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Final Economic Analysis of Critical Habitat Designation for Humpback Whales

Final Report | August 11, 2020

prepared for:

National Marine Fisheries Service

Endangered Species Division

Office of Protected Resources

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. In 1970, the humpback whale (*Megaptera novaeangliae*) was listed as endangered under the Endangered Species Conservation Act of 1969. When the Endangered Species Act (ESA) was passed in 1973, replacing the Endangered Species Conservation Act of 1969, all populations of the humpback whale remained listed. On September 8, 2016, the National Marine Fisheries Service (NMFS) distinguished 14 distinct population segments (DPSs) of the humpback whale and revised the species' ESA listing to include four "endangered" DPSs and one "threatened" DPS. Of the five endangered and threatened DPSs, three are located in U.S. waters: the Western North Pacific and Central America DPSs, which are listed as endangered, and the Mexico DPS, which is listed as threatened. At the time of listing, NMFS described that critical habitat was "not determinable" for these DPSs. NMFS has now considered designating critical habitat for these three DPSs. This final economic analysis focuses specifically on the economic impacts of designating critical habitat for these populations of humpback whales.

2. This final economic analysis analyzes all areas originally considered for designation as critical habitat for the three DPSs. This analysis does not reflect proposed exclusions or changes to the proposed critical habitat designations made in the final rule. Consequently, description of the habitat designations in the final rule may differ from maps and figures presented in this analysis. Exhibit ES-5 of this Executive Summary additionally presents the total costs of the final rule by critical habitat unit, reflecting the potential costs avoided due to areas that were ultimately excluded from the designation.

3. Since publication of the draft economic analysis, this document has been modified to incorporate additional information and address comments and concerns raised during the public comment period. For a detailed discussion of public comments on the draft economic analysis and associated responses, refer to the response to public comments section in the final rule. Key changes between the draft and final versions of this analysis include:

    - Expansion of the discussion of potential impacts to fisheries to more completely characterize the nature and value of commercial fisheries that occur within the areas considered for the critical habitat designations, and to highlight particular concerns regarding potential impacts that may result from the designations.
    - Revisions to the description of the water quality management activity to more thoroughly describe the role of the State of Alaska in managing water quality and incorporate additional administrative costs that will accrue to NMFS, the state, and the U.S. Environmental Protection Agency (EPA) associated with issuance of general discharge permits.

- Additional analysis of aquaculture projects in Alaska, including clearly defining the types and locations of aquaculture activities that may be affected over the timeframe of the analysis, and quantifying the costs of future section 7 consultations on these activities.
- Description and identification of potential costs related to delays in in-water construction projects and dam relicensing as an uncertainty in the analysis and potential unquantified cost of the rule.
- Addition of text to characterize the vulnerability of small communities even to relatively limited costs of the rule, and the potential for small communities to be affected by any costs that might be incurred related to certain activities such as fishing and in-water construction.
- Reorganization of "Scientific Research" as a unique activity, the impacts to which are explicitly considered within the analysis.
- Reorganization of the activity category presented as "Inland Activities" in the DEA to more specifically reflect the type and location of activities included. All activities related to NPDES permitting and other activities that generally occur inland of the critical habitat area and are primarily managed to maintain water quality (e.g., inland mining, vessel discharges) are now presented within the "Water Quality Management and Inland Activities" activity. "Forest Service Activities" previously combined in results tables with "Inland Activities" are now presented independently.
- Development of Final Regulatory Flexibility Analysis (FRFA).

4. This report employs the best data available to analyze the economic impacts of designating particular areas as critical habitat. These impacts represent "benefits of exclusion."[1] NMFS presents its formal consideration of the benefits of including particular areas as critical habitat (the "benefits of inclusion") in the *2020 Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (Megaptera novaeangliae).* Together, these two reports inform NMFS' consideration of whether the benefits of excluding any particular area outweigh the benefits of designating that area pursuant to section 4(b)(2) of the ESA. NMFS' conclusions regarding the weighing of these benefits are presented in a third report, *ESA Section 4(b)(2) Report.*

5. Section 7 of the ESA requires Federal agencies (i.e., "action agencies") to consult with NMFS to ensure that any action they authorize, fund, or carry out is not likely jeopardize the continued existence of any endangered or threatened species. Through the consultation process**,** NMFS may recommend conservation efforts associated with these activities to avoid jeopardizing the continued existence of the species. Thus, a species'

[1] While the benefits of designation, which under the statute include contributions to the conservation of the species, are not readily quantifiable, this report also describes generally the potential economic benefits to the extent available data allow.

listing determination and related jeopardy considerations alone may impose economic impacts, even absent critical habitat designation.

6. Once critical habitat is designated, section 7 of the ESA requires Federal action agencies to consult with NMFS to ensure that any action the agencies authorize, fund, or carry out *will not result in the destruction or adverse modification of critical habitat*. NMFS may, through the section 7 consultation process, require or recommend changes to these activities to ensure that they would avoid destruction or adverse modification of critical habitat. The incremental economic impacts of critical habitat designation stem from the additional effort to consider potential for adverse modification as part of section 7 consultations, and any conservation efforts to avoid adverse modification that would not likely be recommended to avoid jeopardy.

7. This analysis refers to "conservation efforts" as a generic term for recommendations NMFS may make to modify projects or activities for the benefit of the humpback whale and/or its habitat, or that action agencies or other entities may otherwise undertake to avoid adverse effects of projects or activities on the humpback whale and/or its habitat.

8. This economic analysis focuses on identifying these *incremental impacts* of the areas considered for the critical habitat designations for humpback whales. These incremental impacts stem from conservation efforts implemented due to the critical habitat designations that would not otherwise be implemented due to the need to avoid jeopardy to humpback whales or due to protections of other listed species or Federal, state, or local regulations or best management practices.

9. NMFS has identified the essential feature of humpback whale critical habitat as prey species, primarily euphausiids, and small pelagic schooling fishes of sufficient quality, abundance, and accessibility within humpback feeding areas necessary to support population growth.[2] NMFS has identified four broad categories of actions or threats that may affect the essential feature and the ability of the critical habitat to support the conservation of listed humpback whales:

    - Direct harvest of prey species in commercial fisheries;
    - Climate change;
    - Pollution in the marine environment; and
    - Ocean noise.

10. NMFS has further identified an additional potential threat to critical habitat. This threat, however, is not yet well understood:

    - Predator competition for prey species.[3]

[2] The specific species of euphausiids and small pelagic schooling fishes included in the definition of the essential feature differ by DPS, and are defined within the final rule.

[3] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

11. After reviewing the best available data, described in the 2020 Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*), NMFS considered designating critical habitat in (1) coastal waters in the Gulf of Alaska extending from southeast Alaska to the Aleutian Islands, and waters north of the Aleutian Islands in the Bering Sea and (2) coastal waters of the Pacific Coast from the U.S.-Canada border to the U.S.-Mexico border.[4] Exhibits ES-1 and ES-2 display the areas considered for potential inclusion in the critical habitat designation for one or more of the three DPSs of humpback whales, which do not, have completely overlapping ranges. Specifically, NMFS considered habitat Units 1-9 for the Western North Pacific DPS (see ES-1), Units 1-19 for the Mexico DPS (see ES 1 and 2), and Units 11 -19 for the Central America DPS (see ES-2).

12. For simplicity, this analysis refers to the areas considered for critical habitat, as defined in Section 1 of this report, as "critical habitat." However, these areas have not yet been designated as critical habitat and this area may change as NMFS continues to develop the final critical habitat rule.

13. Exhibit ES-3 summarizes the key conclusions of this analysis for each of the economic activities that NMFS has identified may affect the areas considered for critical habitat. Overall, NMFS has not identified a particular project or activity for which it is likely that section 7 consultation with the critical habitat units for humpback whales will result in different conservation efforts than section 7 consultation without the critical habitat. Absent the critical habitat designations, NMFS is already required to consult on these types of activities to consider the potential for jeopardy to the listed humpback whales and identifies conservation efforts accordingly.

14. As summarized in Exhibit ES-3, and detailed in Chapter 2 of this report, NMFS anticipates that in most cases it is likely that the baseline conservation efforts would also result in the projects and activities avoiding adverse modification of critical habitat. One reason for this is that protections should already be in place to avoid impacts to water quality stemming from the Clean Water Act (CWA) that may result from a variety of activities. Additionally, the protection of the prey essential feature of critical habitat is also important to avoid jeopardy and is therefore relevant to consider as part of consultations on the humpback whales outside of the need to consider adverse modification of critical habitat.

15. As summarized in Exhibit ES-3 and detailed in Chapter 2 of this analysis, economic impacts of the critical habitat units that can be monetized are limited to additional administrative effort to consider critical habitat as part of future section 7 consultations. This analysis calculates the incremental administrative costs by multiplying the forecast of section 7 consultations by the estimated average administrative costs per consultation over a ten-year timeframe (Exhibit 1-3). NMFS may identify conservation efforts necessary in particular cases to avoid adverse modification to critical habitat, separate

[4] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

from efforts necessary to avoid jeopardy determinations, which would result in additional costs not identified in this analysis. However, NMFS cannot currently foresee any specific, additional conservation efforts that may be required (Exhibit ES-3).

EXHIBIT ES-1. CRITICAL HABITAT UNITS CONSIDERED FOR HUMPBACK WHALES - ALASKA

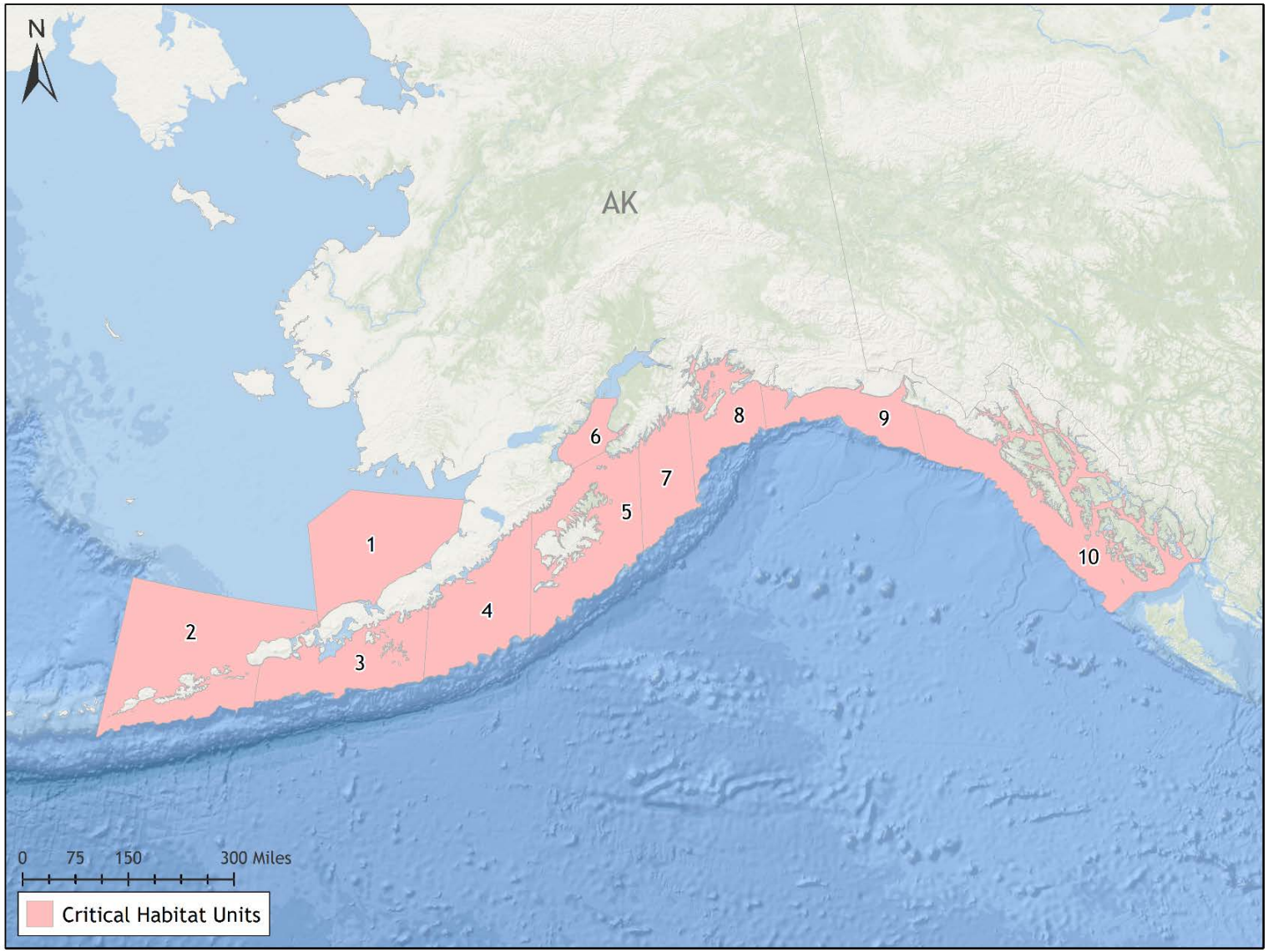


EXHIBIT ES-2. CRITICAL HABITAT UNITS CONSIDERED FOR HUMPBACK WHALES – WASHINGTON, OREGON, CALIFORNIA

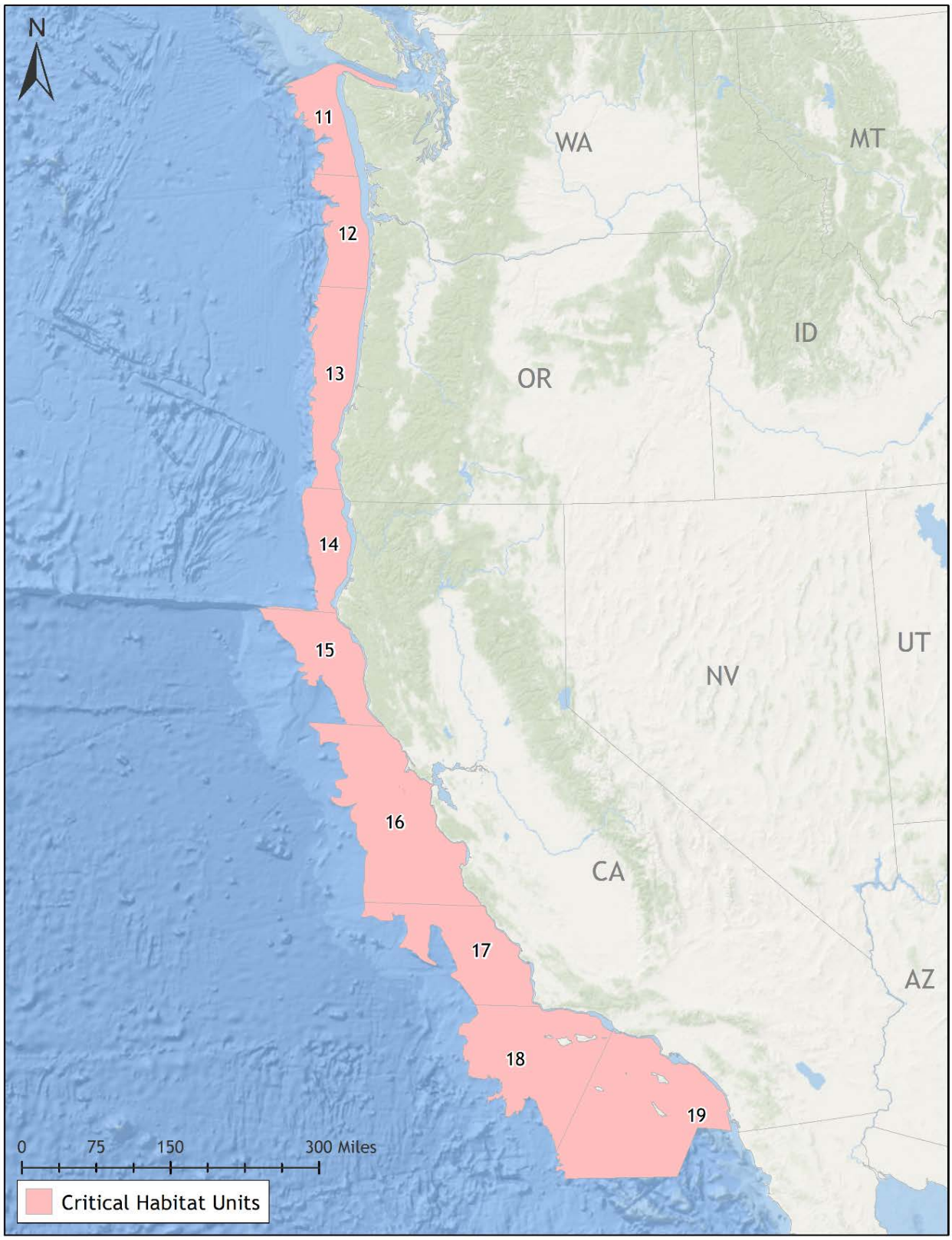


EXHIBIT ES-3. SUMMARY FINDINGS BY ACTIVITY

ACTIVITY	SUMMARY FINDING
Commercial Fishing	It is unlikely that the critical habitat will result in additional conservation efforts as part of future section 7 consultations on commercial fisheries other than the coastal pelagic species (CPS) fishery due to baseline protections. The CPS fishery directly targets fish species that are a primary source of prey for humpback whales and the essential feature of the critical habitat designations. Several baseline protections exist that reduce the likelihood that the critical habitat designations would trigger additional conservation efforts for this fishery. For example, the Federal fisheries management plan (FMP) for the CPS fishery prohibits commercial harvest of krill, which benefits humpback whale critical habitat. However, the fishery has not previously been subject to consultations that have considered the impacts of removal of prey species on humpback whales. Future consultations on the CPS fisheries will require consideration of the fish as prey for humpback whales and as an essential feature of their critical habitat. However, critical habitat is not expected to affect conservation efforts recommended as part of these consultations given the importance of prey availability when evaluating the potential for jeopardy to the whales. NMFS has not identified conservation efforts that would be made specifically to avoid adverse modification of the humpback whale critical habitat that would not also be relevant to avoiding jeopardy to the species. The State of Alaska expressed concern regarding the potential for the critical habitat designations to result in time and area closures or other impacts to fisheries occurring within critical habitat. However, NMFS does not anticipate critical habitat for the whales would result in time or area closures, or other conservation efforts affecting the management of fisheries in Alaska.
Oil and Gas Activities	NMFS has not identified a conservation effort that would be made specifically to avoid adverse modification of the humpback whale critical habitat associated with seismic surveys for oil and gas exploration and development. Although seismic survey activities have the potential to affect humpback whale critical habitat, the specific thresholds at which prey would be adversely affected by the surveys is currently unknown; it is therefore significantly uncertain what specific conservation efforts would be requested, and whether they would differ in any way from those that would be made to avoid jeopardy to the species. For other oil and gas activities, it is unlikely that consideration of the humpback whale critical habitat will generate additional conservation efforts due to existing mitigation measures already required as part of BOEM leases and permits. Future activity levels and associated consultations are uncertain; we assume currently ongoing activities will continue, but do not predict expansion of new activity. Listed species protections, including for humpback whales, are included in oil spill contingency plans.
Alternative Energy	NMFS has not identified a conservation effort it would make specifically to avoid adverse modification of critical habitat. The extent to which changes in the nature of alternative energy projects over time may affect humpback whale critical habitat is unknown. This analysis forecasts future consultations on alternative energy projects based on the best available information. However, as an emerging and evolving activity, future activity levels and associated consultations are uncertain, and potential effects on prey species cannot be predicted. Attempting to forecast those changes in the industry, the potential conservation efforts, and the associated costs would be speculative.
In-Water Construction	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback

ACTIVITY	SUMMARY FINDING
	whales and best practices already in place for minimizing impacts to the whales and water quality surrounding the work area. The State of Alaska expressed concern that project delays and additional administrative costs associated with the critical habitat designations could be particularly burdensome for small, isolated communities that depend upon port infrastructure for commerce.
Vessel Traffic	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback whales.
Aquaculture and Hatcheries	It is unlikely that section 7 consultations will generate additional conservation efforts because the nature of ongoing and anticipated activity within or adjacent to the critical habitat area is unlikely to affect critical habitat. In California, Oregon, and Washington, shellfish aquaculture activity in bays and estuaries is unlikely to affect the humpback whale critical habitat. Finfish aquaculture is an emerging activity in the offshore environment, and future activity levels and associated consultations are uncertain. In Alaska, shellfish farming, seaweed farming, and hatchery production of shellfish seed are expanding industries and activity is anticipated to increase in coming years.
Scientific Research	NMFS has not identified a conservation effort that would be made specifically to avoid adverse modification of the humpback whale critical habitat associated with seismic research surveys. Although seismic survey activities have the potential to affect humpback whale critical habitat, the specific thresholds at which prey would be adversely affected by the surveys is currently unknown; it is therefore significantly uncertain what specific conservation efforts would be requested, and whether they would differ in any way from those that would be made to avoid jeopardy to the species. For other types of scientific research, it is unlikely that section 7 consultations will result in additional conservation efforts as federally authorized research activities include measures to avoid and minimize impacts on marine mammals, listed species, and designated critical habitats. Administrative costs for consultations on ESA section 10 research permits are also expected to be de minimis as these activities are generally managed to avoid affecting listed species and critical habitats.
Water Quality Management and Inland Activities	It is unlikely that critical habitat will trigger additional conservation efforts related to water quality management and inland activities. Aquatic and marine species are protected under existing state water quality standards. Activities with the potential to affect water quality are managed to protect water quality under the CWA, and generally are sufficiently protective of the prey species occurring in these areas.
Military Activities	Many of the activities conducted by the Department of Defense (DOD) are unlikely to affect the critical habitat. For other DOD activities (e.g., use of explosives), it is unlikely that section 7 consultations on those activities and areas will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback whales. DOD plans for training and testing activities include numerous measures to protect humpback whales.
LNG Facilities	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with BMPs associated with Corps permitting of the construction and operation of facilities designed to protect water quality, as well as the ESA-listing status of the humpback whales.
Space Vehicle and Missile Launches	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections and limited potential for the activity to affect critical habitat.

ACTIVITY	SUMMARY FINDING
	Potential impacts from this activity are generally associated with accidents and unsuccessful launches and are considered extremely unlikely to occur, or to affect the critical habitat if they do occur. Further, many potentially affected areas are afforded protections as Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs) for commercially important fish species and krill.
USFS Activities	It is unlikely that section 7 consultations will result in additional conservation efforts for these activities, as the activities occurring within the critical habitat (e.g., transportation of timber by ship) are unlikely to affect critical habitat.
Restoration Activities	Restoration activities are unlikely to affect the humpback whale critical habitat. Administrative costs are expected to be de minimis as these activities are generally managed to avoid affecting listed species and critical habitats.

EXHIBIT ES-4. TOTAL PRESENT VALUE AND ANNUALIZED ECONOMIC IMPACTS OF ALL HABITAT UNITS ORIGINALLY CONSIDERED FOR DESIGNATION BY CRITICAL HABITAT UNIT, 2020-2029 (2020 DOLLARS, 3% AND 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Mexico and Western North Pacific	1	$20,000	$2,300	$23,000	$2,600
Mexico and Western North Pacific	2	$23,000 - $39,000	$2,600 - $4,400	$26,000-$45,000	$2,900-$5,100
Mexico and Western North Pacific	3	$20,000 - $24,000	$2,300 - $2,700	$23,000 - $27,000	$2,600 - $3,100
Mexico and Western North Pacific	4	$23,000 - $24,000	$2,600 - $2,800	$26,000 - $28,000	$2,900 - $3,100
Mexico and Western North Pacific	5	$41,000 - $48,000	$4,600 - $5,400	$47,000 - $55,000	$5,300 - $6,200
Mexico and Western North Pacific	6	$46,000 - $49,000	$5,200 - $5,600	$52,000 - $56,000	$5,900 - $6,400
Mexico and Western North Pacific	7	$23,000	$2,600	$26,000	$3,000
Mexico and Western North Pacific	8	$30,000	$3,400	$35,000	$4,000
Mexico and Western North Pacific	9	$23,000	$2,600	$26,000	$3,000
Mexico	10	$230,000 - $280,000	$26,000 - $32,000	$270,000 - $330,000	$30,000 - $38,000

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Mexico and Central America	11	$66,000 - $72,000	$7,500 - $8,200	$75,000 - $82,000	$8,500 - $9,300
Mexico and Central America	12	$61,000	$6,900	$70,000	$8,000
Mexico and Central America	13	$83,000 - $90,000	$9,500 - $10,000	$96,000 - $100,000	$11,000 - $12,000
Mexico and Central America	14	$22,000	$2,600	$26,000	$3,000
Mexico and Central America	15	$15,000	$1,700	$18,000	$2,000
Mexico and Central America	16	$26,000	$3,000	$30,000	$3,500
Mexico and Central America	17	$70,000	$7,900	$81,000	$9,200
Mexico and Central America	18	$34,000	$3,900	$39,000	$4,400
Mexico and Central America	19	$49,000 - $50,000	$5,500 - $5,700	$55,000 - $57,000	$6,200 - $6,500
All DPS	All Units	$23,000	$2,600	$27,000	$3,000
Total		**$930,000 - $1,000,000**	**$110,000 - $120,000**	**$1,100,000 - $1,200,000**	**$120,000 - $130,000**

Notes:
Estimates are rounded to two significant digits.

16. Overall, this analysis finds that, if designated, the 19 units of critical habitat may increase administrative costs of consultation regarding humpback whales by $930,000 to $1,000,000 over the next ten years assuming a seven percent discount rate ($1.1 million to $1.2 million assuming a three percent discount rate). This equates to an annualized cost of $110,000 to $120,000 over the ten-year period ($120,000 to $130,000 at a three percent discount rate). Exhibit ES-4 presents the total present value and annualized administrative costs associated with the critical habitat, assuming all considered units are designated.[5] The largest portion of administrative costs are anticipated in Unit 10 (25 to

[5] This final economic analysis analyzes areas considered by NMFS for designation as critical habitat for the three DPSs. The results of this analysis do not reflect proposed exclusions or changes to the proposed critical habitat designations made in the final rule. Costs presented herein for critical habitat units that are not ultimately included in the final designation would not be incurred.

27 percent of total costs), followed by Unit 13 (9 percent) and Unit 17 (7 to 8 percent). Unit 10 is also associated with the greatest level of uncertainty and potential for unquantified impacts. This unit supports a high level of economic activity, including in-water construction, aquaculture, and commercial fishing, thereby amplifying the effects of any overarching uncertainties associated with the analysis as a whole. Additionally, uncertainties and potential unquantified costs associated with aquaculture and in-water construction in the form of potential project delays and additional costs to state agencies are of particular importance in this unit given levels of those activities.

17. As noted previously, this report evaluates the costs of designation for all units considered for designation by NMFS; it is not limited to those units that were ultimately included in the proposed and final rules. Exhibit ES-5 provides the administrative costs of the final designation, which excludes certain units originally considered for designation. The final rule designating critical habitat for the three DPSs of humpback whales is anticipated to result in present value impacts of approximately $640,000 to $680,000 assuming a seven percent discount rate, equivalent to annualized costs of $73,000 to $78,000.

EXHIBIT ES-5. TOTAL PRESENT VALUE AND ANNUALIZED ECONOMIC IMPACTS OF THE FINAL RULE BY CRITICAL HABITAT UNIT, 2020-2029 (2020 DOLLARS, 3% AND 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Mexico and Western North Pacific	2	$46,000 - $62,000	$5,200 - $7,100	$52,000 - $71,000	$5,900 - $8,100
Mexico and Western North Pacific	3	$44,000 - $47,000	$5,000 - $5,400	$49,000 - $54,000	$5,600 - $6,100
Mexico and Western North Pacific	5	$73,000 - $81,000	$8,400 - $9,200	$84,000 - $92,000	$9,600 - $11,000
Mexico and Western North Pacific	8	$63,000	$7,200	$73,000	$8,300
Mexico and Central America	11	$67,000 - $73,000	$7,700 - $8,300	$76,000 - $83,000	$8,700 - $9,500
Mexico and Central America	12	$62,000	$7,100	$71,000	$8,100
Mexico and Central America	13	$84,000 - $92,000	$9,600 - $10,000	$97,000 - $110,000	$11,000 - $12,000
Mexico and Central America	14	$24,000	$2,800	$28,000	$3,200
Mexico and Central America	15	$17,000	$1,900	$20,000	$2,300
Mexico and Central America	16	$30,000	$3,400	$35,000	$3,900

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Mexico and Central America	17	$72,000	$8,200	$83,000	$9,500
Mexico and Central America	18	$37,000	$4,200	$42,000	$4,800
All DPS	All Units	$23,000	$2,600	$27,000	$3,000
Total		**$640,000 - $680,000**	**$73,000 - $78,000**	**$740,000 - $780,000**	**$84,000 - $89,000**

Notes:
Estimates are rounded to two significant digits.

18. Exhibit ES-6 displays the expected present value economic impacts by activity type. The largest portions of estimated costs are associated with in-water construction and dredging activities (25 to 33 percent), aquaculture activities (27 to 30 percent), and commercial fishing (14 to 15 percent).

19. The critical habitat units generally include critical habitat for two of the three DPSs, except for Unit 10, which is relevant only to the Mexico DPS. The Mexico DPS of humpback whales occur in each of the 19 critical habitat units. This analysis does not divide impacts associated with a given unit across the relevant DPSs. Units considered for the Central America DPS account for 45 to 49 percent of total impacts. Units considered for the Western North Pacific DPS account for 27 percent of total impacts. Exhibit ES-7 discusses key assumptions and limitations underlying the analysis of impacts, which potentially over-or underestimate costs.

20. All impacts in this report are presented applying a seven percent discount rate. Tables and text presenting total administrative costs by unit also present costs assuming a three percent discount rate for comparison. Undiscounted impacts are presented in Appendix A, and Appendix B provides additional information on present value and annualized impacts applying an alternative discount rate assumption of three percent for comparison.

21. Exhibit ES-8 presents a comparison of the quantified impacts reported in the draft economic analysis to those reported in this final economic analysis. Overall, modifications made to the analysis result in an increase in the anticipated total present value and annualized costs of the rule, especially in Alaska, and in Unit 10 particularly. Increases in the anticipated costs of the rule reflect some changes in anticipated levels of certain activities (e.g. aquaculture) as well as a shift in the timeframe of the analysis and update of the results from 2018$ to 2020$ to adjust for inflation.

EXHIBIT ES-6. TOTAL PRESENT VALUE ECONOMIC IMPACTS BY ACTIVITY TYPE, 2020-2029 (2020 DOLLARS, 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Western North Pacific	1	$4,200	$0	$0	$0	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	2	$4,200	$0	$0	$2,500 - $19,000	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	3	$4,200	$0	$0	$0 - $3,600	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	4	$4,200	$0	$0	$2,400 - $4,100	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	5	$4,200	$720	$0	$12,000 - $19,000	$0	$11,000	$5,400	$0	$3,600	$1,800	$0	$1,400
Mexico and Western North Pacific	6	$4,200	$17,700	$0	$5,700 - $9,200	$0	$11,000	$0	$5,300	$0	$1,800	$0	$0
Mexico and Western North Pacific	7	$4,200	$720	$0	$0	$0	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico and Western North Pacific	8	$4,200	$2,420	$0	$3,500	$1,700	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico and Western North Pacific	9	$4,200	$720	$0	$0	$0	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico	10	$4,200	$4,200	$0	$65,000 - $120,000	$1,700	$110,000	$5,200	$0	$0	$8,700	$23,000	$1,400
Mexico and Central America	11	$10,000	$0	$0	$14,000 - $20,000	$0	$12,000	$19,000	$0	$190	$2,700	$0	$8,400
Mexico and Central America	12	$10,000	$0	$0	$24,000	$0	$12,000	$4,600	$0	$190	$5,100	$0	$4,800
Mexico and Central America	13	$10,000	$0	$5,300	$37,000 - $44,000	$0	$9,800	$2,900	$5,300	$190	$5,900	$0	$6,600
Mexico and Central America	14	$12,000	$0	$3,800	$0	$0	$0	$2,900	$0	$190	$3,300	$0	$0

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Central America	15	$11,000	$0	$0	$0	$0	$0	$2,900	$0	$190	$870	$0	$0
Mexico and Central America	16	$11,000	$0	$0	$12,000	$1,800	$0	$0	$0	$190	$870	$0	$0
Mexico and Central America	17	$11,000	$580	$13,000	$44,000	$0	$0	$0	$0	$190	$870	$0	$0
Mexico and Central America	18	$11,000	$5,900	$0	$4,000	$0	$5,300	$0	$0	$6,400	$870	$0	$0
Mexico and Central America	19	$11,000	$7,600	$0	$8,000 - $9,700	$1,800	$5,300	$13,000	$0	$1,100	$870	$0	$0
All DPS	All Units[a]	$0	$0	$0	$0	$0	$0	$5,400	$0	$0	$17,000	$0	$0
Total		**$140,000**	**$40,000**	**$22,000**	**$230,000 - $330,000**	**$7,100**	**$270,000**	**$71,000**	**$11,000**	**$12,000**	**$63,000**	**$23,000**	**$27,000**

Notes: Estimates are rounded to two significant digits.

* Consultations associated with "All Units" are large-scale national level consultations that are expected to consider humpback whales and critical habitat but are not associated with the designations of any particular unit or units. A "N/A" indicates "not applicable" because the activity does not result in consultations at the spatial scale of the groupings of units described in the first column. This is different than a "$0" entry, which simply indicates that no costs for the activity are associated with the specified unit.

EXHIBIT ES-7. ASSUMPTIONS AND UNCERTAINTIES

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Critical habitat designation is unlikely to change the humpback whale conservation efforts resulting from future section 7 consultations.[6]	May result in an **underestimate** of costs. (All CH units)	**Potentially major.** Based on the best available information, NMFS anticipates that it is unlikely that the critical habitat designations will generate additional or different conservation efforts for the humpback whale than would be recommended to avoid jeopardy absent the critical habitat designations. However, NMFS will review each individual project or activity at the time of consultation to determine whether additional conservation is needed to avoid adverse modification of critical habitat.
Critical habitat designation is unlikely to change fishery management recommendations.	May result in an **underestimate** of costs. (CH units 11-19)	**Potentially major.** While fisheries that directly target prey species are an important concern for humpback whales, NMFS anticipates it is unlikely that the critical habitat designations will trigger changes in the management of these fisheries. Any future consultations on the fishery will require consideration of the fish as prey for humpback whales and as an essential feature of their critical habitat. However, critical habitat is not expected to affect conservation efforts recommended as part of these consultations.
For oil spill and response activities, vessel traffic, space vehicle and missile launches, water quality management, and forest service activities, this analysis relies primarily on patterns of consultation within the past eleven years (2007 to 2018) to forecast future *rates* of consultation activity. This analysis assumes that past consultations provide a good indication of future activity.	**Unknown.** May overestimate or underestimate incremental impacts. (All CH units)	**Likely minor.** Data are not available to determine whether activity rates are likely to change over time. To the extent that these activities increase over the next ten years, this analysis underestimates the potential incremental administrative burden of the critical habitat for the humpback whales. The estimated incremental impacts per consultation are, however, relatively minor and this analysis accordingly does not anticipate variations in consultation rates to substantially change the findings of this analysis.
For all non-U.S. Army Corps of Engineers activities, this analysis relies on patterns of consultation within the past eleven years (2006 to 2016) and interviews with action agency	**Unknown.** May overestimate or underestimate incremental impacts in a given area.	**Likely minor.** Although the expected rate of consultation is not likely to vary much from year to year, the location of these consultations may change. As a result, relying on the approximate location of past consultation activity may

[6] Beyond the potential for critical habitat to trigger additional conservation efforts as part of section 7 consultations, critical habitat may indirectly affect conservation behaviors in ways that generate both opportunity costs and conservation benefits. For example, critical habitat provides notice to other Federal agencies of areas and features important to species conservation; provides information about the types of activities that may reduce the conservation value of the habitat; and may stimulate research, voluntary conservation actions, and outreach and education activities. To the extent that this information causes agencies, organizations, or individuals to change their behavior for the benefit of humpback whales, these changes would be beneficial to the whales and would be considered benefits of this rulemaking. These changes in behavior could also trigger opportunity costs, for example due to the time or money spent to reduce the risk of negatively affecting the species or its habitat.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
personnel to forecast future *locations* of consultation activity.	(All CH units)	underestimate impacts in certain locations while overestimating impacts in others.
This analysis relies on historical Army Corps permit data (2008 to 2017) to forecast future consultations related to Army Corps-permitted dredging and in-water construction projects	**Unknown.** May overestimate or underestimate incremental impacts. (All CH units)	**Likely minor.** Data are not available to determine whether Army Corps permit rates are likely to change over time. To the extent that permitting increases over the next ten years, this analysis underestimates the potential incremental administrative burden of the critical habitat for humpback whales. The estimated incremental impacts per consultation are, however, relatively minor and this analysis accordingly does not anticipate variations in consultation rates to substantially change the findings of this analysis.
This analysis relies on historical Army Corps permit data (2008 to 2017) to forecast future *locations* related to Army Corps-permitted dredging and in-water construction projects	**Unknown.** May overestimate or underestimate incremental impacts in a given area. (All CH units)	**Likely minor.** Although the expected rate of consultation is not likely to vary much from year to year, the location of these consultations may change. As a result, relying on the approximate location of past consultation activity may underestimate impacts in certain locations while overestimating impacts in others. Generally, given the nature of these activities being focused in more populated areas, consultations will likely continue to be concentrated where they have been in the recent past.
This analysis assumes that future consultations on Army Corps-permitted dredging and in-water construction projects occurring more than 100 meters inland of the potential critical habitat area would not require section 7 consultation considering humpback whale critical habitat.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** These activities are managed to be protective of water quality under the CWA and Corps' best management practices. As described for other in-water construction activities, even if these activities were to result in consultation on humpback whale critical habitat, these consultations would not result in additional conservation efforts.
This analysis assumes that all forecasted civil works consultations will be formal, and that civil works projects in all states other than Washington will be subject to individual consultation.	May result in an **overestimate** of costs. (CH units 2, 4-6, 8, 10, 12, 13, 16-19)	**Likely minor.** Some civil works projects may require informal consultation and some projects may be covered by programmatic consultations and not require future individual consultations. However, this analysis conservatively assumes that all forecasted civil works consultations will be formal, and that civil works projects in states other than Washington will be subject to individual consultation.
This analysis forecasts future oil and gas exploration and production activities under the assumption that the existing 5 Year Leasing Program remains in place.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** If the BOEM 2019-2024 Draft Proposed Program is approved, BOEM would be required to evaluate the potential for impacts to the humpback whale critical habitat for activities in areas that are presently not available for oil and gas exploration and development activities. However, associated changes in regional offshore oil and gas development are highly uncertain. Furthermore, NMFS has not identified an instance in which the

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
		critical habitat for humpback whales would change the nature of the conservation efforts identified for humpback whales as part of future consultations on these activities. Thus, any underestimate of costs associated with this uncertainty would most likely be relatively minor administrative costs of consultation.
Critical habitat designation is unlikely to change management efforts for seismic survey activities related to both oil and gas exploration and development and scientific research.	May result in an **underestimate** of costs. (All CH units)	**Potentially major.** Research indicates that seismic surveys may result in behavior effects and mortality in zooplankton and fish that are prey for humpback whales. However, substantial uncertainty exists regarding the threshold at which seismic survey activities may affect prey species, and what conservations efforts could be recommended.
The frequency of new seismic survey consultations related to oil and gas activities is generally constant and is comparable to the average rate of consultations in recent years.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** If the BOEM 2019-2024 Draft Proposed Program is approved, there may be new seismic surveys related to oil and gas activity in the whales' critical habitat area in the future. However, associated changes in regional offshore oil and gas development are highly uncertain. Furthermore, although NMFS acknowledges that conservation efforts may be possible to avoid effects of these activities on critical habitat, there is too much uncertainty at present to predict what conservation efforts may be. Thus, any underestimate of costs associated with this uncertainty would be relatively minor administrative costs of consultation.
Critical habitat designation is unlikely to change alternative energy recommendations.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** The extent to which changes in the nature of alternative energy projects over time may affect humpback whale critical habitat is unknown. Attempting to forecast those changes in the industry, the potential conservation efforts, and the associated costs would be speculative. However, interviews with action agencies responsible for these activities indicated it was unlikely that the extent and location of this activity would expand substantially within the timeframe of this analysis.
Administrative costs for section 7 consultation will be incurred for all forecasted military activities affecting humpback whale critical habitat.	May result in an **overestimate** of costs. (All CH units)	**Potentially major.** This analysis currently assumes that all military activities affecting the critical habitat will be subject to section 7 consultation and incur administrative costs. NMFS is presently weighing the potential exclusion of certain military activities as a matter of national security. Any exemptions for this reason would result in a reduction of estimated future costs.
Designation of critical habitat for humpback whales will not result in indirect costs.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** It is possible that the designations of the critical habitat may prompt changes in state-level policies that could trigger indirect costs for certain activities, or result in time

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
		delays for certain types of projects. The State of Alaska has expressed concern that indirect impacts are likely. However, given that designation of critical habitat for other species in the same areas has only rarely resulted in these types of impacts, it seems unlikely that these designations will have a different outcome. However, a state decision to modify policies to further protect the essential feature of the humpback critical habitat in state-managed activities could result in additional costs.
Economic benefits are not quantified as the specific role of the critical habitat in contributing to the conservation and recovery of the humpback whales is not quantifiable.	Economic benefits are not quantified but described qualitatively.	Potentially major. The primary benefits of the rule stem from its contribution to the conservation and recovery of humpback whales via conservation efforts triggered by this rule. However, as we are unable to identify specific conservation efforts as likely to result from consultations based on the currently available information, we are unable to quantify the potential benefits. Chapter 4 accordingly provides perspectives on the types of economic values associated with humpback whales but is not able to quantify the effects of this rulemaking on these values.
Critical habitat designations will not result in project delays and increased project costs for port infrastructure development and improvements, other in-water construction projects, or FERC relicensing of hydropower dams.	May result in an **underestimate** of costs. (CH units 1-10, with particular uncertainty in Unit 10 due to high level of activity).	**Likely minor.** Public comments and additional outreach did not identify other instances of critical habitat designations across the region specifically resulting in a project delay. The extent to which critical habitat would trigger project delays, above and beyond the listing of the species and other, co-occurring environmental considerations, is uncertain. Given this, while the analysis identifies this as a concern of the local communities, quantifying the potential for project delays, and the potential duration and associated costs, would be speculative.
The critical habitat designations are not expected to affect the level of effort for the State of Alaska to review aquaculture permits.	May result in an **underestimate** of costs. (CH units 1-10, with particular uncertainty in Unit 10 due to high level of activity).	**Likely minor.** The state of Alaska expressed concern that the critical habitat designations may result in a need to dedicate more staff time to address permit review for new aquaculture facilities and that it may increase the number of permits that will require a specific review for potential marine mammal impacts. Any additional costs would consist of incremental administrative costs across a relatively low number of applications, and would not affect the conclusion that conservation efforts are unlikely to result from the designations.

