



March 13, 2019

Bureau of Land Management  
Alaska State Office,  
Attention—Coastal Plain EIS  
222 West 7th Avenue, #13  
Anchorage, AK 99513-7599  
United States

**Re Porcupine Caribou Management Board Comments on Coastal Plain Oil and Gas Leasing Program Draft Environmental Impact Statement**

The Porcupine Caribou Management Board (PCMB) submitted comments to the Bureau of Land Management (BLM) regarding the scope of the Environmental Impact Statement (EIS) on June 19, 2018. The current submission is a response to the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement (draft EIS) released on December 20, 2018. These comments pertain to the impact of the proposed leasing of the program area on the Porcupine Caribou Herd (PCH) with respect to the mandate of the PCMB and the *Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd* (International Porcupine Caribou Agreement).

It is the PCMB's determination that the draft EIS is deficient in evaluating the potential impacts of the proposed development on the PCH and, therefore, inaccurately concludes that the PCH's habitat and biology will not be affected in a way that will negatively affect the herd's abundance or availability. Based, in part, on a recent independent assessment of the vulnerability of the PCH to development in the Arctic National Wildlife Refuge (Russell and Gunn 2019), the PCMB asserts that there **will** be significant long-term impacts on the PCH and Canadian users of the herd from the proposed alternatives as described in the draft EIS.

The PCMB finds that the key deficiencies of the draft EIS are as follows:

1. It inadequately assesses the impacts of the proposed development on the PCH;
2. It fails to adequately consider the impacts to Canadian PCH subsistence and other hunters;
3. It fails to properly describe PCH use of the program area;
4. It fails to adequately assess cumulative impacts;
5. It does not describe the expected implementation or effectiveness of mitigations;
6. It proposes to lease more area than required by law; and
7. It is not harmonized with the proposed seismic program.

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The PCMB requests that a more detailed scientific analysis using the most recent science be conducted by the BLM and that traditional user communities in the Canadian range of the PCH be fully consulted. In view of the significant new information presented by Russell and Gunn (2019) the PCMB believes that the existing alternatives do not meet the needs of PL115-97 and the long-term conservation of the PCH. The PCMB requests that no further steps are taken with respect to operationalizing the leasing program until a revised EIS is published for further comment.

## **A. MANDATE OF THE PORCUPINE CARIBOU MANAGEMENT BOARD**

The PCMB was established in Canada in 1985 through the signing of the *Porcupine Caribou Management Agreement (PCMA)*. Signatories to the PCMA include the following:

- Government of Canada;
- Government of Yukon;
- Government of the Northwest Territories;
- Vuntut Gwitchin First Nation;
- Tr'ondëk Hwëch'in;
- First Nation of Na-Cho Nyak Dun;
- Inuvialuit Game Council; and
- Gwich'in Tribal Council.

The PCMB's goal is to facilitate collaborative management of federal, territorial, First Nation and Inuvialuit government interests in the PCH. In this capacity, the PCMB has become the primary instrument in Canada for implementing a co-management approach for the herd based on scientific research and traditional knowledge. The purview of the PCMB as it relates to comments on the draft EIS is best described in paragraphs (a) and (b) of section E 3 of the PCMA, which state:

Because of the dependence of caribou on its habitat, the Board may make recommendations to other boards and agencies ... on land use planning and land management throughout the Canadian range of the Porcupine Caribou Herd or any portion of it. Recommendations of measures to ensure the conservation and protection of habitat shall include, but are not limited to, measures related to specific projects, plans or activities which may:

- (i) impede, delay or disrupt Porcupine Caribou movements, affect behavioural patterns or reduce productivity;
- (ii) affect Porcupine Caribou habitat; or
- (iii) affect interactions between native users and Porcupine Caribou;

The Board may also identify sensitive habitat areas requiring special protection and recommend measures to protect such areas.



The PCMB asserts that the draft EIS, in its current state, does not adequately reflect the international obligations of the United States with respect to the conservation of Porcupine Caribou, as stated in the International Porcupine Caribou Agreement and the *Alaska National Interest Lands Conservation Act (ANILCA)*. The following are the PCMB's responses to several EIS deficiencies and inaccuracies, categorized by the applicable portion of the PCMB's mandate and based on available scientific data and traditional knowledge. A selection of additional detailed feedback is provided in the table at Appendix A.

