June 19, 2018

Re: Notice of Intent to Prepare an Environmental Impact Statement for Oil and Gas Leasing in the Coastal Plain, Alaska, 83 Fed. Reg. 17,562–63 (April 20, 2018)

I. Introduction

The Natural Resources Defense Council ("NRDC") files these scoping comments on the Bureau of Land Management's ("BLM") proposal to prepare an environmental impact statement ("EIS") for an oil and gas leasing program (the "Program") in the Coastal Plain of the Arctic National Wildlife Refuge (the "Refuge").[1]

NRDC, with more than three million members and activists, is devoted to the protection of our natural resources and has long been active in matters involving the Refuge.[2] We remain thoroughly opposed to the development of any part of the Refuge, including the Coastal Plain. While current law directs BLM to offer at least two oil and gas leases in the Coastal Plain eventually, we are working to change that law and restore prior protections for the Plain. Filing these comments should not be construed as accepting, let alone endorsing, leasing in the Refuge. Rather, our interest in commenting on this notice is to ensure that prior to any concrete steps in furtherance of leasing, BLM fulfills its statutory and regulatory obligations by completing an EIS that conducts a comprehensive analysis that takes a hard look at the environmental consequences of "implement[ing] an oil and gas leasing program within the area defined as the 'Coastal Plain'"[3] and develops alternatives that maximize protections for the Refuge, the surrounding lands and waters, and the environment more broadly. A legally sufficient EIS will, we expect, demonstrate how much against the public interest leasing within the Refuge would be and will lead Congress to reinstate the prior statutory ban against it.

Many factors, including the pristine nature of the Refuge, its richness in biological resources, its importance to Alaska Natives, the fragility of the Coastal Plain, the ongoing and predicted

[1] 83 Fed. Reg. 17562–63 (April 20, 2018).
[2] *See, e.g.*, NRDC, "The Long, Long Battle for the Arctic National Wildlife Refuge," located at https://www.nrdc.org/stories/long-long-battle-Arctic-national-wildlife-refuge; *see also Natural Resources Defense Council v. Lujan*, 768 F. Supp. 870 (D.D.C. 1991);
State of Alaska v. Jewell, No. 3:14-cv-00048-SLG, 2014 WL 12521321 (D. Alaska June 21, 2014); *id.*, 2015 WL 4464576 (July 21, 2015).
[3] Notice of Intent to Prepare an Environmental Impact Statement for Oil and Gas Leasing in the Coastal Plain, Alaska, 83 Fed. Reg. 17,562 (Apr. 20, 2018).

impacts of climate change on the region, and the difficulty of mitigation and remediation, all combine to make environmental review of potential leasing options extremely challenging. Moreover, the impacts of the leasing program would negatively affect the largest national wildlife refuge in the United States, irreparably harm iconic species of the Arctic such as polar bears, musk oxen, and barren ground caribou, and severely impact the only protected coastline region of the United States Arctic. In preparing an EIS, BLM must firmly bear in mind the conclusion that the Department of the Interior (DOI) reached in 1987: "Oil and gas development would result in long-term changes in the wilderness environment, wildlife habitats, and Native community activities currently existing, resulting instead in an area governed by industrial activities."[4]

Below, we discuss: i) the legal background and requirements of the EIS process; ii) the significance of the Coastal Plain of the Refuge; iii) alternatives that BLM must develop in drafting the EIS; iv) the direct impacts related to oil and gas development that the EIS will need to address; v) the cumulative impacts that the EIS is required to study; and vi) the other impacts and considerations that the EIS will need to analyze.

As these comments demonstrate, BLM faces a difficult task in preparing an EIS for the Coastal Plain. Despite the recent legislation calling for leasing, the Refuge continues to be governed by its original, more protective purposes. BLM is obligated to realize these protective purposes as fully as possible in any management regime it develops. The impacts—direct, indirect, and cumulative—that BLM will need to analyze to adequately understand how to best realize the Refuge's protective purposes are truly vast. Moreover, these difficulties of scope are compounded by similarly large amounts of missing information that BLM is required to develop. Given this constellation of obstacles, rushing an EIS to meet some self-imposed deadline is a pathway to failure. BLM must take the time to engage in a painstaking analysis, subject only to the congressionally imposed deadline.

II. Background

A. The National Environmental Policy Act

The National Environmental Policy Act ("NEPA") has a dual purpose: it serves to inform decision making and disclose information to the public about how a federal action will affect the environment and public health.[5] In assessing the environmental impact of the proposed oil and

[4] U.S. Department of the Interior. April 1987. Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment. Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement (hereinafter, "1987 FLEIS").
[5] *See* 40 C.F.R. § 1500.1(b)–(c); *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371 (1989) ("NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct.").

gas leasing, BLM must consider all of the Program's "[d]irect effects, which are caused by the action and occur at the same time and place" and "[i]ndirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[6] "Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."[7]

In the presence of potentially significant impacts, BLM is obligated to identify means to mitigate the Program's adverse impacts.[8] The Council on Environmental Quality (CEQ) explains this requirement:

> All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies…This will serve to alert agencies or officials who can implement these extra measures, and will encourage them to do so.[9]

The Tax Cuts and Jobs Act of 2017[10] ("2017 Tax Act") is not to the contrary. While that Act expanded the purposes of the Refuge "to provide for an oil and gas program on the Coastal Plain,"[11] it did not otherwise modify the purposes of the Refuge as stated in the Alaska National Interest Lands Conservation Act. Thus, all the protective purposes articulated for the Refuge remain binding on the agency and BLM is obligated to ensure that those purposes are accomplished to the greatest possible extent.

B. The 2017 Tax Act

In relevant part, section 20001(b)(2)(A) of the 2017 Tax Act provides that:

> The Secretary shall establish and administer a competitive oil and gas program for the leasing, development, production, and transportation of oil and gas in and from the Coastal Plain.

However, nothing in the 2017 Tax Act purports to supersede or overrule NEPA. Thus, NEPA applies to the proposed oil and gas leases and the entirety of the Program that is the subject of

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[6] 40 C.F.R. § 1508.8.
[7] *Id.*
[8] *See, e.g.,* 40 C.F.R. § 1502.16.
[9] Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 Fed. Reg. 18026-01, 18031–32 (Mar. 23, 1981).
[10] Pub. L. No. 115-97, 131 Stat. 2054.
[11] 2017 Tax Act § 20001(b)(2)(B)(iii).

these comments. BLM has conceded as much.[12] Nor does the 2017 Tax Act waive or modify any other applicable law, including the Endangered Species Act, the Marine Mammal Protection Act, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, the National Wildlife Refuge Administration Act, the Administrative Procedure Act, and the Alaska National Interest Lands Conservation Act (except as the Tax Act expressly adds to section 303(2)(B) and revokes section 1003), among others, along with their applicable regulations.

C. History and Ecological Significance of the Coastal Plain

The Arctic National Wildlife Refuge, including the Coastal Plain, was first established in 1960. Congress increased the size of the Refuge in 1980 and it became the largest national wildlife refuge in the United States, with the most wilderness acreage. Originally established "[f]or the purpose of preserving unique wildlife, wilderness and recreational values…",[13] the Refuge from 1980 has been, by congressional mandate, managed for additional purposes related to its extraordinary natural values, including:

> (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, the Porcupine caribou herd (including participation in coordinated ecological studies and management of this herd and the Western Arctic caribou herd), polar bears, grizzly bears muskox, Dall sheep, wolves, wolverines, snow geese, peregrine falcons and other migratory birds and Arctic char and grayling; (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats; (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents, and (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.[14]

The Coastal Plain is "the most biologically productive part of the Refuge and contains important habitats for a great diversity and abundance of life."[15] It is the only protected coastline in northern Alaska, home to threatened wildlife species, migratory birds, and internationally significant wildlife migrations.

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[12] Coastal Plain Oil and Gas Leasing Program EIS, https://www.blm.gov/programs/planning-and-nepa/plans-in-development/alaska/coastal-plain-eis (last visited Jun. 18, 2018).
[13] Public Land Order 2214 § 1 (Dec. 6, 1960).
[14] Alaska National Interest Lands Conservation Act of 1980, Pub. L. No. 96-487, § 303(2)(B), 94 Stat. 2371, 2390.
[15] U.S. Department of the Interior. April 2015. Arctic National Wildlife Refuge Comprehensive Conservation Plan. p. H-11; (hereinafter, "2015 Conservation Plan"); *see also* 1987 FLEIS, *supra* note 4.

The mission of the U.S. National Wildlife Refuge System, of which the Coastal Plain is an integral part, is "[t]o administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."[16] The extraction of oil and gas is not part of that mission and is generally barred in refuges.[17]

III. Alternatives

The alternatives analysis is the heart of NEPA review. As the D.C. Circuit recently found,

> NEPA requires a detailed, meaningful alternatives analysis. *See* 42 U.S.C. §§ 4332(C)(iii), (E). The CEQ regulations, in turn, require agencies to "[r]igorously explore and objectively evaluate *all reasonable alternatives,* and for alternatives which were eliminated from detailed study, [to] briefly discuss the reasons for their having been eliminated." 40 C.F.R. § 1502.14(a) (emphasis added).[18]

A. Logistical alternatives

The EIS must analyze multiple alternatives that realize as fully as possible the Refuge's protective purposes by locating and minimizing the impacts of built infrastructure,[19] by restricting activities seasonally, and by including mandatory, non-waivable lease terms. These alternatives also need to reflect the 2017 Tax Act's limitation of the Program's surface footprint to 2,000 acres of the Coastal Plain.[20]

BLM has no grounds to claim that the impacts associated with oil and gas development are unknowable until after lease sales are executed and thus no grounds for avoiding its obligation to consider these logistical alternatives now. The 2017 Tax Act provides that "[e]xcept as otherwise provided in this section, the Secretary shall manage the oil and gas program on the Coastal Plain *in a manner similar to the administration of lease sales under the Naval Petroleum Reserves Production Act of 1976 (42 U.S.C. 6501 et seq.) (including regulations)*."[21] This is a

[16] National Wildlife Refuge System—About: Mission, https://www.fws.gov/refuges/about/mission.html (last visited Jun. 18, 2018).
[17] *See* 43 C.F.R. § 3101.5-1(b).
[18] *Friends of Capital Crescent Trail v. Federal Transit Administration*, 877 F.3d 1051, 1063 (D.C. Cir. 2017).
[19] Including gravel and ice roads, water catchment basins, water storage and treatment facilities, infrastructure such as housing, causeways, terminals, pipelines, pads, airstrips, connector roads, gravel mines, ports, shipping procedures, transfer facilities, and other possible development features.
[20] 2017 Tax Act § 20001(c)(3).
[21] 2017 Tax Act § 20001(b)(3) (emphasis added).

command to use regulations in administering Refuge lease sales, similar to the manner in which the BLM administers the National Petroleum Reserve-Alaska (NPR-A). The regulations governing oil and gas development within that area include detailed rules for infrastructure siting,[22] non-waivable lease terms,[23] and geophysical exploration.[24] Notably, to give effect to the Refuge's (still-binding) more protective purposes, BLM will have to develop more stringent regulations than it currently uses in the NPR-A.

In this environmental review, BLM cannot turn a blind eye to the 2017 Tax Act requirements for how it must manage the Program. The Act's requirements are not only foreseeable, but mandatory. The 2017 Tax Act has predetermined, in part, the activities that BLM will need to regulate. BLM will predictably need to tailor those regulations to effectuate the Refuge's protective purposes. As such, the agency must study alternative regulatory regimes and their differential impacts in the EIS.

B. Cautious development scenarios

Current law requires leasing, but not for four years. Fragility, the inevitability of adverse impacts when exploration and production begin, and the need for intensive study prior to committing resources to inform decision-making,[25] all mandate consideration—and probably adoption—of an alternative that defers leasing until four years from the present.