EXHIBIT ES-8. TOTAL PRESENT VALUE AND ANNUALIZED ECONOMIC IMPACTS BY CRITICAL HABITAT UNIT, 2020-2029 (2020 DOLLARS, 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico and Western North Pacific	1	$3,800	$430	$20,000	$2,300	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	2	$6,100 - $21,000	$690 - $2,400	$23,000 - $39,000	$2,600 - $4,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	3	$3,800 - $7,100	$430 - $810	$20,000 - $24,000	$2,300 - $2,700	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	4	$5,900 - $7,500	$680 - $860	$23,000 - $24,000	$2,600 - $2,800	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	5	$25,000 - $31,000	$2,800 - $3,600	$41,000 - $48,000	$4,600 - $5,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico and Western North Pacific	6	$30,000 - $33,000	$3,400 - $3,700	$46,000 - $49,000	$5,200 - $5,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	7	$9,100	$1,000	$23,000	$2,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	8	$15,000	$1,800	$30,000	$3,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	9	$9,100	$1,000	$23,000	$2,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico	10	$110,000 - $160,000	$12,000 - $18,000	$230,000 - $280,000	$26,000 - $32,000	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	11	$60,000 - $66,000	$6,800 - $7,500	$66,000 - $72,000	$7,500 - $8,200	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	12	$56,000	$6,300	$61,000	$6,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico and Central America	13	$76,000 - $82,000	$8,600 - $9,400	$83,000 - $90,000	$9,500 - $10,000	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	14	$20,000	$2,300	$22,000	$2,600	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	15	$14,000	$1,600	$15,000	$1,700	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	16	$24,000	$2,700	$26,000	$3,000	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	17	$64,000	$7,200	$70,000	$7,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	18	$31,000	$3,500	$34,000	$3,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	19	$44,000 - $46,000	$5,000 - $5,200	$49,000 - $50,000	$5,500 - $5,700	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
All DPS	All Units	$22,000	$2,500	$23,000	$2,600	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Total		**$630,000 - $720,000**	**$72,000 - $82,000**	**$930,000 - $1,000,000**	**$110,000 - $120,000**	

Note: Estimates are rounded to two significant digits.

Acronyms:
ADF&G: Alaska Department of Fish and Game
ADEC: Alaska Department of Environmental Conservation

CHAPTER 1 | INTRODUCTION AND FRAMEWORK FOR THE ANALYSIS

22. Section 4(b)(2) of the ESA requires NMFS to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Secretary of Commerce may exclude an area from critical habitat if it is determined that the benefits of exclusion outweigh the benefits of specifying the area as part of the critical habitat, unless the failure to designate the area as critical habitat will result in the extinction of the species concerned.[7]

23. This report employs the best data available to analyze the economic impacts of designating particular areas as critical habitat. These impacts represent "benefits of exclusion." NMFS presents its formal consideration of the benefits of including particular areas as critical habitat (the "benefits of inclusion") in the *2020 Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (Megaptera novaeangliae)*. Together, these two reports inform NMFS' consideration of whether the benefits of excluding any particular area outweigh the benefits of designating that area pursuant to section 4(b)(2) of the ESA.

24. The purpose of the economic analysis is to provide information to assist the Secretary in determining whether the benefits of excluding particular areas from the designations outweigh the benefits of including those areas in the designations. In addition, this information allows NMFS to address the requirements of Executive Orders 12866 (as affirmed and supplemented by Executive Order 13563) and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[8]

25. This final economic analysis analyzes all areas originally considered for designation as critical habitat for the three DPSs. This analysis does not reflect proposed exclusions or changes to the proposed critical habitat designations made in the final rule. Consequently, description of the habitat designations in the final rule may differ from maps and figures presented in this analysis.[9]

[7] 16 U.S.C. § 1533(b)(2).

[8] Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13563, Improving Regulation and Regulatory Review, January 18, 2011; 5. U.S.C. §§ 601 *et seq*; Pub Law No. 104-121; and 2 U.S.C. § 1501, et seq.

[9] For a detailed discussion of public comments on the draft economic analysis and associated responses, refer to the response to public comments section in the final rule.

26. This chapter provides context for the analysis, including an overview of the humpback whales and their habitat, regulatory history, and potential threats to the critical habitat, as well as a summary of the key modifications that were made to this document since publication of the draft economic analysis.[10] It then describes the framework for the economic analysis and how it fits into NMFS' critical habitat rulemaking process. The remaining chapters are organized as follows:

    - **Chapter 2 - Evaluation of Key Economic Activities:** Chapter 2 provides information on each of the economic activity threats to the areas considered for critical habitat by NMFS. This chapter provides information on the baseline management of these activities and evaluates whether and how the critical habitat may trigger additional conservation efforts for the humpback whales and associated economic impacts.
    - **Chapter 3 – Incremental Economic Impacts of Critical Habitat:** Chapter 3 quantifies the estimated incremental economic impacts of the critical habitat designations based on the evaluation in Chapter 2.
    - **Chapter 4 – Economic Benefits:** Chapter 4 addresses the potential economic benefits of the critical habitat designations.
    - **Chapter 5 – Final Regulatory Flexibility Analysis (FRFA):** In accordance with the requirements of the RFA, as amended, Chapter 5 evaluates the potential economic impacts of the rule on small businesses.
    - **Chapter 6 – Assumptions and Uncertainties:** Chapter 6 reviews the key assumptions that underlie the analysis and the likely significance of these assumptions with respect to estimated impacts.

27. In addition, the report includes two appendices that provide additional information on the evaluation of incremental impacts consistent with direction from the Office of Management and Budget (OMB). Appendix A presents undiscounted economic impacts of the critical habitat over the ten-year timeframe of the analysis. Appendix B provides information on the sensitivity of the economic impact results to an alternative discount rate assumption.

28. Since publication of the draft economic analysis, this document has been modified to incorporate additional information and address comments and concerns raised during the public comment period. For a detailed discussion of public comments on the draft economic analysis and associated responses, refer to the response to public comments section in the final rule. Key changes between the draft and final versions of this analysis include:

    - Expansion of the discussion of potential impacts to fisheries to more completely characterize the nature and value of commercial fisheries that occur within the

[10] Throughout the report, information related to the biology of the whales, threats to critical habitat, and potential for conservation efforts to result from the designation of critical habitat is based on the Biological Report (NMFS 2020), communication with NMFS staff, and the available consultation history.

areas considered for the critical habitat designations, and to highlight particular concerns regarding potential impacts that may result from the designations.

- Revisions to the description of the water quality management activity to more thoroughly describe the role of the State of Alaska in managing water quality and incorporate additional administrative costs that will accrue to NMFS, the state, and the U.S. Environmental Protection Agency (EPA) associated with issuance of general discharge permits.
- Additional analysis of aquaculture projects in Alaska, including clearly defining the types and locations of aquaculture activities that may be affected over the timeframe of the analysis, and quantifying the costs of future section 7 consultations on these activities.
- Description and identification of potential costs related to delays in in-water construction projects and dam relicensing as an uncertainty in the analysis and potential unquantified cost of the rule.
- Addition of text to characterize the vulnerability of small communities even to relatively limited costs of the rule, and the potential for small communities to be affected by any costs that might be incurred related to certain activities such as fishing and in-water construction.
- Reorganization of "Scientific Research" as a unique activity, the impacts to which are explicitly considered within the analysis.
- Reorganization of the activity category presented as "Inland Activities" in the DEA to more specifically reflect the type and location of activities included. All activities related to NPDES permitting and other activities that generally occur inland of the critical habitat area and are primarily managed to maintain water quality (e.g., inland mining, vessel discharges) are now presented within the "Water Quality Management and Inland Activities" activity. "Forest Service Activities" previously combined in results tables with "Inland Activities" are now presented independently.
- Development of Final Regulatory Flexibility Analysis (FRFA).

1.1 BACKGROUND

29. In 1970, the humpback whale was listed as endangered under the Endangered Species Conservation Act of 1969. When the ESA was passed in 1973, replacing the Endangered Species Conservation Act of 1969, all populations of the humpback whale remained listed. On September 8, 2016, NMFS distinguished 14 DPSs of humpback whale and revised the species' ESA listing to include four "endangered" DPSs and one "threatened" DPS. Of the five endangered and threatened DPSs, three are located in U.S. waters: the Western North Pacific and Central America DPSs, which are listed as endangered, and the Mexico DPS, which is listed as threatened. At the time of listing, NMFS described that critical habitat was "not determinable" for these DPSs. NMFS has now considered designating critical habitat for these three DPSs.

30. The ESA defines critical habitat under section 3(5)(A) as:

    i. the specific areas within the geographical area occupied by the species, at the time it is listed…, on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection; and

    ii. specific areas outside the geographical area occupied by the species at the time it is listed… upon a determination by the Secretary that such areas are essential for the conservation of the species.

31. Once critical habitat is designated, section 7 of the ESA requires Federal agencies (i.e., "action agencies") to consult with NMFS to ensure that any action the agencies authorize, fund, or carry out (termed "activities with a Federal nexus") *will not likely result in the destruction or adverse modification of critical habitat*. NMFS may, through the section 7 consultation process, recommend changes to these activities to ensure that they would avoid destruction or adverse modification of critical habitat. The social welfare impacts of critical habitat designation generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. Similarly, the costs incurred by a Federal action agency to consult with NMFS under section 7 represent opportunity costs related to humpback whale conservation, as the time and effort associated with those consultations would have been spent on other endeavors absent the listing of the species or critical habitat designation.

32. Section 7 of the ESA also requires Federal agencies to consult with NMFS to ensure that any action it authorizes, funds, or carries out *will not likely jeopardize the continued existence of any endangered or threatened species*. Through the consultation process**,** NMFS may recommend conservation efforts associated with these activities to avoid jeopardizing the continued existence of the species. Thus, a species listing determination and related jeopardy considerations alone may impose economic impacts, even absent critical habitat designation.

33. In some instances, it is difficult to distinguish between impacts stemming exclusively from the critical habitat designations and impacts resulting from other humpback whale conservation efforts to avoid jeopardy to the species itself. That is, a specific conservation effort may address both jeopardy (ESA listing-related) and adverse modification (critical habitat-related) concerns.

34. This economic analysis focuses on identifying the *incremental impacts* of the critical habitat designations. These incremental impacts stem from conservation efforts implemented due to the critical habitat designations that would not otherwise be implemented. This approach is consistent with the OMB guidelines for conducting economic analysis of regulations. OMB guidelines direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."[11] Impacts that are incremental

[11] OMB, "Circular A-4," September 17, 2003.

to that baseline (i.e., occurring over and above the baseline regulatory requirements or management practices) are attributable to the proposed critical habitat regulation.

1.2 OVERVIEW OF SPECIES AND HABITAT

35. As indicated by the definition of critical habitat, important factors in delineating a critical habitat designation include the species' life history, historical distribution and abundance, and physical and biological features of habitat essential to the conservation of species. To derive a measure of economic impacts occurring within discrete areas of critical habitat, this analysis: (1) characterizes existing or potential threats to the critical habitat occurring within these areas; (2) links these threats to particular human activities; (3) identifies the potential conservation efforts that would avoid the threats; and (4) to the extent feasible, quantifies and monetizes the economic impact of the conservation efforts.

1.2.1 HUMPBACK WHALES AND HABITAT FEATURES

36. The endangered Western North Pacific DPS of humpback whales breeds in the areas of Okinawa, Japan and the Philippines, and feeds in the northern Pacific Ocean, including in the waters off Alaska. The endangered Central America DPS of humpback whales breeds along the Pacific coast of Central America, and feeds in the waters off California and Oregon. Whales of the threatened Mexico DPS breed along the Pacific coast of Mexico and feeds in a broad area from California to the Aleutian Islands in Alaska.[12]

37. NMFS had proposed the essential feature of humpback whale critical habitat as including 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.[13]

38. NMFS identified four broad categories of actions or threats that may affect the essential feature and the ability of the critical habitat to support the conservation of listed humpback whales:

- Direct harvest of prey species in commercial fisheries;
- Climate change;
- Pollution in the marine environment; and
- Ocean noise.

39. NMFS has further identified an additional potential threat to critical habitat. This threat, however, is not yet well understood:

[12] NMFS. 2019. Species Directory: Humpback Whale. Viewed January 11, 2019, https://www.fisheries.noaa.gov/species/humpback-whale.

[13] The specific species of euphausiids and small pelagic schooling fishes included in the definition of the essential feature differ by DPS, and are defined within the final rule.

- Predator competition for prey species.[14]

40. As described in NMFS' Biological Report for the designation of critical habitat for the whales, NMFS identified 19 specific areas that are occupied by the whales and that contain the essential feature. These specific areas—or critical habitat "units"—are based on the essential feature and use patterns of the whales. Exhibits 1-1 and 1-2 identify the geographic scope of each of the units.

[14] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

EXHIBIT 1-1. CRITICAL HABITAT UNITS CONSIDERED FOR HUMPBACK WHALES BY DPS – ALASKA

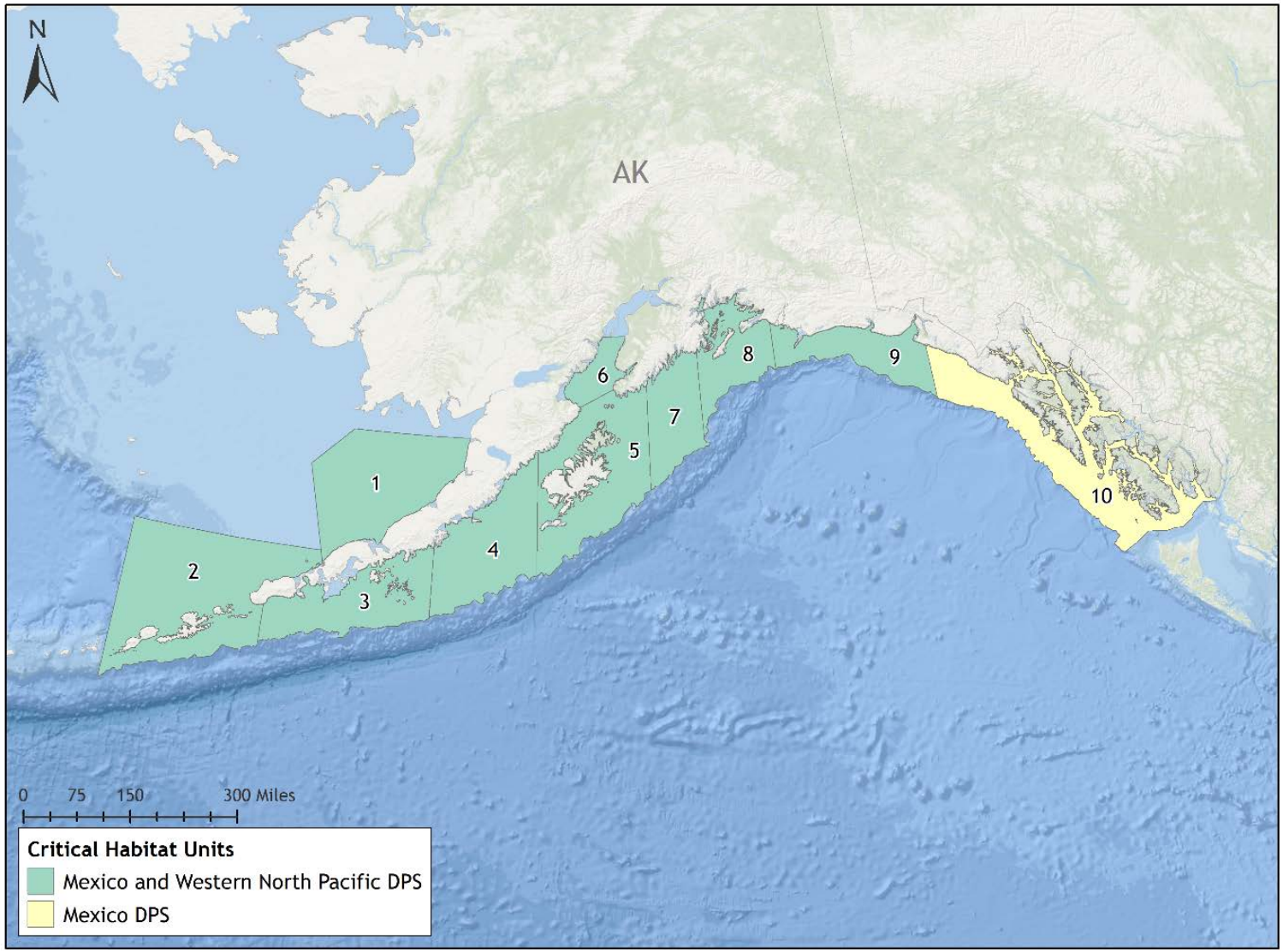
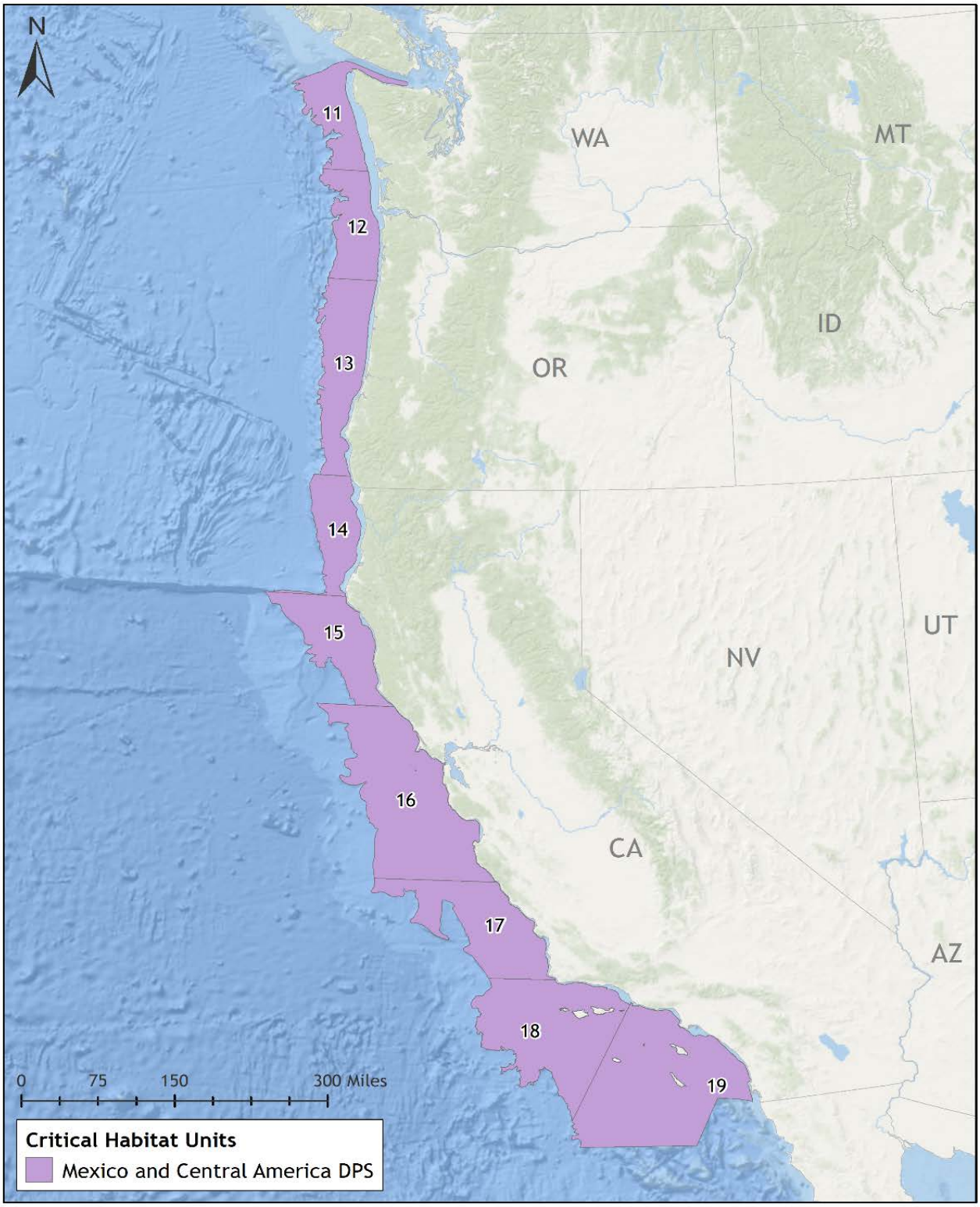


EXHIBIT 1-2. CRITICAL HABITAT UNITS CONSIDERED FOR HUMPBACK WHALES BY DPS – WASHINGTON, OREGON, AND CALIFORNIA



41. In order to determine the boundaries of the areas considered for critical habitat, NMFS relied on whale sightings data and other sources to identify the key feeding areas for humpback whales. The data and information used to determine the boundaries of the specific areas is described in detail in the Biological Report.[15] Based on this information, NMFS considered designating critical habitat that includes (1) coastal waters in the Gulf of Alaska extending from southeast Alaska to the Aleutian Islands, and waters north of the Aleutian Islands in the Bering Sea and (2) coastal waters of the Pacific Coast from the U.S.-Canada border to the U.S.-Mexico border. Exhibit 1-1 displays the areas that were considered for inclusion in the critical habitat designations by DPS.

42. For simplicity, this analysis refers to the areas that were considered for the designations as critical habitat, as identified in Exhibits 1-1 and 1-2, as "critical habitat." However, these areas have not yet been designated as critical habitat and this area may change as NMFS continues to develop the final critical habitat rule.

1.2.2 ECONOMIC ACTIVITIES AND OTHER HABITAT THREATS

43. The following list of potentially affected activities is based on communications with NMFS, outreach to the action agencies that manage these activities, information provided during public comment, and knowledge of those activities that may affect the habitat feature NMFS has proposed for humpback whale critical habitat garnered from previous critical habitat designations in the region.

- **Commercial Fishing** – activities related to harvest of fish within the critical habitat area, with a particular focus on those that target primary prey for humpback whales including coastal pelagic species on the Washington/Oregon/California coasts, and herring in Alaska.[16]
- **Oil and Gas Exploration and Development, Exploratory Seismic Surveys, and Oil Spill Planning and Response (Oil and Gas Activities)** – oil and gas exploration, development, and production activities; planning and response activities for oil spills; and seismic surveys used for oil and gas development.
- **Alternative Energy** – offshore activities related to the exploration, development, siting, and production of wind, and hydrokinetic energy.
- **In-Water Construction and Dredging and Offshore Mining (In-water Construction)** – activities related to U.S. Army Corps of Engineers (the Corps) civil works projects, such as flood control, navigation channel maintenance, and

[15] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

[16] NMFS has not described recreational harvest as a particular critical habitat threat; however, section 7 consultations on fisheries management plans consider harvest both for commercial and recreational purposes. NMFS would therefore consider recreational fishing effects on critical habitat as part of these consultations.

infrastructure support, as well as issuance of section 404 CWA and section 10 of the Rivers and Harbors Act (RHA) permits.

- **Vessel Traffic** – activities related to establishment of shipping lanes by the U.S. Coast Guard (USCG) under the Ports and Waterways Safety Act, maintenance, repair, and replacement of aids to navigation, and other USCG activities related to vessel traffic.
- **Aquaculture and Hatcheries** – activities related to the development, siting, construction, and production of aquaculture, including shellfish farming, seaweed farming, hatchery production of seed for shellfish farms, and hatchery production of salmon
- **Scientific Research** – activities related to large-scale scientific research projects such as placement and operations of oceanographic observation systems, and seismic research surveys.
- **Water Quality Management and Inland Activities;** including:
  - Establishment of Water Quality Standards – activities related to the establishment and approval of state water quality standards.
  - CWA General Permits - activities related to Vessel General Permits (VPG), Multisector (Industrial) General Permits (MSGP), Pesticides General Permits (PGP), and Construction General Permits (CGP).
  - Pesticide Registration – activities related to EPA approval of pesticide use.
  - Vessel discharges
  - Inland mining
  - Power plant operations
  - Agricultural/Land Management Pesticide and Herbicide Application
- **Military Activities** – U.S. Navy training and testing activities.
- **Liquefied Natural Gas (LNG) Facilities (LNG Facilities)** – activities related to the siting, construction, and operation of LNG facilities; and LNG-related spills.
- **Space Vehicle and Missile Launches** – offshore activities related to launching and landing space vehicles and missiles.
- **U.S. Forest Service (USFS) Activities (USFS Activities)** – activities related to timber and forest management.

44. This economic analysis evaluates the potential for the critical habitat designations for humpback whales to result in changes to the level or management of these activities within or affecting the critical habitat. In addition, to support the section 4(b)(2) decision-making process, the analysis identifies the spatial distribution of these activities and, where possible, disaggregates impacts by critical habitat unit, including identifying known uncertainties or unquantified costs associated with a specific critical habitat unit

45. In addition to these identified threats to critical habitat, NMFS addresses other activities in terms of potential for jeopardy to or take of the whales. Unrelated to the current rulemaking, and driven by litigation and the ESA-listing status of humpback whales and other whale species, management efforts are underway to address the issue of entanglements of large whales in commercial fishing gear. In particular, the state-managed Dungeness crab fishery is identified as an important source of whale entanglements.[17] The states are actively working to address this issue. The associated management efforts currently being undertaken are due to potential for jeopardy and/or take of the whales, and are therefore not incremental impacts stemming from the humpback whale critical habitat rule.

1.3 FRAMEWORK FOR THIS ECONOMIC ANALYSIS

46. NMFS is applying a modified cost-effectiveness analysis to support the critical habitat designations for humpback whales. This framework informs the section 4(b)(2) decision-making process by allowing NMFS to compare an assessment of the "benefits of exclusion" that includes both monetized and unquantified impacts, against an indicator of the biological "benefits of inclusion" for any particular area.[18] This section first describes the modified cost-effectiveness analysis framework and then describes the 4(b)(2) exclusion process.

1.3.1 MODIFIED COST-EFFECTIVENESS ANALYSIS

47. When economic activities have biological effects or other consequences for conservation, analyses of the impacts of regulating those activities can take a number of approaches. Two possible approaches are benefit-cost analysis and cost-effectiveness analysis. Each of these approaches has strong scientific support as well as support from OMB through its guidelines on regulatory analysis.[19] Each also has well known drawbacks, both theoretical and practical, as discussed in the following section in the context of critical habitat designation.

48. Benefit-cost analysis (BCA) is the first choice for analyzing the consequences of a regulatory action such as critical habitat designation.[20] BCA is a well-established procedure for assessing the "best" course or scale of action, where "best" is that course which maximizes net benefits.[21] Because BCA assesses the value of an activity in net

[17] 84 Fed. Reg. 95: 22051-22073.

[18] NMFS' modified cost-effectiveness analysis for critical habitat designation was first applied in 2005 with the designation of critical habitat for West coast salmon (National Marine Fisheries Service, Northwest Fisheries Science Center. 2005. Final Economic Analysis of Critical Habitat Designation for 12 West Coast Salmon and Steelhead ESUs. August.)

[19] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[20] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[21] Zerbe, R., and D. Dively, 1994. Benefit Cost Analysis in Theory and Practice, New York: HarperCollins.

benefit terms, it requires that a single metric, most commonly dollars, be used to gauge both benefits and costs. The data and economic models necessary to estimate costs may be difficult or costly to gather and develop, and a comprehensive analysis of the costs associated with a regulatory action is not always feasible. Nonetheless, the principle is straightforward, and it is generally possible in practice to develop a monetary estimate of at least some portion of regulatory costs. This is the case for critical habitat designation, which has direct impacts on activities carried out, funded, or permitted by the Federal government. Conceptually, the "benefits of exclusion," which is the language used in section 4(b)(2) of the ESA, are identical to the "costs of inclusion," and so estimates of these costs could be used in a benefit-cost framework.

49. Assessing the benefits of critical habitat designation in a BCA framework is also straightforward in principle but much more difficult in practice. To the extent that the critical habitat provisions of the ESA increase the protections afforded humpback whales and their habitat, they produce real benefits to the species. In principle, these benefits can be measured first by a biological metric, and then by a dollar metric. A biological metric could take the form of the expected decrease in extinction risk, increase in the annual population growth rate, and so forth. A BCA would then value these quantified biological benefits in terms of willingness-to-pay, the standard economic measure of economic value recommended by OMB.[22] This would produce a dollar estimate of the benefits of critical habitat designation, which could then be compared directly to the costs. In the case of humpback whales, however, the data required to complete an analysis of the monetary estimate of benefits of the critical habitat designation are not available.

50. Recognizing the difficulty of estimating economic values in cases like this one, OMB acknowledges cost-effectiveness analysis (CEA) as an appropriate alternative to BCA.

51. Cost-effectiveness analysis can provide a rigorous way to identify options that achieve the most effective use of the resources available without requiring monetization of all of the relevant benefits or costs. Generally, cost-effectiveness analysis is designed to compare a set of regulatory actions with the same primary outcome (e.g., an increase in the acres of wetlands protected) or multiple outcomes that can be integrated into a single numerical index (e.g., units of health improvement).[23]

52. Ideally, CEA quantifies both the benefits and costs of a regulatory action but uses different metrics for each. In principle, conducting a CEA of critical habitat designation proceeds along the same lines identified above for BCA, except that the last step of assigning economic (dollar) values to biological benefits is not taken. Different configurations of critical habitat could be gauged by both metrics, with the cost-effectiveness (ratio of units of biological benefits to both the quantified and unquantified

[22] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[23] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

cost impacts) evaluated in each case. If a set of alternatives all achieve some target level of biological benefits, the cost-effective alternative is the alternative that achieves the target at the lowest possible cost.

53. Standard CEA presumes that benefits can be measured with a cardinal or even continuous measure. For critical habitat designation, however, constructing such a measure for biological benefits may be problematic. Although critical habitat designation for humpback whales is expected to have benefits, it is not feasible, given the state of the science, to quantify benefits reliably with a single biological metric (e.g., change in abundance or in the probability of recovery). Thus, applying CEA in its standard form is not possible.

54. NMFS is applying an alternative form of CEA in designating critical habitat for humpback whales. Although it is difficult to monetize or quantify the benefits of critical habitat designation, it may be possible to differentiate among habitat areas based on their relative contribution to conservation. This qualitative evaluation of the relative biological benefits may then be combined with estimates of the quantified and unquantified economic costs of critical habitat designation in a framework that essentially adopts the framework of CEA. Individual habitat areas are assessed using both their biological evaluation and economic cost, so that areas with high conservation value and lower economic cost have a higher priority for designation, and areas with a low conservation value and higher economic cost have a higher priority for exclusion.

1.3.2 PROCESS FOR 4(B)(2) EXCLUSION DECISIONS

55. Specific areas that satisfy the definition of critical habitat are not automatically designated as critical habitat. Section 4(b)(2) of the ESA (16 U.S.C. 1533(b)(1)(A)) requires the Secretary to first consider the impact of designation and permits the Secretary to exclude areas from designation under certain circumstances.

56. "The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned."

57. To this end, NMFS undertakes the following general steps to implement section 4(b)(2):

- Identify particular areas for possible exclusion from critical habitat designation;
- Determine the benefit of designation (biological benefits) of each particular area;
- Determine the benefit of exclusion (economic and other impacts) of each particular area;

- Determine whether the benefits of exclusion outweigh the benefits of designation; and
- Determine whether the exclusions (if any) will result in extinction of the species.

58. This analysis focuses primarily on the third step, quantifying the benefits of excluding particular areas from critical habitat. The following section details the framework of this economic analysis.

1.3.3 ECONOMIC ANALYSIS APPROACH

59. OMB guidelines for conducting economic analyses of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."[24] Specifically, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the regulation. That is, the incremental impacts quantified in this analysis are those not expected to occur absent the critical habitat designations for humpback whales.

60. The incremental economic impacts of critical habitat designation generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, the costs incurred by a Federal action agency to consult with NMFS under section 7 represent opportunity costs of humpback whale conservation, as the time and effort associated with those consultations may have been spent on other endeavors absent the critical habitat designation. Costs of implementing reasonable and prudent alternatives to avoid adversely modifying the designated critical habitat are also examples of opportunity costs that may be borne by agencies and third-party participants in consultation.

61. At the guidance of OMB and in compliance with Executive Order 12866, "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency to understand how society, as a whole, will be affected by a regulatory action. This analysis accordingly examines the state of the world with and without the critical habitat designations for humpback whales:

- The "**without critical habitat**" scenario represents the **baseline** for the analysis, considering protections already afforded the whales. The baseline for this analysis is the state of regulation absent the critical habitat of coastal waters along the Washington/Oregon/California coast and Alaska. In the baseline, humpback whales receive protection under the ESA, as well as under other Federal, state and local laws and conservation plans. The baseline includes sections 7, 9, and 10 of the ESA to the extent they are expected to apply absent the critical habitat

[24] OMB, "Circular A-4," September 17, 2003, available at: http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf.

designations for the species in ocean waters along the Washington/Oregon/California coast and Alaska. The analysis qualitatively describes how baseline conservation efforts for humpback whales may be implemented across the areas considered for the designations.

- The "**with critical habitat**" scenario describes and monetizes the **incremental** impacts due specifically to the critical habitat areas considered for humpback whales along the Washington/Oregon/California coast and Alaska. Incremental conservation efforts and associated impacts are those that are expected to occur as a result of the critical habitat designations. This report focuses on the incremental analysis.

62. To quantify the economic impacts of humpback whale conservation efforts, the analysis involves the following general steps:

    A. Identify the baseline of economic activity and the statutes and regulations that constrain that activity in the absence of the critical habitat designations;

    B. Identify the types of activities that are likely to be affected by the critical habitat designations;

    C. Project the projects and activities identified in Step 2 over space and time based on the best available information on planned projects, permitting schedules, or average annual levels of activity;

    D. Estimate the costs of administrative effort and, where applicable, conservation efforts recommended for the activity to comply with the ESA's critical habitat provisions;

    E. Apply well-accepted discounting methods to calculate the present value cost in each year of the ten-year period of analysis analysis (2020-2029) and sum over time to calculate the total present value and annualized impacts; and

    F. Aggregate the costs up to the particular area level. The analysis reports impacts at the particular area level.

63. This analysis refers to "conservation efforts" as a generic term for recommendations NMFS may make to modify projects or activities for the benefit of the humpback whale and/or its habitat, or that action agencies or other entities may otherwise undertake to avoid adverse effects of projects or activities on the humpback whale and/or its habitat. The current ESA section 7 Consultation Handbook includes more targeted descriptions for other terminology as follows.

- **Conservation measures** are actions to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of the consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.

- **Conservation recommendations** are the Services' non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures that a Federal agency can take to minimize or avoid the adverse effects of a proposed action on listed or proposed species, or designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed or proposed species, or designated or proposed critical habitat; and (3) include suggestions on how an action agency can assist species conservation as part of their action and in furtherance of their authorities under section 7(a)(1) of the Act.
- **Reasonable and prudent measures** are actions the Director believes necessary or appropriate to minimize the impacts, i.e., amount or extent, of incidental take.
- **Reasonable and prudent alternatives** are recommended alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or the destruction or adverse modification of designated critical habitat.[25]

1.3.3.1 Identifying Baseline Impacts

64. The first step in the economic analysis is to identify the baseline level of protection already afforded the humpback whales in the areas considered for designations as critical habitat. The baseline for this analysis is the existing state of regulation prior to the critical habitat designations, including the listing of the species under the ESA, and other Federal, state and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond compliance costs of regulations that provide protection to the species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by NMFS and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

65. Baseline protections include sections 7, 9, and 10 of the ESA, and economic impacts resulting from these protections to the extent that they are expected to occur absent the critical habitat designations for the species. This analysis describes these baseline regulations and, where possible, provides examples of the potential magnitude of the costs of these baseline protections. The primary focus, however, is not on baseline costs, since these will not be affected by the potential regulation. Instead, the focus of this

[25] U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act. March.

analysis is on monetizing the incremental impacts forecast to result from the areas considered for the critical habitat designations.

- Section 7 of the ESA, absent critical habitat designation, requires Federal agencies (i.e., "action agencies") to consult with NMFS to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.
- Section 9 defines the actions that are prohibited by the ESA. In particular, it prohibits "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[26] Economic impacts associated with section 9 manifest themselves in sections 7 and 10.
- Enforcement actions taken in response to violations of the ESA are not included in this analysis.

66. The protection of listed species and habitat is not limited to the ESA. Other Federal agencies, as well as state and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Marine Mammal Protection Act (MMPA), CWA, or state environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are not quantified as impacts of critical habitat designation.

1.3.3.2 Identifying Incremental Impacts

67. This analysis focuses on the incremental impacts of critical habitat designation. The purpose of the incremental analysis is to determine the impacts on economic activities due to the designation of critical habitat beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, state, and local regulations or guidelines. Incremental impacts may include the direct costs associated with additional effort for consultations (including consultations that otherwise would have been limited to jeopardy issues, reinitiated consultations, or new consultations occurring specifically because of the designation) as well as the direct costs associated with conservation efforts that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat and triggering of additional requirements under state or local laws intended to protect sensitive habitat.

68. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat

[26] 16 U.S.C. § 1532.

designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts requested by NMFS through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

1.3.3.3 Administrative Section 7 Consultation Costs

69. When critical habitat is designated, section 7 requires Federal action agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to ensuring that the actions are not likely to jeopardize the continued existence of the species). The added administrative costs incurred by all parties to the consultation of including consideration of critical habitat in section 7 consultations and the additional impacts of implementing conservation efforts to protect critical habitat are the direct result of the designation of critical habitat. These costs are considered incremental impacts of the rulemaking.

70. During a consultation, NMFS, the action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to address potential adverse effects to the species and/or critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private (third party) applicant involved. All parties involved in the consultation process, including NMFS, the Federal action agency, and in certain cases, a third party (the applicant) that may be a state agency, a private entity, small governmental jurisdiction, etc. incur administrative costs associated with the activities described here.

71. Section 7 consultations with NMFS may be either informal or formal. *Informal consultation*s consist of discussions between NMFS, the action agency, and applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in NMFS' determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat and recommendations to avoid those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require administrative effort on the part of all participants.

72. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

1. Additional effort to address adverse modification in a new consultation - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond those raised by the listing of the species. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
2. Re-initiation of consultation to address adverse modification - Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and conservation effort costs, are considered incremental impacts of the designation.
3. Incremental consultation resulting entirely from critical habitat designation - Critical habitat designation may trigger additional consultations that would not occur absent the designation (e.g., for an activity that may affect the critical habitat but not the species). All administrative and conservation effort costs associated with incremental consultations are considered incremental impacts of the designation.

73. We find that the first category of administrative costs is most relevant to the areas considered for the critical habitat designations for the humpback whales as project proponents are generally already consulting on activities within the critical habitat area. The administrative costs of a given consultation vary depending on the type and specifics of the project, and it may not be possible to predict the level of effort required for each future consultation. This analysis accordingly employs estimated average, incremental administrative costs per consultation, as described in Exhibit 1-3.

74. These estimates are based on the expected amount of time spent considering adverse modification as part of future section 7 consultations, and hourly GSA rates as of 2020. Based on the information in Exhibit 1-3, for example, the opportunity cost of the time spent on a single informal consultation regarding the whales (including consideration of both jeopardy and adverse modification) is approximately $10,000, of which $2,500 reflects the time spent to consider adverse modification. The time (and therefore cost) spent on informal consultations that consider multiple species, as is typical of consultations involving the whales, would be greater than the total costs presented in Exhibit 1-3.

75. Appendix C describes the derivation of the administrative consultation costs presented in Exhibit 1-3. NMFS and Federal action agencies generally do not track time spent in consultation. As part of the information gathering process for multiple economic analyses of critical habitat over the 15 years, IEc analysts have discussed with NMFS consulting biologists and with Federal action agencies whether better data are available to refine these estimates. Generally, the agencies have not provided additional information and have determined that these estimates are reasonable averages. Where better information is available to refine the estimates for a particular consultation or activity, the more specific cost estimates are applied.

1.3.3.4 Impacts of Section 7 Conservation Efforts

76. Section 7 consultation considering critical habitat may also result in recommendations for conservation efforts specifically addressing potential destruction or adverse modification of critical habitat. For new consultations that otherwise would have been limited to jeopardy issues and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated conservation efforts are assumed to be incremental impacts of the designation. The activity-specific discussions in Chapter 2 describe the potential for relevant projects or activities to result in incremental conservation efforts due to the need to consider adverse modification of critical habitat.

EXHIBIT 1-3. AVERAGE ADMINISTRATIVE CONSULTATIONS COSTS (2020 DOLLARS)

INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION						
CONSULTATION TYPE	NMFS COST	FEDERAL ACTION AGENCY COST	THIRD PARTY COST (E.G., STATE OR LOCAL GOV AGENCY OR PRIVATE ENTITIES)	TOTAL COST (WITHOUT BIOLOGICAL ASSESSMENT)	(OPTIONAL) BIOLOGICAL ASSESSMENT COST	TOTAL COST (WITH BIOLOGICAL ASSESSMENT)
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION						
(Total cost of a consultation considering both Jeopardy and adverse modification)						
Technical Assistance	$620	N/A	$1,100	$1,700	N/A	$1,700
Informal	$2,700	$3,400	$2,100	$8,200	$2,000	$10,000
Formal	$6,100	$6,800	$3,500	$16,000	$4,800	$21,000
Programmatic	$18,000	$15,000	N/A	$33,000	$5,600	$39,000
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION						
Technical Assistance	$310	N/A	$530	$840	N/A	$840
Informal	$1,400	$1,700	$1,000	$4,100	$1,000	$5,100
Formal	$3,000	$3,400	$1,800	$8,200	$2,400	$11,000
Programmatic	$9,100	$7,600	N/A	$17,000	$2,800	$20,000
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION						
(Additive with baseline costs)						
Technical Assistance	$160	N/A	$260	$420	N/A	$420
Informal	$680	$860	$510	$2,000	$500	$2,500
Formal	$1,500	$1,700	$880	$4,100	$1,200	$5,300
Programmatic	$4,600	$3,800	N/A	$8,400	$1,400	$9,800

INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION						
CONSULTATION TYPE	NMFS COST	FEDERAL ACTION AGENCY COST	THIRD PARTY COST (E.G., STATE OR LOCAL GOV AGENCY OR PRIVATE ENTITIES)	TOTAL COST (WITHOUT BIOLOGICAL ASSESSMENT)	(OPTIONAL) BIOLOGICAL ASSESSMENT COST	TOTAL COST (WITH BIOLOGICAL ASSESSMENT)

Source: IEc analysis of full administrative costs is based on fully loaded (inclusive of overhead) hourly rate data from the Federal Government Schedule Rates, Office of Personnel Management (2020) for Federal agencies; hourly rates for third parties are estimated to be $100 per hour on average. The estimates of level of effort required per consultation type derived from a review of consultation records from several Service field offices across the country conducted in 2002.

Notes:

1. While there is a wide range of effort involved in individual consultations, the levels of effort per consultation represent approximate averages based on the best available cost information. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The cost estimates presented in this table may therefore not sum to the total costs reported due to rounding.
2. Estimates reflect average hourly time required by staff.
3. Costs of Biological Assessments associated with a given consultation may be borne by the Federal agency, third party (where applicable) or a combination of these parties to consultation. This analysis assumes all consultations include the cost of a biological assessment.
4. The third party costs generally reflect costs to the applicant whose request for funding, permitting, etc. is under consideration. Depending on the type of activity in question, the third party may be a private entity, a small governmental jurisdiction, a state agency, etc.

1.3.3.5 Indirect Impacts

77. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 of the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the ESA, through other Federal, state, or local actions, that are caused by the designation of critical habitat. When these types of conservation efforts and economic effects occur as a result of critical habitat designation, they are appropriately considered incremental impacts.

