (24.5%) were sighted after June 1 in at least two years and are thus more assuredly PCFG animals. Moore et al. (2023) used the latter value (i.e., 102) to estimate the likelihood of an encountered animal being a PCFG vs non-PCFG animal, because it provides more precautionary inference concerning WNP risk (i.e., implies a higher likelihood of an encountered animal being a non-PCFG and therefore possibly WNP animal). This is similar to the value of 28% used by Moore and Weller (2019);
- The key parameter of interest is the per-strike probability of striking a WNP whale (Table 7). Derived from this parameter are the probabilities of striking at least one WNP out of 3 gray whale strikes, out of 9 strikes, and out of 15 gray whale strikes, respectively. Using data collected during previous gray whale hunts by the Tribe (NMFS 2015), the following two assumptions were used to calculate analogous estimates for vessel approaches and unsuccessful strike attempts: (1) there will be 353 vessel approaches per year, irrespective of hunt season because training will still occur, and (2) there will be 6 unsuccessful strike attempts for every strike in a winter/spring hunt (and thus 18 attempts, 54 attempts, and 90 attempts the 1-, 6- and 10-year periods, respectively)[18].

Models

The analysis used six models from 4 model sets that varied based on the assumptions and types of data used for estimation. Model set 1 used WNP and ENP abundance estimates. Model set 2 used these abundance estimates, as well as ENP and PCFG gray whale sightings data from the proposed hunt area. Model sets 3 and 4 used only the ENP and PCFG gray whale sightings data. Within model sets 1 and 2, two models (A and B) differed based upon whether migrating ENP and WNP whales were assumed to be equally available to the hunt per capita (A) or whether this assumption is relaxed (B). Moore et al. (2023) consider Model 2B the most plausible of all models because model set 2 makes use of all available information and 2B contains fewer assumptions than 2A.

[18] We expect zero in summer-hunt years because the draft proposal limits training strikes (which count as unsuccessful strike attempts) to the summer-fall hunting season, when WNP whales are not expected to be present.

Table 7. Estimated number of approaches, harpoon attempts (including training attempts), and strikes of WNP whales (Moore et al., 2023).

Analysis based on the 2021/2022 population estimates for the ENP 16,650						
For any given encounter, the probability if it being a WNP = 0.8%						
Year	**Number of approaches**	**Expected number of WNPs approached**	**Number of harpoon attempts (training and hunting)**	**Probabilities of at least one whale being a WNP**	**Maximum number of strikes**	**Probability of at least one whale being a WNP**
1	353	2.8	18	13.2%	3	2.3%
6	2,218	16.6	54	34.5%	9	6.8%
10	3,530	27.7	90	50.4%	15	11.1%
Analysis based on a fixed lower ENP abundance threshold of 11,000[19]						
For any given encounter, the probability if it being a WNP = 1.2%						
1	353	4.2	18	19.2%	3	3.5%
6	2,218	25.0	54	47.1%	9	10.1%
10	3,530	41.7	90	65.2%	15	16.3%

Results

- For any given encounter, the probability of it being a WNP gray whale is 0.8%.
- For a single year's hunt, if all 3 strikes are used, the expected probability of the Tribe striking at least 1 WNP gray whale is estimated at 2.3% to 3.5 % (Table 7);
- Over the 10-year waiver period, the probability of the Tribe striking at least 1 WNP gray whale is estimated at 11.1% to 16.3% over the 10-year waiver period (Table 7);
    - To put the 11.1 % strike probability into perspective, it means that it is likely one WNP whale would be killed every 90 years, if and only if, the Tribe were to conduct 9 consecutive 10-year hunts;
    - To put the 16.3% strike probability into perspective, it means that it is likely that one WNP whale would be killed every 61 years, if and only if, the Tribe were to conduct 6 consecutive 10-year hunts.

In the context of the analysis in this document, we considered the probability estimates in Moore et al. (2023) regarding number of approaches, harpoon attempts, and strikes of WNP whales in Moore et al. (2023) as a high risk/precautionary scenario, as the methods, data, model parameters, and assumptions used in Moore et al. (2023) to estimate the probability of the Tribe striking a WNP gray whale unlikely represent how the Tribe would realistically conduct training and hunting activities in a given winter/spring hunt season under the waiver and how many WNP gray whales may be mixed with ENP gray whales in the hunt area in a given winter/spring hunt season. That is, for the estimates in Moore et al. (2023) to be considered reasonably certain to occur, the Tribe would need to conduct training and hunting activities in the winter/spring hunt seasons in a manner consistent with the methods, data, model parameters, and assumptions used in the Moore et al. (2023) analysis, and

[19] Moore et al. (2023) also used a hypothetical ENP abundance of 11,000 animals as a means to provide a range of potential impacts to WNP gray whales based on changes in abundance to ENP gray whales.

WNP gray whales would need to be homogenously mixed with ENP gray whales and transiting through the Makah U&A at a higher proportion than has actually been observed. Otherwise those estimates would overestimate the risks to WNP gray whales that might be subjected to strikes, unsuccessful strike attempts, and vessel approaches during training and hunting activities conducted by the Tribe.

As an illustrative example, in 2000 the Tribe's spring hunt period spanned between April 17 and May 29, during which 7 days of hunt operations were accomplished. In this time, 58 gray whales were reported to have been approached and 3 attempted strikes made; however, no gray whales were actually struck. In this example, which is representative of how the Tribe is likely to conduct a hunt in a given winter/spring hunt season under the waiver, the Tribe had substantially fewer approaches in the winter/spring hunt season than the number of approaches used in Moore et al. (2023). Furthermore, this example illustrates why this high risk/precautionary scenario does not align with the proposed action, does not represent how the Tribe is likely to conduct training and hunting activities based on previous gray whale hunts, and as such, overestimates and misjudges the risks to WNP gray whales that might be subjected to strikes, unsuccessful strike attempts, and vessel approaches during training and hunting activities conducted by the Tribe, and why we considered the estimates in Moore et al. (2023) as a conditional line of evidence for the WNP risk analysis in this document.

The ESA requires us to rely on the best available scientific data and information to conduct our analysis. We have described that scientific data and information in the lines of evidence above. The Moore et al. (2023) analyses were prepared for the IWC and MMPA processes and intentionally adopted a precautionary approach. While helpful to inform an upper bound of risks to WNPs as part of those proceedings, the Moore et al. (2023) analyses do not reflect the actual expected effects of the Tribes' training and hunting activities on WNP gray whales. Those are reflected in the analysis in this document and illustrate based on all the information cited and described that the potential effects of the Tribe's training and hunting activities are extremely unlikely to overlap in space and time with the limited number of WNP gray whales that will be transiting through the action area on their south and northbound migrations.

Summary - Effects of Hunting Activities on WNP Gray Whales

During hunting activities, conducted in winter/spring-hunt seasons, some WNP gray whales may migrate through the action area; however, we do not expect WNP gray whales and hunting activities conducted by the Tribe to co-occur in space and time in any given winter/spring-hunt season over the 10-year waiver period based on the above-mentioned lines of evidence regarding the possibility that the Tribe would approach (using sea-going canoes and small powerboats), hit (with a blunt-end spear), strike (with a toggle-point harpoon), or shoot a WNP gray whale during their migration, south or north, during training and hunting activities expected to occur in the nearshore hunt zone. Therefore, the above-mentioned effects on WNP gray whales during hunting activities are extremely unlikely to occur and therefore discountable.