C. No leasing

The no action alternative is required by NEPA. This analysis provides a baseline against which to measure the potential impacts of leasing alternatives. Additionally, it can inform possible congressional action.[26]

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[22] *See* 43 C.F.R. § 3162.3-1.
[23] *See* 43 C.F.R. § 3131.3.
[24] *See* 43 C.F.R. § 3150 *et seq.*
[25] *See, e.g., infra* Section IV.
[26] *See, e.g.*, Arctic Cultural and Coastal Plain Protection Act, H.R. 5911, 115th Cong. (2018); *see also Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 814 (9th Cir. 1999) (agency should have considered alternative that would have reduced impacts through congressional action); *National Wildlife Federation v. National Marine Fisheries Service*, 235 F. Supp. 2d 1143 (W.D. Wash. 2002) ("An agency's refusal to consider an alternative that would require some action beyond that of its congressional authorization is counter to NEPA's intent to provide options for both agencies and Congress."); *Natural Resources Defense Council v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972) ("The mere fact that an alternative requires legislative implementation does not automatically establish it as beyond the domain of what is required for discussion, particularly since NEPA was intended to provide a basis for consideration and choice by the decisionmakers in the legislative as well as the executive branch.").

IV. Missing Information

BLM is obligated to develop missing information on the topics to be analyzed by the EIS unless the costs are exorbitant or the means to obtain it "are not known."[27] This obligation takes on heightened importance in this context given that current law explicitly requires BLM to implement *all* of the Refuge's purposes and not just the new purpose added by the 2017 Tax Act; BLM is not authorized to pick and choose. As noted herein, BLM is missing critical information that is necessary for drafting the EIS. If BLM proceeds without developing this information—and other missing data that it identifies—any EIS that results will be facially and fatally deficient.

Moreover, there is no basis for BLM to claim that it cannot develop this information. While accurate scientific studies may take time, any desire to rush the EIS prior to a Congressional deadline does not constitute sufficient rationale for failure to develop missing baseline and impact information and would plainly violate the NEPA regulation. Additionally, BLM cannot plausibly claim that the costs of developing this information are exorbitant. The congressionally projected revenue from leasing far exceeds whatever cost this information gathering would incur.[28] The only constraint on BLM's information gathering is contained in the 2017 Tax Act. As long as it remains possible to obtain missing information prior to that congressionally imposed deadline, BLM is obligated to do so.

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[27] *See* 40 C.F.R. § 1502.22. And even if BLM does conclude that the costs are exorbitant or the means of developing the information are not known, it is still obligated to include the following in the EIS:

> (1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

Id.

[28] *See* Congressional Budget Office, A Legislative Proposal Related to the Arctic National Wildlife Refuge 1 (2017) ("CBO estimates that implementing the legislation would increase net offsetting receipts, which are treated as reductions in direct spending, by about $1.1 billion over the 2018- 2027 period.").

V. Direct Impacts

As noted, BLM must consider all of the Program's "[d]irect effects, which are caused by the action and occur at the same time and place."[29] Among others, the EIS must address the impact of oil and gas development on: a) caribou; b) polar bears; c) musk oxen; d) migratory birds; e) vegetation; f) water resources; g) wilderness and Wild and Scenic River values; h) human health; i) fisheries resources; j) permafrost; k) archaeological resources; l) subsistence resources; m) the landscape due to road infrastructure; n) air quality; and o) commercial recreation operations. We discuss each of these areas in more detail below.

A. Caribou

The EIS needs to consider the already demonstrated impact of oil and gas infrastructure and development on the tundra, or barren-ground, caribou (*Rangifer tarandus*), one of the focal wildlife species of the Coastal Plain. The Porcupine Caribou herd ("PCH") (comprising a subspecies referred to as Porcupine or Grant's caribou (*Rangifer tarandus grant*)) is the primary herd to occupy the Coastal Plain and has the longest migration route (over 1500 miles) of any barren-ground caribou herd and any land mammal on earth. The PCH is currently the only caribou herd increasing in numbers. Other barren-ground caribou herds, such as those found in already developed regions of Alaska's coastline, have declined by 90%, including portions of the Central Arctic Herd ("CAH"), which also use the Coastal Plain.

In particular, the EIS must address the recent research illustrating the negative impacts of potential displacement of the PCH by oil and gas leasing development. Recent, long-term investigations on the CAH conclude, contrary to earlier studies, that caribou avoid development areas up to 95% of the time and reduce movements across developed sites by 90%.[30] Similarly, the U.S. Geological Survey has developed modeling scenarios that indicate that "a substantial reduction in calf survival during June would be expected under full development of the 1002 area."[31] This modeling is based on four, well-researched ecological premises: 1) The PCH

[29] 40 C.F.R. § 1508.8.

[30] *See, e.g.*, Vistnes, I. and C. Nellemann. 2008. The matter of spatial and temporal scales: a review of reindeer and caribou response to human activity. Polar Biology 31:399-407; Joly, K., and D. Klein. 2011. Complexity of caribou population dynamics in a changing climate. Alaska Park Science 10:27-31; Wolfe, S., B. Griffith, and C. Wolfe. 2000. Response of reindeer and caribou to human activities. Polar Research 19:63-73. *See also* Russell, Don E.; McNeil, P. 2005. Summer ecology of the Porcupine Caribou Herd. (Report) (2 ed.). Whitehorse, Yukon: Porcupine Caribou Management Board (PCMB). p. 14; Ballard, W.B., M.A. Cronin, and H.A. Whitlaw. 2000. Caribou and Oil Fields, in The Natural History of an Arctic Oil Field. New York, NY: Academic Press. p. 91.

[31] Griffith, B.G., D.C. Douglas, N.E. Walsh, D.D. Young, T.R. McCabe, D.E. Russell, R.G. White, R.D. Cameron, and K.R. Whitten. 2002. Section 3—The Porcupine Caribou Herd, in Douglas, D.C., Reynolds, P.E., and Rhode, E.B., eds., Arctic Refuge coastal plain terrestrial wildlife research summaries: U.S.G.S. Biological Science Report 2002-0001. pp. 8–44.

exhibits low productivity and the lowest capacity for growth among all barren-ground caribou herds; 2) there has been a demonstrated shift away from development areas for calving females in the CAH; 3) the Coastal Plain has a lack of high quality, alternative habitat and in years when caribou do not use the Coastal Plain, their survival decreases; and 4) there is a strong link between calf survival and the free, uninhibited movement of females during calving season. Studies have also shown that the PCH uses the Coastal Plain after calving has been completed.[32] Utilizing this information, the EIS must explain how oil and gas leasing and development impacts to the PCH will be avoided and, where unavoidable, mitigated.

Moreover, BLM's EIS cannot simply use data from earlier studies of the CAH to extrapolate the response of the Coastal Plain caribou herds to oil and gas leasing.[33] First, the PCH is five times larger than the CAH, yet calves in an area 1/5 the size of the CAH. Second, the PCH completes a 1500-mile migration each year from summer to winter grounds (crossing the Brooks Range) while the CAH largely remains year-round in the broader coastal area in the western Arctic and south of the existing oil fields. Third, the size of the Coastal Plain in the Arctic National Wildlife Refuge is much narrower (15 miles wide in places) than caribou habitat in the oil fields to the west (the Prudhoe Bay region is 100 miles wide, the NPR-A is 130 miles wide), providing limited calving ground and habitat for the PCH, highly susceptible across its width from development disturbance anywhere within it. Instead, the EIS must include specific, updated research regarding the impacts to the PCH at all stages of oil and gas development on the Coastal Plain.

Additionally, the EIS will need to develop baseline information about the energetic needs and foraging quality of the PCH. Habitat requirements for the PCH (on an annual basis) as well as the functional groups of habitats that exist on the Coastal Plain and are utilized by the PCH must be collected for the EIS. For example, caribou not only rely on the Coastal Plain for foraging in June during calving season, but utilize the coastline of the Coastal Plain to escape insects that can cause infection and mortality in the herd during the summer months.[34] Impacts from activities offshore and at processing facilities may last throughout the year, and researchers have shown long-lasting impacts to vegetation from winter activities during seismic studies in 1984 and 1985.[35] Such impacts will affect the vegetation and available habitat for the PCH because they disturb the active layer of vegetation, which is dominated by species such as tussock

[32] Pearce, J.M., Flint, P.L., Atwood, T.C., Douglas, D.C., Adams, L.G., Johnson, H.E., Arthur, S.M., and Latty, C.J. 2018. Summary of wildlife-related research on the coastal plain of the Arctic National Wildlife Refuge, Alaska, 2002–17: U.S. Geological Survey Open-File Report 2018–1003. p. 27, https://doi.org/10.3133/ofr20181003.
[33] Griffith et al. 2002, *supra* note 31, at p. 31.
[34] Ballard et al. 2000, *supra* note 30, at p. 91.
[35] *See* Felix, N.A. and Raynolds, M.K. 1989. The effects of winter seismic trails on tundra vegetation in northeastern Alaska, USA. Arctic and Alpine Research 21:188-202.

cottongrass,[36] a primary food source for caribou during calving season. Even though some oil and gas leasing and development activities may be limited seasonally so as to reduce impacts to the Coastal Plain, these studies show that BLM will have to analyze the potential for significant, long-term, year-round disturbance to this sensitive—and largely undisturbed—landscape.[37]

Finally, the EIS must research and analyze the prevalence and abundance of the PCH's predators. This information will inform the impact analysis of oil and gas development on the Coastal Plain's vital role as the birthing grounds for the PCH. Earlier research indicates that the PCH experiences more predation by golden eagles, polar bears, and wolves when they have to shift calving grounds away from the Coastal Plain. However, research on the distribution of predators within the PCH calving grounds on the Coastal Plain has not been updated since 2002 and must be updated for this EIS.[38]

B. Polar Bears

The EIS must explain how impacts to the polar bear (*Ursus maritimus*) will be minimized and mitigated. Since the 1987 FLEIS, polar bears have been listed as threatened under the Endangered Species Act (ESA)[39] and the entire Coastal Plain has been designated as critical habitat for the species. Also post-dating 1987, polar bears' use of terrestrial habitats for maternal denning in the Coastal Plain has increased by over 60% (34.4% utilization in 1985-1995 and 55.2% from 2007-2013).[40] This land-based denning responds to climate change that is reducing sea-ice availability. The Refuge, and in particular the Coastal Plain, has the highest density of polar bear dens of any area along the U.S. Arctic coast.[41]

Polar bears would suffer significant, adverse impacts due to oil and gas development since much activity will occur in winter, which is when polar bears are denning in the areas where exploration and extraction will occur. Research indicates that female polar bears are extremely sensitive to disturbance and will abandon their denning sites and cubs if sufficiently disturbed.[42] To fully address this, the EIS will have to investigate the potential increase in the number of denning sites into the future as sea ice continues to recede, along with potential impacts to the critical habitat that makes up the entire Coastal Plain, including the Native Lands near Kaktovik.

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[36] *Id*.
[37] *See id.*
[38] Pearce et al., 2018, *supra* note 32, at p. 7.
[39] 16 U.S.C. § 1531 *et seq*.
[40] Olson, J.W., Rode, K.D., Smith, T.S., Wilson, R.R., Durner, G.M., Fischbach, A., Atwood, T.C., and Douglas, D.C., 2017. Collar temperature sensor data reveal long-term patterns in southern Beaufort Sea polar bear den distribution on pack ice and land: Marine Ecology Progress Series 564:211–224.
[41] Durner, G.M., Fischbach, A.S., Amstrup, S.C., and Douglas, D.C. 2010. Catalogue of polar bear (*Ursus maritimus*) maternal den locations in the Beaufort Sea and neighboring regions, Alaska, 1910-2010. U.S. Geological Survey Data Series 568. 14 pgs. https://pubs.usgs.gov/ds/568/.
[42] *See* 1987 FLEIS, *supra* note 4.

