RIR/ESA Section 4(b)(2) Preparatory Assessment/FRFA of Critical Habitat Designation for the Arctic Ringed Seal

November 2021

NATIONAL MARINE FISHERIES SERVICE

Alaska Region

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Acronyms

AAC	Alaska Administrative Code
APPS	Act to Prevent Pollution from Ships
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AGIA	Alaska Gasline Inducement Act
AIDEA	Alaska Industrial Development and Export Authority
ANILCA	Alaska National Interest Lands Conservation Act
ANCSA	Alaska Native Claims Settlement Act
AOGCA	Alaska Oil and Gas Conservation Act
AOGCC	Alaska Oil and Gas Conservation Commission
ANS	Alaska North Slope
AS	Alaska Statute
AIAN	American Indian or Alaskan Native
AMSA	Arctic Marine Shipping Assessment
ANWR	Arctic National Wildlife Refuge
ASRC	Arctic Slope Regional Corporation
A-Y-K	Arctic-Yukon-Kuskokwim
Boe	Barrels of oil equivalent
Bpd	Barrels per day
BSAI	Bering Sea and Aleutian Islands
BSNC	Bering Straits Native Corporation
Bcf	Billion cubic feet
BOF	Board of Fisheries
BLM	Bureau of Land Management
BOEM	Burea of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CWA	Clean Water Act
CV	Contingent Valuation
CH	Critical Habitat
CHD	Critical Habitat Designation
ESA	Endangered Species Act
EPA	U.S. Environmental Protection Agency
EFH	Essential Fish Habitat
EEZ	Exclusive Economic Zone

EO	Executive Order
FERC	U.S. Federal Energy Regulatory Commission
FMP	Fishery Management Plan
FRFA	Final Regulatory Flexibility Act Analysis
G&G	Geological and Geophysical
GHG	Greenhouse Gas
ISC	Ice Seal Committee
ITS	Incidental Take Statement
IFQ	Individual Fishing Quota
IHA	Incidental Harrassment Authorization
ITR	Incidental Take Regulation
ITQ	Individual Transferable Quota
IRFA	Initial Regulatory Flexibility Act Analysis
IPHC	International Pacific Halibut Commission
MSA	Magnuson-Stevens Act
MMPA	Marine Mammal Protection Act
MPPRCA	Marine Plastic Pollution Research and Control Act
MHW	Mean High Water
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPR-A	National Petroleum Reserve Alaska
NPDES	National Pollution Discharge Elimination System
NPFMC	North Pacific Fisheries Management Council
OPA	Oil Pollution Act
OMB	Office of Management and Budget
OCS	Outer Continental Shelf
PARS	Port Access Routing Study
RPA	Reasonable and Prudent Alternatives
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
RP	Revealed Preference
RHA	River and Harbors Act
SBA	Small Business Administration
SP	Stated Preference
SAFE	Stock Assessment and Fishery Evaluation
SPCE	(Stated Preference) Choice Experiment
Tcf	Thousand cubic feet

TAC	Total Allowable Catch
TAPS	Trans-Alaska Pipeline System
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
WTP	Willingness to Pay

1 Introduction

This Regulatory Impact Review (RIR)/Endangered Species Act Section 4(b)(2) Preparatory Assessment/Final Regulatory Flexibility Act Analysis (FRFA) (hereinafter together, "RIR/4(b)(2) Preparatory Assessment/FRFA") addresses the designation of critical habitat (CH) for Arctic ringed seals in waters of the northern Bering Sea, Chukchi Sea, and Beaufort Sea, off the coast of Alaska, under the Endangered Species Act of 1973 (ESA). The purpose of this RIR/4(b)(2) Preparatory Assessment/FRFA is to identify and evaluate the economic, socioeconomic, and other costs and benefits associated with designating CH for the Arctic ringed seal, and assist the Secretary of Commerce (Secretary) in determining whether the benefits of excluding any particular area from the CH designation (CHD) outweigh the benefits of inclusion (16 U.S.C. 1533). This information allows the National Marine Fisheries Service (NMFS) to address the requirements of Executive Orders (EOs) 12866 and 13211,[1] and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 601 et seq.; and Pub. L. 104-121).

1.1 Listing and Critical Habitat Designation Background

The Arctic ringed seal was listed as threatened under the ESA on December 28, 2012, primarily due to threats associated with long-term reductions in sea ice and on-ice snow depths expected to occur within the foreseeable future (77 Fed. Reg. 76706; December 28, 2012). In the United States, Arctic ringed seals are found in the northern Bering, Chukchi, and Beaufort Seas. Arctic ringed seals are highly associated with sea ice, and use the ice as a platform for pupping, nursing, molting, and resting.

At the time of listing, NMFS announced its intention to designate CH for the Arctic ringed seal under the ESA in a separate rulemaking, as it was not then determinable. Subsequently, on December 3, 2014, NMFS published a proposed rule to designate CH for the Arctic ringed seal (79 Fed. Reg. 71714; December 3, 2014). Due to a clerical error, that document contained mistakes and NMFS therefore published a corrected proposed rule on December 9, 2014 (79 Fed. Reg. 73010; December 9, 2014). NMFS requested public comments on this proposed CHD and held five public hearings in Alaska on the proposed rule.

Following this, on March 17, 2016, the listing of Arctic ringed seals as a threatened species was vacated by the U.S. District Court for the District of Alaska.[2] This decision was reversed by the U.S. Court of Appeals for the Ninth Circuit on February 12, 2018,[3] and the listing was reinstated on May 15, 2018.

On June 13, 2019, the Center for Biological Diversity filed a complaint in the U.S. District Court for the District of Alaska alleging that NMFS had failed to timely designate CH for the Arctic ringed seal. Under a court-approved stipulated settlement agreement, NMFS issued a revised proposed rule to designate CH for the Arctic ringed seal on January 8, 2021 (86 Fed. Reg. 1452). NMFS requested public and peer review comments on the revised proposed CHD and associated draft impact analysis (NMFS 2020) during a 90-day comment period, and held three public hearings on the proposal. A summary of the comments received and NMFS's responses is provided in the preamble to the final rule.

Since release of the draft impact analysis, this document has been modified to update and incorporate additional information and address substantive issues raised in the comments received; to incorporate

[1] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; Executive Order 13211, *Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001.

[2] *Alaska Oil & Gas Ass'n* v. *Nat'l Marine Fisheries Serv.*, Case Nos. 4:14-cv-29-RRB, 4:15-cv-2-RRB, 4:15-cv-5-RRB, 2016 WL 1125744 (D. Alaska Mar. 17, 2016).

[3] *Alaska Oil & Gas Ass'n* v. *Ross*, 722 F. Appx. 666 (9th Cir. 2018).

revisions to the descriptions of the essential features and the shoreward boundary of the designation identified in the revised proposed rule; and to improve clarity and correct typographical or other minor errors. Additionally, the projected number of future Federal actions that may affect Arctic ringed seal CH and the estimated incremental administrative costs of those projected consultations have been updated to reflect revision of the shoreward boundary of the designation identified in the proposed rule, as noted below. The timeframe, wage schedule, and dollar year for this analysis has also been updated from 2019-2028 to 2021-2030.

Section 3(5)(A) of the ESA defines (16 U.S.C. 1532(5)(A)) CH as:

> *(i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found the physical and 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 that are determined by the Secretary to be essential for the conservation of the species.*

Section 3(3) of the ESA defines the terms "conserve," "conserving," and "conservation" to mean "to use, and 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(3)).

Once CH 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 is not likely result in the destruction or adverse modification of CH. This is in addition to the Section 7(a)(2) requirement that Federal agencies consult with NMFS to ensure that their actions are not likely jeopardize the continued existence of any endangered or threatened species.

NMFS has identified the following physical or biological features essential to the conservation of the Arctic ringed and that may require special management considerations or protection:

1. Snow-covered sea ice habitat suitable for the formation and maintenance of subnivean birth lairs used for sheltering pups during whelping and nursing, which is defined as waters 3 m or more in depth (relative to MLLW [mean lower low water]) containing areas of seasonal landfast (shorefast) ice or dense, stable pack ice, that have undergone deformation and contain snowdrifts of sufficient depth to form and maintain birth lairs (typically at least 54 cm deep).
2. Sea ice habitat suitable as a platform for basking and molting, which is defined as areas containing sea ice of 15 percent or more concentration in waters 3 m or more in depth.
3. Primary prey resources to support Arctic ringed seals, which are defined to be small, often schooling, fishes, in particular, Arctic cod (*Boreogadus saida*), saffron cod (*Eleginus gracilis*), and rainbow smelt (*Osmerus dentex*); and small crustaceans, in particular, shrimps and amphipods.

One specific area of marine habitat in the Bering, Chukchi, and Beaufort Seas has been identified by NMFS where the essential features occur ***(Figure 1-1)***. NMFS has revised the proposed shoreward boundary of this specific area, which was identified in the revised proposed rule as the line of mean lower low water, to instead define this boundary as the 3-m isobath. This final impact analysis analyzes the entire area considered for designation as CH for the Arctic ringed seal, which does not reflect the proposed exclusion identified in the revised proposed rule of a particular area north of the Beaufort Sea shelf from designation based on national security considerations. For simplicity, this report refers to this area as "critical habitat" (CH). The potential costs avoided due to the proposed exclusion of the particular area north of the Beaufort Sea shelf, which is ultimately excluded in the final rule with revision of the proposed southern and western boundaries, is summarized in **Section 8.1.2**; and a summary of the total costs of the final CHD, reflecting this exclusion, is included in **Section 6.11**.

1.2 Purpose and Need

Before designating CH, Section 4 of the ESA requires that NMFS consider the economic, national security, and other relevant impacts of the CHD. Section 4 of the ESA also provides the Secretary with discretion to exclude any particular area from the CH if she determines that the benefits of exclusion outweigh the benefits of designation, unless exclusion will result in the extinction of the species concerned (Section 4(b)(2)). NMFS must also address the requirements of EO 12866 and EO 13211, and the RFA, as amended by the Small Business Regulatory Enforcement Fairness Act.

EO 12866 requires that the Office of Management and Budget (OMB) review proposed regulatory actions that are considered to be "significant". OMB makes this determination based primarily upon the analysis contained in the RIR that accompanies the proposed action. A significant regulatory action is one that is likely to:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in EO 12866.

RFA requirements serve to inform the agency, as well as the public, of the expected and potential economic impacts of a proposed action, to ensure that the agency considers alternatives that minimize significant adverse economic impacts of the rule on a substantial number of small entities, while meeting the goals and objectives of the final action, consistent with applicable law.

This document contains the RIR analysis, required under EO 12866; Section 4(b)(2) Preparatory Assessment, required under the ESA; and the FRFA, required by the RFA.

1.3 Objectives

To consider the potential economic, national security, and other impacts associated with the designation of CH for the Arctic ringed seal, NMFS has identified the following primary objectives for this report:

1. Describe existing regulations and policies that provide baseline protection to the Arctic ringed seal and its habitat (i.e., baseline conditions without CHD);
2. Identify, compile, characterize, and synthesize economic, capital investment, and associated information for activities in and around the Bering Sea, Chukchi Sea, and Beaufort Sea, and adjacent coastal areas of Alaska, that may be affected by the CHD;
3. Determine the incremental economic and other relevant impacts of the CHD relative to the baseline without CHD; and
4. Apply the information compiled through the first three objectives to prepare an RIR/4(b)(2) Preparatory Assessment/FRFA of the Arctic ringed seal CHD and any alternative CHDs.

1.4 Regulatory Impact Requirements

Below we summarize the requirements of each of the three components of this document: RIR, 4(b)(2) Preparatory Assessment, and the FRFA.

1.4.1 Requirements of Regulatory Impact Review

The following statement from Section 1(a) of EO 12866 summarizes the requirements of an RIR:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

The following are the *minimum* requirements for an RIR document:

1. A complete quantitative description (to the extent practicable) of the problem being addressed;
2. A clear description of the management objectives;
3. A comprehensive description of each alternative (including the No Action alternative);
4. A thorough description of the expected effects (both positive and negative) of each alternative, on each potentially impacted group; and
5. A qualitative analysis of the benefits and costs of each alternative. When adequate data are available, expected benefits and costs should be quantified to the fullest extent that these can be usefully estimated.

1.4.2 Requirements of Section 4(b)(2) of the ESA

Section 4(b)(2) of the ESA (16 U.S.C. 1533(b)(1)(A)) requires NMFS to consider the economic, national security, and any other relevant impacts of the CHD. Section 4(b)(2) also provides NMFS, on behalf of the Secretary, with discretion to exclude any particular area from the CH if she determines that the benefits of exclusion outweigh the benefits of designation, unless exclusion will result in extinction of the species.

A Section 4(b)(2) analysis consists of two components:

1. An initial mandatory requirement that the agency consider certain impacts of CHD; and
2. A discretionary component, wherein the Secretary, informed by those considerations, may exclude any particular area from CH.

The ESA's legislative history explains the broad latitude afforded NMFS in its consideration of impacts:

> *Economics and any other relevant impact shall be considered by the Secretary in setting the limits of critical habitat for such a species. The Secretary is not required to give economics or any other "relevant impact" predominant consideration in his (sic) specification of critical habitat…The consideration and weight given to any particular impact is completely within the Secretary's discretion.*[4, 5]

In exercising its discretion under Section 4(b)(2), NMFS may:

1. Identify particular areas for possible exclusion from CHD;
2. Determine the benefit of designation (e.g., biological, economic, or other benefits) of each particular area;
3. Determine the benefit of exclusion of each particular area;
4. Determine whether the benefits of exclusion outweigh the benefits of designation; and

[4] H.R. Rep. No. 95-1625, at 16-17 (1978), 1978 U.S.C.C.A.N. 9453, 9466-67.

[5] The provisions requiring consideration of impacts were originally discussed as applicable only to critical habitat designations for invertebrate species. However, section 4(b)(2) as enacted is not limited to invertebrates, and NMFS and USFWS have applied the provision to designations for vertebrate and invertebrate species.

5. Determine whether the exclusions (if any) will result in extinction of the species.

1.4.3 Requirements of Regulatory Flexibility Act

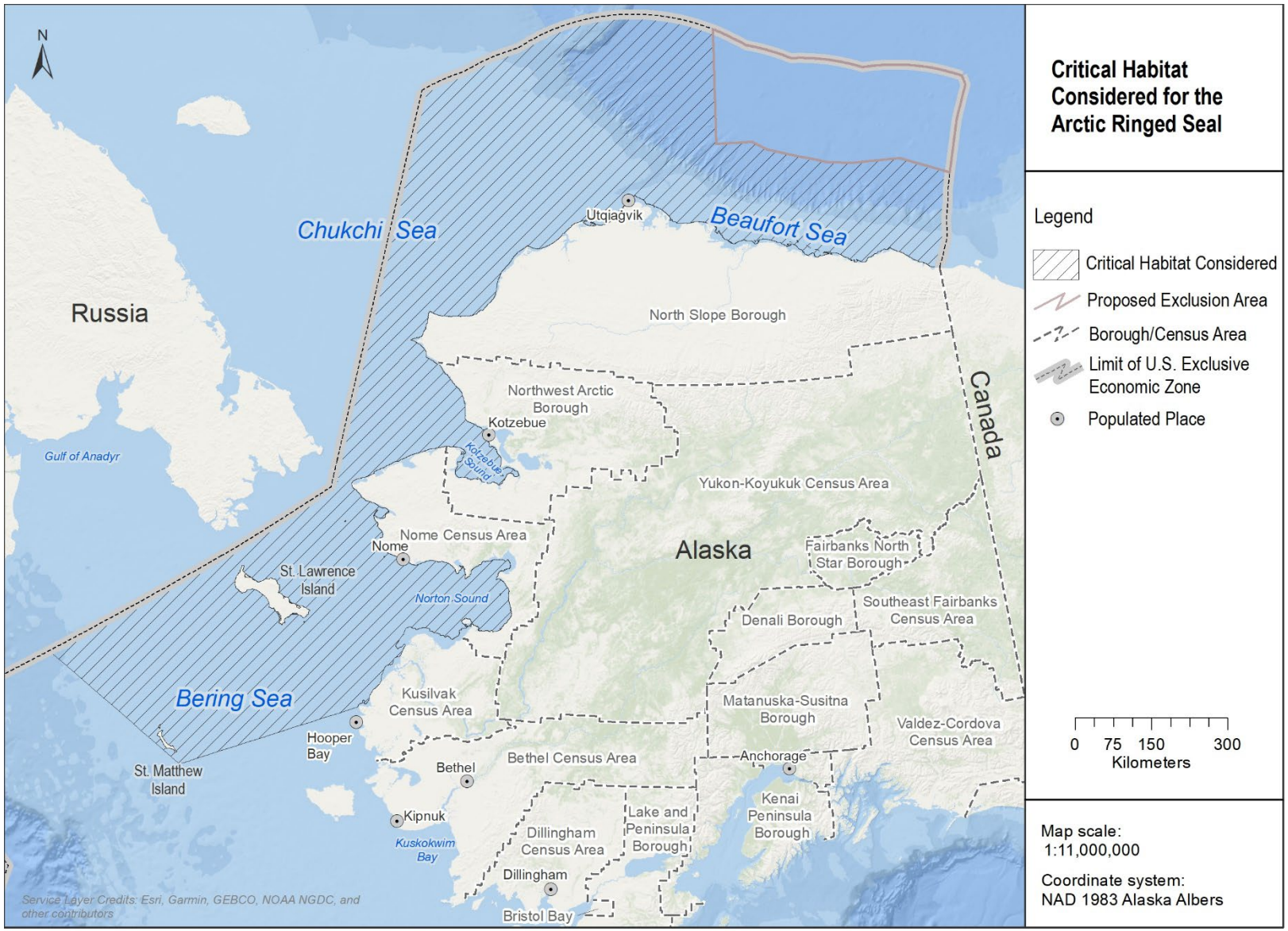
Major goals of the RFA are as follows:

1. To increase agency awareness and understanding of the impact of its regulations on small entities[6];
2. To require that agencies communicate and explain its findings to the public; and
3. To encourage agencies to use flexibility and to provide regulatory relief to small entities.

The RFA emphasizes predicting impacts on small entities as a group, distinct from other entities, and on the consideration of alternatives that may minimize adverse economic impacts, consistent with all applicable law, while still achieving the stated objective of the action.

[6] The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) small government jurisdictions. Section 601(3) of the RFA defines a "small business" as having the same meaning as "small business concern" which is defined under Section 3 of the Small Business Act (SBA). The SBA has established size criteria for all major industry sectors in the U.S., based on such factors as annual gross receipts and number of employees. The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field. The RFA defines "small governmental jurisdictions" as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

Figure 1-1 Area Considered for Arctic Ringed Seal Critical Habitat.



2 Methodology and Framework for Analysis

This section describes the general framework for the analysis. It then describes, in economic terms, the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both distributional effects. Next, it describes the specific framework and methods to evaluate benefits of CHD. This is followed by sections that define the baseline and incremental effects of the Arctic ringed seal CHD, and the potentially affected economic groups, entities, and sectors associated with the CHD. It concludes with a presentation of the time-frame for the analysis and information sources relied upon in the analysis.

2.1 General Framework for the Analysis

An analysis of benefits and costs is preparatory to and supports the ESA's Section 4(b)(2) decision-making process, by allowing NMFS, on behalf of the Secretary, to compare an estimate of the "benefits of exclusion" of any particular area from the designation, against an estimate of the "benefits of inclusion" of that area (NMFS 2005). In addition to having strong scientific support, this approach has support from OMB, through its guidelines on regulatory analysis (OMB 2003). Because an analysis of benefits and costs seeks to empirically measure the value of an activity, it typically requires that a single metric, most commonly U.S. dollars, be used to gauge both benefits and costs. While all efforts are made to monetize the net benefits associated with the Arctic ringed seal CHD, these benefits and costs are quantified and/or discussed qualitatively where sufficient data with which to monetize are not available. EO 12866 explicitly provides for, and OMB guidance concurs in, use of a non-quantitative analysis that is consistent with economic theory and with the best available information, when meaningful quantification is not possible.

2.2 Categories of Potential Economic Effects of Critical Habitat Designation

This economic analysis considers the economic efficiency and distributional effects that may result from designation of CH for the Arctic ringed seal. Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish, in this context, habitat conservation. For example, if the set of activities that may take place on a parcel of land in the vicinity of Arctic ringed seal CH is limited as a result of the CHD (because that set of activities would be expected to destroy or adversely modify CH), the market value of the land may be reduced. This reduction in value represents one potential measure of opportunity cost or change in economic efficiency attributable to the CHD. The opportunity costs, attributable to the aforementioned limits, are in contrast to the welfare gains that accrue from not allowing unconstrained actions to destroy or adversely modify CH without considering alternatives and trade-offs.[7] Economic efficiency effects may also include indirect costs associated with changes in economic activities due to regulatory uncertainty, time delays, and additional state and local legislation or regulation triggered by CHD.

Similarly, the costs of a Federal action agency's consultation with NMFS on actions that may affect CH, under Section 7 of the ESA, represent opportunity costs of the designation. These consultation provisions were expressly established in law, recognizing their inherent costs, but were deemed of sufficient benefit to society's interests (under ESA) to justify incurring this administrative commitment of resources (i.e., the benefits exceed the costs).

[7] It is also possible that the market value of adjacent parcels could rise as a result of the protections afforded by critical habitat designation. For example, a working paper by Mamum et al. (2021) found that critical habitat has had a positive impact on developed (specifically, adjacent parcels with existing housing units) and undeveloped parcel prices relative to nearby control parcels in a national level analysis of the lower 48 states, while this was variably the case for subsets of critical habitat with respect to developed parcels.

This analysis also addresses the distribution of costs and benefits associated with the designation, to the extent a Federal nexus exists, including an assessment of any local or regional economic effects of habitat conservation, and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the costs and benefits of designation of CH for the Arctic ringed seal inequitably burden or benefit a particular group or economic sector. For example, while conservation efforts may have a relatively small effect on the national economy as a whole, individuals employed in a particular sector of the regional or local economy may experience substantially greater economic effects. The differences between economic efficiency effects (i.e., changes in consumers' and producers' surpluses) and distributional effects (i.e., measures of change in economic activity), as well as their application in this analysis, are discussed in greater detail below.

2.2.1 Efficiency Effects

At the guidance of the OMB and in compliance with EO 12866, "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. Economic efficiency is typically measured against a "baseline" or *status quo* condition (i.e. the no action alternative), with all attributable gains and losses compared for each alternative regulatory path. In the context of regulations that would designate CH for the Arctic ringed seal, society seeks to accrue benefits from the conservation, recovery, and stewardship of this threatened species (reflected in the provisions of the ESA) specifically attributable to avoidance of destruction or adverse modification for its CH. At the same time, these welfare gains come at a cost to society. These costs reflect the opportunity cost of resources used or benefits foregone by society, as a result of the specific regulatory alternative considered. Economists generally characterize opportunity costs in terms of changes in producer and/or consumer surpluses in affected markets.[8] Economic efficiency analyses seeks to measure, to the extent practicable, the relative trade-offs of each competing regulatory alternative (including the no action alternative) to assure: 1) that a full accounting of all relevant costs and benefits is made; and 2) that the most economically efficient *available*[9] alternative is identified.

It is, however, not always possible to measure each cost and each benefit in a common metric (e.g., U.S. dollars). When the regulatory action results in welfare changes with both market and non-market characteristics, as is the case for threatened and endangered species management, conservation, and recovery efforts, markets (and, therefore, prices) do not exist for many important components of resource management. The results of an analysis can be severely biased by excessive reliance on price signals from traditional markets and their interpretation in an analysis of benefits and costs, especially within the context of environmental assets with complex and significant attributes not reflected in traditional market structures.

In some instances, compliance costs may provide a reasonable approximation of the economic burden associated with a regulatory action. For example, a Federal agency, such as the U.S. Army Corps of Engineers (USACE), may enter into a consultation with NMFS to ensure that a particular activity it plans to undertake, fund, or permit will not adversely modify CH. The effort required for the consultation (which, in practice, may be quite small), is an economic opportunity cost; because the manager's time and effort could have been spent on an alternative activity, absent the consultation. However, this "burden" captures only one side of the equation. The investment of time and resources spent on consultation also "yields" social benefits, by assuring that inadvertent, unintentional, or inappropriate actions that could destroy or adversely modify CH are not permitted, sanctioned, funded, or undertaken by a Federal agency, without objective public scrutiny, as required under ESA and other relevant law.

[8] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see EPA (2010a).

[9] It is occasionally the case that a specific alternative is mandated by law, even though it may not be the most economically efficient solution.

This analysis begins by measuring the costs and benefits associated with designation of CH for the Arctic ringed seal. Compliance costs may, under certain limiting assumptions, provide a first approximation of the direct "cost" side of the change in economic efficiency. However, if the cost of conservation efforts is expected to significantly affect markets, the analysis will be expanded to consider potential changes in consumers' and/or producers' surpluses in such affected markets.

2.2.2 Distributional and Regional Economic Effects

The OMB encourages Federal agencies to consider distributional effects, separately from benefits and costs (OMB 2003). This analysis considers several types of distributional effects, including effects on small entities; effects on energy supply, distribution, and use; regional economic effects; and environmental justice effects. It is important to note that these measures are fundamentally different economic attributes from benefits and/or costs and, thus, cannot be added to or compared with estimates of net economic changes. Distributional effect estimators describe changes in "economic activity," not economic benefits and costs.

2.2.2.1 Effects on Small Entities and Energy Supply, Distribution, and Use

This analysis also considers how small entities, including small businesses, not-for-profit organizations, and governments, as defined by the RFA (5 U.S.C. 601), might be affected by future incremental conservation efforts attributable to the CHD. In addition, in response to EO 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future effects of CHD for the Arctic ringed seal on the energy industry and its customers.

2.2.2.2 Regional Economic Effects

Regional economic impact analysis can provide an assessment of the potential localized effects of CHD. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in regional economic "activity", resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by fishermen) and the effect of that change on economic output, income, or employment in other local sectors (e.g., suppliers of goods and services to those fishermen). These economic data provide a numerical estimate of the magnitude of growth or contraction of jobs, income, and transactions *in a specific local economy*. These economic impacts reflect "activity" (i.e., they characterize "transfers" among local or regional components of the broader economy), not "net" changes in the economy, as a whole.

The use of regional input/output models in an analysis of the economic impacts of CHD can overstate the long-term effects of a regulatory change. Most importantly, these models provide a static view of the economy of a region or locality. That is, they attempt to measure the initial impact of a regulatory change on aspects of a specific local economy, but do not consider long-term adjustments that the economy will make in response to this change. For example, these models often provide estimates of the number of jobs lost in a given local or regional market, as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

Despite these and other limitations, in certain circumstances, the regional economic impact analysis may provide useful information about the scale, scope, and distribution of *localized* changes in economic activity. It is important to remember that measures of regional economic activity generally reflect shifts in resource use and transfers of economic activity, rather than net welfare losses or gains.

2.2.2.3 Environmental Justice Effects

The analysis considers whether CHD will result in disproportionately high adverse effects on minority or low income populations. EO 12898 was intended to ensure that Federal actions and policies do not result in disproportionately high adverse health effects on minority or low-income populations. Environmental justice concerns may arise from effects on the natural and physical environment that produce human health or ecological outcomes, or from adverse social or economic changes.

2.3 Baseline and Incremental Effects

This analysis examines the state of the world with and without the designation of CH for the Arctic ringed seal. The "without CHD" scenario represents the baseline for the analysis, considering habitat protections already extended to Arctic ringed seal under its ESA Federal listing or under other Federal, state, and local regulations, including collateral protections resulting from protection afforded other listed species, such as the polar bear. The "with CHD" scenario attempts to describe the incremental effects associated specifically with, and unique to, the CHD for the Arctic ringed seal (see **Section 1.1**). This aspect of the analysis also provides an overview of costs and benefits that may be considered co-extensive with the listing of Arctic ringed seals and other baseline protections. The focus of the analysis, however, is determining the increment of effects that can be uniquely attributed to the CHD, to the fullest extent practicable. [10]

The first step in the economic analysis is to identify the baseline level of protection currently afforded the Arctic ringed seal and its habitat by existing regulations, absent the CHD. This section provides a description of the methodology used to identify baseline conditions, against which incremental effects stemming from the CHD for the Arctic ringed seal (i.e., with the CHD) will be contrasted. It also describes the incremental effects in more detail.

2.3.1 Baseline for the Analysis

The baseline for this analysis is the existing state of regulation that provides protection to the Arctic ringed seal under the ESA, as well as under other Federal, state, and local laws, regulations, and guidelines, absent the CHD. The baseline includes the protections of Sections 7, 9, and 10 of the ESA, and economic effects resulting from these protections, in the absence of CHD for the Arctic ringed seal.

Section 7 of the ESA requires Federal agencies to consult with the Secretary, through her designee NMFS, to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species (i.e., the “jeopardy standard”). The portion of the administrative costs of consultations under the jeopardy standard and the effects of any project modifications resulting from consideration of this standard (e.g., project modifications, such as date restrictions, that may be required to address impacts to ringed seals) are considered baseline effects.

The protection of listed species and habitat is not limited to the ESA. Other Federal statues, as well as state and local laws, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act (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 categorized accordingly. Of particular relevance to this report, the Marine Mammal Protection Act (MMPA) provides strong baseline protection for Arctic ringed seals. Many of the relevant existing regulations are discussed in **Section 5.3**.

[10] We note that although the focus of this analysis is on the incremental effects of the rule, due to uncertainties with regard to future management actions associated with Arctic ringed seal CH, it was difficult in some cases to exclude potential impacts that may already occur under the baseline. Thus, the analysis may include some costs which would have occurred under the baseline, regardless of this rule (i.e., co-extensive costs). An effort to explicitly identify the presence of co-extensive cost estimates and distinguish them from uniquely incremental CH costs, whenever possible, has been made herein.

2.3.2 Types of Economic Costs and Benefits of Critical Habitat Designation

This analysis separately monetizes, quantifies, or qualitatively assesses the "incremental" costs and benefits identified as deriving from this CHD action, to the fullest extent practicable (a description of the types of costs is provided in **Section 3,** while descriptions of types of benefits are provided in **Section 4**). This incremental analysis seeks to determine the effects on human uses and activities uniquely attributable to the CHD that are above and beyond those effects due to existing or planned (required or voluntary) conservation efforts being conducted under other Federal, state, and local regulations or guidelines, including the ESA listing.

When CH is designated, Section 7 requires Federal agencies to ensure that their actions will not result in its destruction or adverse modification (in addition to, and separate from, considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of CH in Section 7 consultations, and the additional costs of implementing project modifications, uniquely resulting from the designation of CH, are the direct compliance costs of CHD. These costs are not in the baseline and are appropriately considered attributable costs of the CHD.

Figure 2-1 depicts the decision analysis regarding whether an effect should be considered incremental. The following sections describe this decision tree in detail.

Incremental costs may be the direct compliance costs associated with additional effort for forecasted consultations, reinitiated consultations, new consultations occurring specifically because of the CHD, and additional project modifications that would not otherwise have been required under the jeopardy standard. Additionally, indirect incremental costs of CHD to activities that do not have a Federal nexus may accrue as a result of: 1) changes in activities that do have a Federal nexus (e.g., reduced expansion at a federally permitted port facility affecting growth of businesses associated with the Port or using Port facilities); 2) triggering of additional requirements under state or local laws intended to protect sensitive habitat; and 3) uncertainty and perceptional effects on markets. The nature of these costs is described in greater detail below.

This report considers activities that may be affected by the designation of CH for the Arctic ringed seal. The Arctic ringed seal was listed as threatened primarily due to long-term threats associated with ongoing and projected reductions in sea ice and on-ice snow depths within the foreseeable future stemming from climate change. Activities that release carbon dioxide and other GHGs into the atmosphere are the major contributing factor to climate change and loss of sea ice. However, this analysis addresses only those costs and benefits that are reasonably predictable and attributable to the CHD. Accordingly, in analyzing the costs and benefits of the CHD, this report does not include consultations on any potential project simply because it may involve GHG emissions.

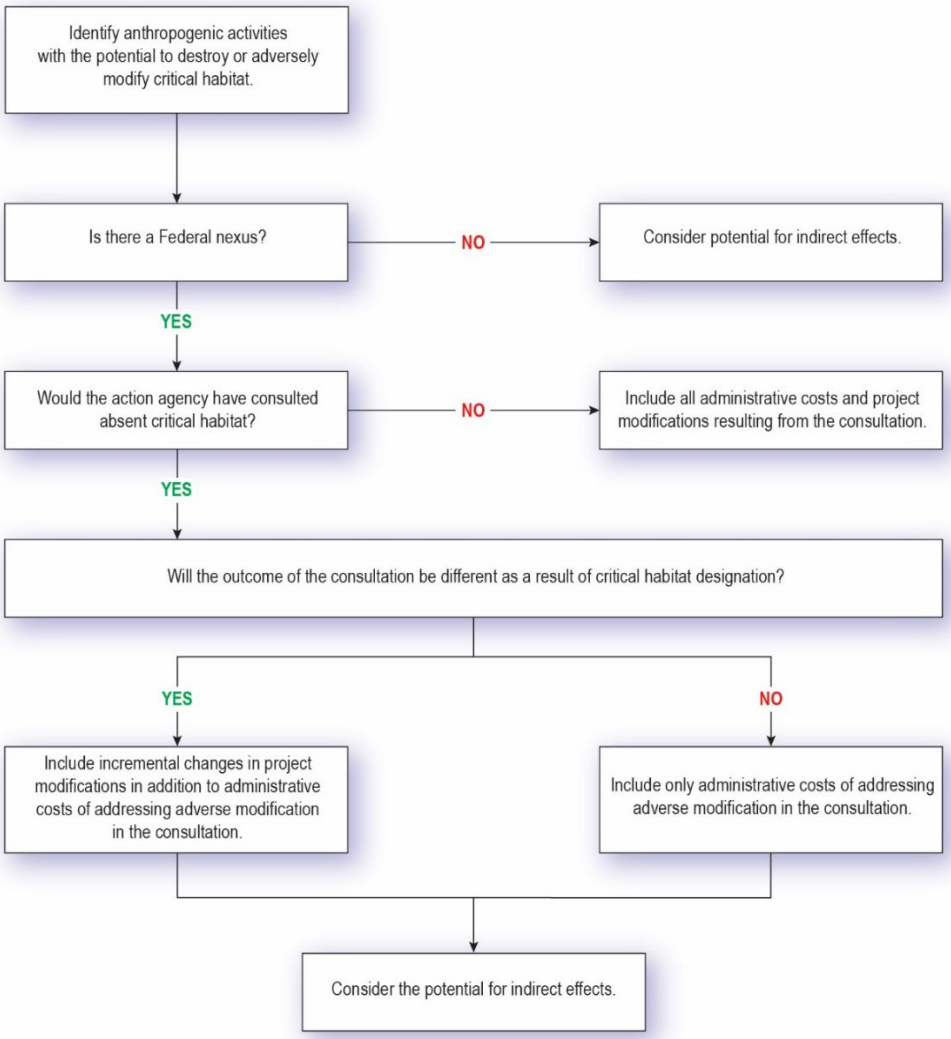


Figure 2-1 Identifying Incremental Effects of Critical Habitat Designation.

2.4 Analytic Time-Frame

The analysis recognizes that diminishing sea ice is a trend with longer-cycle impacts beyond the 10-year period. Although not quantified or analyzed in detail due to the high level of uncertainty regarding longer-

term environmental conditions and future activities, discussion is included regarding the potential types of costs and benefits that may accrue beyond the 10-year timeframe.

