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[EXTERNAL] comments concerning scoping of coastal plain leasing program EIS.

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To whom it may concern,

I am writing with comments concerning the scope of the Coastal Plain Oil and Gas Leasing Program EIS. I am writing as an American citizen, a concerned biologist, the child of petroleum geologists, and a resident of Philadelphia, Pennsylvania. I was not able to be present at any public scoping meeting because the only meetings were conducted in Alaska, but I and many Philadelphians would be interested and attend. However, extraction within the refuge is of concern for all Americans. I highly encourage the BLM to conduct a public scoping meeting near Philadelphia.

To my awareness, the following potential impacts to the human environment, as well as many others, need to be addressed by the EIS.

1. Impacts to caribou.

Alaskan caribou populations are among the last migratory ungulate grazers in America. They are therefore of great biological, ecological and cultural significance.

The Alaska National Wildlife Refuge (ANWR) was enacted to protect caribou from development. Any development, including oil and gas, within the ANWR is therefore likely to impact caribou. These impacts may include:

- a) disruptions to calving. Calving occurs on the coastal plains where oil and gas development is being proposed. Caribou calving occurs at specific times and specific places where caribou cows are relatively free from threat by predators and parasitic insects. These location and timing of calving may change in the future in response to changing climate and distribution of insects, and development could curtail caribou movement.
- b) changes in migration patterns in response to human activity, noise, or land surface changes. The timing and location of caribou migration is controlled by many factors that are not entirely understood. It is unclear whether development could alter or inhibit migration or whether development could limit the ability of caribou herds to adapt to changing demands from weather or the ecosystem, even if development occurs in areas that have not previously been on the migration path.
- c) changes in the ecology due to human presence and development. Caribou herds and their migration patterns exist in a narrow window governed by the sustenance they derive from species caribou consume, and the predators and parasites that constantly reduce caribou's numbers. Ecological changes in the timing, abundance, and location of caribou's food sources or their predators and parasites could render the herd's migration unsustainable, resulting in "ecological extinction" --- disappearance of the caribou herd and or migration pattern. For example, caribou are sensitive to insects, and the timing and location of insect appearance is very sensitive to year-to-year changes in weather. Similar timing effects of insect appearance have decimated forest tree species elsewhere in the west. Such ecological changes could result from the introduction of invasive species, the introduction of roads, changes to local climate, changes to hydrology, or the appearance and movement patterns of organisms. These all could result from development.
- d) unforeseen impacts.

Furthermore, any impact to caribou or their free migration also has cultural significance. Caribou themselves are of great cultural significance to all Americans. Caribou are the magical snowy Reindeer who pull Santa's Sleigh each Christmas, known to all school children. To many Native Americans, caribou represent a way of life, are part of a material culture, or are part of a subsistence economy. The caribou calving grounds are considered sacred sites by the Gwich'in people. To all Americans, the unrestricted migration of the caribou herds evokes the herds of American Bison that once roamed the great plains, and evokes the image of America as an expansive unspoiled land.

2. Impacts of roads.

The impacts of roads on ecosystems everywhere are manifold. There are proximal impacts to the area which is dug up and covered by the road which can be measured in acres. There are many hydrological impacts of roads, as they change the land surface topography and runoff and erosion patterns, which cannot be as easily quantified in terms of land-area impact. Road albedo may affect snowmelt and permafrost. Hydrological impacts may affect a much larger area which cannot be known in advance. Roads further create predictable longer-term impacts. Roads enable the transport of invasive species. Roads create ecological margins or buffer zones that did not exist previously --- microenvironments in which invasive species thrive or which native species may use as a foothold for ecotype conversion. Roads thereby facilitate ecological change and serve to homogenize ecosystems across great distances. These changes may affect the species distributions of insects, mammals, and plants. In the ecologically slow-moving tundra, these changes may take years or many decades to become visible, but may be irreversible once initiated.

Roads also, by design, change human movement capability, which affects property value and land use decisions indefinitely into the future. As the ANWR could only be created on relatively inexpensive land, the development of roads itself threatens the economic calculus of the refuge. The mere development of roads within ANWR transfers wealth in the form of cultural capital from all Americans to a privileged few who can capitalize on the particular economic value of local development. This constitutes a negative impact to all Americans.