78. Under certain circumstances, critical habitat designation may provide new information to a state or local government about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under state or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

79. In addition, project proponents, land managers and landowners may face additional indirect impacts, including the following:

- **Time Delays –** Both public and private entities may experience incremental delays for projects and other activities due to requirements associated with the

need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they would be indirect, incremental impacts of the designation.

- **Regulatory Uncertainty –** NMFS conducts each section 7 consultation on a case-by-case basis and issues a Biological Opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with NMFS under section 7 may face uncertainty concerning whether conservation efforts will be recommended by NMFS and what the nature of these conservation efforts will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. It is difficult to identify whether and how regulatory uncertainty could change individuals' behavior (e.g., resulting in individuals avoiding activities within critical habitat). However, the potential exists for such changes in behavior to generate indirect economic impacts due to critical habitat designation.

1.3.3.6 Geographic Scope of the Analysis

80. The 4(b)(2) exclusion process is conducted for a "particular area," not for the critical habitat as a whole. This analysis is, therefore, conducted at a geographic scale that divides the areas that were considered into smaller subareas. The statute does not specify the exact geographic scale of these "particular areas." For the purposes of this analysis, a "particular area" is defined as the specific areas (or critical habit "units") identified by NMFS, as shown in Exhibits 1-1 and 1-2. Due to the broad geographic coverage of certain activities and difficulty of assigning a specific portion of a consultation to each individual unit, the economic impacts of activities that span all critical habitat units are presented collectively.

1.3.3.7 Analytic Time Frame

81. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). Guidance from OMB indicates that "if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future."[27] The "foreseeable future" for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecasted impacts are based on the planning periods for potentially affected projects and will look out over a ten-year time horizon. OMB supports this time frame stating that "for most agencies, a standard time period of analysis is ten to 20 years, and

[27] The U.S. Office of Management and Budget, February 7, 2011. "Regulatory Impact Analysis: Frequently Asked Questions (FAQs)." Accessed on May 3, 2011 by http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf.

rarely exceeds 50 years."[28] This analysis considers economic impacts to activities over a ten-year period from 2020 through 2029.

1.3.3.8 Discounting Impacts Over Time

82. The analysis employs standard discounting techniques to calculate the present value (PV_c) of economic impacts that are projected to occur in the future. The PV_c of impacts projected to occur from year t to T is measured in 2018 dollars according to the following standard formula:

83. $$PV_c = \sum_{t=t_0}^{t=T} \frac{C_t}{(1+r)^{t-2020}}$$

PV_c= discounted present value of future impacts

t= year of cost from year t_0 (2020) to T (2029)

C_t = cost of species conservation efforts in year t

r = discount rate

84. To calculate present values, guidance provided by OMB specifies the use of a real discount rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates, such as three percent, which some economists believe better reflects the social rate of time preference.[29] Accordingly, this analysis presents impacts at seven percent unless otherwise noted, and provides a sensitivity analysis in Appendix B, summarizing impacts assuming a discount rate of three percent.

1.3.4 SUMMARY

85. The economic framework applied in this report aggregates project-level impacts to estimate the total economic impact of designating particular areas as critical habitat. This framework provides NMFS meaningful information for the 4(b)(2) exclusion process to distinguish between areas that have a relatively high or low benefit of exclusion. This information supports the use of a modified cost-effectiveness approach in designating critical habitat.

[28] The U.S. Office of Management and Budget, February 7, 2011. "Regulatory Impact Analysis: Frequently Asked Questions (FAQs)." Accessed on May 3, 2011 by http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf.

[29] U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 Federal Register 5492, February 3, 2003.

CHAPTER 2 | EVALUATION OF KEY ECONOMIC ACTIVITIES

86. As described in Chapter 1, NMFS has identified numerous activities that may affect the critical habitat for humpback whales. This section discusses the regulatory baseline for these activities and evaluates the potential for the critical habitat to trigger additional conservation efforts and associated economic impacts. Because this analysis includes all critical habitat units considered for designation and was conducted in part to inform NMFS' analysis under section 4(b)(2) of the ESA, this section includes descriptions of activities in some locations that are not ultimately designated as critical habitat in the final rule.

2.1 OVERVIEW OF ECONOMIC ACTIVITIES THAT MAY AFFECT CRITICAL HABITAT

87. NMFS identifies that the following activities may affect humpback whales or their critical habitat and therefore potentially require section 7 consultation:

- Commercial Fishing
- Oil and Gas Activities
- Alternative Energy
- In-Water Construction
- Vessel Traffic
- Aquaculture and Hatcheries
- Scientific Research
- Water Quality Management and Inland Activities; including
  - Establishment of Water Quality Standards
  - CWA General Permits
  - Pesticide Registration
  - Vessel discharges
  - Inland mining
  - Power plant operations
  - Agricultural/Land Management Pesticide and Herbicide Application
- Military Activities
- LNG Facilities

- Space Vehicle and Missile Launches
- USFS Activities

88. For the majority of these activities, this analysis concludes it is unlikely that future section 7 consultations will result in additional conservation efforts specifically attributable to the critical habitat designations.[30] These activities are already managed under the baseline regulatory environment such that NMFS is unlikely to make additional conservation efforts specifically to avoid adverse modification of critical habitat. That is, the ESA listing and MMPA, as well as other existing regulations and BMPs governing these activities, result in their being unlikely to adversely affect critical habitat. Incremental costs may stem from additional administrative effort as part of future section 7 consultations or any indirect impacts of the critical habitat rule.[31]

89. Each of these activities involves a Federal nexus (i.e., they are either permitted, funded, or carried out by a Federal agency) triggering the need for section 7 consultation with NMFS to ensure they do not jeopardize humpback whales or adversely modify their critical habitat. Accordingly, this analysis assumes that future occurrences of these activities affecting critical habitat for the whales (even where the activity itself may be physically occurring outside of critical habitat) will result in consultation. As described in Chapter 1, section 7 consultations generate administrative costs for the time and effort spent in conducting an adverse modification analysis and communications between the consulting parties. The administrative costs of these consultations are incremental impacts of the critical habitat designations.

90. The conclusions described above apply to the majority of activities occurring within or affecting critical habitats, with the following exceptions. For seismic activities related to scientific research or oil and gas exploration and development, and alternative energy, the potential effects of these activities on humpback whales prey species are not well-understood. As a result, there is significant uncertainty as to the likely outcome of future consultations. Additionally, any conclusions of future consultations regarding prey species effects may be related both to adverse modification of critical habitat and jeopardy to the species. As such, NMFS has not identified a conservation effort for these activities that would be made specifically as a result of the critical habitat designations.

91. Finally, NMFS identifies commercial fisheries that directly target the prey species of humpback whales (specifically, the Federal Coastal Pelagic Species Fishery [CPS]) as being of particular concern with respect to the potential for adverse modification of

[30] Although many of these activities occur within the area considered for critical habitat itself, certain activities that occur adjacent to or inland of the critical habitat area may have the potential to affect it.

[31] Indirect impacts are those unintended changes in economic behavior that may occur outside of the ESA, through other Federal, state, or local actions, that are caused by the designation of critical habitat. They are discussed in more detail in Section 1.3.3.5.

critical habitat.[32] However, while the CPS fishery is of particular concern with respect to adverse modification because the fishery targets multiple humpback whale prey species (the identified essential feature of the critical habitat), NMFS has not identified any changes it would recommend in the management of this fishery specifically to avoid adverse modification of critical habitat for the following reasons:

- NMFS has not identified a specific threshold level of prey abundance as part of the essential feature of critical habitat. Determining whether particular fishery management actions would result in adverse modification will be made through analyses as part of future section 7 consultations.
- Future consultations on the fisheries will also require consideration of the potential for jeopardy to the whales. As part of these future consultations, NMFS will evaluate whether effects of the fisheries management on the prey species would lead to jeopardy, and may make recommendations for modifications to avoid this outcome.
- Even outside of ESA section 7 consultation, NMFS considers effects of fisheries management on the humpback whales through the MMPA. The MMPA prohibits "harassment" of marine mammals, which is defined to include impacts of activities on marine mammal feeding.[33]

92. Given the importance of maintaining prey for humpback whales across all aspects of the statutory protections for the species, it is uncertain whether and how the critical habitat designations could trigger different recommendations related to fisheries management for the prey species.[34] Accordingly, while specific outcomes of future consultations are uncertain, NMFS has not identified more or different conservation efforts for fisheries management as likely to result from the critical habitat designations for the humpback whales.

93. The remainder of this chapter evaluates the potential for future section 7 consultations on each of these activities to result in recommendations for additional conservation efforts for humpback whales exclusively to avoid adverse modification of critical habitat. To the extent that NMFS recommends changes to the management of these activities due to the presence of critical habitat—above and beyond any efforts it would identify for the conservation and recovery of the whales due to the listing status—the associated costs would be considered incremental economic impacts of the critical habitat. The

[32] Although herring is also a prey species, the primary fishery for herring is managed by the State of Alaska. Absent a Federal nexus, there is no requirement for consultation with NMFS regarding the effect of this fishery on critical habitat. Section 2.3.1.3 discusses the potential for critical habitat to affect the management of the state fishery.

[33] Specifically, Level B Harassment under the MMPA refers to act that, "have the potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." (16 U.S.C. 1361)

[34] Because the prey species are an essential feature of critical habitat, evaluating the potential for the CPS fisheries to adversely modify critical habitat may be more straightforward than connecting fishing to potential for jeopardy.

information presented below relies on outreach conducted to numerous stakeholders and information received through public comment, as identified in Exhibit 2-1.

EXHIBIT 2-1. SUMMARY OF OUTREACH EFFORTS

AGENCY	REGION/OFFICE	ACTIVITIES ADDRESSED
US Army Corps of Engineers	Headquarters	Collection of permit history data
	Seattle District	Corps civil works activities
	Portland District	Corps civil works activities
	Alaska District	Corps civil works activities
Federal Energy Regulatory Commission	Northwest and Alaska	Non-Federal hydrokinetic alternative energy projects
	California	Non-Federal hydrokinetic alternative energy projects
Bureau of Ocean Energy Management	Washington, Oregon, California	Oil and gas exploration and development; seismic surveys; wind energy
	Alaska	Oil and gas exploration and development; seismic surveys; wind energy
Alaska Department of Fish and Game		Commercial fishing; aquaculture and hatcheries (including shellfish farming, seaweed farming, and hatcheries); all activities with potential indirect impacts in state jurisdiction
Alaska Department of Environmental Conservation		Water quality management
Alaska Department of Transportation		Transportation projects, including port infrastructure.
Washington Department of Ecology (ECY)		State Water Quality Standards
Oregon Department of Environmental Quality (DEQ)		State Water Quality Standards
National Marine Fisheries Service	West Coast Region, Sustainable Fisheries Division	Commercial Fishing
	West Coast Region, Aquaculture Coordinators	Aquaculture and Hatcheries

Notes: This table includes those entities that provided information to inform this report. It does not include other efforts made to contact entities that were not ultimately reached or did not provide information for the analysis.

2.2 SUMMARY OF FINDINGS

94. Exhibit 2-2 summarizes the results of this evaluation. Based on a long history of consulting on humpback whales, NMFS has not identified a particular project or activity for which it is likely that section 7 consultation *with* critical habitat for the humpback whales will result in different conservation efforts than section 7 consultation *without* critical habitat. Absent the critical habitat, NMFS regularly consults on these types of

activities to consider the potential for jeopardy to the humpback whales and identifies conservation efforts accordingly. NMFS anticipates that it is most likely that these baseline conservation efforts would also result in the projects and activities avoiding adverse modification of critical habitat. The reason for this is that protection of the essential feature of critical habitat (prey quality, abundance, and accessibility) is generally important to the conservation and recovery of the whales themselves, even outside of the need to consider adverse modification of critical habitat.

95. This analysis forecasts the number of future consultations expected to consider critical habitat for the whales over the next ten years (2020-2029). We first prioritized primary information on future projects based on communication with Federal action agencies that fund, permit, or carry out these activities, and with state agencies that participate or lead management of certain activities. In addition, we relied on available data on historical projects, including the Corps' permit data, civil works project schedules, and NMFS' consultation history. Overall, the action agencies interviewed did not anticipate that the critical habitat would increase the scope of projects consulting on humpback whales and did not identify expected changes in conservation efforts.

96. In some cases, it may be more straightforward for NMFS to demonstrate that a project or activity may result in adverse modification of critical habitat than to demonstrate effects on the animals themselves (the "jeopardy" standard). For example, commercial fisheries for prey species such as Pacific herring (*Clupea pallasii)* directly remove the essential feature, prey, from the critical habitat. Reducing the availability of prey for the whales would factor into an analysis of the potential for jeopardy to the whales even absent the critical habitat designations. Once critical habitat is designated, however, demonstrating the potential for the fishery to adversely modify critical habitat may be more straightforward than demonstrating the potential for jeopardy. Although the link to adverse modification may be more readily drawn, the outcome of the section 7 consultation—the recommended conservation efforts and associated costs—for the fishery would most likely be the same regardless of the presence of critical habitat.

97. Given presently available information, NMFS anticipates that it is unlikely that the critical habitat designations will generate additional or different recommendations for conservation efforts for the humpback whale and its habitat. However, NMFS will review each individual project or activity at the time of consultation to determine, on the basis of the best scientific and commercial data available at that time, whether additional conservation is needed to avoid destruction or adverse modification of critical habitat.

EXHIBIT 2-2. SUMMARY FINDINGS BY ACTIVITY

ACTIVITY	SUMMARY FINDING
Commercial Fishing	It is unlikely that the critical habitat will result in additional conservation efforts as part of future section 7 consultations on commercial fisheries other than the coastal pelagic species (CPS) fishery due to baseline protections. The CPS fishery directly targets fish species that are a primary source of prey for humpback whales and the essential feature of the critical habitat designations. Several baseline protections exist that reduce the likelihood that the critical habitat designations would trigger additional conservation efforts for this fishery. For example, the Federal fisheries management plan (FMP) for the CPS fishery prohibits commercial harvest of krill, which benefits humpback whale critical habitat. However, the fishery has not previously been subject to consultations that have considered the impacts of removal of prey species on humpback whales. Future consultations on the CPS fisheries will require consideration of the fish as prey for humpback whales and as an essential feature of their critical habitat. However, critical habitat is not expected to affect conservation efforts recommended as part of these consultations given the importance of prey availability when evaluating the potential for jeopardy to the whales. NMFS has not identified conservation efforts that would be made specifically to avoid adverse modification of the humpback whale critical habitat that would not also be relevant to avoiding jeopardy to the species. The State of Alaska expressed concern regarding the potential for the critical habitat designations to result in time and area closures or other impacts to fisheries occurring within critical habitat. However, NMFS does not anticipate critical habitat for the whales would result in time or area closures, or other conservation efforts affecting the management of fisheries in Alaska.
Oil and Gas Activities	NMFS has not identified a conservation effort that would be made specifically to avoid adverse modification of the humpback whale critical habitat associated with seismic surveys for oil and gas exploration and development. Although seismic survey activities have the potential to affect humpback whale critical habitat, the specific thresholds at which prey would be adversely affected by the surveys is currently unknown; it is therefore significantly uncertain what specific conservation efforts would be requested, and whether they would differ in any way from those that would be made to avoid jeopardy to the species. For other oil and gas activities, it is unlikely that consideration of the humpback whale critical habitat will generate additional conservation efforts due to existing mitigation measures already required as part of BOEM leases and permits. Future activity levels and associated consultations are uncertain; we assume currently ongoing activities will continue, but do not predict expansion of new activity. Listed species protections, including for humpback whales, are included in oil spill contingency plans.
Alternative Energy	NMFS has not identified a conservation effort it would make specifically to avoid adverse modification of critical habitat. The extent to which changes in the nature of alternative energy projects over time may affect humpback whale critical habitat is unknown. This analysis forecasts future consultations on alternative energy projects based on the best available information. However, as an emerging and evolving activity, future activity levels and associated consultations are uncertain, and potential effects on prey species cannot be predicted. Attempting to forecast those changes in the industry, the potential conservation efforts, and the associated costs would be speculative.
In-Water Construction	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback whales and best practices already in place for minimizing impacts to the whales and water quality surrounding the work area.

ACTIVITY	SUMMARY FINDING
	The State of Alaska expressed concern that project delays and additional administrative costs associated with the critical habitat designations could be particularly burdensome for small, isolated communities that depend upon port infrastructure for commerce.
Vessel Traffic	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback whales.
Aquaculture and Hatcheries	It is unlikely that section 7 consultations will generate additional conservation efforts because the nature of ongoing and anticipated activity within or adjacent to the critical habitat area is unlikely to affect critical habitat. In California, Oregon, and Washington, shellfish aquaculture activity in bays and estuaries is unlikely to affect the humpback whale critical habitat. Finfish aquaculture is an emerging activity in the offshore environment, and future activity levels and associated consultations are uncertain. In Alaska, shellfish farming, seaweed farming, and hatchery production of shellfish seed are expanding industries and activity is anticipated to increase in coming years.
Scientific Research	NMFS has not identified a conservation effort that would be made specifically to avoid adverse modification of the humpback whale critical habitat associated with seismic research surveys. Although seismic survey activities have the potential to affect humpback whale critical habitat, the specific thresholds at which prey would be adversely affected by the surveys is currently unknown; it is therefore significantly uncertain what specific conservation efforts would be requested, and whether they would differ in any way from those that would be made to avoid jeopardy to the species. For other types of scientific research, it is unlikely that section 7 consultations will result in additional conservation efforts as federally authorized research activities include measures to avoid and minimize impacts on marine mammals, listed species, and designated critical habitats. Administrative costs for consultations on ESA section 10 research permits are also expected to be de minimis as these activities are generally managed to avoid affecting listed species and critical habitats.
Water Quality Management and Inland Activities	It is unlikely that critical habitat will trigger additional conservation efforts related to water quality management and inland activities. Aquatic and marine species are protected under existing state water quality standards. Activities with the potential to affect water quality are managed to protect water quality under the CWA, and generally are sufficiently protective of the prey species occurring in these areas.
Military Activities	Many of the activities conducted by DOD are unlikely to affect the critical habitat. For other DOD activities (e.g., use of explosives), it is unlikely that section 7 consultations on those activities and areas will result in additional conservation efforts due to baseline protections associated with the ESA-listing status of the humpback whales. DOD plans for training and testing activities include numerous measures to protect humpback whales.
LNG Facilities	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections associated with BMPs associated with Corps permitting of the construction and operation of facilities designed to protect water quality, as well as the ESA-listing status of the humpback whales.
Space Vehicle and Missile Launches	It is unlikely that section 7 consultations will result in additional conservation efforts due to baseline protections and limited potential for the activity to affect critical habitat. Potential impacts from this activity are generally associated with accidents and unsuccessful launches and are considered extremely unlikely to occur, or to affect the critical habitat if they do occur. Further, many potentially affected areas are afforded protections as Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs) for commercially important fish species and krill.

ACTIVITY	SUMMARY FINDING
USFS Activities	It is unlikely that section 7 consultations will result in additional conservation efforts for these activities, as the activities occurring within the critical habitat (e.g., transportation of timber by ship) are unlikely to affect critical habitat.
Restoration Activities	Restoration activities are unlikely to affect the humpback whale critical habitat. Administrative costs are expected to be de minimis as these activities are generally managed to avoid affecting listed species and critical habitats.

99. During the public comment period, multiple comments addressed potential economic impacts of the rule and provided information for this final economic analysis. This information is integrated, as relevant and appropriate, throughout this analysis for NMFS' consideration, and a summary of comments and responses is provided in the preamble to the Final Rule. In particular, the State of Alaska and several municipalities, industry organizations, and citizens expressed substantial concern regarding the potential economic impacts of critical habitat in Alaska. Given the comments from the State of Alaska, the text box that follows summarizes the key concerns from the state that were focused on the economic impacts of the rule.

POTENTIAL IMPACTS TO THE STATE OF ALASKA

SUMMARY

NMFS does not presently anticipate that modifications of ongoing activities within or affecting humpback whale critical habitat are likely to result from critical habitat designation given the substantial protections already in place. However, the potential for the rule to affect the state resource management agencies, communities, and industry is a major source of concern to the State of Alaska. The State provided comments describing that the critical habitat designation would result in adverse economic impacts and would impose disproportionate regulatory burden and economic costs on Alaskans. State agencies commented that economic impacts of the rule would be borne by small, costal, rural communities that are dependent upon marine resources and working waterfronts.

KEY CONCERNS

Activity-specific concerns outlined by the State include the following:

- **Impacts to aquaculture** – The State identified that the DEA did not consider shellfish aquaculture activities in Alaska, which are expected to grow substantially in the future.
- **Impacts to water quality management** – The State described that the future rate of activity related to consultation on NPDES General Permits is anticipated to be higher than assumed in the draft economic analysis.
- **Impacts to fisheries** – The State expressed concern that designation of critical habitat could result in closure of certain areas to fishing, or closure of fisheries for humpback whale prey species.
- **Project delays and in-water development limitations** – The State believes designation of critical habitat could result in delay and increased costs for in-water construction activities including for critical port infrastructure supporting transportation and the fishing industry. The City of Sitka noted that designation might result in delays and additional costs related to FERC dam relicensing.
- **Costs to state agencies** – Although not a party to most section 7 consultations, the State is concerned that agencies will incur additional costs related to their regulatory authority for activities such as aquaculture permitting and water quality management.
- **Burdens on small communities –** The State is concerned that any costs that do result from the rule will be disproportionately incurred by Alaskans, and that the small, rural communities that characterize much of the state cannot afford to absorb them, and that impacts to the fishing industry, in particular, will be detrimental to the economies of these communities.

As described within the activity-specific sections that follow, based on follow up communication with State of Alaska agencies and with NMFS, this economic analysis has been modified in response to the comments from the State agencies. Specifically, the analysis now reflects an increased rate of consultation and quantifies associated costs for both aquaculture and water quality management activities. This revised economic analysis describes qualitatively the potential for project delays for in-water construction activities, as well as that some portion of the administrative costs of consultation may be incurred by state agencies, and identifies these as unquantified potential costs of the rule. Finally, the analysis provides additional information related to the value of fisheries in Alaska and the State's concerns related to this activity. The information on the fisheries values provides NMFS with perspective on the importance of the industry to coastal communities and emphasizes the risk to those communities if limitations are placed on these fisheries. However, NMFS continues to emphasize that the critical habitat designation for humpback whales is not expected to affect the management of these fisheries.

Sources:

1. Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.
2. Personal communication with Gary Mendivil, Alaska Department of Environmental Conservation, Adam Moser and Jill Taylor, Alaska Department of Transportation on March 10, 2020.
3. Personal communication with Moira Ingle and Sabrina Larsen, Alaska Department of Fish and Game on March 4, 2020.
4. Email communication from Sabrina Larsen, Alaska Department of Fish and Game, to Industrial Economics, Inc. on March 26, 2020.
5. Email communication from Gary Mendivil, Alaska Department of Environmental Conservation, on March 20, 2020.

2.3 COMMERCIAL FISHING

100. Commercial fisheries present a relatively unique issue with respect to the critical habitat designations. Many of the projects and activities identified in the previous section that may affect the critical habitat have the potential to affect prey species indirectly through impacts on water quality or due to noise generated by the activity. Certain commercial fishing activities, however, have a much more direct effect on critical habitat in physically removing the essential feature from the habitat. In particular, harvest of humpback whale prey species such as Pacific sardine (*Sardinops sagax)*, northern anchovy (*Engraulis mordax)*, Pacific herring (*Clupea pallasii)*, capelin (*Mallotus villosus)*, and juvenile pollock (*Gadus chalcogrammus*), whether directly as a target species or indirectly as bycatch in other fisheries, is the activity that most directly affects critical habitat by specifically reducing prey abundance.

101. Humpback whales target large, dense schools of prey, and there is likely a biomass threshold below which humpback whales cannot successfully feed or will not actively feed due to trade-offs with the energetic demands of feeding. Consequences of prey depletion as a result of fishing activities are also likely to be exacerbated in years when alternative humpback whale prey species are naturally low in abundance due to climate or environmental factors.[35]

102. NMFS does not anticipate that the designation of critical habitat will result in additional conservation efforts for fisheries. For fisheries that do not target primary humpback whale prey species, the potential effect of those fisheries on critical habitat is minimal, or baseline protections provide adequate protection against adverse modification. For fisheries that do target humpback prey species, conservation efforts are unlikely for the federally managed fisheries because any future conservation efforts would most likely be recommended to avoid jeopardy to the whales, regardless of whether critical habitat is designated. For state fisheries for prey species (e.g., Alaska herring fishery), the critical habitat designations do not trigger section 7 consultation or otherwise affect the state's decisions regarding the management of the fisheries. The incremental costs of the designations on commercial fisheries are thus most likely limited to the administrative costs incurred in the course of section 7 consultation by NMFS, Federal action agencies, and third parties. The sections that follow describe the universe of fisheries potentially affected by the rule, provide the reasoning behind the conclusion that costs impacts will be limited to administrative costs, and identify any significant uncertainties or unquantified potential direct or indirect impacts associated with these conclusions.

2.3.1 ALASKAN FISHERIES

103. Commercial fishing is critically important to the economy of the State of Alaska, and in particular to many small communities along its coast including Kodiak, Sitka, Cordova, Petersburg, and others. The Alaska Seafood Marketing Institute (ASMI) estimates that 58,700 workers are directly employed by Alaska's seafood industry, including 29,400 in

[35] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

commercial fishing, 26,000 in processing, and 3,300 in management, hatcheries, and other sub-industries. Additionally, ASMI estimates that in fiscal year 2018 the Alaska seafood industry paid $73 million in taxes to the state government and $51 million in taxes to local governments.[36]

104. Commercial fishing includes federally managed fisheries that occur in Federal waters from 3 to 200 nautical miles offshore, and state-managed fisheries that occur within state waters and are managed solely by the state. Parallel fisheries (e.g., groundfish) occur across both Federal and state waters, with the component outside of three nautical miles managed by the Federal government, and the component within three nautical miles managed by the state. Although the state component of these fisheries are managed independently by the state, they are functionally an extension of the parallel Federal fishery and regulation of the state fishery generally mirrors that of the Federal fishery.[37]

105. Exhibit 2-3 provides information on the ex-vessel value of fisheries in each of the units considered for the critical habitat designations. This exhibit provides perspective on the value of fishing resources that would be at risk if additional regulation of fishing activity were to result from the critical habitat rule. From 2014 to 2018, estimated annual ex-vessel values across the critical habitat units averaged approximately $1 billion. Unit 2 produced the highest average annual ex-vessel values ($319 million) followed by Unit 10 ($206 million). The two most valuable fisheries, groundfish and salmon, accounted for more than 90 percent of total ex-vessel values across all critical habitat units.

106. Although numerous fisheries in Alaska occur within the areas considered for critical habitat, the potential for the critical habitat designations to result in impacts vary by target species and management authority. Specifically, the most relevant fisheries to the critical habitat rule directly target the species upon which humpback whale prey.[38] Direct impacts to these fisheries could potentially occur where the critical habitat designations result in changes in management of Federal fisheries to avoid adverse modification of the habitat through the section 7 consultation process. Impacts to the state-managed component of parallel fisheries and state-managed fisheries may occur indirectly, where the critical habitat designations compel the state to manage its fisheries differently.

[36] McDowell Group. 2020/ The Economic Value of Alaska's Seafood Industry. January. Available at https://uploads.alaskaseafood.org/2020/01/McDowell-Group_ASMI-Economic-Impacts-Report-JAN-2020.pdf.

[37] Personal communication with Forrest Bowers, ADF&G on April 1, 2020.

[38] Incidental take of these "forage fish" species does occur but is considered limited and there are restrictions in place (e.g., (bycatch limits, limits on sale, processing, trade, etc.) (https://www.afsc.noaa.gov/REFM/Docs/2016/GOAforage.pdf, https://www.afsc.noaa.gov/refm/stocks/plan_team/2017/BSAIforage.pdf).

EXHIBIT 2-3. ESTIMATED AVERAGE ANNUAL EX-VESSEL VALUES BY FISHERY (2014-2018)

CRITICAL HABITAT UNIT	GROUNDFISH	HERRING	SALMON	CRAB	DIVE SPECIES	MISC. INVERTEBRATES	TOTAL
Unit 1	$21,087,705	$0	$90,382,955	$24,602,068	$0	$0	$136,072,727
Unit 2	$303,301,328	$359,803	$237,605	$14,761,585	$0	$0	$318,660,321
Unit 3	$29,747,070	$0	$26,514,035	$0	$0	$0	$56,261,105
Unit 4	$20,249,696	$0	$7,090,349	$0	$0	$0	$27,340,045
Unit 5	$54,350,524	$0	$37,144,760	$1,157,823	$206,216	$0	$92,859,322
Unit 6	$2,378,042	$29,941	$17,660,140	$0	$0	$0	$20,068,122
Unit 7	$12,874,558	$0	$66,445	$0	$0	$0	$12,941,002
Unit 8	$20,630,360	$0	$84,055,744	$49,111	$0	$304,120	$105,039,335
Unit 9	$17,875,095	$0	$12,448,651	$0	$0	$14,032	$30,337,778
Unit 10	$58,214,367	$4,834,770	$115,846,080	$14,713,106	$9,735,777	$2,674,446	$206,018,546
Total	**$540,708,745**	**$5,224,513**	**$391,446,763**	**$55,283,692**	**$9,941,993**	**$2,992,598**	**$1,005,598,304**

Notes:

1. Due to ADF&G's confidentiality policy, ex-vessel value data are masked if there are not at least three permits, vessels, and processors in a given critical habitat unit for a specific fishery and year. As a result, the values presented in this exhibit underestimate the true value of the fisheries.
2. Based on the data provided by ADF&G, the salmon fishery includes an additional $3.5 million in ex-vessel value that occurs outside the critical habitat units in "SE Offshore Troll Areas."

Source: Data provided via email by Sabrina Larsen, Alaska Department of Fish and Game, on March 26, 2020.

2.3.1.1 Alaskan Groundfish

107. Although not considered a main prey species, Atka mackerel has been listed as prey for humpback whales in older studies around the Aleutian Islands and Bering Sea.[39] Juvenile walleye pollock are also reported to be consumed by humpback whales. These species are taken as part of the Federal Bering Sea/Aleutian Islands (BSAI), and Gulf of Alaska (GOA) groundfish fisheries.[40,41] Gear types used in these fisheries include trawl, longline, pot, and jig gear.[42] Based on previous consultation history (from 2007 to present), there have been four consultations on the federally managed Alaska groundfish fisheries. Of these, the 2010 programmatic consultation that addressed both the BSAI and GOA FMPs evaluated impacts on humpback whales and their prey.[43] The analysis indicated that the fishery actions do not target humpback whale prey or take them in substantial amounts. Given that there are no or minimal interactions with humpback whale prey or humpback whales' use of feeding areas, it is unlikely NMFS will make conservation efforts specifically to avoid adverse modification of humpback whale critical habitat.[44] As such, this analysis finds that the only direct incremental costs of the critical habitat designations relative to the Federal Alaskan groundfish fisheries will be administrative costs associated with participation in section 7 consultation.[45]

2.3.1.2 Pacific Halibut

108. Pacific halibut are targeted in commercial (primarily using longlines) and recreational fisheries in Alaska and, as federally managed fisheries, are subject to section 7 consultation. The fishery does not target or frequently bycatch humpback whale prey species. However, past consultations on similar fisheries (i.e., the West Coast Pacific halibut fishery) have considered the potential for impacts to humpback whales. Although the recent (2007 to present) consultation history does not identify consultations on the halibut fishery in Alaska, it is possible that future consultations will consider effects on humpback whales and their critical habitat, resulting in incremental administrative costs. Recent consultations on the fishery for Pacific halibut along the West Coast indicate they

[39] Nemoto 1957, Nemoto 1959 as cited in NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

[40] North Pacific Fishery Management Council. 2017. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. October.

[41] North Pacific Fishery Management Council. 2017. Fishery Management Plan for Groundfish of the Gulf of Alaska. October.

[42] North Pacific Fishery Management Council. 2019. Bering Sea/Aleutian Islands and Gulf of Alaska Groundfish. Viewed on May 20, 2019, https://www.npfmc.org/bering-seaaleutian-islands-groundfish/.

[43] National Marine Fisheries Service. 2010. Endangered Species Act – Section 7 Consultation Biological Opinion: Authorization of groundfish fisheries under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area, Authorization of groundfish fisheries under the Fishery Management Plan for Groundfish of the Gulf of Alaska, and State of Alaska parallel groundfish fisheries.

[44] Personal communication with NMFS staff, August 23, 2018.

[45] The potential for a critical habitat designation to result in indirect costs to state-managed fisheries is discussed in Chapter 3.

are unlikely to adversely affect humpback whales.[46] Further, given the gear type employed and fact that the fishery does not target humpback whale prey species, the operation of the fishery does not pose a threat to humpback whale prey.[47] As such, it is unlikely that additional conservation efforts will be recommended, and costs will be limited to the administrative costs of future consultations.

2.3.1.3 Other Considerations

109. While NMFS finds it unlikely that the critical habitat designations for humpback whales will result in additional conservation measures for fisheries, concern exists on the part of the State of Alaska as well as other stakeholders that adverse effects may occur, in the case that new information results in NMFS identifying needed changes in management of fisheries in the future to avoid adverse modification of critical habitat. If this occurs, comments noted that changes to Federal fisheries could also affect the management of co-occurring state fisheries. Comments from a number of commercial fishing organizations, the seafood industry, and coastal communities, including Craig, Sitka, Petersburg, the Aleutians East Borough, Kodiak, indicated their belief that substantial costs to fishing could result from the designations in ways that were not evaluated in the draft economic analysis. Many were particularly concerned about how these costs would affect the small, isolated communities that are economically dependent upon commercial fishing.

110. Following the public comment period, follow-up with representatives from the state sought to better understand the state's concerns, particularly regarding how critical habitat could affect the herring fishery absent a Federal nexus that would require consultation with NMFS, and including a request for examples of whether and how similar outcomes resulted from previous critical habitat designations in Alaska. In a series of phone calls and email communications during March and April 2020, the state described how the designations theoretically could affect state fisheries and provided examples demonstrating these outcomes.

- **Species/Area Closures.** The state described that the critical habitat designations might result in time and area closures to fishing, or closure of fisheries for humpback whale prey species, including herring, because prey is listed as an essential feature of humpback whale critical habitat. ADF&G described a 2011 example of NMFS proposing to close Federal fisheries for atka mackerel and Pacific cod due to a jeopardy and adverse modification finding for Steller sea lions that was attributed to prey limitations. Although that particular closure ultimately did not occur, the state believes that it demonstrates that there is precedent for consideration of this type of closure as a result of critical habitat designation.[48] Additionally, ADF&G cited recent (2020) fisheries closures for

[46] National Marine Fisheries Service. 2017. National Marine Fisheries Service Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat (EFH) Consultation: Consultation on the implementation of the area 2A (U.S. West Coast) halibut catch sharing plan for 2017. May.

[47] Personal communication with NMFS staff, May 7, 2019.

[48] Personal communication with Moira Ingle and Sabrina Larsen, Alaska Department of Fish and Game on March 4, 2020.

Pacific cod, a Steller sea lion prey species, in the Gulf of Alaska and Bering Sea/Aleutian Islands as examples of fisheries closures associated with the prey of an ESA-listed species.[49]

According to public comments from the State of Alaska and fishing industry groups including Cordova Fishermen's District United and Southeast Alaska Fishermen's Alliance, management changes would impose substantial costs to the fishing industry (e.g., through changes to gear or inability to fish in certain areas at certain times). The state also commented that the broad geographic range of the proposed designations was particularly concerning as it leaves open the possibility of a broad area closure, which would make it difficult for the fishing industry to predict or plan for where a future closure might occur.

- **Uncertainty.** ADF&G described that critical habitat adds an element of uncertainty to the future of the fishing industry, even if NMFS does not presently anticipate any additional restrictions on fishing. ADF&G speculated that such uncertainty could cause fishermen to sell permits and leave fisheries that overlap with the critical habitat area. If individuals do sell permits, an economic impact would be incurred if the permits lost value as a result. While this was expressed as a theoretical risk of the designations, the state was not aware of any examples in which permits lost value following critical habitat designation.[50]
- **Impacts to Communities and Processors.** In addition to concern about the impact of closures on the commercial fishing industry, multiple commenters also expressed concern that fisheries closures would adversely affect Alaska's seafood processing industry and fishery dependent communities. The Aleutians East Borough, which is within or adjacent to Units 2 and 3, commented that its constituents are dependent on fishery tax revenue and that any restriction on fishing as a result of the critical habitat designations could strain the local government and economy. [51] Comments from the Petersburg Vessel Owners Association and residents of Petersburg (Unit 10) similarly identified the economic dependence of their community on fisheries.
- **Potential for Lawsuits.** Comments from Southeast Alaska Guides Organization (SEAGO) and the Petersburg Vessel Owners Association indicated a concern that although NMFS does not currently anticipate changes to fisheries management, activities in critical habitat will be subject to greater scrutiny from advocacy groups, potentially leading to lawsuits focused on imposition of additional regulatory measures. As an example, SEAGO cited recent legal notice from the

[49] Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.

[50] Email communication from Sabrina Larson, ADF&G to Industrial Economics, Inc. on March 26, 2020.

[51] Osterback, Alvin D., Mayor, Aleutians East Borough. Resolution 20-32, "A Resolution of the Aleutians East Borough Urging NMFS to Carefully Consider Impacts to Borough Fishermen and Communities when Designating Humpback Whale Critical Habitat.

Wild Fish Conservancy that they will sue NMFS if actions are not taken to stop recreational and commercial fisheries from intercepting Chinook stock that serve as prey for Southern Resident Killer Whales.

111. Based upon the information provided, the analysis considered the potential for the critical habitat designations to result in the types of costs identified by the state.

- **Species/Area Closures.** This analysis provides information for NMFS' consideration on the reasons that the State of Alaska anticipates potential adverse effect of the critical habitat rule on fisheries and acknowledges that communities in Alaska are economically dependent on fisheries and would therefore be vulnerable to changes in their management. However, we did not identify that such impacts would be likely to result from the proposed rule for the following reasons.

  Federally managed fisheries: As previously described, NMFS does not expect to request additional conservation efforts, such as fisheries closures, in Federal fisheries as a result of the designations. Given the volume of comments on this topic, however, we interviewed ADF&G to provide additional information to NMFS on the state's perspective on the potential effects of the critical habitat rule on fisheries. The state described the 2011 example of NMFS proposing to close Federal fisheries for atka mackerel and Pacific cod due to prey concern for Steller sea lions as an indicator that NMFS does consider potential fisheries closures for the benefit of listed species. However, while NMFS proposed this closure, it ultimately did not occur. Interviews with NMFS and State of Alaska agencies did not identify any precedent for critical habitat rules to be the cause of a fishery closure.

  State-managed fisheries: To evaluate the potential for the Federal critical habitat designations to affect state-managed fisheries, we separately consider "state-only" fisheries that are managed independently by the state without necessary consideration of Federal fisheries actions, and "parallel" fisheries which have both a state-managed and federally managed component. For "state-only" fisheries, decisions regarding management are at the discretion of the state, and we have not identified an example of a Federal critical habitat designation resulting in management changes in a "state-only" fishery. The herring fishery is managed as a "state-only" fishery, and ADF&G did not express intent to change management of state fisheries as a result of the

humpback whale critical habitat designations.[52,53] Although there is precedent in the 2020 Pacific cod example for the state to mirror management decisions made in the Federal component of the fishery, there are no parallel fisheries for humpback whale prey species. As a result, parallel fisheries are not expected to be affected by the critical habitat designations.[54]

- **Uncertainty.** We are not aware, based on our research and follow-up with ADF&G of any examples of the devaluation of fishing permits occurring as a result of critical habitat designations. Absent this precedent, it would be speculative to quantify this type of impact as a result of this rule.
- **Impacts to Communities and Processors.** Any additional regulation of fisheries as a result of the critical habitat designations would be likely to result in costs to local communities and downstream components of the fishing industry. However, as this analysis does not find changes in the management of fisheries are likely to result from this critical habitat rule, this analysis does not anticipate impacts to seafood processing industries or tax revenues.
- **Potential for Lawsuits.** Historical precedent does exist for third-party lawsuits to affect how the ESA has been implemented for other species. However, lawsuits related to the ESA occur even absent a critical habitat designation, and it is unclear how the specific example identified by SEAGO is related to critical habitat. While it is possible that critical habitat designation may be used as a factor in a lawsuit, determining the outcomes of such lawsuits, and their potential to change NMFS' perspective on the effects of the rule on fisheries management, would be speculative.

2.3.2 WEST COAST FISHERIES[55]

112. Commercial fishing is an important economic activity in California, Oregon, and Washington, with the region accounting for 13 percent of the country's total landings by

[52] Subsistence harvest for humpback whale prey species (e.g., herring and capelin) occurs within some Federal public waters of Alaska and is regulated through the Federal Subsistence Management Program. According to information from the Office of Subsistence Management at U.S. Fish and Wildlife Service (USFWS) and the Alaska Region of the Forest Service, overall participation and subsistence harvest of humpback whale prey species is low, and subsistence harvest for humpback whale prey species is extremely limited across all areas covered in this program, especially relative to harvest in the state managed fisheries. Given the nature of these activities and the extremely limited harvest, NMFS does not anticipate that any additional management measures would be required for these activities as a result of the critical habitat designations.

[53] ADF&G also expressed concern that herring could be federally listed under the ESA in the future, which could cause NMFS to close the fishery. However, NMFS notes that the herring is not currently a candidate for listing.

[54] The case of the Pacific cod closure raised by the State of Alaska involves both "state-only" and "parallel" fisheries. Consistent with the description of how Federal actions may affect state-managed fisheries, the state's action in response to the Federal fishery closure was limited to closing the state-managed portion of the parallel fishery, while the "state-only" Pacific cod fishery remained open (Personal communication with Forrest Bowers, ADF&G on April 1, 2020).

[55] Although the State of Alaska is part of the west coast of the U.S., fishery management at the Federal level is organized into an Alaska Region, responsible for fisheries in Alaska, and a West Coast Region, responsible for fisheries in Washington, Oregon, and California. As such, the fisheries occurring in these locations are commonly referred to and documented as

value. Commercial fishing is of particular importance to many coastal communities in which it serves as a key economic driver, such as Astoria, Newport, and Coos Bay, OR, Westport, WA and Crescent City, CA. Commercial landings in these three states totaled over $700 million in 2018.[56]

113. Off the West Coast, the humpback whale diet includes Pacific sardine and northern anchovy, which are targeted in Federal commercial fisheries and are managed under the Pacific Fishery Management Council's (PFMC) Coastal Pelagic Species Fishery Management Plan (CPS FMP).[57] Additionally, the west coast groundfish fishery does, to some extent, capture humpback whale prey species.[58] Other humpback prey species are targeted in state-managed fisheries. Herring are commercially harvested through state-managed fisheries, including in San Francisco Bay, California[59], in Yaquina Bay, Oregon, off the Oregon coast[60], and in Puget Sound, Washington.[61] Additionally, fisheries for Pacific halibut and HMS have been identified as potentially affecting humpback whales themselves, but do not target or frequently bycatch humpback whale prey species and are not considered a likely threat to humpback whale critical habitat.[62,63]

2.3.2.1 Coastal Pelagic Species

114. The CPS fishery directly targets several species that are key humpback whale prey species, specifically Pacific sardine and northern anchovy, and thus is the Federal fishery most likely to affect humpback whale critical habitat. This creates the potential for direct competition between humpback whales and certain fisheries.[64] The fishery occurs

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either "Alaskan" or "West Coast," respectively. We retain this lexicon for the purpose of the discussion of commercial fisheries to reduce confusion.