2.5 Potentially Affected Economic Sectors and Groups

The following is a brief listing of the economic sectors and groups potentially affected by Arctic ringed seal CHD in that participants in these sectors may seek some Federal action that requires consultation under Section 7 of the ESA. **Section 6** of this document analyzes the costs and benefits of CHD to these sectors and groups, while **Section 9** is the FRFA of potential impacts to small entities within these sectors. The potentially affected economic sectors and groups include:

- Oil and Gas Sector. There are exploration, development, and production activities of oil and gas resources within and in areas adjacent to Arctic ringed seal CH in the Chukchi and Beaufort Seas.
- Mining Sector. There are in-water dredging mine sites near Nome as well as mines that depend on the use of a port terminal near Kotzebue.
- Ports and Coastal Construction. There are several public ports in Arctic ringed seal CH waters, including the Port of Nome, the Port of Kotzebue, and the DeLong Mountain Terminal Port. Public comments received noted potential projects to address coastal erosion protection and other municipal-type construction projects.,[11]
- Commercial Fishing. There is commercial finfish and shellfish fishing in the southern areas of Arctic ringed seal CH in the Bering Sea.
- Alaska Native Subsistence Use and Personal Use. Alaska Native peoples and non-Native residents of Native communities in the region participate in subsistence use activities, including hunting and fishing, in nearshore areas within and in areas adjacent to the CH.
- Recreation and Tourism. A limited but increasing number of cruise ships bring tourists to CH waters both south and north of the Bering Strait. There are also limited recreation/tourism activities, such as fishing and wildlife viewing, taking place in nearshore CH waters and areas adjacent to CH waters.
- Commercial Shipping and Marine Transportation. Commercial vessels transiting the CH during ice-free summer months include oil tankers, cargo vessels, research vessels, fishing vessels, and cruise ships.
- Military Activities. Military activities within and in areas adjacent to the CH include marine vessel and aircraft traffic, use of sonar and radar, emergency response, icebreaking, and training exercises.
- Educational/Scientific/Passive Users. Research on Arctic ecosystems is occurring, and there is interest by educational/scientific/passive users in increased scientific knowledge about, and preservation of, the Arctic environment within the CH.

2.6 Information Sources

The primary sources of information for this report are communications with, and data provided by, personnel from NMFS, other Federal action agencies, non-governmental organizations, potentially affected private parties, and state and municipal agencies. In addition, this analysis relies upon the ESA Section 7 consultation history of NMFS, as well as public comments, and published journal sources.

[11] Comments received by NMFS from the North Slope Borough on the 2021 Arctic ringed seal revised proposed critical habitat, "Re: Comments on the Proposed Designation of Critical Habitat for the Arctic Ringed Seal, Docket No. NOAA-NMFS-2013-0114", dated April 8, 2021.

3 Types of Economic Costs of Critical Habitat Designation

This section presents the different types of economic costs that may stem from the CHD. These costs are categorized as direct and indirect costs.

3.1 Direct Costs

The direct, incremental costs of CHD stem from the consideration, during Section 7 consultations, of the potential for destruction or adverse modification of CH. The two categories of direct incremental costs of CHD are: 1) the administrative costs of conducting Section 7 consultation; and 2) implementation of any project modifications requested by NMFS through Section 7 consultations to avoid or minimize potential destruction or adverse modification of the CH.

3.1.1 Administrative Section 7 Consultation Costs

Parties involved in Section 7 consultations for Arctic ringed seals include NMFS,[12] in its role as "consulting" agency, a Federal "action" agency (i.e., the Federal action, such as a permit or other authorization, provides the "Federal nexus" requiring consultation), and in some cases, a private (or non-Federal public) entity ("third party") involved in the project or use activity. A third party having an interest in a consultation may be a private entity (e.g., applicant for a Federal permit), local or state government, or some other entity. The Federal action agency is the responsible party that engages in the consultation process with NMFS. During a consultation, NMFS, the Federal action agency, and (possibly, if applicable) the third party applying for Federal funding or permitting communicate, in an effort to minimize potential adverse effects to the species and/or to designated CH. 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 CH associated with the proposed activity, the Federal agency, and whether there is a private (third party) applicant involved.

As discussed in **Section 5.3.1.2**, Section 7 consultation with NMFS may be either informal or formal. If the Federal action agency's assessment shows, and NMFS agrees, that the proposed Federal action is not likely to adversely affect listed species or CH, then NMFS provides concurrence in writing and the consultation (informal to this point) is concluded. If consultation cannot be concluded because the proposed Federal action is likely to adversely affect listed species or CH, the Federal action agency must request formal 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 CH and recommendations to avoid those impacts.

While consultations are required for activities with a Federal nexus that may affect a listed species, regardless of whether CH is designated, the CHD may increase the cost and complexity of consultations in cases where the project or activity in question may adversely modify CH. Administrative expenditures associated with consultation may, therefore, result in both baseline and incremental costs.

[12] In cases where Federal management actions governing fisheries are proposed that "may adversely affect" CH, NMFS may be both the "action" agency and the "consulting" agency, although different Divisions within NMFS would perform these respective roles.

For contextual purposes, **Table 3-1** presents generalized per-event administrative costs of consultations. In general, three different scenarios associated with the CHD may trigger incremental administrative consultation costs:

1. **New consultation** - New consultations taking place after CHD may require additional effort to address CH issues, above and beyond those raised due to the ESA listing status. In this case, only the additional administrative effort (i.e., expenditure of resources) required to address CH is considered an incremental cost of the CHD.
2. **Re-initiation of consultation to address CHD** - Consultations that have already been completed on a project or activity may require re-initiation, specifically to address CH considerations. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs, are appropriately attributed to the CHD.
3. **New consultation resulting entirely from CHD** - CHD may trigger consultations that would not have occurred, absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not). All associated administrative and project modification costs of incremental consultations are considered directly attributable to the CHD.

The administrative costs of these consultations vary, depending on the specific details of the project. One way to address this variability is to show a range of possible costs of consultation. **Table 3-1** provides estimated mid-point consultation costs across low and high levels of effort required for all types of consultation, including those that consider both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline versus incremental, the following assumptions were applied:

- Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review, logistical expenses, data gathering and synthesis, and report writing) and, therefore, incremental administrative costs of considering adverse modification in consultations that will already be required to consider jeopardy, result in the smallest attributable incremental expenditure of these three consultation categories, roughly half that of a re-initiation.
- Incremental costs of a re-initiation of a consultation, because of the CHD, are assumed to be approximately half the cost of the original consultation that considered only jeopardy. This assumes that re-initiations are less time-consuming, as the groundwork for the project has already been considered in terms of its effect on the species (i.e., jeopardy standard);
- Costs associated with an incremental consultation (one occurring because of the designation of CH) would be attributed wholly to CHD;
- Consultations involving Arctic oil and gas activities are expected to be more complex due to their nature and scope (e.g., proposed activities typically involve more components with associated stressors) than other activities, and typically involve third parties; therefore, to avoid understating the cost estimates, third party administrative costs are estimated to be greater for these consultations.

It is important to note that the estimated costs represent the mid-point of a potential range that may result from different levels of effort for specific consultations. Third-party costs listed in **Table 3-1** may in some cases be borne by the Federal agency, a third party, or a combination of these parties. In addition, the higher third party administrative costs estimated for oil and gas activities may not be realized in all cases because the administrative effort required for a specific consultation depends on factors such as the location, timing, nature, and scope of the potential effects of the proposed action on the essential features.

Table 3-1 Estimates of Attributable Administrative Costs per Consultation by Consultation Type (in 2021 dollars).

Consultation Type	NMFS	Federal Action Agency	Third Party, Oil and Gas	Third Party, Other Activities	Total Costs, Oil and Gas	Total Costs, Other Activities
Additional Effort to Address Adverse Modification in a New Consultation						
Technical Assistance	$160	$260	$460	N/A	$880	$420
Informal Consultation	$680	$1,880	$5,770	$N/A	$8,330	$2,560
Formal Consultation	$1,530	$2,930	$17,300	$880	$21,760	$5,340
Programmatic Consultation	$4,610	$5,240	N/A	N/A	$9,850	$9,850
Re-Initiation of Consultation to Address Adverse Modification						
Technical Assistance	$310	$530	$460	$N/A	$1,300	$840
Informal Consultation	$1,370	$3,760	$5,770	$N/A	$10,900	$5,130
Formal Consultation	$3,060	$5,850	$17,300	$1,750	$26,200	$10,660
Programmatic Consultation	$9,220	$10,480	N/A	N/A	$19,700	$19,700
Incremental Consultation Resulting Entirely from Critical Habitat Designation						
Technical Assistance	$630	$1,050	$460	$N/A	$2,140	$1,680
Informal Consultation	$2,740	$7,510	$5,770	$N/A	$16,020	$10,250
Formal Consultation	$6,120	$11,700	$17,300	$3,500	$35,120	$21,320
Programmatic Consultation	$18,440	$20,960	N/A	N/A	$39,400	$39,400

Sources and Notes:

1. Cost estimates other than the third party costs for oil and gas activities are based on hourly rate data from the Federal Government General Schedule Rates, Office of Personnel Management (2021) (rates are multiplied by 2.5 to account for overhead); hourly rates for third parties are estimated to be $100 per hour. Estimates of level of effort required per consultation type were derived from a review of consultation records from several USFWS field offices across the country, conducted in 2002 by Industrial Economics, Inc. (IEc). Estimates reflect the average hourly time required by staff across low and high levels of effort based on the hour and wage assumptions (IEc cost model) described in Appendix A, with the following modifications for this analysis: (1) Based on NMFS's experience conducting consultations on Federal activities in Alaska and that are projected in this analysis, for activities other than oil and gas, third party costs for technical assistance and informal consultations are expected to be negligible and considered not applicable (N/A). The corresponding costs based on the IEc cost model were instead incorporated into the Federal Action agency cost estimates to account for additional costs that may incurred by these agencies in conducting these consultations. (2) Costs to develop biological assessments (identified separately in the IEc cost model) were incorporated into Federal Action agency costs because NMFS expects these costs to be borne largely by these agencies, and it was conservatively assumed in this analysis that all consultations include a biological assessment.
2. Consultations involving Arctic oil and gas activities are expected to be more complex than other activities and typically involve third parties. Absent specific information on the incremental administrative costs to address the CH in future oil and gas consultations, the maximum third party cost estimate of $37,500 (in 2009 dollars) for formal consultations involving Arctic oil and gas activities identified in the economic analysis for polar bear CH (Industrial Economics and Northern Economics 2010) (which reflected information in public comments) was used to derive cost estimates for this analysis. Taking into consideration the anticipated effort required to address the specific CHD in this case (polar bear CH includes terrestrial units in addition to a sea ice unit), for formal consultations third party costs for oil and gas activities were estimated at 75% of the rounded mid-point value of this maximum cost ($20,000 in 2009 dollars), and informal consultation costs were estimated at 25% of this rounded mid-point value (as previously identified in Cardno ENTRIX 2014). Technical assistance for oil and gas activities was estimated at 4 hours using the $100 per hour rate from the IEc cost model.
3. Federal action agency costs are considered here to include consultations with the Alaska Department of Transportation and Public Facilities, which has consulted (infrequently) with NMFS on behalf of the Federal Highway Administration regarding activities that may affect the CH.
4. Totals may not sum due to rounding.

3.1.2 Section 7 Project Modification Costs

Section 7 consultations considering CH may also result in additional project modification requests specifically addressing potential destruction or adverse modification of CH (i.e., project changes that would not likely be necessary to avoid jeopardy). The economic costs of such project modifications, undertaken specifically to avoid or minimize destruction or adverse modification of CH, are attributable as incremental costs of CHD. If a jeopardy or adverse modification determination is made, the biological opinion will include reasonable and prudent alternatives (RPAs), if any, that are economically and technologically feasible, and that would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of CH. The action agency may choose to 1) implement an RPA, 2) modify the proposed action and consult with NMFS again, 3) decide not to authorize, fund, or otherwise proceed with the action, or 4) apply for an exception, a process rarely undertaken.

Costs of associated project modifications assumed to be attributable to CHD differ by consultation type. This is summarized below.

1. **New consultation** - Only project modifications associated solely with avoiding adverse modification are considered incremental.
2. **Re-initiation of consultation to address adverse modification** - Only project modifications associated solely with avoiding adverse modification are considered incremental.
3. **Incremental consultation resulting entirely from CHD** - Costs of all project modifications are considered incremental.

3.2 Indirect Costs

CHD may, under certain circumstances, affect actions that do not have a Federal nexus and, thus, are not subject to the provisions of Section 7 under the ESA. Indirect costs are those changes in economic behavior that may occur outside of the ESA, through other Federal, state, or local actions that are motivated by the CHD. This section identifies common types of indirect costs that may be associated with the CHD. Importantly, these types of costs are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of CHD, they are appropriately considered baseline costs. In particular, attribution of indirect costs can be problematic, difficult to measure, and involve considerable uncertainty. For these reasons, no estimates of these costs are provided, although that does not necessarily mean they are small.

3.2.1 Other State and Local Laws (Trigger Effects)

Under certain circumstances, CHD may provide new information to a community or political jurisdiction about the sensitive ecological nature of a geographic region, potentially triggering additional economic effects under state or local laws. In cases where these effects would not have been triggered in the absence of a CHD, they are appropriately considered indirect, incremental effects of the designation, for purposes of the RIR.[13]

3.2.2 Time Delays

Both public and private entities may incur incremental delays associated with projects and other activities, due to requirements associated with the need to reinitiate the Section 7 consultation process and/or comply with other laws triggered by CHD. To the extent that delay costs (e.g., payments on borrowed funds and contractual obligations) result from the CHD, they are appropriately attributable as incremental costs of the designation.

[13] Enhanced scientific information and understanding of sensitive ecological assets also yield benefits to society, facilitate sustainable management, and reduce risks that may otherwise have high mitigation costs, or result in irreparable damage.

3.2.3 Regulatory Uncertainty

NMFS conducts Section 7 consultations 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, in cases where Federal government agencies must consult with NMFS under Section 7 on proposed actions that may affect listed species or designated CH, private or public parties who seek permits or authorizations from those agencies may face uncertainty concerning whether project modifications will be recommended by NMFS; and, if so, what the nature of such modification recommendations may be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of CHD on specific activities. Where information suggests that this type of regulatory uncertainty, stemming from CHD, may affect a project or allied economic behavior, associated costs are considered indirect, incremental results, attributable to the CHD. As above, identification, attribution, and estimation of such costs are fraught with uncertainties.

3.2.4 Public Perceptions of Critical Habitat Designation

In some cases, the public may perceive that CHD may result in limitations on private property uses above and beyond those associated with anticipated conservation efforts and regulatory uncertainty described above. Public attitudes about the limits or restrictions that CH may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as CH may have a lower market value than an identical property that is not within the boundaries of CH due to perceived limitations or restrictions. To the extent that potential public perception effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

4 Identifying Benefits of Arctic Ringed Seal Critical Habitat Designation

The intended benefit of designating CH for the Arctic ringed seal is to support the long-term conservation of this species. The ongoing loss of sea ice and changes in ocean conditions associated with climate change will be increasingly experienced by Arctic ringed seals, and the significance of other habitat threats will also likely increase as a result. The U.S. Global Climate Change Research Program (2017) reported that Alaska has been warming twice as fast as the global average over the last 50 years and faster than any other U.S. state. As previously discussed, the primary benefit of CHD–and the only regulatory consequence–stems from the ESA Section 7(a)(2) requirement that all Federal agencies ensure that their actions are not likely to destroy or adversely modify the designated habitat. This is in addition to the requirement that all Federal agencies ensure that their actions are not likely to jeopardize the continues existence of the species.

As discussed in detail in **Section 6** of this report, for the economic activities considered in this analysis, NMFS does not anticipate that the Arctic ringed seal CHD will result in any incremental project modification requirements above and beyond those that would be required due to the threatened status of the species. This is not to say such project modifications could not occur in situations NMFS is unable to predict at this time, but based on the best information available, it is likely that any project modifications necessary to avoid impacts to Arctic ringed seal CH would also be necessary to avoid impacts to the species. Nevertheless, the CHD may affect conservation-related behaviors in ways that generate conservation benefits, as well as opportunity costs (e.g., time, effort, or costs incurred to accomplish species or habitat protection). Once designated, CHD provides specific notice to Federal agencies and the public of the geographic areas and physical and biological features essential the conservation of the species, and information about the types of activities that may reduce the conservation value of the habitat. This information will focus future consultations and other conservation efforts on the key habitat attributes that support the conservation of the Arctic ringed seal. By identifying the essential habitat features and where they occur, there may also be enhanced awareness by Federal agencies and the general public of activities that might affect those essential features. Designation of CH can also inform Federal agencies of the habitat needs of the species, which may facilitate using their authorities to support the conservation of the species pursuant to Section 7(a)(1) of the ESA, including to design proposed projects in ways that avoid, minimize, and/or mitigate adverse effects to CH from the outset (although such decisions cannot be forecasted). Public awareness of CHDs may also stimulate voluntary conservation actions by the public, as well as education and outreach activities (e.g., participation in activities such as citizen science, habitat restoration, and marine debris removal projects).

To provide context to the economic cost analyses discussed in subsequent chapters, this section describes the types of economic benefits that may accrue from conservation of Arctic ringed seal CH, and reviews information from the economic literature on the potential value of these types of benefits. The studies reviewed in this section are not specific to Arctic ringed seals or the question of economic benefits of conservation of this species or its habitat. Consequently, these values cannot be directly used to estimate the economic benefits of Arctic ringed seal CHD. Rather, the literature and values cited in this section provide a general sense of the possible magnitude of the use and non-use benefits individuals and society derive from the attributes provided by resources such as Arctic ringed seal CH.

This section includes four subsections. The first subsection provides a brief overview of the types of passive use and use benefits that may arise from Arctic ringed seal CHD, the second subsection presents examples from the peer-reviewed literature on the value of passive use benefits (i.e., consumptive and non-consumptive), the third subsection presents examples from the literature on use benefits (i.e.,

consumptive and non-consumptive), and the final subsection provides a brief summary of the benefits that may accrue from the CHD.

It is important to note that many of the values that are discussed in this section are non-market, meaning that they cannot be directly measured in the marketplace (e.g., typical economic goods and services that have a market price), but rather must be ascertained either indirectly through observing the behavior of people (i.e., revealed preference), or directly through asking people how much they value the resource (i.e., stated preference). **Unless otherwise noted, values from the studies reviewed in this section are adjusted to 2019 dollars for comparison purposes** (U.S. Bureau of Labor Statistics 2020a).

4.1 Framework for Estimating Benefits

The CHD will generate economic benefits if it increases individual well-being, or "utility," aggregated across all individuals in the Nation, as compared with what would otherwise occur absent CHD. In the following discussion, a brief conceptual overview is provided of how economists measure an increase in well-being from consumption of a good or service. This understanding is useful in that it explains: 1) how the CHD might translate into a source of economic benefit or increased individual well-being; and 2) how this benefit could be empirically measured (i.e., quantified).

Economists measure the increase in well-being to consumers of a good or service as the difference between the price consumers pay for the good or service, and the benefit they derive from it. For example, if a tourist would be willing to pay $100 for, say, a guided fishing trip, but only has to pay $75, then the tourist has an increase in well-being (i.e., a "consumer surplus") from the trip equal to $25. Assuming all other things equal, a change, or increase, in this well-being from the consumption of goods and services can, thus, occur either because the price falls, or because the quality of the good or service rises and results in increased value to the consumer (i.e., an increase in consumer surplus). In the case of the CHD, this may result in increased well-being if CHD results in habitat enhancements (relative to what otherwise would occur in the absence of CHD) that increase the quality of goods and services related to or deriving from Arctic ringed seal habitat.

4.1.1 Benefit Valuation Methods

Economists typically rely on observed trades between willing buyers and willing sellers to identify the market-clearing price of a good or service. As described in the introduction to this section, environmental goods for which no market exists (non-market goods) are particularly challenging to value, because absent an observable market, no such "price" is revealed.

The value of non-market goods may be estimated using either revealed preference (RP) or stated preference (SP) valuation approaches. RP valuation methods use information on observed behavior to infer the value of the non-market good or service (Bockstael and McConnell 1983; Boyle 2003). As such, these methods require data on observable behavior to be linked to the non-market good in question. SP methods, on the other hand, involve asking individuals carefully worded hypothetical market questions to either directly or indirectly infer the value they place on a non-market good or service (Mitchell and Carson 1989; Carson et al. 2001). Thus, the principal difference between RP and SP methods is the type of data used. RP methods use data on observed behavior to infer economic values, while SP methods use data on stated or intended behavior to infer economic values. Due to its reliance on observable behavior, RP methods are generally less able to estimate non-use values, which, by definition, are not tied directly to observable behavior.[14] Thus, researchers generally utilize SP methods to estimate non-use values.

[14] However, Larson (1992) has shown that under the assumption of what is termed Hicks-neutrality, the non-use value is measurable from an analysis of market demand, though Flores (1996) has shown that the conditions for Hicks-neutrality to occur are unlikely to be met in practice. In addition, Carson et al. (1999, p. 109) point out that any "technique capable of constructing the

The most commonly used and best-known stated preference method is the contingent valuation method (CV), which in actuality is a class of methods. In CV, economic values for a non-market good or service are revealed through survey questions that set up hypothetical markets for a non-market good or service, and involve asking the respondent to indicate their (willingness to pay, WTP) (or willingness-to-accept compensation) for (or to forgo) the good or service. In a typical CV survey, a public good is described, such as a program to protect one or more "Threatened or Endangered" species, or their CH, and respondents are asked questions to elicit their WTP for the public good through a payment vehicle, like taxes or contributions to a trust fund (Cummings et al. 1986; Mitchell and Carson 1989; Arrow et al. 1993).[15] In addition, the stated preference choice experiment (SPCE) approach has been increasingly used. In the SPCE approach, respondents are asked to choose between two or more alternatives that differ in attributes and costs (Lew 2015). In practice, SP techniques are technically demanding to implement, and results are often challenging to interpret. However, their use has been affirmed by Federal Courts, employed by numerous Federal and state agencies, and refined through over more than 25 years of research, leading to a rich body of peer-reviewed literature.

4.2 Categories of Arctic Ringed Seal Critical Habitat Benefits

The intended benefit of CH is to support the conservation of the species for which it is designated.[16] Various other benefits may also result from conservation of the species and its habitat. The benefits generated by a natural resource, such as Arctic ringed seal CH, can be classified into several categories (see **Figure 4-1**). One important distinction is between non-use (or passive use) benefits that do not require present use and, instead, are derived through the knowledge that Arctic ringed seals and their habitat exist and, if threatened, steps are being taken for their protection, and use benefits that are generally associated with people's present use of the species and its habitat. Within the non-use and use benefit categories there are further subcategories, which are described below. Economists differ on the ways that these values are organized, in terms of non-use and use classification, and sub-classifications. However, as the aim of this analysis is to account for all potential benefits, the specific categorical labels are less important than ensuring that all types of potential benefits that may accrue from designation of Arctic ringed seal CH are identified and addressed.

In addition to the categories shown in **Figure 4-1** above, economic benefits arising from the use and passive use of Arctic ringed seal CH can be divided into consumptive and non-consumptive uses. The economic benefits of conservation of Arctic ringed seal CH primarily arise from non-consumptive uses, which are uses associated with a good or service independent of its consumption. Non-consumptive benefits of Arctic ringed seal CH include use benefits from wildlife viewing, public education, and scientific study and associated literature, as well as passive use benefits, e.g., values associated with the existence of the Arctic ringed seal CH for present and future generations. Consumptive uses of the CH include subsistence use by Alaska Natives, and fishing or other extractive uses.

Previous economic studies have estimated the economic value of the types of benefits that may accrue from CHD. A selection of these studies is reviewed below for each primary type of use value or activity associated with CHD, including passive use, subsistence values, wildlife viewing, fishing, education, and scientific knowledge. As discussed above, these studies provide important context for understanding the

missing market for these types of goods is potentially capable of obtaining total-value estimates," and since total value is the sum of use and non-use values, the total economic value estimate would include non-use value. Simulated markets where actual transactions occur (generally in experimental conditions) for the non-market good and actual referenda involving the non-market good are the other methods for estimating these values.

[15]While willingness-to-accept is sometimes the more relevant welfare measure, empirical and experimental evidence has pointed to a preference for use of WTP welfare measures in stated preference surveys (e.g., Adamowicz et al. 1993; Arrow et al. 1993; Mansfield 1999).

[16] 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 USC 1532)

possible magnitude of the of the use values that may result from CHD; however, they cannot be directly used to estimate the economic benefits associated with the Arctic ringed seal CHD.

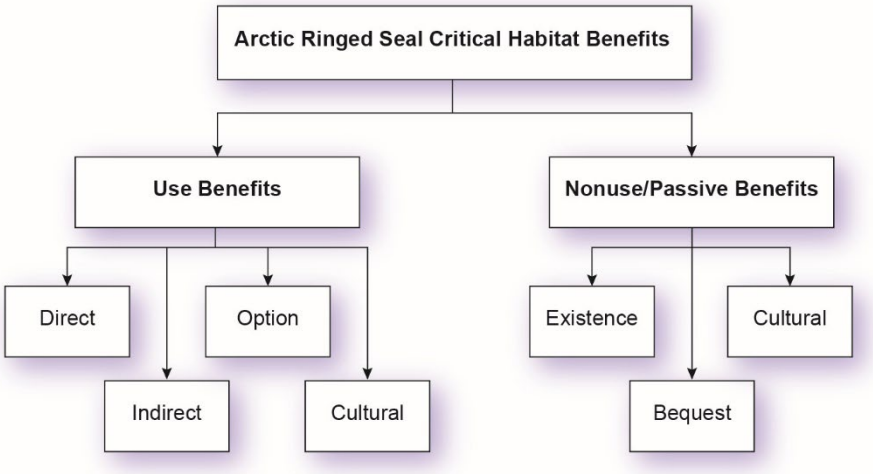


Figure 4-1 Types of Potential Benefits of the Arctic Ringed Seal Critical Habitat Designation.

4.3 Non-Use or Passive Use Benefits

The ESA, states that species threatened with extinction are of "esthetic, ecological, educational, recreational, and scientific value to the Nation and its people" (16 U.S.C. 1531). The primary benefit of the CHD is, thus, the value accruing to the public of fulfilling the ESA national policy of species conservation and recovery. In all but the case of recreational and subsistence hunting value, the use types described in the ESA are considered non-use or passive use values.

A number of peer-reviewed, empirical studies have sought to estimate society's non-use or passive use value, (e.g., WTP), to protect rare species, unique habitats, or whole ecosystems. As they pertain to the Arctic ringed seal CHD these values are discussed here.

Existence value is defined as individual utility or well-being derived from the knowledge of the existence of a natural resource, without the expectation of any form of use. For example, the mere knowledge of the existence of a relatively few California condors in the wild may elicit a large WTP (i.e., generate a large benefit) to assure the continued existence of that species in its natural ecological setting. This benefit derived by an individual, may be substantial, even though the individual has no expectation of ever seeing the bird or visiting its habitat. The protections offered by the Arctic ringed seal CHD under the ESA could be expected to also elicit passive use values. Passive use values may accrue to residents of Alaska, as well as the Nation (as no interaction with the species is required for benefits, residents of other states that are interested in marine habitat conservation may experience a benefit from CHD).

Passive use benefits are also generated by the preservation for future generations of natural resources, such as plant and animal species, habitat, and ecosystems. It has been empirically demonstrated that individuals derive utility from the knowledge that society preserves resources, so that they will be extant for the next generation. These welfare gains, known as bequest value, represent an important conceptual element of passive use valuation. The potential change in the bequest value of Arctic ringed seals and their habitat, due to conservation efforts, is one element of the total benefit society may derive from CHD.

The intrinsic non-use benefit of habitat and wildlife conservation is difficult to measure. Attempts to measure total value (use and non-use) may use survey methods that elicit hypothetical or contingent

values of WTP (or WTA). Because of the technical challenges and cost associated with these methods, to the best of our knowledge, none has been performed assessing habitat valuation in the region being considered for designation under this action. Nevertheless, we considered WTP values found in the literature to provide empirical context for understanding the potential passive use value of CH for the Arctic ringed seal.

Original research work has been completed to value several species, including mammals, fish, birds, and crustaceans. In a meta-analysis involving 31 valuation studies of U.S. threatened, endangered, or rare species, Richardson and Loomis (2009) found that WTP values range considerably among studies and depend on the set-up of the valuation question, including the proposed payment frequency (e.g., one-time or annual payments) and the proposed change to the species population (e.g., doubling in size, avoiding extinction), as well as characteristics of the species itself, such as whether the species is a charismatic megafauna (defined as large vertebrates that are appealing to humans and often the subject of conservation campaigns) and species type (mammal, marine, fish, or bird). For example, the annual WTP for northern spotted owl conservation ranged from $49 per Washington household for a 100 percent avoidance of loss (based on a 1987 survey), to $166 per U.S. household for a 50 percent increase in chance of survival (based on a 1990 survey). This is not surprising, given that both the population being sampled, and the outcome being valued, were significantly different.

Of particular relevance to the assessment of the intrinsic non-use economic value of conservation of Arctic ringed seals are non-market valuation studies that focus on estimating the public's WTP for protecting ESA-listed marine mammals in the U.S. A review by Lew (2015) of economic value information available for threatened, endangered, and rare species compiled value estimates reported by recent studies, including annual WTP estimates for six different ESA-listed marine mammal species from five studies, all of which used the SPCE approach. These estimates represent social welfare benefits of an improvement in status (i.e., to threatened or recovered) for these particular marine mammal species—they are not specifically associated with CH in and of itself. The WTP values reported by these five studies, per U.S. household per year, for improving a species' status ranged from: (1) $46 to $268 for 20 years for improving the status of the endangered western DPS and threatened (at the time of the study) eastern DPS of the Steller sea lion (i.e., to threatened or recovered), depending upon the resulting change in status and baseline assumptions about other stocks of the species and the size of the population increase (Lew et al. 2010); (2) $55 to $108 for 10 years for improving the status of the endangered Hawaiian monk seal, depending upon the resulting change in status (i.e., to threatened or recovered) (Lew and Wallmo 2011); (3) $55 to $86 for 10 years for improving the status of the endangered Hawaiian monk seal (i.e., to threatened or recovered), depending upon the resulting change in status (Wallmo and Lew 2011); (4) $46 to $84, $49 to $91, and $59 to $93 for 10 years for improving the status of the endangered Hawaiian monk seal, endangered North Atlantic right whale, and endangered North Pacific right whale, respectively, depending upon the resulting change in status (i.e., to threatened or recovered) (Wallmo and Lew 2012); and (5) $105 to $112 and $76 to $79 for 10 years for recovery of the endangered southern resident killer whale and endangered (at the time of the study) humpback whale, respectively (Wallmo and Lew 2015).

The WTP values estimated in these studies suggest that there is likely to be a positive non-use value associated with the conservation of Arctic ringed seals and CHD, although the magnitude of this value is not quantified in this analysis.

4.4 Use Benefits

Use benefits of CH will be generated if the value of services derived from use of Arctic ringed seal CH incrementally increases (above what it would be otherwise) due to the designation. Use benefits are described below in four distinct (i.e., additive), but related, categories: direct, indirect, option, and cultural. Direct use value would accrue from any positive change in the level of utility (e.g., enjoyment or profitability) accruing from activities enhanced by CHD. Waters of the Arctic ringed seal CH support and

sustain a myriad of species, including several other ESA-listed species, such as polar bears, bearded seals, several species of great whales, and Steller sea lions that people gain utility from viewing. Viewing marine species (e.g., birds, as well as mammals) is highly valued as a primary component of the aesthetic reward, cultural heritage, and 'quality of life' benefits associated with living in and visiting Alaska. Additionally, the rapid changes occurring in polar regions have brought the Arctic to the forefront of public attention, and significantly elevated government and private sector interest in scientific research, monitoring, and mitigation activities in these regions, includes areas within and adjacent to the ringed seal CH.

Indirect use values are derived from the indirect use of a natural resource. A variety of ecological service flows, attributable to Arctic ringed seal CH, support and benefit other uses and users. For example, ringed seal CH supports an abundant fish and shellfish biomass within a complex, dynamic oceanographic, ecological, and climatological web. If, for instance, project changes are made in order to avoid adverse effects on water quality and to thereby minimize or avoid effects on the ringed seal primary prey essential habitat feature, there may be a consequent benefit to other fish and shellfish species. Many of these species are targeted by commercial users, and support subsistence, personal use, and recreational fisheries, as well. Because many marine species are highly migratory during their life-cycle, ringed seal CH may be crucial to a life phase, but attributable benefits actually accrue to users in areas outside the CHD.

Indirect use benefits may also accrue from scientific and educational advancements attributable to the CHD. If the CHD results in new and enhanced scientific understanding of the relationship between attributes of the CH and the biology of Arctic ringed seals, or the impacts of human interactions, then natural resource managers and scientists, as well as the population as a whole, benefit in a number of ways. The CHD also may contribute to education, informing individuals on oceanographic and climatological changes in the Arctic and the biological and ecological implications of these changes to conservation of Arctic ringed seals, as well as other living marine resources in the Arctic.

Option use values derive from the preservation of the option for future use of a resource. The designation of Arctic ringed seal CH has the potential to sustain the option for individuals to 'use' (i.e., access) the species and its habitat in the future. Conceptually, option value reflects an individual's WTP to avoid foreclosing future access to a resource or activity. Here, WTP reflects the current value to an individual of preserving the opportunity, at some unspecified point in the future, of 'using' (in the broadest sense of that term) Arctic ringed seal CH.

Cultural values can be derived from both use and non-use of the resource. Cultural values do not readily lend themselves to monetary measurement or approximation, as they are specific to each group of people. Economic monetization, in general, is typically based upon the premise that markets exist, or at least, can be approximated, within which trade can occur between willing parties. This is not a valid assumption in the case of cultural values. Nevertheless, changes in individual well-being connected with enhanced cultural welfare of Alaska Natives and other Alaska residents through protection of marine resources constitute real, potentially significant, economic benefits attributable to the Arctic ringed seal CHD.

4.4.1 Direct Use Benefits

This section describes the possible types and potential magnitude of direct use benefits that may result from CHD related to subsistence and wildlife viewing activities.

4.4.1.1 Subsistence

Subsistence harvest of Arctic ringed seals is a traditional practice of Alaska Native populations. To the extent that the CHD enhances the conservation of Arctic ringed seal populations, this in turn, may contribute to maintaining or enhancing Alaska Native subsistence activities associated with this species. It may also contribute to preserving the opportunity for future generations of Alaska Natives to engage in

their traditional subsistence practices, a direct use benefit with social, cultural, economic, and nutritional values.

The economics of subsistence activities in Alaska have been studied with increasing intensity since the Exxon Valdez spill and resulting class action lawsuit by Alaska subsistence harvesters. Three methods are used to estimate the economic benefits of subsistence activities: 1) nutritional value, 2) replacement cost, and 3) non-market valuation (Colt 2001). Depending on the method of estimation, estimates of the value of subsistence harvest range from $4 to $315 per pound. The replacement cost method was ultimately used Duffield (1997) to value Alaska Native subsistence losses in the case of the Exxon Valdez. It is important to note that replacement cost does not take into account the cultural and/or social value of subsistence activity. Thus, replacement cost represents, at best, a crude lower bound estimate of the value of subsistence activity (Colt 2001).

In his 1997 publication, John Duffield reviewed the research that led up to the valuation of Alaska Natives' subsistence harvest losses following the Exxon Valdez spill. The studies included: (a) a 1987 pre-spill study that estimated the value of Alaska subsistence harvest at $315 per pound, based on the tradeoff between subsistence use and income (Wolfe and Walker 1987), and (b) a 1993 study that, using the same data as the 1987 study (from the Alaska Subsistence Division on subsistence activities in 98 Alaska communities), estimated the economic value of subsistence harvest at $81 per pound (Hausman 1993).