Beyond impacts related to denning, any modeling of the future viability of polar bears on the Coastal Plain will have to study the increase in bear-human conflict that development brings,[43] and incorporate information on the decline of the Beaufort Sea population of polar bears.[44]

The EIS cannot rely on results from Prudhoe Bay or the western Arctic (NPR-A) in analyzing the impacts to polar bears on the Coastal Plain. These regions are not comparable. Industrial development in the western Arctic has tried to minimize impacts to denning polar bears by avoiding den sites, but the same mitigation tools will not be effective on the Coastal Plain because many more den sites are located on the Plain than in the western Arctic, and, in particular, in the proposed development area. Instead, the EIS must address how industrial developments in the Coastal Plain itself will avoid denning sites without relying on this non-analogous data. The EIS will also need to address mitigation efforts in coordination with the Village of Kaktovik, as a large number of polar bears are active in the village area due in part to the presence of bowhead whale carcasses.

The EIS must also focus on how environmental pollutants affect polar bears. The species may suffer directly from the environmental contaminants that result from oil and gas drilling and transport activities. For instance, because more polar bear dens and activities are concentrated on the Coastal Plain than in other areas of Alaska's Arctic, the EIS needs to analyze oil spill response plans with specific tools for protecting polar bear critical habitat. Oil spills will happen with oil and gas leasing development, and recent activities in the Arctic illustrate that infrastructure does not yet exist to respond correctly to these oil spills and their impacts on the species and environments of the Arctic.[45]

The EIS must also research the impacts of climate change on the future habitat of polar bears, and how oil and gas leasing development will further impact the species' habitat range. Habitat loss for polar bears has been documented across their circumpolar range. This loss is expected to continue under future climate scenarios, with the current, actual loss of sea ice far exceeding the projected rate of loss.[46] This indicates that Arctic sea ice may be completely gone by 2080,

[43] Atwood, T.C., E. Peacock, M. McKinney, D.C. Douglas, K. Lillie, R.R. Wilson, P. Terletzky, and S. Miller. 2016. Rapid environmental change drives increased land use by an Arctic marine predator. PLoS One 11: e0155932.
[44] Bromaghin, J.F., T.L. McDonald, I. Stirling, A.E. Derocher, E.S. Richardson, E.V. Regehr, D.C. Douglas, G.M. Durner, T.C. Atwood, and S.C. Amstrup. 2015. Polar bear population dynamics in the southern Beaufort Sea during a period of sea ice decline. Ecological Applications 25:634−651.
[45] Transportation Research Board and National Research Council. 2014. Responding to Oil Spills in the U.S. Arctic Marine Environment. Washington, DC: The National Academies Press. https://doi.org/10.17226/18625.
[46] Stroeve, J. C., V. Kattsov, A. Barrett, M. Serreze, T. Pavlova, M. Holland, and W. N. Meier. 2012. Trends in Arctic sea ice extent from CMIP5, CMIP3 and observations. Geophysical Research Letters 39:L16502.

which will cause a significant loss of habitat for polar bears, increasing their reliance on onshore habitats.

C. Musk Oxen

The EIS needs to examine the impact of oil and gas development on musk oxen, who are year-round residents of the Coastal Plain. The Refuge is home to the largest population of musk oxen, and the Coastal Plain is the center of their core habitat area. Musk oxen are also in decline on the Coastal Plain, which has been attributed to increased predation by grizzly bears, as well as potential predation by polar bears.[47]

Oil and gas leasing and development activities will cause significant harm to the habitats utilized by musk oxen because such activities will use the riparian zones frequented by the oxen year-round.[48] Similarly, previous studies indicate musk oxen are vulnerable to even mild disturbances, particularly in large groups. Large groups of musk oxen remain on the Coastal Plain throughout the winter, and are trying to conserve as much energy as possible. Due to the stress that development can put on these animals, previous studies indicate a need for minimizing or preventing disturbance of musk oxen with any development on the Coastal Plain.

To fully analyze these impacts and others, the EIS must: i) address the current status of musk oxen on the coastal plain in terms of seasonal and year-round habitat distributions; ii) explain the mitigation efforts to reduce or prevent development in the riparian zones most commonly utilized by musk oxen in all seasons; iii) describe a plan for minimizing harm to the species and their habitats since they are currently in decline; and iv) focus research on predation of musk oxen by grizzly bears and polar bears, and changes to predation events as the climate continues to warm.

D. Migratory birds

The EIS needs to consider the impacts of oil and gas leasing and development on the more than 57 species of migratory birds that occur as breeding, non-breeding, or both, within the Coastal Plain. For example, one of the species, the snow goose (*Chen caerulescens)*, uses the Coastal Plain as an autumn staging area, and requires available wetland habitat for foraging and other activities prior to fall migration. Snow geese are sensitive to aircraft, which are expected to increase with new technological advances in the development of oil and gas resources on the Coastal Plain. Moreover, the mitigation measures explained in the 1987 FLEIS for snow geese

[47] Berger, J. 2017. Scientist at work: Tracking muskoxen in a warming Arctic. The Conversation. https://theconversation.com/scientist-at-work-tracking-muskoxen-in-a-warming-Arctic-70378 (accessed May 19, 2018).
[48] Pearce et al., 2018, *supra* note 32, at p. 60.

are most likely not possible under new technologies.[49] Therefore, impacts to snow geese may be larger than originally assumed, and this must be specifically addressed in the EIS.

To provide another example, greater white-fronted geese (*Anser albifrons*) ("GWFG") breed and spend their summers on the Coastal Plain, concentrating in wetland regions. Oil and gas leasing and development will bring changes to these wetland areas from the necessary use of for water resources, which will impair the breeding and nesting habitats of the GWFG. They are loyal to breeding and molting sites, and many of these sites are destroyed with all-weather roads and other extraction activities.[50] Oil spills and toxin contamination associated with oil and gas development will also have significant adverse impacts on this species.[51]

Additionally, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are both present on the Coastal Plain. Bald eagles are occasional visitors that breed on the south side of the Brooks Range. Golden eagles are common visitors and nest on the Coastal Plain. Golden eagle nest sites were monitored in 2002 for predation studies related to the PCH, but no recent information about nesting sites for golden eagles exists.[52] Nesting adults seek habitat in the foothills region of the Coastal Plain, and subadult birds are primarily associated with the distribution of caribou calving areas on the Coastal Plain. If the PCH and the CAH on the Coastal Plain are impacted by oil and gas leasing and development, it is likely that the distribution of golden eagles will also shift in parallel with caribou movements. Non-territorial golden eagles are particularly vulnerable to habitat alterations and may exhibit reduced success due to changes in food availability and disturbance to nesting sites.[53]

More broadly, threatened species of migratory birds pose a significant challenge for development, and mitigating habitat disturbance for these species is an ESA requirement that needs to be addressed in the EIS. For instance, the spectacled eider (*Somateria fischeri*) is a rare breeder on the Coastal Plain, and Steller's eider (*Polysticta stelleri*) is an uncommon visitor on

[49] Corn, M.L. 2003. Arctic National Wildlife Refuge: Background and Issues. Congressional Research Service. p. 81.
[50] Liebezeit, J., S. Kendall, S. Brown, C. Johnson, P. Martin, T. McDonald, D. Payer, C. Rea, A. Streever, A. Wildman, and S. Zack. 2009. Influence of human development and predators on nest survival of tundra birds, Arctic Coastal Plain, Alaska. Ecological Applications 19:1628-1644.
[51] Schoen, J. and S. Senner, eds. 2002. Alaska's Western Arctic: A summary and synthesis of resources. Audubon Alaska. Anchorage, Alaska.
[52] Young, D.D., T.R. McCabe, R. Ambrose, G.W. Garner, G. J. Weiler, H.V. Reynolds, M.S. Udevitz, D.J. Reed, and B. Griffith. 2002. Section 6—Predators, *in* Douglas, D.C., Reynolds, P.E., and Rhode, E.B., eds., Arctic Refuge coastal plain terrestrial wildlife research summaries: USGS Biological Science Report 2002-0001. pp. 51-53.
[53] McIntyre, C.L. and S.B. Lewis. 2018. Statewide movements of non-territorial golden eagles in Alaska during the breeding season: Information for developing effective conservation plans. Alaska Park Science 17: 65-74.

the Coastal Plain. Both species' populations are in decline, and they were not listed during the earlier EIS process, so the new EIS will have to consider adequate protections for these species.

Recent research about how to mitigate the impacts of oil and gas leasing and development on migratory bird habitat must also be included in the EIS. Habitat on the Coastal Plain plays a key role for 14 shorebird species (~230,000 birds) that occupy the Coastal Plain during the breeding season. Habitat suitability analyses suggest that the second most productive wetlands for these species are in the Coastal Plain (exceeded only by the NPR-A), illustrating its significance for biological diversity in the region.[54] These birds may also reuse nests year after year, requiring special mitigation efforts.

Additionally, the EIS must update cumulative surveys regarding the impact of potential port sites on species of migratory birds. Earlier attempts to open the Coastal Plain to oil and gas leasing and development required such surveys for all species of migratory birds and the impacts to these species from potential port sites.[55] The information from these 30-year-old surveys is dated, however, and not representative of either the current species compositions or future impacts to the migratory species with climate changes in the region.

E. Vegetation

The EIS must address potential impacts to the plant species that make their home on the Coastal Plain, their habitats and ecological zones, and how impacts to those species may then impact caribou, musk oxen, migratory bird species, fish, and other wildlife that depend on those plant species for seasonal or year-round sustenance. The ecological importance of the Coastal Plain cannot be overstated. While the area represents only 10% of the total Refuge acreage, it includes almost 100% of the Refuge's coastal plain and Arctic foothills ecological zones, with specialized plant and animal species that rely on the integrity of these landscapes for portions of their life cycles. The Coastal Plain also represents the only protected portion of these ecological systems within Alaska. Because of the compact size and proximity of the Coastal Plain to upland regions and foothills, it has the greatest plant and animal diversity of any other similarly sized region on Alaska's North Slope. The coastal plain and Arctic foothills ecological zones are characterized by plant species that are selected for extreme Arctic environments and specially adapted to the landscape.

[54] Saalfeld, S.T., R.B. Lanctot, S.C. Brown, D.T. Saalfeld, J.A. Johnson, B.A. Andres, and J.R. Bart. 2013. Predicting breeding shorebird distributions on the Arctic coastal plain of Alaska. Ecosphere 4:1-17. http://dx.doi.org/10.1890/ES12-00292.1.

[55] Willms, M.A., and D.W. Crowley. 1988. Migratory bird use of potential port sites on the Beaufort Sea coast of the Arctic National Wildlife Refuge. U.S. Fish and Wildlife Service Report. 30 pgs.

The EIS must also address the impacts to vegetation that may change the current species composition (such as loss of water). For example, the Coastal Plain remains an important baseline in documenting climate change in the Arctic. According to the FLEIS, 99% of the Coastal Plain is classified as wetlands, which means much of the land is covered by shallow water. In the Arctic, these wetlands are located on top of the permafrost layer, which impedes drainage, but also creates a thin layer of water, rock and soil where most biological productivity in the Plain occurs.[56] Micro-organisms and plant roots grow in these wetlands, producing the sedges, shrubs, and small trees (located in foothills and uplands) that are required by all fish and wildlife species of the Coastal Plain. The predominant vegetation classes and their plants are sensitive to small climatic changes, as well as changes in moisture content and soil disturbance. Climate change is causing a shift from plant communities dominated by graminoids (grasses), sedge-dryas, lichen and forbs to deciduous shrubs. However, the Coastal Plain remains one area of the Alaska Arctic where these climatic changes are minimized.[57] If the current species composition were to change due to oil and gas development, then the Coastal Plain will no longer play a role as a source of baseline data.

Additionally, invasive plant species due to development have been documented in other areas of Alaska's Arctic, including other oil and gas developments. However, there are currently few signs of invasive plant species in the Coastal Plain. The EIS must clearly explain how oil and gas leasing and development will protect the native plant species of the Coastal Plain from invasive species that may be introduced into the region with development activities, particularly roads, equipment, and human habitation.