[56] National Marine Fisheries Service. 2020. Fisheries of the United States: 2018. Available at https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2018-report.

[57] Pacific Fishery Management Council. 2018. Coastal Pelagic Species Fishery Management Plan as Amended through Amendment 16. February.

[58] The Federal salmon fishery does occur within the critical habitat area. However, this fishery is not currently identified as presenting a threat to humpback whales, or to the critical habitat essential feature because they do not target or frequently bycatch humpback whale prey species. Previous consultations on the Pacific Coast Salmon FMP have not identified any impacts on humpback whales (pers. comm. with NMFS staff, March 22, 2019).

[59] California Department of Fish and Wildlife. 2018. State-Managed California Commercial Pacific Herring Fishery. Accessed on September 21, 2018, https://www.wildlife.ca.gov/Fishing/Commercial/Herring.

[60] Oregon Department of Fish and Wildlife. 2018. Landing Statistics: 2017. Accessed on September 21, 2018, https://www.dfw.state.or.us/fish/commercial/landing_stats/2017/index.asp.

[61] Washington Department of Fish and Wildlife. 2011. Pacific Herring Information Summary. Accessed September 21, 2018, https://wdfw.wa.gov/conservation/fisheries/PacificHerringInformation_121911.pdf.

[62] National Marine Fisheries Service. 2017. National Marine Fisheries Service Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat (EFH) Consultation: Consultation on the implementation of the area 2A (U.S. West Coast) halibut catch sharing plan for 2017. May.

[63] National Marine Fisheries Service. 2013. Biological Opinion on the continued management of the drift gillnet fishery under the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species. May 2.

[64] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

throughout the waters off Washington, Oregon, and California using a variety of gear types including purse seines, drum seines, lampara nets, and dip nets.[65] In 2016, the total ex-vessel value of the fishery exceeded $43 million, driven largely by the landings of market squid.[66]

115. Management of the CPS fishery and other actions taken by the PFMC and other agencies provide some protection to the humpback whale critical habitat prey, including the following:

- Amendment 12 to the CPS FMP prohibits harvest of all species of krill (primary prey for humpback whales), and the PFMC has adopted EFH for all krill species to ensure availability of this key food resource for many species of marine animals, including humpback whales.[67]
- The CPS FMP recognizes Pacific herring as a critical ecosystem component and requires monitoring of incidental catch of the species closely.[68]
- The PFMC has prohibited development of commercial fisheries for other forage fish that serve as prey for humpbacks, such as sand lance.[69]
- NMFS considers effects of fisheries management on the humpback whales through the MMPA. The MMPA prohibits "harassment" of marine mammals, which is defined to include impacts of activities on marine mammal feeding.[70]
- Marine protected areas and reserves established by Oregon (where fishing for CPS species is prohibited) and California provide benefits to production of many species, including humpback prey species.[71, 72]

116. The essential feature of the critical habitats is its prey and the CPS fishery targets some of these prey species. Thus, the management of this fishery is of particular concern with respect to adverse modification of critical habitat. However, even absent critical habitat

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[65] Pacific Fishery Management Council. 2018. Coastal Pelagic Fishery Management Plan as Amended through Amendment 16. February.

[66] Pacific Fishery Management Council. 2017. Status of the Pacific Coast Coastal Pelagic Species Fishery and Recommended Acceptable Biological Catches: Stock Assessment and Fishery Evaluation 2017. December.

[67] Pacific Fishery Management Council. 2018. Coastal Pelagic Species Fishery Management Plan as Amended through Amendment 16. February.

[68] Pacific Fishery Management Council. 2018. Coastal Pelagic Species Fishery Management Plan as Amended through Amendment 16. February.

[69] Pacific Fishery Management Council. 2016. Amendment 25 to the Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. August.

[70] Specifically, Level B Harassment under the MMPA refers to act that, "have the potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." (16 U.S.C. 1361)

[71] California Department of Fish and Wildlife (CDFW). 2016. California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission on August 24, 2016. Retrieved from www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan.

[72] ODFW. Oregon Marine Reserves. Viewed January 10, 2019, http://oregonmarinereserves.com/.

designation, NMFS considers the importance of the prey to the conservation of the whales under both the ESA and MMPA.

117. The fishery has not to date been subject to section 7 consultations that have considered potential effects of the fishery on humpback whales.[73] Currently, there is a lack of data regarding sufficient levels of prey abundance for the whales. This data limitation has limited NMFS' ability to make recommendations regarding the management of the fishery even absent critical habitat. To the extent that future data gathering and analysis efforts provide more information on sufficient levels of prey abundance, NMFS will consider this information in the context of potential jeopardy to the species, as well as potential for adverse modification. NMFS has not identified that the conservation efforts it may recommend would be different to avoid adverse modification than to avoid jeopardy.

118. In summary, while this analysis recognizes uncertainty related to the outcome of future consultations on the CPS fishery, it is most likely that the incremental costs of the critical habitat designations would be limited to the administrative costs to consider adverse modification.

2.3.2.2 Groundfish

119. The Federal west coast groundfish fishery occurs throughout the waters of coastal Washington, Oregon, and California, and targets over 90 individual species of rockfish, flatfishes, groundfishes, and sharks and skates.[74] The majority of groundfish are harvested with bottom trawl gear, though troll, longline, hook and line, pots, gillnets, and other gear types are also employed.[75] Although the juveniles of certain target groundfish species have been identified in diet studies as contributing to humpback whale diets, the adult life-stages of these species directly targeted in the fishery are not known prey for humpback whales.[76]

120. A 2012 Biological Opinion on the Pacific Coast Groundfish Fishery found that operation of the fishery had the potential to adversely affect humpback whales. The majority of potential effects described focused on impacts to the whales themselves through entanglement, ship strikes, and acoustic disturbance. The analysis, however, further considered the impacts of the fishery on prey availability, and concluded that the amendment of the CPS FMP to prohibit harvest of krill effectively limits the potential for competition between humpback whales and commercial fisheries, and that removal of

[73] The northern anchovy stock has also not been subject to a formal stock assessment for the central population since 1995 (National Marine Fisheries Service. 2018. Species Directory: Northern Anchovy. Accessed September 24, 2018, https://www.fisheries.noaa.gov/species/northern-anchovy.).

[74] Pacific Fishery Management Council. 2016. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. August.

[75] Pacific Fishery Management Council. 2019. Groundfish: Background. Viewed May 20, 2019, https://www.pcouncil.org/groundfish/background/.

[76] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

groundfish species that feed on krill may in fact positively affect the abundance of the krill upon which humpbacks feed.[77]

121. Altogether, the extent of direct competition for prey between humpback whales and the groundfish fishery is limited, and the prohibition on harvest of krill offsets the removal of humpback prey species in commercial fisheries. As such, critical habitat is unlikely to trigger additional conservation efforts as part of section 7 consultations on this fishery, and incremental costs will be limited to the administrative costs of consultation.

2.3.2.3 Pacific Halibut

122. Pacific halibut are targeted along the coasts of California, Washington, and Oregon in both commercial and recreational fisheries, with longline gear being the primary gear for commercial harvest.[78] The fishery does not target or frequently bycatch humpback whale prey species, and thus is not identified as a threat to humpback whale critical habitat. However, it has been the subject of past consultations relative to humpback whales. Although the longline gear used to harvest halibut commercially is identified as a potential entanglement threat to humpback whales, the most recent Biological Opinion for this fishery found that the operation of the fishery was not likely to adversely affect humpback whales.[79] Because this fishery does not target or otherwise pose a threat to humpback whale prey species, it is unlikely that NMFS would identify actions needed to avoid adverse modification of the humpback whale critical habitat. Nonetheless, future consultations for this fishery will require a critical habitat analysis once it is designated. As such, incremental costs will be limited to the administrative costs associated with future section 7 consultations.

2.3.2.4 Highly Migratory Species

123. The HMS fishery targets a variety of widely distributed species including tunas, sharks, billfish and swordfish, and other species such as dorado, using a diverse array of gear including troll, gillnet, longlines, and purse seines.[80] These fisheries are not identified as a threat to humpback whale prey species; however, the fisheries have been subject to previous section 7 consultation as a result of concerns related to entanglement in fishing gear.[81] Future section 7 consultations on this fishery following the critical habitat

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[77] National Marine Fisheries Service. 2012. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Section 7(a)(2) "Not Likely to Adversely Affect" Determination Operation of the Pacific Coast Groundfish Fishery in 2012

[78] Pacific Fishery Management Council. 2019. Pacific Halibut: Background and Management. Viewed on May 21, 2019, https://www.pcouncil.org/pacific-halibut/background-information/#halfishgear.

[79] National Marine Fisheries Service. 2017. National Marine Fisheries Service Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat (EFH) Consultation: Consultation on the implementation of the area 2A (U.S. West Coast) halibut catch sharing plan for 2017. May.

[80] Pacific Fishery Management Council. 2019. Highly Migratory Species: Background. Viewed on May 21, 2019, https://www.pcouncil.org/highly-migratory-species/background/.

[81] NMFS. 2013. Biological Opinion on the continued management of the drift gillnet fishery under the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species 2012/03020:DDL

designations will therefore include a critical habitat analysis, resulting in incremental administrative costs.

2.4 OIL AND GAS ACTIVITIES

124. The activities described in the sections that follow include those generally associated with the development and production of oil and gas in the offshore environment. They include activities related to exploration of the seafloor for resources using methods including seismic surveys. They also include construction, operation, and maintenance of platforms and other facilities associated with extraction and transportation of the resources. This also includes activities relating to planning for and responding to emergencies including unexpected releases of oil and gas into the marine environment.

2.4.1 OIL AND GAS EXPLORATION AND DEVELOPMENT

125. The Bureau of Ocean Energy Management (BOEM) is responsible for managing oil and gas resources on the Outer Continental Shelf (OCS) in Federal waters (i.e., that are more than three nautical miles offshore).[82] NMFS has identified oil and gas-related activities as potential threats to humpback whale critical habitat for two main reasons: (1) these activities involve noises that may alter the behavior of prey species or the feeding behavior of humpback whales, and (2) oil spills and leaks may pollute feeding areas, harming prey species.[83]

126. As a condition of leases and permits issued by BOEM, the agency generally requires a variety of mitigation measures to minimize effects to listed species from the activities. For example, mitigation measures identified under Biological Opinion AKR-2016-9580 for a lease sale in Cook Inlet include lease stipulations that outline protective measures to decrease likelihood of impacts to resources such as marine mammals, other biological resources, and habitats; provision of detailed information regarding sensitive species and habitats and how to reduce impacts; measures for operation of vessels and aircraft that minimize possible acoustic and physical disturbance; and designation of "harassment zones" around rigs and other activities.[84,85] Another consultation on oil and gas exploration drilling includes mitigation measures including use of protected species observers during certain activities, identification and use of shut-down and monitoring

[82] Bureau of Ocean Energy Management (BOEM), 2016. 2017-2022 Outer Continental Shelf Oil and Gas Leasing Proposed Program. U.S. Department of the Interior.

[83] Threats related to seismic surveys associated with oil and gas exploration and development are discussed with other types of seismic surveys in Section 2.4.2.

[84] NFMS. 2017. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for Lease Sale 244, Cook Inlet, Alaska 2017-2022. September 13.

[85] BOEM. 2017. Leasing Activities Information: Lease Stipulations: Cook Inlet Planning Area, Oil and Gas Sale 2244 (Cook Inlet Sale 244). Available at https://www.boem.gov/Sale-244-Stipulations/.

zones, minimizing debris in the water, and aircraft operation rules to limit disturbance to marine mammals.[86]

127. The only existing oil and gas production activity on the west coast of the continental United States is within the Southern California Planning area (see Exhibit 2-4). Information collected from BOEM concluded that current activity off the coast of Southern California is likely to continue, but no new activity is currently forecasted to begin (see Exhibit 2-5).[87] Additionally, the current five-year leasing program plan does not include lease sales in the Pacific Region (i.e., off the coasts of Washington, Oregon, or California).[88]

128. Within the Alaska region of BOEM, eight Federal program areas overlap with the potential critical habitat designations for humpback whales (see Exhibit 2-6). The State of Alaska, through its Department of Natural Resources, also manages numerous oil and gas activities within state waters. These activities include leasing of submerged lands within the state waters of Cook Inlet (see Exhibit 2-7). The only ongoing oil and gas exploration and development activities within this area are limited to Cook Inlet (see Exhibit 2-8). Relative to the potential for future new activities, the current National OCS Oil and Gas Leasing Program includes only a potential lease sale in Cook Inlet in 2021, the boundaries of which do overlap with the potential critical habitat area (Exhibit 2-9).[89] Other significant oil and gas-related activity within the areas considered for the critical habitat designations occur at the Port of Valdez, which is the southern terminus of the trans-Alaska pipeline. From this port, supertankers receive and transport 1.5 million gallons of crude oil every day.[90]

129. In January 2018, BOEM published a Draft Proposed Program (DPP) for the 2019-2024 OSC Oil and Gas Leasing Program.[91] If approved, this program would supersede the current 2017-2022 Program and coordination with BOEM would be required to evaluate the potential for impacts to the humpback whale critical habitat, once designated. The DPP proposes 19 lease sales in Alaska, seven of which are within BOEM planning areas that overlap with the potential humpback whale critical habitat,[92] and seven lease sales in

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[86] NMFS. 2016. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for Furie's Offshore Oil and Gas Exploration Drilling in the Kitchen Lights Unit of Cook Inlet, Alaska, 2017-2021

[87] Personal communication with Rick Yarde, BOEM, October 26, 2018.

[88] Bureau of Ocean Energy Management (BOEM). 2016. 2017–2022 Outer Continental Shelf Oil and Gas Leasing Proposed Program. March.

[89] Personal communication with Frances Mann, BOEM, October 31, 2018.

[90] City of Valdez. 2020. Port. Viewed at https://www.valdezak.gov/151/Port, on March 25, 2020.

[91] Bureau of Ocean Energy Management (BOEM). 2018. 2019–2024 National Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program. January.

[92] The DPP proposes the following specific lease sales: one sale in the North Aleutian Basin, which overlaps units 1 and 2; one sale in St. George Basin, which overlaps unit 2; one sale in Shumagin, which overlaps units 2, 3 and 4; one sale in Kodiak, which overlaps units 4, 5, and 7; two sales in Cook Inlet, which overlaps units 4, 5, and 6; and one sale in Gulf of Alaska, which overlaps units 5, 7, 8, 9, and 10 (Exhibit 1-1 and Exhibit 2-5).

the Pacific Region, all of which overlap with the potential humpback whale critical habitat.[93,94]

130. Although this new DPP may be approved, associated changes in regional offshore oil and gas development are highly uncertain. The 2019-2024 Program is still a draft and has yet to undergo environmental and other reviews. In Alaska, industry has not yet expressed interest in any of the new areas being considered for lease sales.[95] In California, activity is unlikely in northern California due to lack of potential for resources, and is unlikely in Central California due to the expansive network of Marine Protected Areas. Any new activity is likely to be relatively far south and is uncertain.[96]

131. Given the uncertainties described, it would be speculative to forecast future new oil and gas development activity in this region over the timeframe of the analysis. As a result, this analysis does not forecast expansion of oil and gas exploration activities and assumes ongoing activities will continue at their current rate and locations. Moreover, NMFS anticipates that the critical habitat designations for the humpback whales would be unlikely to affect conservation efforts associated with future section 7 consultations due to baseline protections already in place in the form of mitigation measures required by BOEM to minimize impacts to biological resources. As a result, incremental costs associated with oil and gas exploration and production as a result of the humpback whale critical habitat will be limited to administrative costs of consultation.

[93] The DPP proposes the following specific lease sales: one sale in Washington/Oregon, overlapping units11, 12, 13, and 14; two sales in Northern California, overlapping units 14 and 15; two sales in Central California, overlapping units 16 and 17; and two sales in Southern California, overlapping units 17, 18, and 19 (Exhibit 1-1 and Exhibit 2-3).

[94] BOEM. Notice of Availability of the 2019–2024 Draft Proposed Outer Continental Shelf Oil and Gas Leasing Program and Notice of Intent To Prepare a Programmatic Environmental Impact Statement, 83 Federal Register 829. January 8, 2018.

[95] Personal communication with Frances Mann, BOEM, October 31, 2018.

[96] Personal communication with Rick Yarde, BOEM, October 26, 2018.

EXHIBIT 2-4. PACIFIC OCS LEASING AREAS

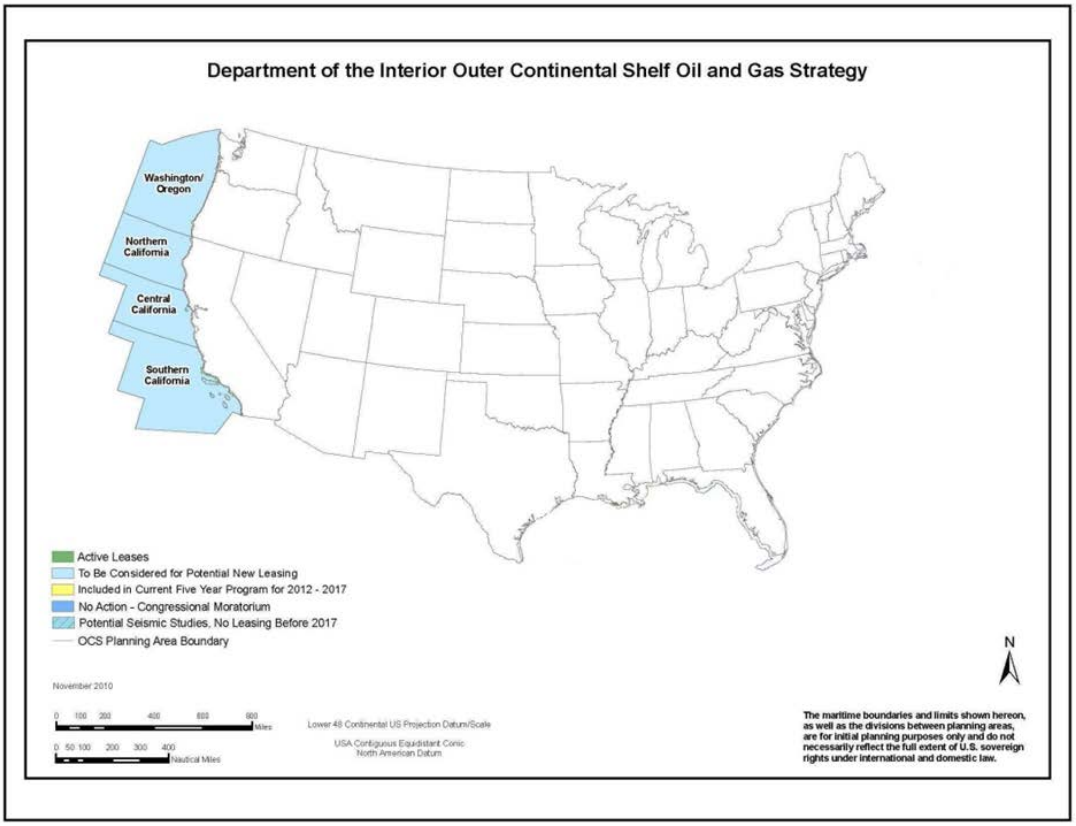


EXHIBIT 2-5. PACIFIC OCS SOUTHERN CALIFORNIA LEASES

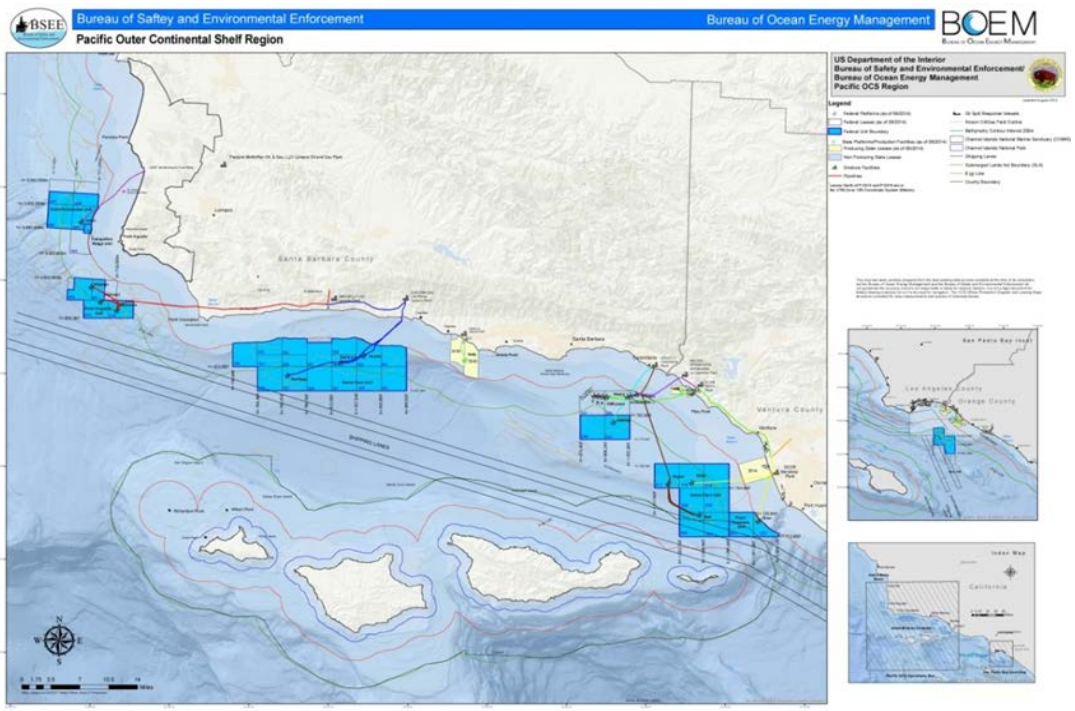


EXHIBIT 2-6. ALASKA OCS BOEM LEASE AREAS

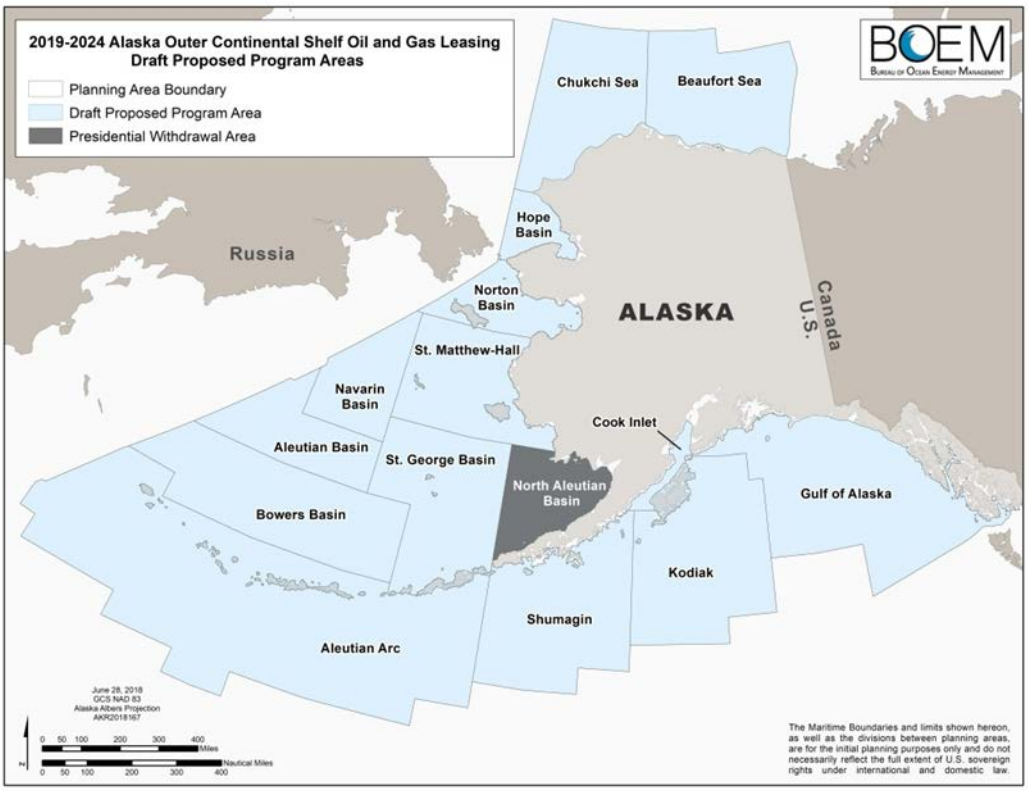


EXHIBIT 2-7. STATE OF ALASKA COOK INLET OIL AND GAS UNITS

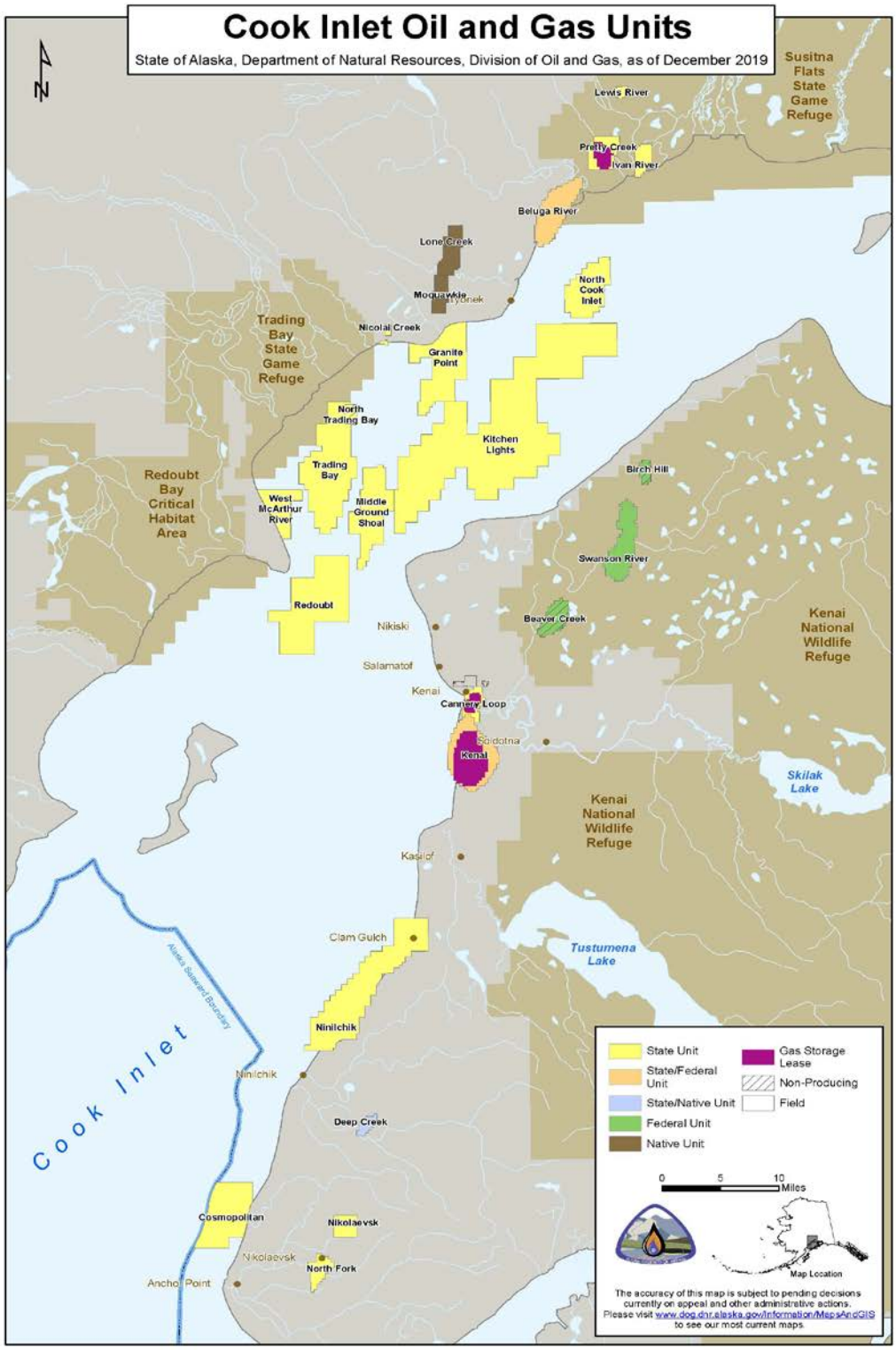


EXHIBIT 2-8. COOK INLET ACTIVE LEASES

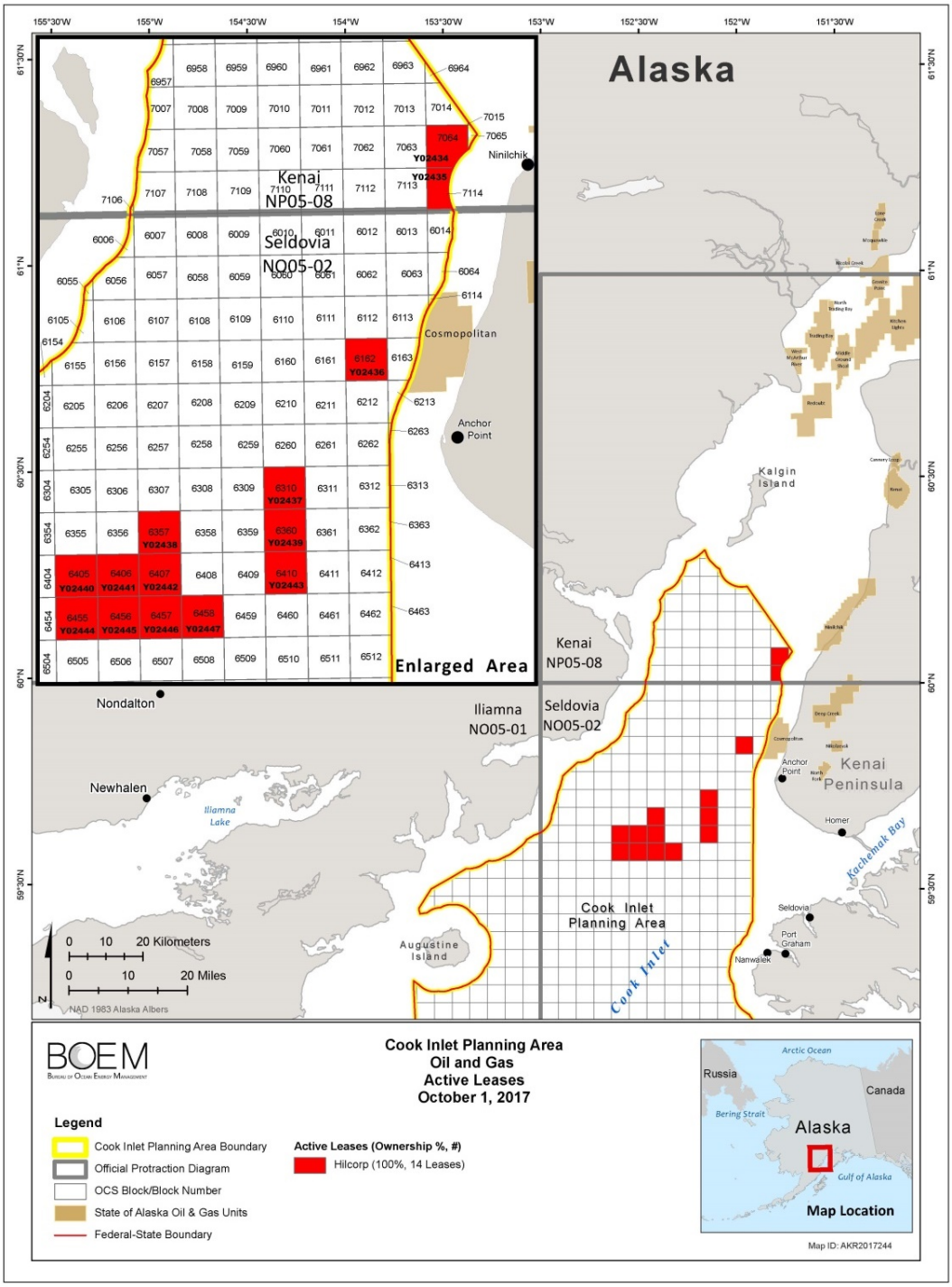
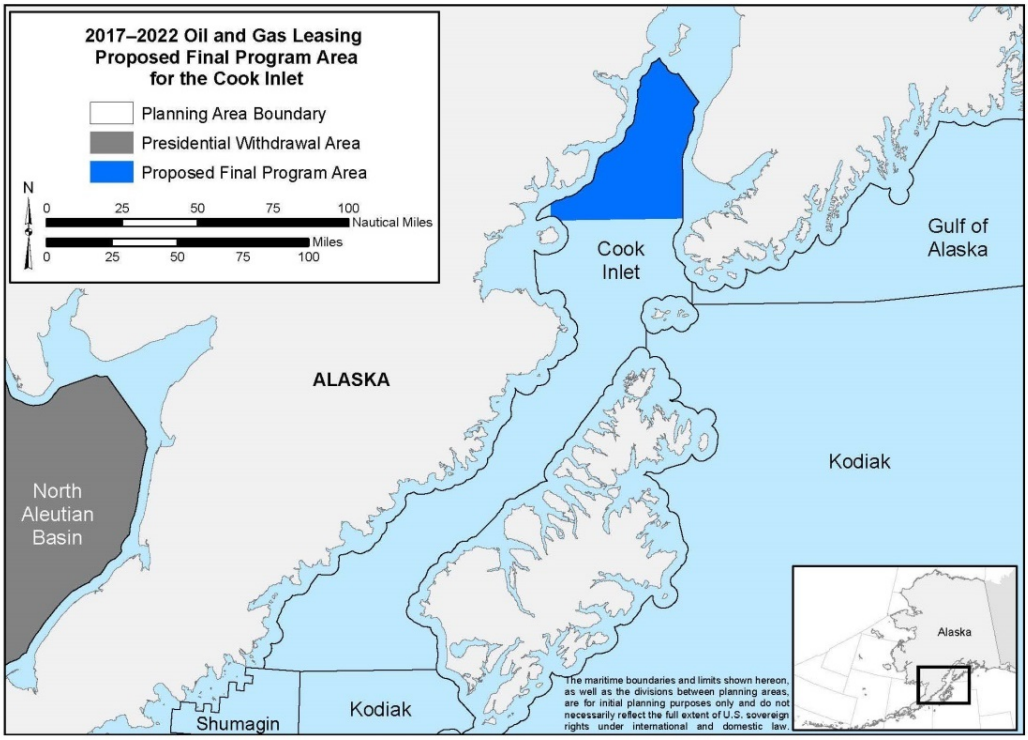


EXHIBIT 2-9. COOK INLET PROPOSED FINAL PROGRAM AREA



2.4.2 OIL AND GAS RELATED EXPLORATORY SEISMIC SURVEYS

132. Seismic surveys are often used in oil and gas exploration. They have the potential to change marine mammal behavior and cause auditory injury. Additionally, there is evidence that suggests the potential for seismic survey activities to result in behavioral effects as well as injury and mortality to fishes and zooplankton, although impacts may be spatially and temporally limited.[97,98] The jeopardy standard and the MMPA provide baseline protection to the whales from seismic survey activities. There are presently not specific protections in place to address the impact of seismic surveys on humpback whale prey species, as the extent to which seismic surveys may negatively affect the abundance of and access to prey for humpback whales has not been established.

133. Although seismic survey activities have the potential to negatively impact humpback whale critical habitat, the specific thresholds at which prey would be affected is unknown, and it is not clear what specific conservation efforts would be requested.[99]

[97] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

[98] Popper A.N. and A.D. Hawkins. 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Journal of Fish Biology. 94(5): 692-713.

[99] Personal communication NMFS staff, March 29, 2019.

Absent information on what conservation efforts might be identified, this analysis quantifies the incremental costs of the critical habitat designations associated with consultations on seismic survey activities as limited to administrative costs.

134. As these types of activities are difficult to project with any certainty, this analysis relies on the consultation history and assumes the past rate of consultation for this activity is reflective of the future rate of consultation, with the addition of one known planned seismic survey scheduled to occur within the next few years.[100] However, if the BOEM 2019-2024 DPP is approved, there may be new seismic surveys related to oil and gas activity within or affecting the whales' critical habitat area in the future. Given the uncertainty surrounding future oil and gas activity, forecasting associated seismic surveys would be speculative.

2.4.3 OIL SPILL PLANNING AND RESPONSE

135. Oils spills and response activities have the potential to affect prey quality and availability due to the oil itself or through the chemicals and activities that are used and undertaken to manage a spill. In coastal zones (i.e., marine waters), the USCG is the designated lead agency for oil spill planning and response, including development of regional contingency plans that outline the procedures to be followed in the event of an oil spill.[101] The regional contingency plans, and more geographically specific area contingency plans, generally include specific procedures designed to help avoid impacts to wildlife due to the spill itself, or response activities. Section 7 consultation related to oil spill response generally occurs relative to contingency planning.

136. Oil spill response in Alaska is regulated by the 1990 Oil Pollution Act (OPA), which requires the USCG and the EPA to develop a statewide oil spill response plan, and by Alaska Statute 46.04, which requires the Alaska Department of Environmental Conservation (ADEC) develop a statewide response plan and individual response plans for ten geographic subareas spanning the State of Alaska.[41,42] Further, Alaska Statute 46.04 requires that the oil industry develop oil discharge prevention and contingency plans. ADEC, EPA – Region 10, and the USCG manage response operations according to the Alaska Regional Contingency Plan (RCP) and four Area Contingency Plans (ACP).[102] The Alaska RCP requires that each ACP contain a Fish and Wildlife Sensitive Environments Plan in consultation with US Fish and Wildlife Service (FWS) and NMFS.

137. The Northwest Area Contingency Plan (NWACP) outlines the procedures that will be employed in the event of an oil spill in Washington, Oregon, or Idaho to minimize impacts to marine mammals.[103] Section 9310.10.2.7 of the NWACP's Northwest Wildlife

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[100] Personal communication with Rick Yarde, BOEM, October 26, 2018.

[101] U.S. Environmental Protection Agency. 2018. Area Contingency Planning. Accessed at https://www.epa.gov/oil-spills-prevention-and-preparedness-regulations/area-contingency-planning, on October 3, 2018.

[102] Alaska Department of Environmental Conservation. 2018. Oil and Hazardous Substance Response Plans. Viewed at http://dec.alaska.gov/spar/ppr/contingency-plans/response-plans, on October 3, 2018.

[103] Region 10 Regional Response Team and the Northwest Area Committee. "NW Area Contingency Plan." Viewed at http://www.rrt10nwac.com/NWACP/Default.aspx on January 11, 2019.

Response Plan provides guidance on specific response activities when large whales, including humpbacks, are moving through the affected area of a spill. Because humpbacks and other large whales are highly mobile, they will generally not stay within the affected area for long. However, detailed observations and monitoring should be conducted during that time. Although deterrence of large whales from the location of a spill is not typically used, it may be done on a case-by-case basis using hazing techniques such as helicopter fly-overs, banging pipes, and underwater firecrackers.[104]

138. The California State Oil Spill Contingency Plan outlines corollary procedures for oil spill response in California.[105] A separate Wildlife Response Plan describes the procedures to be used to meet wildlife protection responsibilities during a spill.[106]

139. Due to the extensive consideration of impacts to wildlife within contingency plans, it is unlikely that the critical habitat for humpback whales will change the outcome of consultations on oil spills or response planning. Incremental costs will be limited to the administrative costs associated with future section 7 consultations.

2.5 ALTERNATIVE ENERGY

140. Offshore alternative energy activities include exploration, siting, and production activities relating to the development of wind and hydrokinetic energy. NMFS has identified offshore alternative energy activities as a potential threat to humpback whale critical habitat because large, permanent structures in the critical habitat may impede humpback whale movement (i.e., access to prey concentrations) and feeding behavior and leaks or use of biocides to control growth of marine organism may pollute the water, harming prey. These projects frequently involve a Federal nexus due to BOEM leasing areas in Federal waters, or through BOEMs involvement in overseeing placement of transmission lines. In addition, the Federal Energy Regulatory Commission (FERC) is involved in licensing non-Federal hydrokinetic (i.e., tidal and wave energy projects).

141. According to BOEM, as of October 2018, there were no permitted renewable wind energy projects in Federal waters off the Pacific coasts of Washington, Oregon or California.[107] In the past, several projects have been considered and proposed in Federal waters off of Oregon, but none have reached the permitting stage that would require section 7 consultation.[108] Interest in development of wind projects in Federal waters offshore of California has primarily focused on Morro Bay, and there is additional

[104] Region 10 Regional Response Team and the Northwest Area Committee. 2017. Northwest Area Contingency Plan: 9310.10.2.4.1.

[105] California Department of Fish and Wildlife. 2017. California State Oil Spill Contingency Plan. April. Accessed at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=137679&inline, on October 3, 2018.

[106] California Department of Fish and Wildlife. 2016. Wildlife Response Plan for Oil Spills in California. March. Accessed at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=16207&inline=true,, on October 3, 2018.

[107] Personal communication with Rick Yarde, BOEM, October 26, 2018.

[108] See, for example, BOEM. WindFloat Pacific – Offshore Wind Pilot Project. Accessed at: https://www.boem.gov/windfloatpacific/ on January 11, 2019.

potential for wind project development in Diablo Canyon (central California) and in Northern California north of the Greater Farallones National Marine Sanctuary. In October 2018, BOEM issued a Call for Information and Nominations from companies interested in developing wind energy projects in these areas.[109] However, the level of interest and potential for expansion of this activity is uncertain. Interest in renewable energy development in the Federal waters offshore of Washington and Oregon has decreased in recent years, and new projects of this type are unlikely to be developed in the next ten years.[110] There are no known potential wind energy activities in Federal waters off Alaska.

142. FERC is responsible for permitting non-Federal hydrokinetic (i.e., wave and tidal) energy projects in both state and Federal waters.[111] In general, interest in the development of hydrokinetic energy projects on the west coast has been limited.[112] No hydrokinetic projects on the west coast have reached the licensing stage that would require section 7 consultation. In California, only CalWave— a U.S. Department of Energy (DOE)-funded project that proposes to construct a test center facility consisting of four grid-connected test "berths" located approximately five miles offshore of Vandenberg Air Force Base for the development of wave energy[113] — has received a preliminary permit from FERC. Because the preliminary permit only reserves the space for the project and does not trigger an environmental review, the project has not formally considered impacts on humpback whales or their habitat. For projects that hypothetically receive licenses in the future, project siting is a principal issue because the site must be close enough to shore to connect to the power grid but far enough from shore to minimally impact protected species. FERC representatives in California indicated that the presence of critical habitat theoretically could be included among the factors that would be considered during project siting.[114] However, since no projects have progressed to the stage of environmental review, it is unclear how or whether the presence of critical habitat would affect project siting. Furthermore, FERC representatives for Oregon, Washington, and Alaska did not suggest that critical habitat has been a limiting factor in siting of projects that have been licensed to date.

143. In Oregon, PacWave (formerly known as Pacific Marine Energy Center – South Energy Test Site[115]) proposes constructing four testing "berths" to demonstrate the viability of wave energy across 33 square miles of ocean approximately five nautical miles offshore

[109] BOEM. California Activities. Accessed at: https://www.boem.gov/california/ on January 10, 2019.