Synthesis of Training and Hunting Activities on WNP Gray Whales

Even though some WNP gray whales may occur in the action area during training and hunting activities conducted by the Tribe over the 10-year waiver period, we do not expect WNP gray whales and training and hunting activities conducted by the Tribe to co-occur in space and time in any given winter/spring-hunt season over the 10-year waiver period based on the collective body of evidence considered herein.

Lines of evidence summary:

- Of the 60 WNP gray whales identified in both the eastern and western North Pacific, only two of these gray whales have verified records while migrating near or through the Makah U&A, and in both cases these whales transited through the Makah U&A at a distance of 7-25 miles from shore;
- Despite significant research efforts and thousands of recorded observations of gray whales in the Makah U&A over the years, no WNP gray whales have ever been documented in the nearshore waters of the Makah U&A (5 miles or less from shore);
- And, as noted previously, the Tribe does not consider the offshore hunt to be a viable hunt as it will be more difficult to find gray whales greater than five miles from shore in the winter and spring. In two of the hunt years, no whales were sighted greater than five miles from shore, and in no years were whales sighted this distance from shore during May when weather conditions are more likely to be favorable. Additionally, safety risks increase substantially five or more miles offshore, especially in the winter/spring hunt seasons;
- During the 1998 training exercises and the 1999 to 2000 Makah whale hunts, all hunts occurred in late April and May (Table 3), when weather and seas generally begin to improve in the Makah U&A (NMFS 2015);
- On May 11, 1999, the Makah suspended one of their 4 days of hunting for that year after less than 2 hours of hunting because of inclement weather conditions;
- During the fall/winter of 1999/2000, the Makah Tribal Council did not issue any whaling permits because weather conditions were unsuitable;
- The Tribe's 1999-2000 gray whale hunts occurred within 1 mile of shore.
- The survey data in Table 3 and Table 4 suggests that the greatest probability of the Tribe approaching a gray whale in the Makah's U&A in the winter/spring hunt seasons occurs within three miles of shore, i.e., within the inner portion of the nearshore hunt zone;
- Sightings of WNP gray whales, based on satellite tag locations, trajectories, and movements of gray whales in the action area, suggests that WNP gray whales that migrate in the eastern North Pacific migrate well beyond the nearshore hunt zone. The available data similarly suggest that WNP gray whales transit relatively quickly through the action area at speeds of 3.4 to 4.6 miles/hour and are estimated to be present in the entire action area for relatively brief periods of time (e.g., 7-8 hours);
- In the Makah's U&A northbound ENP gray whales, which corresponds with the Tribe's training and hunting activities during the summer/fall-hunt seasons, tend to travel closer to shore than southbound ENP gray whales, which corresponds with the Tribe's training and hunting activities during the winter/spring-hunt seasons. Although there is considerable variability in these sightings, the best available information suggests that northbound ENP

gray whales migrate an average 5 to 7 miles offshore, and southbound gray whales migrate an average of 9 to 16 miles offshore in the Makah's U&A;

- Under the high risk/precautionary scenario in Moore et al. (2023) over the 10-year waiver period, the probability of the Tribe striking at least 1 WNP gray whale is estimated at 11.1% to 16.3% over the 10-year waiver period (Table 7);
    - To put the 11.1 % strike probability into perspective, it means that it is likely one WNP whale would be killed every 90 years, if and only if, the Tribe were to conduct 9 consecutive 10-year hunts;
    - To put the 16.3% strike probability into perspective, it means that it is likely that one WNP whale would be killed every 61 years, if and only if, the Tribe were to conduct 6 consecutive 10-year hunts.

As such, we find that the collective body of evidence considered herein establishes that it is extremely unlikely that the Tribe would approach (using sea-going canoes and small powerboats), hit (with a blunt-end spear), strike (with a toggle-point harpoon), or shoot a WNP gray whale during their migration, south or north, during training and hunting activities.

Therefore, based on lines of evidence 1 through 6 and the supporting effects analysis in this document, we do not expect the above-mentioned effects of the proposed action to cause adverse effects to WNP gray whales, as we do not expect WNP gray whales and training and hunting activities conducted by the Tribe to co-occur in space and time in any given winter/spring-hunt season over the 10-year waiver period. Therefore, the above-mentioned effects of the proposed action on WNP gray whales during training and hunting activities are extremely unlikely to occur and therefore discountable.

Marine Mammals - Effects of the proposed action on humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, Southern Resident killer whales[20]

During training and hunting activities, the likelihood of the Tribe approaching[21] humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales is remote and extremely low as explained below. Therefore, for humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, Southern Resident killer whales, we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects to whales from training and hunting activities.

Effects of Vessel Operations and Gunfire Noise

The increase in vessel transits and vessel noise, vessel approaches, risks of vessel strikes, or water quality and ecosystem-related impacts are unlikely to have any discernable adverse physiological (e.g., increases in stress hormones, energy loss), behavioral (e.g., startle response, changes in surfacing, diving, orientation, vocalizations, and increased transit time through the action area), or

[20] As the proposed action would be directed at gray whales (ENP), the prospect that the Tribe may inadvertently strike (toggle-point harpoon) or hit (blunt-end spears incapable of penetrating a whale's skin) a humpback whale, fin whale, blue whale, north Pacific right whale, sei whale, sperm whale, or a southern resident killer whale with a harpoon/spear is highly improbable due to the distinguishable physical characteristics of gray whales, and thus, discountable, and will not be considered further.

[21] An approach is defined as a vessel that is within 100 yards of a whale.

reproductive (e.g., mating success) effects on humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, or a Southern Resident killer whales in the action area based on these lines of evidence.

As the physical characteristics of gray whales makes them distinguishable from humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales, we do not expect the Tribe to intentionally approach – operate a vessel within 100 yards (or 300-400 yards of Southern Resident killer whales[22]) over the 10-year waiver period.

- **Vessel Traffic** – The increase in vessel transits (sea-going canoe and motorized chase boats) would represent less than one half of one percent of an increase in the overall average vessel transits in the action area (Figure 1) relative to the thousands of vessels that transit through the action area in a given year. On average, this represents 37 events per year over the 10-year waiver period. If any of these whales are exposed to sea-going canoe and motorized chase boats we expect the exposure and response to be short-lived and minimal and would not disturb humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales based on the random and intermittent presence these whales in the action area during training and hunting activities Furthermore, as the proposed action would be directed at ENP gray whales, it is highly improbable, based on the physical characteristics of these whales, that the Tribe would approach a humpback whale, fin whale, blue whale, north Pacific right whale, sei whale, sperm whale, or Southern Resident killer whale during training and hunting activities. Depending on the context of exposure, responses of these whales to increases in vessel transits during training or hunting activities could include startle responses, avoidance, or other behavioral reactions, physiological stress responses, or no measurable response at all. Even if the Tribe inadvertently approached a humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales during training and hunting activities, we do not expect these whales exposed to sea-going canoes and motorized chase boats to exhibit a discernable response, e.g., changes in surfacing, diving, orientation, vocalizations, to the minor increase in vessel transits as any response would be intermittent, transitory, and rapidly diminish with little to no energetic cost as any exposure is likely to be minimal and of short duration (Baird 2016, 2016a), and not interfere with a whale's active migration or other behaviors. Under these circumstances, we find the effects describe above from an increase to vessel transits to humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales in a given winter/spring-hunt season over the 10-year waiver period to be insignificant.