F. Water Resources

The EIS needs to address the limited water resources in the Coastal Plain, and the impacts of oil and gas leasing and development on these water resources. The 1987 FLEIS identified the use of water resources for oil and gas leasing and development on the Coastal Plain as having the potential for major adverse effects on the water resources of the region. Unlike the western Arctic oilfields of Prudhoe Bay and the NPR-A, water is much more limited in the drier, eastern Arctic. The Coastal Plain is a desert landscape, receiving less than 6 inches of rain each year. Of the 225 lakes, ponds and puddles within the Coastal Plain, less than 25% are more than 7 feet deep, and only 8 of the lakes have enough water to build or support a mile or more of ice road.[58] Oil and gas development will have highly concentrated impacts on these lakes. For instance, one exploratory well can use 15 million gallons of water, even when using current technologies.[59] At

[56] 1987 FLEIS, *supra* note 4, at p. 13.
[57] Jorgenson, J.C., M.K. Raynolds, J.H. Reynolds, A.M. Benson. 2015. Twenty-five year record of changes in plant cover on tundra of Northeastern Alaska. BioOne 47:785-806.
[58] Gibbs, W. 2001. The Arctic Oil and Wildlife Refuge. Scientific American 284:62-69.
[59] Corn, M.L., 2003, *supra* note 49, at p. 69.

least part of the leasing EIS must include a detailed explanation of where water is going to come from and proof that there are adequate water resources for development as well as for wildlife and recreational needs, which remain foundational purposes of the Refuge. Additionally, given the relative absence of surface water on the Coastal Plain and the related need to use water from other sources, the EIS must address all potential activities that may be used to sequester water, including: water reservoirs, truck-transported water, and excavating for deep pools and ponds.

G. Wilderness and Wild and Scenic River Values

The EIS needs to address impacts to the wilderness character of the landscape. Wilderness is one of the original motivations for creating the Refuge and the Coastal Plain is currently designated a Wilderness Study Area (WSA). The Arctic Refuge Wilderness Review includes the entire Coastal Plain.[60] The Coastal Plain WSA is "exemplary in the degree to which [it] meet[s] Wilderness Act criteria."[61] 1,607,433 acres of the Coastal Plain (8% of the Arctic National Wildlife Refuge) is "highly suitable for wilderness designation"[62] and, according to the 2010 CCP, "preliminarily recommended for wilderness designation."[63] The language in the 2017 Tax Act is in conflict with this finding, and will cause oil and gas leasing activities to take place adjacent to designated wilderness, and within recommended wilderness. The EIS must specifically and in detail explain steps that BLM will take to protect the wilderness qualities and characteristics of this region while trying to undertake oil and gas leasing activities. Moreover, it is not sufficient for the EIS to simply state that oil and gas leasing will be done so as to minimize the impacts to wilderness. Prior research has shown that oil and gas leasing activities cannot coexist with wilderness protections and the EIS needs to substantively address this core problem.[64]

The EIS also needs to address impacts to the suitability of the Coastal Plain for Wild and Scenic River status. In 2011, the U.S. Fish and Wildlife Service completed a Wild and Scenic Rivers Suitability report for the Coastal Plain under 1968 National Wild and Scenic Rivers Act ("WSRA").[65] Of the six major rivers to flow through the Coastal Plain, four—the Canning, the Hulahula, the Okpilak, and the Jago—were found to have outstanding remarkable values ("ORVs") under the WSRA.[66] Of these, the Hulahula River was found to be suitable for

[60] 2015 Conservation Plan, *supra* note 15, at p. H-30.
[61] *Id.* at p. H-12.
[62] *Id*. at p. H-30.
[63] *Id.*
[64] 1987 FLEIS, *supra* note 4, at p. 164–65.
[65] 16 U.S.C. §§ 1271-1287.
[66] U.S. Department of Interior and U.S. Fish and Wildlife Service. 2011 Wild and Scenic River Eligibility Report-Arctic National Wildlife Refuge. ELIG-14.

designation as a "wild" river under WSRA.[67] Moreover, even though the other three rivers were not found suitable, the WSRA still provides guidelines for protecting the ORVs found for each of these rivers.[68] The ORVs for all of those four rivers would be directly threatened by any oil and gas leasing and development activities along these river corridors and at the mouths of each of these rivers.

H. Human health

NEPA requires agencies to fully consider the potential human health impacts that may be caused by any decision.[69] To fully consider human health impacts in accordance with the spirit and the letter of NEPA, the BLM must conduct a health impact assessment ("HIA") or an equivalent process that identifies and estimates the significant changes of leasing-related actions on the health of the local population, allows the public to fully understand the costs and benefits of different alternatives, and results in aggressive, mandatory mitigation.

In its NEPA review for the 2012 management plan covering leasing in the NPR-A, BLM utilized an HIA process. The HIA resulted from regional residents' concerns about "the potential impacts of regional industrial expansion on their health and culture."[70] During this review, BLM worked with local communities, tribal interests, health experts, and the U.S. Environmental Protection Agency ("EPA") to consider potential health impacts from new onshore federal oil and gas exploration and development as well as mitigation options. The agency erroneously limited its inquiry to impacts from just NPR-A development, but did consider the effects on communities across the North Slope, from Point Hope to Kaktovik and inland as far as Anaktuvuk Pass.[71]

In the NPR-A assessment, BLM was utilizing an approach recommended by the EPA, the U.S. Department of Health and Human Services, and other government authorities to assess

[67] *Id.* at p. 1 (noting that rivers found suitable "suitable be managed to maintain their free flow, water quality, ORVs, and preliminary or recommended classification" and that "[a]ny suitable rivers that are recommended for inclusion in the National Wild and Scenic River System (NWSRS) would be managed according to interim management prescriptions intended to protect the river's qualities until congressional action regarding designation is taken").
[68] *Id.* at p. 2 (noting that "[r]efuge rivers found suitable but not recommended for inclusion in the NWSRS would also receive additional management protection").
[69] 42 U.S.C. § 4331; 40 C.F.R. 1508.27(b)2; 40 CFR 1500.2(f)
[70] Wernham, Aaron. 2007. Inupiat Health and Proposed Alaskan Oil Development: Results of the First Integrated Health Impact Assessment/Environmental Impact Statement for Proposed Oil Development on Alaska's North Slope. *EcoHealth* 4:500. Available at: https://doi.org/10.1007/s10393-007-0132-2.
[71] BLM. 2012. Integrated Activity Plan and Final Environmental Impact Statement for the National Petroleum Reserve in Alaska (hereinafter, "NPR-A FEIS"). vol. 1, p. 490.

community health impacts.[72] HIAs are also accepted by the International Petroleum Industry Environmental Conservation Association and the International Association of Oil & Gas Producers. These industry groups, in their guide on HIAs, list advantages including maximizing the benefits for local communities, limiting potential impacts, preventing project delays by anticipating and incorporating stakeholder concerns, clarifying the potential elements of project trade-offs, allowing a clearer analysis of potential mitigation strategies, identifying factors that might not otherwise have been adequately addressed, contributing to the overall health system in an area, and making project decisions process more transparent for stakeholders.[73]

The best available peer-reviewed science makes clear that oil and gas development comes with significant human health impacts. An overview of peer-reviewed scientific literature from 2009–2015 as it relates to the potential impacts of unconventional natural gas development on public health, water quality, and air quality found that at least 685 papers were published in peer-reviewed scientific journals. Of those, "84% of public health studies contain findings that indicate public health hazards, elevated risks, or adverse health outcomes; 69% of water quality studies contain findings that indicate potential, positive [*i.e.* affirmative] association, or actual incidence of water contamination; and 87% of air quality studies contain findings that indicate elevated air pollutant emissions and/or atmospheric concentrations."[74]

Oil and gas development generates toxic air emissions, creates large quantities of toxic waste, and presents a range of significant threats to public health and safety. Such development involves multiple sources of pollutants and disturbance caused by connected actions, including the operation of wellpads, trucks, roads, wells, compressors, pipelines, tanks, pits, separators, dehydrators, rigs, and more. It may create health impacts from air pollution, water contamination, soil contamination, or a combination of all three. Oil and gas development also includes hundreds of potential pollutants, both man-made and naturally occurring, many of which are either emitted or injected into the environment, or both. When considered together, pollutants with common timing and/or common geography may create additional, synergistic health impacts that have to be assessed and addressed. Also, oil and gas development may take place in areas that are experiencing health impacts from other oil and gas projects with regional

[72] *See, e.g.*, Pope, S.J. et al. 2016. The Health Impact Assessment (HIA) Resource and Tool Compilation: A Comprehensive Toolkit for New and Experienced HIA Practitioners in the U.S. Washington, DC. EPA/600/R-15/330. Available at: https://cfpub.epa.gov/si/si_public_record_report.cfm?direntryid=334197.

[73] International Petroleum Industry Environmental Conservation Association/International Association of Oil & Gas Producers, 2016. Health Impact Assessment: A Guide for the Oil and Gas Industry. Available at: http://www.ipieca.org/news/ipieca-iogp-launches-the-revised-health-impact-assessment-guide/.

[74] Hays, J. and S.B.C. Shonkoff. 2016. Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015," PLoS One, 11(4):e0154164. Available at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154164.

implications, or from other activities in the area that present health threats to the same communities.

The BLM must fully consider all of these impacts to meet requirements of NEPA and to appropriately assess health impacts and inform the public. The BLM must assess this information for people who live or spend significant time within the affected environment. The alternatives analysis must also include discussion of specific actions—including leasing stipulations enforceable by the public and amendable as needed to account for emerging information—that will be taken to reduce or mitigate all potentially significant health impacts greatly, and the costs and benefits associated with different alternative approaches to protecting human health. Further, due to the multiple variables and factors involved in oil and gas development, it is essential that the BLM ensure a health impact assessment that fully considers all cumulative impacts, as required by federal regulations.

Additionally, it is not enough for BLM to simply list the harms that oil and gas development can cause to humans. Instead, the EIS must analyze impacts in the context of the most recent and relevant regional demographic and health data. BLM must also develop missing significant information that bears on whether and how to allow or restrict various exploratory and development techniques, if it can do so consistent with Tax Act timelines.

Of special relevance are data about particularly vulnerable population segments. In 2012, the BLM found that the majority of residents in North Slope Borough communities were Iñupiat or Native Alaskan. The population was very young, with a median age between 20 and 25 years old and children comprising 34 percent of the population.[75] Well-established science shows that children are more vulnerable than adults to environmental health risks due to a number of factors. According to the World Health Organization, children breathe more air, consume more food, and drink more water than adults do in proportion to their weight. In addition, "children's central nervous, immune, reproductive, and digestive systems are still developing. At certain early stages of development, exposure to environmental toxicants can lead to irreversible damage."[76]

People who are already ill can be more vulnerable to health risks, including environmental health risks. BLM found that North Slope Borough residents reported poorer overall health than those of Alaska as a whole.[77] For example, chronic lower respiratory disease was one of the most frequently cited health concerns among North Slope Borough residents.[78] Northern Alaska is

[75] NPR-A FEIS, *supra* note 71, at p. 490.
[76] World Health Organization. 2018. Children's Environmental Health: Environmental Risks. Available at: http://www.who.int/ceh/risks/en/.
[77] NRP-A FEIS, *supra* note 71, at p. 491
[78] *Id.* at p. 493.

already facing significant air quality challenges. Research has found that onshore operations including oil and gas drilling and production are the dominant source of various air pollutant levels in the region, including toxic air pollution,[79] and that the pollution can reach levels found in major urban areas.[80] Another study found that Prudhoe Bay operations are a significant source of air pollution in Utqiagvik (formerly Barrow).[81] The BLM must closely analyze demographic data in the region in order to fulfill its responsibility to assess all potential impacts, including cumulative impacts, the costs and benefits of each alternative, and options for mitigation strategies.