[110] Personal communication with Rick Yarde, BOEM, October 26, 2018.

[111] Information on non-Federal hydrokinetic (i.e., wave and tidal energy) projects licensed by FERC provided by Tim Konnert, FERC on September 24, 2018 and by David Turner, FERC, on April 5, 2017 and September 25, 2018.

[112] Personal communication with Tim Konnert, FERC, September 24, 2018.

[113] CalWave Project Fact Sheet. Accessed at http://www.iatpp.calpoly.edu/pdfs/CalWave%20Factsheet%20v8.pdf on September 26, 2018.

[114] Personal communication with Tim Konnert, FERC, September 24, 2018.

[115] DOE. "Oregon Wave Energy Test Site Rebranded as PacWave". September 14, 2018. Accessed at https://www.energy.gov/eere/water/articles/oregon-wave-energy-test-site-rebranded-pacwave on September 25, 2018.

of Newport, Oregon. The project is led by Oregon State University (OSU) and funded by DOE.[116] In April 2018, OSU submitted a Draft License Application – which includes a preliminary draft Environmental Assessment, a draft Biological Assessment (BA), draft Monitoring Plans, draft Protection, Mitigation, and Enhancement Measures, and an Adaptive Management Framework – to FERC to construct and operate PacWave. The draft BA concluded that the project is not likely to adversely affect any ESA-listed species.[117] In Washington, FERC previously issued two licenses for hydrokinetic projects (Admiralty Inlet and Makah Bay), although neither project was constructed. While there are no currently active hydrokinetic projects in Alaska, the Kvichak River hosts one active preliminary permit for this type of project, though the location is outside of and unlikely to affect the critical habitat area. In the past, several projects have been proposed in Cook Inlet and one has been licensed, but no projects have been constructed.

144. Although section 7 consultations that considered impacts to humpback whales have not been completed for any alternative energy projects in Federal waters, NMFS has developed Biological Opinions for two hydrokinetic projects in Oregon state waters within the critical habitat area. These consultations indicate that many of the threats identified for this activity are already under the jeopardy standard (e.g., physical disturbance due to sound, electromagnetic fields, habitat alteration, chemical contamination, and prey availability).[118,119] Representatives from FERC further noted that impacts to small fish that are the essential feature of humpback whale critical habitat are considered as one of the potential impacts of hydrokinetic projects, and would require monitoring after project construction.[120]

145. NMFS has indicated that as an emerging activity, it would be speculative to attempt to predict whether and what additional humpback whale conservation efforts will be recommended as part of future consultations on alternative energy projects. NMFS is committed to working to assist FERC in meeting responsibilities under section 7(a)(2) of the ESA to avoid destroying or adversely modifying any humpback whale critical habitat when evaluating and permitting alternative energy projects. As the potential effects of these activities on humpback whales and their habitat are not known for this activity type,

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[116] DOE. PacWave. Accessed at https://www.energy.gov/eere/water/pacwave on September 25, 2018.

[117] DOE. "Important Licensing Milestone Reached for Oregon Wave Energy Test Site". April 24, 2018. Accessed at https://www.energy.gov/eere/water/articles/important-licensing-milestone-reached-oregon-wave-energy-test-site on September 25, 2018.

[118] National Marine Fisheries Service. 2012. Endangered Species Act Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Reedsport Ocean Power Technologies (OPT) I 0-PowerBuoy Wave Park, 2.5 miles offshore of Reedsport, Oregon, in the Eastern Pacific Ocean (FERC Docket No. P-12713-002).

[119] National Marine Fisheries Service. 2012. Endangered Species Act Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the for the Department of Energy's Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project Funding and US Army Corps Engineers Nationwide Permit #5 for 20 12-2013 WET-NZ Wave Energy Test Project at the Northwest National Marine Renewable Energy Center Test Site.

[120] Personal communication with David Turner, FERC, September 25, 2018.

this analysis quantifies the administrative cost of considering critical habitat in ongoing and new consultations anticipated over the next ten years.

2.6 IN-WATER CONSTRUCTION

146. The NMFS consultation history indicates that in-water construction and dredging projects occur within the areas considered for designations as critical habitat for humpback whales. These projects could potentially affect the critical habitat areas, for example, through noise-related impacts or degradation of water quality. The majority of in-water construction and dredging projects that may affect the areas considered for potential designations as critical habitat are permitted or conducted by the Corps. The Corps conducts civil works projects (including flood control activities, navigation dredging/channel maintenance, and infrastructure support such as bridge construction and repair) and also provides permits to individuals, businesses, and non-Federal governments under section 404 of the CWA and section 10 of the RHA.[121] There are five Corps districts with jurisdiction over the areas included in or affecting the critical habitat areas: the Alaska District, Seattle District, Portland District, San Francisco District, and Los Angeles District.

2.6.1 PERMITTED ACTIVITIES

147. The Corps permits activities in coastal areas that generally require section 7 consultation with NMFS, including pier and dock construction and replacement, bulkhead maintenance, and buoy and float installations. Section 404 of the CWA requires parties to obtain a permit from the Corps prior to discharging dredge or fill material into "waters of the United States." Construction, dredging, and disposal activities within the areas considered for the designations are likely to require section 404 permitting. The Corps' review of projects for the issuance of section 404 permits requires section 7 consultation with NMFS to the extent that the project may affect listed species or critical habitat. As part of the section 404 permit process, the Corps reviews the potential effects of the proposed action on plant and animal populations and recommends efforts to avoid adverse effects to these populations, as well as to habitats. In general, conservation efforts for plants and animals include:

- Select sites or manage discharges to ensure that habitat remains suitable for indigenous species;
- Avoid sites having unique habitat or other value, including habitat of threatened or endangered species;
- Utilize habitat development and restoration techniques to minimize adverse impacts and compensate for destroyed habitat;
- Time discharge to avoid biologically critical time periods; and

[121] U.S. Army Corps of Engineers. Civil Works. Viewed at: http://www.usace.army.mil/Missions/Civil-Works/ on April 28, 2017.

- Avoid the destruction of remnant natural sites within areas already affected by development.

148. These conservation efforts would be required by the Corps for section 404 permits regardless of the critical habitat designations for the humpback whales. Accordingly, impacts of implementing these conservation efforts provide baseline protection to the humpback whale critical habitat.

149. Specifically within the areas considered for the humpback whale critical habitat designations, the Corps requires that individuals conducting these types of permitted activities implement a variety of BMPs that provide baseline protections to the whales and their habitat (including water quality), even absent the critical habitat designations. For example, the Seattle district requires that individuals conducting pile driving establish a marine mammal buffer area to be monitored before and during pile driving, and that activity be suspended if an ESA-listed marine mammal is seen within 400 feet of a work site. Other general conditions are designed to minimize potential impacts to water quality, such as banning the use of certain chemically treated pilings.[122] Section 7 consultations on these activities under the jeopardy standard have also resulted in conservation efforts that provide baseline protection to humpback whales and their prey from construction and dredging projects. Although NMFS' Biological Opinion for the Standard Local Operating Procedures for Endangered Species implemented by the Portland district does not specifically consider humpback whales, the Biological Opinion does include in-water work windows, dredging BMPs, and pile-driving requirements to use a vibratory hammer where possible, use sound attenuators where an impact hammer is necessary, and limit the number of strikes per day.[123] NMFS' Biological Opinion for the Port of Grays Harbor Maintenance Dredging Terminals in Washington includes BMPs for disposal of dredge material and minimizing turbidity.[124] In 2018, NMFS completed a section 7 consultation on the Cook Inlet Pipeline Cross-Inlet Extension project.[125] The Biological Opinion includes mitigation measures to reduce leaks, ensure PSO monitoring and reporting of marine mammals, and limit humpback whale exposure to project-related noise.

150. Due to the location and nature of activities relative to the whales themselves, the majority of section 7 consultations conducted on Corps permitted activities have found that the

[122] NMFS. 2008. Programmatic Biological Evaluation for 10 Activities in the State of Washington for Species Listed or Proposed by National Marine Fisheries Service and U.S. Fish and Wildlife Service under the Endangered Species Act, viewed at http://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/Endangered-Species/SPIFs/ on April 28, 2017.

[123] NMFS. 2012. Endangered Species Act Section 7 Formal Programmatic Opinion, Letter of Concurrence, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Actions Authorized or Carried Out by the U.S. Army Corps of Engineers in Oregon (SLOPES IV In-water Over-water Structures).

[124] NMFS. 2018. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Port of Grays harbor Maintenance Dredging Terminals 1, 2, and 4 (COE No.: NWS-2017-850).

[125] National Marine Fisheries Service. 2018. Endangered Species Act Section 7(a)(2) Biological Opinion for the Issuance of a U.S. Army Corps of Engineers Permit and Incidental Harassment Authorization for Harvest Alaska LLC Cook Inlet Pipeline Cross-Inlet Extension Project (AKR-2018-9719).

activities are not likely to adversely affect humpback whales and thus do not suggest additional conservations efforts. Despite the lack of specific measures to protect whales, generally implemented BMPs, such as limiting the amount of time dragheads and cutterheads are raised off the bottom and ceasing activity if a sheen or other indication of contamination is identified, provide baseline protection to the species and its habitat by reducing potential impacts on water quality.[126]

151. Altogether, the baseline management of construction activities provides protection to the whales and their critical habitat. As a result, NMFS does not anticipate that additional humpback whale conservation efforts will be recommended due to the critical habitat. Thus, the incremental costs of the critical habitat designations relative to these activities are likely to be limited to administrative costs.

152. During public comment, several small communities and ports identified that any constraints and delays to development and maintenance of port facilities introduced by the critical habitat designations could place a significant financial burden on small, rural communities, and the fishing industry in particular. The Petersburg Economic Development Council cited an experience where the addition of MMPA requirements resulted in the permitting time for two waterfront improvement projects being delayed by 6 to 12 months. They further note that the costs of additional regulation are borne by local residents, stakeholders, and municipal governments.[127] The state is substantially dependent upon its port and harbor infrastructure for transportation (e.g., maintaining ferry service between remote locations) and for the economic livelihood of many small communities. Concerns regarding potential for project delays are exacerbated in Alaska, where the construction window is substantially limited by weather conditions.[128] Public comments and additional outreach did not identify other instances of critical habitat designations across the region specifically resulting in a project delay. The extent to which critical habitat would trigger project delays, above and beyond the listing of the species and other, co-occurring environmental considerations, is uncertain. Given this, while the analysis identifies this as a concern of the local communities, quantifying the potential for project delays, and the potential duration and associated costs, would be speculative. As a result of public comment, due to the particular concerns of how project delays could result in incremental costs, and high level of in-water construction activity in Alaska, this analysis considers potential indirect costs associated with project delays as a key uncertainty of the critical habitat designations.

153. The State of Alaska's Department of Transportation (DOT) expressed concern that the designation of critical habitat could result in significant project delays if the designations required re-initiation of completed consultations, particularly if ongoing construction

[126] NMFS. 2010. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Corps Maintenance Dredging Program for the Oregon Coastal Projects.

[127] Board of Directors, Petersburg Economic Development Council. "Humpback Whale Critical Habitat Proposed Rule." Received by NMFS Office of Protected Resources, Endangered Species Division, January 23, 2020.

[128] Personal communication with Adam Moser, Alaska Department of Transportation, on March 10, 2020.

would need to be paused pending completion of consultation.[129] The Alaska DOT cited an example from 2014 wherein the City of Kodiak was required to pause ongoing work on a ferry terminal when the initial consultation finding of "unlikely to adversely affect" Steller sea lions required reconsideration when it was determined that sea lions were consistently present in the project area. The cost of this delay to the state was approximately $4.5 million.[130] In this example, re-initiation of the consultation was driven by the need to avoid jeopardy to the animals, rather than concerns regarding project impacts to their critical habitat. Nonetheless it demonstrates the nature and potential costs of such an outcome. Past experience indicates that re-initiation of consultation for small-scale, individual projects following designation of critical habitat is rare. Based on knowledge of recently completed, in-progress, or anticipated consultations between NMFS and ADOT (where ADOT acts as a non-Federal designee for a Federal action agency), NMFS is not aware of any circumstances that would necessitate reinitiating a completed consultation based solely on the designation of critical habitat for humpback whales.[131]

154. Previous interviews with the Seattle and Portland District offices of the Corps suggested low levels of permitted activity in these areas.[132, 133] Additionally, neither District anticipated a substantial change in the rate of consultations over the next ten years.[134]

2.6.2 CIVIL WORKS ACTIVITIES

155. In addition to the Corps-permitted activities described above, the Corps itself provides a civil works function, which includes activities such as flood control, maintenance of navigation, and infrastructure support such as bridge construction and repair, among others.[135] For the most part, these activities occur outside of the area considered for critical habitat designations. Nonetheless, these types of activities have the potential to affect humpback whale critical habitat through impacts to water quality or to the prey species themselves.

156. Humpback whales are regularly considered as part of consultation on Corps civil works activities. For instance, in 2018, NMFS completed a consultation on dredging activities for eight Federal navigation channels in Washington. For the three dredging locations on the outer coast of the state, NMFS found that the described activities were unlikely to

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[129] Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.

[130] Email communication from the Alaska Department of Transportation to IEc, March 18, 2020/

[131] Email communication with Jon Kurland, NMFS Alaska Regional Office to Lisa Manning, NMFS HQ, on April 22, 2020.

[132] Personal communication with Juliana Houghton, U.S. Army Corps of Engineers, Seattle District, April 11, 2017.

[133] Personal communication with Shawn H. Zinszer, U.S. Army Corps of Engineers, Portland District, April 6, 2017.

[134] Attempts to confirm the historical and potential future level of permitted activity with the San Francisco and Los Angeles Districts of the Corps were unsuccessful.

[135] U.S. Army Corps of Engineers. Civil Works. Viewed at: http://www.usace.army.mil/Missions/Civil-Works/ on April 28, 2017.

adversely affect humpback whales, or to cause detectable effects in their prey species. It further required implementation of a number of terms and conditions designed to minimize impacts to water quality and effects on listed fish, which by default provides protection to other fish species including humpback whale prey.[136] A Biological Opinion for similar activities in Oregon similarly concluded that impacts to humpback whales due to the covered activities were discountable. Although the opinion does not specifically consider impacts to their prey species, the terms and conditions required to reduce impacts to listed fish species are likely to be protective of other species such as humpback prey species.[137]

157. Despite the lack of specific measures to protect humpback whales and their prey species, generally implemented BMPs such as limiting the amount of time dragheads and cutterheads are raised off the bottom and ceasing activity if a sheen or other indication of contamination is identified provide baseline protection to the species and its habitat by reducing potential impacts on prey species and water quality.[138]

158. As a result of the baseline management of these activities, NMFS has indicated that it is unlikely that the critical habitat designations will generate additional conservation efforts. Economic impacts of the critical habitat designations would be limited to administrative costs associated with including a critical habitat analysis in future consultations.

2.7 VESSEL TRAFFIC

159. Vessel traffic may affect the ability of humpback whales to access prey if the whales behaviorally avoid high traffic areas or are unable to detect prey due to increased vessel noise levels, thus posing a potential threat to humpback whale critical habitat.[139] Vessel traffic has a Federal nexus through the shipping lanes established by the USCG under the Ports and Waterways Safety Act as well as through USCG maintenance of the network of maritime aids to navigation.

160. NMFS' section 7 consultation history identifies one Biological Opinion related to vessel traffic for the regulatory codification of Traffic Separation Schemes (TSSs) near the ports of Los Angeles/Long Beach and San Francisco/Oakland. The Biological Opinion evaluates potential impacts to humpback whales and suggests several conservation efforts designed to minimize the interaction between ships and humpback and other whale

[136] NMFS. 2018. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for U.S Army Corps of Engineers' (COE) proposed 25-year maintenance dredging program for eight Federally-Authorized Navigation Channels in western Washington State.

[137] NMFS. 2016. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Reinitiation of the U.S. Army Corps of Engineers' Operations and Maintenance Dredging of the Oregon Coastal Navigation Projects.

[138] NMFS. 2010. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Corps Maintenance Dredging Program for the Oregon Coastal Projects.

[139] NMFS. 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*).

species.[140] Although potential impacts to humpback whale prey species are not considered, the analysis did conclude that the TSSs would not affect water quality as they only affect where ships travel, and do not affect the number, type, or speed of the ships travelling within them. The Biological Opinion, which was issued in 2017, noted that the whales may be located within the San Francisco TSS action area but determined that the TSS was not likely to adversely affect the species. USCG and NMFS have recently reinitiated this consultation because additional species within the action area have since been listed under the ESA (oceanic whitetip shark and giant manta ray) and new, scientific information has since become available that may indicate there are effects not previously considered. This consultation, which is ongoing, will consider effects of the action on humpback whale critical habitat as appropriate, but is not being reinitiated as a result of critical habitat designation. We are not aware of any previously completed consultations with USCG that would require reinitiation as a result of designating critical habitat for humpback whales.

161. Additionally, NMFS' section 7 consultation history includes two informal consultations on aids to navigation. These consultations include USCG as the lead action agency and relate to the repair, placement, or replacement of maritime aids to navigation such as beacons or buoys. As with other activities potentially affecting critical habitat, NMFS does not anticipate the critical habitat will generate additional conservation efforts for humpback whales associated with vessel traffic management or aids to navigation, and incremental costs will be limited to the additional administrative costs of consultation.

2.8 AQUACULTURE AND HATCHERIES

162. Aquaculture facilities within or adjacent to critical habitat would be subject to section 7 consultation due to the Federal nexus created by permits issued by the Corps and through other avenues. Outside of Alaska, the vast majority of aquaculture activity in the northwest is limited to shellfish production in Puget Sound and in the coastal bays and estuaries.[141] Similarly, shellfish aquaculture in California is limited to bays and estuaries, primarily in Humboldt Bay, and Tomales Bay.[142] These activities are generally not considered to affect humpback whales. For example, a recent programmatic Biological Opinion on shellfish aquaculture across coastal Washington notes that the covered activities have "no effect" on humpback whales and they are not considered within the opinion. It is unlikely that conservation efforts relative to estuarine shellfish farming will be triggered by the critical habitat designations.

[140] NMFS. 2017. Endangered Species Act Section 7(a)(2) Biological Opinion, for the regulatory codification of Traffic Separation Schemes near the ports of Los Angeles/Long Beach and San Francisco/Oakland.

[141] Personal communication with Laura Hoberect, NMFS Regional Aquaculture Coordinator for the Northwest, December 6, 2018.

[142] Personal communication with Diane Windham, NMFS Regional Aquaculture Coordinator for the Southwest, December 20, 2018.

163. A developing industry in offshore aquaculture is focused on the area south of Point Conception due to the relatively favorable oceanic conditions.[143] Two existing projects and one project under development are growing mussels on lines, while another project under development is focused on offshore finfish production. Growing of mussels is not an activity associated with reduction in water quality, and it is thus unlikely that conservation efforts would be suggested to avoid adverse modification of humpback whale critical habitat. The finfish project under development is presently in the process of conducting a siting analysis, a primary consideration of which is how to minimize water quality impacts (e.g., by placing the facility in an area with active currents to disperse facility discharges). Although the details of the project and potential for additional conservation efforts related to critical habitat are uncertain, the fact that water quality has been identified as a primary consideration stemming from regulatory requirements even absent the critical habitat designations makes it unlikely that additional measures will be needed specifically due to the designations of humpback whale critical habitat.[144] This analysis estimates that incremental costs will be limited to the administrative costs associated with future section 7 consultations.

164. In Alaska, aquaculture includes several different types of production, including seaweed farming, shellfish farming, and hatcheries focused on production of seed for shellfish farming. Unlike in Washington, Oregon, and California, these activities frequently occur directly within the areas considered for critical habitat designations, particularly within southeast Alaska (Unit 10).[145] The state currently receives and reviews approximately 12 Aquatic Farm applications per year,[146] with approximately 50 percent located in southeast Alaska, and 25 percent located in each of southcentral and western Alaska.[147] In recent years the state has engaged in a variety of initiatives to promote and expand the growth of aquaculture in the state, including additional funding through a grant from NOAA for the Alaska Mariculture Initiative and establishment of the Alaska Mariculture Task Force. As such, this industry is expected to expand in terms of numbers and size of farms in future years.[148]

165. Aquaculture permitting in Alaska is a joint effort between ADF&G, ADEC, and the Alaska Department of Natural Resources (ADNR). The state's review of aquaculture permits presently includes review by the ADF&G Marine Mammals Program, and Alaska law specifies that "the proposed farm or hatchery may not significantly affect fisheries,

[143] Personal communication with Diane Windham, NMFS Regional Aquaculture Coordinator for the Southwest, December 20, 2018.

[144] Personal communication with Diane Windham, NMFS Regional Aquaculture Coordinator for the Southwest, December 20, 2018.

[145] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

[146] Email communication from Sabrina Larsen, ADF&G to Industrial Economics, Inc., on March 26, 2020.

[147] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

[148] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

wildlife, or their habitats in an adverse manner."[149] The review generally includes consideration of marine mammal locations, potential impacts, and suggested mitigation, providing a baseline level of protection to marine mammals and their habitat even absent designation of Federal critical habitat.[150]

166. In addition to the application package and associated state permits required by the Alaska Aquatic Farm Program, certain Federal permits are required that provide a Federal nexus for this activity that results in a need for section 7 consultation.[151,152] Until 2014, a Corps General Permit covered most aquatic farm permits, limiting the need for individual consultations. This General Permit expired in 2014. Since then and until recently, the Corps limited its requests for consultation on individual aquaculture activities to those that included pile driving, which resulted in minimal consultations on these activities. More recently, the Corps has recognized a broader array of potential impacts on listed species, and thus NMFS expects an increase in the number of consultation requests from the Corps on these applications.

167. As a result of public comment, and additional information provided by the state, the forecast of future aquaculture activity in the region is increased to better-reflect the rate of new permits that have been requested in recent years.[153,154] Specifically the analysis finds that additional administrative costs associated with consideration of critical habitat will be incurred for each of the 12 applications anticipated annually. Fifty percent of the future aquaculture activity is anticipated to occur in southeast Alaska, while the remaining 50 percent is split evenly between southcentral and western Alaska.[155]

168. In public comments and by letter to NMFS in June 2019, the state has expressed concern about the potential effects the critical habitat designations may have on the state.[156] The state noted their concern that the critical habitat designations may result in a need to dedicate more staff time to address permit review for new facilities and potential concerns related to marine mammals and their habitat, and that it may increase the number of permits that will require a specific review for potential marine mammal

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[149] Alaska Statute AS 16.40.105(3).

[150] Alaska Department of Fish and Game. 2019. Guidelines for Emerging Mariculture Industry and Marine Mammal Interactions. April 12.

[151] Alaska's Aquatic Farm Program. Information on the Application Process

[152] Depending on the location of the proposed farm, Federal permit requirements may include Corps permits for uses within navigable waterways (Section 10 of the Rivers and Harbors Act; Section 404 of the CWA); or permits from USFS or USFWS for proposals within national forests and wildlife refuges, respectively.

[153] Personal communication with Moira Ingle and Sabrina Larsen, Alaska Department of Fish and Game on March 4, 2020.

[154] Email communication from Sabrina Larsen, Alaska Department of Fish and Game, to Industrial Economics, Inc. on March 26, 2020.

[155] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

[156] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

impacts, as occurred when critical habitat was designated for Cook Inlet beluga whales.[157] Additionally, the permit review process is already subject to substantial delays, and the need for additional consideration of critical habitat may further delay proposed projects.[158]

169. Public comments also expressed that any additional regulation could severely inhibit the development of the burgeoning seaweed farming industry, resulting in the loss of potential revenues that would otherwise be realized. However, NMFS has not identified any recommended changes to the management of these industries that would result from the critical habitat rule.

170. The State of Alaska and other public comments also identified salmon hatcheries as another type of fish production having the potential to incur incremental costs resulting from the critical habitat designations.[159] Public comments from the Southeast Alaska Guides Organization noted concern that the designations could result in reduced production of salmon for harvest due to additional regulatory burden on existing hatcheries and limitations in new facilities.[160] The potential impacts of this activity on humpback whale critical habitat are generally associated with the siting and actual construction of the facility. This industry is well-established and construction of new facilities is not anticipated in the near future, but physical expansion of individual existing facilities is possible.[161] Although a need for additional consultation may arise as a result of facility expansion, the Alaska Region of NMFS has generally not consulted on these activities. In certain limited cases, Letters of Concurrence have been requested.[162] However, these requests have been infrequent, and this analysis anticipates associated costs are limited. ADF&G confirmed in communications following the public comment period that no specific type or extent of costs related to this industry was omitted from the draft economic analysis.[163]

2.9 SCIENTIFIC RESEARCH

171. Numerous federally funded or permitted research activities are conducted within the areas considered for the critical habitat designations. For example, the National Marine Sanctuaries (NMS) program conducts a variety of field operations for research and other

[157] Email communication from Sue Goodglick, Alaska Department of Fish and Game to Industrial Economics, Inc. on April 8, 2020.

[158] Personal communication with Moira Ingle, Alaska Department of Fish and Game on March 4, 2020.

[159] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

[160] Braden, Forrest, Executive Director, Southeast Alaska Guides Organization. "Humpback Whale Critical Habitat." Received by NMFS, January 31, 2020.

[161] Personal communication with Moira Ingle, Alaska Department of Fish and Game on March 4, 2020.

[162] NMFS. 2018. Port Asumcion Southern Southeast Regional Aquaculture Association Letter of Concurrence, POA-2016-389, NMFS #AKR-2016-9617.

[163] Personal communication with Moira Ingle, Alaska Department of Fish and Game on March 4, 2020.

management purposes, in addition to issuing research permits to academic, agency, and partner scientists.[164] The National Science Foundation (NSF) has significant research infrastructure investments in the region, including the Ocean Observatories Initiative (OOI).[165] Recent consultations on scientific research activities that have included humpback whales have consisted of numerous geophysical seismic surveys. The threats posed by these activities are similar in nature to those described for seismic activities related to oil and gas exploration and development.

172. As noted previously in the context of oil and gas exploration and development, seismic survey activities have the potential to negatively impact humpback whale critical habitat, the specific thresholds at which prey would be affected is unknown, and it is not clear what specific conservation efforts would be requested.[166] Absent information on what conservation efforts might be identified, this analysis quantifies the incremental costs of the critical habitat designations associated with consultations on seismic survey activities as limited to administrative costs.

173. In addition to the seismic research activities that represent the majority of recent scientific research activity recently subject to section 7 consultation, NSF operates the OOI. The OOI is designed to capture oceanic processes at various geographic scales, and consists of a network of nodes and associated infrastructure including cables, buoys, deployment platforms, moorings, junction boxes, electric power generation and two-way communications systems. In a 2011 Letter of Concurrence, NMFS concluded that these activities are not likely to adversely affect humpback whales.[167] Other scientific research activities within the region include field operations carried out within the Olympic National Marine Sanctuaries, including vessel operations, vessel maintenance, aircraft operations, non-motorized craft operations, and SCUBA and snorkel operations.[168] NMFS does not believe the critical habitat designations will result in modification to any of these activities, as they do not raise concerns for the prey feature or ability of the whales to feed or use their habitat.[169]

174. As these types of activities are difficult to forecast, this analysis relies on the consultation history and assumes the past rate of consultation for this activity is reflective of the future rate of consultation.

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[164] Douros, William, Regional Director, Office of National Marine Sanctuaries, West Coast Region. "Comments on the Proposed Rule to Designate Critical Habitat for the Central America, and Mexico Distinct Population Segments of Humpback Whales". Received by Dr. Lisa Manning, NMFS, December 10, 2019.

[165] Smith, Holly. National Science Foundation. Comment ID#NOAA-NMFS-2019-0066-0075, submitted December 13, 2019.

[166] Personal communication NMFS staff, March 29, 2019.

[167] Conant, Therese. NMFS. "RE: Request for Concurrence for the Ocean Observatories Initiative". Received by Jean McGovern, Program Director, Ocean Observatory Initiative, National Science Foundation, January 25, 2011.

[168] Office of National Marine Sanctuaries, NOAA. 2018. Programmatic Environmental Assessment of Field Operations in the West Coast National Marine Sanctuaries. August 7.

[169] Email communication from NMFS to Industrial Economics, Inc. on April 13, 2020.

2.10 WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES

175. Water quality management, which includes regulatory administrative activities related to pesticide registrations, approval of state water quality standards, and issuance of CWA general permits, as well as other activities that affect water quality and require individual NPDES permits, may affect humpback whale prey species through exposure to storm water and pesticide runoff. Section 7 consultation for regulatory administrative activities generally occurs at a programmatic level as part of EPA's triennial review of state water quality standards, or at the point of approval of a general permit, rather than individually for each individual pollution source.[170]

176. A number of activities that occur inland of the critical habitat may affect the critical habitat, primarily through potential impacts to water quality. Although they do not occur within the critical habitat, future section 7 consultations on these projects and activities may require consideration of the potential for adverse modification of the whales' critical habitat. Based on NMFS' consultation history, the inland activities for which section 7 consultations have included evaluation of potential effects on humpback whales include:

- Inland Mining
- Power Plant Operations
- Agriculture/Land Management Pesticide and Herbicide Application

2.10.1 DEVELOPMENT OF STANDARDS AND DISCHARGE PERMITS

177. The State of Alaska has had primacy for administration of the National Pollutant Discharge Elimination System (NPDES) through its Alaska Pollutant Discharge Elimination System (APDES) since 2012. As such, the state works with EPA to establish water quality standards for the state, and consults on and certifies general permits and individual permits under the CWA.[171] The state noted in public comments and follow-up communications that it currently administers at least two general APDES permits for activities that occur in and have the potential to affect humpback whale critical habitat, for seafood processor discharges and cruise ship discharges. Each of these general permits requires section 7 consultation, and both the state and EPA incur the administrative costs of consultation on these activities.[172] The Large Cruise Ship General permit was issued by Alaska in 2014 and will be re-issued in 2021[173], while the Seafood

[170] See, for example, NMFS. 2015. Biological Opinion on EPA multi-sector general permit for industrial stormwater discharges pursuant to the National Pollution Elimination System. Available at https://repository.library.noaa.gov/view/noaa/14797.

[171] Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.

[172] Personal communication with Gary Mendivil, Alaska Department of Environmental Conservation, Adam Moser and Jill Taylor, Alaska Department of Transportation on March 10, 2020.

[173] Alaska Department of Environmental Conservation, Division of Water. "Large Cruise Ship General Permit." Viewed at https://dec.alaska.gov/water/cruise-ships/cruise-general-permit/ on April 15, 2020.

Processors discharge permit was issued in 2019.[174] The costs of these consultations that will be incurred by NMFS, EPA, and the state are reflected in the final economic analysis.

178. The State of Alaska plays an important role and devotes substantial resources to the management of its water quality program with respect to species conservation, and incurs notable costs associated with review and approval of individual discharge permits.[175] For example, in reviewing individual discharge permit applications for facilities such as wastewater treatment plants, the state will conduct due diligence, which may include site visits, to assess the potential effect of the permit on listed species and their habitat. The state described that any additional requirements triggered by the critical habitat designations could be especially burdensome for the state given costs already incurred in this process.[176] However, the state acknowledges that it does not have any specific requirement for review of individual discharge permits relative to designation of Federal critical habitat, and as such, does not anticipate that any specific costs would be incurred for that activity as a result of the designations.[177]

179. The state is also responsible for issuing Section 401 "Certificates of Reasonable Assurance" ("401 Certification) relative to Army Corps Section 404 permits confirming that state water quality standards are being met. During public comment, the state described that the critical habitat designations could result in increased costs to ADEC during this process due to a potential need to become engaged in the section 7 consultation process.[178] However, it is unclear how or if the critical habitat designations would increase the cost of this review above and beyond the cost already incurred in this process, and the state confirmed that it has not to date been involved in consultations related to 404 permits due to the presence of critical habitat.[179]

180. In Washington, any changes in water quality standards require development of a new rule that is then sent to EPA for review. The state develops new rules at varying intervals as new science or new EPA recommendations emerge. The state develops water quality standards to address multiple criteria, including human health, recreation, and protection of aquatic life at all life stages. Most relevant to the humpback whale critical habitat are marine water quality standards for aquatic life, for which the Washington Department of

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[174] Alaska Department of Environmental Conservation, Division of Water. "Seafood Processing & Hatchery Section." Viewed at https://dec.alaska.gov/water/wastewater/seafood/ on April 15, 2020.

[175] Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.

[176] Personal communication with Gary Mendivil, Alaska Department of Environmental Conservation, March 4, 2020.

[177] Email communication from Gary Mendivil, Alaska Department of Environmental Conservation, to Industrial Economics, Inc. on March 20, 2020.

[178] Lang, Doug Vincent, Commissioner, Alaska Department of Fish and Game. "Re: Proposed Rule to Designate Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales; Request for Comments". Received by Dr. Lisa Manning, NMFS, January 31, 2020.

[179] Personal communication with Gary Mendivil, Alaska Department of Environmental Conservation, March 4, 2020.

Ecology described that there are no updates currently planned. The Department of Ecology did not identify any examples of whales (including humpback whales) or their habitat specifically triggering a change in water quality standards and noted that the prey species are already considered as part of the need to broadly protect aquatic life. The Department of Ecology did not anticipate that critical habitat for humpback whales would affect the nature of state water quality standards.[180]

181. The Oregon Department of Environmental Quality described that proposed critical habitat for humpback whales is outside of state waters and that it is unlikely that state water quality standards will affect the whales or the prey species. However, endangered and threatened species, as well as humpback whale prey species that live or spawn in state waters, are explicitly protected under existing state water quality standards. Applications for variances from the standards must consider potential for effects on threatened and endangered species regardless of critical habitat designation. This is mostly an issue for salmon in Oregon and has not been an issue for humpback whales. The Department of Environmental Quality describes that it is unlikely the state water quality standards may affect critical habitat for humpback whales.[181]

2.10.2 OTHER ACTIVITIES AFFECTING WATER QUALITY

182. A number of activities that occur both within and inland of the critical habitat may affect the critical habitat, primarily through potential impacts to water quality. As described above, many are covered by general permits issued by the states or EPA, but others may be subject to individual review under section 7. Although they do not all occur within the critical habitat, future section 7 consultations on these projects and activities may require consideration of the potential for adverse modification of the whales' critical habitat. Based on NMFS' consultation history, the activities for which section 7 consultations have included evaluation of potential effects on humpback whales include:

- Inland Mining
- Power Plant Operations
- Agriculture/Land Management Pesticide and Herbicide Application

183. These activities are presently subject to section 7 consultation through permits and licenses issued for individual activities by EPA, FERC, the Nuclear Regulatory Commission, the Corps, etc. Generally, these activities are managed to protect water quality and limit impacts on threatened and endangered species. Additionally, given the associated action area, many of these activities are subject to consultation and conservation efforts due to presence of other ESA-listed species and critical habitat.[182]

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[180] Personal communication with staff from the Washington Department of Ecology, October 26, 2018.

[181] Personal communication with Oregon Department of Environmental Quality, October 30, 2018.

[182] See, for example, NMFS. 2017. Endangered Species Act (ESA) Section(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response: Re-Issuance of a permit to the City of Los Angeles for wastewater discharge by the Hyperion Treatment Plant under the National Pollutant Discharge Elimination System (NPDES).

184. During public comment, the City of Sitka stated that the critical habitat designations will likely increase compliance costs related to licensing of their hydroelectric dams/power houses due to additional effort and delay associated with FERC relicensing and oversight. It is uncertain whether and why critical habitat for the whales would delay FERC relicensing of dams given NMFS does not anticipate critical habitat would affect the outcome of consultations on these projects. However, as described for construction projects above, this analysis highlights potential for the critical habitat rule to generate project delays as an uncertain outcome that would be too speculative to quantify.

185. The added need to consider critical habitat for humpback whales is unlikely to generate additional conservation efforts with respect to consultations on inland activities. As a result, this analysis expects that the critical habitat will generate only additional administrative effort as part of future consultation on these activities. Given the limited effect of critical habitat on these activities, this analysis does not include a detailed forecast of their spatial and temporal distribution. Instead, it relies on the consultation history to determine the locations and a reasonable average number of annual informal, formal, and programmatic consultations that may consider the whales' critical habitat. Administrative impacts associated with future consultations on these activities are quantified in Chapter 3.

2.11 MILITARY ACTIVITIES

186. This section describes potential levels of military activity that may result in consultation considering humpback whale critical habitat. It does not reflect potential effects on national security, or account for areas that may ultimately be excluded from critical habitat for national security reasons.

187. As a Federal entity, the Navy is required to consult with NMFS on its activities that may affect ESA listed species. Within the potential humpback whale critical habitat area, consultation generally occurs relative to the Navy's development of training and testing plans. Training and testing activities such as use of sonar, detonation of explosives, aircraft noise, vessel noise, etc. may pose a threat to humpback whales and their prey, including behavioral changes, injury and mortality. Within the potential critical habitat, NMFS has consulted on training and testing activities in Hawaii/Southern California, the Northwest, and Gulf of Alaska. An additional consultation was completed on the Surveillance Underwater Towed Array Sensor System (SURTASS) Low Frequency Active Sonar, but the area and activities conducted under that program are outside the range of the areas considered for humpback whale critical habitat.[183]

[183] NMFS. 2016. Endangered Species Act Section 7 Biological Opinion and Conference Report on the U.S. Navy's Surveillance Towed Array Sensor System Low Frequency Active Sonar Routine Training, Testing, and Military Operations and NMFS Issuance of Four Letters of Authorization for the U.S. Navy to "Take" Marine Mammals Incidental to Surveillance Towed Array Sensor System Low Frequency Active Sonar Routine Training, Testing, and Military Operations in Areas of the Pacific Ocean for the Period of August 15, 2016 through August 14, 2017 pursuant to the Five-Year Marine Mammal Protection Act Regulations.

188. Previous Biological Opinions written by NMFS have considered the effects of military testing and training exercises on humpback whales, the results of which provide some degree of baseline protection absent critical habitat. For example, NMFS' Biological Opinion on the Northwest Training and Testing (NWTT) activities describes measures required under the Navy's incidental take permit for these activities includes:

- The use of lookouts for a variety of purposes, including observing for the presence of biological resources; and
- Implementation of mitigation zones around specific activities wherein the activity will be ceased or modified if a marine mammal enters the area.

It also identifies several conservation efforts specific to the whales and their habitat, including:

- Monitor sighting, location, and stranding data for ESA-listed marine mammals and sea turtle species in the NWTT Action Area;
- As practicable, develop procedures to aid any individuals of an ESA-listed marine mammals, sea turtles, and fish that have been impacted by NWTT activities and is in a condition requiring assistance to increase likelihood of survival;
- Continue to model potential impacts to ESA-listed species using the Navy Acoustic Effects Model (NAEMO) and other relevant models; validate assumptions used in risk analyses; and seek new information and higher quality data for use in such effort; and
- Continue technical assistance/adaptive management efforts with NMFS to help inform future consultations on Navy training and testing in the NWTT Action Area.[184]

189. The 2016 Biological Opinion on SURTASS includes similar requirements for monitoring and reporting the impacts of the covered activities on marine mammals to increase knowledge of the species and better understand the impacts of the activity on marine mammal populations.[185] Although these activities are geographically distant from the potential critical habitat and unlikely to affect it, they provide examples of the types of conservation efforts requested for military training and testing activities.

190. As a result of the measures already in place to protect the whales and their prey base from impacts due to military training and testing, NMFS anticipates it is unlikely that additional conservation efforts will be recommended as a result of the critical habitat.[186]

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[184] NMFS. 2015. 2015 Biological Opinion and Conference Report on NWTT and related activities.

[185] NMFS. 2016. Endangered Species Act Section 7 Biological Opinion and Conference Report on the U.S. Navy's Surveillance Towed Array Sensor System Low Frequency Active Sonar Routine Training, Testing, and Military Operations and NMFS Issuance of Four Letters of Authorization for the U.S. Navy to "Take" Marine Mammals Incidental to Surveillance Towed Array Sensor System Low Frequency Active Sonar Routine Training, Testing, and Military Operations in Areas of the Pacific Ocean for the Period of August 15, 2016 through August 14, 2017 pursuant to the Five-Year Marine Mammal Protection Act Regulations.

[186] Personal communication NMFS staff, multiple dates in 2018.

This analysis anticipates that incremental impacts to these activities will be limited to administrative costs associated with critical habitat designations in future section 7 consultations.

2.12 LNG FACILITIES

191. NMFS has identified LNG activities as a potential threat to humpback whale critical habitat because LNG-related structures (such as offshore floating terminals, platforms, breakwaters, jetties, and offshore ports) may impede access to prey and spills may affect prey by reducing water quality. LNG facilities may be subject to section 7 consultation due to the Federal nexus created by the need for construction permits from the Corps or licensing by FERC for siting, construction, and operation of the facilities. During construction of LNG facilities, baseline protections for the proposed humpback whale critical habitat occur via the BMPs implemented by the Corps through permitting of the construction. These BMPs are described in detail in section 2.6.1. NMFS does not anticipate the critical habitat will generate additional conservation efforts for humpback whales associated with LNG facilities. Incremental costs will be limited to the administrative costs associated with future section 7 consultations.

2.13 SPACE VEHICLE AND MISSILE LAUNCHES

192. Space vehicle and missile launches require licensing by the Federal Aviation Administration (FAA), thereby creating a Federal nexus and triggering section 7 consultation. Potential impacts on humpback whale critical habitat could include reduction in prey availability due to noise disturbance (due to sonic boom and landings) and explosions (in the event of an unsuccessful launch or landing), and reduced prey quality as a result of contamination (via discharge of fuel in the event of an unsuccessful landing). Water contamination in the event of fuel discharge from an unsuccessful launch or landing may also affect prey quality. However, such impacts are considered to be extremely unlikely to occur and/or extremely unlikely to adversely impact the critical habitat areas.[187,188,189]

193. To date, consultations have focused on activities at only two facilities – the Kodiak Launch Complex on Kodiak Island, AK, and the Space Exploration Technology Corporation's (SpaceX) Falcon 9 lift launch vehicle at Vandenberg Air Force Base in California. As an emerging industry, past trends are unlikely to reflect likely future activity. Given the presence of EFH and Habitat Areas of Particular Concern (HAPCs) in the vicinity of Vandenberg Air Force Base for multiple federally managed fish species

[187] NMFS. 2017. Endangered Species Act Section 7(a)(2) concurrence for the issuance of an IHA, under the MMPA, for the Space X Boost-Back and Landing of the Falcon 9 First Stage and associated activities. October 16.

[188] SpaceX. 2017. Incidental Harassment Authorization Application: Boost-Back and Landing of the Falcon 9 First Stage at SLC-4 West, Vandenberg Air Force Base, California, and Contingency Landing Options Offshore.

[189] NMFS. 2017. Incidental Harassment Authorization. November 30. Issuance of regulations and letters of authorization under the Marine Mammal Protection Act to authorize incidental take of marine mammals by U.S. citizens engaged in space vehicle and missile launch operations at the Kodiak Launch Complex on Kodiak Island, Alaska

(e.g., Pacific Coast Groundfish, CPS, and HMS), measures to avoid, minimize, or offset any adverse effects stemming from the action are already considered as part of section 7 consultation. Previous consultations on this activity at the Kodiak Launch Complex have found that the activity is not likely to adversely affect humpback whales because they would be unlikely to be exposed to launch noise (since they would generally be submerged).[190] Thus, it is unlikely that the critical habitat for humpback whales will change the outcome of consultations on space vehicle and missile launches. As no incremental conservation efforts are expected for this activity type, costs of the designations will be limited to the administrative cost of considering critical habitat in ongoing and new consultations anticipated over the next ten years.