- **Vessel Noise** – The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[23] at open throttle, and at a frequency of 0.135 to 1.2 kHz, which is within the hearing range of humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales. However, underwater sound pressure

[22] Any vessels engaged in hunting or training operations would be required to follow Washington State and Federal distance and speed regulations for Southern Resident killer whales. See https://www.bewhalewise.org/.
[23] Based on the range of broadband source levels of one 150 horsepower outboard motor.

levels for disturbance to marine mammals are: broadband 160 dB root-mean-square sound pressure level (RMS) re 1µPa for impulse sound, and 120 dB RMS re 1µPa for continuous sound (NMFS 2018), which is higher than broadband source levels associated with the small powerboat the Tribe would use. As we do not expect the Tribe to approach humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, and sperm whales within 100 yards, and Southern Resident killer whales within 300-400 yards, we do not expect humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales to exhibit a discernable adverse response, e.g., changes in surfacing, diving, orientation, vocalizations, to noise generated by these small powerboats as any exposure broadband source levels generated by the chase boat(s) would be localized, intermittent, of short duration, and only detected by humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales if they are in close proximity of the point source (chase boat). Therefore, the prospect of a measurable or detectable disturbance response to an increase to vessel noise generated by the chase boat(s) by humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales in a given winter/spring-hunt season or summer/fall hunt season over the 10-year waiver period is insignificant.

- **Vessel Strikes** – Vessels used for training and activities would be small vessels (sea-going canoe and small powerboats) and would be traveling at slow speeds, and during training and hunting activities, motorized vessels would be traveling at speeds similar to the sea-going canoe. With the remote prospect of humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales in the action area, we do not expect motorized vessels used for training or hunting activities to approach, encounter, or strike humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales. Therefore, the prospect of a vessel striking humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales over the 10-year waiver period is discountable.

- **Water quality (spills)** – If any spill occurred[24], effects would be minor and short-lived, even if they occurred in a semi-contained area such as Neah Bay. The volume of fuel or other contaminants carried by any hunt-related vessels would be miniscule compared to the volume of water in any potential receiving waters (e.g. Neah Bay, Strait of Juan de Fuca, and the Pacific Ocean). A spill of fuel or similar fluids would not mix with water, but would form a thin layer on the surface, continually spreading while it evaporated, broke apart, was hydrolyzed by ultraviolet light, and was decomposed by bacteria. This would probably occur over hours or days. The introduction of hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a small increase in the likelihood of an oil spill occurring. For the reasons described above, in the unlikely event that a spill does occur during the course of the hunt, we would expect the impacts to be short in duration and small in geographic scope.

[24] No spills were reported in the 1999 and 2000 Makah hunts, 2015.

- **Water Quality (hunting and butchering)** – Impacts to water quality could also come from whale hunting and butchering activities, which could produce two broad classes of potential contaminants: organic material (e.g., blood, lymph, and digestive tract contents) and bioaccumulated contaminants (e.g., PCBs, DDT). During a successful whale hunt, the initial strike and kill would be expected to release substantial amounts of organic matter, which would continue to leak out of the carcass as it is hauled to the beach and butchered on shore. The likely effects of this material would be attraction of predators to the blood scent, avoidance of blood by common prey fish species, and secondary effects of decreased dissolved oxygen associated with the breakdown of the organic material by marine bacteria. These effects would extend over a relatively short period (likely several hours) and would have a very low probability of affecting the immediate marine environment in any detectable manner for more than a day or two.

- **Water Quality (carcass disposal)** – If the unused portions of the carcass were towed out to sea for post-harvest disposal, some bioaccumulated contaminants might be released into the marine ecosystem. The amount of toxins released from a flensed carcass, however, would be substantially less than the amount from a whale that died and decomposed entirely at sea. Given the size of the ocean area in which carcasses would be disposed, the removal of most of the blubber from carcasses prior to disposal, and the likely death and decomposition of some whales in the area naturally, the expected impact to the marine environment from carcass disposal would be negligible in any given year or over a period of years.

- **Disturbance (whale towing)** – Whales that are killed in the course of a hunt by the Makah Tribe will be towed to shore using a motorized support vessel. Towing whale carcasses could result in physical disturbance to humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales in the water column or near landing beaches. The Tribe would be expected to land (and therefore tow) up to 3 whales in winter/spring hunt years and up to 1 whale in summer/fall hunts years, or up to 2 whales per year on average over the course of the 10-year waiver period. Any disturbance to the immediate marine environment from towing would likely be minor, local, and of short duration (minutes to hours), and would not result in any discernable adverse behavioral responses to humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales in the action area.

- **Ecosystem (removal of gray whales)** – The proposed waiver would allow for the removal of up to 25 ENP gray whales from the marine ecosystem over a 10-year period. Gray whales killed during the hunt are likely to be transiting through the action area during their annual migration to or from their Arctic feeding grounds, or feeding in the action area. Transiting gray whales are less likely to have an impact on the environment through which they are traveling, however feeding gray whales play a more significant role in the local ecosystem. If the consumption of pelagic prey by gray whales represented a significant factor in determining zooplankton species abundance or plays a significant role in structuring planktonic communities, it would be possible that the abundance, species composition, and spatial distribution of pelagic organisms could be altered if whales were harassed in or removed from the action area (NMFS 2015). The amount of ecological change induced by a whale hunt would depend on the relative change in whale presence and prey consumption, as well as the importance of whale prey consumption relative to oceanographic/climatic

processes in determining the dynamics of zooplankton species assemblages in the action area. In this case, however, the consumption of pelagic prey by gray whales is not likely a significant factor in structuring pelagic communities relative to the highly variable and energetic oceanographic and climatic processes characteristic of the action area. Oceanographic processes in the action area are generally large in scale, with ocean circulation driven by a major eastern boundary current system, the California Current System (NMFS 2015). Even assuming that gray whales do play a substantial role in structuring pelagic communities, the potential reduction in the few numbers of whales over the 10-year period is not expected to result in any detectable ecological effects, as the number of whales potentially removed is substantially smaller than the observed levels of interannual variability in whale abundance within the action area.

Therefore, we do not expect the above-mentioned water quality, disturbance, and ecosystem-related effects to humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales to have a discernable adverse effect, and would be too small to meaningfully measure, detect or evaluate and therefore insignificant.

- **Gunfire Noise** – we estimate there would be up to 16 rifle shots for each harvested whale. We estimate that the Tribe would fire up to 48 shots in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season. However, it is unlikely that all of these shots would occur if the first whale is killed and harvested (during the summer/fall hunt season), or the whale is struck, breaks the harpoon line, and is lost.