For settlement purposes in the Exxon Valdez case, the defendants presented the economic value of subsistence harvest at $18 per pound, based on replacement cost. The plaintiffs provide a range of $21 to $24 per pound for the replacement cost of subsistence harvest. The damages awarded to the plaintiffs for subsistence harvest was within the plaintiffs' range of proposed replacement costs (Duffield 1997).

Subsistence use in Arctic Alaska is widespread, benefiting almost all residents. The Alaska Department of Fish and Game (ADF&G), Division of Subsistence, estimated in 2017 that 96 percent of Arctic Alaskan households used fish and 92 percent used game that was procured through subsistence activities (ADF&G 2017b). In terms of subsistence participation, it was estimated that approximately 78 percent of Arctic Alaskan households participated in subsistence fish harvests and 63 percent participated in subsistence game harvests. In terms of nutritional and replacement value, ADF&G estimated that the 25,531 Arctic Alaska residents in rural areas harvest approximately 10,269,886 pounds of useable wild food annually, with replacement value in 2017 dollars of between $51.3 million to $102.7 million.[17] A number of communities in the western region of Alaska also participate in subsistence harvest of fish and game, and so the estimate for Arctic residents provides a minimum indication of the value of subsistence harvest in communities located near Arctic ringed seal CH (also see **Section 5.4.5.2**).

4.4.1.2 Subsistence – Cultural Use

Alaska Natives living along the Bering, Chukchi, and Beaufort seas rely on ice seals for food, clothing, equipment, and handicrafts (Watchers of the Sea 2007). In addition to providing nutritional sustenance and materials, hunting ice seals is culturally important to Alaska Natives. As described by Sue 'Ainana' Steinacher, subsistence hunting is about identity, learning, patience, self-reliance, belonging, family, community, and nourishing bodies, family, and spirit (Watchers of the Sea 2007).

Hunting seals and other animals provides people and the community a connection to each other and an identity as Native people. Seal hunting is also important because it brings people in the community together, to share and celebrate (Watchers of the Sea 2007). As discussed above, to the extent that the CHD enhances the conservation of Arctic ringed seal populations, this in turn, may contribute to maintaining or enhancing Alaska Native subsistence activities associated with this species.

[17] The study uses a range of $5.00 to $10.00 as the replacement cost per pound in 2017 dollars.

4.4.1.3 Wildlife Viewing and Sightseeing

The Arctic ringed seal and other Arctic wildlife populations, including a wide variety of bird species, walrus, polar bears, sea lions, whales, and other seal species, are valued for wildlife viewing, photography, and sightseeing. As discussed in **Section 5.4.6**, viewing of these species is marketed as an attraction for tourism cruises within Arctic ringed seal CH. These cruises are, at present, limited in number, and Arctic ringed seal habitat is remote and relatively difficult to access, but their frequency may increase with continued sea ice diminishment.

There are no known studies of the economic value of marine mammal viewing in Arctic Alaska. This section instead considers a study on seal viewing in England, as well as a study that summarized the value of other types of wildlife viewing in several different parts of Alaska. These studies illustrate the type of values for wildlife viewing that have been estimated in other contexts. As these contexts are quite different from Arctic Alaska, **these values cannot be applied to estimate the value of wildlife viewing experiences within Arctic ringed seal CH**. Nonetheless, these estimates demonstrate that such non-consumptive use values do exist, can be meaningfully measured with sufficient resources and effort, and may represent important sources of utility (i.e., benefits) to users.

A working paper by Bosetti and Pearce (2003) used the CV method to estimate the economic value of seal conservation, focused on the Cornish Grey Seal population in southwest England. The study found a mean WTP of about $18[18] per person per year to view seals in a sanctuary and a slightly higher WTP of $20 per person per year to view seals in the wild. While this paper measures the value of viewing a different species, to residents of a different country, it indicates that some people derive value from the experience of viewing seals, and may derive increased value from doing so in the seal's natural habitat. To the extent that the CH determination increases the likelihood that people can view seals in their habitat, an increase in social welfare would result.

Loomis (2005) compiled a database of over 1,200 estimates of consumer surplus values per person per activity-day (an activity day represents the typical amount of time a person pursues an activity within a 24-hour period) for outdoor recreation activities, including from eight studies estimating the benefits of wildlife viewing on Alaska National Forest and other public lands. Consumer surplus is the value of a recreation activity (in terms of WTP) beyond what must be paid to enjoy it. There was significant variation in the estimates of consumer surplus per person per activity-day among those eight studies, with values ranging from $14 to $123 (averaging $68 overall). This variation is due, in part, to use of different methodologies that may produce differing value estimates for very similar wildlife viewing experiences. This range of values also underscores the fact that the value of wildlife viewing may vary significantly, based on such factors as the species being viewed, site characteristics, and demographics of the wildlife viewers. The relevant information to draw from these analyses, as it bears on the CHD, is that these non-consumptive uses can increase consumer surplus.

4.4.2 Indirect Use Benefits

This section discusses the possible types and potential magnitude of indirect use benefits that may result from CHD, including those related to fishing, environmental education, and scientific knowledge.

4.4.2.1 Fishing [Recreational, Commercial, Subsistence, Personal Use]

Protection of Arctic ringed seal CH may also benefit fish populations important for commercial, subsistence, recreational, and personal-use fisheries. The economic benefits of fishing have been studied extensively by economists, resulting in a wide range of value estimates. There are numerous studies of the value of recreational fishing in Alaska, but NMFS is not aware of studies of the value of recreational fishing within the Arctic ringed seal CH. (Values from other locations have not been applied

[18] One British pound = $1.625946 on 1/1/2013; "Euro Historical Rates Table," https://www.x-rates.com/historical/?from=GBP&amount=1.00&date=2013-01-01.

to fishing in the CH as the fishing experience, and, thus, its value, may widely differ between locations.) For example, Loomis (2005), referenced above, included four consumer surplus values for recreational fishing in Alaska. These values (per person per activity-day) ranged from $63 to $113 (averaging $85 overall), with variation based on differences in such attributes as location and the angler population. Personal use fishing and subsistence use fishing are also widespread throughout Alaska, including Arctic Alaska, see discussion above in **Section 4.4.1.1** on the prevalence and value of subsistence fishing activities in Arctic Alaska.

While there is currently no federally-managed commercial fishing in the Chukchi Sea or Beaufort Sea due to limited data on fish populations in these waters, there is some federally managed commercial harvest in the areas of the northern Bering Sea, within Arctic ringed seal CH. Halibut is also commercially harvested within Arctic ringed seal CH. In addition, State-managed commercial harvests of salmon, herring, and crab occur in waters of the CH in Norton and Kotzebue Sounds. In Bering Sea waters, predominantly to the south of the CH, there is extensive, year-round commercial fishing. Commercial fisheries are discussed in more detail in **Section 5.4.4**.

4.4.2.2 Environmental Education and Scientific Knowledge Benefits

Arctic ringed seal CHD may lead to scientific and educational benefits. If CHD motivates research that results in new and enhanced scientific understanding of the biology of Arctic ringed seals or their habitat, then natural resource managers and scientists, as well as the public as a whole, benefit in a number of ways. For example, improvements in documenting and inventorying oceanographic, hydrological, and ecological aspects of the CH areas may address questions about finfish and shellfish communities, stock abundance, growth and distribution patterns, or the potential for commercially harvestable surpluses. Increased knowledge may also contribute to public education, informing individuals, communities, organizations, and governments (local, regional, state, and Federal) of the biological, ecological, social, and economic implications of human actions.

Empirical research reports indicate that environmental education and increased scientific knowledge can provide substantial benefits to individuals and society as a whole. Many economic studies focus on the value of general education, including wage, health, and improved social relationship benefits. However, studies specifically focusing on the benefits of environmental education and increased scientific knowledge, such as those that may accrue from CHD are few. Still, a study by Dalrymple (2003) highlighted the value to society of increasing public access to scientific knowledge, describing scientific knowledge as a public good, with importance to the economy and innovation.[19]

Stakeholders often seek to inform and/or influence the political process of any measure pertaining to species conservation by developing and disseminating pertinent scientific information. The individuals involved in these efforts (e.g., marine mammal researchers, natural resource economists, non-profit organizations, trade and industry groups, conservation groups, and other special interests) are presumed to derive net welfare gains from their participation in such activities. Examples of these types of efforts include scientific studies and monitoring of Arctic ringed seal populations and habitat; informing public resource management policy development, decision-making, and implementation; public education campaigns; and informational lobbying.

4.5 Summary

The intended benefit of designating CH for the Arctic ringed seal is to support the long-term conservation of this species. In addition to the benefits of CH to the seals, other forms of benefits may accrue, including enhanced education/public awareness and scientific knowledge, as well as passive-use values

[19] The author discussed that a public good, in the context of scientific knowledge, has two key characteristics: " … (1) It is tangible in the sense that it is capable of being treated as a fact, or understood and realized; and (2) it has intrinsic value in terms of relating to the fundamental nature of a thing."

associated with conservation of the species and the CH. Benefits may also extend to direct and indirect uses, such as subsistence hunting and gathering, commercial and sport fishing, and wildlife viewing. While the magnitude of many of these types of benefits has been studied, none of these types of benefits has been studied in direct association with the CHD for Arctic ringed seals. Further, in all cases, the types of economic benefits associated with CHD are at least partially co-extensive with those already afforded through the ESA listing of the Arctic ringed seal as threatened. As a result, at this time sufficient economic information and scientific data are not available to accurately quantify or monetize the total economic benefits expected from CHD.

5 Contextual Information

This section presents information regarding the geographic areas and human activities that may affect or be affected by the Arctic ringed seal CHD. First, the geographic area of analysis is introduced. Then, a socioeconomic profile of this area is presented. This is followed by the regulatory baseline. Finally, the present economic activities in the area and actions being taken to protect Arctic ringed seals are discussed and synthesized.

5.1 Geographic Scope (Study Area)

The geographic scope of the analysis includes the specific area being considered for Arctic ringed seal CH and nearby coastal boroughs and U.S. census areas (see **Figure 1-1** in **Section 1**). The analysis focuses on activities within or affecting this area, and presents costs and benefits at the lowest level of resolution feasible, given available data. Note that economic activities affecting (or affected by) CH may be sited outside of the boundaries of the CHD (e.g., activities in shoreline and nearshore areas adjacent to the CH); these activities are considered relevant to this analysis. Activities and projects that have the potential to affect the essential features of CH, but are located outside the boundaries of the CH, may trigger Section 7 consultation(s) under ESA.

5.2 Description of Affected Economies

This section describes the socioeconomic environment in the five coastal Alaska boroughs and U.S. census areas near the CH. From south to north these are: Bethel Census Area, Kusilvak Census Area, Nome Census Area, Northwest Arctic Borough, and North Slope Borough (hereafter, Study Area). For comparison, the section also presents socioeconomic data for the State of Alaska, and the U.S., as a whole. The focus of this section is the socioeconomic parameters that could be affected by the CHD: demographic characteristics of local residents, and employment and income levels.

These data are presented in four subsections: 1) population trends and projections; 2) race and ethnicity; 3) income-related measures of social well-being; and 4) employment by major economic sector. The data used for the economic and socioeconomic analyses are the most recent available published data from reliable sources.

5.2.1 Population Trends and Projections

Although the Study Area accounts for approximately 35 percent of total land area in Alaska, it has only seven percent of the total State's population. The Bethel Census Area is the most populous borough/census area in the Study Area, with a population of approximately 17,000 people in 2010; followed by the Nome Census Area, with approximately 9,500 people in 2010; and the North Slope Borough with just over 9,400 people. Larger communities within the Study Area include Utqiaġvik (Barrow) (North Slope Borough, 4,212 people), Kotzebue (Northwest Arctic Borough, 3,201 people), Nome (Nome Census Area, 3,598 people), Hooper Bay (Kusilvak Census Area, 1,093 people), and Kipnuk[20] (Bethel Census Area, 639 people). Communities with the largest populations are located on or near the coast.

As shown in **Table 5-1**, each borough/census area in the Study Area experienced growth in the number of residents between 1990 and 2010, ranging from 14.5 percent (Nome Census Area) to 29.9 percent growth (North Slope Borough). The significant increase in the North Slope Borough population over this time period can be attributed to families returning to the North Slope due to increased employment opportunities. The other boroughs/census areas experienced slower, but still significant population

[20] Bethel is a larger community within the Bethel Census Area, but Kipnuk is the largest coastal community bordering the CH.

growth, especially during the 1990s, when the population grew by about 21 percent in Kusilvak and about 18 percent in the Northwest Arctic Borough. Between 1990 and 2010, the population growth rate in the Study Area was 3.7 percent higher than the growth rate for the Nation, but was 1.3 percent less than the statewide growth rate.

Population projections through 2035 for residents of the five Study Area boroughs/census areas, the State of Alaska, and the U.S., as a whole, are shown in **Table 5-2**. The total population across the Study Area is projected to grow throughout this time period, albeit with reductions in growth rates projected in the long term. Projected Study Area population growth rates are slightly lower than the State growth rate (with the exception of the 2030-2035 time period).

The population statistics from the Census are for permanent residents of the Study Area and do not include non-resident workers. In 2016, according to the Alaska Department of Labor and Workforce Development, nearly 50 percent of the workforce, or 21,507 workers, were not residents of the Study Area (see **Table 5-3**). This non-resident worker population is equivalent to approximately 42 percent of the resident population in the Study Area. It should be noted that this representation of non-resident workers primarily reflects the workforce in the North Slope Borough, where there are an estimated 16,101 non-local workers, largely employed in the oil operations and support services industries. (Most non-resident North Slope oil and gas workers fly into Prudhoe Bay and work a one to two-week shift before returning home for a one to two-week break.)

Table 5-1 Population and Population Growth, 1990-2010.

Area	Population			Population Growth (%)		
	1990	2000	2010	1990-2000	2000-2010	1990-2010
Bethel Census Area	13,656	16,046	17,013	17.5%	6.0%	24.6%
Kipnuk	*470*	*644*	*639*	*37.0%*	*-0.8%*	*36.0%*
Nome Census Area	8,288	9,196	9,492	11.0%	3.2%	14.5%
Nome	*3,500*	*3,536*	*3,598*	*1.0%*	*1.8%*	*2.8%*
Kusilvak Census Area	5,791	7,028	7,459	21.4%	6.1%	28.8%
Hooper Bay	*845*	*1,022*	*1,093*	*21.0%*	*6.9%*	*29.3%*
Northwest Arctic Borough	6,113	7,208	7,523	17.9%	4.4%	23.1%
Kotzebue	*2,751*	*3,082*	*3,201*	*12.0%*	*3.9%*	*16.4%*
North Slope Borough	5,979	7,385	9,430	23.5%	27.7%	29.9%
Utqiaġvik	*3,469*	*4,581*	*4,212*	*32.1%*	*-8.1%*	*21.4%*
Study Area Total	39,827	46,823	50,917	17.6%	8.7%	27.8%
State of Alaska	550,043	626,931	710,231	14.0%	13.3%	29.1%
U.S.	248,718,302	281,424,603	308,745,538	13.1%	9.7%	24.1%

Sources: U.S. Census Bureau (2012).

Table 5-2 Population Projections (2010-2035).

Area	Population				Population Growth (%)		
	2010	2020	2030	2035	2010-2020	2020-2030	2030-2035
Bethel Census Area	17,013	18,162	19,596	20,423	6.75%	7.90%	4.22%
Kusilvak Census Area	7,459	8,184	9,181	9,721	9.72%	12.18%	5.88%
Nome Census Area	9,492	9,812	10,193	10,447	3.37%	3.88%	2.49%
Northwest Arctic Borough	7,523	7,642	7,860	8,002	1.58%	2.85%	1.81%
North Slope Borough	9,430	9,505	10,544	10,948	0.80%	10.93%	3.83%
Study Area Total	50,917	53,305	57,374	59,541	4.69%	7.63%	3.78%
State of Alaska	710,231	731,566	771,767	808,367	3.00%	5.50%	4.74%
U.S.	308,746,000	332,639,000	355,101,000	364,862,000	7.74%	6.75%	2.75%

Sources: U.S. Census Bureau (2017); Alaska Department of Labor and Workforce Development, Research and Analysis Section (2020).

Table 5-3 2016 Workforce by Residency.

Region	Local Residents	Non-Local Residents	Nonresidents	Total Workers	Percent Non-Local
Bethel Census Area	7,983	1,086	1,135	10,204	21.8%
Kusilvak Census Area	3,162	277	234	3,673	13.9%
Nome Census Area	4,373	527	706	5,606	22.0%
Northwest Arctic Borough	3,030	687	754	4,471	32.2%
North Slope Borough	3,483	9,297	6,804	19,584	82.2%
Study Area Total	22,031	11,874	9,633	43,538	49.4%

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section (2018).

5.2.2 Race and Ethnicity

The racial and ethnic compositions of the five boroughs/census areas in the Study Area, the State of Alaska, and the U.S., as a whole, are presented in **Table 5-4** below.

The predominant resident racial group in each borough/census area is American Indian or Alaska Native (AIAN), with 77 percent of the total Study Area population (compared to 14.5 percent statewide). By borough/census area, the proportion AIAN ranges from 91.2 percent (Kusilvak Census Area) to 51 percent (North Slope Borough).

The second largest racial group in each Study Area borough/census area is white, comprising 14.7 percent of the total resident Study Area population. Relative to statewide totals, there are few other minority groups in the Study Area.

5.2.3 Alaska Native Corporations and Communities

In 1971, President Richard Nixon signed into law the Alaska Native Claims Settlement Act (ANCSA). Under ANCSA, aboriginal financial and land claims were settled in exchange for $962.5 million in compensation, as well as approximately 40 million acres of land (Norris 2002). The ANCSA established twelve for-profit Alaska Native regional corporations (a thirteenth corporation was later added for Alaska Natives living outside the State), which administer the claims from the settlement. In addition, more than 200 Alaska Native village corporations were created. Both the regional and village corporations own land in and around Native villages, with ownership proportionate to the enrolled populations of these corporations during the 1970s. Surface rights to the land are owned by the village corporations, with subsurface rights controlled by regional corporations. In turn, the village and regional corporations are owned by enrolled Alaska Natives (Linxwiler 2007). Approximately 80,000 Natives are enrolled under ANCSA, and receive 100 shares for the village corporation in which they are enrolled and the same amount for the regional corporation in which they are enrolled (Linxwiler 2007).

Waters in CH for the Arctic ringed seal are located seaward of land owned and managed by four ANCSA Regional Corporations and some of their related Village Corporations. These four ANCSA Regional Corporations are: the Arctic Slope Regional Corporation (ASRC), NANA Regional Corporation, the Bering Straits Native Corporation (BSNC), and the Calista Regional Corporation. We note that while these four regional corporations own land near Arctic ringed seal CH, through Section 7(i), of ANCSA, all of the twelve land-owning Alaska Native Regional Corporations share a large portion of their resource revenues. The shared funds benefit village corporations and shareholders.

The ASRC represents the business interests of its approximately 13,000 Iñupiaq shareholders who primarily reside in the eight villages in the region (Arctic Slope Regional Corporation 2020a). Corporate headquarters are in Utqiaġvik, which, with 4,212 residents, is the largest village represented by the ASRC.[21] Of Utqiaġvik residents, 61.2 percent identify themselves as AIAN.

The NANA Regional Corporation has more than 14,500 Iñupiaq shareholders (NANA Regional Corporation 2020). Within the NANA region there are approximately 7,500 people residing in eleven communities or villages. Approximately eighty-one percent of people residing in this region identify themselves as AIAN. Kotzebue is the largest community in the Regional Corporation with over 3,200 residents, about seventy-three percent of whom identify themselves as AIAN.

The BSNC, headquartered in Nome, serves more than 8,000 shareholders (Bering Straits Native Corporation 2021). Approximately 9,500 people reside in the BSNC region, of which approximately one-third reside in Nome (pop. 3,500). Areas in the north and west of the Corporation's Region are occupied by Iñupiat speakers, while the eastern and southern areas are the home of the Yup'ik. The Unaliq people occupy the coastal margin of Norton Sound (Bering Straits Native Corporation 2020).

[21] Unless otherwise noted, in-text demographic data in this section are from U.S. Census Bureau (2013b).

Table 5-4 Population by Ethnic and Racial Groups (2014-2018 Average).

Area	Population	Race							Ethnicity
		White	Black	AIAN	Asian	Native Hawaiian or OPI	Other	Two or More Races	Hispanic or Latino
Bethel Census Area	18,040	1,986 (11.01%)	119 (0.66%)	14,927 (82.74%)	187 (1.04%)	3 (0.02%)	124 (0.69%)	694 (3.85%)	429 (2.38%)
Kusilvak Census Area	8,198	319 (3.89%)	60 (0.73%)	7,480 (91.24%)	32 (0.39%)	2 (0.02%)	3 (0.04%)	302 (3.68%)	81 (0.99%)
Nome Census Area	9,925	1,601 (16.13%)	89 (0.90%)	7,396 (74.52%)	160 (1.61%)	43 (0.43%)	23 (0.23%)	613 (6.18%)	253 (2.55%)
Northwest Arctic Borough	7,734	859 (11.11%)	87 (1.12%)	6,382 (82.52%)	76 (0.98%)	0 (0.00%)	41 (0.53%)	289 (3.74%)	89 (1.15%)
North Slope Borough	9,797	3099 (31.63%)	84 (0.86%)	5,093 (51.99%)	548 (5.59%)	175 (1.79%)	98 (1.00%)	700 (7.15%)	207 (2.11%)
Study Area Total	53,694	7,864 (14.65%)	439 (0.82%)	41,278 (76.88%)	1,003 (1.87%)	223 (0.42%)	289 (0.54%)	2,598 (4.84%)	1,059 (1.97%)
State of Alaska	738,516	478,834 (64.84%)	24,129 (3.27%)	106,660 (14.44%)	46,556 (6.30%)	8,849 (1.20%)	11,027 (1.49%)	62,461 (8.46%)	51,186 (6.93%)
U.S.	322,903,030	234,904,818 (72.7%)	40,916,113 (12.7%)	2,699,073 (0.8%)	17,574,550 (5.4%)	582,718 (0.2%)	15,789,961 (4.9%)	10,435,797 (3.2%)	57,517,935 (17.8%)

Source: U.S. Census Bureau (2018a).

The Calista Regional Corporation has over 32,000 shareholders in Southwest Alaska, in a region southeast of the CH (Calista Corporation 2020b). The Calista Region includes approximately 56 villages (48 communities and 8 seasonally-occupied) (Calista Corporation 2020a). Approximately 87 percent of 24,467 people in the Calista Region identify themselves as AIAN. The largest village represented by Calista, and located along the coast south of the southern boundary of the Arctic ringed seal CH, is Hooper Bay (pop. 1,093), where 94.6 percent of residents identify themselves as AIAN.

5.2.4 Income-Related Measures of Social Well-Being

Per capita and median household income, poverty rates, and unemployment rates are widely used indicators of economic well-being. **Table 5-5** presents these socioeconomic data for the Study Area, the State of Alaska, and the U.S., as a whole. In general, these indicators show that the Study Area has lower rates of economic well-being than other areas of the State of Alaska or the Nation, with higher overall unemployment and poverty, and lower per capita income. The exception to this is the North Slope Borough, which has higher per capita income and lower unemployment, but still has a higher poverty rate than the State average.

In 2014-2018, per capita personal income in the Study Area averaged nearly $10,000, less than the Statewide average of $35,874 and the National average of $32,621 (2018 dollars, see **Table 5-5**). Only in the North Slope Borough does per capita income ($49,903) exceed the Statewide average. Similarly, median household income in the North Slope Borough in 2014-2018 was the highest in the Study Area at $75,431 (2018 dollars), exceeding the same figures for the other Boroughs/Census Areas in the Study Area (which range from $35,539 in Kusilvak Census Area to $62,949 in Northwest Arctic Borough), the Study Area as a whole ($57,309), and the State ($76,715). **Table 5-6** provides the trends in median household incomes from 1989 to 2018. As shown in the table, the Study Area median household income decreased (-6 percent) between 1989 and 2018, while the statewide median household income increased by 0.4 percent.

A third indicator, poverty rate, represents the percentage of an area's total population living at or below the poverty threshold established by the U.S. Census Bureau. Based on available data for 2018, poverty

Table 5-5 Income (2018 Dollars), Poverty Rates, and Unemployment Rates.

Area	Per Capita Income (2014-2018)	Median Household Income (2014-2018)	Poverty Rate (2018)	Unemployment Rate (Feb. 2020)[2]
Bethel Census Area	$19,760	$54,212	32.7%	12.6%
Kusilvak Census Area	$12,578	$35,539	35.1%	19.2%
Nome Census Area	$22,293	$58,987	22.0%	10.4%
Northwest Arctic Borough	$23,230	$62,949	21.1%	13.7%
North Slope Borough	$49,903	$75,431	11.1%	4.7%
Study Area[3]	$25,086	$57,309	25.5%	11.9%
State of Alaska	$35,874	$76,715	10.9%	5.9%
U.S.	$32,621	$60,293	11.8%	3.8%

Sources: U.S. Census Bureau (2018a, 2018b, 2018c, 2019b); U.S. Bureau of Labor Statistics (2020c, 2020b).

Notes:

1. The data presented here are the most recent data available from reliable sources that is consistent across the various geographic levels analyzed.
2. Rates not seasonally adjusted.
3. Weighted average based on population in each census area/borough.

rates for the boroughs/census areas within the Study Area, aside from the North Slope Borough, were higher (ranging from 21.1 percent to 35.1 percent) than the Statewide and National rates (10.9 percent and 11.8 percent, respectively).

Finally, the unemployment rate represents the percentage of the labor force that is unemployed and is actively seeking employment. As of February 2020, the North Slope Borough unemployment rate was 4.7 percent, the only Borough/Census Area in the study below the State level (5.9 percent). The borough/census area unemployment rates elsewhere in the Study Area ranged from 10.4 percent (Nome Census Area) to 19.2 percent (Kusilvak Census Area).

5.2.5 Major Economic Sectors

Alaska's Northern Region, including the North Slope and Northwest Arctic boroughs and the Nome Census Area, is characterized by two types of economies: one is village-based with most workers employed by local government or service industries, augmented with subsistence production, while the other is based on mineral and oil and gas resource extraction (predominantly at Prudhoe Bay and the Red Dog Mine near Kotzebue) (Alaska Department of Labor and Workforce Development, Research and Analysis Section 2018). Moving farther south in the Study Area, the economies in the Bethel and Kusilvak census areas are also dependent upon natural resources, primarily commercial fishing and subsistence activities (Alaska Department of Labor and Workforce Development, Research and Analysis Section 2016). The town of Bethel within the Bethel Census Area also includes a significant service industry base as the town is a service center for the surrounding region.

Tables 5-7 through 5-11 provide information on the number of employees, by sector, as well as on employer establishments, annual payroll, number of non-employer firms, and non-employer receipts for the various industry sectors within the five boroughs. Industry sectors are defined by the North American Industry Classification System (NAICS). Unlike employer establishments, non-employer firms have no paid employees; however, non-employer receipts contribute substantially to a number of sectors.

Table 5-6 Historic Median Household Incomes (2018 dollars).

Area	Median Household Income (1989)	Median Household Income (1999)	Median Household Income (2009-2013)	Median Household Income (2014-2018)	Income Change (1989-2018)
Bethel Census Area	$49,807	$53,975	$55,809	$54,212	-2.9%
Kusilvak Census Area	$40,364	$45,634	$43,378	$35,539	-18.1%
Nome Census Area	$59,105	$62,364	$53,957	$58,987	9.3%
Northwest Arctic Borough	$65,319	$69,509	$66,518	$62,949	-5.4%
North Slope Borough	$98,966	$95,508	$87,198	$75,431	-13.5%
Study Area[2]	$66,993	$69,115	$60,939	$57,309	-6.0%
State of Alaska	$81,191	$77,968	$76,400	$76,715	0.4%
U.S.	$58,933	$63,489	$57,274	$60,293	5.3%

Sources: U.S. Census Bureau (1992a, 1992b, 2003a, 2003b, 2013a, 2018a)

Notes:

1. Pre-2018 median income values were adjusted to 2018 dollars by multiplying by CPI-U-RS adjustment factors (U.S. Census Bureau 2020).
2. Weighted average based on population in each census area/borough.

Table 5-7 2017 County Business Patterns and Non-Employer Statistics for the Bethel Census Area.

NAICS Code[1]	Industry Code Description	Number of Employees[2]	Employer Establishments[3]	Compensation of Employees Received[4]	Non-Employer Firms[5]	Non-Employer Receipts ($1,000)[6]
	Government and government enterprises	3049	*Not Reported*	$114,944,871	*Not Reported*	*Not Reported*
44-45	Retail Trade	836	51	16,547	57	4,762
62	Health Care and Social Assistance	500-999	52	S	34	728
48-49	Transportation and Warehousing	302	17	16,880	102	2,917
61	Educational Services	20-99	5	*Unavailable*	34	211
81	Other Services (except Public Administration)	79	28	1,970	101	1319
71	Arts, Entertainment, and Recreation	69	5	1,383	*23*	*350*
51	Information	66	5	3,587	*3*	*24*
53	Real Estate and Rental and Leasing	66	9	1934	32	1840
56	Administrative and Support and Waste Management and Remediation Services	64	17	3,012	38	502
31-33	Manufacturing	57	3	543	22	157
22	Utilities	40	6	966	N	N
72	Accommodation and Food Services	40	18	898	23	1588
52	Finance and Insurance	*35*	5	*1908*	11	39
11	Agriculture, Forestry, Fishing and Hunting	*0-19*	6	*Unavailable*	114	2512
54	Professional, Scientific, and Technical Services	*18*	6	*826*	*50*	*3064*
42	Wholesale Trade	*17*	4	*1006*	6	540
23	Construction	*14*	10	*760*	31	1024
21	Mining, Quarrying, and Oil and Gas Extraction	*Unavailable*	*Unavailable*	*Unavailable*	*Not Reported*	*Not Reported*
	Total	2,909	251	139,024	683	21,799

Sources: U.S. Bureau of Labor Statistics (2018); U.S. Census Bureau (2019a)

Notes:

1. The U.S., Canada, and Mexico developed North American Industry Classification System (NAICS) is the new industry classification system, which replaces the U.S. Standard Industrial Classification (SIC) system to provide comparable statistics across the three countries.
2. "Number of employees" are number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.
3. "Employer establishments" consist of full and part-time employees, including salaried officers and executives of corporations, who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.

NAICS Code[1]	Industry Code Description	Number of Employees[2]	Employer Establishments[3]	Compensation of Employees Received[4]	Non-Employer Firms[5]	Non-Employer Receipts ($1,000)[6]

4. "Compensation of employees, received" is the sum of Wage and Salary Disbursements and Supplements to Wages and Salaries.
5. A "non-employer firm" is defined as one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to Federal income taxes. Most non-employers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income.
6. "Receipts" (net of taxes) are defined as the revenue for goods produced, distributed, or services provided, including revenue earned from premiums, commissions and fees, rents, interest, dividends, and royalties. Receipts exclude all revenue collected for local, state, and Federal taxes.

Table 5-8 2017 County Business Patterns and Non-Employer Statistics for North Slope Borough.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments[c]	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]
	Government and government enterprises	3049	*Not Reported*	$114,944,871	*Not Reported*	*Not Reported*
44-45	Retail Trade	836	51	16,547	57	4,762
62	Health Care and Social Assistance	500-999	52	S	34	728
48-49	Transportation and Warehousing	302	17	16,880	102	2,917
61	Educational Services	20-99	5	S	34	211
81	Other Services (except Public Administration)	79	28	1,970	101	1319
71	Arts, Entertainment, and Recreation	69	5	1,383	*23*	*350*
51	Information	66	5	3,587	*3*	*24*
53	Real Estate and Rental and Leasing	66	9	1934	32	1840
56	Administrative and Support and Waste Management and Remediation Services	64	17	3,012	38	502
31-33	Manufacturing	57	3	543	22	157
22	Utilities	40	6	966	N	N
72	Accommodation and Food Services	40	18	898	23	1588
52	Finance and Insurance	*35*	5	*1908*	11	39
11	Agriculture, Forestry, Fishing and Hunting	*0-19*	6	*S*	114	2512
54	Professional, Scientific, and Technical Services	*18*	6	*826*	*50*	*3064*
42	Wholesale Trade	*17*	4	*1006*	6	540
23	Construction	*14*	10	*760*	31	1024
21	Mining, Quarrying, and Oil and Gas Extraction	Unavailable	Unavailable	Unavailable	Not Reported	Not Reported
	Total	2,909	251	139,024	683	21,799

Sources: U.S. Bureau of Labor Statistics (2018); U.S. Census Bureau (2019a)

Notes:

1. The U.S., Canada, and Mexico developed North American Industry Classification System (NAICS) is the new industry classification system, which replaces the U.S. Standard Industrial Classification (SIC) system to provide comparable statistics across the three countries.
2. "Number of employees" are number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.
3. "Employer establishments" consist of full and part-time employees, including salaried officers and executives of corporations, who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments[c]	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]

4. "Compensation of employees, received" is the sum of Wage and Salary Disbursements and Supplements to Wages and Salaries.
5. A "non-employer firm" is defined as one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to Federal income taxes. Most non-employers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income.
6. "Receipts" (net of taxes) are defined as the revenue for goods produced, distributed, or services provided, including revenue earned from premiums, commissions and fees, rents, interest, dividends, and royalties. Receipts exclude all revenue collected for local, state, and Federal taxes.

Table 5-9 2017 County Business Patterns and Non-Employer Statistics for Northwest Arctic Borough.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]
	Government and government enterprises	1056	*Not Reported*	50,069,620	*Not Reported*	*Not Reported*
21	Mining, Quarrying, and Oil and Gas Extraction	500-999	3	Unavailable	Not Reported	Not Reported
62	Health Care and Social Assistance	250-499	5	Unavailable	*17*	*194*
44-45	Retail Trade	194	12	4,971	*20*	*1838*
48-49	Transportation and Warehousing	188	11	13,007	16	2040
56	Administrative and Support and Waste Management and Remediation Services	154	7	7,057	12	93
72	Accommodation and Food Services	131	11	4,087	*9*	*181*
23	Construction	59	*7*	6936	15	386
81	Other Services (except Public Administration)	51	10	1117	*21*	*569*
51	Information	*39*	4	*2630*	*Unavailable*	*Unavailable*
53	Real Estate and Rental and Leasing	*3*	3	*22*	*13*	*706*
11	Agriculture, Forestry, Fishing and Hunting	*Not Reported*	*Not Reported*	*Not Reported*	*48*	*814*
31-33	Manufacturing	*Not Reported*	Not Reported	*Not Reported*	Unavailable	Unavailable
42	Wholesale Trade	*Not Reported*	Not Reported	*Not Reported*	*Unavailable*	*Unavailable*
52	Finance and Insurance	*Not Reported*	Not Reported	*Not Reported*	9	15
54	Professional, Scientific, and Technical Services	*Not Reported*	Not Reported	*Not Reported*	44	1,677
61	Educational Services	*Not Reported*	Not Reported	*Not Reported*	6	171
71	Arts, Entertainment, and Recreation	*Not Reported*	Not Reported	*Not Reported*	Unavailable	Unavailable
0	Total	*2012*	*81*	171009	*242*	*9291*

Sources: U.S. Bureau of Labor Statistics (2018); U.S. Census Bureau (2019a)

Notes:

1. The U.S., Canada, and Mexico developed North American Industry Classification System (NAICS) is the new industry classification system, which replaces the U.S. Standard Industrial Classification (SIC) system to provide comparable statistics across the three countries.
2. "Number of employees" are number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]

3. "Employer establishments" consist of full and part-time employees, including salaried officers and executives of corporations, who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.
4. "Compensation of employees, received" is the sum of Wage and Salary Disbursements and Supplements to Wages and Salaries.
5. A "non-employer firm" is defined as one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to Federal income taxes. Most non-employers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income.
6. "Receipts" (net of taxes) are defined as the revenue for goods produced, distributed, or services provided, including revenue earned from premiums, commissions and fees, rents, interest, dividends, and royalties. Receipts exclude all revenue collected for local, state, and Federal taxes.