2.14 USFS ACTIVITIES

194. Management of timber harvest and other activities on Federal lands by the USFS creates a Federal nexus triggering section 7 consultation. USFS activities that may be the focus of section 7 consultations include development or amendment of Forest Management Plans, facility (e.g. dock) construction, timber sales, mining activities on USFS-managed land, and other forest management activities related to timber harvest on USFS-managed land. Although much of the activity related to these activities occurs in terrestrial habitat and thus does not pose a threat to humpback whales or their habitat, past consultations identify a limited number of potential impacts to marine species and habitats (particularly from timber activities in Alaska), including impacts from the transportation of timber on barging routes used for log transport, and impacts on water quality related to log transport facilities (LTFs). Potential impacts include acoustic disturbance related to vessel traffic, degradation of prey habitat due to LTFs, risk of vessel collisions, and prey disturbance by commercial vessel operations.[191]

195. Although the activity does occur within the area considered for critical habitat, NMFS has generally found in previous consultations that have considered impacts to humpback whales, including potential impacts to their prey, that these types activities may affect, but are unlikely to adversely affect, humpback whales.[192] NMFS has similarly indicated that it is also unlikely that any future consultations on these activities would generate conservation efforts to avoid adverse modification of critical habitat. Incremental costs to this activity of the critical habitat designations would be limited to administrative costs of future section 7 consultations.

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[190] NMFS. 2017. Endangered Species Act – Section 7 Consultation Biological Opinion: Issuance of regulations and letters of authorization under the Marine Mammal Protection Act to authorize incidental take of marine mammals by U.S. citizens engaged in space vehicle and missile launch operations at the Kodiak Launch Complex on Kodiak Island, Alaska.

[191] See, for example, NMFS. 2007. Letter of Concurrence: Baht Timber Sale Biological Assessment/Biological Evaluation. June 5; NMFS. 2015. Letter of Concurrence: Anan Bay Floating Dock Construction Project. November 6; and NMFS. 2007. Letter of Concurrence: Scratchings Timber Sale. March 14.

[192] See, for example, NMFS. 2007. Letter of Concurrence: Baht Timber Sale Biological Assessment/Biological Evaluation. June 5; NMFS. 2015. Letter of Concurrence: Anan Bay Floating Dock Construction Project. November 6; and NMFS. 2007. Letter of Concurrence: Scratchings Timber Sale. March 14.

2.15 CONCLUSION

196. The findings of the activity-specific evaluations in this chapter are summarized in Exhibit 2-2. Overall, NMFS has not identified any particular projects or activities for which it is reasonably foreseeable that the critical habitat designations will generate additional conservation efforts and associated economic impacts. However, this analysis finds that future section 7 consultations for activities within or affecting the critical habitat area are likely to experience additional administrative costs associated with the need to conduct an analysis of the potential for adverse modification. As a result of public comments, this final economic analysis reflects a higher rate of consultations and level of future costs associated with aquaculture and water quality management in Alaska. It also finds that there is the potential for certain economic impacts identified in public comments for which uncertainty is high, or information was not available to quantify those impacts, and presents this information qualitatively for consideration. Chapter 3 assesses the expected scope and scale of these activities across the critical habitat units over the next ten years and quantifies the associated incremental administrative costs due to the critical habitat designations for humpback whales.

CHAPTER 3 | INCREMENTAL ECONOMIC IMPACTS OF CRITICAL HABITAT

197. This chapter quantifies incremental economic impacts associated with considering adverse modification of the humpback whale critical habitat as part of future section 7 consultations. To support the section 4(b)(2) decision-making process, the analysis projects the spatial distribution of activities and, where possible, disaggregates impacts to particular geographic areas.[193]

3.1 FORECAST OF SECTION 7 CONSULTATIONS

198. Ideally, this analysis would rely on management plans and planning documents to determine the locations and frequencies of future projects and activities that may require section 7 consultations that include an analysis of the critical habitat for humpback whales. For several activity types, Federal action agencies and state agencies were able to provide detailed forecasts of the future rate, location, and types of activities that are likely to be subject to section 7 consultation. While this analysis relies on these forecasts to the greatest extent possible, this information is not available for the all the economic activities described in Chapter 2.

199. Where particular projects or planning information are not available, this analysis projects the expected numbers and locations of future economic activities potentially subject to section 7 consultation regarding the critical habitat for the humpback whales relying on two additional sources as the best available indicators of future activity levels:

a. Historical permit and project data for Corps-permitted projects (including coastal and in-water construction, aquaculture and hatcheries, and outfalls).

b. NMFS' section 7 consultation history (from 2007 to 2017) to forecast all other activities.

3.1.1 NMFS CONSULTATION HISTORY

200. To inform the forecast of projects and activities requiring consultation, NMFS provided a historical record of all consultations that considered impacts to humpback whales between 2007 and 2017. This analysis relies on the consultation history to supplement the activity-specific information provided by Federal action agencies. The consultation history informs the forecast at least in part for all activities other than alternative energy

[193] This final economic analysis analyzes all areas originally considered for designation as critical habitat for the three DPSs. The results of this analysis do not reflect proposed exclusions or changes to the proposed critical habitat designations made in the final rule. Costs presented for critical habitat units that are not ultimately included in the final designation would not be incurred.

and LNG facilities, as discussed below. As described in the following sections, this analysis relies on historical levels of consultation activity in order to predict potential future consultation activity levels for some, but not all, activities. For those activities relying on historical consultation levels, the consultation history identifies a total of 149 consultations conducted over the 10-year period that considered impacts to humpback whales. Of these, five were programmatic-level consultations, 49 were formal, and 95 were informal. Formal consultations more frequently include conservation recommendations. Consultations occurred most frequency for in-water construction and dredging projects (46 consultations), followed by military activities (27 consultations), and water quality management activities (19 consultations). Reasonable and prudent alternatives focused on avoiding jeopardy and reasonable and prudent measures associated with incidental take of the whales that were recommended as part of the past consultations are baseline protections accorded the whales and their habitat absent the critical habitat rule. NMFS considers how the additional consideration of the potential for adverse modification may influence the conservation recommendations made as part of future consultations following the designation of critical habitat, as described in section 2.3 through 2.14.

201. Generally, economic activities that may require section 7 consultation to consider adverse modification of the critical habitat area additionally engage in consultation to consider potential for jeopardy to the humpback whales even absent critical habitat designation. Given this, it is unlikely that the critical habitat designations would expand the suite of projects and activities subject to section 7 consultation. Consequently, for activity forecasts that rely in part on the consultation history, this analysis assumes that the average annual frequency and locations of section 7 consultations over the next ten years will be similar to the average annual frequency and locations of historical section 7 consultations over the past eleven years, and applies the average annual rate of consultations by activity and critical habitat unit to forecast future consultation levels.[194] A summary table providing the number of forecasted section 7 consultations by activity type is provided in Exhibit 3-2.

202. For these activities, this analysis assigns consultations to critical habitat units based on the available information on the locations of the various economic activities. Consultations relevant to humpback whales and critical habitat, in general, and not to any particular unit or units (e.g., nationwide consultations) are categorized collectively as “all units” in the exhibits below.

3.1.2 DATA SOURCES BY ACTIVITY

203. The following sections summarize the data sources that inform the consultation forecast for each activity. For most activities, this analysis relies on information provided by

[194] The consultation history did not identify any clear trends in consultation activity levels over time or space (either by activity or in the aggregate). For relevant activities, this analysis therefore estimates the average annual historical consultation rate in each critical habitat unit and for each activity type.

Federal action agencies supplemented with historical consultation information from the NMFS consultation history.

3.1.2.1 In-Water Construction

204. In-water construction and dredging activities are conducted and permitted by the Corps. To forecast Corps activities, this analysis employs multiple sources of future consultation information. For civil works projects conducted by the Corps within or affecting the critical habitat area, the project forecast is based on interviews with contacts at the Corps civil works branches in Seattle, Portland, and Alaska and historical information from the Corps Navigation Data Center's Dredging Information System for the San Francisco and Los Angeles districts.[195] For projects permitted by the Corps within or affecting the critical habitat area, this analysis bases the forecast of projects and activities on the historical rate of activities observed in the Corps permit database.

Army Corps Civil Works Activities

205. The Corps' Alaska District identified that civil works activity in Alaska includes dredging work and infrastructure construction, maintenance, and improvements in numerous small ports and harbors in the state. Based on conversations and information provided by the Corps Alaska District, this analysis estimates that nine informal consultations will occur on civil works projects in Alaska related to port maintenance activities and new port construction across potential critical habitat Units 2, 4, 5, 6, 8, and 10.[196]

206. The Corps' Seattle District identified three types of activities potentially affecting the potential humpback whale critical habitat area that may be subject to consultation with NMFS.[197] These activities include dredging of navigation channels, including port entrances, maintenance of jetties, and "flood fights," which are emergency actions such as rip-rap placement designed to reduce flood risk to coastal communities, such as Shoalwater Bay. The Corps identified that regular maintenance of jetties and navigation channels for the state's key ports are covered by a single programmatic consultation, and believe it is unlikely to be reinitiated upon the humpback whale critical habitat designations.[198] The Corps estimated that three consultations on Federal navigation channel dredging and jetty maintenance projects not covered by the programmatic

[195] U.S. Army Corps of Engineers. Dredging statistics: Corps owned dredges and dredging contracts. Accessed October 2018 at: https://usace.contentdm.oclc.org/digital/collection/p16021coll2/id/2640. The Army Corps dredging statistics database includes information on all dredging projects performed or contracted by the Corps from 1995 to the present. The database includes information on Corps district, name of dredging location, geographic coordinates, year, cost, dredge type, disposal type, and quantity of material dredged, among other categories. Some of this information, such as geographic coordinates, is not listed for many of the historical dredging projects.

[196] Personal communication with Michael Salyer, U.S. Army Corps of Engineers, September 21, 2018.

[197] Information on civil works projects in the Seattle district is based on personal communication with Fred Goetz and Nancy Gleason, U.S. Army Corps of Engineers, April 19, 2017, and with Fred Goetz, U.S. Army Corps of Engineers, December 27, 2018

[198] NMFS. 2018. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Maintenance Dredging Program for Eight Federally-Authorized Navigation Channels Puget Sound and along the West Coast of Washington State. WCR-2017-6057. January.

consultation would occur in the Seattle District area over the next ten years. Although difficult to predict with certainty, the Corps additionally estimated that four coastal emergency actions may occur, requiring consultation.

207. In the context of a previous, recent economic analysis for expansion of Southern resident killer whale critical habitat, the Portland District identified future channel dredging and jetty maintenance projects that have the potential to affect the critical habitat, including 12 coastal harbors in Oregon with jetties and channel entrances that extend into the Pacific Ocean.[199] The Portland District indicated that the Corps conducts periodic maintenance on these jetties and channels. Based on this interview, this analysis estimates that the Corps would need to consult on one project at each of these locations over the next ten years. However, a 2017 Biological Opinion programmatically addresses a number of these activities.[200] To the extent that individual activities will be addressed through a programmatic consultation, rather than individual consultations, in the future, this analysis may overestimate the incremental administrative costs associated with this activity in Oregon.

208. Absent more specific information from the San Francisco and Los Angeles Districts regarding future civil works activities, this analysis references historical information from the Corps Navigation Data Center's Dredging Information System to forecast civil works projects in the San Francisco and Los Angeles Districts.[201] The Dredging Information System includes 93 projects conducted by or for the San Francisco and Los Angeles Districts from 2008 to 2017. Based on the geographic coordinates associated with these projects, 17 were located within the areas considered for critical habitat designations in Units 16, 17, 18, and 19.

Army Corps Permitted Activities

209. The Corps provided a historical record of permits issued from 2008 to 2017 that involved section 7 consultation and overlapped with, or were within 100 meters shoreward of, the units considered for critical habitat .[202] Overall, the permit data identifies 36 historical permits located within the critical habitat related to in-water construction, corresponding to nearly four permits per year on average. The majority of these permits were located

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[199] Although the essential features of the critical habitat for Southern resident killer whales and humpback whales differ, the location and number of future Civil Works projects that will be subject to section 7 consultation are relevant to both designations due to the geographic proximity of the two potential critical habitat areas.

[200] NMFS. 2017. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Reinitiation of the U.S. Army Corps of Engineers' Operations and Maintenance Dredging of the Oregon Coastal Navigation Projects. WCR-2016-5055. May.

[201] U.S. Army Corps of Engineers. Dredging statistics: Corps owned dredges and dredging contracts. Accessed October 2018 at: https://usace.contentdm.oclc.org/digital/collection/p16021coll2/id/2640. The Army Corps dredging statistics database includes information on all dredging projects performed or contracted by the the Corps from 1995 to the present. The database includes information on Corps district, name of dredging location, geographic coordinates, year, cost, dredge type, disposal type, and quantity of material dredged, among other categories. Some of this information, such as geographic coordinates, is not listed for many of the historical dredging projects.

[202] While the permit data includes section 7 consultations with the U.S. Fish and Wildlife Service, this analysis relies only on section 7 consultations with NMFS.

within critical habitat Unit 10 (Southeastern Alaska). As a low-end estimate, this forecast assumes that the frequency and locations of in-water construction consultations over the next ten years will be similar to the frequency and locations of historical Corps permits over the past ten years.

210. Additionally, as a high-end estimate, this analysis forecasts additional in-water construction consultations based on the consultation history. The consultation history includes 46 consultations on in-water construction activities with a lead action agency other than the Corps. These consultations include, for example, actions such as ferry terminal improvements (Federal Highway Administration), Washington statewide transportation activities (U.S. Department of Transportation), and dock and pier improvements (multiple agencies). The high-end estimate assumes that the frequency and locations of future in-water construction consultations will be similar to the frequency and locations of these historical locations in addition to the historical Corps permits. These consultations are only included in the high-end forecast due to uncertainty regarding whether or not these activities would require Corps permits and whether or not they would have been included in the Corps-provided permit data.

3.1.2.2 Commercial Fishing

211. This analysis forecasts future commercial fishing consultations based on conversations with NMFS supplemented with historical consultation information from the consultation history. Based on conversations with NMFS, this analysis estimates three new consultations for the Coastal Pelagic Species Fishery Management Plan (CPS FMP), one reinitiation and one programmatic consultation for the two Alaskan groundfish fisheries (Bering Sea/Aleutian Island [BSAI] and Gulf of Alaska [GOA]), and one reinitiation and one formal consultation for the Alaska halibut fishery.[203] Additionally, NMFS' West Coast Region anticipates that the number of future consultations may slightly exceed the historical rate due to rebuilding of numerous groundfish stocks and a resulting increase in activity in that fishery. Accordingly, this analysis includes an additional west coast groundfish consultation and a reinitiation of the existing groundfish consultation that would be triggered by the critical habitat designations.[204]

212. Additionally, this analysis identified six formal consultations and three informal consultations related to commercial fishing in the 2008 to 2017 consultation history. These consultations were primarily related to fisheries off the coast of Washington, Oregon, and California (critical habitat Units 11 through 19), and include two formal consultations on the west coast Pacific halibut fishery, two formal consultations on the Pacific coast groundfish fishery, two formal consultations on the California-based HMS fishery (including one for the deep-set longline component, and one for the drift gillnet component), and three informal consultations on a three application for Exempted Fishing

[203] Personal communication with NMFS staff, March 22, 2019.

[204] Personal communication with Aja Szumylo, National Marine Fisheries Service, November 11, 2018.

Permits (EFPs).[205] This analysis assumes that future consultations will be completed at the same rate as historical consultations in these locations.

3.1.2.3 Oil and Gas Activities

213. This analysis forecasts future consultations on oil and gas activities and seismic surveys primarily based on the consultation history. This analysis identified 13 historical consultations on oil and gas activities (including oil and gas related seismic surveys and oil spill planning and response) between 2007 and 2017, including one programmatic consultation, four formal consultations, and eight informal consultations. These consultations were spread across critical habitat units off the coasts of Alaska and California. This analysis assumes that future consultations will occur at the same rate and in the same critical habitat units as historical consultations.

214. Additionally, based on discussion with BOEM, this analysis includes an additional seismic survey for oil and gas in the consultation forecast for 2019 in Unit 19.[206] Additionally, the Pacific (Washington, Oregon, and California) and Alaska BOEM regions noted the Administration's interest in opening all planning areas in the Draft 5–Year National OCS Program. However, there is substantial uncertainty regarding industry interest in all planning areas and uncertainty surrounding the areas that will be included in the final National OCS Program.[207] In the case that additional activities related to oil and gas exploration and development result in additional consultations considering humpback whale critical habitat, this analysis underestimates the associated incremental administrative costs of the rule.

3.1.2.4 Alternative Energy

215. Based on discussions with FERC and BOEM, this analysis includes three formal consultations on wind energy projects and two formal consultations on hydrokinetic projects on the Washington/Oregon/California coast.[208] However, these types of projects are emerging activities which are difficult to forecast. The hydrokinetic projects are fairly well-developed and they may be permitted within the ten-year timeframe of this analysis although the timing is uncertain. As a result, this analysis conservatively assumes that all consultations on these activities will occur in the first year following the critical habitat designations. Assuming this activity all occurs in the first year leads the analysis to more likely overestimate than underestimate the economic impacts.

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[205] This analysis relies on the consultation history over a period between 2007 and 2017 to estimate the average annual rate of consultation. This time period did not capture a recent formal consultation on an Exempted Fishing Permit (FMP) for the HMS fishery. Critical habitat for the humpback whales is not expected to affect the outcome of consultations on fisheries, as described in the analysis. The analysis may slightly underestimate administrative costs of consults on fisheries; however, including the administrative costs associated with one additional consultation every ten years would not measurably affect the findings of this analysis.

[206] Personal communication with Rick Yarde, BOEM, October 26, 2018.

[207] Personal communication with Rick Yarde, BOEM, October 26, 2018 and Frances Mann, BOEM, October 31, 2018.

[208] Personal communication with Rick Yarde, BOEM, October 26, 2018 and Tim Konnert, FERC, September 24, 2018.

216. Based on conversations with the FERC representative in Alaska, this analysis does not include any alternative energy projects consultations in Alaska within the timeframe of this analysis.[209]

3.1.2.5 Aquaculture and Hatcheries

217. For Washington and Oregon, the consultation forecast is based on the consultation history and information from the NMFS West Coast Regional Aquaculture Coordinators. Based on the consultation history, this analysis includes two consultations on Nationwide Permit 48, which provides authorization for a variety of activities related to commercial shellfish aquaculture under Section 10 of the Rivers and Harbors Act, and Section 404 of the CWA.[210] The Northwest Regional Aquaculture Coordinator further indicated that there are two state-wide consultations on shellfish activities for Oregon and Washington that concluded "no effect" on humpback whales.[211] This analysis assumes a single formal consultation in the future for each statewide program.

218. The Southwest Regional Aquaculture Coordinator for NMFS indicated that the only likely expansion of offshore aquaculture activity in the future in the region would occur south of Pt. Conception. Two additional projects (one for mussels and one for finfish) are anticipated to be subject to consultation upon permitting.[212] As the specific location for these activities is still under review, the consultation forecast assumes one will occur in potential critical habitat Unit 18 and one in critical habitat Unit 19.

219. For Alaska, this analysis forecasts 12 informal consultations per year based on information provided by ADF&G.[213] This forecast is based on the rate of applications for aquatic farms in recent years. However, ADF&G believes that this rate may increase over time. If that is the case, the analysis understates administrative costs of Section 7 consultations on this activity.

3.1.2.6 LNG Facilities

220. FERC maintains a list of proposed LNG import and export terminals across the United States.[214] Currently, this list includes two proposed LNG terminals adjacent to the critical habitat (Units 6 and 13). This analysis assumes that formal consultations will occur on both of these proposed LNG terminals in 2019. This analysis assumes that these projects will result in formal consultations because all historical LNG consultations in the consultation history were formal consultations.

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[209] Personal communication with David Turner, FERC, September 25, 2018 and Frances Mann, BOEM, October 31, 2018.

[210] U.S. Army Corps of Engineers. 2019. Decision Document: Nationwide Permit 48. Viewed on May 10, 2019, https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/6759.

[211] Personal communication with Laura Hoberecht, National Marine Fisheries Service, December 6, 2018.

[212] Personal communication with Diane Windham, National Marine Fisheries Service, December 20, 2018.

[213] Email communication from Sabrina Larson, ADF&G to Industrial Economics, Inc. on March 26, 2020.

[214] FERC. North American LNG Export Terminals (Proposed), as of October 2018. Accessed at: https://www.ferc.gov/industries/gas/indus-act/lng/lng-proposed-export.pdf?csrt=13242143116563767413

3.1.2.7 Water Quality Management and Inland Activities

221. This analysis forecasts future consultations on water quality management primarily based on the consultation history. This analysis identified 18 historical consultations related to water quality management between 2007 and 2017, including one programmatic consultation, five formal consultations, and 12 informal consultations. These consultations were spread across many critical habitat units, with five consultations relevant to "all units." This analysis assumes that future consultations will occur at the same rate and in the same critical habitat units as historical consultations.

222. Additionally, based on discussion with the ADEC, this analysis forecasts four additional formal consultations on water quality management in Alaska. Specifically, this analysis assumes that in the next ten years two consultations will occur on the general permit for seafood processing discharges in Alaska, and two consultations will occur on the general permit for cruise ship discharges in Alaska.

3.1.2.8 Other Activities

223. For all other activities, this analysis forecasted future consultations based exclusively on the consultation history. Specifically, this analysis identified the following historical consultations on the remaining activities:

- *Vessel Traffic*: one formal and two informal consultations spread across Units 8, 10, 16, and 19.
- *Military Activities*: 13 formal consultations and 14 informal consultations, with the largest percentage of consultations in Units 10, 11, and 19 (and two consultations relevant to "all units")
- *Space Vehicle and Missile Launches*: two formal and three informal consultations, with the largest percentage located in Unit 18.
- *USFS Activities*: thirteen informal consultations located in Unit 10.
- *Scientific Research*: seven formal consultations and one informal consultation, spread across critical habitat units in Alaska, Oregon, and Washington.

224. For all of these activities, this analysis assumes that the frequency and location of consultations over the next ten years will match the frequency and location of consultations observed in the consultation history.

3.1.3 CONSULTATION FORECAST

225. Based on the information sources discussed above, Exhibits 3-1 and 3-2 present the total forecast of section 7 consultations by critical habitat unit over the next ten years. Exhibit 3-1 summarizes the future consultations by consultation type and Exhibit 3-2 summarizes the consultations by activity.

226. As described previously, this analysis estimates a range of future consultations due to uncertainty surrounding the historical rate of in-water construction activities within the critical habitat area. In some units, the activity forecast identifies fractions of

consultations. This is because some consultations consider activities that cross multiple units. In these instances, the forecast divides the consultation (and associated costs) across the relevant units. In addition, in some cases this analysis relied on consultation history data to estimate an average annual rate of consultations to forecast future consultations over the ten-year timeframe.

EXHIBIT 3-1. SECTION 7 CONSULTATION FORECAST BY CONSULTATION TYPE (TEN YEAR TOTAL, 2020 – 2029)

DPS	CRITICAL HABITAT UNIT(S)	PROGRAMMATIC	FORMAL	INFORMAL
Mexico and Western North Pacific	1	0.2	0.6	7.5
Mexico and Western North Pacific	2	0.2	0.6 - 4.2	8.5 - 9.4
Mexico and Western North Pacific	3	0.2	0.6 - 1.5	7.5
Mexico and Western North Pacific	4	0.2	0.6	8.5 - 9.4
Mexico and Western North Pacific	5	0.2	4.0 - 4.9	10.9 - 12.7
Mexico and Western North Pacific	6	1.1	3.4	10.8 - 12.6
Mexico and Western North Pacific	7	0.2	2.1	6.0
Mexico and Western North Pacific	8	0.2	2.1	9.8
Mexico and Western North Pacific	9	0.2	2.1	6.0
Mexico	10	0.2	3.1 - 5.9	110.9 - 133.6
Mexico and Central America	11	1.4 - 1.9	7.1	9.3 - 10.7
Mexico and Central America	12	1.4	9.9	1.9
Mexico and Central America	13	1.0	15.9 - 17.8	2.3
Mexico and Central America	14	0.0	3.7	1.0
Mexico and Central America	15	0.0	1.9	1.0
Mexico and Central America	16	0.0	4.6	1.0
Mexico and Central America	17	0.0	15.2	1.3
Mexico and Central America	18	0.0	5.0	3.5
Mexico and Central America	19	0.0	8.3	3.5 - 4.4
All DPS	All Units*	0.9	2.7	2.7
Total		**7.6 - 8.1**	**93.5 - 103.5**	**213.9 - 244.4**

Notes:
* Consultations associated with "all units" are large-scale national level consultations that are expected to consider humpback whales and critical habitat but are not associated with the designation of any particular unit or units.

EXHIBIT 3-2. SECTION 7 CONSULTATION FORECAST BY ACTIVITY TYPE (TEN YEAR TOTAL, 2020 - 2029)

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Western North Pacific	1	0.4	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.4	0.0	0.0
Mexico and Western North Pacific	2	0.4	0.0	0.0	1.0 - 5.5	0.0	7.5	0.0	0.0	0.0	0.4	0.0	0.0
Mexico and Western North Pacific	3	0.4	0.0	0.0	0.0 - 0.9	0.0	7.5	0.0	0.0	0.0	0.4	0.0	0.0
Mexico and Western North Pacific	4	0.4	0.0	0.0	1.0 - 1.9	0.0	7.5	0.0	0.0	0.0	0.4	0.0	0.0
Mexico and Western North Pacific	5	0.4	0.2	0.0	5.0 - 7.7	0.0	6.0	1.8	0.0	0.9	0.4	0.0	0.4
Mexico and Western North Pacific	6	0.4	4.5	0.0	3.0 - 4.8	0.0	6.0	0.0	1.0	0.0	0.4	0.0	0.0
Mexico and Western North Pacific	7	0.4	0.2	0.0	0.0	0.0	6.0	0.9	0.0	0.0	0.4	0.0	0.4
Mexico and Western North Pacific	8	0.4	1.1	0.0	2.0	0.9	6.0	0.9	0.0	0.0	0.4	0.0	0.4
Mexico and Western North Pacific	9	0.4	0.2	0.0	0.0	0.0	6.0	0.9	0.0	0.0	0.4	0.0	0.4
Mexico	10	0.4	2.0	0.0	32.0 - 57.5	0.9	60.0	2.7	0.0	0.0	4.0	11.8	0.4
Mexico and Central America	11	1.2	0.0	0.0	4.0 - 5.8	0.0	1.4	8.0	0.0	0.1	0.9	0.0	2.3
Mexico and Central America	12	1.2	0.0	0.0	6.0	0.0	1.4	1.6	0.0	0.1	1.5	0.0	1.4
Mexico and Central America	13	1.2	0.0	1.0	10.0 - 11.8	0.0	1.0	0.7	1.0	0.1	2.4	0.0	1.8
Mexico and Central America	14	1.8	0.0	1.0	0.0	0.0	0.0	0.7	0.0	0.1	1.1	0.0	0.0

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Central America	15	1.6	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.1	0.5	0.0	0.0
Mexico and Central America	16	1.6	0.0	0.0	3.0	0.5	0.0	0.0	0.0	0.1	0.5	0.0	0.0
Mexico and Central America	17	1.6	0.3	3.0	11.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0
Mexico and Central America	18	1.6	2.1	0.0	1.0	0.0	1.0	0.0	0.0	2.4	0.5	0.0	0.0
Mexico and Central America	19	1.6	2.2	0.0	2.0 - 2.9	0.5	1.0	3.6	0.0	0.6	0.5	0.0	0.0
All DPS	All Units*	N/A	N/A	N/A	N/A	N/A	N/A	1.8	N/A	N/A	4.5	N/A	N/A
Total		**17.2**	**12.8**	**5.0**	**81.0 - 121.9**	**2.7**	**125.8**	**24.5**	**2.0**	**4.5**	**20.4**	**11.8**	**7.3**

Notes:
* Consultations associated with "All Units" are large-scale national level consultations that are expected to consider humpback whales and critical habitat but are not associated with the designation of any particular unit or units. A "N/A" indicates "not applicable" because the activity does not result in consultations at the spatial scale of the groupings of units described in the first column. This is different than a "0" entry, which simply indicates that no consultations for the activity are associated with the specified unit.

3.2 INDIRECT EFFECTS

227. As described in Section 1.3.3.5, the designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to consultation under section 7 under the ESA. Indirect impacts reflect changes in economic behavior that may occur outside of the ESA, through other Federal, state, or local actions, and that are caused by the designation of critical habitat.

228. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other state or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation. Indirect costs may also be incurred where designation of critical habitat results in costs associated with project delays, or regulatory uncertainty that results in changes in behavior (e.g., resulting in individuals avoiding activities within critical habitat).

229. In order to gather information regarding potential indirect effects of the critical habitat designations for the humpback whales, we reached out to state agencies to identify potential pathways by which the designations could change the level or management of activities, as described in Sections 3.3.1 through 3.3.4. Additionally, due to the unique circumstances of tribal communities, NMFS conducted outreach and worked to gather input from tribes on potential effects that may occur as a result of these designations. That effort is described in further detail in NMFS's *Section 4(b)(2) Report*. Any economic impacts specific to tribes or tribal communities that are identified through addition coordination efforts by NMFS will be incorporated into this analysis and will be considered by NMFS under their 4(b)(2) analysis prior to finalizing the critical habitat designations.

3.2.1 WASHINGTON

230. This analysis considers the extent to which the critical habitat designations may trigger additional state or local policies and laws in Washington that could result in indirect impacts related to certain activities. Previous discussions with the Washington Department of Ecology identified a potential for implications on the State Department of Fish and Wildlife permitting of hydraulic projects. Additionally, Washington Department of Ecology indicated that information on the critical habitat will need to be made available to resource managers and stakeholders as part of the ongoing marine spatial planning efforts. Adding these areas to the maps does not have direct implications on activities allowed or restricted; however, it is possible that the additional information

could result in project proponents relocating or revising plans (e.g., for scoping renewable energy projects).[215]

231. Additionally, the Washington Department of Ecology (ECY) develops new or revised water quality standards upon the receipt of new scientific information from EPA, tribes, or the public, which most often occurs during the triennial review of the existing standards. The EPA reviews and provides guidance as requested on WA water quality standards after the state adopts the standards. The triennial review itself is not an EPA action and therefore does not trigger ESA section 7 consultation.

232. In general, the WA ECY protects the state's waters in four designated use categories: aquatic life uses, recreational uses, water supply uses, and miscellaneous uses. The State of Washington considers four use categories in marine waters: aquatic life uses, shellfish harvesting, recreational uses, and miscellaneous uses. Because WA ECY is required to provide full protection to aquatic life at all life stages, existing water quality standards address any water quality issues that may affect humpback whale prey species survival and propagation. The humpback whale endangered species listing has not triggered changes in any state water quality rules to date. As a result, indirect economic impacts related to water quality standards are unlikely in Washington.

233. There is no indication from these initial communications that the existence of critical habitat for other endangered species, such as killer whales in Puget Sound, has resulted in changes in State programs, projects, or policies. Thus, this analysis finds that it is unlikely that the critical habitat designation of the outer coastal waters will change the level or management of economic activities in these areas.

3.2.2 OREGON

234. Representatives from the State of Oregon previously described the extensive planning process that the state has undertaken to consider and manage the multiple uses of its territorial sea.[216] Specifically, the state has considered extensively how to balance its development with the health of the state's marine resources and habitats. Oregon's Statewide Planning Goals and Guidelines include Goal 19: Ocean Resources, "to conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations."[217] Sections 2, 4, and 5 of Oregon's Territorial Sea Plan, which implements Goal 19, establish standards against which applications for all proposed actions (including renewable energy specifically) will be reviewed, and which will provide the basis for the regulating agency to develop specific measures for environmental protection and

[215] Communication with Jennifer Hennessey and Terry Swanson, Washington Department of Ecology, April 27, 2017. This communication was in reference to the potential expansion of critical habitat for Southern Resident Killer Whales, though the findings remain relevant to the humpback whale designations.

[216] Information in this section is based on personal communication with Elizabeth Ruther, Oregon Dept. of Land Conservation and Development, April 2017 and January 2018. This communication was in reference to the potential expansion of critical habitat for Southern Resident Killer Whales, though the findings remain relevant to the humpback whale designations.

[217] Oregon's Statewide Planning Goals & Guidelines, Goal 19: Ocean Resources (OAR 660-015-0010(4)).

mitigation. For all ocean uses, these standards include a directive that they not adversely affect "critical marine habitats," which are defined to include federally designated critical habitat. For example, the ecological resources of concern on which renewable energy facilities "shall have no significant adverse effect include "critical marine habitats" (including those defined as such by the ESA).[218] Additionally, Important, Sensitive, or Unique (ISU) Areas," including estuary and river mouths (particularly those that support salmon) are provided the "highest level of protection from the effects of renewable energy development."

235. Given the high degree of scrutiny to which activities in Oregon's territorial sea are subject, and the particular emphasis on protecting "critical marine habitat" from negative effects, it is possible that the designation of ESA-defined critical habitat may result in additional conservation efforts being requested by the state to protect that habitat. Interviewees were not able to predict with certainty to what extent this might occur, or what type of conservation efforts may be requested, but noted that it would depend upon several things including the nature of the project, and whether the proposed project location was located in a marine zone in which strict conservation protections are already in place.[219]

236. Additionally, as mandated by the CWA, the Oregon Department of Environmental Quality (DEQ) reviews its water quality standards every three years to include new science, improve protection, and comply with any new ESA regulations or court decisions. The review process also considers ecological value in the form of increased protection for threatened and endangered species. The current Oregon DEQ water quality standards include protections for endangered or threatened species from activities related to anti-degradation, discharge loads, stream loading, water quality trading, variance, and dam removal. The habitats of most humpback whale prey species are not affected by Oregon's water quality standards, and anadromous prey species such as eulachon are explicitly protected under water quality standards. Because the Oregon DEQ water quality standards protect endangered and threatened species to the fullest extent, it is unlikely that the critical habitat designations for humpback whales would result in indirect economic impacts related to water quality.

237. To further evaluate the potential scope and scale of indirect effects, it is worth considering that much of the area in Oregon's offshore marine waters considered for critical habitat for humpback whales is already designated as critical habitat for green sturgeon. Thus, whether that designation has triggered specific conservation efforts or requirements in the past offers some evidence of the potential impacts of the whales' critical habitat designations (as well as whether any future conservation efforts can be solely attributed to the whales' critical habitat). To date, no projects have been proposed in the area that have posed a threat to the essential features of green sturgeon habitat, and thus critical habitat designation has not resulted in additional project costs. Yet, it is

[218] Oregon Territorial Sea Plan Part 5: Use of the Territorial Sea for the Development of Renewable Energy Facilities or Other Related Structures, Equipment or Facilities (B)(4)(g)(3)(a)(v).

[219] Personal communication with Elizabeth Ruther, Oregon Dept. of Land Conservation and Development, April 12, 2017.

possible that future proposed projects may present different threats or threats in different locations that could result in a different outcome. To the extent that the critical habitat designations for humpback whales may trigger specific conservation efforts in Oregon's coastal waters, this analysis may underestimate the total cost of the designations.

3.2.3 CALIFORNIA

238. The California Environmental Quality Act (CEQA) requires that state and local agencies responsible for project approval consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. A "project" may include state agency activities such as issuance of a permit or approval of a plan. For example, the California Department of Fish and Game is required by CEQA to consider the potential environmental impacts of the state managed herring fishery each year.[220] In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were "categorically exempt" from preparing an Environmental Impact Report (EIR) under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, any additional administrative or conservation requirements would be indirect, incremental effects of the designation. However, this analysis does not attempt to quantify these impacts due to substantial uncertainty as to how designation of critical habitat may affect implementation and outcome of the CEQA process, and the number of projects affected. To the extent that the critical habitat designations for humpback whales may trigger specific conservation efforts, this analysis may underestimate the total cost of the designations.

239. In accordance with the Marine Life Protection Act (MLPA), California established the Marine Life Protection Program, which resulted in a coordinated and deliberate process to establish a cohesive, extensive network of Marine Protected Areas (MPAs) within its state waters. Among the goals of the Marine Life Protection Program is "to protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems." Given the focus on protection of the ecosystems as a whole, including the habitat itself, this analysis considers the possibility that the identification of habitat that is considered critical to the recovery of an endangered species may result in indirect costs in the form of the addition of new MPAs, or changes to the boundaries or nature of existing MPAs. Presently, the MPA network does not wholly incorporate already-designated critical habitat in California State waters suggesting that designation as critical habitat alone is not an automatic trigger for inclusion within an MPA. Further, the selection of MPA sites, as well as designation of the type of MPA to be designated, was the result of a multi-year, stakeholder-driven process considering numerous criteria extending beyond the ecological value of the habitat. Finally, changes or additions to the MPA network are driven by petition, rather than being specifically tied to an event such

[220] California Department of Fish and Wildlife. 2019. California Environmental Quality Act (CEQA). Viewed at https://www.wildlife.ca.gov/Fishing/Commercial/Herring/CEQA on June 6, 2019.

as Federal designation of critical habitat. As such, it is unlikely that the critical habitat designations for humpback whales would necessarily trigger specific changes in the extent and nature of the existing MPA network.

3.2.4 ALASKA

240. As described in Chapter 2, ADF&G considered the extent to which the designation of critical habitat may generate indirect impacts on activities for which no Federal nexus exists. For example, there is a sizeable fishery for herring that is managed by the state and, as it targets the essential feature of critical habitat, there is the potential for the designation of critical habitat to influence how herring fisheries are managed by the state. The state also manages numerous other fisheries that do not involve a Federal nexus triggering section 7 consultation, including for certain species of groundfish, salmon, crabs, and shrimp. However, ADF&G specified that "generalizations regarding changes in the way the state may make management decisions as a result of [critical habitat designation] are not possible."[221]

241. Representatives from ADF&G further indicated concern regarding potential impacts to the tourism industry as a result of the critical habitat designations for humpback whales. According to the state, activities related to tourism "may potentially result in disturbance to or entanglement of marine mammals."[222] However, risk of disturbance and entanglement would be considered as part of a jeopardy analysis for actions with a Federal nexus and resulting economic impacts would not be attributable to the critical habitat designations. To the extent that construction of tourism-related infrastructure could result in impacts to the critical habitat specifically (i.e., the prey species), NMFS does not believe additional conservation efforts would be likely for these projects given existing baseline protections (as described in Chapter 2). The administrative costs of the section 7 consultation are captured in the context of construction activities requiring Corps permits, as described in Chapters 2 and 3.

242. Finally, public comments received from the State of Alaska and numerous stakeholders in Alaska expressed concern that the critical habitat designations may result in permitting and project delays for activities including in-water construction, NPDES/APDES permitting, and aquaculture permitting. To the extent that delays in permitting result from the designations, these costs represent indirect costs of the rule. However, it is not possible to predict with certainty the timing, frequency, and extent to which these costs will be incurred and they are thus unquantified in the analysis.

3.3 ESTIMATED INCREMENTAL ADMINISTRATIVE COSTS

243. As discussed previously, economic impacts of the critical habitat that can be monetized are most likely to be limited to additional administrative effort to consider critical habitat

[221] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

[222] Ingle, Moira ESA Coordinator, ADF&G. "Information on Aquatic Farming and Fish Hatcheries within NMFS Preliminary Critical Habitat for Humpback Whales in Alaska". Received by Dr. Lisa Manning, NMFS, June 17, 2019.

as part of future section 7 consultations that are incurred by all parties to the consultation. Those parties that may incur costs include NMFS, the Federal action agency (i.e., the agency permitting the activity), and where relevant, a third-party applicant, which may be a municipality, a private party, etc. This analysis calculates the incremental administrative costs by combining the forecast of section 7 consultations by the estimated average administrative costs per consultation presented in Exhibit 1-3.

244. Overall, this analysis finds that the critical habitat may increase administrative costs of consultation regarding humpback whales by $930,000 to $1,000,000 over the next ten years ($110,000 to $120,000 annualized) assuming a seven percent discount rate (or $1.1 million to $1.2 million and $120,000 to $130,000 annualized, assuming a three percent discount rate).[223] Exhibit 3-3 presents the total present value and annualized administrative costs associated with the critical habitat by critical habitat unit. The greatest portion of these impacts are associated with consultations on activities occurring in critical habitat Unit 10 (Southeastern Alaska). Additionally, Exhibit 3-4 summarizes total present value and annualized administrative costs by DPS. More than half of total costs are associated with the Mexico and Central America DPS, encompassing all critical habitat units in Washington, Oregon, and California.

245. Exhibit 3-5 displays the expected present value economic impacts by activity type. The largest portions of estimated costs are associated with in-water construction and dredging activities (25 to 33 percent), aquaculture and hatchery activities (27 to 30 percent), and commercial fishing (14 to 15 percent). All other activities experience relatively minor administrative costs of consultation over the timeframe of the analysis.

246. All impacts are presented assuming a seven percent discount rate. Tables and text presenting total administrative costs by unit also present costs assuming a three percent discount rate for comparison. Undiscounted impacts are presented in Appendix A, and Appendix B provides additional information on present value and annualized impacts applying an alternative discount rate assumption of three percent for comparison.

[223] Section 1.3.3.7 provides an explanation for the selected timeframe for this analysis.

EXHIBIT 3-3. TOTAL PRESENT VALUE (2020-2029) AND ANNUALIZED ECONOMIC IMPACTS OF ALL HABITAT UNITS ORIGINALLY CONSIDERED FOR DESIGNATION BY HABITAT UNIT (2020 DOLLARS, 3% AND 7% DISCOUNT RATES)

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Mexico and Western North Pacific	1	$20,000	$2,300	$23,000	$2,600
Mexico and Western North Pacific	2	$23,000 - $39,000	$2,600 - $4,400	$26,000-$45,000	$2,900-$5,100
Mexico and Western North Pacific	3	$20,000 - $24,000	$2,300 - $2,700	$23,000 - $27,000	$2,600 - $3,100
Mexico and Western North Pacific	4	$23,000 - $24,000	$2,600 - $2,800	$26,000 - $28,000	$2,900 - $3,100
Mexico and Western North Pacific	5	$41,000 - $48,000	$4,600 - $5,400	$47,000 - $55,000	$5,300 - $6,200
Mexico and Western North Pacific	6	$46,000 - $49,000	$5,200 - $5,600	$52,000 - $56,000	$5,900 - $6,400
Mexico and Western North Pacific	7	$23,000	$2,600	$26,000	$3,000
Mexico and Western North Pacific	8	$30,000	$3,400	$35,000	$4,000
Mexico and Western North Pacific	9	$23,000	$2,600	$26,000	$3,000
Mexico	10	$230,000 - $280,000	$26,000 - $32,000	$270,000 - $330,000	$30,000 - $38,000
Mexico and Central America	11	$66,000 - $72,000	$7,500 - $8,200	$75,000 - $82,000	$8,500 - $9,300
Mexico and Central America	12	$61,000	$6,900	$70,000	$8,000
Mexico and Central America	13	$83,000 - $90,000	$9,500 - $10,000	$96,000 - $100,000	$11,000 - $12,000
Mexico and Central America	14	$22,000	$2,600	$26,000	$3,000
Mexico and Central America	15	$15,000	$1,700	$18,000	$2,000
Mexico and Central America	16	$26,000	$3,000	$30,000	$3,500
Mexico and Central America	17	$70,000	$7,900	$81,000	$9,200
Mexico and Central America	18	$34,000	$3,900	$39,000	$4,400
Mexico and Central America	19	$49,000 - $50,000	$5,500 - $5,700	$55,000 - $57,000	$6,200 - $6,500
All DPS	All Units	$23,000	$2,600	$27,000	$3,000
Total		**$930,000 - $1,000,000**	**$110,000 - $120,000**	**$1,100,000 - $1,200,000**	**$120,000 - $130,000**

Notes:
Estimates are rounded to two significant digits.