I. Fisheries resources

The EIS must consider the impact of oil and gas development on fish species living on the Coastal Plain. That region is home to over 22 species of both freshwater and anadromous fish.[82] Arctic grayling and Dolly Varden (Arctic char) are the primary sport fish and subsistence species on the Coastal Plain. Smaller species, such as stickleback, are present in high numbers and represent the food supply for these larger species. In its current state, the Coastal Plain represents one of the most intact fisheries along the U.S. Arctic coastline.

Oil and gas leasing and development will impact the fisheries resources on the Coastal Plain. Development structures such as gravel docks and causeways will impede free migration movements up and down waterways. Spawning habitats will be degraded with increased erosion of streams and rivers, sedimentation, and water draw-down from lakes and river systems for the construction of ice roads and for processing activities.

Moreover, such impacts cannot be well-mitigated if they are permitted to occur. Development at the most environmentally-sensitive Alpine facility has proven that protecting native habitat for fish species is difficult, returning to original habitat requirements is impossible, and meeting even the most lenient requirements for permits associated with protecting freshwater resources is deeply problematic.[83] Additionally, oil and gas leasing and development activities on the North

[79] US Department of the Interior and Eastern Research Group, Inc. 2014. Arctic Air Quality Modeling Study: Emissions Inventory – Final Task Report. BOEM 2014-1001. Available at: https://www.boem.gov/uploadedFiles/BOEM/BOEM_Newsroom/Library/Publications/2014-1001.pdf.
[80] Rosen, Yereth, What Tiny Particles Blowing in North Slope Air Tell Us about Oil-Field Pollution. Anchorage Daily News, April 9, 2017, https://www.adn.com/arctic/2017/04/09/what-tiny-particles-blowing-in-north-slope-air-tell-us-about-oil-field-pollution-impacts/#7404.
[81] Kolesar, K.R. et al. 2017. Effect of Prudhoe Bay emissions on atmospheric aerosol growth events observed in Utqiaġvik (Barrow), Alaska. Atmospheric Environment, ol. 152, pp. 146-155. Available at: https://www.sciencedirect.com/science/article/pii/S1352231016309785.
[82] US Fish and Wildlife Service. 2008. Alaska Fisheries Technical Report Number 101. 47 pp. (hereinafter, "Technical Report 101").
[83] National Research Council (NRC). 2003. Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. National Academies Press, Washington, D.C. p. 92.

Slope cannot avoid spills and leakage, which will kill and reduce the growth of fish populations.[84]

The EIS needs to give particular attention to impacts on the Arctic char (*Salvelinus alpinus*), one of the most sensitive fish species in the Refuge. This species relies on pristine wintering habitats in springs that remain unfrozen across the Coastal Plain, where they will remain exposed to the direct activities of oil and gas leasing and development throughout the winter, isolated by ice for up to eight months of the year. BLM must thoroughly study how best to ensure protection of all waterways where these fish are present, particularly since they will be impacted by activities in all seasons. Data collection must include a thorough inventory of all of these water resources, fish species, and a plan to protect these habitats from degradation since they currently represent a healthy ecosystem. Further, BLM's study of impacts on the fisheries resources must consider the cumulative impacts of oil and gas leasing and development on the Coastal Plain in reference to the larger region of the Arctic.[85]

The EIS will also need to take into consideration the cumulative impacts on fish species that stem from the interplay among water, terrestrial habitats, and resource needs. For example, nearshore facilities will deposit warm water into marine environments, which disrupt fish movement patterns.[86] This will prevent fish from migrating to headwaters at the appropriate time of year and can cause population crashes. Similarly, water withdrawal, changes in drainage patterns, and contamination all contribute to changes in water flow in lakes and streams, which can negatively impact fish survival. Specific issues that the EIS needs to address include: 1) any changes to circulation and hydrography that will impact migrating fish species; 2) direct impacts on migration corridors for fish species (between marine/freshwater, and also between different bodies of freshwater); 3) changes in temperature, salinity, turbidity in nearshore terrestrial, marine, and freshwater environments where native fish species are present; and, 4) impacts to the subsistence and recreational fisheries due to development activities and remediation for these subsistence and recreational impacts.[87]

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[84] U.S. Department of the Interior—Marine Management Service, Outer Continental Shelf Oil and Gas Leasing Program: 1997-2002, Final Environmental Impact Statement, Volume I (1996); Peterson, C.H. 2001. The "Exxon Valdez" oil spill in Alaska: Acute, indirect and chronic effects on the ecosystem. Advances in Marine Biology 39:1-103.

[85] *See* Technical Report 101, *supra* note 82, at p. 46 ("Major changes in coastal development, fishing effort, or harvest methods, however, should be carefully considered, as these may alter what appears to be a sustainable system.").

[86] Hachmeister, L.E., D.R. Glass, and T.C. Cannon. 1991. Effects of solid-fill gravel causeways on the coastal central Beaufort Sea environment, in Shelf, C.S. Benner and R.W. Middleton, eds., Fisheries and Oil Development on the Continental American Fisheries Society Symposium 11. pp. 81–96.

[87] In addition to researching each of these categories, it will be important to look exclusively at the Beaufort Sea region, and not simply to deduce impacts from studies in the NPR-A because the systems and subsequent impacts will be different. The currents and the ways in which these fish species use the two regions are extremely different. NRC, 2003, *supra* note 83, at p. 129.

J. Permafrost

The EIS must also address the substantial and permanent impacts oil and gas leasing will have on the Coastal Plain's permafrost, the layer upon which the myriad ecosystems and natural communities of the Arctic Coastal Plain exist. The entire Coastal Plain is underlain by permafrost with varying thickness depending on location and other groundwater resources. Recent studies illustrate direct and cumulative impacts to permafrost degradation due to oil and gas development in Arctic environments. Moreover, oil and gas development exacerbates the impacts on permafrost caused by climate change associated with other anthropogenic activities.[88] Specifically, gravel roads, oil wells, pipelines, annular thawing, and fluid withdrawal can all compromise the permafrost layer and accelerate localized warming, creating dust, warmer subsurface temperatures, and thermokarst areas that perpetuate additional warming and increase the footprint of an impacted site.[89]

Analyzing the impact of oil and gas development on the presence and character of permafrost on the Coastal Plain will require careful evaluation of oil and gas development techniques. Any disturbance to the active layer—the surface layer in which plants grow above the permafrost—can impact the nature of this layer and compromise the fragile plant communities of the Coastal Plain. Down-hole injection, for example, is used to alleviate impacts of superficial waste disposal, but actually accelerates permafrost warming and melting.[90] At a minimum, the EIS must address how waste disposal practices can avoid degrading permafrost resources, along with groundwater resources that are inextricably linked to the permafrost layer. This should be done through routine soil profiles and monitoring stations established prior to any oil and gas leasing or development activities to establish baseline information.

Additionally, BLM cannot address the impacts to permafrost simply by using data collected from the NPR-A. The thickness of permafrost varies greatly across the North Slope of Alaska, with the permafrost layer being much thicker in some areas of the NPR-A than in the Coastal Plain.[91] Given that the Coastal Plain has a much thinner layer of permafrost, development impacts will be more magnified than in the NPR-A, and therefore BLM needs to consider these impacts—and how to mitigate them—independently of the NPR-A processes. As a necessary corollary to the foregoing, the EIS must also consider the impacts of melting permafrost on subsequent impacts to infrastructure and other development activities.

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[88] Yu, Q., HE Epstein, R. Engstrom, N. Shiklomanov, and D. Strelestskiy. 2015. Land cover and land use changes in the oil and gas regions of Northwestern Siberia under changing climatic conditions. Environmental Research Letters 10:124020.
[89] NRC, 2003, *supra* note 83, at p. 70.
[90] *Id*. at p. 72.
[91] 1987 FLEIS, *supra* note 4, at p. 11.

K. Archeological resources

The EIS will need to consider the impact of oil and gas development on the archaeological resources of the Coastal Plain. Humans have occupied the Coastal Plain for an estimated 10,000 years and over 100 sites are known in the region, creating a rich diversity of archeological and historical resources present on the Coastal Plain. Such resources include prehistoric tent sites, caribou hunting tools such as corrals, cemeteries, and other ceremonial locations, and more recent structures such as cabins and camps. Semi-subterranean driftwood or whalebone houses are also present, and many of these tend to occur in clusters.[92] These sites are not confined to one part of the Coastal Plain and can occur almost anywhere, such as riparian areas, along the coastline, and in the foothills.

Oil and gas leasing and development projections from earlier studies indicate potential conflict between development and these archeological sites, particularly at Potok and Camden Bay.[93] In order to properly consider the impact of development, accurate surveys of archeological sites should be conducted with the understanding that finding these cultural resources should require cessation of development activities in those locations.[94]

L. Subsistence resources

The EIS must address the impact of oil and gas development on the cultural resources of the Coastal Plain, including, in particular, subsistence uses. Such use spans many centuries for Native Alaskans in the region, and extends to additional Indigenous populations in adjacent Canadian provinces. As the 1987 FLEIS recognized,

> subsistence activities have served as an anchor for Native cultures in these times of change and will continue to do so as long as adequate resources are available. The ability of the villagers to maintain their present way of life in combination with a mixed cash/subsistence economy will depend on several factors, among them the manner in which resources are developed; regional, local and individual efforts to manage sociocultural impacts; and the health of subsistence resources.[95]

The 1987 FLEIS further recognized that "a major restriction in subsistence activities"[96] would occur should oil and gas leasing and development occur on the Coastal Plain.

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[92] 2015 Conservation Plan, *supra* note 15, at p. 4-132.
[93] 1987 FLEIS, *supra* note 4, at p. 45.
[94] *Id.* at p. 143.
[95] *Id.* at p. 36.
[96] *Id.* at p. VII.

The impacts to subsistence use of the Coastal Plain are inextricably linked to the harm that will substantially impact specific resources, such as Sadlerochit Spring—a warm spring that provides year-round habitat for freshwater fish species, other riparian wildlife species, and is also a favorite traditional use area by residents of Kaktovik.[97] In order to properly identify and address impacts such as this, BLM needs to collect thorough subsistence information from all populations of individuals who utilize the Coastal Plain as part of their analysis of impacts to subsistence use. It is not sufficient to focus only on one particular group of people and such analysis needs to include the subsistence use of resources by people outside of the Coastal Plain who rely on wildlife that utilize the Coastal Plain.[98]

Additionally, subsistence use of resources extends across multiple species and habitats of the Coastal Plain, including rodents (such as ground squirrels), marine mammals, caribou, musk oxen, wolves, moose, and many other species.[99] Given this breadth, an accurate analysis of potential harm to subsistence resources needs to include an updated survey of the numbers of each of these species and projections of species population viability in the face of oil and gas development, including the cumulative impacts that will result from decades of habitat degradation before, during, and after these activities conclude.

M. Extraction of water, gravel, and rock for road infrastructure

The EIS also needs to address the impacts of localized resource extraction for road construction. Gravel road construction and supporting infrastructure will create irreparable damages to the pristine Coastal Plain. Gravel will be extracted from open pit mines with overburden piles.[100] Impoundments will be placed throughout the areas adjacent to roads, and are avoided by most nesting birds during the breeding season on the Arctic coast.[101] Roads will create late snowmelt on their compacted surfaces, gravel spray, dust and noise, contaminants from dust, and road oiling. Road dust, in particular, impacts local vegetation, especially bryophytes,[102] which are species of mosses and lichens that provide the nutritional basis for much of the plant material consumed by the larger species of the Coastal Plain, such as caribou and polar bears. Gravel spills from inadequately placed culverts can reduce or eliminate vegetation habitats in a given area. Gravel roads will also have severe impacts on permafrost on the Coastal Plain—because permafrost is susceptible to small temperature changes, even small, localized activities can have

[97] *Id.* at p. 20.
[98] This includes, for example, all villages of the Gwich'in people who regularly hunt caribou from the PCH, even though they do not hunt the caribou while the animals are located on the Coastal Plain. *Id.* at p. 40.
[99] *See, e.g., id.* at p. 30.
[100] Meehan, R. 1988. Oil development in Northern Alaska: A guide to the effects of gravel placement on wetlands and waterbirds. U.S. Fish and Wildlife Service, Anchorage, Alaska. p. 37.
[101] *Id.* at p. 38.
[102] *Id.* at p. 39.

dramatic effects on the permafrost layer across an entire region.[103] As permafrost is compacted during road construction, vehicle traffic, and rolligon use, its temperature warms and creates thermokarst, which replaces the permafrost with standing water. The pools of standing water will accelerate the melting of additional adjacent permafrost, which can expand the area of impact dramatically on the Coastal Plain, increasing the overall footprint of development activities.