  If the Tribe successfully strikes a gray whale, and the whale does not break the harpoon line, the Tribe would use a .50 caliber rifle[25] to shoot and kill it. We do not expect humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales to co-occur in the vicinity of an active whale hunt. Nonetheless, whales at the surface could be exposed to gunfire noise (a change in ambient sound pressure levels), and may exhibit no reaction, a startle reaction or avoidance, etc., if they are in close proximity to the gunfire. However, due to the nature of gunfire noise, sound pressure levels would be transitory and rapidly diminish lasting no more than a few seconds. Therefore, we do not expect humpback whales, fin whales, blue whales, north Pacific right whales, sei whales, sperm whales, and Southern Resident killer whales to be exposed to gunfire noise as it is likely they would be too far from the point source, and thus any response to gunfire noise would not result in any discernable adverse behavioral responses. That is, as all such effects would be too small and transitory to meaningfully measure, detect or evaluate as adverse, and therefore are insignificant.

Marine Mammals - Effects of the proposed action on Guadalupe fur seals

The prospect that the Tribe would approach Guadalupe fur seals during training and hunting activities is remote, as Guadalupe fur seals spend most of their time in the open ocean and in the vicinity of Guadalupe Island, Mexico. Nonetheless, we recognize that Guadalupe fur seals may occur in the action area over the 10-year waiver period.

[25] A .50 caliber BMG rifle produces a sound pressure levels up to 147.9 dB at the point source (Pater et al, 1994).

Effects of Vessel Operations and Gunfire Noise

The increase in vessel transits and vessel noise, vessel approaches, risks of vessel strikes, or water quality and ecosystem-related impacts, or gunfire noise are unlikely to have any discernable adverse physiological, behavioral, or reproductive effects on Guadalupe fur seals in the action area based on these lines of evidence.

- Based on the life history strategies of Guadalupe fur seals - Guadalupe fur seals spend most of their time in the open ocean and in the vicinity of Guadalupe Island, Mexico, the prospect that Guadalupe fur seals would be exposed to the random and transitory effects associated with training and hunting activities is remote.
- **Vessel Traffic** – The increase in vessel transits (sea-going canoe and motorized chase boats) would represent less than one half of one percent of an increase in the overall average vessel transits in the action area (Figure 1) relative to the thousands of vessels that transit through the action area in a given year. On average, this represents 37 events per year over the 10-year waiver period. As such, we do not expect this minor increase in vessel transits to elicit an adverse physiological, behavioral, or reproductive response by Guadalupe fur seals based on the rare and intermittent presence these seals in the action area during training and hunting activities. As the proposed action would be directed at ENP gray whales, it is highly improbable, based on the physical characteristics of these whales, that the Tribe would approach a Guadalupe fur seals during training and hunting activities. Depending on the context of exposure, responses of these seals to increases in vessel transits during training or hunting activities could include startle responses, avoidance, or other behavioral reactions, physiological stress responses, or no measurable response at all. Even if the Tribe inadvertently approached a Guadalupe fur seal during training and hunting activities, we do not expect these fur seals exposed to sea-going canoes and motorized chase boats to exhibit a discernable response, e.g., changes in surfacing, diving, orientation, vocalizations, to the minor increase in vessel transits as any response would be intermittent, transitory, and rapidly diminish with little to no energetic cost as any exposure is likely to be minimal and of short duration (Baird 2016, 2016a), and not interfere with a seal's active migration. Under these circumstances, we find the effects describe above from an increase to vessel transits to Guadalupe fur seals in a given winter/spring-hunt season over the 10-year waiver period to be insignificant.
- **Vessel Noise** – The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[26] at open throttle, and at a frequency of 0.135 to 1.2 kHz. However, underwater sound pressure levels for disturbance to marine mammals are: broadband 160 dB root-mean-square sound pressure level (RMS) re 1µPa for impulse sound, and 120 dB RMS re 1µPa for continuous sound (NMFS 2018), which is higher than broadband source levels associated with the small powerboat the Tribe would use. As we do not expect the Tribe to approach Guadalupe fur seals, we do not expect Guadalupe fur seals to exhibit a discernable adverse response, e.g., startle response or avoidance, to noise generated by these small powerboats as any exposure broadband source levels generated by the chase boat(s) would be localized, intermittent, of short duration, and only detected by Guadalupe fur seals if they are in close

[26] Based on the range of broadband source levels of one 150 horsepower outboard motor.

proximity of the point source (chase boat). Therefore, the prospect of a measurable or detectable disturbance response to an increase to vessel noise generated by the chase boat(s) by Guadalupe fur seals in a given winter/spring-hunt season or summer/fall hunt season over the 10-year waiver period is insignificant.

- **Vessel Strikes** – Vessels used for training and activities would be small vessels (sea-going canoe and small powerboats) and would be traveling at slow speeds, and during training and hunting activities, motorized vessels would be traveling at speeds similar to the sea-going canoe. With the remote prospect of Guadalupe fur seals in the action area, we do not expect motorized vessels used for training or hunting activities to approach, encounter, or strike Guadalupe fur seals. Therefore, the prospect of a vessel striking Guadalupe fur seals over the 10-year waiver period is discountable.
- **Water quality (spills)** – If any spill occurred[27], effects would be minor and short-lived, even if they occurred in a semi-contained area such as Neah Bay. The volume of fuel or other contaminants carried by any hunt-related vessels would be miniscule compared to the volume of water in any potential receiving waters (e.g. Neah Bay, Strait of Juan de Fuca, and the Pacific Ocean). A spill of fuel or similar fluids would not mix with water, but would form a thin layer on the surface, continually spreading while it evaporated, broke apart, was hydrolyzed by ultraviolet light, and was decomposed by bacteria. This would probably occur over hours or days. The introduction of hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a small increase in the likelihood of an oil spill occurring. For the reasons described above, in the unlikely event that a spill does occur during the course of the hunt, we would expect the impacts to be short in duration and small in geographic scope.

- **Water Quality (hunting and butchering)** – Impacts to water quality could also come from whale hunting and butchering activities, which could produce two broad classes of potential contaminants: organic material (e.g., blood, lymph, and digestive tract contents) and bioaccumulated contaminants (e.g., PCBs, DDT). During a successful whale hunt, the initial strike and kill would be expected to release substantial amounts of organic matter, which would continue to leak out of the carcass as it is hauled to the beach and butchered on shore. The likely effects of this material would be attraction of predators to the blood scent, avoidance of blood by common prey fish species, and secondary effects of decreased dissolved oxygen associated with the breakdown of the organic material by marine bacteria. These effects would extend over a relatively short period (likely several hours) and would have a very low probability of affecting the immediate marine environment in any detectable manner for more than a day or two.

- **Water Quality (carcass disposal)** – If the unused portions of the carcass were towed out to sea for post-harvest disposal, some bioaccumulated contaminants might be released into the marine ecosystem. The amount of toxins released from a flensed carcass, however, would be substantially less than the amount from a whale that died and decomposed entirely at sea. Given the size of the ocean area in which carcasses would be disposed, the removal of most of the blubber from carcasses prior to disposal, and the likely death and decomposition of

[27] No spills were reported in the 1999 and 2000 Makah hunts, NMFS 2015.

some whales in the area naturally, the expected impact to the marine environment from carcass disposal would be negligible in any given year or over a period of years.