EXHIBIT 3-4. TOTAL PRESENT VALUE AND ANNUALIZED ECONOMIC IMPACTS OF ALL HABITAT UNITS ORIGINALLY CONSIDERED FOR DESIGANTION BY DPS, 2020-2029 (2020 DOLLARS, 3% AND 7% DISCOUNT RATES)

DPS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS (7% DISCOUNT RATE)	PRESENT VALUE IMPACTS (3% DISCOUNT RATE)	ANNUALIZED IMPACTS (3% DISCOUNT RATE)
Western North Pacific	$270,000 - $300,000	$31,000 - $35,000	$310,000 - $350,000	$35,000 - $40,000
Mexico	$930,000 - $1,000,000	$110,000 - $120,000	$1,100,000 - $1,200,000	$120,000 - $130,000
Central America	$450,000 - $460,000	$51,000 - $53,000	$520,000 - $530,000	$59,000 - $61,000

Notes:
1. Estimates are rounded to two significant digits.
2. Impacts presented in this exhibit may not be summed across DPSs. Most critical habitat units are associated with multiple DPSs, and the forecasted impacts are presented for all critical habitat units relevant to each DPS. As a result, summing across DPSs would result in double counting of some impacts.

EXHIBIT 3-5. TOTAL PRESENT VALUE ECONOMIC IMPACTS BY ACTIVITY TYPE, 2020-2029 (2020 DOLLARS, 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUA-CULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Western North Pacific	1	$4,200	$0	$0	$0	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	2	$4,200	$0	$0	$2,500 - $19,000	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	3	$4,200	$0	$0	$0 - $3,600	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	4	$4,200	$0	$0	$2,400 - $4,100	$0	$14,000	$0	$0	$0	$1,800	$0	$0
Mexico and Western North Pacific	5	$4,200	$720	$0	$12,000 - $19,000	$0	$11,000	$5,400	$0	$3,600	$1,800	$0	$1,400
Mexico and Western North Pacific	6	$4,200	$17,700	$0	$5,700 - $9,200	$0	$11,000	$0	$5,300	$0	$1,800	$0	$0
Mexico and Western North Pacific	7	$4,200	$720	$0	$0	$0	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico and Western North Pacific	8	$4,200	$2,420	$0	$3,500	$1,700	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico and Western North Pacific	9	$4,200	$720	$0	$0	$0	$11,000	$3,600	$0	$0	$1,800	$0	$1,400
Mexico	10	$4,200	$4,200	$0	$65,000 - $120,000	$1,700	$110,000	$5,200	$0	$0	$8,700	$23,000	$1,400
Mexico and Central America	11	$10,000	$0	$0	$14,000 - $20,000	$0	$12,000	$19,000	$0	$190	$2,700	$0	$8,400
Mexico and Central America	12	$10,000	$0	$0	$24,000	$0	$12,000	$4,600	$0	$190	$5,100	$0	$4,800
Mexico and Central America	13	$10,000	$0	$5,300	$37,000 - $44,000	$0	$9,800	$2,900	$5,300	$190	$5,900	$0	$6,600
Mexico and Central America	14	$12,000	$0	$3,800	$0	$0	$0	$2,900	$0	$190	$3,300	$0	$0
Mexico and Central America	15	$11,000	$0	$0	$0	$0	$0	$2,900	$0	$190	$870	$0	$0
Mexico and Central America	16	$11,000	$0	$0	$12,000	$1,800	$0	$0	$0	$190	$870	$0	$0
Mexico and Central America	17	$11,000	$580	$13,000	$44,000	$0	$0	$0	$0	$190	$870	$0	$0

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUA-CULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Central America	18	$11,000	$5,900	$0	$4,000	$0	$5,300	$0	$0	$6,400	$870	$0	$0
Mexico and Central America	19	$11,000	$7,600	$0	$8,000 - $9,700	$1,800	$5,300	$13,000	$0	$1,100	$870	$0	$0
All DPS	All Units*	$0	$0	$0	$0	$0	$0	$5,400	$0	$0	$17,000	$0	$0
Total		**$140,000**	**$40,000**	**$22,000**	**$230,000 - $330,000**	**$7,100**	**$270,000**	**$71,000**	**$11,000**	**$12,000**	**$63,000**	**$23,000**	**$27,000**

Notes: Estimates are rounded to two significant digits.
* Consultations associated with "All Units" are large-scale national level consultations that are expected to consider humpback whales and critical habitat but are not associated with the designation of any particular unit or units. A "N/A" indicates "not applicable" because the activity does not result in consultations at the spatial scale of the groupings of units described in the first column. This is different than a "0" entry, which simply indicates that no consultations for the activity are associated with the specified unit.

3.4 CONCLUSIONS

248. Overall, this analysis estimates that present value impacts of the critical habitat designations will total $930,000 to $1,000,000 over the next ten years ($110,000 to $120,000 annualized). These impacts reflect the administrative costs associated with considering humpback whale critical habitat during future section 7 consultations. NMFS does not anticipate that the critical habitat designations would result in incremental conservation efforts for any activity. The largest portion of costs are expected in Unit 10 (Southeastern Alaska), followed by Unit 13 (Oregon), and Unit 17 (California). The largest portions of estimated costs are associated with in-water construction and dredging activities (25 to 33 percent), aquaculture and hatchery activities (27 to 30 percent), and commercial fishing (14 to 15 percent). All other activities experience relatively minor administrative costs of consultation over the timeframe of the analysis.

249. Exhibit 3-6 presents a comparison of the quantified impacts reported in the draft economic analysis to those reported in this final economic analysis. Overall, modifications made to the analysis result in an increase in the anticipated total present value and annualized costs of the rule, especially in Alaska, and in Unit 10 particularly. Increases in the anticipated costs of the rule reflect some changes in anticipated levels of certain activities (e.g. aquaculture) as well as a shift in the timeframe of the analysis and update of the results from 2018$ to 2020$ to adjust for inflation.

EXHIBIT 3-6. TOTAL PRESENT VALUE AND ANNUALIZED ECONOMIC IMPACTS BY CRITICAL HABITAT UNIT, 2020-2029 (2020 DOLLARS, 7% DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico and Western North Pacific	1	$3,800	$430	$20,000	$2,300	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	2	$6,100 - $21,000	$690 - $2,400	$23,000 - $39,000	$2,600 - $4,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	3	$3,800 - $7,100	$430 - $810	$20,000 - $24,000	$2,300 - $2,700	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	4	$5,900 - $7,500	$680 - $860	$23,000 - $24,000	$2,600 - $2,800	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico and Western North Pacific	5	$25,000 - $31,000	$2,800 - $3,600	$41,000 - $48,000	$4,600 - $5,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	6	$30,000 - $33,000	$3,400 - $3,700	$46,000 - $49,000	$5,200 - $5,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	7	$9,100	$1,000	$23,000	$2,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	8	$15,000	$1,800	$30,000	$3,400	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Western North Pacific	9	$9,100	$1,000	$23,000	$2,600	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
Mexico	10	$110,000 - $160,000	$12,000 - $18,000	$230,000 - $280,000	$26,000 - $32,000	• Increased rate of consultation on aquaculture and hatchery projects in future years per data from ADF&G. • Increased rate of consultation on water quality management activity related to General Permits per data from ADEC. • Costs updated from 2018$ to 2020$. Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	11	$60,000 - $66,000	$6,800 - $7,500	$66,000 - $72,000	$7,500 - $8,200	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	12	$56,000	$6,300	$61,000	$6,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	13	$76,000 - $82,000	$8,600 - $9,400	$83,000 - $90,000	$9,500 - $10,000	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	14	$20,000	$2,300	$22,000	$2,600	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	15	$14,000	$1,600	$15,000	$1,700	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	16	$24,000	$2,700	$26,000	$3,000	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	17	$64,000	$7,200	$70,000	$7,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	18	$31,000	$3,500	$34,000	$3,900	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Mexico and Central America	19	$44,000 - $46,000	$5,000 - $5,200	$49,000 - $50,000	$5,500 - $5,700	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.

DPS	CRITICAL HABITAT UNIT(S)	DRAFT ECONOMIC ANALYSIS		FINAL ECONOMIC ANALYSIS		BASIS FOR CHANGES
		PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS (7% DISCOUNT RATE)	ANNUALIZED IMPACTS	
All DPS	All Units	$22,000	$2,500	$23,000	$2,600	• Costs updated from 2018$ to 2020$. • Timeframe of analysis shifted from 2019-2028 to 2020-2029.
Total		**$630,000 - $720,000**	**$72,000 - $82,000**	**$930,000 - $1,000,000**	**$110,000 - $120,000**	

Note: Estimates are rounded to two significant digits.

Acronyms:
ADF&G: Alaska Department of Fish and Game
ADEC: Alaska Department of Environmental Conservation

CHAPTER 4 | ECONOMIC BENEFITS

250. The primary goal of critical habitat is to support the long-term conservation and recovery of the whales. Most directly, critical habitat contributes to conservation and recovery of listed species due to additional conservation efforts implemented to avoid adverse modification of critical habitat due to the section 7 consultation process. Chapters 2 and 3 of this report evaluate the expected economic costs that may be generated by the critical habitat designations for humpback whales. This analysis identifies that, based on the best available information at this time, it is unlikely that the need to avoid adverse modification would trigger additional conservation efforts above and beyond those that would be undertaken to avoid jeopardy. However, this analysis emphasizes the uncertainty associated with that finding. Following the designation of critical habitat, each consultation will be subject to analysis of potential for jeopardy and of adverse modification based on the specific circumstances of the planned project or activity. If for a given future project, NMFS makes a conservation recommendation to avoid adverse modification that would not have been made but for the critical habitat designation (i.e., would not have been made to avoid jeopardy), the associated costs and benefits would be considered economic effects of this rulemaking. In addition, given the additional requirement to consider effects to the critical habitat, federal agencies may modify the design of their action prior to entering into formal consultation. Such decisions cannot be forecasted.

251. Given these uncertainties, this analysis is unable to quantify the economic benefits of this rulemaking. This section therefore discusses the economic literature on the benefits of conservation of humpback whales, in general, but does not estimate the extent to which this rule contributes to that conservation.

252. The economics literature demonstrates that, in general, conservation and recovery of the whales would generate economic benefits both associated with potential use values people hold for the whales (e.g., for wildlife viewing), as well as non-use values (i.e., people's preference for the continued existence of the whales regardless of any direct or indirect use of the animals). For discussion of how NMFS assessed the conservation

value of particular areas under section 4(b)(2) of the ESA, please refer to the Final Biological Report (NMFS, 2020a).

KEY FINDINGS

- Given the uncertainty regarding conservation efforts that may be triggered by this rule, we are unable to quantify the benefits. This section therefore provides an overview of economic literature on the benefits of the overall conservation of the humpback whale. The economic benefits described are not benefits specifically of this rulemaking.
- The primary goal of critical habitat designation is to support long-term conservation and recovery of the whales. Conservation efforts triggered by this rule would result in benefits, including use benefits (e.g., wildlife-viewing), non-use benefits (e.g., existence values), and ancillary ecosystem service benefits (e.g., water quality improvements and enhanced habitat conditions for other marine and coastal species).
- The existing economics literature finds that people value humpback whales in terms of the utility gained from whale watching experiences. In Washington, Oregon, California, and Alaska, humpback whales are a target species for whale watchers. Whale watch participants in these states generate tens of millions of dollars in economic activity annually.
- Recent research regarding the public's value for the recovery of humpback whales identifies that populations across the broader U.S. are willing to pay for the recovery of the species. One recent study identified an average willingness to pay (WTP) per household in Washington, Oregon, and California of $73 (2018 dollars) per year for ten years for the recovery of humpback whales, as compared with $70 for the broader U.S. Additionally, an older study estimated a lump-sum WTP of $298 dollars per household to avoid the loss of humpback whales.
- Absent information on the incremental change in humpback whale populations or recovery potential associated with these conservation efforts, this analysis is unable to apply the available literature to quantify or monetize associated incremental use and non-use economic benefits. This literature demonstrates, however, that humpback whales have value to people nationally and serve as an economic engine regionally.

4.1 ECONOMIC BENEFITS OF HUMPBACK WHALES

253. The primary intended benefit of critical habitat is to support the conservation and recovery of threatened and endangered species, such as humpback whales.[224] As discussed previously, the primary, regulatory benefit of critical habitat designations stem from the ESA section 7(a)(2) requirement that all Federal agencies ensure their actions are not likely to destroy or adversely modify the designated habitat. Critical habitat rules contribute to conservation and recovery by focusing on protecting the physical and biological features of habitat that are essential to the conservation of the species. In this case, the essential feature is humpback whale prey. Adequate prey is essential to supporting healthy individual whales, successful reproduction, and ultimately, population growth.

254. Beyond the potential for critical habitat to trigger additional conservation efforts as part of section 7 consultations, critical habitat may indirectly affect conservation behaviors in

[224] Under the ESA, the term "conservation" means "…the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary." (16 U.S.C. 1532)

ways that generate both opportunity costs and conservation benefits. For example, critical habitat provides notice to other Federal agencies of areas and features important to species conservation; provides information about the types of activities that may reduce the conservation value of the habitat; and may stimulate research, voluntary conservation actions, and outreach and education activities. To the extent that this information causes agencies, organizations, or individuals to change their behavior for the benefit of humpback whales, these changes would be beneficial to the whales and would be considered benefits of this rulemaking. These changes in behavior could also trigger opportunity costs, for example due to the time or money spent to reduce the risk of negatively affecting the species or its habitat.

255. Economic benefits should be measured in terms of the value people hold for the conservation benefits to humpback whales resulting from the rule. As discussed above, we are unable to estimate the conservation benefits of this rule. We provide a discussion on the value of conservation of the humpback in general, however this discussion should not be interpreted as an estimation of benefits for this rule.

256. From an economic perspective, the "value" of an animal or species reflects the full range of contributions the species makes to people's well-being. Value is frequently measured in terms of the public's willingness to pay (WTP) for the species, inclusive of all use and non-use services, such as the following:

a) **Market value:** This is relevant to species, such as salmon, that are bought and sold in commercial markets. This type of value is generally quantifiable based on market data but is irrelevant to humpback whales.

b) **Non-market use value:** Non-market use values are associated with uses of a given resource outside of markets, including for recreational purposes such as hunting or fishing. For example, whale watching for humpback whales provides a non-market value.[225] The value people hold for this activity is measured by the utility they derive from the activity above and beyond what they pay for it.

c) **Non-use value:** The concept of non-use values recognizes that people may have a positive preference for a good or service beyond any current or even expected future use. Non-use values are thought to reflect an environmental ethic and are a measure of the utility that people derive from indicators of improved ecological heath or functioning. Economists generally see these values as motivated by three key factors:

- Existence value, defined as the benefit gained simply from knowing the resource exists;
- Option value, allowing for potential use of the resource in the future; and/or

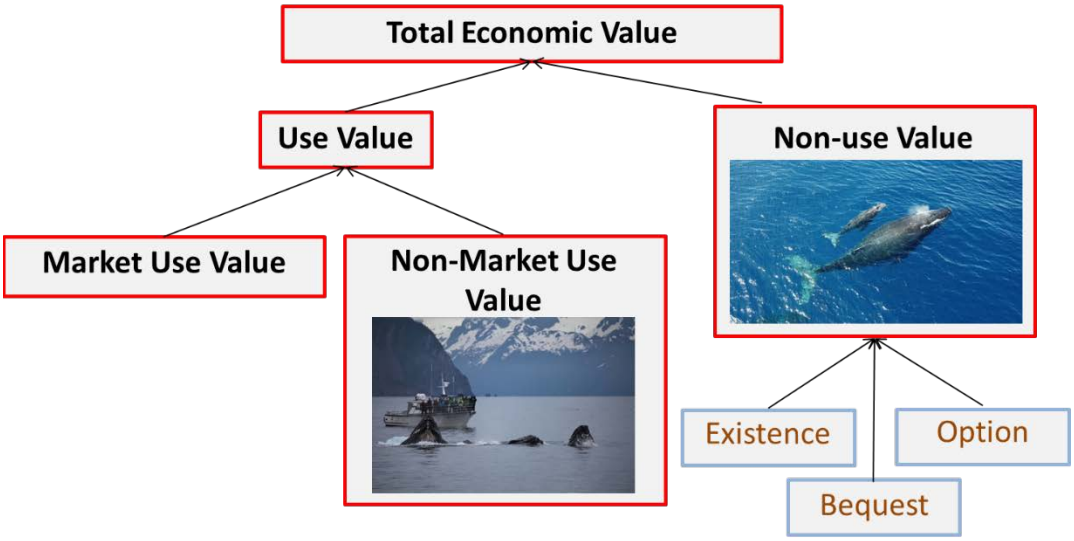
[225] While commercial whale watch operations are market actors, the animals themselves are not bought and sold. People's WTP for wildlife viewing, above and beyond what they do pay for the activity, is considered a nonmarket value. The regional economic activity generated by whale watching in the region is a separate measure of economic benefits (i.e., regional economic impact as opposed to economic value) associated with the humpback whales.

- Bequest value, reflecting a desire to ensure continued existence of the resource for future generations.

d) **Ecological value:** Perhaps more indirectly, ecological value may contribute to people's WTP for the species, for example as a predator or prey species, or in supporting a healthy, stable, resilient ecosystem. The ecological function of a species may contribute to the total economic value of other resources (e.g., species interconnected by the food chain) or to the broader ecosystem.

257. Exhibit 4-1 demonstrates components of the total economic value of a species. Changes in the quality or availability of a species may affect any or all of the components of its total economic value.

EXHIBIT 4-1. COMPONENTS OF TOTAL ECONOMIC VALUE OF A SPECIES



258. Quantification and monetization of species conservation benefits in terms of the change in total economic value requires two primary pieces of information:

a) Data on the incremental change in the population of humpback whales or in the probability of recovery that is expected to result from conservation efforts triggered by this rule; and

b) Information on the public's WTP for this incremental change for any relevant use or non-use values. For example, information would be required regarding how an increased population of humpback whales would contribute to WTP for whale watching or to the non-use value that a population holds for the species.

259. With respect to the first piece of information, determining the incremental effect of the critical habitat designation on humpback whale conservation and recovery is not feasible at this time as we are unable to estimate any conservation efforts triggered by this rule.

260. As described in Chapter 2 of this analysis, in most cases, critical habitat is not expected to change how a project or activity is implemented. NMFS has not identified a particular

project or activity for which it is likely that section 7 consultation with the critical habitat for the humpback whales will result in different conservation efforts than section 7 consultation without the critical habitat. The reason for this is that protection of the essential feature of critical habitat (prey) is generally important to the conservation and recovery of the whales themselves, even outside of the need to consider adverse modification of critical habitat.

261. Although the critical habitat is not expected to change NMFS' identification of conservation efforts for the whales, the adverse modification analysis conducted as part of section 7 consultations provides useful scientific information to build upon NMFS' and other Federal agencies' understanding of the biological needs of, and threats to, the humpback whales. While this scientific information is not the reason for the consultation process, it is an ancillary benefit of the consultations.

262. The remainder of this section discusses existing information related to the second piece of information described above: information on the public's WTP for humpback whales. Specifically, this section provides a more detailed description of the economic methods that economists employ to monetize these types of benefits and provide an overview of the existing literature specifically related to humpback whales. These studies provide evidence that the public holds a positive value for efforts that increase humpback whale populations or the probability of recovery for the species. However, for the reasons described above, these studies cannot be applied to quantify the incremental economic benefits resulting from the critical habitat designations for the humpback whale.

4.1.1 ECONOMIC VALUATION METHODS FOR SPECIES AND HABITAT CONSERVATION

263. Various economic benefits, measured in terms of social welfare values or regional economic productivity, may result from conservation efforts for listed species. Economists apply a variety of methodological approaches to estimate use and non-use values for species and for habitat improvements.

264. Revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities (i.e., people "reveal" their value through their behavior). For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models are rooted in the idea that the value of a recreational resource can be estimated by analyzing the travel and time costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of site-specific characteristics on property values.

265. Because non-use values reflect a preference for the continued existence of a resource beyond any direct or indirect use of it, non-use values cannot be measured by observing how they affect people's choices or behaviors. Thus, revealed preference methods do not apply to non-use values. Economists therefore employ stated preference methods to elicit information on non-use values (or on total economic values for species, inclusive of use and non-use value). Stated preference methods include such tools as the contingent valuation, contingent behavior, and choice experiments. In simplest terms, these survey-

based methods elicit information from respondents in order to estimate their WTP for a given resource or service (e.g., a species population), or for programs designed to protect that resource or service. A substantial body of literature has developed that describes the application and limitations of this technique to the valuation of natural resource assets.[226] Numerous published studies estimate individuals' WTP to protect endangered species.[227]

266. An ideal study for use in quantifying the social welfare values of the critical habitat designations for humpback whales would be specific to measuring the incremental benefits to humpback whales generated by any conservation efforts that may result from this rule. Absent primary research specific to the policy question, the following section describes existing studies focused on humpback whales to provide perspective on these social welfare values associated with humpback whales. This summary is limited to the available information describing values of humpback whales within the United States.

4.1.2 WHALE WATCHING VALUES

267. Humpback whales are a popular species for whale watching along the Washington/Oregon/California coast and in Alaska. The economic value of whale watching can be assessed through the economic methods discussed above. These studies measure the economic value of whales in general, but should not be considered specific benefits of this critical habitat rule.

A 2006 synthesis of the literature focused on whale watching describes social welfare values (i.e. WTP) for whale watching (not specific to humpback whales) of between approximately $42 and $56 per person per trip (2018 dollars) based on studies conducted in the U.S.[228] According to this literature, the author estimates the non-market use value of whale watching in California in 2005 to have been on the order of $53 million for boat-based whale watchers.[229] As noted, this estimated value is not specific to the humpback whales but covers all whale watching across the state. Multiple site- and trip-specific attributes contribute to WTP for individual whale watching trips, such as the number of whales and variety of species viewed.

268. Humpback whales are a target species for whale watching on the Washington/Oregon/California coast and in Alaska. In Alaska in particular, whale watching activity is concentrated in southeast Alaska, where boat-based cruises visit the feeding grounds of humpback whales. Humpback whales, along with killer whales, are the primary tourist focus for whale watching in Alaska. In Oregon, humpback whales and gray whales are the primary focus for whale watchers. Humpback whales are also

[226] See, for example, Phaneuf, Daniel and Till Requate. *A Course in Environmental Economics: Theory, Policy, and Practice*. Cambridge University Press, 2016.

[227] See, for example, Lew. November 2015. Willingness to Pay for Threatened and Endangered Marine Species: A Review of the Literature and Prospects for Policy Use. *Frontiers in Marine Science* Vol. 2(96).

[228] All values in this discussion adjusted from the dollar years presented in the original studies to 2018 dollars using the Consumer Price Index (CPI) to adjust for inflation.

[229] Pendleton, Linwood. 2006. Understanding the Potential Economic Impact of Marine Wildlife Viewing and Whale Watching in California. Developed for the National Ocean Economics Program.

described as a target species for whale watching in California, particularly in Monterey Bay and the Santa Barbara Channel.[230] Whale watching in Washington is focused on killer whales, though humpback whales are an additional target species.

4.1.3 VALUES FOR RECOVERY OF HUMPBACK WHALES

269. A stated preference study conducted in 2010 evaluated people's WTP for recovery of multiple west coast species, including humpback whales.[231] The study identified an average WTP per household in Washington, Oregon, and California of $73 (2018 dollars) per year for ten years for the recovery of the humpback whales. The study additionally estimated an average WTP per household across the broader U.S. of $70 (2018 dollars) per year for ten years. The WTP from the national sample identified values close to the WTP of west coast households, suggesting that the value the public holds for the whales is not tied to proximity to the resource. In fact, an additional study employing the data from the same 2010 survey identified that the region with the highest WTP value for recovering humpback whales was New England ($98 per household per year for ten years when converted to 2018 dollars).[232] Again, as noted elsewhere, this study's conclusions about the economic value of whales in general should not be considered a specific benefit of this critical habitat rule.

4.2 ANCILLARY BENEFITS

As previously described, NMFS has not identified additional conservation efforts it expects to make specifically to avoid destruction or adverse modification of the critical habitat. The adverse modification analysis completed as part of future section 7 consultations, however, provides useful information on the biological needs of the species and the quality of and threats to the essential feature of its critical habitat. In this way, the critical habitat not only plays a role in the conservation and recovery of the species, but also in understanding the status of prey species across the critical habitat. Increased understanding of the status of this habitat feature may therefore contribute to improvements in broader ecosystem health in the future.

4.3 REGIONAL ECONOMIC IMPACTS OF HUMPBACK WHALES

270. Regional economic impact analysis identifies how changes in demand for a good or service affect interrelated economic sectors along the supply chain for the directly affected good or service. Regional economic impacts are not economic values and not the focus of a social welfare benefit-cost analysis. However, regional economic impacts can provide useful information regarding how regulations affect monetary flows in a given

[230] O'Connor, S., R. Campbell, H. Cortez, and T. Knowles. 2009. Whale Watching Worldwide: Tourism Numbers, Expenditures, and Expanding Economic Benefits: A Special Report from the International Fund for Animal Welfare. Yarmouth, MA, USA.

[231] Wallmo, Kristy and Daniel K. Lew. 2015. Public Preferences for Endangered Species recovery: An Examination of Geospatial Scale and Non-Market Values. *Frontiers in Marine Science*. Vol. 2 (96).

[232] Wallmo, Kristy and Daniel K. Lew. 2016. A Comparison of Regional and National Values for Recovering Threatened and Endangered Marine Species in the United States. *Journal of Environmental Management* 179: 38-46.

region. We are unable to estimate the regional impacts of this critical habitat designation, rather we discuss the regional impacts of humpback whales more broadly.

271. Economists employ models of economic activity levels in commercial markets in order to estimate the regional economic impacts generated by a policy or activity. Regional economic impacts refer to changes in regional economic activity levels and may be measured, for example, in terms of changes in revenues, value-added, employment, wages and tax receipts. Regional economic impacts may also be associated with changes in non-market activities, such as recreation. For example, whale watching trips generate tourism related expenditures and increased activity in interrelated economic sectors.

272. With respect to the regional economic contribution of whale watching, a 2009 study by the International Fund for Animal Welfare estimated participation in whale watching by state in the U.S. and in other regions around the world. Based on surveys of tourism operators, government tourism offices, academic researchers and organization, and available literature, the findings of this study relevant to the Washington, Oregon, California, and Alaska are summarized in Exhibit 4-2. Note that these estimates are inclusive of, but not specific to, whale watching for humpback whales. As impacts of whale watching activities, in general, these estimates do not reflect impacts resulting from this critical habitat rule.

EXHIBIT 4-2. WHALE WATCHING STATISTICS AS OF 2008

STATE	NUMBER OF WHALE WATCHERS	REGIONAL EXPENDITURES (2018$)	PERCENT INCREASE IN EXPENDITURES BETWEEN 1998 AND 2008
Alaska	520,000	$540 million	280% increase
California	1,400,000	$97 million	30% increase
Oregon	380,000	$35 million	370% increase
Washington	430,000	$72 million	350% increase

Source:
O'Connor, S., R. Campbell, H. Cortez, and T. Knowles. 2009. Whale Watching Worldwide: Tourism Numbers, Expenditures, and Expanding Economic Benefits: A Special Report from the International Fund for Animal Welfare. Yarmouth, MA, USA.

Additionally, the University of Alaska Center for Economic Development (CED) recently estimated the economic contribution of all wildlife viewing activities in Alaska.[233, 234] CED estimated 5.2 million participation-days for wildlife viewing in Alaska in 2017,

[233] To develop this estimate, CED used IMPLAN (an input/output modeling program) to calculate economic impacts of wildlife viewing activities in Alaska. Specifically, the analysis relies upon aggregated data on spending from a variety of sources as model inputs, and estimates jobs, gross state product, and revenues by activity type. Analysis methodology is described in further detail in Appendix A of the report, available here: https://static1.squarespace.com/static/59f6b60bcf81e02892fd0261/t/5c7eff9415fcc0410111212a/1551826896433/Outdoor+Recreation+-+Impacts+and+Opportunities.pdf

[234] The University of Alaska Center For Economic Development. 2019. Economic Development in Alaska Outdoor Recreation Impacts and Opportunities. Presented To The Alaska Division of Economic Development.

which generated $2.2 billion in consumer spending and supported 28,000 jobs. While these estimates encompass all wildlife viewing activities and are not exclusive to whale watching, they provide some additional recent context on the value of whale watching in Alaska.

CHAPTER 5 | FINAL REGULATORY FLEXIBILITY ANALYSIS AND ENERGY IMPACTS ANALYSIS

273. This analysis considers the extent to which the potential economic impacts associated with the critical habitat designations for the humpback whale could be borne by small entities (Section 5.1) and the energy sector (Section 5.2). The Final Regulatory Flexibility Analysis (FRFA) is conducted pursuant to the Regulatory Flexibility Analysis (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA) and U.S. Census Bureau. The energy analysis in Section 5.2 is conducted pursuant to Executive Order No. 13211.

274. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the critical habitat designations. Incremental impacts are detailed in Chapter 3 of this report.[382]

5.1 FINAL REGULATORY FLEXIBILITY ANALYSIS

275. This FRFA uses the best available information to identify the potential impacts of critical habitat on small entities. However, there are uncertainties that complicate quantification of these impacts, particularly with respect to the extent to which the quantified impacts may be borne by small entities. As a result, this FRFA employs a conservative approach (i.e., more likely to overestimate than underestimate impacts to small entities) in assuming that the quantified costs that are not borne by the Federal government are generally borne by small entities. As the potential critical habitat occurs in marine waters, this analysis focuses on small entities located in counties along the Pacific Coast of California, Oregon, and Washington, and in coastal counties in Alaska.

5.1.1 SUMMARY OF FINDINGS

276. Estimated impacts to small entities are summarized in Exhibit 5-1. As described in Chapters 2 and 3 of this analysis, the quantified costs associated with critical habitat for the humpback whales reflect administrative effort to consider potential for adverse modification as part of future section 7 consultations. Primarily, consultations are between NMFS and Federal action agencies to evaluate the potential for projects and activities to result in adverse modification of critical habitat. Therefore, most incremental

[382] This final economic analysis analyzes all areas originally considered for designation as critical habitat for the three DPSs. The results of this analysis do not reflect proposed exclusions or changes to the proposed critical habitat designations made in the final rule. Costs presented herein for critical habitat units that are not ultimately included in the final designation would not be incurred.

impacts are borne by NMFS and other Federal agencies and not by private entities or small governmental jurisdictions.

277. However, some consultations may include third parties (e.g., project proponents or landowners) that may be small entities. These third parties may bear some portion of the administrative consultation costs. This analysis first identifies which consultations are likely to include third parties and then identifies the types of small entities (i.e., which economic sectors) that may participate in these consultations.

278. Ultimately, this analysis finds that consultations on in-water and coastal construction activities and aquaculture may generate costs borne by small entities. All other activities are either not expected to involve small entities or are associated with no more than one consultation per year spread across the entire critical habitat. As described in Chapter 3, this analysis anticipates approximately eight consultations on in-water and coastal construction activities per year, six of which are in critical habitat Unit 10 in Alaska. As a result, this analysis focuses on the small in-water construction entities located in Unit 10. This analysis estimates that the small entities involved in these consultations will incur $5,200 in annualized administrative costs. Additionally, this analysis anticipates 12 consultations per year on aquaculture activities in Alaska, 6 of which will occur in Unit 10, and 6 will occur in each of southcentral (Units 6-9) and southwestern (Units 1-5) Alaska. This analysis anticipates that third parties involved in these consultations will incur $5,300 in annualized administrative costs, half of which will be incurred in Unit 10.[383,384]

279. Exhibit 5-1 summarizes the number of potentially affected small entities, as well as the potential per-entity impact of the rule, according to two scenarios. These scenarios are intended to reflect the range of uncertainty regarding the number of small entities that may be affected by the designations and the potential impacts of the critical habitat designations on their annual revenues. Under Scenario 1, this analysis identifies the maximum number of future consultations involving small entities and assumes that each consultation involves one unique small entity.

280. Scenario 1 accordingly estimates a high-end estimate of the number of potentially affected small entities and a low-end estimate of the potential effect in terms of the economic effects (i.e., percent of annual revenues) for each entity. This scenario may overstate the number of small entities likely to be affected by the rule and may understate the potential revenue effect. Specifically, Scenario 1 estimates that six small entities involved with in-water construction have the potential to bear an impact of up to $870 per entity, which would represent less than 0.05 percent of average revenues for businesses in these economic sectors. Additionally, Scenario 1 estimates that 12 small entities involved

[383] Differences in costs of consultation between activity types is driven by the mix of consultation types (e.g. formal vs. informal) anticipated in future consultations for the activity.

[384] The State of Alaska identified that the rate of consultation for hatchery activities was likely to remain at their current, relatively low rate into the future. As a result, this analysis focuses on aquaculture activities exclusively.

with aquaculture have the potential to bear an impact of up to $440 per entity, which would represent approximately one percent of average revenues for aquaculture farms.

281. Under Scenario 2, this analysis assumes all future costs to an industry are borne by a single small entity within that industry. This method may understate the number of small entities affected and overstate the per-entity impacts. As such, this method arrives at a low-end estimate of potentially affected entities and a high-end estimate of potential economic effects. Under this scenario, one small in-water construction entity would bear costs of $5,200, which would represent 0.4 percent of the average annual revenues for an individual small entity engaged in in-water and coastal construction. If this cost were borne by the business in the industry with the lowest average annual revenues, the cost would represent four percent of the average annual revenues. Additionally, under this scenario one small aquaculture entity would bear costs of $5,300, which would represent approximately 12 percent of average annual revenues. However, due to the nature of production in this industry and limited availability of per-business revenue data, there is substantial uncertainty associated with the average annual revenue estimate employed for this analysis, as described in Section 5.1.5.

282. While these scenarios reflect a range of potentially affected entities and the associated revenue effects, the actual number of small entities affected and revenue effects are likely to be somewhere in the middle. In other words, some subset greater than one and less than six of the small in-water construction entities may participate in the section 7 consultations and bear associated impacts of less than one percent of average annual revenues. Similarly, somewhere between one and 12 small aquaculture entities may participate in section 7 consultations and bear associated impacts of one to 12 percent of average annual revenues.

EXHIBIT 5-1. SUMMARY OF QUANTIFIED IMPACTS TO SMALL ENTITIES INVOLVED WITH IN-WATER CONSTRUCTION AND AQUACULTURE

		IN-WATER CONSTRUCTION[1]	AQUACULTURE
[A]	Total Annualized Impacts to Small Entities [2]	$5,200	$5,300
[B]	Estimated Average Annual Revenues for an Individual Small Entity [3]	$1,300,000	$42,000
Scenario 1: Assumes All Small Entities Potentially Affected by Critical Habitat Share Incremental Costs Equally			
[C]	Maximum Number of Consultations in Critical Habitat Areas[4]	6	12
[D]	Estimated Impact per Small Entity ([A]/[C])	$870	$440
[E]	Impact per Small Entity as Percentage of Revenues ([D]/[B])	0.05%	1.0%
Scenario 2: Assumes All Consultations Involve the Same Individual Small Entity			
[F]	Estimated Number of Small Entities Expected to Undergo Consultation	1	1

		IN-WATER CONSTRUCTION[1]	AQUACULTURE
[G]	Estimated Impact per Small Entity ([A]/[F])	$5,200	$5,300
[H]	Impact per Small Entity as Percentage of Revenues ([G]/[B])	0.4%	12%

Notes:

1. This analysis focuses on the six annual in-water construction consultations expected to involve private entities that are forecasted to occur in Unit 10. This analysis forecasts approximately two additional in-water construction consultations per year across all other critical habitat units combined, and no more than 0.7 per year in any other individual unit.
2. This value represents total administrative costs expected to be borne by third parties in the affected industries.
3. For in-water construction, average annual revenues are estimated based on revenue data from the D&B Hoovers Database for 52 small businesses in the in-water and coastal construction sector in Unit 10. (Dun and Bradstreet. D&B Hoovers Database. Accessed January 11, 2019. http://www.hoovers.com/company-information.html)

   For aquaculture, average annual revenues are estimated based on sales data from the Alaska Mariculture Development Plan. (State of Alaska. 2018. Alaska Mariculture Development Plan. Accessed April 13, 2020. https://www.afdf.org/wp-content/uploads/Alaska-Mariculture-Development-Plan-v2018-03-23-small-single-pg-view.pdf)
4. This analysis assumes that each consultation will include one unique small business.

5.1.2 FRFA REQUIREMENTS

283. First enacted in 1980, the RFA was designed to ensure that Federal agencies consider the potential for their regulations to unduly inhibit the ability of small entities to compete. The goals of the RFA include increasing the government's awareness of the impact of regulations on small entities and to encourage agencies to exercise flexibility in their rulemakings to provide regulatory relief to small entities.

284. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).[385] For this rulemaking, this analysis takes the form of a FRFA. Under 5 U.S.C., Section 604(a) of the RFA, a FRFA is required to contain:

   a) a succinct statement of the need for, and objectives of, the rule;

   b) a summary of significant issues raised by public comments in response to the initial regulatory flexibility analysis, a summary of assessment of the agency of such issues, and a statement of any changes in the proposed rule as a result of such comments;

   c) a description of and an estimate of the number of small entities to which the rule will apply or an explanation of why no such estimate is available;

[385] 5 U.S.C. 601 et seq.

d) a description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and

e) a description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

5.1.3 NEEDS AND OBJECTIVES OF THE RULE

285. The objective of the rule is to utilize the best scientific and commercial information available to designate critical habitat for the humpback whale to address the conservation needs of the species in order to meet recovery goals. The ESA requires NMFS to designate critical habitat for listed species to the maximum extent prudent and determinable. This is the legal basis for this rule.

286. Section 4(b)(2) of the ESA requires NMFS to designate critical habitat for threatened and endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, impact on national security, and any other relevant impact, of specifying any particular area as critical habitat."

287. The ESA defines critical habitat under Section 3(5)(A) as:

i. "(i) the specific areas within the geographical area occupied by the species, at the time it is listed..., on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and

ii. (ii) specific areas outside the geographical area occupied by the species at the time it is listed… upon a determination by the Secretary that such areas are essential for the conservation of the species."

5.1.4 SUMMARY OF SIGNIFICANT ISSUES RAISED IN PUBLIC COMMENT IN RESPONSE TO THE IRFA

288. During public comment, multiple commenters stated that administrative costs to small entities are underestimated. One local government stated that the estimated cost of $4,900 per year to small entities is significantly underestimated, as the government already pays more than that in direct expenses and delay costs for in-water construction projects permitted under the MMPA. The direct expenses and delay costs currently incurred by third parties for in-water construction permitted under the MMPA are not costs resulting from the critical habitat designation and thus are not appropriate to include in the cost estimate for this rule. That existing administrative costs resulting from requirements unrelated to the critical habitat designation are high does not indicate that costs are underestimated for this rule. Of the total economic impacts of the rule identified in Chapter 3 costs, only a portion may be incurred by third parties, and of those third parties,

only a portion would be considered small entities. No edits were made to the FEA as a result of this comment.

289. Another commenter noted that the IRFA lists the Wrangell-Petersburg Census Area as a small government jurisdiction adjacent to critical habitat that may be involved in future consultations. This FEA replaces discussion and analysis of the Wrangell-Petersburg Census Area with Petersburg Borough and the City and Borough of Wrangell.

5.1.5 DESCRIPTION AND ESTIMATE OF THE NUMBER OF SMALL ENTITIES TO WHICH THE RULE APPLIES

290. Three types of small entities are defined in the RFA:

- **Small Business -** Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
- **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.

291. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC),* FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers,

and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.[386]

292. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.[387] The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

293. The SBA in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.[388] "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."[389]

294. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the ESA, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities that Federal agencies may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which these designations could potentially affect small entities, regardless of whether these entities would be directly regulated by the NMFS through the rule under consideration or by a delegation of impact from the directly regulated entity.

Description of Economic Activities for Which Impacts Are Most Likely

295. This FRFA focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapter 3 of this economic analysis. Small entities participate in section 7 consultation as a third party (the primary consulting parties being NMFS and the Federal action agency). Therefore, it is possible that the small entities may spend additional time considering critical habitat during a section 7 consultation. The costs of this additional time and effort are the subject of this FRFA.

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[386] 773 F. 2d 327 (D.C. Cir. 1985).

[387] 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

[388] Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 20.

[389] Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 21.

296. Of the activities analyzed, vessel traffic, space vehicle and missile launches, USFS activities, scientific research, and military activities are not expected to impact third parties, and therefore, are not expected to affect small entities.

297. Potentially affected activities that may involve a small entity include:

- Commercial Fishing (NAICS: 11411, Fishing)
- Oil and Gas Activities (NAICS: 2111, Oil and Gas Extraction)
- Alternative Energy (NAICS 221118, Other Electric Power Generation)
- In-Water Construction (NAICS: 21232, Sand, Gravel, Clay and Ceramic Mining and Quarrying; 23711, Water and Sewer Line and Related Structures Construction; 237120, Oil and Gas Pipeline and Related Structures Construction; 237130, Power and Communication Line and Related Structures Construction; 237310, Highway, Street, and Bridge Construction; 237990, Other Heavy and Civil Engineering Construction)
- Aquaculture and Hatcheries (NAICS: 112512 Shellfish Farming; 112519 Other Aquaculture)
- LNG Facilities (NAICS: 488999, All Other Support Activities for Transportation)
- Water Quality Management and Inland Activities (NAICS: 2213 Water, Sewage and Other Systems; 212, Mining; 22111, Electric power Generation; NAICS: 111, Crop Production; 115112, Soil Preparation, Planting, and Cultivating)

298. For all activities except in-water and coastal construction and aquaculture (i.e., commercial fishing, oil and gas, alternative energy, aquaculture, LNG facilities, water quality management, and scientific research), the costs borne by third parties in related industries are expected to be negligible. For each of these activities, one or fewer consultations are anticipated per year spread across the area being considered for critical habitat. As a result, for each of these activities the annualized incremental cost that may be borne by small entities is estimated to be less than $1,400.

299. This analysis accordingly focuses on the costs of consultations on in-water and coastal construction activities and aquaculture, which occur more frequently within the critical habitat area. As described in Chapter 3, approximately eight consultation per year focus on in-water and coastal construction activities. The majority of these (six per year) are concentrated within critical habitat Unit 10 in Alaska. As such, this analysis focuses on the small in-water construction businesses and government jurisdictions in the region surrounding critical habitat Unit 10. Additionally, this analysis estimates that 12 aquaculture consultations per year are distributed across the critical habitat units in Alaska.