3. Impacts of peripheral human activity.

If oil and gas extraction is to create jobs, the jobsite will often be within the ANWR. The ANWR may therefore not only have to accommodate the land use changes directly associated with extraction, but also with transporting and housing people. Both transportation and human habitation have numerous impacts in such a remote and sensitive area. With the creation of jobs within ANWR will come increased human activity in all forms. Regardless of jurisdiction, all of the following human activities in remote areas are possible and many are almost inevitable: poaching or harassing wildlife, partying on beaches or other ecologically sensitive areas, leaving fire pits and beer cans, setting trailers on fire through meth cooking accidents, creating ATV tracks across the tundra, and illegal dumping or littering, to name a few. These impacts of human activity and livelihood should be considered impacts of oil and gas leasing. These same impacts may be tolerable in a populated area with adequate policing, but are greatly exacerbated by the remoteness and sensitivity of the refuge.

4. Economic and political impacts of oil and gas export per se.

Because of the global market for oil and gas and oil and gas products, leasing of oil and gas resource extraction will inevitably lead to increased oil and gas export. Oil and gas export has many impacts:

- a) When used as fuel or for other purposes, it alters global climate by creating carbon emissions at the point of use. Climate changes due to carbon emissions worldwide have particularly strong effects on Alaska and ANWR specifically. Selling oil and gas that contribute to climate change sets an example and precedent worldwide, which will drastically hurt Americans, Alaskans and ANWR in the future. Climate change also affects permafrost, which causes ecological changes that affect caribou across their range.
- b) It robs future generations of Americans of a non-renewable resource. Even supposing that oil and gas extraction will occur at some point within ANWR, reasonable people from across the political spectrum could ask "why now?". Oil and gas are strategic resources that could be developed at any point in the future, when more efficient uses exist or when the need is greater. At this point in our nation's history, we are economically prosperous, not threatened by any significant war or great political conflict, and oil and gas prices are low. As a reasonable alternative with lower impact, development could be postponed to future generations.
- c) Use of exported oil and gas as fossil fuels generates pollution. Fossil fuels use, regardless of point of consumption, generates organic and heavy metal pollutants which accumulate at high latitudes due to atmospheric circulation patterns. Oil and gas export thus not only effectively generates these pollutants, but encourages an unsustainable rate of fossil fuels consumption worldwide. Pollution generated by fossil fuels use worldwide detracts Americans and particularly Alaskans and the ANWR and its ecosystem, including caribou.
- d) Export relinquishes any influence Americans might have over how the exported oil and gas are used. American law no longer has any say about whether exported oil and gas are used sustainably or how much pollution might be generated by their use. For example, parts of Africa and Asia still use leaded gasoline, despite that leaded gasoline is forbidden by American and European standards. That lead pollution at point of consumption is a human-environmental impact of fossil fuels export. That same lead pollution is transported globally by the atmosphere and bioaccumulates in fish and other organisms.

5. The cultural significance of wilderness and open range.

Any development within the ANWR is at cross-purposes with the very intention for conservation of wilderness that created the refuge. Conservation except when more economical land use options exist is no conservation at all. Deep within the American historical narrative is our heritage of westward expansion and the thrill of the open range. The vision of the great buffalo herds thundering across the great plains is a quintessential image of America. It is a vision we can no longer experience except in our cultural memory, but the great caribou herds migrating across the open Alaskan range offer a glimpse into that important moment in American history. Alaska and ANWR specifically represent the last frontier, and the last open range of the west. To despoil that last open range makes permanent a sense of loss of freedom and opportunity our country incurred following the exploitation and settlement of the west. The depth and importance of open range to American consciousness and history are evident, for example, in this 1895 painting by Fredric Remington called "The Fall of the Cowboy":



The painting depicts a cowboy closing a fence, which can be seen stretching into the distance. In this bleak winter landscape, the closing of the fence represents how land-use change---the transition from open range to fenced private lands---put a close to the cowboys' occupation and the loss of a way of life that was a compelling and unique part of the American story. Any development within the ANWR closes another door to the freedom of the open range and the sense of wildness that remains so important to millions of Americans. The meaning and sense of loss in Remington's painting is taught to schoolchildren across America to this day. Development within ANWR repeats this loss and symbolizes the repetition of the mistake of unbridled exploitation.

I hope this non-exhaustive list of impacts will encourage BLM to appropriately broaden the scope of the Coastal Plain Oil and Gas Leasing Program EIS to include these, as well as similar impacts that I am not aware of.

Sincerely,

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