Although vegetation can return to these areas if contaminants are not present, it has been shown that the returning vegetation is a sparse representation of the former habitat, not providing the full species composition of the undisturbed, natural landscape that was found in the area prior to development. In short, "the placement of gravel fill for roads or pads is a permanent, dramatic environmental change."[104]

N. Air Quality

Oil and gas operations come with a suite of air quality issues, including increased emissions of NOx (oxides of nitrogen), SOx (oxides of sulfur), and methane, a potent greenhouse gas. Fugitive emissions of methane have plagued the oil and gas industry for years and can be expected to exist when the Program is operational. These pollutants have caused human health and other problems elsewhere in Alaska, and the EIS must analyze these impacts and propose mitigation strategies.[105]

O. Effects on tour operators and other recreational business interests

The EIS must also consider the impacts of oil and gas development on the recreation industry. Visitors to the Coastal Plain use the region for many different activities spanning all seasons of the year. Such uses of the Coastal Plain are well-established, historical uses of the region, and are also compatible with the mission and original purpose of the Refuge. These activities include kayaking, packrafting, camping, hunting, fishing, wildlife viewing, and photography.[106] For example, recent local business growth in Kaktovik has started to rely specifically on wildlife species (in this case, polar bears) as the engine for their entire business. More broadly, recreational and commercial use of the Refuge has increased in recent years, and in particular, the number of caribou hunting operations.[107] These hunting activities rely on a consistent, and healthy population of caribou from both the PCH, and the portions of the CAH that utilize the Coastal Plain. Oil and gas leasing and development will significantly impact the movement of

[103] *Id.* at p. 41.
[104] *Id.* at p. 37.
[105] *See, e.g.*, NRDC, "The Arctic National Wildlife Refuge: Oil Development Damages Air, Water and Wildlife," located at https://assets.nrdc.org/sites/default/files/facts2.pdf.
[106] 2015 Conservation Plan, *supra* note 15, at p. 4-163.
[107] *Id.* at p. 4-164.

these wildlife species, and therefore, may change or eliminate the possibilities for recreation and tour businesses, including local ones, to continue operation and growth in the area.

In particular, the EIS must analyze the following impacts of relevance to commercial outfitters and guides: 1) loss of public access to large tracts of land on the Coastal Plain (similar to what occurs on NPR-A lands when oil and gas leasing and development takes place); 2) loss of livelihood—one operator estimates a loss of 25% of annual revenue if oil and gas leasing and development occurs on the Coastal Plain;[108] and 3) damage to resources that will impede visitor use of the Coastal Plain, including damage to popular fishing areas, take-outs for float trips and access to hunting areas, for both sport and subsistence purposes.

P. Analysis of direct impacts

Critically, particularly given the provisions of the 2017 Tax Act, it is not proper for the EIS to defer analysis of these direct impacts until particular lease operations are planned or approved, and *Native Village of Point Hope v. Jewell*[109] does not require otherwise. In the *Point Hope* case, the Bureau of Ocean Energy Management proposed an offshore oil lease sale in 34 million acres in the Chukchi Sea.[110] The Ninth Circuit held that the Department of the Interior was not required "at the lease stage to analyze potential environmental effects on a site-specific level of detail."[111]

The lack of specificity argument in *Point Hope* is not well-taken here. First, the express terms of the 2017 Tax Act *require* that leases be offered on at least 800,000 acres in the Coastal Plain,[112] just over 2 percent of the area of the Chukchi Sea lease in the *Point Hope* case but well over half the area of the Coastal Plain and so, for purposes of this EIS, BLM must assume that such leasing will occur. Indeed, the 2017 Tax Act further narrows the field by charging BLM with holding these lease sales in the areas "with the highest potential for the discovery of hydrocarbons."[113]

Second, the 2017 Tax Act commits BLM to developing particular sets of regulations governing the Program and to ensuring that those regulations effectuate the protective purposes of the

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[108] Michael Wald, personal communication.
[109] 740 F.3d 489 (9th Cir. 2014).
[110] U.S. Department of the Interior. 2015. Chukchi Sea Outer Continental Shelf Oil and Gas Lease Sale 193 Record of Decision. p. 3. Available at: https://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Leasing/Lease_Sales/Sale_193/03-31-2015-LS193-ROD-Second-SEIS.pdf.
[111] *Id.*, citing *N. Alaska Evtl. Ctr. v. Kempthorne*, 457 F.3d 969, 975-76 (9th Cir. 2006).
[112] *See* 2017 Tax Act § 20001(c)(1)(B)(i) ("The Secretary shall offer for lease under the oil and gas program under this section— (I) not fewer than 400,000 acres area-wide in each lease sale.").
[113] *Id.*

Refuge as fully as possible. BLM knows that it will have to develop a regulatory regime that addresses certain activities and is designed to minimize impacts and realize the protective purposes of the Refuge.

As noted above, the direct (and other) effects of this mandatory leasing and the attendant regulatory regime are "reasonably probable" within the meaning of *Kern v. U.S. Bureau of Land Management*.[114] In *Kern*, involving a challenge to a BLM forest Resource Management Plan, the Ninth Circuit held that:

> An agency may not avoid an obligation to analyze in an EIS environmental consequences that foreseeably arise from an RMP merely by saying that the consequences are unclear or will be analyzed later when an EA is prepared for a site-specific program proposed pursuant to the RMP.

Because of the small and discrete area of the maximum footprint to be allowed on the Coastal Plain – roughly the same in land area as the Alaskan village of Kupreanof, population 27,[115] the holding and logic of *Kern* applies here.

VI. Cumulative Impacts

The EIS must substantively analyze the cumulative impacts of the Program:

> Consideration of cumulative impacts requires "some quantified or detailed information; ... [g]eneral statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided." The cumulative impact analysis must be more than perfunctory; it must provide a "useful analysis of the cumulative impacts of past, present, and future projects." Finally, cumulative impact analysis must be timely. It is not appropriate to defer consideration of cumulative impacts to a future date when meaningful consideration can be given now.[116]

NEPA regulations define "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."[117] In particular, as discussed in more detail

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[114] 284 F.3d 1062, 1072 (9th Cir. 2002).
[115] https://en.wikipedia.org/wiki/Kupreanof,_Alaska.
[116] *Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1072 (9th Cir. 2002) (internal citations omitted).
[117] 40 C.F.R. § 1508.7.

below, the EIS must consider reasonably foreseeable actions that are likely to affect greenhouse gas emissions.

In assessing cumulative impacts, BLM cannot overlook the fact that even a small mineral extraction project can have massive adverse environmental impacts. Examples include the Exxon Valdez grounding, the Deepwater Horizon blowout, the proposed Pebble Mine project in Alaska,[118] and the Aliso Canyon natural gas well blowout near Los Angeles.[119]

A. Timeframe of Cumulative Impacts Analysis

Due to the duration of the Program, the EIS must consider not only the immediate impacts, but also the impacts to the environment and resources at five, ten, twenty, and fifty years during and after the drilling has occurred. The impacts to the natural resources outlined in this comment will last much longer than the Program timeline, and these aggregate impacts need to be considered before leasing and development occur on the Coastal Plain.[120] The cumulative impacts analysis must provide details on a) the past, present, and future projects within and adjacent to the Refuge, such as offshore activities and impacts; b) those impacts that may cause secondary effects outside the Refuge with regard to water quality, air quality, wildlife, and habitat impacts; and c) impacts to wilderness character in adjacent wilderness lands and wild and scenic rivers.

Similarly, analysis of each Program alternative will need to consider impacts from the activities that plausibly precede, attend, or follow leasing, as well as impacts from other human activities potentially affecting the same values, processes, and factors. All of these are reasonably foreseeable, given that a major purpose of leasing is to engender exploration, production, and transportation, and ultimately the combustion of fossil fuels. These impacts will include:

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[118] U.S. Environmental Protection Agency. 2014. Proposed Determination of the U.S. Environmental Protection Agency Region 10 Pursuant to Section 404(c) of the Clean Water Act Pebble Deposit Area, Southwest Alaska. Available at: https://www.epa.gov/bristolbay/2014-proposed-determination-pursuant-section-404c-clean-water-act-pebble-deposit-area.

[119] Drew Michanowicz, *The Aliso Canyon Gas Leak Was a Disaster. There Are 10,000 More Storage Wells Out There Just Like It*, L.A. Times, May 14, 2018, http://www.latimes.com/opinion/op-ed/la-oe-michanowicz-aliso-canyon-gas-leak-20180514-story.html.

[120] For example: "Recovery to pre-disturbance communities was not possible where trail subsidence occurred due to thawing of ground ice. Previous studies of disturbance from winter seismic vehicles in the Arctic predicted short- term and mostly aesthetic impacts, but we found that severe impacts to tundra vegetation persisted for two decades after disturbance under some conditions.... Climate change is likely to make permafrost even more sensitive to seismic exploration activity in the future." Jorgenson, J.C., J.M. Ver Hoef, and M.T. Jorgenson. 2010. Long-term recovery patterns of arctic tundra after winter seismic exploration. Ecological Applications 20(1):205-221.

- The effects of exploration including post-leasing seismic testing, drilling, production, infrastructure, and transportation (including transportation by tanker from Arctic or other coasts);
- Impacts from similar activities on ANILCA corporation holdings in the vicinity owned by Arctic Slope Regional Corporation and Kaktovik Inupiat Corporation, on state lands in Prudhoe Bay, and in NPR-A;
- Potential impacts to coastline, ice, and marine mammals from drilling in state waters, and in the federal OCS where DOI has perpetuated inactive leases and proposed to hold multiple new lease sales, considered together with impacts from accessing the Refuge from ocean and constructing infrastructure in the coastal zone;
- Impacts from disaster response and remediation, particularly those associated with oil spills, on land and water; and
- Cumulative impacts from leasing, exploration, development, and transportation of fossil fuels within and near the Coastal Plain together with climate change, both current and predicted.

B. Baseline Information Development

Cumulative impact analyses for the species and habitats found on the Coastal Plain, and all associated range-wide resources, such as impacts to migration routes and behavior for the PCH, must be evaluated on a multi-year basis and compared with an undisturbed area that can be used as a control, or reference group. Without a valid baseline of information, the cumulative impacts analysis will have little value. For baseline information, BLM should consult with the U.S. Fish and Wildlife Service Inventory and Monitoring program, as well as other collaborative research groups.

C. Specific Impacts

Beyond these broader considerations, the EIS will need to address particular cumulative impacts and include all species potentially impacted by oil and gas leasing related activities. In many cases, substantial research is needed regarding cumulative impacts, even for the most-studied species in the Coastal Plain.[121] A detailed set of recommendations for areas of particular focus is available from the National Research Council's 2003 report *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*, which BLM should follow.[122] Some of these recommendations are:

[121] *See also supra* Section IV.
[122] NRC, 2003, *supra* note 83.

- Permafrost requires infrastructure to be built to withstand thawing, and the new technologies used to prevent thawing have not been evaluated with regards to environmental degradation on the North Slope in regions where these technologies have been used. Oil and gas leasing and development on the Coastal Plain will require similar warming resistant building structures, and so these will need to be evaluated for potential harm to the surrounding environment, as well as necessary remediation action when development is complete.