Table 5-10 2017 County Business Patterns and Non-Employer Statistics for Nome Census Area.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]
	Government and government enterprises	1696	*Not Reported*	76,431,535	*Not Reported*	*Not Reported*
62	Health Care and Social Assistance	1000-2,499	29	*Unavailable*	12	223
44-45	Retail Trade	336	31	7,830	33	1456
48-49	Transportation and Warehousing	184	10	13,384	28	814
72	Accommodation and Food Services	146	19	4,770	22	1023
21	Mining, Quarrying, and Oil and Gas Extraction	20-99	3	*Unavailable*	*25*	*1827*
31-33	Manufacturing	20-99	3	*Unavailable*	*Unavailable*	*Unavailable*
81	Other Services (except Public Administration)	75	18	2,428	45	599
51	Information	51	6	1748	6	101
56	Administrative and Support and Waste Management and Remediation Services	43	6	1,101	22	235
71	Arts, Entertainment, and Recreation	41	5	323	31	424
52	Finance and Insurance	39	5	3,495	17	275
23	Construction	38	13	4,224	*24*	*684*
42	Wholesale Trade	35	4	2,080	*5*	*445*
53	Real Estate and Rental and Leasing	14	10	929	28	2136
54	Professional, Scientific, and Technical Services	11	6	339	*70*	*1361*
11	Agriculture, Forestry, Fishing and Hunting	Not Reported	Not Reported	Not Reported	141	4,233
61	Educational Services	Not Reported	Not Reported	Not Reported	*15*	*38*
	Total	*2183*	172	*120359*	528	16825

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]

Sources: U.S. Bureau of Labor Statistics (2018); U.S. Census Bureau (2019a)

Notes:

1. The U.S., Canada, and Mexico developed North American Industry Classification System (NAICS) is the new industry classification system, which replaces the U.S. Standard Industrial Classification (SIC) system to provide comparable statistics across the three countries.
2. “Number of employees” are number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.
3. “Employer establishments” consist of full and part-time employees, including salaried officers and executives of corporations, who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.
4. “Compensation of employees, received” is the sum of Wage and Salary Disbursements and Supplements to Wages and Salaries.
5. A “non-employer firm” is defined as one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to Federal income taxes. Most non-employers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner’s principal source of income.
6. “Receipts” (net of taxes) are defined as the revenue for goods produced, distributed, or services provided, including revenue earned from premiums, commissions and fees, rents, interest, dividends, and royalties. Receipts exclude all revenue collected for local, state, and Federal taxes.

Table 5-11 2017 County Business Patterns and Non-Employer Statistics for the Kusilvak Census Area.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]
	Government and government enterprises	1,665	*Not Reported*	39,083,164	*Not Reported*	*Not Reported*
44-45	Retail Trade	331	*26*	5607	12	360
62	Health Care and Social Assistance	100-249	15	I	8	29
61	Educational Services	20-99	8	*Unavailable*	14	34
48-49	Transportation and Warehousing	61	5	2395	*20*	*340*
71	Arts, Entertainment, and Recreation	19	3	59	*Unavailable*	*Unavailable*
81	Other Services (except Public Administration)	18	7	733	*47*	*296*
53	Real Estate and Rental and Leasing	6	3	308	4	84
11	Agriculture, Forestry, Fishing and Hunting	*Not Reported*	*Not Reported*	*Not Reported*	*361*	*3651*
23	Construction	*Not Reported*	*Not Reported*	*Not Reported*	*11*	*60*
51	Information	*Not Reported*	*Not Reported*	*Not Reported*	Unavailable	Unavailable
52	Finance and Insurance	*Not Reported*	*Not Reported*	*Not Reported*	Unavailable	Unavailable
54	Professional, Scientific, and Technical Services	*Not Reported*	*Not Reported*	*Not Reported*	*19*	*71*
56	Administrative and Support and Waste Management and Remediation Services	*Not Reported*	*Not Reported*	*Not Reported*	*22*	*115*
72	Accommodation and Food Services	*Not Reported*	*Not Reported*	*Not Reported*	*Unavailable*	*Unavailable*
	Total	*679*	79	*17901*	525	5165

Sources: U.S. Bureau of Labor Statistics (2018); U.S. Census Bureau (2019a)

Notes:

1. The U.S., Canada, and Mexico developed North American Industry Classification System (NAICS) is the new industry classification system, which replaces the U.S. Standard Industrial Classification (SIC) system to provide comparable statistics across the three countries.
2. “Number of employees” are number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.
3. “Employer establishments” consist of full and part-time employees, including salaried officers and executives of corporations, who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.

NAICS Code[a]	Industry Code Description	Number of Employees[b]	Employer Establishments	Compensation of Employees Received[d]	Non-Employer Firms[e]	Non-Employer Receipts ($1,000)[f]

4. "Compensation of employees, received" is the sum of Wage and Salary Disbursements and Supplements to Wages and Salaries.
5. A "non-employer firm" is defined as one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to Federal income taxes. Most non-employers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income.
6. "Receipts" (net of taxes) are defined as the revenue for goods produced, distributed, or services provided, including revenue earned from premiums, commissions and fees, rents, interest, dividends, and royalties. Receipts exclude all revenue collected for local, state, and Federal taxes.

5.3 Regulatory Baseline

This section provides relevant information about the baseline regulatory elements that may provide conservation protections for Arctic ringed seals. Where proposed activities directly affect CH areas, these existing regulations may provide a level of protection to the species, even in the absence of Section 7 of the ESA.

5.3.1 Federal

This section summarizes Federal regulatory elements.

5.3.1.1 Marine Mammal Protection Act of 1972

Arctic ringed seals benefit from protections afforded by the MMPA. The MMPA prohibits the taking and importation of marine mammals and marine mammal products in U.S. waters, subject to a number of exceptions (16 U.S.C. 1371 et seq.). Some of these exceptions include take for scientific purposes, public display, subsistence use by Alaska Natives, and unintentional incidental take coincident with conducting lawful activities. Take is defined in the MMPA to include the "harassment" of marine mammals. "Harassment" includes any act of pursuit, torment, or annoyance which "has the potential to injure a marine mammal or marine mammal stock in the wild" or "has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

U.S. citizens who engage in a specified activity other than commercial fishing (which is specifically and separately addressed under the MMPA) within a specified geographical region may petition the Secretary to authorize the incidental, but not intentional, taking of small numbers of marine mammals within that region for a period of not more than five consecutive years. If the Secretary makes certain MMPA-required findings, regulations (i.e., incidental take regulations or ITRs) are prescribed that specify permissible levels of take, means of effecting the least adverse impact on the species and its habitat, and requirements for monitoring and reporting. Similar to promulgation of incidental take regulations, the MMPA also established an expedited process by which U.S. citizens can apply for an authorization to incidentally take small numbers of marine mammals where the take will be limited to harassment (i.e., incidental harassment authorizations or IHAs). These authorizations are limited to one year and, as with incidental regulations, the Secretary must make certain MMPA-required findings for issuance of such authorizations.

Any marine mammal listed as an endangered or threatened species under the ESA automatically has depleted status under the MMPA, which triggers certain MMPA provisions for depleted stocks. In the future, if NMFS expressly concludes that the harvest of Arctic ringed seals by Alaska Natives is materially and negatively affecting the species, NMFS may regulate such harvests pursuant to sections 101(b) and 103(d) of the MMPA. NMFS would have to hold an administrative hearing on the record for such proposed regulations. NMFS concluded that currently, the subsistence harvest of Arctic ringed seals by Alaska Natives appears to be sustainable, and NMFS does not expect that the listing of the Arctic ringed seal under the ESA will lead to any regulation of subsistence harvest of these seals by Alaska Natives (77 Fed. Reg. 76706; December 28, 2012).

5.3.1.2 Endangered Species Act

The listing of the Arctic ringed seal under the ESA results in protection under Section 7 of the ESA. Section 7 requires Federal agencies to ensure that actions they fund, authorize, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species, or destroy or adversely modify designated CH (16 U.S.C. 1536(a)(2)). "Action," in this case, is defined broadly to include Federal grants, permitting, licensing, or other regulatory actions. In general, if a listed species may be present in an action area, the Federal action agency must determine whether the proposed action may affect listed species or designated CH. If the action agency's assessment shows, and NMFS agrees, that the

proposed action is not likely to adversely affect listed species or CH, then NMFS provides concurrence in writing and the consultation (informal to this point) is concluded.

If consultation cannot be concluded because the proposed action is likely to adversely affect listed species or CH, the Federal action agency must request formal consultation. To initiate formal consultation, the action agency must provide NMFS with information that includes the purpose of the proposed action, location of the action, description of the action, information on the listed species and CH that may be affected, and information on how the species and CH may be affected by that action. Once complete information is received by NMFS, NMFS has up to 135 days to complete consultation and prepare a biological opinion that contains an analysis of whether the Federal action agency has insured that its action is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of designated CH. When a Federal action agency has not insured that its action is unlikely to avoid jeopardizing listed species or to result in the destruction or adverse modification of CH,, the biological opinion will include RPAs, if any, that are economically and technologically feasible, and that that would avoid the likelihood of jeopardizing the listed species or destruction or adverse modification of CH. As noted in **Section 3.1.2**, the action agency may choose to 1) implement an RPA; 2) modify the proposed action and consult with NMFS again; 3) decide not to authorize, fund, or proceed with the action; or 4) apply for an exception, a process rarely undertaken.

A biological opinion includes an incidental take statement (ITS) that identifies the level of take that is anticipated from implementation of the proposed action and exempts the action agency from the ESA section 9 prohibition on take for the amount or extent of take specified in the ITS. Incidental take is a take that is incidental to, and not the purpose of, an otherwise lawful activity. The ITS also specifies non-discretionary reasonable and prudent measures, considered necessary or appropriate to minimize the impact of the anticipated incidental take on the species.

ESA-listed species that occur within potential Arctic ringed seal CH include polar bear, spectacled eider, Steller's eider, bowhead whale, fin whale, humpback whale, North Pacific right whale, Steller sea lion, and bearded seal. Designated CH exists within the ringed seal CH for the spectacled eider (Units 3 and 4, Norton Sound and Ledyard Bay, respectively, polar bear (Unit 1, sea ice habitat), and Steller sea lion (haulouts and associated 20-nm aquatic zones at St. Lawrence and Hall Islands). The essential feature of the polar bear sea ice CH unit is sea ice habitat used for feeding, breeding, denning, and movements, which is sea ice over waters 300 m or less in depth that occurs over the continental shelf, with adequate prey resources (primarily ringed and bearded seals) to support polar bears (75 Fed. Reg. 76086; December 7, 2010). In addition, the area under consideration by NMFS for designation as CH for the Beringia DPS of the bearded seal provides sea ice essential to this species for whelping, nursing of pups, and molting, as well the species' prey resources.

Measures that protect these species or designated CH may also provide some protection to Arctic ringed seals, where the species co-occur. Similarly, designating CH for Arctic ringed seals may benefit other sensitive species by protecting habitat they share. In particular, given the extensive range overlap between Arctic ringed seals and polar bears, it is likely that some consultations on polar bears may overlap with areas designated as CH for Arctic ringed seals. For example, activities with the potential to modify polar bear sea ice CH, such as offshore oil and gas exploration and development, also have the potential to affect the essential features of Arctic ringed seal CH.

In areas where there is existing CH, activities with potential adverse impacts on these habitats would already result in consultations with NMFS or the USFWS, depending on species management agency. As such, in these areas, the incremental costs of consultations required due to the Arctic ringed seal CHD may be reduced due to cost efficiencies in addressing potential impacts to multiple species simultaneously (e.g., a consultation initiation package prepared by a Federal action agency includes information such as the description of the proposed action, environmental baseline, cumulative effects,

and assessment of the stressors that may result from each component of the proposed action which may be relevant to analyzing the potential impacts on CH for multiple species).

5.3.1.3 Public Law 110-243

Public Law 110-243 (122 Stat. 1569) is a 2008 joint resolution that directs the U.S. to "initiate international discussions, and take necessary steps with other Arctic nations to negotiate an agreement or agreements for managing migratory, transboundary, and straddling fish stocks in the Arctic Ocean and establishing a new international fisheries management organization (or organizations) for the region." Consistent with this Congressional direction, in 2015, the United States together with four other Arctic coastal nations adopted a declaration concerning the prevention of unregulated commercial fishing in the high seas portion of the central Arctic Ocean. Subsequently, in 2018, these nations, together with China, Iceland, Japan, South Korea, and the European Union, signed the legally binding International Agreement to Prevent Unregulated High Seas Fisheries in the central Arctic Ocean, under which the signatories agree that their commercial fleets will not fish in the high seas of the central Arctic Ocean until conservation and management measures are in place (O'Rourke et al. 2021).

5.3.1.4 Magnuson-Stevens Fishery Conservation and Management Act: Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (as amended) (MSA) mandates that fishery management plans (FMPs) be developed by the Regional Fishery Management Councils to prevent overfishing and rebuild overfished fisheries. The MSA includes provisions requiring the Councils to describe and identify essential fish habitat (EFH) for the managed species, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC § 1802(10)). In January 2007, the MSA was amended to mandate the use of annual catch limits in federally-managed fisheries, and accountability measures to end overfishing, provide for widespread market-based fishery management through limited access programs, and to call for increased international cooperation.

The MSA requires Federal agencies to consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to Federal and state agencies regarding any action that would adversely affect EFH. After receiving a conservation recommendation from NMFS, the Federal agency must respond in writing, describing measures the agency proposes to mitigate or offset the adverse impacts on EFH, or explain its reasons for proposing to proceed in a manner inconsistent with NMFS' recommendations.

EFH has been designated in a number of areas for certain life stages of some Arctic ringed seal prey species, such as Arctic cod, saffron cod, walleye pollock, and yellowfin sole.

The MSA may provide indirect conservation benefits to Arctic ringed seals by imposition of measures to prevent overfishing of Arctic ringed seal prey species, and by improving conditions for these prey species.

5.3.1.5 Arctic Fishery Management Plan

Changing ecological conditions and warming trends in the Arctic could lead to development of a commercial fishery in the U.S. Arctic. Recognizing this, in 2009, under the MSA the North Pacific Fishery Management Council (NPFMC) approved a new FMP for Fish Resources of the Arctic Management Area (Arctic FMP) to be implemented by NMFS (North Pacific Fishery Management Council 2009) . The Arctic FMP covers all marine waters in the U.S. EEZ of the Chukchi and Beaufort seas from three nautical miles offshore of the coast of Alaska, to 200 nautical miles offshore, north of the Bering Strait, west to the 1990 U.S/Russia maritime boundary line, and east to the U.S./Canada maritime boundary. Under the Arctic FMP, no federally managed commercial fisheries will be authorized in the Arctic Management Area until sufficient information is available to support the sustainable management of a commercial fishery. The

Arctic FMP does not regulate subsistence fishing, recreational fishing, or State of Alaska-managed fisheries in the Arctic, nor does it regulate the harvest of marine mammals and birds.

5.3.1.6 Rivers and Harbors Act

The Rivers and Harbors Act (RHA; 33 U.S.C. 401 et seq.) authorizes the USACE to issue permits for dams or dikes in intrastate waters of the U.S. (Section 9) and construction or other work, such as construction of docks/piers and aquaculture structures and work such as dredging or disposal of dredged materials, in or affecting navigable waters (Section 10). In issuing these permits, USACE conducts a "public interest balancing," which can include evaluation of beneficial and detrimental effects of a project on fish and wildlife values. As a general matter, adverse impacts to Arctic ringed seals are considered to be detrimental to the public interest, and the USACE findings for Section 10 permits must document how these impacts would be avoided. Through this evaluation, USACE requires applicants to avoid and minimize impacts of a project by altering its design or by including mitigation measures.

The RHA also authorizes the U.S. Coast Guard (USCG) to protect U.S. navigable waters, which are considered those waters that, at some time in the past, present, or future, are used to transport interstate or foreign commerce. Protection of navigable waters also includes regulating bridge-related activities. In general, a bridge cannot be constructed across any navigable water(s) until the USCG has approved the location and construction plans. Under 14 U.S.C. 81, the USCG is also charged with establishing, maintaining, and operating aids to navigation to serve the needs of U.S. Armed Forces and maritime commerce, and when those aids are electronic, air commerce as well, when requested by the Federal Aviation Administration.

5.3.1.7 Clean Water Act (CWA)

The purpose of the CWA (33 U.S.C. 1251 et seq.) is to restore the physical, biological, and chemical integrity of the waters of the U.S., using two basic mechanisms: (1) direct regulation of discharges pursuant to permits issued under the National Pollution Discharge Elimination System (NPDES) and Section 404 (discharge of dredge or fill materials); and (2) the Title III water quality program.

Under the NPDES program, the U.S. Environmental Protection Agency (EPA) sets pollutant-specific limits on the point source discharges for major industries and provides permits that apply these limits to individual point sources. EPA has delegated responsibility for the NPDES permitting program to most states, including the State of Alaska. State-issued NPDES permits are treated as non-Federal actions. As such, the issuance of NPDES permits by states is not subject to the consultation requirements of the ESA.

Under the water quality standards program, EPA has issued water quality criteria to establish limits on the ambient concentration of pollutants in surface waters that will still protect the health of the water body. States issue water quality standards that reflect the Federal water quality criteria and submit the standards to EPA for review. State water quality standards are subject to review every three years (triennial review). States apply the standards to NPDES discharge permits to ensure that these discharges do not violate the state water quality standards.

Under Section 401 of the CWA, all applicants for a Federal license or permit to conduct activity that may result in discharge to navigable waters of the U.S. are required to submit a state certification to the licensing or permitting agency. Section 404 of the CWA prescribes a permit program for the discharge of dredged or fill material into navigable waters that requires permit applicants to show that they have "taken steps to avoid wetland impacts, where practicable, minimized potential impacts to wetlands, and provided compensation for any remaining, unavoidable impacts through activities to restore or recreate wetlands."

The CWA will influence activities occurring within the Arctic ringed seal CH, because some of these activities (e.g., dredging, filling, road/bridge construction) may require NPDES or Section 404 permits.

5.3.1.8 Clean Water Act; Comprehensive Environmental Response, Compensation, and Liability Act and Oil Pollution Act of 1990

The CWA; Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.) and the Oil Pollution Act (OPA) of 1990 (33 U.S.C. 2701 et seq.) mandate that parties that release hazardous materials or oil into the environment are responsible not only for the cost of cleaning up the release, but also responsible for restoring any injury to natural resources that results from the actual or threatened release, or from response actions. These provisions would be applied to address impacts to Arctic ringed seal CH from release incidents.

5.3.1.9 Water Resources Development Act

The Water Resources Development Act (33 U.S.C. 2201 et seq.) authorizes the construction or study of USACE projects, and applies to all features of water resources development and planning, including environmental assessment and mitigation requirements.

5.3.1.10 Act to Prevent Pollution from Ships (APPS) as amended by the Marine Plastic Pollution Research and Control Act (MPPRCA)

The APPS, as amended by the MPPRCA, requires all U.S. ships and all ships in U.S. navigable waters or the EEZ to comply with the International Convention for the Prevention of Pollution from Ships (33 U.S.C. 1901 et seq.). Under the regulations implementing APPS, as amended by MPPRCA, the discharge of plastics, including synthetic ropes, fishing nets, plastic bags, and a biodegradable plastic, into the water is prohibited. Discharge of floating dunnage, lining, and packing materials is prohibited in the navigable waters and in areas offshore less than 25 nautical miles from the nearest land. Food waste or paper, trash, glass, metal, bottles, crockery, and similar refuse cannot be discharged in the navigable waters or in waters offshore inside 12 nautical miles from the nearest land. Finally, food waste, paper, rags, glass, and similar refuse cannot be discharged in the navigable waters or in waters offshore inside three nautical miles from the nearest land. There are some exceptions for emergencies. USCG has the primary responsibility for enforcing regulations under the APPS, and the APPS applies to all vessels, including cruise ships, regardless of flag, operating in U.S. navigable waters and the EEZ.

5.3.1.11 The Lacey Act

The Lacey Act, as amended in 1981, (16 U.S.C. 3372 et seq.) prohibits the trade of fish, wildlife, or plants taken in violation of any foreign, state, tribal, or other U.S. law. For example, it is a violation of the Lacey Act for a retail store in New York to sell Arctic ringed seal parts taken illegally from Alaska.

5.3.2 State Regulations

Alaska Statutes (AS) 16.05.841 and 16.05.871 provide a measure of protection to habitat for Arctic ringed seal prey species, by requiring Fish Habitat Permits for activities that may impact the habitat of anadromous fish species, including some species upon which the Arctic ringed seal preys (e.g., rainbow smelt). These statutes are discussed below. For activities that are low impact, practiced by several members of the public in a defined area, and traditional in use (such as boat launches and stream crossings along popular trail systems), General Permits may be issued in place of Fish Habitat Permits (ADF&G 2020e). Also, the Alaska Oil and Gas Conservation Act (AOGCA), and associated statutes require practices by the oil and gas industry that provide protection to natural resources such as CH.

5.3.2.1 Alaska Statute 16.05.841 (Fishway Act)

The Fishway Act requires that private parties or government agencies notify and obtain authorization from ADF&G, Division of Habitat, for activities that cross or occur within a stream that fish use if the activity might impede the efficient passage of resident or anadromous fish (ADF&G 2020d).

5.3.2.2 Alaska Statute 16.05.871 (Anadromous Fish Act)

Pursuant to the Anadromous Fish Act, private parties and government agencies must provide prior notification and obtain permit approval from the ADF&G, Division of Habitat, for all activities that occur within or across specified anadromous water bodies. Activities that "use, divert, obstruct, pollute, or change the natural flow or bed" of a specified anadromous water body (quoted portions from AS 16.05.871 (b)) may include construction; bank stabilization; blasting; road crossings; mining; water withdrawals; the use of vehicles or equipment in the waterway; gravel removal; stream realignment or diversion; and the placement, excavation, deposition, or removal of any material .(ADF&G 2020d). This may provide a measure of protection to some of the species preyed upon by the Arctic ringed seal (e.g., rainbow smelt).

5.3.2.3 Alaska Statute 31.05 (Alaska Oil and Gas Conservation Act)

In 1955, the AOGCA created the Alaska Oil and Gas Conservation Commission (AOGCC). Its regulatory authority is listed in Title 20, Chapter 25, of the Alaska Administrative Code (AAC) . The mission of the AOGCC is to "protect the public interest in exploration and development of Alaska's valuable oil, gas, and geothermal resources" (AOGCC 2020b). Examples of the AOGCC stipulations are the requirements that an application for a Permit to Drill be submitted and approval obtained from the AOGCC prior to drilling, re-drilling, or re-entering a well (20 AAC 25.005); and that a complete proposed well casing and cementing program be submitted with the Permit to Drill application that is designed, among other things, to prevent contamination of freshwater (20 AAC 25.030).

The AOGCC's authority extends to certain oil and gas operations within the state, including operations that occur on federally and privately owned lands (AOGCC 2020a). The commission may take enforcement action if it is deemed that an individual violated or failed to comply with a provision of AS 31.05, chapter 25, or a commission order, permit, or other approval. The potential enforcement actions may include one or more of the following as applicable: corrective action or remedial work, revocation or suspension of a permit or other approval, payment under the bond required by 20 AAC 25.025, or imposition of penalties under AS 31.05.150.

5.4 Current and Projected Economic and Social Activity

This section discusses the economic and social activities within, and in the vicinity of, the Arctic ringed seal CH. A discussion of the expected costs of the Arctic ringed seal CHD to the various sectors and projects identified in this section is provided in **Section 6**.

5.4.1 Oil and Gas Exploration, Development, and Production

One of the primary economic activities within and in areas adjacent to Arctic ringed seal CH is oil and gas exploration, development, and production. The Alaska North Slope (ANS), located on the northern slope of the Brooks Range with coastline running along the Beaufort and Chukchi Seas, is a major oil production area. This area contains State and Federal lands that border the CH waters. ANS production is primarily onshore in State lands. Approximately eight percent of current ANS production comes from offshore facilities within CH, primarily in State of Alaska waters. However, as onshore ANS production areas drain into CH, pollution from various potential sources associated with ANS activities, such as hydrocarbon or other spills, have the potential to affect the CH. Depending upon the location and type of onshore oil and gas activities (such as increased marine traffic or construction, maintenance, and use of ice roads), there may be other effects on the CH.

Oil and gas revenue for Alaska totaled about $2.6 billion, or about 78 percent of the State's general fund revenue in fiscal year 2019 (not including Permanent Fund transfer). In this fiscal year, ANS onshore and offshore oil production averaged 496.9 thousand barrels per day (bpd), accounting for about 97 percent of Alaska's total oil and gas output (Alaska Tax Division 2019). Historically, approximately 50 percent to 55 percent of Alaska's total oil production came from units producing on land with leases that included State

waters within the CH (Alaska Tax Division 2013). Of the 526.5 thousand bpd produced in ANS in fiscal year 2017, 281.9 thousand bpd came from units producing on land with leases that include State waters within Arctic ringed seal CH; production platforms located offshore within the State and Federal waters of the CH produced a total of 52.9 thousand bpd (Alaska Tax Division 2017).

Currently, the majority of oil production occurs in the Prudhoe Bay oil field, which was discovered in 1968. Prudhoe Bay, located in the North Slope Borough, originally contained over 25 billion barrels of oil, making it the richest oil field in all of North America (BP 2006). Infrastructure to bring these reserves to market was quickly developed and the Trans-Alaska Pipeline System (TAPS) started delivering ANS oil to the ice free Port of Valdez, in 1977. Oil production from ANS fields peaked in 1988, when over 2 million barrels of oil flowed through TAPS every day. Production from ANS onshore fields has been declining steadily since the late 1980s. As shown in **Table 5-12**, production has been declining in almost all areas, with the exception of new production at Point Thomson and projected production at NPR-A, and this decline is projected to continue into the future, with total production declining to 492.9 bpd in 2027.

Declines in onshore ANS production, along with generally rising oil prices in the early 2000s through 2014 spurred interest in developing the expected offshore oil resources in the Beaufort Sea OCS and the Chukchi Sea OCS.[22] Since 2014 per barrel oil prices have fallen and some firms have abandoned leases, or at least have placed them on long-term deferment. BOEM (2016a) indicated that between

Table 5-12 Alaska North Slope Oil Production by Lease Area, Fiscal Year 1978-2027 Historical and Projected.

	Production Fiscal Year (Average in Thousands of Barrels per Day)						
	History					Projected	
Lease Location	1978	1988	1998	2008	2017	2018	2027
Onshore production with leases entering State Waters							
Prudhoe Bay	786.9	1602.6	704.2	291.1	239.8	228.6	206.7
Point Thomson	0	0	0	0	3.1	3.1	7.4
PBU Satellites	0	0	53.6	67.5	39.0	57.5	43.1
Offshore platform production in State and/or Federal Waters							
Endicott	0	77.1	57.2	14.1	8.6	8.2	7.4
Offshore, other	0	0	0	34.4	44.3	35.8	33.3
Onshore production from leases outside CH Boundaries							
Alpine	0	0	0	114.9	58.9	63.1	34.3
NPR-A	0	0	0	0	0	0.1	16.3
Greater Point McIntyre Area	0	37.4	151.7	44.3	27.7	30.5	24.9
Kuparuk	0	287	260.4	112.6	80.6	82.6	73.3
Kuparuk Satellites	0	0	28	36.5	24.4	23.9	22.6
Other	0	0	0	0	0	0	23.6
Total, All Leases	**786.9**	**2004.1**	**1225.2**	**715.4**	**526.5**	**533.4**	**492.9**

Source: Alaska Tax Division (2017).

[22] Alaska North Slope oil prices fell in 2009 after a peak in 2008, but recovered within the following years and continued to generally increase until June 2014, when the price of oil fell from approximately $100 per barrel to under $30 per barrel in early 2016 (U.S. Energy Information Administration 2021).

February and November 2016, industry relinquished more than 90 percent of the 527 leases held in the Chukchi Sea and Beaufort Sea planning areas, in the midst of low oil prices. As of June 2021, there were no active leases in the Chukchi Sea planning area (down from 450 active leases in February 2016), and there were 19 active leases in the Beaufort Sea planning area (down from 77 active leases in February 2016) (BOEM 2016b, 2021). Notwithstanding current oil prices, demand is expected to continue to grow, at least for a period (International Energy Agency (IEA) 2019; BP 2020).

Although as yet largely not in production, Federal Arctic OCS waters, located within the CH boundaries, are projected to contain vast oil and gas resources. Together, the Chukchi and Beaufort Seas are estimated to contain 42.86 billion barrels of oil equivalent (boe), 85 percent of the estimated OCS oil resources in Alaska (as there has been little exploration in some areas, estimates for these areas are based on available resource assessment data, data from analogous onshore plays, and modeling) (BOEM 2017). The Beaufort Sea OCS is estimated to contain 8.89 billion barrels of technically recoverable oil(BOEM 2017). The currently undeveloped Chukchi Sea OCS is thought to have even greater resource potential. Estimates anticipate 15.37 billion barrels of technically recoverable oil (BOEM 2017).

Development of these regions could help offset declining onshore oil production, and maintain adequate TAPS throughput in the future. TAPS was originally designed to move 1.5 million bpd, and is currently operating at about 39 percent of this capacity. Studies performed by the pipeline operator, Alyeska Pipeline Service Company, identified potential challenges at throughput between 300,000 and 600,000 bpd. There are mitigation measures, such as using heaters along the pipeline to keep oil flowing, which can offset these problems, if throughput doesn't increase (Low Flow Study Project Team 2011).

In addition to oil reserves, ANS contains substantial natural gas deposits. However, commercial production of natural gas from the ANS is not feasible until a natural gas pipeline is constructed. The status of development of such a pipeline is discussed in **Section 5.4.1.5.**

The remainder of this section describes oil and gas management, including information on the Federal nexus and the leasing process, and then describes current and projected future exploration, development, and production activities within and in areas adjacent to Arctic ringed seal CH.

5.4.1.1 Oil and Gas Management: Federal Nexus

Oil and gas activities within and adjacent to the Arctic ringed seal CH fall under State and Federal management. The Alaska Department of Natural Resources (ADNR) Division of Oil and Gas manages all oil and gas activities within three miles of the shoreline, including nearshore areas in the Beaufort Sea. Oil and gas activities in areas farther than three miles offshore are considered part of the OCS and are permitted and regulated by the Federal Bureau of Ocean Energy Management (BOEM). The BOEM manages the exploration and development of offshore resources by balancing economic development, energy independence, and environmental protection through oil and gas leases, renewable energy development, and environmental reviews and studies.

The CH includes six BOEM planning areas: Navarin Basin, St. Matthew-Hall, Norton Basin, Hope Basin, Beaufort Sea, and Chukchi Sea. Navarin Basin, St. Matthew-Hall, Norton Basin, and Hope Basin have been excluded from BOEM leasing plans due to low resource potential and/or low support for potential new leasing. The Beaufort Sea planning area is currently the only areas with existing leases within the Arctic ringed seal CH.

The OCS Lands Act provides for the jurisdiction of the U.S. over the submerged lands of the OCS, and authorizes the Secretary of the Interior to lease them for certain purposes. It requires that all operations on the OCS be conducted in a safe manner, by trained personnel, using technology, precautions, and techniques sufficient to prevent or minimize the likelihood of blowouts, loss of well control, fires, spillage, physical obstruction to other users, or other occurrences that may cause damage to the environment, property, or endanger life or health. It gives the Secretary the right to cancel a lease or permit at any time

if he/she determines that continued activity pursuant to that lease or permit would probably cause serious harm or damage to life (including fish and other aquatic life), property, any mineral, national security or defense, or to the marine, coastal, or human environment.

The BOEM issues permits for oil and gas exploration activities, called geological and geophysical (G&G) permits. Permits require that all G&G activities for mineral exploration or scientific research must not: interfere with or endanger operations under any lease or right-of-way or permit issued or maintained pursuant to the OCS Lands Act; cause harm or damage to aquatic life or to the marine, coastal, or human environment; cause pollution; create hazardous or unsafe conditions; unreasonably interfere with or harm other uses of the area; or disturb archaeological resources. Between 1998 and 2019, the BOEM issued 14 G&G permits (for activities that were completed) for the Beaufort Sea OCS and seven G&G permits for the Chukchi Sea OCS (BOEM 2020a).

The Bureau of Land Management (BLM) administers Federal onshore oil and gas leasing and issues permits for geophysical exploration, permits to drill oil and gas wells, and authorizations to construct pads and install production facilities. Oil and gas leasing in the National Petroleum Reserve-Alaska (NPR-A) is authorized under the Naval Petroleum Reserves Production Act of 1976, as amended. In 2020, the BLM completed a new Integrated Activity Plan and associated Environmental Impact Statement for the NPR-A (the first Integrated Activity Plan for the NPR-A was completed in 2013). Among the range of alternatives considered, the alternative that would make the most land open to oil and gas leasing was identified as BLM's preferred alternative (BLM 2020b). In addition, the BLM completed an Environmental Impact Statement in 2019 to implement an oil and gas leasing program for the Coastal Plain of the Arctic National Wildlife Refuge (BOEM 2019).

As discussed in **Section 5.3.1.1**, NMFS is responsible for issuing authorizations for incidental "takes" under the MMPA. **Table 5-13** summarizes IHAs and ITRs issued by NMFS for activities associated with Arctic OCS oil and gas development between 2010 and 2019.

Table 5-13 Ice Seal MMPA Oil and Gas Related IHAs and ITRs Issued between 2010 and 2019.

Commercial Operator	Activity	Location of Authorized Activity			
		Chukchi	Beaufort	Chukchi and Beaufort	All Areas
BP	Artificial Island facility operation		1		1
	Surveys		3		3
Shell	Surveys	1		2	3
	Exploratory drilling	2	1		3
Fairweather (for Shell)	Anchor retrievals			1	1
SAExploration	Surveys		2		2
Statoil	Surveys	2			2
TGS	Surveys	1			1
ION Geophysical	Surveys			1	1
Hilcorp and Eni	Ice roads		1		1
Hilcorp	Artificial island development and production		1		1
Hilcorp	Surveys		1		1
Total	**All**	**6**	**10**	**4**	**20**

5.4.1.2 State and Federal Oil and Gas Leasing Process

The BOEM implements a leasing process that uses scientific information and stakeholder feedback to determine which specific areas offer the greatest resource potential while minimizing conflicts with environmental and subsistence considerations (BOEM 2012). Once leases are purchased, lease owners can apply for exploration permits and retain the right to develop a resource if economically viable deposits are discovered. Lease sales are managed according to a five-year leasing plan designed to balance social, economic, and environmental considerations.

All BOEM lease sales include environmental controls on lease operations. Additionally, the Bureau of Safety and Environmental Enforcement (BSEE) has broad permitting and monitoring authority over lessees. Permits require use of the best available and safest technologies during exploration, development, and production. They also require various measures to avoid environmental damage. Monitoring occurs over the life of the lease (BOEM 2012).