## **B. PCMB COMMENTS ON THE DRAFT EIS**

### **1. The draft EIS does not adequately assess impacts to PCH**

The draft EIS concludes that development in the program area will not have an overall impact on the size of the PCH (e.g. E-6, E-9). However, a recent vulnerability analysis of the PCH completed by internationally recognized experts found that development in the Arctic National Wildlife Refuge will increase the probability of PCH population declines and constrain population growth (Russell and Gunn 2019). The EIS must provide current scientific data to demonstrate how mitigations can and will be implemented in a way that reduces residual effects on the PCH.

The draft EIS also fails to adequately consider the impacts of development on the PCH at various historic population sizes and during times when the herd is in an increasing or decreasing phase of its population cycle. This is important given that the draft EIS estimates the time between the first lease sale and the reclamation of development to be 85 years (B-7). This implies that the herd could experience two full population cycles during the life of the project. Current science indicates that herd recovery after a population decline will be more precarious with any of the proposed development alternatives.

In addition, the draft EIS indicates that harvesting will be allowed from new roads in the program area. Increased harvesting pressure associated with roads has been demonstrated to have a significant impact on caribou mortality and behavior. Failing to address this is a significant deficiency of the draft EIS. The EIS needs to consider how harvesting pressure will be minimized and adaptively managed in relation to herd size and current population trends. To assist with adaptive harvest management, PCMB recommends that a harvest management plan be implemented for the PCH on the US range, similar to the *Harvest Management Plan for the Porcupine Caribou Herd in Canada* and its associated *Implementation Plan*, and that the overall harvest be coordinated with Canada (see [pcmb.ca](http://pcmb.ca)).

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## **2. The draft EIS does not adequately consider impacts to Canadian PCH subsistence harvesters and other hunters**

The draft EIS recognizes that Canadian users account for approximately 85% of the harvest (page 3-168 and Figure 3-7) but does not include an adequate assessment of the impacts of development on Canadian subsistence and licensed PCH hunters. Given that the proposed development is predicted to negatively affect the productivity of the PCH (Russell & Gunn 2019), the draft EIS is inaccurate when it concludes that development in the program area would not appreciably affect the availability or abundance of caribou for subsistence use (p E-11, E-13 and E-15).

The PCMB notes that when the International Porcupine Caribou Agreement refers to “users” and “affected users” of the PCH, it does not differentiate between users on either side of the international boundary. The International Porcupine Caribou Agreement, section 2.b., specifies that native users include those Canadian users defined under the PCMA. Canadian user communities include Old Crow, Dawson City, Mayo, Fort McPherson, Tsiigehtchic (Arctic Red River), Inuvik, Aklavik and Tuktoyaktuk. These communities should be afforded similar focus in the draft EIS to Kaktovik and other Alaskan user communities.

The PCH has provided food security for remote and isolated communities in Yukon and Northwest Territories for millennia. In addition to providing food and sustenance, traditional harvesting practices ensure native users uphold important cultural values and maintain an ongoing connection to the land.

Canada’s commitment to protecting the subsistence harvesting rights of First Nation and Inuvialuit communities is evident from the creation of the PCMA, with the following wording:

The parties hereto recognize the value of these caribou to Canada generally and that a special relationship exists between native users and these caribou.

...

The parties recognize the special dependence of all native users on the Porcupine Caribou and in particular, the unique dependence of the native users of Old Crow on the Porcupine Caribou.

The draft EIS is deficient in recognizing the interests of Canadian traditional PCH user communities. It is incumbent upon BLM to ensure that any risks of jeopardizing the traditional way of life of Canadian native users are accurately identified and avoided.

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### 3. The draft EIS does not properly describe PCH use of the program area

The draft EIS defines the core calving and post-calving areas using a percentage of years that caribou are present using the four categories: <20%, 20-30%, 30-40%, and >40% (map 3-21). The >40% category is used as the basis for selecting areas that may be subject to more restrictive leasing stipulations in order to protect PCH calving and post-calving habitat (maps 2-5 and 2-7). The draft EIS does not describe how these categories were selected or why this is a scientifically appropriate approach for defining primary calving and post-calving areas.