- Cumulative effects of animal populations with current North Slope development extends far beyond the actual oil and gas development areas (up to several kilometers for visual impacts and much further for ecological impacts)[123] and this includes long-range impacts to marine mammals with sounds from seismic activities. Many of these impacts will remain after development is completed, and therefore, analysis of each of these potential impacts must include a range of distances in which species or habitats may be impacted by industrial activities.

- Interference with subsistence activities is considered a cumulative effect for both Inupiaq and Gwich'in cultures and oil and gas leasing has already proven to cause irreversible harm to subsistence-based cultural and spiritual resources.[124]

- Roads have far-reaching and cumulative impacts that include covering native tundra vegetation with gravel, dust, flooding, thermokarst development, introduction of invasive species, increase off-road travel that impacts surrounding habitat, increasing hunting and recreational pressures in concentrated areas due to more access to particular areas.

- Animal species have already proven to be adversely impacted by oil and gas leasing and development in other regions of the North Slope, and these impacts can be assumed on the Coastal Plain. However, less baseline information is available for the Beaufort Sea and Coastal Plain populations of many species, so the impacts seen elsewhere may be even greater with development of oil and gas resources on the Coastal Plain.[125] These cumulative impacts include: changes in migration patterns for bowhead whales, disturbance to denning polar bears, persistence of higher-than-normal predator species with oil field activities that decreases prey species such as caribou and musk oxen, an increasingly likelihood of "sink" areas for migratory bird species-areas where mortality is greater than reproductive rates, declines in the numbers of caribou due to industrial development.

[123] *Id.* at p. 156.
[124] *Id.* at pp. 132–49.
[125] *Id.* at pp. 98–131.

- Oil spills will have cumulative impacts on the regional environment of the Coastal Plain and surrounding areas. Because current mitigation measures are inadequate for large spill clean-up,[126] oil will accumulate in the near-shore and on-shore environments and likely persist for many decades. These impacts are well-documented, and BLM will need to include these documented resources as part of their environmental review, requiring remediation measures to account for the dynamic nature of the environments in which these spills will occur and need to be cleaned.

- Research should address how cumulative development is affecting the productivity of tundra ecosystems, flow patterns of water across the Arctic Coast, and long-term changes to the albedo effect of the region because of dust and melting permafrost. These effects are most likely very different between the current, undisturbed habitats of the Coastal Plain, and the developed regions of the Arctic coast, however, the comparison between these regions has not yet been studied and has been recommended by others as a requirement for any oil and gas development in the Coastal Plain.[127]

Additionally, the EIS must consider other actions that could influence the release of greenhouse gases, including the Administration's:

- Proposals to change NHTSA's fuel economy and EPA's greenhouse gas emission standards for medium and heavy-duty vehicles;
- Decision to leave the Paris Accords,
- Plans to expand offshore oil drilling;[128]
- Proposals to stay of the oil and gas NSPS; and[129]
- Plan to reconsider methane standards for landfills.[130]

[126] *Id.* at p.158.
[127] *Id.* at p.151.
[128] Request for Information and Comments on the Preparation of the 2019-2024 National Outer Continental Shelf Oil and Gas Leasing Program MAA104000, 82 Fed. Reg. 30,886 (Jul. 3, 2017).
[129] *See* Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources: Stay of Certain Requirements, 82 Fed. Reg. 27,645 (Jun. 16, 2017); Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources: Three Month Stay of Certain Requirements, 82 Fed. Reg. 27,641 (Jun. 16, 2017).
[130] Stay of Standards of Performance for Municipal Solid Waste Landfills and Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, 82 Fed. Reg. 24,878 (May 31, 2017).

VII. Other Impacts and Considerations

A. Transboundary Considerations

"CEQ has determined that agencies must include analysis of reasonably foreseeable transboundary effects of proposed actions in their analysis of proposed actions in the United States."[131] BLM must consider the environmental consequences of the Program outside of the United States.

The Coastal Plain shares resources that are transboundary, from cultural heritage, to caribou migration patterns and winter habitat, to polar bear denning habitat and musk oxen year-round foraging habitats. The also Refuge borders two international parks (Ivvavik National Park and Vuntut National Park, Northwest Territories). These parks include additional habitat for the PCH. In addition, the Vuntut Gwitchin and other First Nations of the Northwest Territories and other regions of Canada maintain strong cultural ties to resources within the Refuge, such as caribou and their associated habitats.

Development of oil and gas resources in and around the Refuge will affect terrestrial and marine wildlife populations that extend into Canada, may affect bird populations in wintering habitat outside the United States, and will affect human populations in Canada that interact with and depend on wildlife. Moreover, the effects of an oil spill originating on the Refuge may extend into Canadian territory. [132]

B. Indirect Impacts

i. Climate Change

The Arctic is experiencing some of the more dramatic impacts of climate change, and the EIS will not only have to address these impacts, but also project the additional, future impacts of climate change that will compound the impacts of any oil and gas development in the future.

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[131] Council on Environmental Quality, CEQ Guidance On NEPA Analyses For Transboundary Impacts (July 1, 1997), located at: https://www.energy.gov/sites/prod/files/2014/08/f18/CEQTransboundaryGuidance_07_01_97.pdf.

[132] Transportation Research Board and National Research Council, 2014, *supra* note 45, at p. 1 ("The threat of a major oil spill and the potential impacts on the region's marine ecosystems are of concern for a broad range of U.S. and international interests, including Alaska Natives and others who live in the region, citizens and organizations concerned about the health of the Arctic environment, agencies committed to protecting the environment and threatened species, agencies that regulate extractive activities or transportation, and industries that plan to develop oil and gas, shipping routes, fisheries, or tourism.").

The Arctic continues to warm at more than twice the global rate,[133] which is already impacting the physical landscape across the Coastal Plain. These impacts include loss of summer sea ice, permafrost thaw, altered nutrient and hydrologic cycling, warmer air temperatures, warmer near surface water temperatures, altered sea ice extent, altered phenology, and longer growing seasons. [134] Each of these impacts will have cascading effects on species in the region. For example, warmer temperatures are causing changes to caribou migration patterns that are impacting overall survival for the PCH.[135]

In this connection, there are many recent, major, peer-reviewed scientific assessments of greenhouse gases and climate change that BLM needs to analyze to determine the indirect impact of climate change on the Refuge's natural values. These include:

- Intergovernmental Panel on Climate Change's ("IPCC") 2013–2014 Fifth Assessment Report (AR5);[136]

[133] Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Pachauri, R.K. and L.A. Meyer (eds.). IPCC, Geneva, Switzerland, 151 pgs.
[134] Pearce, J.M., Flint, P.L., Atwood, T.C., Douglas, D.C., Adams, L.G., Johnson, H.E., Arthur, S.M., and Latty, C.J., 2018, Summary of wildlife-related research on the coastal plain of the Arctic National Wildlife Refuge, Alaska, 2002–17: U.S. Geological Survey Open-File Report 2018–1003, 27 pgs, https://doi.org/10.3133/ofr20181003.
[135] Gustine, D.D., T.J. Brinkman, M.A. Lindgren, J.I. Schmidt, T.S. Rupp, and L.G. Adams. 2014. Climate-Driven Effects of Fire on Winter Habitat for Caribou in the Alaskan-Yukon Arctic. PLoS ONE 9(10): e112584; Whitten, K.R. 1991. Movement patterns of the Porcupine Caribou Herd in relation to oil development. Federal Aid in Wildlife Restoration Research Progress Report, Juneau, Ak. 48 pgs.
[136] IPCC. 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). Cambridge University Press, 1535 pgs., doi:10.1017/CBO9781107415324; IPCC. 2014. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.). Cambridge University Press, 1132 pgs.; IPCC. 2014: Climate Change 2014. Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.). Cambridge University Press, 688 pgs.; IPCC. 2014. Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.). Cambridge University Press, 1435 pgs.

- U.S. Global Change Research Program's ("USGCRP") 2014 ''Climate Change Impacts in the United States: The Third National Climate Assessment'' (NCA3);[137]
- NRC's 2011 ''Report on Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia'' (Climate Stabilization Targets);[138]
- NRC's 2011 ''National Security Implications for U.S. Naval Forces''(National Security Implications);[139]
- NRC's 2013 ''Abrupt Impacts of Climate Change'' (Abrupt Impacts);[140]
- NRC's 2014 ''The Arctic in the Anthropocene: Emerging Research Questions'' (Arctic);[141] and
- The peer-reviewed studies and the "Description of evidence base" sections appearing and/or cited in USGCRP's 2017 Climate Science Special Report.[142]

In addition, BLM must consider NOAA's 2017 State of the Climate report, which sets out the following facts:[143]

- Land and ocean temperatures, sea level, and greenhouse gas concentrations in the atmosphere broke records set just one year prior;
- The number of extremely hot days, defined as the frequency of days on which the temperature was in the 90th percentile of the historical record since 1950, rose;
- Global lower tropospheric temperature was the highest on record;
- 2016 ocean temperatures set a record high;

[137] USGCRP. 2014. Climate Change Impacts in the United States: The Third National Climate Assessment. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe (eds.). U.S. Global Change Research Program, Washington, DC. 841 pgs.
[138] NRC. 2011. Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia. The National Academies Press, 298 pgs.
[139] NRC. 2011. National Security Implications of Climate Change for U.S. Naval Forces. The National Academies Press, 226 pgs.
[140] NRC. 2013. Abrupt Impacts of Climate Change: Anticipating Surprises. The National Academies Press, 250 pgs.
[141] NRC. 2014. The Arctic in the Anthropocene: Emerging Research Questions. The National Academies Press, 220 pgs.
[142] USGCRP. 2017. Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program. Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.). U.S. Global Change Research Program, Washington, DC. 669 pgs. The References section of this document may be found at pages 11, 77-97, 135-159, 179-185, 215-227, 249-266, 294-300, 327-335, 362-374, 396-404, 429-442, 471-492, 523-539, 568-583, 603-607, 623-635, 640-641, 650-651, 660-663.
[143] Jessica Blunden, International Report Confirms 2016 Was Third Consecutive Year of Record Global Warmth, ClimateWatch Magazine, Aug. 10, 2017, https://www.climate.gov/news-features/understanding-climate/international-report-confirms-2016-was-third-consecutive-year.

- Global upper ocean heat content was at a near-record high (the high was set in 2015);
- Global average sea level rose to a new record high and was about 3.25 inches higher than the 1993 average. 2016 was the sixth consecutive year that global sea level has increased compared to the previous year;
- Extremes were observed in the water cycle and precipitation, along with extensive drought;
- The Arctic continued to warm and sea ice extent remained low;[144] and
- Preliminary data show that 2016 was the 37th consecutive year of overall alpine glacier retreat across the globe, with new record low April and May snow cover extents for the North American Arctic. Record high temperatures were observed at the 209-meter depth at all permafrost observatories on the North Slope of Alaska and at the Canadian observatory on northernmost Ellesmere Island.

ii. The Effects of Ocean Acidification

Because fossil fuel production, and consumption, is the end goal of leasing, their impacts on climate outside of Alaska must be studied in the EIS.[145] In the context of oil and gas development on the Coastal Plain, BLM needs to account for scientific research concerning climate change impacts not simply on terrestrial systems like the Refuge itself, but also on our oceans, where scientific understanding is rapidly evolving, especially in particularly vulnerable Arctic regions.[146] Ocean acidification and warming are directly related to the global increase in

[144] Sea ice loss enhances wave action at the Arctic coast. The Beaufort Sea ice is experiencing especially high rates of loss in the past 50 years, causing accelerations in coastal erosion along the permafrost coastlines. Rates doubled in a 30-year period with estimates of 14-30 meters of coastline retreat per year in some areas of the Beaufort Sea coastline. This coastline retreat threatens some already existing oil development structures in the NPR-A and could cause significant challenges for infrastructure development and transport on the Coastal Plain. *See* Overeem, I., R.S. Anderson, C.W. Wobus, G.D. Clow, F.E. Urban, and N. Matell. 2011. Sea Ice Loss Enhances Wave Action at the Arctic Coast. Geophysical Research Letters 38:17503.