BOEM lease sales in 2007 (Beaufort Sea) and 2008 (Chukchi Sea) showed increased industry interest in Arctic OCS regions within Arctic ringed seal CH (Northern Economics 2009). However, the potential lease sales scheduled for the Chukchi Sea in 2016, and for the Beaufort Sea in 2017, were cancelled in October 2015 due to market conditions and low industry interest (U.S. Department of the Interior 2015). One lease sale each in the Chukchi Sea and Beaufort Sea were originally included in the proposed program for 2017-2022, but these were removed from the final program in response to low industry interest and low oil prices (BOEM 2016a).

In 2015, a 25-mile nearshore zone in the Chukchi and Beaufort Seas was withdrawn from disposition for leasing or development activities due to its importance for Native Alaskan subsistence use.[23] The Hanna Shoal area in the Chukchi Sea was also withdrawn from leasing and development at that time. Subsequently, in 2016 the Chukchi Sea and much of the Beaufort Sea were withdrawn from future oil and gas leasing indefinitely, as were the Norton Basin and St. Matthew-Hall planning areas .[24][25] In 2017, EO 13795 was issued, which opened all Alaska region areas for consideration in a revised leasing program, except for the North Aleutian Basin.[26]

The *2019-2024 National Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program* released in 2018 proposed lease sales in all of the available areas in Alaska, with three sales each for the Chukchi and Beaufort Seas (BOEM 2018a). Comments received by NMFS from the State of Alaska (ADNR) on the revised proposed CHD for the Arctic ringed seal[27] summarized the following examples of projected economic benefits of petroleum development in the Chukchi Sea and Beaufort Sea OCS based on an analysis prepared by Northern Economics (2018): 10,850 annual jobs in the U.S. (including direct, indirect, and induced annual jobs; 5,560 in Alaska), with 26,540 annual jobs at peak in the U.S. (16,480 in Alaska); $685.3 million in annual labor income in the U.S. (including direct, indirect, and induced annual labor income; $349.7 million in Alaska), with $1.7 billion annual labor income at peak in the U.S. ($680 million in Alaska); and $2.5 billion in Alaska and local government property taxes, Alaska corporate income taxes, royalty payments to Alaska and the U.S., and additional TAPS throughput. This analysis

[23]. "Memorandum on Withdrawal of Certain Areas of the United States Outer Continental Shelf Offshore Alaska from Leasing Disposition." *Daily Compilation of Presidential Documents*, 201500059, January 27, 2015.

[24] "Memorandum on Withdrawal of Certain Portions of the United States Arctic Outer Continental Shelf from Mineral Leasing." *Daily Compilation of Presidential Documents*, 201600860, December 20, 2016; Executive Order 13754, *Northern Bering Sea Climate Resilience*, December 9, 2016.

[25] Executive Order 13754, *Northern Bering Sea Climate Resilience*, December 9, 2016.

[26] Executive Order 13795*, Implementing an America-First Offshore Energy Strategy*, April 28, 2017.

[27] Comments received by NMFS from the State of Alaska (through ADF&G) on the 2021 Arctic ringed seal revised proposed critical habitat, "Re: NOAA-NMFS-2020-0029: Designation of Critical Habitat for the Beringia Distinct Population Segment of the Bearded Seal, Proposed rule; and NOAA-NMFS-2013-0114: Designation of Critical Habitat for the Arctic Subspecies of the Ringed Seal; Revised proposed rule; request for comments," dated April 8, 2021.

was conducted by Northern Economics for the American Petroleum Institute to evaluate the potential economic benefits of future exploration, development, and production of oil and gas resources in the Alaska OCS areas consistent with BOEM's 2019-2024 draft proposed leasing schedule (BOEM 2018), which includes three sales each in the Chukchi Sea planning area (2020, 2022, and 2024) and the Beaufort Sea planning area (2019, 2021, and 2023). The timeframe for this analysis covered the proposed 5-year leasing program plus 20 years after the leasing program, and the projections were based on a set of exploration and development scenarios and specific assumptions that were outlined in the final report for the analysis (Northern Economics 2018). As stated by Northern Economics (2018), "[t]he scenarios represent only a possible picture of the future." .However, the proposed timeline for these lease sales has been affected by a March 2019 decision issued by the U,.S. District Court for the District of Alaska, which reinstated the 2016 oil and gas leasing withdrawals in the Chukchi and Beaufort Seas.[28] In addition, on January 20, 2021, the 2016 withdrawals from future oil and gas leasing were also reinstated in their original forms under EO 13990.[29]

In 1999, the BLM held its first lease sale within the NPR-A since 1984 within the northeast planning area; and the BLM has since held lease sales within the northwest and northeast planning areas, as well as in the southern area of NPR-A. Lease sales have been held annually for the NPR-A since 2010. Leases have a primary term of 10 years. Once leases are purchased, applicants can apply for land use authorizations and permits to conduct activities such as seismic operations, drilling, pipeline construction, etc. (BLM 2020a).

On July 12, 2019, the ADNR Department of Oil and Gas released the *Beaufort Sea Areawide Oil and Gas Lease Sales Final Finding of the Director.* This document applies to Beaufort Sea lease sales in State waters, which are to be held from 2019 to 2028. The director found that holding lease sales is in the best interest of the State of Alaska, and decided to offer all available State-owned acreage in the Beaufort Sea for lease over this period (ADNR, Division of Oil and Gas 2019a).

State lease sales are held on an annual basis. Before any oil and gas lease sale is executed, the ADNR must prepare a written document on whether the sale is in the best interest of the State. This document describes the existing environment; assesses the potential effects of issuing leases; lists the applicable laws and regulations to oil and gas exploration, development, production, and transportation; and describes mitigation measures with which lessees must comply. Mitigation measures identified in the best interest finding must be included as terms of the lease.

State and Federal leasing decisions are based on several analytical factors, including environment, critical species habitat, intensity of subsistence activities, and hydrocarbon potential. In the Beaufort Sea, the areas containing high petroleum potential are within 75 miles of the shoreline. This zone contains historical and active leases, as well as important areas for subsistence use. In the Chukchi Sea, the majority of high petroleum potential is farther offshore. Most of the historical and all of the active leases fall in this region, between 25 and 200 miles offshore.

5.4.1.3 Current Oil Production

Onshore oil production in the ANS has been the primary oil producing region in Alaska since the discovery of oil at Prudhoe Bay in 1968. In 2017, the three largest producing oil and gas units in Alaska (Prudhoe Bay, Kuparuk, and Colville River) were all located in this region, and accounted for 82 percent of State oil production (Alaska Tax Division 2017).

In the northeast corner of the NPR-A, oil development is expanding westward from the Colville River Delta. Production at the Alpine Colville Delta-5 (CD5) began in 2015. The Greater Mooses Tooth One (GMT1) project, which was approved by the BLM in 2015, began construction in 2017, and first

[28] *League of Conservation Voters v. Trump*, 363 F. Supp. 3d 10113 (D. Alaska 2019).

[29] Executive Order 13990, *Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis*, January 20, 2021.

production occurred in late 2018 (BLM 2015). In 2018, the BLM approved development of the Greater Mooses Tooth Two (GMT2) project, which is expected to have peak production of 30,000 BPD. First oil is anticipated from GMT2 in 2021 (ConocoPhillips Alaska 2020). In 2018, the BLM also initiated preparation of a Master Development Plan for the Willow oil and gas prospect, which is located within the northeast corner of the NPR-A. BLM conducted its first lease sale in in the Arctic National Wildlife Refuge (ANWR) in January 2021 (85 Fed. Reg.; December 7, 2020).

There are currently nine producing oil and gas units that include State waters in the Beaufort Sea within or in areas adjacent to (shoreward of) Arctic ringed seal CH (a unit is composed of a group of leases covering all or part of a deposit of oil or gas). These include three producing units located entirely in State offshore waters, one producing unit located offshore in State and Federal waters, and one producing unit located offshore entirely in Federal waters (ADNR, Division of Oil and Gas 2019f).

Offshore oil production in the Beaufort Sea occurs on manmade gravel islands. Wells are drilled from these island platforms to extract oil from surrounding leases. Extracted resources are transported to shore via causeways, ice roads, and subsea pipelines where they make their way into TAPS and eventually to market. All production in the ANS and adjacent waters utilizes three different types of wells to obtain oil. The production well is where oil and gas are extracted from the reservoir. Additionally, there are injection wells designed to maintain reservoir pressure. Here water and extracted gas are pumped back into the reservoir, replacing pressure and maximizing the amount of oil extracted (Puder et al. 2003).

Processing facilities are needed to support oil extraction. When a production well (onshore or offshore) brings fluids to the surface they are a mixture of oil, gas, and water. Facilities must separate the water, gas, and oil. The resulting water can be re-injected into the reservoir and the oil transported to TAPS. Gas is piped to a gas processing facility which removes heavy natural gas liquids to send through TAPS. Some gas is also used to power on-site field operations, but over 90 percent of the gas is typically re-injected into the reservoir (Puder et al. 2003).

This section summarizes information on the current and anticipated future units with leases that are within the Arctic ringed seal CH.

Units Onshore With Leases that Include State Waters within or in Areas Adjacent to (Shoreward of) Critical Habitat

The Prudhoe Bay Unit is the largest producer of oil on the North Slope. The majority of acreage and facilities are located onshore, but the lease extends into State-regulated Beaufort Sea waters. Production in fiscal year 2017 from Prudhoe Bay and its satellite facilities averaged 278.8 thousand bpd. The facility is operated by BP Exploration Alaska Inc., with ExxonMobil, ConocoPhillips, and Chevron all holding working interests. BP is negotiating the sale of its Alaska operations to Hilcorp Energy (Hanlon 2020). It is estimated that this field still contains 2 billion barrels of recoverable oil and 26 Tcf of natural gas (Anchorage Economic Development Corporation (AEDC) 2014).

The Badami Unit is located east of Prudhoe Bay and spans both onshore and offshore State lands. Savant Alaska LLC, a subsidiary of Glacier Oil and Gas, has been operating this unit since it took over from BP in 2010, with ASRC Exploration LLC as a working partner. Production in May 2018 from the Badami Unit averaged 1,721 bpd (Cashman 2019). This unit has an estimated recoverable reserve of 33 million barrels of oil.

The Milne Point Unit is located northwest of Prudhoe Bay and draws on onshore and offshore reservoirs within State jurisdiction. From January through August 2019, average production from the Milne Point Unit was 23,322 bpd (ADNR, Division of Oil and Gas 2019c). In 2014, BP Exploration Alaska Inc. sold half of its interest in the Milne Point Unit to Hilcorp Energy. Milne Point originally had 3.1 billion barrels of oil reserves, but has been producing since the eighties. Hilcorp and BP also developed a viscous oil project at the Milne Point Moose Pad, which began producing in 2019 (Sutherlin 2019).

The Point Thomson Unit is located east of Badami, bordering the Beaufort Sea adjacent to the ANWR. This unit, which is operated by ExxonMobil, began producing in 2016, with reported production averaging 5,200 bpd (condensate) between January and July 2018 (ExxonMobil 2019). Peak production from the first stage of development at this facility is estimated to be 10,000 bpd (condensate). The Point Thomson Unit is estimated to contain 200 million barrels of condensate and eight Tcf of natural gas (AEDC 2012).

Units Offshore With Leases Entirely in State Waters within or in Areas Adjacent to (Shoreward of) Critical Habitat

The Endicott field (Duck Island Unit) is produced from an offshore island located to the northeast of Prudhoe Bay. From January through November 2018, the unit produced an average of 7,267 bpd (ADNR, Division of Oil and Gas 2019e). This unit was originally estimated to have 1 billion barrels of oil reserves, but has been producing since 1987. Production facilities are located on two artificial islands with a causeway connecting the islands to shore. In 2014, BP Exploration Alaska Inc. sold its interest in the Endicott Unit to Hilcorp Energy (AEDC 2014).

The Oooguruk Unit is near Harrison Bay within the Beaufort Sea west of Prudhoe Bay. The unit is thought to contain 120 million to 150 million barrels of oil equivalent (Boe). Production facilities and wells are located on a six-acre manmade gravel island. Production was reported in 2019 to be approximately 10,000 bpd. In 2019, Eni U.S. Operating Company Inc. acquired full ownership of the Oooguruk field (Eni 2019a).

The Nikaitchuq Unit is located in nearshore Beaufort Sea waters northwest of Milne Point and Prudhoe Bay. This unit uses a pipeline bundle to carry oil from its Spy Island drill site to an onshore processing plant (AEDC 2014). The Nikaitchuq Unit is operated by Eni U.S. Operating Company Inc. and averaged 20,78 bpd in in 2017 and 16,508 bpd in 2018 (ADNR, Division of Oil and Gas 2019b). Eni suspended drilling of new wells in 2015, then commenced exploration drilling at Spy Island again in 2018 (AEDC 2012).

Offshore Units with Leases in Federal Waters within Critical Habitat

The Northstar Unit, owned and operated by Hilcorp Energy (previously by BP Exploration Alaska Inc.), is located entirely offshore to the north of Prudhoe Bay. Its lease includes not only State but also significant Federal OCS acreage. Oil production occurs from an artificial island. Northstar produced an average of 10,361 bpd from January through November 2019 (ADNR, Division of Oil and Gas 2019d). Original reserves are estimated at 310 million barrels and the unit has been producing since 2001. The Northstar Island is located in about 39 feet of water and uses a 6-mile sub-sea pipeline to transport oil to land (AEDC 2012).

5.4.1.4 Future Oil Production

Future oil and gas production within the Arctic ringed seal CH and surrounding areas depends largely on technological advances. Recent advancements in exploration and production technologies have increased interest in developing OCS resources, potentially offsetting at least some of the declines in ANS output. Arctic OCS operations present challenges due to weather and water depth. The presence of pack ice throughout much of the year makes drill ships with ice breaker support vessels the likely method of exploration. Operations occur during the open water season (July to October) and industry analysis suggests that one drill ship could drill one or two wells over this period (Northern Economics 2009).

Development in the Chukchi Sea will likely require new drilling and production technologies, as well as significant investment in pipeline and support infrastructure. There are currently no platforms operating in conditions similar to the Chukchi Sea, where year-round ice movements and seafloor depths of over 100 feet make operation challenging (Northern Economics 2009). Structural designs for platforms have been proposed that utilize a wide base platform, anchoring system, and ballast in concrete cavities to

stabilize and resist ice forces (Northern Economics 2009). The *Arctic Offshore Technology Assessment of Exploration and Production Options for Cold Regions of the US Outer Continental Shelf* determined such bottom-founded structures would be safe and economical in waters of up to 250 feet in depth in the Chukchi Sea (IMV Projects Atlantic 2008). Using subsea wells and pipelines installed under the seafloor could greatly expand the reach of offshore platforms. Extracted fluids could be processed on the platforms with re-injection prior to transport of oil. Miles of onshore and offshore pipeline and supporting infrastructure would be required to bring oil to TAPS. Economically feasible development scenarios are consequently based upon the discovery and development of large reserves (Northern Economics 2009).

Extended reach drilling is a new technology which is allowing producers to extract oil from a variety of deposits while minimizing environmental disturbance. This method allows a well to be drilled laterally several miles away from the drill rig. It can allow production of deposits located three to four miles away from the drilling platform, thereby increasing the range of extractable deposits (IMV Projects Atltantic 2008). This can reduce the need for building new offshore facilities as offshore deposits can be accessed from shore or existing offshore facilities within the extended reach drilling range.

This section describes expected oil and gas production in offshore State and Federal waters within Arctic ringed seal CH.

Onshore Units with Leases that Include State Waters within or in Areas Adjacent to (Shoreward of) Critical Habitat

The Pikka Unit is located both onshore and in nearshore State waters between the Colville River Unit and the Oooguruk Unit. Based on the results of two exploration wells drilled during the 2015-2016 season, Repsol and Armstrong Oil and Gas announced a significant discovery of the Nanushuk field within the Pikka Unit in 2016. Oil Search Alaska LLC bought out Armstrong Oil and Gas and became the project operator in 2018. The Nanushuk project will include three drill sites with up to 151 production and injection wells, a processing facility, and other associated infrastructure. The project will be located on coastal plains and wetlands near the Colville River and Colville River Delta. Drilling is scheduled to begin in 2021 and early production of 30,000 bpd is expected in 2022. Full production is scheduled in 2024 following the development of facilities to manage production of about 120,000 bpd (BLM 2020b).

Offshore Units in Federal OCS Waters within Critical Habitat

The Liberty Unit is located offshore in Federal Beaufort Sea OCS waters. In 2014, Hilcorp Energy acquired primary ownership and operatorship of the Liberty Unit, which was previous fully owned and operated by BP Exploration Alaska Inc. Hilcorp subsequently submitted to BOEM a *Development and Production Plan* for the Liberty Prospect; BOEM approved this plan with the inclusion of additional mitigation measures in 2018 (BLM 2018b). Development would include construction of a gravel drilling and production island. Output could reach a peak of 60,000 to 70,000 bpd, and it is estimated that the Liberty Unit holds 80 million to 150 million barrels of recoverable oil (Hilcorp Alaska 2017).

The Taktuk Unit is located offshore in Federal Beaufort Sea OCS waters north of Point Thomson near Camden Bay. The Taktuk Unit leases, which were acquired by ASRC Exploration from Shell in 2016, were set to expire in 2017. However, the BSEE approved suspension of operations in 2018, with submission of an exploration plan to the BOEM required in 2023 (BSEE 2018).

Nikaitchuq North is located in Federal Beaufort Sea OCS waters immediately north of the Nikaitchuq Unit. Eni plans call for wells to be drilled from the existing Spy Island drill site using extended reach drilling techniques. BOEM approved a revised *Exploration Plan* for this project in 2018 (BOEM 2020b).

In 2008, the Federal government held the first OCS lease sale in the Chukchi Sea since 1991. The sale auctioned over 2.7 million acres of oil and gas leasing blocks, with lease sales totaling over $2.6 billion. Shell purchased $2.1 billion of leases and ConocoPhillips purchased most of the remainder (Ground Truth Trekking 2015). The litigation measures resulting from the Deepwater Horizon incident in the Gulf

of Mexico, equipment issues, and declines in global demand and prices limited exploratory drilling on OCS leases (Ground Truth Trekking 2015).

Shell was conditionally approved to drill up to six exploration wells on Chukchi Sea leases. Shell also gained conditional approval to conduct exploration drilling on OCS leases in the Beaufort Sea located north of Point Thomson near Camden Bay. Shell had planned to drill five wells in Chukchi and Beaufort OCS leases in 2012, but by the end of the season had only drilled the tops of two wells (one in the Beaufort Sea and one in the Chukchi Sea) (Ground Truth Trekking 2015). Shell's efforts were hampered by lingering sea ice and incidents leaving both its drillship and drill rig requiring repairs (Anderson 2013). A revised exploration plan was developed by Shell, and after a comprehensive review, this plan was conditionally approved by the BOEM in 2015. Shell successfully drilled an exploration well in the Chukchi Sea during the summer of 2015; but subsequently announced that it is ceasing exploration activity in offshore Alaska for the foreseeable future (Shell 2015).

ConocoPhillips submitted an exploration plan to begin exploratory OCS drilling in the Devil's Paw area of the Chukchi Sea in 2012. However, in 2013, ConocoPhillips announced it was putting its plan on hold (ConocoPhillips Alaska 2013). Statoil had been planning to drill its first well in the Chukchi Sea in 2014. Subsequently, during the fall of 2015, it announced its decision to abandon this effort (Equinor 2015).

There is currently a high level of uncertainty regarding the volume and timing of oil production in Federal OCS waters within CH. As discussed above, although the 2019-2024 draft proposed leasing program released in 2018 scheduled three sales each for the Chukchi and Beaufort Seas, a 2019 court decision reinstated the 2016 withdrawal of the Chukchi Sea and most of the Beaufort Sea from consideration for oil and gas leasing, and the withdrawals from future oil and gas leasing were also subsequently reinstated in their original forms in January 2021 under EO 13990. As discussed by BOEM (2016a), in addition to future unpredictability of markets and prices, among the variety of other factors that could affect future energy markets, demand for oil and gas, and industry interest, is the possibility of future changes in U.S. energy policies related to addressing the ongoing challenges of GHG emissions and climate change.

5.4.1.5 Natural Gas Production

There are currently no wells operated within or in areas adjacent to Arctic ringed seal CH solely for natural gas production. However, units that include State-regulated Beaufort Sea waters have substantial natural gas deposits. Combined, the onshore and offshore areas within the Prudhoe Bay and Point Thomson units are believed to hold 31.8 Tcf of natural gas and hundreds of millions of barrels of condensate (Thomas et al. 2009). G&G data suggest there may be much larger deposits of undiscovered recoverable natural gas in Arctic OCS waters. The BOEM estimates that there could be 27.73 Tcf of undiscovered, technically recoverable natural gas in the Beaufort Sea OCS and 76.77 Tcf in the Chukchi Sea OCS. Combined, there could be an estimated 123 Tcf of recoverable natural gas deposits in offshore areas within Arctic ringed seal CH (as there has been little exploration in some areas, estimates for these areas are based on available resource assessment data, data from analogous onshore plays, and modeling) (BOEM 2017).

Natural gas currently being produced in the ANS and Beaufort Sea is used to facilitate oil production. Some is burned as fuel for oil field activities, but the vast majority is re-injected into reservoirs to maintain pressure and optimize oil production (Thomas et al. 2009). A small amount of natural gas is sent through TAPS, approximately 30,000 bpd of heavier gas liquids or about 5 percent of total transport. None of the other natural gas produced is available for commercial sale. Large scale natural gas production for use outside of the North Slope will not be feasible unless or until a gas pipeline is constructed.

There has been serious consideration of an ANS natural gas pipeline since the 1970s. In March 2020, the FERC issued a final Environmental Impact Statement for the Alaska Liquified Natural Gas (LNG) project, involving construction and operation of facilities by Alaska Gasline Development Corporation (AGDC) (U.S. Federal Energy Reuglatory Commission (FERC) 2020). BP and ExxonMobil signed an

agreement with the Alaska Gasline Development Corporation in 2019 to collaborate on ways to advance the project (Alaska Gasline Development Corporation 2019a). Alaska LNG has an estimated cost of $45 billion to $65 billion (FERC 2015), and would include a gas treatment plant on the North Slope (Prudhoe Bay) and associated pipelines, a 62-mile long Point Thomson Unit transmission line, approximately 800 miles of pipeline (and associated facilities) to transport the natural gas to a new 20 million metric-ton per annum liquefaction plant in the Nikiski area, and an associated storage and marine terminal (FERC 2020).

In March 2019, the USACE and BLM issued a join record of decision for the proposed Alaska Stand Alone Gas Pipeline (ASAP) being advanced by the AGDC (USACE and BLM 2019). The ASAP would include a gas conditioning facility near Prudhoe Bay, a buried 733-mile long natural gas pipeline connecting to the existing ENSTAR Natural Gas Company pipeline system in the Matanuska-Susitna Borough, a buried 30-mile long small-diameter lateral line connecting the main pipeline to Fairbanks, and associated facilities. AGDC has stated that the ASAP project would not be required if the Alaska LNG project moved forward (FERC 2020).

5.4.2 Mining

Currently, mining activity within the Arctic ringed seal CH is limited to offshore gold dredging in Nome, Alaska. Offshore dredging occurs on claims within three miles of the State shoreline and in two recreational areas: 250 acres located to the west of Nome and 320 acres located to the east of Nome. The ADNR holds lease sales every 10 years for the Nome offshore site. A lease sale was most recently held during the winter of 2020 (ADNR, Division of Mining, Land, and Water 2020a). Dredging operations occur during the open-water period, as well as under the ice, under permits from Alaska Department of Environmental Conservation (ADEC) and the ADNR. A USACE permit is required for suction dredge operations in marine waters deeper than 20 feet (ADNR, Division of Mining, Land, and Water 2020a).

Comments on the 2014 proposed Arctic ringed seal CHD highlighted North Slope coal resources, noting that it has evaluated future development of this resource.[30] Estimated to be one-ninth of the world's known coal resource and one-third of the U.S. resource, the Northern Alaska Coal Province extends across a broad belt 3,000 mile eastward from the Chukchi Sea (Arctic Slope Regional Corporation 2020b). Also, comments received by NMFS from the State of Alaska (ADNR) on the 2021 revised proposed CHD noted the Graphite One mine project north of Nome.[31] for which a prefeasibility study is in progress (Graphite One 2021).

Mining activities in Alaska are regulated primarily by the State, but are also overseen by Federal Agencies such as the EPA and the USACE. Types of State required permits include: waste management, air quality, pollutant discharge, storm water, and temporary use permits. Additionally, various permits from the EPA and USACE may be required (ADNR, Division of Mining, Land, and Water 2020b).

5.4.3 Ports and Coastal Construction

Primary port facilities serving summer vessel traffic within Arctic ringed seal CH include the Port of Nome (medium-draft port), the Port of Kotzebue (shallow-draft port), and the Delong Mountain Terminal Port (shallow-draft port). There are also numerous docks located within or near the CH, servicing barges and small vessels, including at Prudhoe Bay and Utqiaġvik.

[30] Comments received by NMFS from Arctic Slope Regional Corporation on the 2014 Arctic ringed seal proposed critical habitat, "Re: Comments on Proposed Designation of Critical Habitat for the Arctic Ringed Seal, Docket No. NOAA-NMFS-2013-0114," dated March 31, 2015.

[31] Comments received by NMFS from the State of Alaska through ADF&G on the 2021 revised proposed Arctic ringed seal critical habitat, "Re: NOAA-NMFS-2020-0029: Designation of Critical Habitat for the Beringia Distinct Population Segment of the Bearded Seal, Proposed Rule; and NOAA-NMFS-2013-0114: Designation of Critical Habitat for the Arctic Subspecies of the Ringed Seal; Revised Proposed Rule; Request for Comments," dated April 8, 2021.

The Port of Nome is a regional transportation hub located on the southern side of the Seward Peninsula in Norton Sound. It is the closest U.S. port to the Bering Strait. The USACE has been conducting annual maintenance dredging of the Nome Harbor entrance channel and inner harbor basin for the period 2013 through 2022 to maintain safe access to the harbor (USACE 2012). Activity at the Port of Nome has increased in recent years with large barges, fishing boats, and gold dredgers competing for space at the City dock and berthing facilities, and the port has insufficient draft to accommodate new, deeper drafting vessels. The USACE and the Alaska Department of Transportation and Public Facilities jointly sponsored a three-year study to determine the feasibility of constructing navigation improvements as part of a larger system of port facilities in the Arctic and sub-Arctic region. A *Draft Integrated Feasibility Report, Draft Environmental Assessment, and Draft Finding of No Significant Impact* was completed for this study in 2015 (USACE 2015). Informed by this analysis and reports from other related assessments, the USACE released an *Integrated Feasibility Report and Final Environmental Assessment* for its Port of Nome Modification Feasibility Study in March 2020. This assessment identifies a recommended plan to improve navigation access by creating a new deep water basin and modifying the existing outer basin (harbor) to make the basin larger, and with a wider entrance channel (USACE 2020).

The Delong Mountain Terminal Port is used to transport lead and zinc concentrate from the Red Dog mine, which is located near Kotzebue. Concentrate is stored year-round at the terminal site, and in the summer months is loaded onto barges and transported to ships anchored offshore. The terminal, which is owned by the Alaska Industrial Development and Export Authority (AIDEA), is located on property owned by NANA Regional Corporation (which is leased by AIDEA), and is operated by Teck Resources Limited (Alaska Industrial Development and Export Authority 2017).

Residential and commercial development projects occur in areas shoreward of Arctic ringed seal CH. For example, the North Slope Borough noted in its comments on the 2021 revised proposed Arctic ringed seal CHD municipal-type projects or other activities such as erosion protection, road construction, water treatment activities, port infrastructure, and municipal expansion.[32] Such actions would not trigger ESA Section 7 consultation with respect to CH, unless they have a Federal nexus and the specific actions have the potential to adversely affect the CH.

5.4.4 Commercial Fisheries

There is extensive, year-round commercial harvest of fish in the Bering Sea, with some commercial harvest in the areas of the northern Bering Sea within the Arctic ringed seal CH. Currently, recorded commercial catch from waters in the Arctic ringed seal CH includes flatfish, halibut, Pacific cod, pollock, several species of crab, and salmon. As noted in **Section 5.3.1**, there is currently no commercial fishing of federally-managed fish resources in the Chukchi and Beaufort seas due to limited data on fish populations in these waters. However, as more data become available, commercial fishing may be allowed in these waters. Also, as commercial fisheries follow target stocks that expand their range in association with changes in climatic and oceanographic conditions, total tonnage and species caught within Bering Sea waters of the CH may increase. This section describes management of all primary species commercially harvested within the Bering Sea, then provides available data on the tonnage and value of fish currently harvested commercially within the portions of State and Federal management areas, respectively, that overlap with Arctic ringed seal CH.

5.4.4.1 Management of Commercial Fisheries: Federal Nexus

Fisheries in and off Alaska are collaboratively managed by the State, the Federal government, and through international cooperation. ADF&G has jurisdiction to manage commercial fisheries (except Pacific halibut fisheries) within three miles of the shoreline. NMFS manages fisheries in the U.S. EEZ,

[32] Comments received by NMFS from the North Slope Borough on the 2021 Arctic ringed seal revised proposed critical habitat, "Re: Comments on Proposed Designation of Critical Habitat for the Arctic Ringed Seal, Docket No. NOAA-NMFS-2013-0114," dated April 8, 2021.

from 3 nautical miles off the coast line of Alaska to 200 nautical miles offshore, as well as Pacific halibut from the shoreline to 200 nautical miles offshore. NMFS enforces commercial harvest limits established by the North Pacific Fisheries Management Council (NPFMC). The ADF&G enforces harvest allocations set by the Alaska Board of Fisheries (BOF).

Management of fish species that are present in both state and Federal waters is typically allocated to either a state or Federal agency. For example, NMFS defers management of salmon fisheries in Federal waters to the State of Alaska, while retaining Federal oversight.[33] Groundfish fisheries, including cod, a large number of flatfish species, a similar variety of rockfish and 'other' species, and pollock, are generally managed by NMFS. King crab, Tanner crab, and snow crab fisheries are jointly managed by ADF&G and NMFS. All commercial halibut fisheries in and off Alaska, from zero to 200 nautical miles, are managed by NMFS, under terms of the International Pacific Halibut Commission (IPHC).

Federal fisheries are managed in accordance with 50 CFR Part 679: Fisheries of the EEZ off Alaska. Every federally managed species has an FMP, which requires a stock assessment and fishery evaluation (SAFE) to be prepared each year. The NPFMC uses the FMPs, as amended, and SAFE evaluations to determine the total allowable catch (TAC) for the various commercial fisheries, by area, by target species.

Increasing numbers of Federal fisheries in and off of Alaska have come under one or another form of dedicated allocations. Many rely upon a catch share system, wherein, after a TAC is set, individual transferable quotas (ITQs) are distributed among individual qualifying fishermen, while others allocate TAC shares to a specific gear-group or operational mode (e.g., trawlers, Catcher/Processor vessels). These shares determine the quantity of fish the recipient or sector may harvest, by management area, for the year. Under some forms of these catch share programs, recipients may buy, lease, and sell these shares or operate cooperatively to optimize harvest of the allotted shares.

5.4.4.2 State Fisheries Harvest Information

Commercial harvest data in State fisheries are reported by ADF&G management area. Portions of the Arctic ringed seal CH are located in the ADF&G Arctic-Yukon-Kuskokwim (A-Y-K) Management Region, which includes the coastal waters of the Bering, Chukchi, and Beaufort Seas, as well as the rivers and streams draining into these bodies of water. Within the A-Y-K Management Region there are four ADF&G fisheries management areas, two of which overlap with the Arctic ringed seal CH: Norton Sound & Kotzebue Management Area and the Arctic Management Area. ADF&G issues commercial fishing permits in these areas for salmon, crab, and herring.

The ADF&G management boundaries for State fisheries do not align well with the CH boundaries. ADF&G management units include in-river commercial catch, as well as catch within the State-managed nearshore coastal waters (within the three-nautical-mile boundary). Much of the commercial fisheries harvest reported by the ADF&G is in-river catch, rather than catch from marine waters. However, the ADF&G also provides data specific to several of the nearshore areas (bays and sounds) within the CH. As available, these harvest data, specific to the Arctic ringed seal CH, are provided below.

The ADF&G fisheries harvest reports generally include species, pounds landed, and ex-vessel value. Salmon harvest accounts for most of the commercial fishing within the A-Y-K Management Region, with most of this harvest occurring in-river. The value of commercial fish harvest in the A-Y-K, including in-river harvest, is small compared to total State harvest value. For example, the total ex-vessel gross value of the salmon harvest in this management unit (including in-river harvest) was estimated to be $3.6 million in 2019, accounting for about 6 tenths of a percent of the total State-wide harvest gross ex-vessel value of $658 million (ADF&G 2019a).

[33] There are very small areas in which salmon fisheries occur in Federal waters. Under the Federal Fishery Management Plan, NMFS defers management in Federal waters to the State of Alaska, while retaining Federal oversight. The same management arrangement is in place for commercial crab fisheries in and off Alaska.

Norton Sound & Kotzebue Management Area

The Norton Sound & Kotzebue Management Area includes all waters from Point Romanof in Norton Sound to Point Hope in Kotzebue Sound, and St Lawrence Island. This region supports a population of around 17,000 persons, nearly all of whom depend to some degree on fish and game for their livelihood (ADF&G 2020c). Chum and pink salmon are the predominant salmon species found in the Norton Sound and Kotzebue Sound areas, with smaller stocks in these areas of sockeye, coho, and Chinook. In 2019, the total gross ex-vessel value of salmon harvested in Kotzebue Sound (within CH) was approximately $1,538,976 (ADF&G, Division of Commercial Fisheries 2019b), and in Norton Sound (within CH) was $2,073,586 (ADF&G, Division of Commercial Fisheries 2019c).

There is an important commercial king crab fishery in Norton Sound (within CH) with ex-vessel gross value of approximately $535,000 in 2019 (ADF&G, Division of Commercial Fisheries 2019d). Management of this king crab fishery has imposed limits on vessel size, and designated this fishery as a "super exclusive" fishery, which prohibits vessels registered for the Norton Sound king crab fishery from participating in any other king crab fishery in the same year.

Between 2009 and 2014, the commercial herring fishery in Norton Sound had a total value ranging from $10,000 to $270,000 (Menard et al. 2015). However, while a small commercial bait fishery was authorized in 2017 there has been minimal commercial herring fishing in the area since 2006 due to limited market interest (ADF&G, Division of Commercial Fisheries 2017a).

Northern Management Area

The Northern (Arctic) Management Area includes all Alaskan waters north of the western tip of Point Hope, including waters draining into the Arctic Ocean and Chukchi Sea. Small populations of chum, pink, and Chinook salmon have been reported along the northern coast. There are no commercial fisheries for salmon species in the Northern Area (Estensen et al. 2013). Although not reported in ADF&G catch data, publications by ADF&G indicate that Arctic cisco and least cisco are commercially caught in this region, with such fishing generally occurring in October and November using set gillnets operated under the ice (ADF&G 2020b).

5.4.4.3 Federal Fisheries Harvest Information

The southern portion of Arctic ringed seal CH overlaps with a limited part of the northern portion of the Federal Bering Sea and Aleutian Island (BSAI) Management Area. Catch data from NMFS indicate that pollock, Pacific cod, flatfish, and halibut are commercially caught within the Arctic ringed seal CH. As noted above, the IPHC sets the allocation limits for halibut harvest in and off Alaska, but NMFS manages and enforces commercial halibut harvest.