300. Exhibit 5-2 identifies the economic sectors most likely engaged in consultation on in-water and coastal construction and aquaculture activities and the associated small business size standards.

301. Along with private businesses, there also may be consultations for which small governmental jurisdictions (i.e., jurisdictions with populations of less than 50,000 people) are the third parties participating in the consultations as opposed to businesses. Exhibit 5-3 presents small government jurisdictions adjacent to critical habitat units that may be involved in future consultations. Nine of these areas—Juneau City and Borough, Sitka City and Borough, Haines Borough, Ketchikan Gateway Borough, Prince of Wales-Hyder Census Area, Skagway Municipality, Hoonah-Angoon Census Area, Wrangell City and Borough, and Petersburg Borough—are adjacent to critical habitat Unit 10.

302. As described above and detailed in Chapters 2 and 3 of this report, incremental impacts associated with this rulemaking that can be monetized are expected to be limited to administrative costs associated with section 7 consultations. This analysis relies on the best available information on the rate of future consultations and the average cost per consultation borne by third parties (i.e., not borne by Federal agencies).

In-Water Construction

303. Ultimately, up to six small entities per year may bear costs associated with participation in consultation regarding humpback whale critical habitat in Unit 10. The total annualized administrative costs that may be borne by these small entities (businesses or governments) engaged in in-water and coastal construction activities is $5,200 (discounted at seven percent).

304. This analysis estimates average annual revenues for these small entities based on data from D&B Hoovers. Specifically, this analysis relies on a query of the D&B Hoovers database for businesses identified as belonging to one of the in-water and coastal construction NAICS codes listed in Exhibit 5-2 and located in one of the boroughs or census areas adjacent to Unit 10.[390] Based on the SBA size standards for each NAICS code, this analysis identifies 52 small businesses in the D&B Hoovers dataset in boroughs adjacent to Unit 10. The D&B Hoovers database includes revenue estimates for each of these 52 businesses.

305. Exhibit 5-4 summarizes the number of small businesses identified within each NAICS code, as well as the average annual revenues associated with the businesses. Average annual revenues range from $120,000 (for NAICS 21232 and 237110) to $2.1 million (for NAICS 237310) across the industries. Weighting by the number of small businesses within each NAICS code, average annual revenues are $1.3 million across all small businesses in the in-water and coastal construction NAICS codes. As a result, the total estimated annualized administrative costs of $5,200 represent less than 0.4 percent of average annual revenues at these businesses. Comparing the $5,200 against the estimated $1.3 million average annual revenues assumes an equal probability of each of the small businesses bearing the full impact as we do not have information to identify that one

[390] The analysis relied on a query of businesses in the following areas: Juneau Borough, Sitka Borough, Haines Borough, Ketchikan Gateway Borough, Prince of Wales-Outer Ketchikan Census Area, Skagway-Hoonah-Angoon Census Area, and Wrangell-Petersburg Census Area.

NAICS code engaged in in-water construction activities is more likely to participate in consultation than another.

306. For the NAICS codes with the lowest average annual revenues (21232 and 237110), the total estimated annualized administrative costs of $5,200 represent approximately four percent of average annual revenues. That is, if a single business with average annual revenues of $120,000 were subject to the incremental costs of all six consultations in one year, the effect on that one business would be four percent. While this impact may be considered significant, it would be experienced just by the business. This FRFA finds that it is unlikely that this scenario would occur for the following reasons:

- This analysis conservatively assumes that quantified costs not borne by the Federal government are borne by small entities. In fact, there is no reason to believe that small businesses are more likely to bear these costs than large businesses or state or local government agencies.
- Only four out of the 52 small in-water construction businesses identified adjacent to Unit 10 are associated with NAICS codes with average annual revenues of approximately $120,000. The other 48 small businesses are associated with NAICS codes for which high-end administrative costs ($5,200) would reflect less than one percent of average annual revenues. We have no reason to believe that the four small businesses with the lowest average annual revenues would be more likely to participate in section 7 consultations than the small businesses with higher annual revenues.
- The four percent revenue estimate is associated with Scenario 2, where all consultations are conducted by a single small entity. Under Scenario 1, where each consultation is conducted by a separate small entity, incremental costs are less than one percent of average annual revenues for all NAICS codes, including the businesses with annual revenues of $120,000.

Aquaculture

307. This analysis estimates that up to 12 small aquaculture businesses may bear costs associated with participation in consultation regarding humpback whale critical habitat each year, half of which are located in unit 10. The total annualized administrative costs that may be borne by these small entities engaged in aquaculture activities is $5,300, of which 50 percent is anticipated to be incurred in unit 10 (discounted at seven percent). This estimate represents the third-party applicant costs associated with 12 informal consultations. Given the nature of aquaculture operations in Alaska and the average annual revenues of aquaculture businesses, this analysis considers it unlikely that aquaculture businesses would bear the costs of Biological Assessments associated with consultations.

308. This analysis estimates average annual revenues for small aquaculture entities based on statistics provided in the Alaska Mariculture Development Plan.[391] The Alaska Mariculture Development Plan states that sales across all aquatic farm operations totaled $1.23 million in 2016. These revenues were spread across 29 different operations, for an average annual revenue of $42,000 per aquatic farm.

309. If the $5,300 in annualized administrative costs were spread across 12 unique businesses ($440 per business), the costs to each business would represent approximately one percent of average annual revenues. However, if the $5,300 in administrative costs was borne by a single small entity, the costs would represent approximately 12 percent of average annual revenues. While this impact may be considered significant, it would be experienced just by the business.

310. However, these estimates likely overstate costs as a percentage of revenues for several reasons:

- This analysis conservatively assumes that quantified costs not borne by the Federal government are borne by small entities. In fact, there is no reason to believe that small businesses are more likely to bear these costs than large businesses.
- Each permitted aquatic farm is not associated with a unique business. Data from ADF&G indicate that the number of farms operated by each permit holder ranges from one to six, with an average of 1.16 aquatic farms operated by each permit holder. For businesses that operate multiple aquatic farms, our revenue estimate is likely to underestimate average annual revenues.
- Many aquatic farms are not the primary sources of income for their operators. McDowell Group (2017) notes that many small aquatic farms in Alaska are "hobby or lifestyle farms, allowing the operators to work and perhaps live in remote locations and supplement other sources of income."[392] This report also includes data on aquatic farm sales in 2015, which demonstrate that out of 22 oyster farms with sales, six had total sales less than $5,000 and another three farms had total sales between $5,000 and $10,000. These operations lower our estimate of average annual sales across all aquatic farms even though they are unlikely to represent primary sources of income.
- The nature of the aquatic farming industry results in variable revenues in any given year. While aquatic farms require high upfront costs, operations may not realize any revenues for several years. For instance, McDowell Group (2017) estimates that oysters typically take two to five years to grow to a marketable size

[391] State of Alaska. 2018. Alaska Mariculture Development Plan. Accessed April 13, 2020. https://www.afdf.org/wp-content/uploads/Alaska-Mariculture-Development-Plan-v2018-03-23-small-single-pg-view.pdf

[392] McDowell Group. 2017. Alaska Mariculture Initiative Economic Analysis to Inform a Comprehensive Plan Phase II. Prepared for Alaska Mariculture Task Force. Available at: https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/AMI_Phase2_final_Nov2017.pdf

in Alaska, while geoducks may take eight to ten years.[393] As a result, our average annual revenue estimate may be pulled down by farms that are still ramping up production, and may not reflect average annual revenues at mature farms.

311. Overall, for in-water construction activities, even applying multiple conservative assumptions with respect to the quantified incremental administrative costs of consultation, this analysis does not identify a significant impact on a substantial number of small businesses.

312. For the aquaculture industry, given available data, the analysis finds there is potential for a substantial number of businesses to be significantly impacted by the rule if all areas under consideration are designated. However, as described above, the estimate of annual revenues used in this analysis is highly uncertain and likely substantially understated. As a result, we believe this outcome is unlikely.

[393] McDowell Group. 2017. Alaska Mariculture Initiative Economic Analysis to Inform a Comprehensive Plan Phase II. Prepared for Alaska Mariculture Task Force. Available at: https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/AMI_Phase2_final_Nov2017.pdf

EXHIBIT 5-2. MAJOR RELEVANT ACTIVITIES AND A DESCRIPTION OF THE INDUSTRY SECTORS ENGAGED IN THOSE ACTIVITIES

MAJOR RELEVANT ACTIVITY	DESCRIPTION OF INCLUDED INDUSTRY SECTORS	NAICS CODE	SBA SIZE STANDARD
In-Water Construction	**Sand, Gravel, Clay and Ceramic Mining and Quarrying** - This industry comprises (1) establishments primarily engaged in developing the mine site and/or mining, quarrying, dredging for sand and gravel, or mining clay, (e.g., china clay, paper clay and slip clay) and (2) preparation plants primarily engaged in beneficiating (e.g., washing, screening, and grinding) sand and gravel, clay, and ceramic and refractory minerals.	21232	500 employees
	Water and Sewer Line and Related Structures Construction - This industry comprises establishments primarily engaged in the construction of water and sewer lines, mains, pumping stations, treatment plants, and storage tanks.	237110	$36.5 million
	Oil and Gas Pipeline and Related Structures Construction - This industry comprises establishments primarily engaged in the construction of oil and gas lines, mains, refineries, and storage tanks.	237120	
	Power and Communication Line and Related Structures Construction - This industry comprises establishments primarily engaged in the construction of power lines and towers, power plants, and radio, television, and telecommunications transmitting/receiving towers.	237130	
	Highway, Street, and Bridge Construction - This industry comprises establishments primarily engaged in the construction of highways (including elevated), streets, roads, airport runways, public sidewalks, or bridges.	237310	
	Other Heavy and Civil Engineering Construction - This industry comprises establishments primarily engaged in heavy and engineering construction projects (excluding highway, street, bridge, and distribution line construction).	237990	
	Dredging and Surface Cleanup Activities (a subset of Other Heavy and Civil Engineering Construction, above)	2379901	$27.5 million
Aquaculture	**Shellfish Farming** - This U.S. industry comprises establishments primarily engaged in farm raising shellfish (e.g., crayfish, shrimp, oysters, clams, mollusks)	112512	$1 million
	Other Aquaculture - This U.S. industry comprises establishments primarily engaged in (1) farm raising of aquatic animals (except finfish and shellfish) and/or (2) farm raising of aquatic plants.	112519	$1 million

Source: U.S. Small Business Administration, "Table of Small Business Size Standards Matched to North American Classification System Codes". February 26, 2016. Accessed at https://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf on January 15, 2019; Small Business Administration. 2019.

EXHIBIT 5-3. POTENTIALLY AFFECTED SMALL GOVERNMENT JURISDICTIONS ADJACENT TO THE CRITIAL HABITAT UNITS

COUNTY NAME[1]	STATE	POPULATION	ADJACENT CRITICAL HABITAT UNITS
Small Jurisdictions Adjacent to Unit 10			
Skagway Municipality	AK	1,061	10
Hoonah-Angoon Census Area	AK	2,132	10
Wrangell City and Borough	AK	2,484	10
Haines Borough	AK	2,518	10
Petersburg Borough	AK	3,255	10
Prince of Wales-Hyder Census Area	AK	6,474	10
Sitka City and Borough	AK	8,738	10
Ketchikan Gateway Borough	AK	13,804	10
Juneau City and Borough	AK	32,330	10
Skagway Municipality	AK	1,061	10
Hoonah-Angoon Census Area	AK	2,132	10
Small Jurisdictions Adjacent to Other Critical Habitat Units			
Yakutat City and Borough	AK	689	11
Bristol Bay Borough	AK	890	1
Lake and Peninsula Borough	AK	1,375	1, 3
Aleutians East Borough	AK	3,425	1, 2, 3
Aleutians West Census Area	AK	5,750	2
Valdez-Cordova Census Area	AK	9,301	9
Kodiak Island Borough	AK	13,649	5
Pacific County	WA	21,281	12
Curry County	OR	22,507	13, 14
Tillamook County	OR	26,076	13
Del Norte County	CA	27,424	14
Jefferson County	WA	30,856	11
Clatsop County	OR	38,562	12
Lincoln County	OR	47,881	13

Source: Population acquired from 2018 American Community Survey Five-Year Estimates.

EXHIBIT 5-4. AVERAGE ANNUAL REVENUES FOR SMALL BUSINESSES BY NAICS CODE

NAICS CODE	NAICS DESCRIPTION	NUMBER OF SMALL BUSINESSES	AVERAGE ANNUAL REVENUES
IN-WATER CONSTRUCTION			
21232	Sand, Gravel, Clay and Ceramic Mining and Quarrying	2	$120,000
237110	Water and Sewer Line and Related Structures Construction	2	$120,000
237120	Oil and Gas Pipeline and Related Structures Construction	0	N/A
237130	Power and Communication Line and Related Structures Construction	7	$760,000
237310	Highway, Street, and Bridge Construction	24	$2,100,000
237990	Other Heavy and Civil Engineering Construction	17	$670,000
Weighted Average Revenues per Construction Business		**52**	**$1,300,000**
AQUACULTURE			
112512	Shellfish Farming	29	$42,000
112519	Other Aquaculture		
Weighted Average Revenues per Aquaculture Business		**29**	**$42,000**

Notes:

1. For in-water construction, average annual revenues are estimated based on revenue data from the D&B Hoovers Database for 52 small businesses in the in-water and coastal construction sector in Unit 10. (Dun and Bradstreet. D&B Hoovers Database. Accessed January 11, 2019. http://www.hoovers.com/company-information.html)
2. For aquaculture, average annual revenues are estimated based on sales data from the Alaska Mariculture Development Plan. (State of Alaska. 2018. Alaska Mariculture Development Plan. Accessed April 13, 2020. https://www.afdf.org/wp-content/uploads/Alaska-Mariculture-Development-Plan-v2018-03-23-small-single-pg-view.pdf)

5.1.6 DESCRIPTION OF REPORTING AND RECORDKEEPING EFFORTS

313. The critical habitat rule will require that Federal agencies insure their actions do not destroy or adversely modify critical habitat through a section 7 consultation. During formal section 7 consultation under the ESA, NMFS, the Federal action agency, and a third-party participant applying for Federal funding or permitting, may communicate in efforts to minimize potential adverse impacts to the habitat and/or the essential features. Communication may include written letters, phone calls, and/or meetings. Project

variables such as the type of consultation, the location, impacted essential features, and activity of concern, may in turn dictate the complexity of these interactions. Third party costs may include administrative work, such as cost of time and materials to prepare for letters, calls, or meetings. The cost of analyses related to the activity and associated reports may be included in these administrative costs. In addition, following the section 7 consultation process, entities may be required to monitor progress during the said activity to ensure that impacts to the habitat and features have been minimized. The rule does not directly mandate "reporting" or "record keeping" within the meaning of the Paperwork Reduction Act (PRA). The rule does not impose record keeping or reporting requirements on small entities.

5.1.7 AGENCY STEPS TO TO MINIMIZE THE SIGNIFICANT ECONOMIC IMPACT ON SMALL ENTITIES

314. In accordance with the requirements of the RFA (as amended by SBREFA, 1996) this analysis considered various alternatives to the critical habitat designations for the humpback whale.

Alternative 1: Designating all specific areas

315. NMFS considered the alternative of designating all specific areas (i.e., no area excluded), and will evaluate comments received. The results presented in Exhibit 5-1 reflect this alternative. NMFS has not chosen this alternative due to considerations of potential impacts, as described in NMFS' *Section 4(b)(2) Report* (2020).

Alternative 2: Designating a subset of areas

316. An alternative to designating critical habitat within all of the areas considered for designation is the designation of critical habitat within a subset of those areas. Under section 4(b)(2) of the ESA, NMFS must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. NMFS has the discretion to exclude an area from designation as critical habitat if the benefits of exclusion (i.e. the impacts that would be avoided if an area was excluded from the designation) outweigh the benefits of designation (i.e., the conservation benefits to the humpback whale if an area was designated), so long as exclusion of the area will not result in extinction of the species. Exclusion under section 4(b)(2) of the ESA of one or more of the areas considered for designation would reduce the total impacts of designation. This alternative would result in a critical habitat designation that provides for the conservation of the species while potentially reducing the economic, national security and other relevant impacts on entities. The activities and associated costs considered in this FRFA are heavily concentrated in unit 10, including all in-water construction costs, and half of the costs associated with aquaculture.

5.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

317. Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant

energy actions." The purpose of this requirement is to ensure that all Federal agencies appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[300]

318. OMB provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with the proposed regulatory action:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[301]

319. Due to the extensive requirements of proposed energy projects to consider environmental impacts, including impacts on marine life, even absent the critical habitat designations for the humpback whale, this analysis anticipates that it is unlikely that critical habitat will change conservation efforts recommended during section 7 consultation for these projects. Consequently, it is unlikely the identified projects will be affected by the designations beyond the quantified administrative impacts. Therefore, the designations are not expected to impact the level of energy production along the Washington/ Oregon/ California coast and in Alaska. It is unlikely that any impacts to the industry that remain unquantified will result in a change in production above the 1 billion kilowatt-hour threshold identified in the Executive Order. Therefore, it appears unlikely that the energy industry will experience "a significant adverse effect" as a result of the critical habitat designations for the humpback whale.

[300] Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, https://georgewbush-whitehouse.archives.gov/omb/memoranda/m01-27.html

[301] Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, https://georgewbush-whitehouse.archives.gov/omb/memoranda/m01-27.html

CHAPTER 6 | ASSUMPTIONS AND UNCERTAINTIES

320. This section reviews the key assumptions that underlie the analysis and the likely significance of these assumptions with respect to estimated impacts. The uncertainties identified in Exhibit 6-1 apply across all critical habitat units, and affect the results in each of those units accordingly. In units with higher levels of economic activity, in particular unit 10, these uncertainties are heightened. A detailed accounting of more specific uncertainties associated with particular critical habitat units is provided in Exhibit 3-3.

321. The largest sources of uncertainty in this analysis stem from the possibility that the critical habitat designations will trigger additional conservation efforts for a particular future project or activity. This analysis relies on the best available information from NMFS describing the likelihood of incremental conservation efforts for each activity. At this time, NMFS has not been able to identify a circumstance in which the rule would generate additional conservation efforts. All other assumptions and sources of uncertainty described in Exhibit 6-1 associated with this analysis are likely to have minor effects on the findings. Exhibit 6-1 summarizes each key assumption, the direction of the potential bias introduced, and the likely significance with respect to estimated impacts.

EXHIBIT 6-1. ASSUMPTIONS AND UNCERTAINTIES

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Critical habitat designation is unlikely to change the humpback whale conservation efforts resulting from future section 7 consultations.	May result in an **underestimate** of costs. (All CH units)	**Potentially major.** Based on the best available information, NMFS anticipates that it is unlikely that the critical habitat designations will generate additional or different conservation efforts for the humpback whale than would be recommended to avoid jeopardy absent the critical habitat designations. However, NMFS will review each individual project or activity at the time of consultation to determine whether additional conservation is needed to avoid adverse modification of critical habitat.
Critical habitat designation is unlikely to change fishery management recommendations.	May result in an **underestimate** of costs. (CH units 11-19)	**Potentially major.** While fisheries that directly target prey species are an important concern for humpback whales, NMFS anticipates it is unlikely that the critical habitat designations will trigger changes in the management of these fisheries. Any future consultations on the fishery will

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
		require consideration of the fish as prey for humpback whales and as an essential feature of their critical habitat. However, critical habitat is not expected to affect conservation efforts recommended as part of these consultations.
For oil spill and response activities, vessel traffic, space vehicle and missile launches, water quality management, and forest service activities, this analysis relies primarily on patterns of consultation within the past eleven years (2007 to 2018) to forecast future *rates* of consultation activity. This analysis assumes that past consultations provide a good indication of future activity.	**Unknown.** May overestimate or underestimate incremental impacts. (All CH units)	**Likely minor.** Data are not available to determine whether activity rates are likely to change over time. To the extent that these activities increase over the next ten years, this analysis underestimates the potential incremental administrative burden of the critical habitat for the humpback whales. The estimated incremental impacts per consultation are, however, relatively minor and this analysis accordingly does not anticipate variations in consultation rates to substantially change the findings of this analysis.
For all non-U.S. Army Corps of Engineers activities, this analysis relies on patterns of consultation within the past eleven years (2006 to 2016) and interviews with action agency personnel to forecast future *locations* of consultation activity.	**Unknown.** May overestimate or underestimate incremental impacts in a given area. (All CH units)	**Likely minor.** Although the expected rate of consultation is not likely to vary much from year to year, the location of these consultations may change. As a result, relying on the approximate location of past consultation activity may underestimate impacts in certain locations while overestimating impacts in others.
This analysis relies on historical Army Corps permit data (2008 to 2017) to forecast future consultations related to Army Corps-permitted dredging and in-water construction projects	**Unknown.** May overestimate or underestimate incremental impacts. (All CH units)	**Likely minor.** Data are not available to determine whether Army Corps permit rates are likely to change over time. To the extent that permitting increases over the next ten years, this analysis underestimates the potential incremental administrative burden of the critical habitat for humpback whales. The estimated incremental impacts per consultation are, however, relatively minor and this analysis accordingly does not anticipate variations in consultation rates to substantially change the findings of this analysis.
This analysis relies on historical Army Corps permit data (2008 to 2017) to forecast future *locations* related to Army Corps-permitted dredging and in-water construction projects	**Unknown.** May overestimate or underestimate incremental impacts in a given area. (All CH units)	**Likely minor.** Although the expected rate of consultation is not likely to vary much from year to year, the location of these consultations may change. As a result, relying on the approximate location of past consultation activity may underestimate impacts in certain locations while overestimating impacts in others. Generally, given the nature of these activities being focused in more populated areas, consultations will likely continue to be concentrated where they have been in the recent past.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
This analysis assumes that future consultations on Army Corps-permitted dredging and in-water construction projects occurring more than 100 meters inland of the potential critical habitat area would not require section 7 consultation considering humpback whale critical habitat.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** These activities are managed to be protective of water quality under the CWA and Corps' best management practices. As described for other in-water construction activities, even if these activities were to result in consultation on humpback whale critical habitat, these consultations would not result in additional conservation efforts.
This analysis assumes that all forecasted civil works consultations will be formal, and that civil works projects in all states other than Washington will be subject to individual consultation.	May result in an **overestimate** of costs. (CH units 2, 4-6, 8, 10, 12, 13, 16-19)	**Likely minor.** Some civil works projects may require informal consultation and some projects may be covered by programmatic consultations and not require future individual consultations. However, this analysis conservatively assumes that all forecasted civil works consultations will be formal, and that civil works projects in states other than Washington will be subject to individual consultation.
This analysis forecasts future oil and gas exploration and production activities under the assumption that the existing 5 Year Leasing Program remains in place.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** If the BOEM 2019-2024 Draft Proposed Program is approved, BOEM would be required to evaluate the potential for impacts to the humpback whale critical habitat for activities in areas that are presently not available for oil and gas exploration and development activities. However, associated changes in regional offshore oil and gas development are highly uncertain. Furthermore, NMFS has not identified an instance in which the critical habitat for humpback whales would change the nature of the conservation efforts identified for humpback whales as part of future consultations on these activities. Thus, any underestimate of costs associated with this uncertainty would most likely be relatively minor administrative costs of consultation.
Critical habitat designation is unlikely to change management efforts for seismic survey activities related to both oil and gas exploration and development and scientific research.	May result in an **underestimate** of costs. (All CH units)	**Potentially major.** Research indicates that seismic surveys may result in behavior effects and mortality in zooplankton and fish that are prey for humpback whales. However, substantial uncertainty exists regarding the threshold at which seismic survey activities may affect prey species, and what conservations efforts could be recommended.
The frequency of new seismic survey consultations related to oil and gas activities is generally constant and is comparable to the average rate of consultations in recent years.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** If the BOEM 2019-2024 Draft Proposed Program is approved, there may be new seismic surveys related to oil and gas activity in the whales' critical habitat area in the future. However, associated changes in regional offshore oil and gas development are highly uncertain. Furthermore, although NMFS acknowledges that conservation efforts may be possible to avoid effects of these

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
		activities on critical habitat, there is too much uncertainty at present to predict what conservation efforts may be. Thus, any underestimate of costs associated with this uncertainty would be relatively minor administrative costs of consultation.
Critical habitat designation is unlikely to change alternative energy recommendations.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** The extent to which changes in the nature of alternative energy projects over time may affect humpback whale critical habitat is unknown. Attempting to forecast those changes in the industry, the potential conservation efforts, and the associated costs would be speculative. However, interviews with action agencies responsible for these activities indicated it was unlikely that the extent and location of this activity would expand substantially within the timeframe of this analysis.
Administrative costs for section 7 consultation will be incurred for all forecasted military activities affecting humpback whale critical habitat.	May result in an **overestimate** of costs. (All CH units)	**Potentially major.** This analysis currently assumes that all military activities affecting the critical habitat will be subject to section 7 consultation and incur administrative costs. NMFS is presently weighing the potential exclusion of certain military activities as a matter of national security. Any exemptions for this reason would result in a reduction of estimated future costs.
Designation of critical habitat for humpback whales will not result in indirect costs.	May result in an **underestimate** of costs. (All CH units)	**Likely minor.** It is possible that the designations of the critical habitat may prompt changes in state-level policies that could trigger indirect costs for certain activities, or result in time delays for certain types of projects. The State of Alaska has expressed concern that indirect impacts are likely. However, given that designation of critical habitat for other species in the same areas has only rarely resulted in these types of impacts, it seems unlikely that these designations will have a different outcome. However, a state decision to modify policies to further protect the essential feature of the humpback critical habitat in state-managed activities could result in additional costs.
Economic benefits are not quantified as the specific role of the critical habitat in contributing to the conservation and recovery of the humpback whales is not quantifiable.	Economic benefits are not quantified but described qualitatively.	The primary benefits of the rule stem from its contribution to the conservation and recovery of humpback whales via protection of the essential habitat features. Determining the incremental effect of the critical habitat on humpback whale conservation and recovery – apart from all other ongoing or planned conservation efforts for the species and its essential features – is complex. Chapter 4 accordingly provides perspectives on the types of economic values associated

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS (AFFECTED CH UNITS)	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
		with humpback whales but is not able to quantify these values.
Critical habitat designations will not result in project delays and increased project costs for port infrastructure development and improvements, other in-water construction projects, or FERC relicensing of hydropower dams.	May result in an **underestimate** of costs. (CH units 1-10, with particular uncertainty in Unit 10 due to high level of activity).	**Likely minor.** Public comments and additional outreach did not identify other instances of critical habitat designations across the region specifically resulting in a project delay. The extent to which critical habitat would trigger project delays, above and beyond the listing of the species and other, co-occurring environmental considerations, is uncertain. Given this, while the analysis identifies this as a concern of the local communities, quantifying the potential for project delays, and the potential duration and associated costs, would be speculative.
The critical habitat designations are not expected to affect the level of effort for the State of Alaska to review aquaculture permits.	May result in an **underestimate** of costs. (CH units 1-10, with particular uncertainty in Unit 10 due to high level of activity).	**Likely minor.** The state of Alaska expressed concern that the critical habitat designations may result in a need to dedicate more staff time to address permit review for new aquaculture facilities and that it may increase the number of permits that will require a specific review for potential marine mammal impacts. Any additional costs would consist of incremental administrative costs across a relatively low number of applications, and would not affect the conclusion that conservation efforts are unlikely to result from the designations.

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APPENDIX A | UNDISCOUNTED ECONOMIC IMPACTS BY YEAR

EXHIBIT A-1. UNDISCOUNTED ADMINISTRATIVE COSTS BY YEAR (2020 DOLLARS)

UNIT	YEAR										
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	TOTAL
1	$5,500	$2,400	$1,900	$1,900	$3,400	$2,400	$2,400	$1,900	$1,900	$1,900	$26,000
2	$8,000 - $10,000	$2,400 - $4,600	$1,900 - $4,100	$1,900 - $4,100	$3,400 - $5,600	$2,400 - $4,600	$2,400 - $4,600	$1,900 - $4,100	$1,900 - $4,100	$1,900 - $4,100	$28,000 - $50,000
3	$5,500 - $5,900	$2,400 - $2,900	$1,900 - $2,400	$1,900 - $2,400	$3,400 - $3,900	$2,400 - $2,900	$2,400 - $2,900	$1,900 - $2,400	$1,900 - $2,400	$1,900 - $2,400	$26,000 - $31,000
4	$5,500 - $5,700	$5,000 - $5,200	$1,900 - $2,100	$1,900 - $2,100	$3,400 - $3,600	$2,400 - $2,700	$2,400 - $2,700	$1,900 - $2,100	$1,900 - $2,100	$1,900 - $2,100	$28,000 - $31,000
5	$7,800 - $8,800	$4,800 - $5,800	$6,900 - $7,800	$4,300 - $5,300	$5,800 - $6,800	$4,800 - $5,800	$4,800 - $5,800	$4,300 - $5,300	$4,300 - $5,300	$4,300 - $5,300	$52,000 - $62,000
6	$13,000	$4,600 - $5,100	$4,100 - $4,600	$6,600 - $7,100	$5,600 - $6,100	$4,600 - $5,100	$7,200 - $7,600	$4,100 - $4,600	$4,100 - $4,600	$4,100 - $4,600	$58,000 - $63,000
7	$5,800	$2,800	$2,300	$2,300	$3,800	$2,800	$2,800	$2,300	$2,300	$2,300	$30,000
8	$6,300	$3,300	$2,800	$2,800	$6,800	$3,300	$3,300	$5,300	$2,800	$2,800	$39,000
9	$5,800	$2,800	$2,300	$2,300	$3,800	$2,800	$2,800	$2,300	$2,300	$2,300	$30,000
10	$33,000 - $40,000	$30,000 - $37,000	$29,000 - $36,000	$29,000 - $36,000	$31,000 - $38,000	$32,000 - $39,000	$30,000 - $37,000	$29,000 - $36,000	$32,000 - $39,000	$29,000 - $36,000	$300,000 - $370,000
11	$21,000 - $22,000	$5,200 - $6,000	$5,200 - $6,000	$10,000 - $11,000	$5,200 - $6,000	$12,000 - $13,000	$5,200 - $6,000	$5,200 - $6,000	$5,200 - $6,000	$7,500 - $8,300	$83,000 - $91,000
12	$17,000	$8,500	$8,500	$3,200	$3,200	$7,900	$8,500	$3,200	$3,200	$16,000	$79,000
13	$27,000 - $28,000	$2,900 - $3,900	$2,900 - $3,900	$8,200 - $9,200	$14,000	$18,000 - $19,000	$8,200 - $9,200	$8,200 - $9,200	$8,200 - $9,200	$11,000 - $12,000	$110,000 - $120,000
14	$4,900	$1,400	$1,400	$1,400	$1,400	$11,000	$1,400	$1,400	$1,400	$3,700	$30,000
15	$4,500	$950	$950	$950	$950	$5,700	$950	$950	$950	$3,300	$20,000
16	$5,900	$2,400	$2,400	$2,400	$2,400	$7,100	$2,400	$2,400	$2,400	$4,800	$35,000
17	$15,000	$6,500	$6,500	$6,500	$6,500	$22,000	$6,500	$6,500	$6,500	$8,800	$91,000
18	$12,000	$2,700	$2,700	$2,700	$2,700	$7,400	$2,700	$2,700	$2,700	$5,100	$43,000
19	$18,000	$4,000 - $4,200	$4,000 - $4,200	$4,000 - $4,200	$4,000 - $4,200	$8,700 - $8,900	$4,000 - $4,200	$4,000 - $4,200	$4,000 - $4,200	$6,300 - $6,600	$61,000 - $63,000
All Units	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$30,000

Total	**$220,000 - $240,000**	**$98,000 - $110,000**	**$92,000 - $110,000**	**$98,000 - $110,000**	**$110,000 - $130,000**	**$160,000 - $180,000**	**$100,000 - $120,000**	**$92,000 - $110,000**	**$92,000 - $110,000**	**$120,000 - $140,000**	**$1,200,000 - $1,300,000**

APPENDIX B | ECONOMIC IMPACTS APPLYING A 3% DISCOUNT RATE

EXHIBIT B-1. TOTAL PRESENT VALUE AND ANNUALIZED ADMINISTRATIVE COSTS BY CRITICAL HABITAT UNIT (2020 DOLLARS, 3 PERCENT DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
Mexico and Western North Pacific	1	$23,000	$2,600
Mexico and Western North Pacific	2	$26,000 - $45,000	$2,900 - $5,100
Mexico and Western North Pacific	3	$23,000 - $27,000	$2,600 - $3,100
Mexico and Western North Pacific	4	$26,000 - $28,000	$2,900 - $3,100
Mexico and Western North Pacific	5	$47,000 - $55,000	$5,300 - $6,200
Mexico and Western North Pacific	6	$52,000 - $56,000	$5,900 - $6,400
Mexico and Western North Pacific	7	$26,000	$3,000
Mexico and Western North Pacific	8	$35,000	$4,000
Mexico and Western North Pacific	9	$26,000	$3,000
Mexico	10	$270,000 - $330,000	$30,000 - $38,000
Mexico and Central America	11	$75,000 - $82,000	$8,500 - $9,300
Mexico and Central America	12	$70,000	$8,000
Mexico and Central America	13	$96,000 - $100,000	$11,000 - $12,000
Mexico and Central America	14	$26,000	$3,000
Mexico and Central America	15	$18,000	$2,000
Mexico and Central America	16	$30,000	$3,500
Mexico and Central America	17	$81,000	$9,200
Mexico and Central America	18	$39,000	$4,400
Mexico and Central America	19	$55,000 - $57,000	$6,200 - $6,500
All DPS	All Units	$27,000	$3,000
Total		**$1,100,000 - $1,200,000**	**$120,000 - $130,000**

EXHIBIT B-2. TOTAL PRESENT VALUE AND ANNUALIZED ADMINISTRATIVE COSTS BY DPS (2020 DOLLARS, 3 PERCENT DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT	TOTAL PRESENT VALUE IMPACT	ANNUALIZED IMPACT
Mexico	1	$23,000	$2,600
	2	$26,000 - $45,000	$2,900 - $5,100
	3	$23,000 - $27,000	$2,600 - $3,100
	4	$26,000 - $28,000	$2,900 - $3,100
	5	$47,000 - $55,000	$5,300 - $6,200
	6	$52,000 - $56,000	$5,900 - $6,400
	7	$26,000	$3,000
	8	$35,000	$4,000
	9	$26,000	$3,000
	10	$270,000 - $330,000	$30,000 - $38,000
	11	$75,000 - $82,000	$8,500 - $9,300
	12	$70,000	$8,000
	13	$96,000 - $100,000	$11,000 - $12,000
	14	$26,000	$3,000
	15	$18,000	$2,000
	16	$30,000	$3,500
	17	$81,000	$9,200
	18	$39,000	$4,400
	19	$55,000 - $57,000	$6,200 - $6,500
	All Units	$27,000	$3,000
	Total	**$1,100,000 - $1,200,000**	**$120,000 - $130,000**
Western North Pacific	1	$23,000	$2,600
	2	$26,000 - $45,000	$2,900 - $5,100
	3	$23,000 - $27,000	$2,600 - $3,100
	4	$26,000 - $28,000	$2,900 - $3,100
	5	$47,000 - $55,000	$5,300 - $6,200
	6	$52,000 - $56,000	$5,900 - $6,400
	7	$26,000	$3,000
	8	$35,000	$4,000
	9	$26,000	$3,000
	All Units	$27,000	$3,000
	Total	**$310,000 - $350,000**	**$35,000 - $40,000**
Central America	11	$75,000 - $82,000	$8,500 - $9,300
	12	$70,000	$8,000
	13	$96,000 - $100,000	$11,000 - $12,000
	14	$26,000	$3,000
	15	$18,000	$2,000
	16	$30,000	$3,500
	17	$81,000	$9,200
	18	$39,000	$4,400
	19	$55,000 - $57,000	$6,200 - $6,500
	All Units	$27,000	$3,000
	Total	**$520,000 - $530,000**	**$59,000 - $61,000**

Note: Impacts presented in this exhibit are not additive across DPSs. Most critical habitat units are associated with multiple DPSs, and the estimated impacts in these units are presented for each relevant DPS. As a result, summing across DPSs would result in double counting of impacts.

EXHIBIT B-3. TOTAL PRESENT VALUE ADMINISTRATIVE COSTS BY ACTIVITY TYPE (2020 DOLLARS, 3 PERCENT DISCOUNT RATE)

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Western North Pacific	1	$4,400	$0	$0	$0	$0	$17,000	$0	$0	$0	$1,900	$0	$0
Mexico and Western North Pacific	2	$4,400	$0	$0	$2,500 - $22,000	$0	$17,000	$0	$0	$0	$1,900	$0	$0
Mexico and Western North Pacific	3	$4,400	$0	$0	$0 - $4,200	$0	$17,000	$0	$0	$0	$1,900	$0	$0
Mexico and Western North Pacific	4	$4,400	$0	$0	$2,500 - $4,500	$0	$17,000	$0	$0	$0	$1,900	$0	$0
Mexico and Western North Pacific	5	$4,400	$850	$0	$14,000 - $22,000	$0	$13,000	$6,300	$0	$4,200	$1,900	$0	$1,700
Mexico and Western North Pacific	6	$4,400	$20,000	$0	$6,700 - $11,000	$0	$13,000	$0	$5,300	$0	$1,900	$0	$0
Mexico and Western North Pacific	7	$4,400	$850	$0	$0	$0	$13,000	$4,200	$0	$0	$1,900	$0	$1,700
Mexico and Western North Pacific	8	$4,400	$2,850	$0	$4,300	$2,000	$13,000	$4,200	$0	$0	$1,900	$0	$1,700
Mexico and Western North Pacific	9	$4,400	$850	$0	$0	$0	$13,000	$4,200	$0	$0	$1,900	$0	$1,700
Mexico	10	$4,400	$4,900	$0	$76,000 - $140,000	$2,000	$130,000	$6,100	$0	$0	$10,000	$26,000	$1,700
Mexico and Central America	11	$12,000	$0	$0	$15,000 - $22,000	$0	$13,000	$22,000	$0	$230	$3,100	$0	$9,800
Mexico and Central America	12	$12,000	$0	$0	$28,000	$0	$13,000	$5,400	$0	$230	$6,000	$0	$5,600
Mexico and Central America	13	$12,000	$0	$5,300	$45,000 - $54,000	$0	$9,800	$3,400	$5,300	$230	$6,900	$0	$7,700

DPS	CRITICAL HABITAT UNIT(S)	COMMERCIAL FISHING	OIL AND GAS ACTIVITIES	ALTERNATIVE ENERGY	IN-WATER CONSTRUCTION	VESSEL TRAFFIC	AQUACULTURE AND HATCHERIES	MILITARY ACTIVITIES	LNG FACILITIES	SPACE VEHICLE AND MISSILE LAUNCHES	WATER QUALITY MANAGEMENT AND INLAND ACTIVITIES	USFS ACTIVITIES	SCIENTIFIC RESEARCH
Mexico and Central America	14	$14,000	$0	$4,600	$0	$0	$0	$3,400	$0	$230	$3,800	$0	$0
Mexico and Central America	15	$13,000	$0	$0	$0	$0	$0	$3,400	$0	$230	$1,000	$0	$0
Mexico and Central America	16	$13,000	$0	$0	$14,000	$2,100	$0	$0	$0	$230	$1,000	$0	$0
Mexico and Central America	17	$13,000	$680	$14,000	$51,000	$0	$0	$0	$0	$230	$1,000	$0	$0
Mexico and Central America	18	$13,000	$6,900	$0	$4,700	$0	$5,300	$0	$0	$7,500	$1,000	$0	$0
Mexico and Central America	19	$13,000	$8,000	$0	$9,300 - $11,000	$2,100	$5,300	$15,000	$0	$1,200	$1,000	$0	$0
All DPS	All Units[a]	$0	$0	$0	$0	$0	$0	$6,300	$0	$0	$20,000	$0	$0
Total		**$160,000**	**$46,100**	**$24,000**	**$270,000 - $390,000**	**$8,300**	**$310,000**	**$84,000**	**$11,000**	**$15,000**	**$73,000**	**$26,000**	**$32,000**

Notes: Estimates are rounded to two significant digits.

* Consultations associated with "All Units" are large-scale national level consultations that are expected to consider humpback whales and critical habitat but are not associated with the designation of any particular unit or units. A "N/A" indicates "not applicable" because the activity does not result in consultations at the spatial scale of the groupings of units described in the first column. This is different than a "$0" entry, which simply indicates that no costs for the activity are associated with the specified unit.

APPENDIX C | DATA AND ASSUMPTIONS FOR ESTIMATING ADMINISTRATIVE COSTS OF SECTION 7 CONSULTATIONS

Industrial Economics, Incorporated (IEc) developed a model in 2002 calculating the administrative costs of section 7 consultations to inform economic analyses of critical habitat rules. This effort included interviews with Federal agency staff with significant experience implementing section 7 consultations. While the model was originally developed for the U.S. Fish and Wildlife Service, for the past 15 years NMFS has adopted it as the best available information on administrative costs of consultation for its critical habitat rulemakings, as well. Over the course of dozens of rulemakings, the assumptions and consultation costs have been reviewed, and at times adjusted, by NMFS biologists and Federal agency staff.

The estimated level of effort for time spent in consultation is based on interviews with Federal agency staff. Specifically, staff provided information on hours or days spent by task and consultation type, as well as the staff level (in terms of the Federal General Schedule (GS) level) typically assigned to these tasks. To account for the range of complexity across consultations, the interviewees described time estimates and GS level assignments at low and high levels of effort for each consultation type. Separately, the model considers the number of hours and hourly rate to conduct Biological Assessments.

Wages for Federal agencies reflect the midpoint between Step 1 and Step 10 within each GS level using the GS Hourly Rates and are multiplied by 2.5 to account for overhead.[249]

Based on these interviews, Exhibit C.1 describes the resulting key assumptions related to total hours and wage level for consultations and technical assistances that considered both the listing of the species (jeopardy) and critical habitat (adverse modification). Of these total consultation costs, approximately 25 percent is the cost to consider adverse modification. Similarly, re-initiation of past consultations to address adverse modification require 50 percent of these total costs.

The consultation costs in Exhibit 1-3 of this analysis reflect the average across the low and high levels of effort by consultation type and party.

[249] In the analysis presented in the main text, wage rates reflect the 2020 GS Schedule (effective January 2020), available at: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/20Tables/html/GS_h.aspx

EXHIBIT C.1. KEY HOUR AND WAGE RATE ASSUMPTIONS USED IN THE SECTION 7 COST MODEL

CONSULTATION TYPE	EFFORT LEVEL	FWS/NMFS		FEDERAL ACTION AGENCY		THIRD PARTY		BIOLOGICAL ASSESSMENTS	
		TOTAL HOURS	GS LEVEL	TOTAL HOURS	GS LEVEL	TOTAL HOURS	HOURLY WAGE	TOTAL HOURS	HOURLY WAGE
Technical Assistance	Low	5	GS-10			6	$100		
	High	13	GS-10			15	$100		
Informal Consultation	Low	19	GS-10	23	GS-11	12	$100	0	$100
	High	45	GS-12	56	GS-12	29	$100	40	$100
Formal Consultation	Low	45	GS-12	56	GS-12	29	$100	40	$100
	High	74	GS-13	94	GS-12	41	$100	56	$100
Programmatic Formal Consultation	Low	200	GS-11	160	GS-11			56	$100
	High	280	GS-11	240	GS-11			56	$100