- **Disturbance (whale towing)** – Whales that are killed in the course of a hunt by the Makah Tribe will be towed to shore using a motorized support vessel. Towing whale carcasses could result in physical disturbance to Guadalupe fur seals in the water column or near landing beaches. The Tribe would be expected to land (and therefore tow) up to 3 whales in winter/spring hunt years and up to 1 whale in summer/fall hunts years, or up to 2 whales per year on average over the course of the 10-year waiver period. Any disturbance to the immediate marine environment from towing would likely be minor, local, and of short duration (minutes to hours), and would not result in any discernable adverse behavioral responses to Guadalupe fur seals in the action area.
- **Ecosystem (removal of gray whales)** – The proposed waiver would allow for the removal of up to 25 ENP gray whales from the marine ecosystem over a 10-year period. Gray whales killed during the hunt are likely to be transiting through the action area during their annual migration to or from their Arctic feeding grounds, or feeding in the action area. Transiting gray whales are less likely to have an impact on the environment through which they are traveling, however feeding gray whales play a more significant role in the local ecosystem. If the consumption of pelagic prey by gray whales represented a significant factor in determining zooplankton species abundance or plays a significant role in structuring planktonic communities, it would be possible that the abundance, species composition, and spatial distribution of pelagic organisms could be altered if whales were harassed in or removed from the action area (NMFS 2015). The amount of ecological change induced by a whale hunt would depend on the relative change in whale presence and prey consumption, as well as the importance of whale prey consumption relative to oceanographic/climatic processes in determining the dynamics of zooplankton species assemblages in the action area. In this case, however, the consumption of pelagic prey by gray whales is not likely a significant factor in structuring pelagic communities relative to the highly variable and energetic oceanographic and climatic processes characteristic of the action area. Oceanographic processes in the action area are generally large in scale, with ocean circulation driven by a major eastern boundary current system, the California Current System (NMFS 2015). Even assuming that gray whales do play a substantial role in structuring pelagic communities, the potential reduction in the few numbers of whales over the 10-year period is not expected to result in any detectable ecological effects, as the number of whales potentially removed is substantially smaller than the observed levels of interannual variability in whale abundance within the action area.

Therefore, we do not expect the above-mentioned water quality, disturbance, and ecosystem-related effects to Guadalupe fur seals to have a discernable adverse effect, and would be too small to meaningfully measure, detect or evaluate and therefore insignificant.

- **Gunfire Noise —** we estimate there would be up to 16 rifle shots for each harvested whale. We estimate that the Tribe would fire up to 48 shots in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season. However, it is unlikely that all of these shots would occur if the first whale is killed and harvested (during the summer/fall hunt season), or the whale is struck, breaks the harpoon line, and is lost.

If the Tribe successfully strikes a gray whale, and the whale does not break the harpoon line, the Tribe would use a .50 caliber rifle[28] to shoot and kill it. We do not expect Guadalupe fur seals to co-occur in the vicinity of an active whale hunt. Nonetheless, if Guadalupe fur seals were at the surface they could be exposed to gunfire noise (a change in ambient sound pressure levels), and may exhibit a startle reaction or avoidance if they are in close proximity to the gunfire. However, due to the nature of gunfire noise, sound pressure levels would be transitory and rapidly diminish lasting no more than a few seconds. Therefore, we do not expect to be exposed to gunfire noise as it is likely they would be too far from the point source, and thus any response to gunfire noise would not result in any discernable adverse behavioral responses. That is, as all such effects would be too small and transitory to meaningfully measure, detect or evaluate as adverse, and therefore are insignificant.

Turtles - Effects of the proposed action on leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles

The prospect that the Tribe would approach leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles during training and hunting is extremely low as their occurrence in the action area is rare. Nonetheless, we recognize that leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles may occur in the action area over the 10-year waiver period, and therefore, we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects to leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles during the Tribe's training and hunting activities.

Effects of Vessel Operations and Gunfire Noise

The increase in vessel transits and vessel noise, vessel approaches, risks of vessel strikes, or water quality and ecosystem-related impacts are unlikely to have any discernable adverse physiological, behavioral, or reproductive effects on leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in the action area based on these lines of evidence.

- Based on the complex life history strategies of these species in the ocean environment, e.g., offshore ocean migration routes and timing to nesting areas; no nesting areas in the action area, the prospect that leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles would be exposed to the random and transitory effects associated with training and hunting activities is remote and improbable.
- **Vessel Traffic** – The increase in vessel transits (sea-going canoe and motorized chase boats) would represent less than one half of one percent of an increase in the overall average vessel transits in the action area (Figure 1) relative to the thousands of vessels that transit through the action area in a given year. On average, this represents 37 events per year over the 10-year waiver period. As such, we do not expect this minor increase in vessel transits to elicit an adverse behavioral or physiological response by leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles based on the rare and intermittent presence these turtles in the action area during training and hunting activities. As the proposed action would be directed at ENP gray whales, it is highly improbable, based on the physical characteristics of these turtles, that the Tribe would approach leatherback sea turtles, green

[28] A .50 caliber BMG rifle produces a sound pressure levels up to 147.9 dB at the point source (Pater et al, 1994).

sea turtles, loggerhead sea turtles, and olive ridley sea turtles during training and hunting activities. Depending on the context of exposure, responses of these turtles to increases in vessel transits during training or hunting activities could include startle responses, avoidance, or other behavioral reactions, physiological stress responses, or no measurable response at all. Even if the Tribe inadvertently approached leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles during training and hunting activities, we do not expect these turtles exposed to sea-going canoes and motorized chase boats to exhibit a discernable response, e.g., changes in surfacing, diving, orientation, vocalizations, to the minor increase in vessel transits as any response would be intermittent, transitory, and rapidly diminish with little to no energetic cost as any exposure is likely to be minimal and of short duration (Baird 2016, 2016a), and not interfere with a turtle's active migration or other behaviors. Under these circumstances, we find the effects describe above from an increase to vessel transits to leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in a given winter/spring-hunt season over the 10-year waiver period to be insignificant.

- **Vessel Noise** - The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[29] at open throttle, and at a frequency of 0.135 to 1.2 kHz. As we do not expect the Tribe to approach these turtles, we do not expect these turtles to exhibit a discernable adverse response, e.g., startle response or avoidance, to noise generated by these small powerboats as any exposure broadband source levels generated by the chase boat(s) would be localized, intermittent, of short duration, and only detected by these turtles if they are in close proximity of the point source (chase boat). Therefore, the prospect of a measurable or detectable disturbance response to an increase to vessel noise generated by the chase boat(s) by leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in a given winter/spring-hunt season or summer/fall hunt season over the 10-year waiver period is insignificant.

- **Vessel Strikes** – Vessels used for training and activities would be small vessels (sea-going canoe and small powerboats) and would be traveling at slow speeds, and during training and hunting activities, motorized vessels would be traveling at speeds similar to the sea-going canoe. With the remote prospect of leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in the action area during training and hunting activities, the very low prospect of leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in the nearshore hunt zone during training and hunting activities, and that sea turtles have been observed to demonstrate active avoidance of vessels moving at slow speeds during sea turtle research operations[30], we do not expect motorized vessels used for training or hunting activities to approach, encounter, or strike leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles. Therefore, the prospect of a vessel striking a leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles during training or hunting activities over the 10-year waiver period is discountable.

[29] Based on the range of broadband source levels of one 150 horsepower outboard motor.
[30] Email from Dan Lawson, NMFS, to Robert Anderson, NMFS, on April 18, 2023.