Total catch within the BSAI Management Area in 2018 was 1,908.7 metric tons (round weight), or 89 percent of the total 2.14 million metric tons of groundfish commercially caught in 2018 off Alaska **(Table 5-14**).

Table 5-15 summarizes 2018 data on the portion of BSAI groundfish, halibut, and sablefish commercial fishing activity within the Arctic ringed seal CH. The table presents retained tonnage and value within the potential CH. In 2018, commercial vessels harvested 30,812 round metric tons of groundfish from waters of the potential CH, with a total gross ex-vessel value of $23.7 million; this represents approximately 3 percent of the total ex-vessel value of the BSAI groundfish fishery. Pacific Cod accounts for 88 percent of the gross ex-vessel value of groundfish commercially caught in this area. Halibut is also harvested within the Arctic ringed seal CH; in 2018, 438 metric tons of halibut, valued at $4 million was harvested in this area.

Table 5-14 2018 Bering Sea and Aleutian Islands Management Area Groundfish and 2014 to 2018 Range of Values.

Species	2018 Total Catch (1,000 Metric Tons, Round Weight) (Range 2014 to 2018)	2018 Ex-Vessel Value ($ Millions) (Range 2014 to 2018)
Pollock	1,369.8 (1,284.7 - 1,369.8)	$408.24 ($352.89 - $427.97)
Sablefish	1.5 (0.6 - 1.5)	$4.47 ($3.73 - $6.45)
Pacific Cod	217.9 (217.9 – 257.6)	$196.29 ($143.84 - $196.29)
Other Groundfish	13.8 (7.3 – 13.8)	$7.56 ($2.96 - $9.33)
Flatfish	197.3 (197.3 – 250.6)	$95.76 ($63.47 - $95.76)
Rockfish	38.7 (32.3 – 38.7)	$18.14 ($13.99 - $18.37)
Atka Mackerel	69.5 (27.9 – 69.5)	$53.42 ($23.75 - $53.42)
Total	1,908.7 (1,850.1 – 1,912.1)	$783.87 ($656.98 - $783.87)

Source: Fissel et al. (2019).

Table 5-15 2018 Groundfish and Halibut Harvest within the Potential Arctic Ringed Seal Critical Habitat.

Target Species	Round Metric Tons	Ex-Vessel Value
Groundfish		
Flatfish	889	$490,210
Pacific Cod	23,065	$20,746,435
Pollock	1,889	$562,179
Rockfish	5	$3,452
Sablefish	1	$310
Other	4,963	$1,859,991
Groundfish Subtotal	30,812	$23,662,579
Halibut	438	$3,989,613
Total Within Potential CH	31,250	$27,652,192

Source: Steve Lewis, NMFS, Alaska Region, Catch in Areas Database query results, March 19, 2020.

5.4.5 Alaska Native Subsistence Use and Personal Use

Subsistence hunting and fishing activities within and in areas adjacent to Arctic ringed seal CH are very important to the culture and local economies of Northern Alaska coastal villages and communities. Alaskan residents with 12 consecutive months of residency, both Alaska Natives and non-Natives, may participate in subsistence fisheries and subsistence hunts (except for marine mammals, of which subsistence use is limited to Alaska Natives who live on the coast of the North Pacific or Arctic oceans.) Many residents who work full- or part-time for wages continue to hunt and fish for much of their food. It was recently estimated that the subsistence harvest contains 34 percent of the caloric requirements of western Alaska and 36 percent of the caloric requirements of Arctic Alaska, considerably higher than for

the rural Alaska population overall (25 percent) (ADF&G, Division of Subsistence 2017b). Within the CH, marine resources are integral to a majority of the communities' traditions and culture, including those of communities that lie inland. This section covers the traditional and current uses of Arctic ringed seals and other species in the CH by indigenous people and others for purposes of personal consumption and for customary and traditional uses.

As discussed in **Section 5.2** (Description of Affected Economies), the coastal population near the CH is predominantly Alaska Native. This section, thus, primarily focuses on the Native population and their subsistence use.

5.4.5.1 Identifying Federal Nexus

Subsistence hunting and fishing in Alaska by Alaska residents are regulated by the State and the Federal government, with management responsibility depending upon where the harvests occur. This is a "dual management system" because of overlapping State-Federal jurisdictions in many areas. In general, the State of Alaska regulates subsistence fishing and hunting on all State of Alaska lands and waters while the Federal government regulates these activities on Federal public lands and federally-reserved waters in Alaska (ADF&G, Division of Subsistence 2017b).

State and Federal laws define subsistence uses as the "customary and traditional uses" of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade (ADF&G, Division of Subsistence 2017b). State and Federal programs recognize "traditional and cultural use" as a unique element of subsistence use. Subsistence guidelines for both State and Federal programs restrict subsistence uses last, only after restricting other uses, such as sport or commercial. Federal and State subsistence programs are operated in a coordinated fashion in accordance with a Memorandum of Understanding between the Federal Subsistence Board and the State of Alaska.

Federal jurisdiction over subsistence programs stem from the Alaska National Interest Lands Conservation Act (ANILCA) and the MMPA. ANILCA provides rural Alaskans priority access to traditional and customary uses of wild renewable resources. In order to administer the ANILCA subsistence on Federal public lands and waters, the Secretaries of the Interior and Agriculture established the Federal Subsistence Management Program. The program provides for public participation through the Federal Subsistence Board and 10 regional advisory councils. The Federal Subsistence Board is the decision-making body that oversees the program. The program provides opportunities for a subsistence way of life by rural Alaskans on Federal public lands and waters, while maintaining healthy populations of fish and wildlife (Office of Subsistence Management 2016).

The Fisheries Resource Monitoring Program was established to help provide information for management of subsistence fisheries on Federal public lands in Alaska. The Monitoring Program funds projects that address research priorities identified by management agencies and local users. The Division of Commercial Fisheries, ADF&G, handles the management of subsistence fisheries in the State of Alaska in conjunction with the Federal government.

Section 101(b) of the MMPA provides an exemption from its take prohibitions that allows Alaska Natives to harvest marine mammals for subsistence use for traditional Native handicraft purposes, provided that the taking is not done in a wasteful manner. Alaska Native subsistence hunting of species listed as threatened and endangered is also exempted under section 10(e) of ESA, which allows for taking of listed species if it is primarily for subsistence purposes, so long as it is not done in a wasteful manner. Designation of CH will not affect the continued subsistence harvest of Arctic ringed seals, nor the harvest of other subsistence species and resources found within or near the CH.

NMFS is the primary Federal agency responsible for research, management, and conservation of ice seals. NMFS, along with the Ice Seal Committee (ISC), co-manages ice seals by monitoring harvest and cooperating on needed research and education programs pertaining to these seals. The ISC is an Alaska

Native organization devoted to conserving ice seal populations, habitat, and hunting, along with preserving Native cultures and traditions.

5.4.5.2 Native Peoples Subsistence and Cultural Use

As discussed in **Section 5.2.3**, the Arctic ringed seal CH is located seaward of land owned and managed by four Alaska Native Claims Settlement Act (ANCSA) Regional Corporations and some of their related Village Corporations. These ANCSA Regional Corporations include: the ASRC, NANA Regional Corporation, the BSNC, and the Calista Regional Corporation. Villages in the region balance their economies between subsistence hunting and fishing, and wage employment.

Reliance on subsistence harvests in the ASRC region is evident in data for several communities, including Kaktovik. In 1998, subsistence resources made up at least half of the food consumed in 83 percent of the households in Kaktovik, although this decreased to 69 percent in 2003 (ADNR, Division of Oil and Gas 2011). In Point Lay, a subsistence survey conducted in 2012 estimated 595 pounds of wild foods were harvested per capita (Braem et al. 2017). Marine mammals accounted for the most estimated pounds harvested by Point Lay households that year (53 percent of the total harvest), and fish (e.g., salmon, Dolly Varden, and Arctic grayling) made up about 9 percent Point Hope households surveyed in 2014 harvested an estimated 451 pounds of wild foods per capita. Marine mammals constituted 70 percent of the total harvest, while fish (e.g., salmon, Dolly Varden, and Arctic grayling) accounted for 19 percent of the harvest (Braem et al. 2017). Utqiaġvik households surveyed in 2014 harvested an estimated 362 pounds of wild food per capita. Similar to Point Lay, marine mammals accounted for 53 percent of the total harvest, and fish (e.g., whitefish and salmon) comprised 13 percent of the harvest (Brown et al. 2016). Inland villages, such as Anaktuvuk Pass and Atqasuk in the North Slope Borough, do not rely as heavily on marine resources as other villages on the North Slope, but marine resources are still integral to the community's traditions and culture. Shares of marine resources are commonly brought into inland communities from coastal villages and this occurs with Anaktuvuk Pass and Atqasuk.

Within the NANA region, subsistence fishing occurs in the State of Alaska's Kotzebue Sound Management Area. There are comprehensive subsistence harvest studies available for seven of the eleven Kotzebue Sound communities. The top ten species of fish and wildlife harvested in these seven communities during the time period 1980 to 2007 were: caribou, sheefish, chum salmon, bearded seal ("ugruk"), whitefishes, moose, Dolly Varden ("char"), Arctic ringed seal, berries, and beluga ("white") whale. Arctic ringed seals represented 3 percent of the total subsistence harvest by weight (ADF&G 2020h). More recently, subsistence surveys were conducted in Deering in 2013 and in Kotzebue from June 2014 to May 2015 (Braem et al. 2017). Deering households harvested an estimated 663 pounds of wild foods per capita, with fish accounting for 18 percent of the total harvest (e.g., salmon, Dolly Varden, and sheefish) and marine mammals constituting 11 percent of the harvest. Kotzebue households harvested an estimated 203 pounds of wild food per capita, with marine mammals accounting for 15 percent of the total harvest and fish (e.g., salmon, sheefish, and Dolly Varden) and marine invertebrates comprising 44 percent of the harvest.

Within the BSNC region, subsistence fishing occurs in the State of Alaska's Norton Sound-Port Clarence Management Area. Subsistence hunting for marine mammals in the area includes harvest of walrus, polar bear, and seals, including Arctic ringed seal. A comprehensive subsistence survey conducted in the Bering Straits Region by Kawerak, Inc.[34], estimated that in fall of 2005 to spring of 2006, about two-thirds of the respondents living in the this region consumed wild foods at least three days a week; and about 20 percent consumed wild foods six or seven days a week (Ahmasuk et al. 2007). In addition, subsistence surveys were conducted in the communities of Golovin in 2012, Diomede and Stebbins in 2013, and Shishmaref in 2014 by Braem et al. (2017). The authors found that Golovin households harvested 315.5 pounds of wild food per capita, with fish and marine invertebrates comprising more than half the total

[34] After the passage of the Alaska Native Claims Settlement Act in 1971, Bering Straits Native Association organized Kawerak as the regional non-profit corporation (incorporated under State Law in 1973) to provide services throughout the Bering Straits Region.

harvest (54 percent), and marine mammals accounting for 19 percent of the total harvest. For Diomede, the estimated per capita harvest of wild food was 299 pounds. Marine mammals were the largest contributtion to the total subsistence harvest (75 percent), and marine invertebrates accounted for 10 percent of the harvest. Stebbins households harvested 343 pounds of wild food, with fish constituting 55 percent of the total harvest (e.g., salmon, Pacific herring, and saffron cod) and marine mammals constituting 22 percent of the harvest. Finally, for Shishmaref, the estimated per capita harvest of wild food was 633 pounds. More than half the total harvest was accounted for by marine mammals (55 percent) and fish (e.g., salmon, saffron cod, and Dolly Varden) constituted 22 percent of the harvest.

The Calista Regional Corporation has the largest total population out of the four Regional Corporation regions near the CH. Only a small portion of the Calista Regional Corporation is adjacent to the CH. Emmonak is the largest village within the Calista region located adjacent to the CH. In 2008, subsistence use in Emmonak was widespread, with 510 usable pounds of wild resources harvested per capita (Fall 2011). Wild resources included wild plants, shellfish, birds, eggs, marine mammals, land mammals, salmon, and other fish. Approximately 16 percent of the total harvest was marine mammals, while fish accounted for approximately 53 percent of the total harvest.

Traditional and Current Arctic Ringed Seal Harvest Practices

As noted above, subsistence hunting of Arctic ringed seals by Native peoples residing on the coast is exempt under section 10(e) of the ESA and section 101(b) of the MMPA. Designation of CH for the Arctic ringed seal will not prohibit or limit subsistence hunting of Arctic ringed seals (86 Fed. Reg. 1452; January 8, 2021). Arctic ringed seals are predominately hunted by coastal Alaska Natives from Bristol Bay to Kaktovik for human consumption (meat and seal oil) and for pelts to make clothing, rope, and handicrafts.

Sharing of subsistence resources, including Arctic ringed seals, is one of the most important traditions in Inupiat culture along the North Slope. Hunters share with community members and guests during community feasts or potlatches. For example, in the North Slope village of Nuiqsut, researchers found that all subsistence hunters shared part of their harvest at least once, and that 87 percent of the harvests resulted in sharing (ADNR, Division of Oil and Gas 2011).

Approximately 64 coastal communities in Alaska, from Bristol Bay to the Beaufort Sea, harvest ringed seals for subsistence uses. Ice seal harvest data collected from 1992 to 2014 for 41 of 55 communities that regularly hunt ice seals and per capita removal estimates from the surveyed communities were used to estimate the average regional and statewide subsistence harvest. The estimated average number of ringed seals harvested in 2015, including struck and lost animals, is 6,454 seals (Nelson et al. 2019).

Subsistence Fisheries

Of the estimated 34.3 million pounds of wild foods annually harvested in rural Alaska, subsistence fisheries contribute about 53 percent from finfish and about 3 percent from shellfish (Fall et al. 2020). The ADF&G Division of Commercial Fisheries manages the State subsistence fisheries, with the exception of fisheries on all Federal public lands and waters that are under Federal management.

Under State of Alaska subsistence fishing regulations, finfish may be taken for subsistence purposes at any time in any area of the State, with the exception of salmon, rainbow trout, and steelhead trout, which have seasonal limitations (5 AAC 01.005; 5 AAC 01.180). Finfish species taken for subsistence purposes in waters within or in areas adjacent to the CH include salmon, herring, sheefish, whitefish (i.e., species of cisco and “broad” and “humpback” whitefish), Arctic char/Dolly Varden (locally called “trout”), saffron cod, capelin, rainbow smelt, northern pike, starry flounder, yellow fin sole, Arctic flounder, Alaska plaice, Arctic grayling, burbot, and halibut (Menard et al. 2015). Some subsistence fisheries within the CH require a permit issued by the ADF&G. These fisheries are primarily salmon, halibut, shrimp, and crab.

Salmon and herring are the most important fisheries in the A-Y-K region. In addition, white fish are important to residents in this region and extensive monitoring of non-salmon species has been done in

the Kotzebue Sound, Norton-Sound-Port Clarence, Yukon, and Kuskokwim Management areas by the ADF&G (ADF&G 2020a).

Household surveys of subsistence harvest of fish were conducted in 2014, in five North Slope coastal communities: Utqiaġvik, Nuiqsut, Point Hope, Point Lay, and Wainwright. These surveys indicated that an estimated 12,504 salmon, 64,492 Arctic cisco, 58,901 whitefish, 26,597 Arctic grayling, 26,903 least cisco, and 7,019 Dolly Varden were harvested in these communities (Fall et al. 2017).

Household surveys of subsistence harvest of fish in the Kotzebue region were conducted in 2004 in six Kobuk River communities: Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak. In addition to salmon, major fisheries take place in the Kotzebue region for sheefish, other whitefishes, and Dolly Varden. The surveys indicated that an estimated 26,181 salmon, 10,835 sheefish, 50,501 whitefish, and 11,697 Dolly Varden were harvested in the six surveyed communities for subsistence (Fall et al. 2007). Kotzebue region data from household surveys of subsistence harvest of fish conducted in 2014 are more complete than for any year since 2004, missing only three communities (Deering, Shishmaref, and Wales) (Fall et al. 2017). The 2014 surveys indicated that an estimated 72,595 salmon, 31,909 sheefish, 82,335 whitefish, 13,059 Dolly Varden, and 17,616 saffron cod were harvested in the surveyed communities for subsistence.

In addition, in the Norton Sound-Port Clarence District, the estimated subsistence harvest of salmon in 2014 based on data from household surveys and permits issued was 84,210 fish (Fall et al. 2017).

Shellfish, particularly crab, are also used for subsistence purposes in areas within the CH. The main subsistence fishery within CH that requires an ADF&G permit for participation is the Norton Sound subsistence king crab fishery, which has both a summer and winter harvest. Residents utilize red king crab for subsistence mainly in the winter. During the 2017-2018 winter crab season, 123 permits were issued, and the 82 permit holders that actually fished harvested 4,424 crab, down from 6,039 crab retained in 2016-2017 (Menard et al. 2020). During the 2018 summer crab season, 32 permits were issued, and the 14 permit holders that set pots reported harvesting 673 crab, down from 1,777 crab harvested in 2017 (Menard et al. 2020).

5.4.6 Recreation and Tourism

There are few recreation or tourism activities within the CH boundaries due to the presence of ice and overall hazardous conditions in these Arctic waters. Even when the area is ice-free during warmer months, navigation can be treacherous due to powerful tidal currents and weather events. There are, however, several companies (including Heritage Expeditions, Zegrahm Expeditions, and Hapag-Lloyd) that offer tourist cruises during summer months through the CH. Cruise offerings in expedition vessels include trips from Nome south along the Alaskan coastline, as well as trips in and out of Nome to Russian waters. Recently, cruise ships have been venturing farther north as well. Until recently, there was too much ice for cruise ships to navigate the Northwest Passage, but with sea ice receding there is greater opportunity for such voyages. For example, one tour company offers a voyage from Nome through the Northwest Passage along the Beaufort Sea coastline, continuing on to eventually reach Iceland (Hapag Lloyd Cruises 2020). These cruises are marketed partly based on the opportunity to view marine mammal wildlife, including ice seals, polar bear, sea otter, Steller sea lions, walrus, whales, and dolphins (Sloan 2018). Bird-watching, particularly in the Bering Sea, is also a key attraction (Abercrombie and Kent 2020). Tourism in the Arctic is expanding rapidly. In 2004, an estimated 1.2 million vessel passengers visited the Arctic; by 2007 this number had doubled (Alaska Northern Waters Task Force 2012).

There are also tourism activities in coastal communities bordering CH waters, particularly in Kotzebue, Nome, and Utqiaġvik. For example, Nome attracts visitors with its wildlife, scenery, and Native cultural

history.[35] Visitors are also attracted to events in the area such as the Iditarod and the Midnight Sun Festival (Alaska.Org 2020). In Kotzebue, favorite recreational activities include hunting and fishing that peak during August and September (U.S. Fish and Wildlife Service 2013). Tour companies charter flights to visit these communities and offer tourists the opportunity to learn about native culture and life in the Arctic, as well as experience the natural wonders of the region, including wildlife. One key cultural attraction in Kotzebue is the Northwest Arctic Heritage Center, run by the National Park Service in conjunction with the Noatak National Preserve. The Noatak River "features some of the Arctic's finest arrays of plants and animals" and also provides world class float-trip opportunities from the Brooks Range to the Chukchi Sea (National Park Service 2020).

Tourists as well as residents participate in bird-watching and fishing in coastal and inland areas near these communities. Birders are drawn to the region in the spring, summer, and fall months to view migratory species (ADF&G 2021), while anglers fish in the region's rivers for such species as Arctic grayling, salmon, Dolly Varden, Arctic char, least cisco, Northern Pike, burbot, and various types of whitefish (ADF&G 2006). Due to the short summer tourist season and relatively expensive cost (in the range of $700 to $800 for a one-day excursion from Anchorage) (Northern Alaska Tour Company 2020), tourism visits to these communities are fairly limited.

It is not expected that recreation and tourism activities would have a Federal nexus triggering consultation under the ESA.

5.4.7 Commercial Shipping and Marine Transportation

Marine vessels transiting Arctic ringed seal CH include oil and gas tankers, container ships, cargo ships, cruise ships, fishing vessels, research vessels, and icebreakers. Commercial shipping activity occurs mainly in the summer months when sea ice is at a minimum. Arctic vessel traffic is classified as destinational (vessels traveling within the region) or non-destinational (vessels using the Arctic area as a passageway between the Atlantic and Pacific Oceans using either the Northern Sea Route or the Northwest Passage). Destinational vessels include cargo ships and barges providing supplies to Arctic communities.

Most Arctic marine traffic is destinational, shipping supplies to the region and exporting minerals out of the region. Nearly all cruise ships passenger vessel traffic within CH occurs in the ice-free waters in the summer season, mostly along the North American continent, south of the Bering Strait or within the Canadian Arctic Archipelago. However, cruise ship and other vessel traffic north of the Bering Strait is also expanding. For example, Automatic Identification System data indicate that the number of unique vessels operating annually in U.S. waters north of the Bering Sea in 2015 to 2017 increased 128 percent over the number recorded in 2008 (U.S. Committee on the Marine Transportation System 2019).

The two major shipping routes through Arctic ringed seal CH are the Northwest Passage and the Northern Sea Route. The Northwest Passage runs parallel to the Alaskan Coast cutting through the Bering Strait, then up through the Canadian Arctic Archipelago. The Northern Sea Route runs parallel to the Russian Coast through the Bering Strait and into the Bering Sea.

Currently there is little activity by ice breakers and research vessels in the Arctic. Russian and Canadian icebreakers are used along the Northern Sea Route and within the Canadian Arctic Archipelago to clear shipping passageways. The U.S. currently does not engage in icebreaking activities for commercial or navigational purposes outside of emergency response activities carried out by the USCG (Committee on the Assessment of USCG Polar Icebreaker Roles and Future Needs 2013). There are no current U.S. or Alaska regulations on icebreaking activities. Such activities may increase with increases in shipping and marine transport in the area if an alternative trade route connecting the Atlantic and Pacific oceans becomes economically and operationally viable (USCG 2020c). Numerous studies indicate that the Arctic

[35] Belleville, Richard. Nome Discovery Tours. Personal communication with Elizabeth Harrison, Staff Economist, Cardno ENTRIX. March 25, 2013.

Ocean is moving toward an ice-diminished condition, particularly a reduction of thick, unmoving, multi-year ice, resulting in greater maritime access to and through the region, longer navigable seasons, and generally less difficult ice conditions for marine operations. While the expected ice would be less thick than the multi-year ice, increased ice mobility may increase hazards for ships operating in the region(ABS Consulting et al. 2010).

There is potential for highly increased shipping activity if changes in sea ice patterns open new shipping lanes and allow for a longer navigable season. Increased marine traffic directly over the pole is possible via the theoretical Trans-Arctic Shipping Route. A number of future polar shipping scenarios are presented in the 2009 Arctic Marine Shipping Assessment (AMSA), including the "Arctic Race" and "Arctic Saga" scenarios (Arctic Council 2009). In both scenarios there is high demand for trade and Arctic resources. However, in an "Arctic Race" scenario this demand results in ad-hoc, un-mitigated rush for Arctic wealth and resources, while in an "Arctic Saga" scenario there is a healthy rate of development, including rules-based concern for preservation of Arctic ecosystems and culture. A "Polar Lows" scenario results from low demand and unstable governance, with an under-developed future for the Arctic. A "Polar Preserve" scenario results from low demand for resource and trade, but with stable governance and slow development in the region with an extensive eco-preserve program and stringent "no-shipping zones."

Major uncertainties identified by AMSA for these scenarios include the legal climate, global trade dynamics, rate of sea ice change, safety of new routes, oil prices, global agreements on construction rules and standards, shipping technology, escalation of maritime disputes, shift to nuclear energy, new resource discoveries, potential loss of the Suez or Panama canals, and the maritime insurance industry engagement, among others. The 2009 AMSA makes the following predictions:

- Bering Strait will become a chokepoint for marine traffic in and out of the Arctic Ocean from the Pacific Ocean,
- New Arctic resource discoveries are highly probably and most new explorations and developments will require marine transport and increased operational support,
- Longer seasons of navigation will have significant implications for multiple uses in regional Arctic waterways, and
- New Arctic ship technologies will set a norm for more independently operated, icebreaking commercial ships.

AMSA notes that there are few aids to navigation in the U.S. Arctic and no vessel routing measures in the Bering Strait. In response to the potential for increased vessel traffic in U.S. Arctic waters in the future, the USCG completed a Port Access Route Study (PARS) to evaluate the need for new vessel routing measures in the Bering Strait (75 Fed. Reg. 68568, November 8, 2010; 79 Fed. Reg. 72157, December 5, 2014). Subsequently, in 2017 the United States and the Russian Federation submitted a proposal to the International Maritime Organization (IMO) to establish voluntary two-way routes and precautionary areas to be avoided around ecologically sensitive island groups in the Bering Sea and Bering Strait. The IMO approved these measures in 2018 (Rosen 2018). A primary purpose of all PARSs is to "reconcile the need for safe access routes with other reasonable waterway uses, such as renewable energy sites" (USCG 2020b). The USCG is currently conducting a PARS focused on the U.S. Arctic Coast to evaluate the need for establishing a vessel routing system for this region (83 Fed. Reg. 65701; December 21, 2018).

Section 7 of the ESA does not apply generically to vessel movement or activity. Should the continuing increase in vessel traffic lead to rulemaking by the USCG or other Federal agencies on shipping and marine transportation activities by U.S. vessels within Arctic ringed seal CH, these rulemakings may require consultation.

5.4.8 Military Activities

Alaska is home to a number of military operations, including those of the U.S. Air Force, USCG, and U.S. Navy, that conduct operations within or in areas adjacent to Arctic ringed seal CH. These Arctic operations are conducted in the context of the security interests in the region, including missile defense and early-warning systems, deployment of sea vessels and aircraft for strategic deterrence, maritime presence, security operations, and navigation support (O'Rourke et al. 2021). Military activity in the Arctic has increased in recent years (NMFS 2016) due to growing commercial importance, international competition, and possible strategic challenges. Activities within or near Arctic ringed seal CH include military vessel traffic (marine, submarine, and aircraft), sonar, radar, icebreaking, and training exercises (NMFS 2016).

This section summarizes the types and, where possible, locations of military activities within or in areas adjacent to Arctic ringed seal CH.

5.4.8.1 Air Force

The U.S. Air Force has several facilities and conducts activities along the coasts of the Beaufort and Chukchi Seas. The Distant Early Warning Radar Line, a system of 63 radar stations constructed between 1954 and 1957, was decommissioned during the 1990s. However, the Barter Island, Cape Lisburne, Cape Newenham, and Cape Romanzof radar sites, located shoreward of the area being considered as CH for Arctic ringed seals remain active, with annual resupply operations supported by barge traffic, primarily during summer.[36] In addition, the Air Force conducts sampling and monitoring at the active, as well as inactive sites, and carries out containment or debris removal actions at these sites. Other Air Force activities within the CH include military aircraft training exercises, aircraft traffic over open water, and radar surveillance of Arctic airspace.

5.4.8.2 Coast Guard and Navy

The U.S. Navy's primary mission is to maintain, train, equip, and operate combat-ready naval forces capable of "accomplishing American strategic objectives, deterring maritime aggression, and assuring freedom of navigation in ocean areas" (84 Fed. Reg. 7186; March 1, 2019). Naval operations in the Arctic are primarily limited to submarine operations conducted at various locations within Arctic waters. Submarine activity includes vessel traffic and sonar activity. The Navy also conducts ice exercises (ICEXs) on top of and below the ice; accompanying camps are typically built in the Beaufort Sea 150 to 200 nm north of Prudhoe Bay, Alaska. ICEXs typically last 30 to 45 days. In addition, the Navy expects to work collaboratively on research and testing activities in the Arctic to better understand oceanographic conditions.[37] Navy activities are ongoing and expected to increase in the future (Navy Task Force Climate Change 2014).

USCG operations and activities within Arctic ringed seal CH are primarily responsive actions to safety, environmental, or national security threats, including those related to search and rescue, ice patrolling, homeland security response, pollution incident investigation and response, and monitoring of tanker and shipping transit. Currently, the USCG has very limited Arctic emergency response capabilities to support its mission in the Arctic, and no permanent bases on the ANS. In response to increased Arctic vessel traffic, in July of 2012 the USCG established a summer Arctic base in Utqiaġvik (active through October) (Medred 2012). This base enabled the USCG to better respond and assist mariners in distress in areas off of the north coast of Alaska during the ice-free summer months. Since 2016, the USCG has used Kotzebue as its base of summer operations. (Rosen 2019). The recommendations by the Alaska State

[36] Information submitted to NMFS by the U.S. Air Force by letter dated April 30, 2010, regarding national security considerations for Arctic ringed seal critical habitat, "National Security Impacts Associated with Critical Habitat Designation for Arctic Ringed Seals and Beringia Bearded seals.".

[37] Comments received by NMFS from the U.S. Navy on the 2014 Arctic ringed seal proposed critical habitat, "U.S. Navy Comments on Proposed Critical Habitat for the Arctic Subspecies of Ringed Seal NOAA-NMFS-2013-0114", dated March 30, 2015.

Legislature's Alaskan Northern Waters Task Force include establishment of a permanent Arctic base, and funding of icebreakers and other ice-capable vessels (Alaska Northern Waters Task Force 2012).

The USCG also occasionally conducts ice breaking activities in the Arctic. The USCG Cutters *Healy*, and *Polar Star*, based in Seattle, are the U.S.'s only active polar icebreakers (ice breaker *Polar Sea* is nonoperational) (O'Rourke 2020). Demand for icebreaking activity in the Arctic is limited, but expected to increase as future needs arise (NMFS 2016). The *Healy,* which entered service in 2000, has only medium icebreaking capability and is used primarily to support scientific research. In April 2019, the USCG awarded a contract to build a heavy icebreaker to be delivered in 2024 (Schreiber 2019).

Due to its currently limited icebreaking abilities, the USCG may seek assistance from polar icebreakers operated either commercially or by other countries. With potential increases in commercial activity in the Arctic region due to climate change, the demand for USCG regulatory and support services would likely also increase. Primary drivers for future activity are oil and gas exploration and recovery, and increased shipping between the Atlantic and Pacific oceans (on potential new shipping routes made feasible by reduced sea ice) and within the Arctic Basin (ABS Consulting et al. 2010).

For the USCG to continue to meet its mission objectives, USCG operation of polar icebreakers is likely going to become essential. Thus, reduced sea ice associated with global warming is likely to actually increase the frequency and geographic range of ice breaking activities.

As established by the Ports and Waterways Safety Act (Pub. L. 95-474, October 17, 1978; 33 U.S.C. 1223), the USCG is responsible for "designation of fairways and traffic separation schemes to provide safe access routes for vessels proceeding to and from ports. In fulfilling this responsibility, as noted above in **Section 5.4.8**, the USCG is currently conducting a PARS focused on the U.S. Arctic Coast to evaluate the need for establishing a vessel routing system.

Although potentially mitigated to some extent by vessel routing measures, increased shipping activity could lead to more oil spills in the waters of the CH. Oil spill response is regulated by the OPA of 1990. OPA addresses the prevention, response, and payment of oil pollution incidents in navigable waters of the U.S. Alaska Statute 46.04 also requires the ADEC to develop a statewide response plan and individual response plans for ten geographic subareas spanning the State (USCG 2020a). Federal, State, and local entity response to discharge of oil and other hazardous substances is governed by the Alaska Regional Contingency Plan, along with four Area Contingency Plans. The plans are reviewed annually and revised as necessary. Version 1 of the Alaska Regional Contingency Plan, which superseded the Alaska Federal State Preparedness Plan for Responding to Oil and Hazardous Substance Discharges/Releases (Unified Plan), was issued in 2018. The Arctic and Western Alaska Area Contingency Plan was most recently revised in 2019 (Alaska Regional Response Team 2018).

5.4.9 Educational, Scientific, Non-Consumptive Use of Arctic Ringed Seal and its Habitat

This section discusses recent scientific and educational efforts associated with Arctic ringed seal habitat conservation. Such efforts are fairly limited, likely due to the fact that Arctic ringed seal habitat is located in a remote and challenging environment. However, a group, formed through a partnership of NMFS, the ISC (an Alaska Native Organization), and ADF&G, meets and discusses research and management related to subsistence harvest and conservation of ice seals.

5.4.9.1 State and Local Efforts

The ADF&G has been conducting research on the Arctic ringed seal since the 1960s (ADF&G 2020i). State research projects, conducted in collaboration with NMFS and the ISC, and in cooperation with local communities, include the following activities:

- Biosampling the subsistence harvest to monitor ringed seal population health.
  ADF&G is currently collecting tissues and measurements from harvested ringed seals in collaboration

with 8 villages: Utqiaġvik, Point Hope, Shishmaref, Diomede, Nome, Gambell, Savoonga, and Hooper Bay.

- Satellite telemetry to study movement, habitat use, and behavior of Arctic ringed seals.
  Satellite tracking efforts are focused on working with seal hunters in multiple villages to capture seals and outfit them with satellite transmitters (ADF&G 2020g).
- Harvest monitoring to document subsistence needs.
  ADF&G is working with ISC, Bristol Bay Native Association, Association of Village Council Presidents, and Maniilaq to collect ice seal harvest information in interested communities (ADF&G 2020f).
- Surveys of local knowledge.
  ADF&G conducts surveys to document what hunters know about marine mammals and sea ice and compiles this information in reports.

ADF&G also publishes educational materials on the Arctic ringed seal, including information on their biology, and their subsistence and cultural importance (ADF&G 2008).

The North Slope Borough's Department of Wildlife Management also conducts research to further understand movements, habitat use, and foraging behavior of ringed seals, and to document subsistence harvest (including of ringed seals) (North Slope Borough 2020).

5.4.9.2 Federal Research

The Polar Ecosystems Program of NMFS's Marine Mammal Laboratory conducts research and monitoring on ice seals, including Arctic ringed seals, and harbor seals of the coast of Alaska. The primary purpose of the program is to support management and assessment of marine mammal population status under the MMPA, and to better understand factors affecting marine mammal populations and their ecological roles in the Arctic.

5.5 Summary and Projected Number of Future Actions that May Affect Arctic Ringed Seal Critical Habitat

To produce a reasonable estimate of future Federal actions that may require Section 7 consultation to address effects on Arctic ringed seal CH, NMFS' record of consultations over the last 10 years was reviewed to identify Federal activities that occurred within or in areas adjacent to the specific area being considered for designation as Arctic ringed seal CH and that, if implemented in the future, could affect one or more of the identified essential features (or both the CH and Arctic ringed seals). Relatively few relevant consultations were identified for the 3 years prior to when the Arctic ringed seal was listed as threatened in December 2012. Given this, this analysis estimates the number of consultations over the next 10 years (2021-2030) based primarily on the average annual consultation rate for each activity type between 2013 and 2019.[38] Consultations for a few potential activities were also included based on preliminary information indicating they could affect Arctic ringed seal CH within the next 10 years. Specifically, this analysis assumes one formal consultation with BLM on the NPR-A Integrated Activity Plan, two formal consultations with the USACE on port construction projects (Crowley fuel dock and Port of Nome navigational improvements), and one programmatic consultation with the USCG on its ice breaker program. In addition, the number of consultations that may require re-initiation to address Arctic ringed seal CH was estimated by activity type based on the timeframe, location, and potential effects of the actions addressed in the existing consultations.

Based on the information discussed above, **Table 5-16** presents a summary of the estimated number of consultations by activity type expected to consider Arctic ringed seal CH over the next 10 years. NMFS determined that all of the future consultations identified in **Table 5-16** would be expected to address

[38] Although the listing of Arctic ringed seals as threatened was vacated in March 2016 and was subsequently reinstated in May 2018 due to litigation, NMFS continued to consider effects on these seals in consultations during the period in which the listings were vacated.

effects on both Arctic ringed seals and the species' CH, and as such, administrative costs would be limited to the additional effort required to consider CH in those consultations.