[145] *See Sierra Club v. F.E.R.C.*, 867 F.3d 1357, 1374 (D.C. Cir. 2017) ("We conclude that the EIS for the Southeast Market Pipelines Project should have either given a quantitative estimate of the downstream greenhouse emissions that will result from burning the natural gas that the pipelines will transport or explained more specifically why it could not have done so. As we have noted, greenhouse-gas emissions are an indirect effect of authorizing this project, which FERC could reasonably foresee, and which the agency has legal authority to mitigate. See 15 U.S.C. § 717f(e). The EIS accordingly needed to include a discussion of the "significance" of this indirect effect, as well as "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions[."]); *San Juan Citizens Alliance v. United States Bureau of Land Management*, No. 16-cv-376 (D.N.M. June 14, 2018); *but see but see Friends of Capital Crescent Trail v. Federal Transit Administration*, 877 F.3d 1051,1064 (D.C. Cir 2017) (distinguishing *Sierra Club v. FERC*).

[146] *See, e.g.*, Mathis, J.T., J.N. Cross, W. Evans, and S.C. Doney. 2015. Ocean Acidification in the Surface Waters of the Pacific-Arctic Boundary Regions. *Oceanography* 28(2):122–135. Available at https://doi.org/10.5670/oceanog.2015.36.

atmospheric CO_2 emissions. Global atmospheric CO_2 concentrations reached average annual levels of over 402.9 parts per million (ppm) in 2016,[147] which is higher than at any point during the last 800,000 years.[148] Over the past 200 years, the global oceans have absorbed approximately 25% of the anthropogenic CO_2 released to the atmosphere.[149] Approximately 2.6 billion metric tons of CO_2 per year (i.e., 26% of total emissions) entered the global oceans in the last decade.[150]

As the global oceans absorb the excess of CO_2, seawater chemistry profoundly changes and the oceans become more acidic.[151] The average pH of the global surface ocean has already decreased by 0.1 units (from 8.2 to 8.1 pH units), which represents a 30% increase in acidity and a 10% decrease in carbonate ion concentration in comparison with pre-industrial levels.[152] Changes in ocean chemistry are unprecedented in the geological record, with acidification taking place at rates faster than in the past ~300 million years, a period that includes three major mass extinctions that resulted in the extinction of 96% of marine species.[153] Anthropogenic CO_2 emissions will further reduce surface ocean pH by 0.3 to 0.5 units on average by 2100, and regional changes may be even more severe.[154] If the current acidification rate continues, a return to the current pH state would require thousands of years.[155]

Several studies show that ocean acidification is already impairing the ability of marine organisms to grow shells and produce skeletons, causing long-term consequences for marine ecosystems. Calcifying organisms are particularly vulnerable to decreasing pH due to their dependence on

[147] Blunden, J. and D.S. Arnd. 2017. State of the Climate in 2016. Bulletin of the American Meteorological Society 98:1-277.
[148] Dieter Lüthi et al. 2008. High-Resolution Carbon Dioxide Concentration Record 650,000–800,000 Years before Present. Nature 453:379–82.
[149] IPCC. 2014. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (Eds.). Cambridge University Press.
[150] Corinne Le Quéré et al. 2016. Global Carbon Budget 2016. Earth System Science Data 8:605–49.
[151] Scott C. Doney et al. 2009. Ocean Acidification: The Other CO_2 Problem. Annual Review of Marine Science 1:169–92.
[152] Richard A. Feely et al. 2004. Impact of Anthropogenic CO2 on the CaCO3 System in the Oceans. Science 305: 362–366; Doney, 2009, *supra* note 151.
[153] Bärbel Hönisch et al. 2012. The Geological Record of Ocean Acidification. Science 335:1058–63. doi:10.1126/science.1208277.
[154] K. Caldeira and M. E. Wickett. 2007. Ocean Model Predictions of Chemistry Changes from Carbon Dioxide Emissions to the Atmosphere and Ocean. J. Geophys. Res. 110: C09S04; B.I. McNeil and R. J. Matear. 2006. Projected Climate Change Impact on Oceanic Acidification. Carbon Balance and Management 1:1–6.
[155] S. Solomon et al. 2009. Irreversible Climate Change due to Carbon Dioxide Emissions. Proceedings of the National Academy of Sciences 106:1704–1709.

carbonate ions concentration and calcium carbonate saturation states,[156] especially those species that use aragonite (a form of calcium carbonate) as the main building blocks for shells and skeletons.[39] As the saturation state of calcium carbonate minerals decreases, calcification is depleted and stopped, and dissolution occurs. Shelled molluscs, pteropods, and corals are among the marine species more vulnerable to ocean acidification because they depend on adequate pH and calcium carbonate saturation state conditions to growth, survive and sustain entire ecosystems. [157]

Ocean acidification can cost the shellfish industry millions of dollars in economic losses and thousands of jobs. Ocean acidification has already cost the oyster industry in the U.S. Pacific Northwest approximately $110 million dollars and compromised ~3,200 jobs.[158] As the shellfish industry faces the increasing effects of ocean acidification, sales and job security will drastically affect coastal communities, particularly in areas where fishing and coastal tourism provide the main economic support.[159] For example, a Canadian shellfish company reported losses of ~ $10 million during its scallop fisheries in 2014 because of acidic waters.[160] As the ocean acidification trend continues, the shellfish industry that include oysters, mussels, scallops and crabs will be subject to substantial economic loses. [161]

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[156] K. J. Kroeker et al. 2013. Impacts of Ocean Acidification on Marine Organisms: Quantifying Sensitivities and Interaction with Warming. Global Change Biology 19:1884–96, doi:10.1111/gcb.12179. [39] J.B. Ries, A.L. Cohen, and D. C. McCorkle. 2009. Marine Calcifiers Exhibit Mixed Responses to CO2 Induced Ocean Acidification. Geology 37:1131–1134.

[157] Alan Barton et al. 2012. The Pacific Oyster, Crassostrea Gigas, Shows Negative Correlation to Naturally Elevated Carbon Dioxide Levels: Implications for near-Term Ocean Acidification Effects. Limnology and Oceanography 57:698-710.

[158] Washington State Blue Ribbon Panel on Ocean Acidification. 2012. Ocean Acidification: From Knowledge to Action. Washington State's Strategic Response. (Olympia, Washington: Washington Department of Ecology, 2012), https://fortress-wa-gov.libproxy.lib.unc.edu/ecy/publications/publications/1201015.pdf.

[159] Julia A. Ekstrom et al. 2015. Vulnerability and Adaptation of US Shellfisheries to Ocean Acidification. Nature Climate Change 5: 207–14.

[160] Hales, B., Chan, F., Boehm, A.B., Barth, J.A., Chornesky, E.A., Dickson, A.G., Feely, R.A., Hill, T.M., Hofmann, G., Ianson, D., Klinger, T., Largier, J., Newton, J., Pedersen, T.F., Somero, G.N., Sutula, M., Wakefield, W.W., Waldbusser, G.G., Weisberg, S.B., and Whiteman, E.A. 2015. West Coast Ocean Acidification and Hypoxia Science Panel: Multiple Stressor Considerations: Ocean Acidification in a Deoxygenating Ocean and Warming Climate.

[161] Chan, F., Boehm, A.B., Barth, J.A., Chornesky, E.A., Dickson, A.G., Feely, R.A., Hales, B., Hill, T.M., Hofmann, G., Ianson, D., Klinger, T., Largier, J., Newton, J., Pedersen, T.F., Somero, G.N., Sutula, M., Wakefield, W.W., Waldbusser, G.G., Weisberg, S.B., and Whiteman, E.A. 2016. The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions. California Ocean Science Trust, Oakland, California; *see also* J.T. Mathis, S.R. Cooley, N. Lucey, S. Colt, J. Ekstrom, T. Hurst, C. Hauri, W. Evans, J.N. Cross, R.A. Feely. 2014. Ocean acidification risk assessment for Alaska's fishery sector. Progress in Oceanography 136: 71-91.

iii. BLM Must Quantify and Monetize Climate Change Effects Caused By The Program

BLM must quantify and monetize the climate change effects caused by the reasonably foreseeable effects of the Program, including cumulative impacts. Doing so is required by law.[162] In undertaking this analysis, BLM must be guided by the best currently available, peer-reviewed scientific evidence and economic analysis. At present, the technical report on the social cost of carbon (SCC) submitted by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) and vetted and used by numerous federal agencies constitutes that evidence, although IWG's cost estimates constitute the floor, and not the ceiling, of the SCC.

Executive Order 13,783 is not to the contrary. Although it disbanded the IWG and withdrew technical support documents, the Order instructs agencies to ensure its estimates are consistent with the guidance contained in OMB Circular A-4.[163] Circular A4 also requires agencies to use the best currently available data and methodologies, which necessarily constitute the SCC floor established by IWG's work. Moreover, Executive Order 13,873 does not, in any way, undermine these scientific foundations; the SCC remains a meaningful way to account for and communicate climate impacts from incremental emissions. Any downward deviation from the IWG's range of SCC estimates would be arbitrary and capricious. [164]

C. BLM's Analysis Must Consider Effects on Environmental Justice Communities

The EIS needs to consider the effects of the Program on low-income, disadvantaged communities, including those who rely on subsistence hunting that may be affected by the Program. By enacting NEPA, Congress declared that "each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment."[165] Federally mandated environmental justice review is not satisfied by mechanically checking off the box on rote, procedural steps. It is not enough to list

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[162] *See, e.g., Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172, 1203 (9th Cir. 2008) (decision not to monetize the benefit of carbon emissions reduction or to undervalue the benefits or overvalue a rulemaking's costs is arbitrary and capricious); *Zero Zone Inc. v. Department of Energy* 832 F.3d 654 (7th Cir. 2016) (expected reduction in environmental costs must be taken into account when determining whether an energy conservation measure is appropriate under a cost-benefit analysis).

[163] Office of Management and Budget, Executive Office of the President, OMB Circular A-4, Regulatory Analysis (2003), available at: https://www.transportation.gov/sites/dot.gov/files/docs/OMB%20Circular%20No.%20A-4.pdf

[164] *See* Withdrawal of Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, 82 Fed. Reg. 16,576, 16,576–77 (Apr. 5, 2017) ("The withdrawal of the guidance does not change any law, regulation, or other legally binding requirement.").

[165] 42 U.S.C. § 4331(c).

general demographic data. Agencies are required to consider whether projects that have environmental impacts will place disproportionate risks or burdens on vulnerable communities.[166]

In particular, BLM will need to engage in refined proximity analyses for those communities most impacted by the Program; it cannot simply use census tracts. Additionally, BLM must avoid the pitfall of lumping all potentially impacted communities together. This approach masks the impacts the Program will have on particular groups. BLM is also required to consider "[w]hether the risk or rate of hazard exposure by a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group."[167] Oil and gas leasing is dangerous. Gas explodes. Oil spills. Accidents may be rare, but when they occur, they can have catastrophic impacts on lives and livelihoods.

VIII. Conclusion

We appreciate the opportunity to comment on BLM's scoping process and look forward to reviewing BLM's Draft EIS. Should you have any questions or wish to discuss any of these matters in greater detail, please do not hesitate to contact Garett Rose, 202-717-8355, grose@nrdc.org.

Sincerely,

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Dr. Natalie Dawson, Ph.D, Consulting Scientist
Niel Lawrence, Alaska Director and Senior Attorney

[166] U.S. Environmental Protection Agency, Summary of Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629 (February 16, 1994), https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice.
[167] Council on Environmental Quality, Environmental Justice Guidance under the National Environmental Policy Act 26 (1997), https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.