- **Water quality (spills)** – If any spill occurred[31], effects would be minor and short-lived, even if they occurred in a semi-contained area such as Neah Bay. The volume of fuel or other contaminants carried by any hunt-related vessels would be miniscule compared to the volume of water in any potential receiving waters (e.g. Neah Bay, Strait of Juan de Fuca, and the Pacific Ocean). A spill of fuel or similar fluids would not mix with water, but would form a thin layer on the surface, continually spreading while it evaporated, broke apart, was hydrolyzed by ultraviolet light, and was decomposed by bacteria. This would probably occur over hours or days. The introduction of hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a small increase in the likelihood of an oil spill occurring. For the reasons described above, in the unlikely event that a spill does occur during the course of the hunt, we would expect the impacts to be short in duration and small in geographic scope.

- **Water Quality (hunting and butchering) –** Impacts to water quality could also come from whale hunting and butchering activities, which could produce two broad classes of potential contaminants: organic material (e.g., blood, lymph, and digestive tract contents) and bioaccumulated contaminants (e.g., PCBs, DDT). During a successful whale hunt, the initial strike and kill would be expected to release substantial amounts of organic matter, which would continue to leak out of the carcass as it is hauled to the beach and butchered on shore. The likely effects of this material would be attraction of predators to the blood scent, avoidance of blood by common prey fish species, and secondary effects of decreased dissolved oxygen associated with the breakdown of the organic material by marine bacteria. These effects would extend over a relatively short period (likely several hours) and would have a very low probability of affecting the immediate marine environment in any detectable manner for more than a day or two.
- **Water Quality (carcass disposal)** – If the unused portions of the carcass were towed out to sea for post-harvest disposal, some bioaccumulated contaminants might be released into the marine ecosystem. The amount of toxins released from a flensed carcass, however, would be substantially less than the amount from a whale that died and decomposed entirely at sea. Given the size of the ocean area in which carcasses would be disposed, the removal of most of the blubber from carcasses prior to disposal, and the likely death and decomposition of some whales in the area naturally, the expected impact to the marine environment from carcass disposal would be negligible in any given year or over a period of years.
- **Disturbance (whale towing)** – Whales that are killed in the course of a hunt by the Makah Tribe will be towed to shore using a motorized support vessel. Towing whale carcasses could result in physical disturbance to leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in the water column or near landing beaches. The Tribe would be expected to land (and therefore tow) up to 3 whales in winter/spring hunt years and up to 1 whale in summer/fall hunts years, or up to 2 whales per year on average over the course of the 10-year waiver period. Any disturbance to the immediate marine environment from towing would likely be minor, local, and of short duration (minutes to hours), and would not result in any discernable adverse behavioral responses to leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles in the action area.

[31] No spills were reported in the 1999 and 2000 Makah hunts, NMFS 2015.

- **Ecosystem (removal of gray whales)** – The proposed waiver would allow for the removal of up to 25 ENP gray whales from the marine ecosystem over a 10-year period. Gray whales killed during the hunt are likely to be transiting through the action area during their annual migration to or from their Arctic feeding grounds, or feeding in the action area. Transiting gray whales are less likely to have an impact on the environment through which they are traveling, however feeding gray whales play a more significant role in the local ecosystem. If the consumption of pelagic prey by gray whales represented a significant factor in determining zooplankton species abundance or plays a significant role in structuring planktonic communities, it would be possible that the abundance, species composition, and spatial distribution of pelagic organisms could be altered if whales were harassed in or removed from the action area (NMFS 2015). The amount of ecological change induced by a whale hunt would depend on the relative change in whale presence and prey consumption, as well as the importance of whale prey consumption relative to oceanographic/climatic processes in determining the dynamics of zooplankton species assemblages in the action area. In this case, however, the consumption of pelagic prey by gray whales is not likely a significant factor in structuring pelagic communities relative to the highly variable and energetic oceanographic and climatic processes characteristic of the action area. Oceanographic processes in the action area are generally large in scale, with ocean circulation driven by a major eastern boundary current system, the California Current System (NMFS 2015). Even assuming that gray whales do play a substantial role in structuring pelagic communities, the potential reduction in the few numbers of whales over the 10-year period is not expected to result in any detectable ecological effects, as the number of whales potentially removed is substantially smaller than the observed levels of interannual variability in whale abundance within the action area.

Therefore, we do not expect the above-mentioned water quality, disturbance, and ecosystem-related effects to leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles to have a discernable adverse effect, and would be too small to meaningfully measure, detect or evaluate and therefore insignificant.

- **Gunfire Noise** - we estimate there would be up to 16 rifle shots for each harvested whale. We estimate that the Tribe would fire up to 48 shots in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season. However, it is unlikely that all of these shots would occur if the first whale is killed and harvested (during the summer/fall hunt season), or the whale is struck, breaks the harpoon line, and is lost.

  If the Tribe successfully strikes a gray whale, and the whale does not break the harpoon line, the Tribe would use a .50 caliber rifle[32] to shoot and kill it. We do not expect leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea turtles to co-occur in the vicinity of an active whale hunt. Nonetheless, if any of these turtle species were at the surface they could be exposed to gunfire noise (a change in ambient sound pressure levels), and may exhibit a startle reaction or avoidance if they are in close proximity to the gunfire. However, due to the nature of gunfire noise, sound pressure levels would be transitory and rapidly diminish and rapidly diminish lasting no more than a few seconds. Therefore, we do not expect leatherback sea turtles, green sea turtles, loggerhead sea turtles, and olive ridley sea

[32] A .50 caliber BMG rifle produces a sound pressure levels up to 147.9 dB at the point source (Pater et al, 1994).

turtles to be exposed to gunfire noise as it is likely they would be too far from the point source, and thus any response to gunfire noise would not result in any discernable adverse behavioral responses. That is, as all such effects would be too small and transitory to meaningfully measure, detect or evaluate as adverse, and therefore are insignificant.

Fish - Effects of the proposed action on salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio

Based on the complex and varied life history strategies of these fish species in the ocean environment, e.g., ocean migratory routes, migration timing, oceanic diel vertical movement patterns, etc., the prospect that juvenile or adult salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio in the action area would be exposed to the random and transitory effects associated with training and hunting activities is remote.

Nonetheless, we recognize that these fish species occur in the action area, and therefore, we analyzed the likelihood of the proposed action to cause physiological, behavioral, or reproductive effects to salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio during the Tribe's training and hunting activities.

Effects of Vessel Operations and Gunfire Noise

The increase in vessel transits and vessel noise, vessel approaches, risks of vessel strikes, or water quality and ecosystem-related impacts are unlikely to have any discernable adverse physiological or behavioral effects on salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio in the action area based on these lines of evidence.