Table 5-16 Estimates of Future Section 7 Consultations by Activity Type Expected to Consider Arctic Ringed Seal Critical Habitat Within the 10-Year Period of Analysis (2021-2030).

Activity	Status	Location	Sources of Potential Effects on Ringed Seal CH	Future Section 7 Consultations	Total Number of Future Consultations			
					Formal		Informal	
					New	Re-init.	New	Re-init.
Oil and Gas								
Onshore Oil	Four producing units (Prudhoe, Badami, Milne, and Point Thomson) and two units in development located onshore with leases that include State waters of the Beaufort Sea (Oooguruk and Pikka).	Adjacent to Beaufort Sea waters.	Oil and other hazardous material spills; vessel discharges. Ice road and ice pad construction and maintenance. Habitat alteration from footprint of new in-water structures. Water quality and other impacts of dredging associated with vessel landings/docks. Noise from seismic surveys, construction, development and production activities, and associated maritime and aircraft traffic.	Seismic or other geophysical surveys (including on-ice); and oil development and production –1 formal consultation and 9 informal consultations; and re-initiation of 1 formal programmatic consultation (ANWR 1002 leasing) and 1 informal consultation (Nanushuk project) to address ringed seal CH. NPR-A Integrated Activity Plan – 1 formal consultation. Action Agency: BLM, NMFS, USACE, USCG (spill drills)	2	1 Progr.	9	1
Offshore Oil, Beaufort and Chukchi seas	Beaufort Sea: Three producing units offshore in State waters. One producing unit in both State and Federal waters. One unit under development in Federal waters. One active exploration plan in Federal OCS region. All current production and development within Federal waters is located in the Beaufort Sea. Exploration is also occurring in the Beaufort Sea. BOEM lease sale schedule under the draft 5-year OCS proposed program for 2019-2024 lists potential sales in	Beaufort Sea: All current production and development is located in the Beaufort Sea; exploration and production is occurring in the Beaufort Sea. Chukchi Sea: No exploration or production is currently occurring in the Chukchi Sea.	Oil and other hazardous material spills; vessel discharges. Construction and maintenance of ice roads, ice pads, and ice airstrips. Physical alteration of sea ice by ice-breaking or other through-ice activities. Habitat alteration from new in-water structures and artificial islands. Noise from seismic surveys, through-ice activities, in-water construction, drilling, and	Seismic and other geophysical surveys; and oil development and production, including operation of artificial islands – 21 formal consultations and 3 informal consultations; and re-initiation of 3 formal consultations (Hilcorp Liberty development plan authorization and associated ITR, ENI/Hilcorp ice roads ITR, Northstar ITR) to address ringed seal CH.	21 +1 Progr.	3 +1 Progr.	3	0

Activity	Status	Location	Sources of Potential Effects on Ringed Seal CH	Future Section 7 Consultations	Total Number of Future Consultations			
					Formal		Informal	
					New	Re-init.	New	Re-init.
	2019, 2021, and 2023). The proposed program has been affected by a 2019 court decision (see **Section 5.4.1.2**). Chukchi Sea: No current exploration or production occurring. BOEM lease sale schedule under the draft 5-year OCS proposed program for 2019-2024 lists potential sales in 2020, 2022, and 2024). The proposed program has been affected by a 2019 court decision (see **Section 5.4.1.2**).		production, and associated maritime and aircraft traffic.	OCS oil and gas leasing and exploration program, Beaufort and Chukchi Seas – 1 programmatic consultation; and 1 re-initiation of formal programmatic consultation to address ringed seal CH. Action Agency: NMFS, BOEM, BSEE (others may include USACE, EPA, and possibly FERC for pipelines, but these may be co-action agencies under shared consultations)				
Natural Gas	No current commercial production. Potential development and distribution from Beaufort Sea, only after a natural gas pipeline is built. In 2020, FERC released a final Environmental Impact Statement for the Alaska LNG project proposed by the Alaska Gasline Development Corporation. A key component of the project facilities would be modification of the West Dock causeway.	Beaufort Sea and nearshore areas.	Oil and other hazardous material spills; vessel discharges. Water quality and other marine habitat alterations from subsea screeding. Noise from in-water construction and project-associated maritime and aircraft traffic	Three informal consultations; and re-initiation of 1 formal programmatic consultation (AK LNG project) to address ringed seal CH. Action Agency: EPA, FERC, USACE, (some may be cooperating agencies).	0	1 Prog.	3	0
Mining								

Activity	Status	Location	Sources of Potential Effects on Ringed Seal CH	Future Section 7 Consultations	Total Number of Future Consultations			
					Formal		Informal	
					New	Re-init.	New	Re-init.
Nome Offshore Dredging	Recreational and commercial offshore suction dredging in State waters within the 3 mile boundary.	Norton Basin.	Through-ice dredging, associated vehicle traffic and physical alteration of sea ice. Noise, water quality impacts, and other marine habitat alterations from suction dredging operations.	None anticipated.	0	0	0	0
Commercial Fisheries								
	Mostly State fisheries, although some Federal Fisheries and State-Federal parallel fisheries do occur (halibut and crab).	Federal fisheries currently present in northern Bering Sea portion of the potential CH.	Removal of ringed seal prey biomass. Modification of benthic habitat by bottom-trawl gear. Oil or other hazardous material spills; wastewater and other vessel discharges.	Federal fisheries management – 1 formal consultation and 1 informal consultation; and re-initiation of 1 formal consultation (Bering Sea/Aleutian Islands groundfish fisheries) to address ringed seal CH. Action Agency: NMFS	1	1	1	0
Commercial Shipping and Marine Transportation								
	Vessels traversing CH waters during ice-free summer months include oil and gas tankers, cargo ships, research vessels, fishing vessels, and cruise ships. The number of marine vessels traversing CH is projected to increase with diminishing future sea ice.	Two major sea shipping lanes are currently utilized during ice free summer months (and, to a lesser extent, fall and spring months): Northwest Passage (runs along Alaska Coast through the Bering Strait up to the Canadian Arctic Archipelago), and Northern Sea Route (runs along the Russian Coat through the Bering Strait and into the Bering Sea).	Oil or other hazardous material spills; wastewater and other vessel discharges; vessel noise; and ice-breaking activities.	None anticipated.	0	0	0	0

Activity	Status	Location	Sources of Potential Effects on Ringed Seal CH	Future Section 7 Consultations	Total Number of Future Consultations			
					Formal		Informal	
					New	Re-init.	New	Re-init.
Ports and Coastal Construction								
Ports and Harbors	An integrated feasibility report and environmental assessment of proposed navigational improvements at the Port of Nome was completed in 2020. The recommended plan would include creating a new deep water basin and modifying the existing outer basin (harbor) to make the basin larger, and with a wider entrance channel.	Vicinity of coastal communities in the northern Bering, Chukchi, and Beaufort Seas.	Oil or other hazardous material spills; wastewater and/or other discharges from vessels or land equipment. Noise from in-water construction, dredging, and associated vessels. Water quality and other marine habitat alterations from dredging.	Port of Nome proposed navigational improvements – 1 formal consultation. Other port/harbor projects – 1 formal consultation (Crowley fuel dock, Kotzebue Sound) and 4 informal consultations. Action Agency: NMFS, USACE	2	0	4	0
Other Coastal Construction	Infrastructure construction, maintenance, and improvements associated with coastal communities in areas adjacent to CH may involve Federal funding and/or permitting/authorization. Examples include coastal village airport replacement/relocation projects and subsea cable-laying.	Primarily within the vicinity of coastal communities of the northern Bering, Chukchi, and Beaufort Seas.	Oil or other hazardous material spills; wastewater and/or other discharges from vessels or land equipment. Noise from in-water construction and associated vessels.	Three formal consultations and six informal consultations. Action Agency: FAA, FHWA/ADOT, USACE	3	0	6	0
Subsistence								
	Subsistence hunting and fishing in CH and adjacent areas, primarily by Alaska Natives, includes caribou, moose, and numerous species of fish and shellfish. Subsistence hunting in CH by Alaska Natives also includes marine mammals, such as ringed and bearded seals. Subsistence hunting and fishing is managed by Federal and State entities; harvest of marine mammals is co-managed by Federal entities and Alaska Native organizations.	Coastal areas of the northern Bering, Chukchi, and Beaufort Seas.	Effects on CH are not expected.	None anticipated.	0	0	0	0

Activity	Status	Location	Sources of Potential Effects on Ringed Seal CH	Future Section 7 Consultations	Total Number of Future Consultations			
					Formal		Informal	
					New	Re-init.	New	Re-init.
Military								
	Military training, safety, law enforcement, and icebreaking activities in CH involve vessel (marine, submarine) and aircraft traffic. These activities are expected to increase with diminishing future sea ice.	Bering, Chukchi, and Beaufort Seas.	Oil or other hazardous material spills; and wastewater and other vessel discharges. Ice roads/runways, on-ice structures, and ice breaking or other through-ice activities. Noise from vessels and ice-breaking activities.	USCG icebreaker program – 1 formal programmatic consultation. U.S. Navy and USCG Arctic training and testing activities – 3 formal consultations and 11 informal consultations; and re-initiation of 1 informal consultation (USCG Arctic Shield operations) to address ringed seal CH. Alaska Regional Contingency Plan – Re-initiation of 1 formal programmatic consultation to address ringed seal CH. Action Agency: NMFS, USCG; U.S. Navy	3 +1 Progr.	1 Progr.	11	1
Scientific Research								
	Scientific research activities are generally managed to avoid affecting listed species or their habitats; however, some scientific research, e.g., research involving the removal of ringed seal prey species, may affect designated CH.	Bering, Chukchi, and Beaufort Seas.	Noise from vessels and seismic surveys. Removal of ringed seal prey biomass. Modification of benthic habitat by bottom-trawl gear or other bottom-sampling. Oil or other hazardous material spills; wastewater and other vessel discharges.	AK Fisheries Science Center fisheries and ecosystem research – 1 programmatic formal consultation; and re-initiation of 1 formal programmatic consultation to address ringed seal CH. Other research – I informal consultation. Action Agency: NMFS	1 Progr.	1 Prog.	1	0

Table 5-17 Section 7 Consultation History for Relevant Consultations by Activity Type and Year.

Activity Type	2013			2014			2015			2016			2017			2018			2019		
	I	F	P	I	F	P	I	F	P	I	F	P	I	F	P	I	F	P	I	F	P
Oil and Gas	1	2	1	2	4	0	1	5	0	0	1	0	0	0	0	3	1	0	3	3	0
Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial Fisheries	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Shipping/Marine Transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ports/Coastal Construction	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	5	0	0
Military	0	0	0	1	0	0	3	0	0	1	0	0	1	0	0	1	1	0	1	1	0
Subsistence	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Research	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

Notes: I – informal consultation, F – formal consultation; P – programmatic consultation.

6 Incremental Economic Impacts of Arctic Ringed Seal Critical Habitat Designation

This section provides a discussion of the expected incremental economic impacts of the Arctic ringed seal CHD to the various sectors and projects outlined in **Section 5.4**. These expected impacts primarily stem from the administrative costs associated with consideration of the CH as part of future Section 7 consultations,[39] which are summarized in the last column of **Table 5-16**. All monetized costs summarized in this section are expressed in 2021 dollars.

NMFS projections of such future consultations are based on the best available data on historical activity and permitting, planned projects, and projections of future activity within each sector. However, there is uncertainty regarding the number of future consultations. There is also uncertainty regarding whether a consultation will result in incremental project modifications due to CHD that would be above and beyond any such restrictions that would be imposed to avoid jeopardy to the species. In addition, third party costs identified in this section may in some cases be borne by the Federal agency, a private third party (applicant/project proponent), or a combination of these parties.

As discussed in **Section 2.3.2** and **Section 3**, the direct costs of Section 7 consultations may include both administrative costs and project modifications. NMFS determined that all of the future consultations identified in **Table 5-16** would be expected to address effects on both Arctic ringed seals and the species' CH. Although potential project modifications resulting from future consultations must be reviewed on a case-by-case basis, based on the best scientific and commercial data available and NMFS' assessment of the record of Section 7 consultations for 2013 to 2019 on activities that may affect the essential features of the CH (relatively few relevant consultations were identified for the 3 years prior to when the Arctic ringed seal was listed under the ESA), as well as available information on planned activities, NMFS has not identified any likely incremental economic impacts associated with project modifications that would be required solely to avoid impacts to CH. The CHD is not likely to result in more requested project modifications because Section 7 consultations on potential effects to Arctic ringed seals and incidental take authorizations for Arctic activities under section 101(a) of the MMPA both typically address habitat-associated effects to the seals even in the absence of a CHD. This is not to say such project modifications could not occur in situations NMFS is unable to predict at this time, but based on the best information available, it is likely that any project modifications necessary to avoid impacts to Arctic ringed seal CH would also be necessary to avoid impacts to the species in section 7 consultations that would occur irrespective of the CHD. The expected costs of Section 7 consultations over the 10-year period of analysis are therefore limited to the additional administrative costs of considering Arctic ringed seal CH in future consultations involving Arctic ringed seals.

The Arctic region is undergoing rapid habitat modification due to climate change. As sea ice cover diminishes, there is potential for a greater diversity and level of activity within and in areas adjacent to the CH area, including increased oil and gas exploration, development, and production; commercial fishing; recreation/tourism; shipping; and military activity. This potential long-term increase in economic activity is beyond the 10-year temporal scope of this analysis. However, as discussed below, increased economic activity may increase both the frequency and the types of actions that are subject to Section 7 consultations regarding potential effects on Arctic ringed seal CH, with potentially greater future costs associated with CHD.

[39] In addition to costs arising from Section 7 consultations, indirect costs may also arise that are not associated with a consultation.

6.1 Oil and Gas Exploration, Development, and Production

One of the primary economic activities within and in areas adjacent to Arctic ringed seal CH is oil and gas exploration, development, and production. The oil and gas industry has been active in onshore areas adjacent to the CH since the 1960s. However, offshore production is currently limited to nearshore waters of the Beaufort Sea. Exploration and potential future development activities are ongoing within and in areas adjacent to the CH. **Section 5.4.1** describes oil and gas activities in more detail.

6.1.1 Potential Costs to Oil and Gas

The oil and gas sector faces *potential* additional administrative costs to address Arctic ringed seal CH in Section 7 consultations. NMFS estimates that one **programmatic** consultation, three **re-initiations of programmatic** consultations, 23 ***formal*** consultations, three ***re-initiations of formal*** consultations, 15 ***informal*** consultations, and one ***re-initiation of informal*** consultation on oil and gas activities may occur over the next 10 years. These include consultations on seismic and other geophysical surveys, oil and gas leasing and exploration, oil development and production, including operation of artificial islands, and natural gas project activities (see **Table 5-16**).

> Formal consultations

- *2 for seismic or other geophysical surveys associated with onshore exploration and development*
- *21 for seismic and other geophysical surveys associated with offshore exploration and development*
- *3 re-initiations of formal consultations (Hilcorp Liberty development plan authorization and associated ITR; ENI/Hilcorp ice roads ITR; Northstar ITR)*

> Programmatic consultations

- *1 for the OCS oil and gas leasing and exploration program*
- *3 re-initiations of programmatic consultations (ANWR 1002 leasing, OCS oil and gas leasing and exploration program; Alaska LNG project)*

> Informal consultations

- *8 for activities occurring in the NPR-A and in the three actively producing onshore units with leases entering State waters of the Beaufort Sea*
- *4 for minor activities associated with offshore oil and gas exploration and development activities*
- *3 for minor activities associated with the Alaska LNG project*
- *1 re-initiation of informal consultation (Nanushuk project)*

As discussed above, although potential project modifications resulting from future consultations must be reviewed on a case-by-case basis, NMFS does not expect that CHD will result in *incremental* project modifications for oil and gas activities (i.e., NMFS does not anticipate additional project modifications to oil and gas activities above and beyond any that would be required because of the Arctic ringed seal's listing status and the jeopardy standard). In assessing costs associated with oil gas activities, a conservative approach was taken by estimating that future formal and informal consultations addressing these activities would be more complex than for other activities, and would therefore incur higher third-party (i.e., applicant/permittee) incremental administrative costs per consultation to consider effects to Arctic ringed seal CH. These higher third-party costs may not be realized in all cases because the administrative effort required for a specific consultation depends on factors such as the location, timing, nature, and scope of the potential effects of the proposed action on the essential features.

The total incremental administrative costs associated with the projected consultations, in undiscounted dollars, are estimated to be $784,000 of which $242,000 (31 percent) will be borne by Federal agencies and the remainder will be borne by the oil and gas sector.

6.2 Mining

Commercial mining within the CH is, at present, limited to offshore gold dredging in waters adjacent to Nome, Alaska. A USACE permit is required for suction dredge operations in marine waters deeper than 20 feet (ADNR 2014; ADNR, Division of Mining, Land, and Water 2020a).

6.2.1 Potential Costs to Mining

Based on review of prior consultations, NMFS does not anticipate consultations on these activities within the next 10 years would include the CH, so there are no expected costs to mining attributable to the CHD.

6.3 Ports and Coastal Construction

Primary port facilities serving summer vessel traffic within the Arctic ringed seal CH include the Port of Nome (medium-draft port), the Port of Kotzebue (shallow-draft port), and the Delong Mountain Terminal Port (shallow-draft port). There are also numerous docks located within or in areas adjacent to the CH servicing barges and small vessels, including at Prudhoe Bay and Utqiaġvik. Because of the locations of maintenance or construction projects involving coastal structures such as docks or seawalls, anticipated consultations were identified for such activities only in cases where consultation records indicate they may affect the CH (*e.g.*, some projects requiring vessel support).

In March 2020, the USACE released an *Integrated Feasibility Report and Final Environmental Assessment* for its Port of Nome Modification Feasibility Study that identifies a recommended plan to improve navigation access by creating a new deep water basin and modifying the existing outer basin (harbor) to make the basin larger, and with a wider entrance channel (USACE 2020). Funding is not yet in place for this project, but potentially could be within the next 10 years. Residential and commercial construction, maintenance, and improvements associated with coastal communities, such as airport improvement projects and construction of sea walls or bulkheads to mitigate coastal erosion, may occur in areas adjacent to Arctic ringed seal CH. In addition, activities such as cable-laying may occur within the CH.

6.3.1 Potential Costs to the Ports and Coastal Construction Sector

Over the next 10 years, one ***formal*** consultation is projected for the proposed navigational improvements at the Port of Nome. A ***formal*** consultation is also projected for a dock improvement project near Kotzebue, although this work may be completed prior to the designation of Arctic ringed seal CH, in which case re-initiation of the consultation would be expected instead. In addition, four ***informal*** consultations on other activities associated with ports and harbors are projected over the next 10 years.

NMFS also estimates that three ***formal*** consultations and six ***informal*** consultations on coastal construction, maintenance, or improvement activities associated with coastal communities (and that have a Federal nexus) could occur within this timeframe.

The total incremental administrative costs of consultations for ports and coastal construction, in undiscounted dollars, are estimated to be $52,300, of which $47,900 will be borne by the government and $4,400 by third-party participants.

6.4 Commercial Fisheries

Commercial fishing within the Arctic ringed seal CH is currently limited to the Bering Sea. (Under the Arctic FMP, no commercial fisheries will be authorized in the Beaufort and Chukchi Seas in the Arctic Management Area until sufficient information is available to support the sustainable management of a commercial fishery.) Halibut fishing, which is managed by NMFS under terms of the IPHC, occurs in Federal waters throughout the Bering Sea portion of the CH. Federal waters salmon and crab commercial fisheries management is deferred to ADF&G, with Federal oversight. Catch data indicate that

commercial salmon catch within CH is primarily, if not exclusively, from State waters in Norton and Kotzebue sounds. There is also an important crab fishery in Norton Sound. Some groundfish and halibut fishing has taken place in northerly regions of the Bering Sea, and expectations are that fishing activity within CH may expand in the future, if climate change results in commercially important fish stocks moving northward.

6.4.1 Potential Costs to Commercial Fisheries

NMFS estimates that over the next 10 years, one ***formal*** consultation and one ***re-initiation of formal*** consultation on the Bering Sea/Aleutian Islands groundfish fisheries could occur. One ***informal*** consultation on commercial fisheries activities is also projected for this timeframe. With continued sea ice diminishment, and the potential for commercially important fish species to move into more northern waters, interest in commercial fisheries north of the Bering Strait has increased. Consequently, beyond the 10-year analysis time period, it is possible that the frequency and nature of consultations on management of commercial fishing may change.

The total incremental administrative costs of consultations for commercial fisheries, in undiscounted dollars, are estimated to be $18,600, with the government portion being $15,900, and the third-party cost of $2,600.

6.5 Alaska Native and Subsistence Use

Subsistence use is managed by State and Federal entities. Subsistence use of resources found within the CH includes fish, shellfish, marine mammals, and other marine life forms. Subsistence harvest of Arctic ringed seals and other marine mammals is a traditional practice among Alaska Native peoples in the CH area.

6.5.1 Potential Costs

NMFS does not anticipate consultations on subsistence activities, so there are no expected costs to subsistence users attributable to the CHD.

6.6 Recreation and Tourism

Limited recreation and tourism activities occur in the CH waters (cruises) and in and near population centers adjacent to the CH (wildlife viewing, rafting, sport fishing). It is not expected that there will be any consultations required for these activities due to the CHD. None of these activities appear to have a Federal nexus triggering consultation under the ESA.

6.6.1 Potential Costs

The Arctic ringed seal CHD is not anticipated to result in costs to recreation or tourism.

6.7 Commercial Shipping and Marine Transportation

Marine vessels operating within the Arctic ringed seal CH include oil and gas tankers, container ships, cargo ships, cruise ships, research vessels, fishing vessels, icebreakers, and, occasionally, private vessels operated by adventurers transiting the NW passage route. Commercial shipping and most other vessel traffic, particularly in CH waters north of the Bering Strait, occurs mainly in the summer months when sea ice is at a minimum. Marine vessel activity within the CH is highest south of the Bering Strait, but vessel traffic north of the Bering Strait is expanding. Vessel traffic within the CH, along established shipping and proposed transit routes, is predicted to increase in the future in response to a longer ice-free shipping season (as sea ice melts earlier in the spring and reforms later in the fall) is predicted by climate models.

6.7.1 Potential Costs to Commercial Shipping and Marine Transportation

NMFS does not anticipate any additional costs to the commercial shipping and marine transportation sector over the next 10 years due to the Arctic ringed seal CHD. Section 7 of the ESA does not apply generically to vessel movement or activity. As described in **Section 3.1**, Section 7 consultation requirements apply only when there is a Federal action (actions authorized, funded, or carried out by a Federal agency).

Although vessel traffic in the Arctic is not anticipated to increase significantly in the near-term (Arctic Council 2009), it may increase substantially in the long-term (i.e., past the 10-year timeframe of this economic impact analysis) with continued Arctic sea ice reduction (see discussion in **Section 5.4.7**). With continued growth in vessel traffic, the USCG or other Federal agencies may issue regulations on shipping and marine transportation activities by U.S. vessels within Arctic ringed seal CH. Such Federal actions may require consultation. Whether such consultations would occur is not known, but it is possible given the potential interaction of shipping and marine transportation with Arctic ringed seal habitat. As NMFS notes in the final rule listing the Arctic ringed seal (77 Fed. Reg. 76706, 76713; December 28, 2012):

> *The most significant risk posed by shipping activities in the Arctic is the accidental or illegal discharge of oil or other toxic substances carried by ships, due to their immediate and potentially long-term effects on individual animals, populations, food webs, and the environment. Shipping activities can also affect ringed seals directly through noise and physical disturbance (e.g., icebreaking vessels), as well as indirectly through ship emissions and the possibility of introducing exotic species that may affect ringed seal food webs.*

6.8 Military Activities

Military activities in the CH include military vessel traffic (marine, submarine, and aircraft), sonar, radar, icebreaking, emergency response, and training exercises. Military activity in the Arctic has increased in recent years due to growing commercial activity, international competition, and possible strategic challenges in the region. There are currently no year-round military bases adjacent to the CH. However, the USCG establishes a summer base in the region. The Alaska State Legislature's Alaskan Northern Waters Task Force has recommended establishment of a permanent Federal Arctic base, potentially in an area adjacent to the CH.

6.8.1 Potential Costs

Over the next 10 years, for USCG activities, NMFS anticipates one ***programmatic*** consultation on the USCG icebreaking program, one ***re-initiation of a programmatic*** consultation on the Alaska Regional Contingency Plan (which governs Federal, State, and local response to oil and other hazardous material discharges), and one ***re-initiation of an informal*** consultation on Arctic Shield operations. For Navy training and testing activities, over this time period three ***formal*** consultations, and 11 ***informal*** consultations are projected.

The total incremental administrative costs for consultations on military activities, in undiscounted dollars, are estimated to be $78,900. All costs will be borne by NMFS, as the 'consulting' agency, and the USCG (and/or EPA in the case of the Alaska Regional Contingency Plan) and the U.S. Navy, as the Federal 'action' agencies. This cost estimate includes three formal consultations on activities within a particular area that NMFS considered for designation but is not ultimately designated as CH in the final rule. The costs associated with these consultations are addressed in **Section 8**.

6.9 Educational, Scientific, Non-Consumptive Use of Arctic Ringed Seal and its Habitat

Scientific and educational efforts associated with the Arctic ringed seal CH include those of the ISC (an Alaska Native Organization), the ADF&G, and the Marine Mammal Laboratory.

6.9.1 Potential Costs

Over the next 10 years, NMFS anticipates one ***programmatic*** consultation on Alaska Fisheries Science Center scientific research, one ***re-initiation of programmatic*** consultation on this research, and one ***informal*** consultation on other scientific research activities.

The total incremental administrative costs for consultations related to scientific research, in undiscounted dollars, are estimated to be $32,100, with the government bearing all costs.

6.10 Indirect Effects and Other Considerations

As discussed in **Section 3.2**, CHD may, under certain circumstances, result in indirect costs, such as those related to regulatory uncertainty, and additional economic effects triggered by CHD under state or local laws. 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 CH. Public comments received from several commenters, including the State of Alaska (ADNR), on the revised proposed CHD for the Arctic ringed seal and the associated draft impact analysis expressed concern that the CHD will have a variety of adverse economic impacts that were not meaningfully accounted for, including the following indirect effects and other considerations:

- Potential for lawsuits: Their comments expressed concern that the CH will likely be used in actual and threatened litigation, thereby imposing additional costs and project delays. The State commented that oil, gas, and other activities are frequently the subject of litigation intended to delay, impede, increase the costs of, and defeat these activities on the North Slope and in the Chukchi and Beaufort seas. As examples, the State cited a lawsuit challenging the polar bear CHD (*Alaska Oil and Gas Ass'n* v. *Jewell,* Case No. 13-35919 (9th Cir. 2016)), and noted that there have been lawsuits regarding the Cook Inlet beluga whale CHD.[40]
- Additional requirements under non-ESA Federal regulatory programs: Their comments expressed concern that the CHD could result in costs attributable to the designation under non-ESA regulatory programs. They noted, for example, that USACE can impose significantly higher mitigation costs for CWA Section 404 permits on projects located in CH compared to projects located outside of CH. Additionally, they stated that the CWA's National Pollution Discharge Elimination System (NPDES) permit program mandates special considerations and protections for areas designated as CH. Commenters also stated this was the case under the Outer Continental Shelf Lands Act. The State and another commenter[41] described that areas designated as CH have been expressly excluded from coverage in at least two Alaska-related NPDES permits issued by EPA (EPA 2007, 2010b, 2016).[42] In addition, regarding Section 404 permits, the State noted as a specific example that compensatory mitigation for the Point Thomson project involved significantly greater total acreage and therefore greater costs solely because affected wetlands were located in polar bear CH.[47]
- Time delays: Their comments indicated concern that the CHD could generate time delays, and that such delays could add significant costs to projects (the State suggested perhaps millions of dollars,

[40] Comments received by NMFS from the State of Alaska (through ADF&G) on the 2021 Arctic ringed seal revised proposed critical habitat, "Re: NOAA-NMFS-2020-0029: Designation of Critical Habitat for the Beringia Distinct Population Segment of the Bearded Seal, Proposed rule; and NOAA-NMFS-2013-0114: Designation of Critical Habitat for the Arctic Subspecies of the Ringed Seal; Revised proposed rule; request for comments," dated April 8, 2021.

[41] Comments received by NMFS from the Alaska Oil and Gas Association, the American Petroleum Institute, and the International Association of Geophysical Contractors on the 2021 Arctic ringed seal revised proposed critical habitat, "Re: Comments of the Alaska Oil and Gas Association, the American Petroleum Institute, and the International Association of Geophysical Contractors regarding Proposed Rule to designate ringed seal critical habitat — NOAA-NMFS-2013-0114," dated April 8, 2021.

[42] Both commenters cited general permit AKG524000, Offshore Seafood Processors in Alaska (March 1, 2010). Both commenters also cited a general permit related to oil and gas discharges in Cook Inlet, but referenced different versions of this permit. One commenter cited AK[G]315000, Oil and Gas Extraction Facilities in Federal and State Waters in Cook Inlet (effective June[1]4, 2007), while the State cited AKG285100, Authorization to Discharge Under the National Pollutant Discharge Elimination System for Oil and Gas Exploration in Federal Water of Cook Inlet (effective September 1, 2016).

although it was unclear if this was in reference to any particular source of delays, e.g., lawsuits). The State described that due to the limited window available when construction may occur, depending on the project, delays could have cascading effects regarding the timing of construction, the start of operations, and the ability to produce oil and gas, or other resources. A commenter also specifically expressed concern that additional effort for Section 7 consultations and implementation of mitigation measures will add possible delays and substantial costs to local municipal-type projects that will likely require Federal permits or involve Federal funding (e.g., construction of sea walls, the repair or maintenance of roads, water treatment activities, and building and other infrastructure construction) such that many of them will no longer be affordable.

> Regulatory uncertainty and potential lease devaluation: Their comments indicated concern that increased regulatory uncertainty due to the CHD could result in adverse economic impacts. The State specifically commented that the CHD will devalue acquired and future oil and gas leases because the CHD will increase risks associated with developing the leases.

> Impacts to the State of Alaska and local communities: Their comments expressed concern that the impacts indicated above could result in less exploration, fewer opportunities to discover economic reserves, and, therefore, less development and production of oil and gas resources on the North Slope and in the adjacent Chukchi and Beaufort seas, to the detriment of local communities, the State of Alaska, and the Unites States. The State expressed similar concern regarding potential impacts of the CHD on development of critical minerals, citing as an example the Graphite One mine project north of Nome. The State's comments further described that the CHD would place disproportionate regulatory burdens and economic costs on Alaskans, while the North Slope Borough described that the burdens of the CHD will fall most heavily on the coastal communities in northern and western Alaska. The Borough commented that the development of natural resources in and adjacent to the North Slope largely support the regional economy, allows the Borough to provide essential services and other benefits to its residents, and supports the municipal tax base. The Borough expressed concern that because a significant portion of its revenue is derived from taxes on oil and gas infrastructure, additional impacts to these projects as a result of the CHD would be felt by the Borough.

> Impacts to national security interests Commenters stated that the North Slope of Alaska and the adjacent offshore areas of the Chukchi and Beaufort Seas are the location of significant, nationally strategic domestic oil and gas exploration, development, and production activities, and according to the State, production and transportation of critical minerals. Their comments expressed concern that the impacts identified involving development and production of domestic energy resources would also affect national security interests.

This analysis considered the potential for the CHD to result in the types of costs identified in the above comments:

> Potential for lawsuits: The specific court case cited as an example of the potential for litigation challenged the polar bear CH rule itself. However, when considering the economic impacts of the CHD, NMFS does not consider costs of litigation associated with challenging the CH rule. Historical precedent does exist for third party lawsuits challenging activities occurring in designated CH. However, such lawsuits typically include claims regarding effects to both listed species and critical habitat, and may include claims under other laws, e.g., the MMPA, the National Environmental Policy Act, etc. Moreover, it is not possible to predict the nature, frequency, timing, or outcome of such lawsuits, and as such, attempting to do so would involve significant speculation. Therefore, determining the outcomes of such third-party litigation would be speculative.

> Additional requirements under non-ESA Federal regulatory programs: It is recognized in this analysis that under certain circumstances, Federal agencies, such as USACE (as well as local and State agencies), may choose to manage areas differently once CH is designated. However, NMFS is not

aware of plans by any agency to institute future restrictions to provide specific protections for Arctic ringed seal CH. In the specific NPDES general permits cited as examples, the CH falling under NMFS jurisdiction that was excluded from coverage reflected consideration of potential effects to one particular species and its CH—not all CH within the areas covered by these permits was excluded from coverage. It is not possible to predict the timing, frequency, nature of, or extent to which this CHD may trigger additional requirements under non-ESA regulatory programs. As such, attempting to forecast such hypothetical outcomes would be speculative.

- Time delays: With regard to potential time delays associated with the need to address critical habitat in future consultations, the indirect incremental impact associated with such delays would be limited to any costs incurred specifically associated with the additional time necessary to complete the analysis of whether a proposed project is likely to result in the adverse modification of CH. NMFS determined all of the projected future Federal actions identified over the timeframe of the analysis (the next 10 years) that may trigger Section 7 consultation due to the potential to affect one or more of the essential features of the CH also have the potential to affect Arctic ringed seals. In other words, none of the future activities identified in this analysis would be expected to trigger consultation solely on the basis of the CHD. Section 7 consultations addressing effects on the species typically address habitat-associated effects to the seals, even in the absence of a CHD Therefore, NMFS does expect that addressing effects on the CH in future consultations will require substantial additional time or resources.
- Regulatory uncertainty and potential lease devaluation: While there is potential for regulatory uncertainty, whether and to what extent projects or allied economic behavior may be affected due to regulatory uncertainty stemming from the CHD is significantly uncertain. The types of data that would be necessary to quantify costs associated with regulatory uncertainty, such as data linking the CHD to changes in industry economic behavior are unavailable. Regarding the State's concern that the CHD will devalue oil and gas leases, we are not aware of any empirical evidence or studies of such effects for the areas included in the designation, and none were identified in their comments. Due to the significant uncertainty and information limitations, it would be speculative to attempt to forecast changes in economic behavior resulting from regulatory uncertainty on the part of industry relative to this CHD.
- Impacts to the State of Alaska and local communities: As discussed above, this analysis recognizes that some potential exists for indirect impacts of the CHD. However, as Section 7 consultations are already required for projects that may affect Arctic ringed seals, and it is unlikely that additional project modification requests will result from addressing CH in these consultations (as discussed at the beginning of **Section 6**), the impacts of the CHD will likely be primarily limited to the incremental administrative costs of addressing CH in future ESA section 7 consultations that would likely otherwise occur regardless to consider effects on Arctic ringed seals. As discussed in **Section 6.1**, including a CH analysis in consultations would slightly increase operating costs for oil and gas sector activities, but such costs are not anticipated to change the level of oil and gas sector activities within CH, owing to the CHD.
- Impacts to national security: As discussed in **Section 9.2.1,** the CHD for the Arctic ringed seal is not expected to significantly affect oil and gas production decisions, subsequent oil and gas supply, or the cost of energy production. NMFS did not find evidence to support the commenters' concern that impacts to national security interests are at issue relative to impacts of the CHD on development and production of domestic energy resources.