- **Vessel Traffic** – The increase in vessel transits (sea-going canoe and motorized chase boats) would represent less than one half of one percent of an increase in the overall average vessel transits in the action area (Figure 1) relative to the thousands of vessels that transit through the action area in a given year. On average, this represents 37 events per year over the 10-year waiver period. As such, we do not expect this minor increase in vessel transits to elicit an adverse behavioral or physiological response by salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio based on their vertical distribution of these fish species in the Pacific Ocean typically ranges from 50 to 700 feet — salmon 50 to 100 feet; green sturgeon 65 to 230 feet, eulachon 65 to 500 feet, and rockfish 270 to 700 feet. Under these circumstances, we find the effects describe above from an increase to vessel transits to salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio over the 10-year waiver period to be insignificant.
- **Vessel Noise** – The chase boats (small powerboats) used by the Tribe will be equipped with outboard engines that would generate broadband source levels at a range of 97.5 to 102.0 dB[33] at open throttle, and at a frequency of 0.135 to 1.2 kHz. As we do not expect the Tribe to approach these fish species, we do not expect these fish species to exhibit a discernable adverse response, e.g., startle response or avoidance, to noise generated by these small powerboats as any exposure broadband source levels generated by the chase boat(s) would be localized, intermittent, of short duration, and only detected by these fish species if they are in

[33] Based on the range of broadband source levels of one 150 horsepower outboard motor.

close proximity of the point source (chase boat). However, we do not expect salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio to be at or near the surface as the vertical distribution of these fish species in the Pacific Ocean typically ranges from 50 to 700 feet — salmon 50 to 100 feet; green sturgeon 65 to 230 feet, eulachon 65 to 500 feet, and rockfish 270 to 700 feet. Therefore, the prospect of a measurable or detectable disturbance response to an increase to vessel noise generated by the chase boat(s) by salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio in a given winter/spring-hunt season or summer/fall hunt season over the 10-year waiver period is insignificant.

- **Vessel Strikes** – Vessels used for training and activities would be small vessels (sea-going canoe and small powerboats) and would be traveling at slow speeds, and during training and hunting activities, motorized vessels would be traveling at speeds similar to the sea-going canoe. However, we do not expect salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio to be at or near the surface as the vertical distribution of these fish species in the Pacific Ocean typically ranges from 50 to 700 feet — salmon 50 to 100 feet; green sturgeon 65 to 230 feet, eulachon 65 to 500 feet, and rockfish 270 to 700 feet. Therefore, the prospect of a vessel striking a salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio during training or hunting activities over the 10-year waiver period is discountable.

- **Water quality (spills)** – If any spill occurred[34], effects would be minor and short-lived, even if they occurred in a semi-contained area such as Neah Bay. The volume of fuel or other contaminants carried by any hunt-related vessels would be miniscule compared to the volume of water in any potential receiving waters (e.g. Neah Bay, Strait of Juan de Fuca, and the Pacific Ocean). A spill of fuel or similar fluids would not mix with water, but would form a thin layer on the surface, continually spreading while it evaporated, broke apart, was hydrolyzed by ultraviolet light, and was decomposed by bacteria. This would probably occur over hours or days. The introduction of hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a small increase in the likelihood of an oil spill occurring. For the reasons described above, in the unlikely event that a spill does occur during the course of the hunt, we would expect the impacts to be short in duration and small in geographic scope.

- **Water Quality (hunting and butchering)** – Impacts to water quality could also come from whale hunting and butchering activities, which could produce two broad classes of potential contaminants: organic material (e.g., blood, lymph, and digestive tract contents) and bioaccumulated contaminants (e.g., PCBs, DDT). During a successful whale hunt, the initial strike and kill would be expected to release substantial amounts of organic matter, which would continue to leak out of the carcass as it is hauled to the beach and butchered on shore. The likely effects of this material would be attraction of predators to the blood scent, avoidance of blood by common prey fish species, and secondary effects of decreased dissolved oxygen associated with the breakdown of the organic material by marine bacteria. These effects would extend over a relatively short period (likely several hours) and would

[34] No spills were reported in the 1999 and 2000 Makah hunts, NMFS 2015.

have a very low probability of affecting the immediate marine environment in any detectable manner for more than a day or two.

- **Water Quality (carcass disposal)** – If the unused portions of the carcass were towed out to sea for post-harvest disposal, some bioaccumulated contaminants might be released into the marine ecosystem. The amount of toxins released from a flensed carcass, however, would be substantially less than the amount from a whale that died and decomposed entirely at sea. Given the size of the ocean area in which carcasses would be disposed, the removal of most of the blubber from carcasses prior to disposal, and the likely death and decomposition of some whales in the area naturally, the expected impact to the marine environment from carcass disposal would be negligible in any given year or over a period of years.
- **Disturbance (whale towing)** – Whales that are killed in the course of a hunt by the Makah Tribe will be towed to shore using a motorized support vessel. Towing whale carcasses could result in physical disturbance to salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio in the water column or near landing beaches. The Tribe would be expected to land (and therefore tow) up to 3 whales in winter/spring hunt years and up to 1 whale in summer/fall hunts years, or up to 2 whales per year on average over the course of the 10-year waiver period. Any disturbance to the immediate marine environment from towing would likely be minor, local, and of short duration (minutes to hours), and would not result in any discernable adverse behavioral responses to salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio in the action area.
- **Ecosystem (removal of gray whales)** – The proposed waiver would allow for the removal of up to 25 ENP gray whales from the marine ecosystem over a 10-year period. Gray whales killed during the hunt are likely to be transiting through the action area during their annual migration to or from their Arctic feeding grounds, or feeding in the action area. Transiting gray whales are less likely to have an impact on the environment through which they are traveling, however feeding gray whales play a more significant role in the local ecosystem. If the consumption of pelagic prey by gray whales represented a significant factor in determining zooplankton species abundance or plays a significant role in structuring planktonic communities, it would be possible that the abundance, species composition, and spatial distribution of pelagic organisms could be altered if whales were harassed in or removed from the action area (NMFS 2015). The amount of ecological change induced by a whale hunt would depend on the relative change in whale presence and prey consumption, as well as the importance of whale prey consumption relative to oceanographic/climatic processes in determining the dynamics of zooplankton species assemblages in the action area. In this case, however, the consumption of pelagic prey by gray whales is not likely a significant factor in structuring pelagic communities relative to the highly variable and energetic oceanographic and climatic processes characteristic of the action area. Oceanographic processes in the action area are generally large in scale, with ocean circulation driven by a major eastern boundary current system, the California Current System (NMFS 2015). Even assuming that gray whales do play a substantial role in structuring pelagic communities, the potential reduction in the few numbers of whales over the 10-year period is not expected to result in any detectable ecological effects, as the number of whales potentially removed is substantially smaller than the observed levels of interannual variability in whale abundance within the action area.

Therefore, we do not expect the above-mentioned water quality, disturbance, and ecosystem-related effects to salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio to have a discernable adverse effect, and would be too small to meaningfully measure, detect or evaluate therefore insignificant.

- **Gunfire Noise** - we estimate there would be up to 16 rifle shots for each harvested whale. We estimate that the Tribe would fire up to 48 shots in a given winter/spring hunt season, and up to 32 shots in a given summer/fall hunt season. However, it is unlikely that all of these shots would occur if the first whale is killed and harvested (during the summer/fall hunt season), or the whale is struck, breaks the harpoon line, and is lost.

  If the Tribe successfully strikes a gray whale, and the whale does not break the harpoon line, the Tribe would use a .50 caliber rifle[35] to shoot and kill it. We do not expect salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio to be at or near the surface as the vertical distribution of these fish species in the Pacific Ocean typically ranges from 50 to 700 feet — salmon 50 to 100 feet; green sturgeon 65 to 230 feet, eulachon 65 to 500 feet, and rockfish 270 to 700 feet. Furthermore, due to the nature of gunfire noise, sound pressure levels would be transitory and rapidly diminish lasting no more than a few seconds. As such, we do not expect salmon, steelhead, eulachon, green sturgeon, yelloweye rockfish, and bocaccio to be exposed to gunfire noise. That is, as all such effects would be too small and transitory to meaningfully measure, detect or evaluate as adverse, and therefore are insignificant.

Effects on Critical Habitat

The effects of the proposed action are not expected to adversely affect designated critical habitats for humpback whale – Mexico DPS, humpback whale – Central America DPS, Southern Resident killer whale DPS, leatherback sea turtle, and the southern DPS of green sturgeon That is, the effects on critical habitat physical and biological features (PBFs)/primary constituent elements (PCEs) would be insignificant as the activities would not have a discernable adverse impact any of the PBFs/PCEs for the species considered herein.

Humpback whale - Mexico and Central American DPS

Features identified as essential to the conservation of these DPSs include prey species, primarily euphausiids and small pelagic schooling fishes of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.

Impacts to water quality have the potential to affect critical habitat by impacting the prey species. Above, we describe potential changes in water quality due to training and hunting-related activities. These effects are expected to be negligible. The introduction of training and hunt-related vessels would represent a very small increase in vessel presence in the action area relative to the number of vessels already present, and therefore a very small increase in the likelihood of an oil spill occurring. For the reasons described above, if a spill were to occur, it would likely be short in duration and small in geographic scope. For small schooling fish, they would likely be able to avoid these areas for the short duration during which they occur, avoiding any serious physical harm. This avoidance

[35] A .50 caliber BMG rifle produces a sound pressure levels up to 147.9 dB at the point source (Pater et al, 1994).

is anticipated to be temporary and will not lead to a significant disruption of normal behavior patterns.

The negligible impact to water quality from hunt-related activities is not expected to change the quality, abundance, and accessibility of prey species. As such, effects to water quality humpback whale prey species in the action area are considered insignificant and therefore are not likely to adversely modify the critical habitat designated for the Mexico and Central American DPSs of humpback whales.

Southern Resident killer whale

The essential features for the conservation of the Southern Resident killer whale DPS are: water quality to support growth and development; prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and passage conditions to allow for migration, resting, and foraging. The pathway to effects on Southern Resident killer whale critical habitat would be through impacts to water quality.

As described above, changes to water quality may occur due to oil spills or the release of organic materials. However, these changes would be localized and of short-duration. Therefore, any effects to water quality would not be to the extent that it would decrease its ability to support growth and development of Southern Resident killer whales. In addition, we would not expect the prey species to be affected by changes to water quality. Southern Resident killer whales feed almost exclusively on fish, mainly salmon. As discussed above, the fish would likely be able to avoid spill areas for the short duration during which they occur, avoiding any serious physical harm. This avoidance is anticipated to be temporary and will not lead to a significant disruption of normal behavior patterns. In addition, changes in water quality due to spills or the release of organic materials in this dynamic environment would extend over a relatively short period and be localized. Given this, prey species will remain of sufficient quality, quantity, and availability. All of these effects are expected to be insignificant and therefore not likely to adversely affect critical habitat for Southern Resident killer whales. The hunt activities will not impact passage conditions for migration, resting, and foraging.

Leatherback sea turtle

The features for conservation of leatherback turtles is the occurrence of prey species of sufficient condition, distribution, diversity, abundance and density necessary to support individual as well as population growth, reproduction, and development of leatherbacks. The pathway of potential effects to critical habitat would be through affects to this prey species. Again, this is through water quality. For the reasons described above, impacts to water quality are expected to be minor, localized, and of short duration. These impacts would be of low magnitude and would not affect the condition, distribution, diversity, abundance, or density of leatherback prey species in the action area. All of these effects are expected to be insignificant and therefore not likely to adversely affect critical habitat for leatherback sea turtles.

Green sturgeon

The southern DPS of green sturgeon critical habitat is designated in the action area within the 60 fathoms depth contour both in the coastal and Strait portions. The attributes of essential PCEs for green sturgeon in coastal marine areas include food resources, migratory corridor, and water quality. As discussed above, hunt activities may impact these three PCEs through the introduction of: vessel or aircraft noise, gunshot noise, and whale towing activities which could encourage green sturgeon to avoid the immediate vicinity and therefore impact migration; whale butchering activities that may temporarily have a minor impact on water quality; and the removal of gray whales which has a remote likelihood of altering the planktonic communities of the local ecosystem. All of these effects are expected to be insignificant for the reasons discussed above and therefore not likely to adversely modify green sturgeon critical habitat.

Therefore, we expect the likelihood of effects on critical habitat PBFs for humpback whales – Mexico DPS, humpback whales – Central America DPS, Southern Resident killer whale DPS, leatherback sea turtle — Pacific DPS, and PCEs for green sturgeon would be too small to meaningfully measure, detect or evaluate and therefore are insignificant.

Conclusion

Based on this analysis, NMFS has determined that the proposed action is not likely to adversely affect (NLAA) humpback whale – Mexico DPS, humpback whale – Central America DPS, fin whale, blue whale, north Pacific right whale, sei whale, sperm whale, Southern Resident killer whale DPS, western north Pacific Gray whale DPS, Guadalupe fur seal, leatherback sea turtle – Pacific DPS, green sea turtle – east Pacific DPS, loggerhead sea turtle – north Pacific DPS, olive ridley sea turtle, Puget Sound steelhead ESU, upper Columbia River steelhead DPS, middle Columbia River steelhead DPS, lower Columbia River steelhead DPS, Snake River steelhead DPS, upper Willamette River steelhead DPS, Snake River sockeye salmon ESU, Ozette Lake sockeye salmon ESU, Puget Sound Chinook salmon ESU, lower Columbia River Chinook salmon ESU, upper Columbia River spring-run Chinook salmon ESU, Snake River fall-run Chinook salmon ESU, upper Willamette River Chinook salmon ESU, Hood Canal summer-run chum salmon ESU, Columbia River chum salmon ESU, lower Columbia River coho salmon ESU, southern DPS of eulachon, southern DPS of green sturgeon, Puget Sound/Georgia Basin DPS of yelloweye rockfish, or Puget Sound/Georgia Basin DPS of bocaccio. NMFS also concludes that the proposed action is NLAA designated critical habitats for humpback whale – Mexico DPS, humpback whale – Central America DPS, Southern Resident killer whale DPS, leatherback sea turtle – Pacific DPS, and southern DPS of green sturgeon.

Reinitiation of Consultation

Reinitiation of consultation is required and NMFS shall request it when (1) the proposed action causes take; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). In addition to the four reinitiation triggers, NMFS would consider reinitiation of consultation if the Tribe intended to

conduct training or hunting activities greater than 5 miles off shore during the winter/spring-hunt seasons, or if one or more WNP gray whales are documented in the nearshore hunt zone, i.e., within 5 miles of shore.

This concludes the ESA consultation.

Please direct questions regarding this consultation to Robert Anderson, Protected Resources Division, Portland, Oregon at robert.c.anderson@noaa.gov, or (503) 231-2226.

Sincerely,

Chris Yates
Assistant Regional Administrator
for Protected Resources Division

cc: Administrative File: 151404WCR2015PR00084

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