6.11 Summary of Incremental Administrative Costs of Future Section 7 Consultations

As previously discussed, the costs stemming from the CHD are expected to be largely limited to additional administrative costs to consider the CH as part of future Section 7 consultations, which are the only costs monetized in this analysis. **Table 6-1** provides a summary of the total incremental administrative costs that are anticipated over the next 10 years for the entire area considered for designation as CH for the Arctic ringed seal (illustrated in **Figure 1-1**), as outlined in **Sections 6.1** to **6.9**. These incremental administrative costs are estimated to range from $726,000 to $849,000 in present value terms, depending on the discount rate employed.[43] In annual terms, the estimated range of discounted administrative costs is $52,500 to $96,600. Federal agencies are anticipated to bear at least 43 percent of these costs.

Table 6-1 Total and Annualized Costs of the Entire Critical Habitat Area Considered for Designation, 2021-2030, in 2021 Dollars.

Entity Bearing Cost	Present Value Cost (3% Discount Rate)	Annualized Present Value Cost (3% Discount Rate)	Present Value Cost (7% Discount Rate)	Annualized Present Value Cost (7% Discount Rate)
Federal Agency	$366,000	$41,700	$313,000	$41,700
Third Party	$482,000	$54,900	$413,000	$54,900
Total	**$849,000**	**$96,600**	**$726,000**	**$96,600**

Notes:

1. For estimating Section 7 consultation costs, due to uncertain or unclear timelines (or ranges), it is assumed that there is an equal probability of these occurring over the specified range of time. In calculating present values, the estimated total incremental costs in undiscounted dollars over the 10 years (Federal Agency = $416,590 and Third Party = $549,150) are allocated in equal amounts for each year.
2. Totals may not sum due to rounding.

As discussed in **Section 1.1**, in the revised proposed rule to designate CH for the Arctic ringed seal, NMFS proposed to exclude a particular area north of the Beaufort Sea shelf based on national security considerations. The potential costs avoided due to the proposed exclusion of this particular area, which is ultimately excluded in the final rule, is summarized in **Section 8.1.2**; and a summary of the total incremental administrative costs over the next 10 years of the final CHD, reflecting this exclusion, is provided in **Table 6-2**. The final rule designating CH for the Arctic ringed seal, with this area excluded, is anticipated to result in present value incremental administrative costs of approximately $714,000 to $834,000, depending on the discount rate employed.[43] In annual terms, the estimated range of discounted administrative costs is $51,700 to $95,000. Federal agencies are anticipated to bear at least 42 percent of these costs.

[43] This analysis captures the projected future costs over a 10-year period; the number of projected consultations is summarized in the last column of Table 5-16. For each sector/activity/project, this analysis compares economic costs incurred in different time periods in present value terms. The present value (PV_C) represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of future cash flows expressed in today's dollars according to the following standard formula (with t = year of cost from year t_0 (2021) to T (2030); r =- discount rate, and C_t = incremental cost in year t):

$$PV_c = \sum_{t=t_0}^{t=T} \frac{C_t}{(1+r)^{t-2021}}$$

Table 6-2 Total and Annualized Costs of the Final Critical Habitat Designation, 2021-2030, in 2021 Dollars.

Entity Bearing Cost	Present Value Cost (3% Discount Rate)	Annualized Present Value Cost (3% Discount Rate)	Present Value Cost (7% Discount Rate)	Annualized Present Value Cost (7% Discount Rate)
Federal Agency	$352,000	$40,100	$301,000	$40,100
Third Party	$482,000	$54,900	$413,000	$54,900
Total	**$834,000**	**$95,000**	**$714,000**	**$95,000**

Notes:

1. For estimating Section 7 consultation costs, due to uncertain or unclear timelines (or ranges), it is assumed that there is an equal probability of these occurring over the specified range of time. In calculating present values, the estimated total incremental costs in undiscounted dollars over the 10 years (Federal Agency = $400,570 and Third Party = $549,150) are allocated in equal amounts for each year.
2. Totals may not sum due to rounding.

7 Distributional Impacts of Arctic Ringed Seal Critical Habitat Designation

This section identifies the distribution of impacts by economic sector, and also provides an evaluation of environmental justice, based on the proportion of impacts expected to be borne by low-income and/or minority populations.

7.1 Potential Distributional Impact Considerations

A benefit cost analysis, measuring economic efficiency, is not the only or the overriding public policy objective. Executive Order 12866 encourages consideration of *distributional effects* separately from efficiency effects. As clarified in OMB Circular A-4 (OMB 2003, p. 14):

> *Your regulatory analysis should provide a separate description of distributional effects (i.e., how both benefits and costs are distributed among sub-populations of particular concern) so that decision makers can properly consider them along with the effects on economic efficiency…. Where distributive effects are thought to be important, the effects of various regulatory alternatives should be described quantitatively to the extent possible, including the magnitude, likelihood, and severity of impacts on particular groups. …. Your analysis should also present information on the streams of benefits and costs over time in order to provide a basis for assessing intertemporal distributional consequences, particularly where intergenerational effects are concerned…Distributional effects may arise through "transfer payments" that stem from a regulatory action as well. For example, the revenue collected through a fee, surcharge in excess of the cost of services provided, or tax is a transfer payment.*

Potential distributional impacts of the costs of the CHD are minimal. Aside from the protection provided through Section 7, the ESA imposes no other requirements or limitations on any entities or individuals as a result of CHD. As discussed in **Section 6**, based on the best information available, NMFS anticipates that it is unlikely that the CHD will result in additional or different requested project modifications than would be necessary to avoid impacts to the species in Section 7 consultations that would occur irrespective of the CHD. The costs of this CHD are thus expected to largely consist of additional administrative costs to consider the CH as part of future Section 7 consultations, with third-party administrative costs primarily borne by the oil and gas sector. Consultation costs could create a distributional impact if the third parties which were bearing those costs were a population of concern, for example, small, local businesses. However, as discussed in **Section 9**, based on the best information currently available the CHD is expected to result in minimal impacts to small entities. Costs to the oil and gas industry are expected to be limited to administrative costs of consultation, with no anticipated incremental project modification requests through Section 7 consultations above and beyond requirements related to the ESA listing status of the species. Including a CH analysis in consultations would slightly increase operating costs for oil and gas sector activities (with minor impacts on profitability for shareholders[44]); but such costs are not anticipated to change the level of oil and gas sector activities within CH, owing to the CHD. As such, there are no anticipated impacts of the CHD to oil and gas-related employment, income, or taxes, and there are no such impacts of the CHD anticipated for the other activities considered in this analysis. Thus, there are no anticipated adverse social or economic impacts of the CHD to Study Area residents.

There may be distributional impacts of the benefits of the CHD; however, at this time sufficient economic information and scientific data are not available to accurately quantify or monetize the benefits of CHD. Because the expected benefits of CHD occur beyond the ten-year study period, there are potential

[44] There is no reason to believe that oil and gas company shareholders are disproportionately low-income or minority.

intertemporal distributional consequences, particularly related to intergenerational effects. The benefits of CHD have been evaluated qualitatively in this analysis and are acknowledged to persist beyond the ten-year study period of this analysis.

7.2 Environmental Justice Impacts on Low Income and Minority Populations

The EPA's Office of Environmental Justice offers the following definition of environmental justice (EPA 2015, p.4):

> *"The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies."*

EO 12898 was intended to ensure that Federal actions and policies do not result in disproportionately high adverse human health or environmental effects on minority or low-income populations.

No adverse human health effects are anticipated from CHD, and only positive environmental effects are anticipated to accrue from the additional protections provided to the essential features of Arctic ringed seal CH. As discussed in **Section 5.2**, compared to the State and the Nation, the Study Area is characterized by a disproportionately high proportion of minority residents and low-income residents. As presented in **Table 5-4**, residents in all boroughs and census areas in the Study Area are disproportionately minority, specifically AIAN. Across the Study Area, minorities account for 88.8 percent of the population. Also, as presented in **Table 5-5**, with the exception of the North Slope Borough, data on the poverty rate, per capita income, and unemployment rate in all boroughs and census areas in the Study Area indicate that residents are disproportionately low income compared to the State and the Nation.

The costs associated with the designation are expected to be modest and primarily consist of additional administrative costs to consider the CH as part of future Section 7 consultations, with third-party costs primarily borne by the oil and gas sector. Further, the CHD is not expected to significantly affect oil and gas production decisions, subsequent oil and gas supply, or the cost of energy production (**Section 9.2**). In addition, as detailed in **Section 9.1**, based on the best information available, the CHD is expected to result in minimal impacts to small entities. The CHD is therefore not expected to have a disproportionately high effect on low income or minority populations.

While the CHD for the Arctic ringed seal is not expected to have a disproportionately high effect on minority populations or low-income populations, it is important to note that AIAN minority populations disproportionately participate in subsistence activities in the Study Area. CHD will not adversely affect the continued subsistence harvest of Arctic ringed seals. No costs are, therefore, anticipated for subsistence users due to the CHD.

8 Area Exclusions - A Section 4(b)(2) Preparatory Assessment of Arctic Ringed Seal Critical Habitat Designation

As discussed above, Section 4(b)(2) of the ESA requires the Secretary to designate CH for threatened and endangered species on the basis of the best scientific data available after taking into consideration the economic, national security, and any other relevant impacts, of specifying any particular area as CH. Section 4(b)(2) also provides NMFS discretion, as delegated by the Secretary, to exclude any area from CH if the benefits of such exclusion outweigh the benefits of specifying such area as part of the CH, so long as the exclusion will not result in extinction of the species (16 U.S.C. 1533). A synthesis of the economic, national security, and other relevant impacts of designating CH for the Arctic ringed seal is presented in this section, followed by a discussion of NMFS's consideration of whether to engage in the discretionary 4(b)(2) exclusion analysis. Because NMFS elected to undertake such an analysis based on national security impacts, a summary of NMFS's evaluation is also provided. The detailed information presented in the other sections of this report regarding potential impacts of the CHD, and the analysis and conclusions in the preamble to the final rule regarding specific areas identified for designation as Arctic ringed seal CH, informed the synthesis and summaries presented in this section, and thus should be read in combination with this section.

Because CH is, by definition, "essential to the conservation" of the species, conservation benefits to the listed species occur as a result of the consultation process when project modifications are implemented to minimize or avoid destruction or adverse modification of CH. Such project modifications may also moderate adverse impacts to other components of the ecosystem. In the case of the Arctic ringed seal CHD, NMFS anticipates that the CHD is not likely to result in any additional requests for project modifications above and beyond those it would identify due to the species' listing status under the ESA and the requirement that Federal agencies avoid jeopardizing the continued existence of the species. This is not to say such project modifications could not occur in situations NMFS is unable to predict at this time, but based on the best information available, it is likely that any project modifications necessary to avoid impacts to Arctic ringed seal CH would also be necessary to avoid impacts to the species in section 7 consultations that would occur irrespective of the CHD. Nevertheless, the CHD may indirectly affect conservation-related behaviors in ways that generate conservation benefits (as well as opportunity costs), as discussed in detail in **Section 4** of this report.

8.1 Synthesis: Impacts of the Arctic Ringed Seal Critical Habitat Designation

8.1.1 Economic Impacts

The projected economic costs of the CHD stem, primarily, from the projected Section 7 consultations associated with ongoing and planned activities with a Federal nexus that may affect the essential features of the CH (see **Section 6** for details). NMFS' assessment of the record of Section 7 consultations for 2013 to 2019 on activities that may affect the essential features of the CH (relatively few relevant consultations were identified for the 3 years prior to when the Arctic ringed seal was listed under the ESA), as well as available information on planned activities, did identify any likely incremental economic impacts associated with project modifications that would be required solely to avoid impacts to Arctic ringed seal CH. Therefore, direct incremental costs of this CHD are expected to be limited to the additional administrative costs of considering Arctic ringed seal CH in future Section 7 consultations that would already occur to address effects on the species. In present value terms, over the next 10 years (2021-2030), the total incremental administrative costs of these consultations for the entire area

considered for designation as CH are estimated to be $726,000 using a discount rate of seven percent, and $849,000 using a discount rate of three percent.

The largest share of these estimated costs (approximately 83 percent) are associated with consultations on NMFS and BOEM authorizations and permitting of oil and gas activities. In assessing costs associated with oil gas activities, a conservative approach was taken by estimating that future formal and informal consultations addressing these activities would be more complex than for other activities, and would therefore incur higher third-party (i.e., applicant/permittee) incremental administrative costs per consultation to consider effects to Arctic ringed seal CH. These higher third-party costs may not be realized in all cases because the administrative effort required for a specific consultation depends on factors such as the location, timing, nature, and scope of the potential effects of the proposed action on the essential features. As discussed in **Section 5.4.1**, there is also considerable uncertainty regarding the timing and extent of future oil and gas exploration and development in Alaska's OCS waters, as indicated by Shell's 2015 withdrawal from exploratory drilling in the Chukchi Sea; BOEM's 2017-2022 OCS oil and gas leasing program; and the reinstatement of the 2016 withdrawal of the Chukchi Sea and most of the Beaufort Sea from consideration for oil and gas leasing in January 2021 (E.O. 13990). Although NMFS completed formal consultations for oil and gas exploration activities in the Chukchi Sea in all but two years between 2006 and 2015, no such activities or related consultations with NMFS have occurred since that time.

8.1.2 National Security Impacts

As noted above, section 4(b)(2) of the ESA requires NMFS to take into consideration the impact on national security of specifying any particular area as CH. National security impacts resulting from the designation depend on whether the designation would add new burdens beyond those related to consideration of effects on the species in future consultations. Anticipated interference with mission-essential training, testing, or unit readiness, either through delays in critical training and testing activities or through expected requirements to modify the action to prevent adverse modification of CH, are possible negative impacts of CH designations.

NMFS has prepared an analysis to address the requirement of Section 4(b)(2) of the ESA concerning evaluation of national security impacts. This analysis is presented in the preamble to the final rule designating CH for the Arctic ringed seal. In summary, the Navy provided a written assessment of potential national security impacts and descriptions of training and testing activities occurring within the Arctic region, including ice exercises that are conducted in the northeastern most portion of the potential Arctic ringed seal CH. The Navy expressed the concern that the CH may impact national security if training and testing activities are prohibited or are required to be mitigated (for the protection of CH) to the point where training and testing value is severely degraded, or if the Navy is unable to access certain locations within the Arctic region. The Navy requested that NMFS exclude from the designation of CH a particular area located north of the Beaufort Sea shelf based on impacts to national security. In addition, the Air Force requested that NMFS consider excluding CH located adjacent to a number of radar sites based on national security impacts. NMFS anticipates that the time and costs associated with consideration of the effects of future Air Force activities associated with these radar site on Arctic CH would be limited if any.

8.1.3 Other Relevant Impacts

Under Section 4(b)(2) of the ESA, NMFS also must consider "other relevant impacts" of the CHD. For example, NMFS may consider potential adverse effects on tribal lands or tribal trust resources. In preparing the final CHD, NMFS did not identify any existing management or conservation plans that benefit listed species, tribal lands or resources, or anything else that would be adversely affected by the CHD.

8.2 Exclusions under Section 4(b)(2)

As discussed above, Section 4(b)(2) provides NMFS discretion, as delegated by the Secretary, to exclude any particular area from CH if the benefits of such exclusion outweigh the benefits of specifying such area as part of the CH, so long as the exclusion will not result in extinction of the species. This discretion is limited, however, in that the Secretary may not exclude an area from designation if exclusion will result in the extinction of the species.

NMFS conducted a discretionary 4(b)(2) exclusion analysis to determine whether to exclude an area north of the Beaufort Sea shelf from the CHD based on impacts to national security. This analysis is presented in the preamble to the final rule designating CH for the Arctic ringed seal.

The total incremental costs associated with the particular area requested for exclusion by the Navy, which stem from administrative costs of adding CH analyses to consultations on the Navy's ICEX activities over the next 10 years (2021-2030), are estimated to be $12,0000 (discounted at 7 percent) to $14,100 (discounted at 3 percent) ($16,000 in undiscounted dollars). Thus, the total incremental costs associated with the CHD over the next 10 years, with this area is excluded, are estimated to be $714,000 (discounted at 7 percent) to $834,000 (discounted at 3 percent). In annual terms, the estimated range of discounted incremental costs is $51,700 to $95,000.

9 Potential Impacts on Small Entities - A Regulatory Flexibility Act Analysis of Arctic Ringed Seal Critical Habitat Designation

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group, distinct from other entities, and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the SBA to file amicus briefs in court proceedings involving an agency's violation of the RFA.

In determining the scope, or 'universe', of the entities to be considered in an RFA, NMFS generally includes only those entities that can reasonably be expected to be directly regulated by NMFS through the rule. If the effects of the rule fall primarily on a distinct segment, or portion of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis. NMFS interprets the intent of the RFA to address negative economic impacts, not beneficial impacts and, thus, such a focus exists in analyses that are designed to address RFA compliance.

The regulatory mechanism through which CH 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 they fund or permit may be proposed or carried out by small entities. As discussed in previous sections, other entities, including in some cases small entities, may participate as third parties during ESA Section 7 consultations (the primary parties being the Federal action agency and NMFS). Thus, small entities may be indirectly affected by the CHD. The SBA, in its guidance on how to comply with the RFA, acknowledges that consideration of indirectly affected small entities is not required by the RFA. It nonetheless encourages agencies to include these small entities when performing an RFA. In the present IRFA, NMFS has adopted this approach.

Data on cost structure, affiliation, and operational procedures and strategies in the sectors regulated by the CHD are insufficient, at present, to permit preparation of a "factual basis" upon which to certify that the preferred alternative does not have the potential to result in a significant adverse economic impact on a substantial number of small entities (as those terms are defined under RFA). Because, based on all available information, it is not possible to 'certify' this outcome, should the CHD be adopted, a formal IRFA has been prepared and is included in this package for Secretarial review.

9.1 Contents of FRFA[45]

Under 5 U.S.C., Section 604 of the RFA, each FRFA is required to contain:

1. A statement of the need for, and objectives of, the rule;
2. A statement of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a statement of the assessment of the agency of such issues, and a statement of any changes made in the proposed rule as a result of such comments;
3. The response of the agency to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration in response to the proposed rule, and a detailed statement of any change made to the proposed rule in the final rule as a result of the comments;
4. 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;
5. A description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and
6. 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.

9.1.1 Definition of a Small Entity

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) and small government jurisdictions.

Small businesses. Section 601(3) of the RFA defines a 'small business' as having the same meaning as 'small business concern,' which is defined under Section 3 of the Small Business Act. 'Small business' or 'small business concern' includes any firm that is independently owned and operated and which is not dominant in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the U.S., and which operates primarily within the U.S. or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor." "A (small) business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the U.S., and publishes those on its website. For example, SBA defines an oil extraction business as a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. Other SBA industrial sector size criteria pertinent to this analysis are those of support activities for oil and gas operations, port and harbor operations, marine cargo handling, and coastal construction. **Table 9-1**, below, includes the pertinent sectoral categories and thresholds, as defined by SBA, for RFA analysis purposes.

[45] For a detailed treatment of the analytic methods and procedures to be used in economic analyses in support of RIR and RFAA requirements, see: (Queirolo 2014)

Table 9-1 Small Business Size Standards matched to North American Industry Classification System.

NAICS Code	NAICS U.S. Industry Title	SBA Small Business Threshold Criteria
Subsector 211 - Oil and Gas Extraction		
211120	Crude Petroleum and Natural Gas Extraction	1,250 employees (average employment)
Subsector 213 – Support Activities for Mining		
213112	Support Activities for Oil and Gas Operations	$41.5 million (average annual receipts)
Sector 48 -Transportation		
Subsector 488 – Support Activities for Transportation		
488310	Port and Harbor Operations	$41.5 million (average annual receipts)
488320	Marine Cargo Handling	$41.5 million (average annual receipts)
Sector 23 - Construction		
Subsector 237 – Heavy and Civil Engineering Construction		
237990	Other Heavy and Civil Engineering Construction	$39.5 million (average annual receipts)

Source: SBA (2019).

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Tribes, Alaska Regional or Village Corporations organized pursuant to the ANCSA (43 U.S.C. 1601), and Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) a person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock; or (2) if two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors, or general partners control the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint ventures if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations. The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

9.1.2 Need for the Rule

Under provisions of the ESA, at the time a species is listed as threatened or endangered, the listing agency must designate CH for that species, on the basis of the best scientific data available, to the maximum extent prudent and determinable. NMFS concluded that CHD for Arctic ringed seals was prudent, but not determinable at the time of listing and, therefore, would be designated in separate rulemaking. As a result, the statutory deadline for designating CH was extended by one year, prompting the present action to designate CH for the Arctic ringed seal. Moreover, under an amended court-approved stipulated settlement agreement, NMFS agreed to submit a final rule to designate CH for the Arctic ringed seal to the Federal Register by April 29, 2022.

NMFS has identified a single "specific area" within the geographic area occupied by Arctic ringed seals at the time of listing that is being considered as CH for this species. This CH includes marine waters within one specific area in the Bering, Chukchi, and Beaufort seas (**Figure 1-1**). NMFS has determined that the essential features that occur within this area may require special management considerations or protection; a prerequisite for designation.

9.1.3 Objectives of, and Legal Basis for the Rule

The objective of this rule is to utilize the best scientific data and commercial information available to designate CH for the Arctic ringed seal, in accordance with ESA Section 4, and to best meet the conservation needs of the species. The ESA requires NMFS to designate CH for listed species to the maximum extent prudent and determinable. This is the legal basis for this rule.

Section 4(b)(2) of the ESA requires NMFS to designate CH 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." The ESA defines CH 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."

9.1.4 Summary of Significant Issues Raised by Public Comments in Response to the IRFA

NMFS published the revised proposed rule to designate CH for the Arctic ringed seal on January 8, 2021 (86 Fed. Reg. 1452). An IRFA was prepared and summarized in the Classification section of the preamble to the revised proposed rule. NMFS received no comments on the IRFA during the public comment period on the revised proposed CHD.

9.1.5 Description of Small Entities Potentially Impacted by the Rule

As discussed above, the SBA, in its guidance on how to comply with the RFA, acknowledges that consideration of indirectly affected small entities is not required by the RFA. It nonetheless encourages agencies to include these small entities when performing an RFA. In the present IRFA, NMFS has adopted this approach. This section summarizes what is known about the potential adverse economic impacts of Arctic ringed seal CHD on small entities. As discussed in detail in **Section 6** of the RIR for this

CHD, incremental costs of this CHD are expected to be largely limited to administrative costs of ESA Section 7 consultations. For certain activities, small entities may participate in some consultations, as a third party (the primary parties being the Federal action agency and NMFS). It is, therefore, possible that such small entities may invest time and resources considering CH during ESA Section 7 consultations for Arctic ringed seals, although there is no means of empirically confirming this hypothesis, *a priori*.

Several industry sectors participate in activities that are physically co-extensive with the CHD; and some of these may have members that would qualify as "small businesses" within the RFA analysis meaning of that term, although data on aggregate annual gross receipts from all affiliated entities worldwide or total full-time, part-time, temporary, or any other form of employment for individual businesses, including affiliated entities worldwide, are unavailable.

Table **9-2** summarizes businesses and government entities that engage in activities for which consideration of CH in ESA Section 7 consultations may generate third party administrative costs[46] as a result of this rulemaking, and that potentially meet the standards set forth in the RFA analysis. Two of the oil and gas operations identified in **Table 9-2** do not exceed the size criterion established by the SBA for entities in this particular industry and neither have known affiliations with other large entities. Various other businesses engage in support activities for oil and gas operations that may also require consideration of CH in ESA Section 7 consultations, as exemplified by the companies listed in **Table 5-13** of the RIR. Given that the identities of individual businesses that engage in these support activities vary, **Table 9-2** does not identify specific companies in this industry subsector that may be indirectly affected by the CHD. However, with respect to potential effects of the CHD on small businesses that engage in support activities for oil and gas operations, it is notable that all but one of the entities identified in **Table 5-13** exceed the SBA size criterion for this industry. No not-for-profit enterprises were identified that are likely to be affected by the CHD. Two of the three government jurisdictions listed in **Table 9-2** that own ports qualify as "small governmental jurisdictions", serving populations of fewer than 50,000 persons.

In addition to the activities identified for the entities identified in **Table 9-2**, as described in **Table 5-16** and **Section 6.3** of the RIR, an estimated three ESA Section 7 consultations are anticipated for coastal construction (NAICS 237990, Other Heavy and Civil Engineering Construction) that may generate costs borne by third parties. The specific third parties that may be involved in future ESA Section 7 consultation for coastal construction activities are unknown, and it is not known whether the third parties are likely to be large or small entities. For all other activity types analyzed (as listed in **Table 5-16** of the RIR), the only entities identified with potential impacts related to the CHD are NMFS and Federal action agencies, and they are therefore not expected to affect small entities. All entities potentially indirectly affected by the CHD that are classified as 'large' have been accounted for and treated in the RIR, and are excluded from further analysis within the RFA analysis.

[46] As indicated in Table 3-1 of this analysis, for activities other than oil and gas, third-party costs for technical assistance and informal consultations are expected to be negligible regardless of entity size.

Table 9-2 Entities that May Require Consideration of Arctic Ringed Seal Critical Habitat in ESA Section 7 Consultations.

NAICS Code/Industry Title	Entity Title	Average Annual Receipts ($ billion)	Size of Entity (Employees or Population)	Small Entity
Sector 21 – Mining, Quarrying, and Oil and Gas Extraction				
Subsector 211 - Oil and Gas Extraction				
211120- Crude Petroleum and Natural Gas Extraction	BP	$272	70,100	No
211120- Crude Petroleum and Natural Gas Extraction	Eni	$73	31,321	No
211120- Crude Petroleum and Natural Gas Extraction	Equinor (formerly Statoil)	$68	21,412	No
211120- Crude Petroleum and Natural Gas Extraction	ConocoPhillips	$36	10, 400	No
211120- Crude Petroleum and Natural Gas Extraction	Shell	$18	83,000	No
211120- Crude Petroleum and Natural Gas Extraction	Hilcorp	$1	3,000	No
211120- Crude Petroleum and Natural Gas Extraction	Oil Search Alaska LLC	$1.6	1,600	No
211120- Crude Petroleum and Natural Gas Extraction	SAExploration	$02.	1,000	Yes
211120- Crude Petroleum and Natural Gas Extraction	Alaska LNG Project, Alaska Gasline Development Corp.	$0.002	8	Yes
Sector 48 –Transportation				
Subsector 488 – Support Activities for Transportation				
488310- Port and Harbor Operations	Port of Nome (City of Nome)	$0.00175	2010 Population of 3,598	Yes
488310- Port and Harbor Operations	Port of Kotzebue (City of Kotzebue)	N/A[2]	2010 Population of 3,201	Yes
488310- Port and Harbor Operations	DeLong Mountain Terminal (State of Alaska)	N/A	2010 Population of 710,231	No
488320 – Marine Cargo Handling	Crowley Maritime	$2.5	6,300	No

Sources: Oil Search (2018); Alaska Gasline Development Corporation (2019b); BP (2019); ConocoPhillips (2019a, 2019b); Eni (2019b); Equinor (2019); Oil Search (2019); Royal Dutch Shell (2019); City of Nome (2020); SAExploration Holdings (2020); Hilcorp (2021); Crowley (2022).

Notes:

1. N/A – Information not available.
2. Kotzebue no longer posts annual budget data, the port is assumed to be within a small government jurisdiction.

9.1.6 Reporting, Record-Keeping, and Other Compliance Requirements

As noted above, the CHD does not impose new record-keeping or reporting requirements on small entities. During a Section 7 consultation under the ESA, NMFS, the Action agency, and (possibly, if applicable) the third party applying for Federal funding or permitting communicate, in an effort to minimize potential adverse effects to the species and/or to designated CH. 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 interest, and the potential effects to the species and designated CH associated with the activity that has been proposed. The third-party costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and the development of research, such as biological studies and engineering reports.

Oil and Gas Exploration, Development, and Production

This analysis identified nine separate oil and gas exploration businesses operating offshore within or in areas adjacent to Arctic ringed seal CH that are potentially indirectly affected by this action. All but two of these companies exceed the maximum size criterion for small entity status established by the SBA for entities in this industry, and none are directly regulated small entities. Based on past ESA Section 7 consultations, the additional third party costs in future consultations involving Arctic ringed seal CH over the next 10 years (2021-2030) are expected to be borne principally by large oil and gas operations. The estimated range of annual third-party costs over this 10-year period is $29,900 to $54,900 (discounted at 7 percent), virtually all of which is expected to be associated with oil and gas activities. It is possible that a limited portion of these administrative costs may be borne by small entities (based on past consultations, an estimated maximum of two entities).

Support Activities for Oil and Gas Operations

Various businesses engage in oil and gas support activities that may require consideration of CH in ESA Section 7 consultations, as evident by the companies listed in **Table 5-13** of the RIR. With respect to potential effects of the action on small businesses engaged in support activities for oil and gas operations, all but one of the companies identified in **Table 5-13** exceed the SBA maximum size criterion for small entity status in this industry and none are directly regulated by this action. Therefore, this analysis expects that no directly regulated oil and gas small entities will be substantially adversely affected by this action.

Transportation

One of three ports, Delong Mountain Terminal exceeds the size criterion for small entity status. It is operated by the State of Alaska, which serves a population greater than 50,000, and, therefore, is a large entity for RFA analysis purposes. In addition, one marine cargo handling company with a planned dock expansion project exceeds the maximum size for small entity status in this industry. The other two ports potentially affected indirectly by the CHD, the Port of Nome and the Port of Kotzebue, are owned by entities serving a population of fewer than 50,000 people and, therefore, these port owners are considered small governmental jurisdictions for RFA analysis purposes. The total third-party costs that may be borne by these small government jurisdictions over 10 years (2021-2030) are less than $1,000 (discounted at 7 percent) for the additional administrative effort to consider Arctic ringed seal CH as part of a future ESA Section 7 consultation involving one port (Port of Nome).

Coastal Construction

An estimated three future ESA Section 7 consultations on coastal construction activities are anticipated over 10 years (2021-2030) involving Arctic ringed seal CH, and that may involve third parties. As noted in **Section 9.1.5**, it is not known whether the third parties are likely to be large or small entities. The total third party costs for the additional administrative effort to consider the CH as part of these consultations are $2,000 (discounted at 7 percent).

9.1.7 Identification of all Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Rule

NMFS has identified no such Federal rules.

9.1.8 Description and Analysis of Significant Alternatives to the Critical Habitat Designation

Although this report considers the economic impacts of designating the entire area as CH for the Arctic ringed seal, this is one of several alternatives considered by NMFS for the designation. The "no action" alternative was considered. However, this alternative is not a viable choice for several reasons. Retention of the status quo would not be consistent with the objectives identified by the agency for this action (see the 'Purpose and Need' discussion in the RIR). In addition, Section 4 of the ESA requires NMFS to designate, to the maximum extent prudent and determinable, the specific areas containing the physical or biological features essential the conservation of the species and that may require special management considerations or protection. Finally, because the CHD does not have the potential to have a significant adverse economic impact on a substantial number of small entities, the status quo/no action alternative cannot result in a smaller burden, and could conceivably impose a greater burden, if selected (i.e., would not "minimize adverse impacts" as required under the RFA).

NMFS considered the alternative of designating the entire area meeting the definition of CH. However, as discussed below and in **Section 8** of this report, NMFS has not chosen this alternative due to consideration of national security impacts. An alternative to designating the entire area meeting the definition of CH is the designation of a subset of this area. Through the ESA 4(b)(2) consideration process, NMFS identified and selected an alternative under which a particular area is excluded based on national security impacts after determining that the benefits of exclusion outweigh the conservation benefits to the species, while the remainder of the specific area that contains at least one identified essential feature is designated as CH (see **Section 8**). This alternative results in a CHD that provides for the conservation of the species and is consistent with the ESA and joint NMFS and U. S. Fish and Wildlife Service regulations concerning CH at 50 CFR part 424 while potentially reducing national security impacts. Based on the best information currently available, this alternative would result in minimal impacts to small entities and the economic impacts associated with the CHD would be modest. Analysis of this alternative is described in the preamble to the final rule designating CH for the Arctic ringed seal.

9.2 Statement of Energy Effects

Pursuant to EO 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" (OMB 2001).

OMB (2001) provides guidance for implementing this EO, outlining nine outcomes that may constitute "a significant adverse effect," when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 bpd;
- Reductions in fuel production in excess of 4,000 bpd;
- 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.

9.2.1 Oil and Natural Gas Production

The CHD overlaps with five BOEM planning areas for Outer Continental Shelf oil and gas leasing; however, the Beaufort Sea planning area is the only area with existing leases. Currently, the majority of oil and gas production occurs on land, adjacent to the Beaufort Sea, shoreward of the CH area.

Any proposed offshore oil and gas projects likely undergo an ESA Section 7 consultation to ensure that the project would not likely to destroy or adversely modify designated CH. As discussed in **Section 6** of the RIR for this action, it is unlikely that the CHD will result in additional requests for project modifications above and beyond those that may be requested because of the Arctic ringed seal's ESA-listing status and the requirement that Federal agencies avoid jeopardizing the continued existence of the species. Incremental impacts to the energy industry directly attributable to CHD would most likely be primarily limited to additional administrative costs of addressing CH in ESA Section 7 consultations that would otherwise occur regardless to consider effects on Arctic ringed seals. ESA Section 7 consultations have occurred for numerous oil and gas projects within the area of the CHD (e.g., regarding possible effects on endangered bowhead whales, a species without designated CH), without adversely affecting energy supply, distribution, or use. The same outcome is expected relative to CH for Arctic ringed seals. Therefore, CHD for the Arctic ringed seal is not expected to significantly affect oil and gas production decisions, subsequent oil and gas supply, or the cost of energy production.

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12 Appendix A: Hour and Wage Assumptions Used in the Costs Per Section 7 Consultation Estimates

Table A-1 Hour and Wage Assumptions used in the Estimates of Attributable Administrative Costs Per Section 7 Consultation by Consultation Type.

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

Sources and Notes:

1. Table reproduced from Industrial Economics (2020).
2. Hours and Federal government General Schedule (GS) grade and step level assumptions are based on research conducted by Industrial Economics in 2002 to estimate administrative costs of Section 7 consultations.
3. In the analysis presented in this report, wage rates reflect the Federal Government GS Rates, Office of Personnel Management (2021) (available at https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/) (see Table A-2).

Table A-2 Federal General Schedule (2021) Wage Rates Used in the Estimates of Attributable Administrative Costs Per Section 7 Consultation by Consultation Type.

GS Level	Step 1	Step 10	Midpoint	Midpoint With Overhead
1	$9.46	$11.83	$10.65	$26.61
2	$10.63	$13.38	$12.01	$30.01
3	$11.60	$15.08	$13.34	$33.35
4	$13.03	$16.93	$14.98	$37.45
5	$14.57	$18.95	$16.76	$41.90
6	$16.24	$21.12	$18.68	$46.70
7	$18.05	$23.47	$20.76	$51.90
8	$19.99	$25.99	$22.99	$57.48
9	$22.08	$28.70	$25.39	$63.48
10	$24.32	$31.61	$27.97	$69.91
11	$26.72	$34.73	$30.73	$76.81
12	$32.02	$41.63	$36.83	$92.06
13	$38.08	$49.50	$43.79	$109.48
14	$45.00	$58.49	$51.75	$129.36
15	$52.93	$68.81	$60.87	$152.18

Sources and Notes:

1. Wage rates reflect the Federal Government GS Rates, Office of Personnel Management (2021) (available at https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/).
2. Wages for Federal agencies used in the analysis presented in this report reflect the midpoint between Step 1 and Step 10 within each GS level using the GS hourly rate. Rates are multiplied by 2.5 to account for overhead (Midpoint With Overhead column).
3. Hours and Federal government General Schedule (GS) grade and step level assumptions (see Table A-1) are based on research conducted by Industrial Economics in 2002 to estimate administrative costs of Section 7 consultations.