Additionally, alternatives B and C use less stringent timing limitations and required operating procedures during the calving period. While there is a smaller statistical probability that the herd will calve in areas outside of the 40% category, the herd **has** calved throughout the Coastal Plain program area. It is reasonable to expect that the herd will again need to select any portion of the 1002 region for calving in response to annual environmental and biological factors. Previously documented annual fluctuations of calving locations indicate that the area chosen for calving by the PCH is the critical area for reproductive success **in that year**. Since each reproductive year is important, and since Porcupine caribou herd productivity is relatively low the alternatives must acknowledge and address the fact that calving could occur anywhere in the 1002 area. A failure to do so will result in the long-term loss of significant portions of prime calving habitat for the PCH, as was observed for the Central Arctic caribou herd. Anticipated decreases in calf survival have been predicted by numerous authors (e.g., Griffith et al. 2002; Russell & Gunn 2019).

The draft EIS notably fails to describe impacts of development on large aggregations of caribou (Russell & Gunn 2019). Documented scientific observations have shown that the program area is important for large groups of PCH that form during the post-calving period but the impact of development on these “super groups” was not assessed in the draft EIS. The 1002 area is unique in that the largest known caribou aggregations (100,000 or more caribou) take place there during the post-calving period. Reactions of such large groups of caribou to vehicle traffic, drilling and other types of development are not known (Russell & Gunn 2019).

The draft EIS also does not adequately account for how climate change will affect the use of the program area by the PCH. As snow depth decreases in the future, the program area will predictably be used more frequently by the PCH, thus increasing the potential influence of future development on the herd (Russell & Gunn 2019).



**4. Cumulative impacts are assessed for the program area rather than the range of the PCH**

With respect to the PCH, the analysis of cumulative impacts in the draft EIS is deficient as it only considers cumulative impacts in the program area and not throughout the entire range of the herd. Further, this consideration is cursory, at best. An effective and complete assessment of the cumulative impacts of current and potential development in the range, including the proposed lease sales areas described in the draft EIS, is essential for adequately determining the impacts of implementing an oil and gas leasing program on the PCH.

This assessment is also required by the International Porcupine Caribou Agreement, which states: “when evaluating the environmental consequences of a proposed activity, the Parties will consider and analyze potential impacts, including cumulative impacts...”

**5. The draft EIS does not describe the expected implementation or effectiveness of mitigations**

The mitigation measures in the draft EIS are deficient as they fail to provide adequate evidence that they will reduce or eliminate the impacts of the proposed development on the PCH. The draft EIS also fails to specify how impacts of development on the PCH will be measured and monitored over time. Metrics for effectiveness must be established to determine the efficacy of mitigation measures as well as to establish the need to adapt the project design and implementation based on evidence. A monitoring program described and approved by the Porcupine Caribou Technical Committee (PCTC) and overseen by an independent body should be required. The program should be expected to assess pre-development conditions and determine post-development impacts and the effectiveness of mitigations. The deficiency of scientifically proven mitigations for the Central Arctic caribou herd and a lack of confidence in their efficacy is a prime example of inadequate pre- and post-development assessment and monitoring (Russell & Gunn 2019).

It is troubling the draft EIS does not even acknowledge the existence and usefulness of the PCTC, an international body of scientists formalized by the International Porcupine Caribou Board and dedicated to the scientific study and management of the PCH. Without engaging and establishing a relationship with this scientific body and having their concurrence regarding the assumptions made about caribou behavior and potential reactions to development, many statements made in the draft EIS lack credibility.



## 6. The draft EIS proposes to lease more area than required by law

While the leasing program is required by the *Tax Cuts and Jobs Act* of 2017 (Public Law 115-97), the PCMB notes that there is no need to lease the entire program area to comply with the law. PL 115-97 requires two lease sales with each sale offering for lease at least 400,000 acres of the highest hydrocarbon potential lands (ES-1). Alternatives B and C offer 1,563,500 acres for lease. Alternatives D1 and D2 offer ~1,037,200 acres for lease (ES-3). The PCMB supports the highest level of protection possible in the 1002 area and recommends that the alternatives be adjusted to reflect, at most, the minimum leasing area required by law (800,000 acres). In addition, the draft EIS does not provide assurances that lease stipulations related to surface occupancy and timing restrictions will remain in place over time. The only way of ensuring areas that are important to the PCH are excluded from development is not to lease them in the first place.

## 7. The draft EIS does not harmonize leasing with the seismic program

The seismic program related to oil and gas development in the 1002 area is not being harmonized with the leasing program outlined in the draft EIS. Seismic activity is planned in areas that require the highest level of protection. This is an inappropriate sequencing of activities and the PCMB perceives this as disingenuous. BLM should not allow seismic activities in areas that may not be leased.

## C. RECOMMENDATIONS

The PCMB appreciates the acknowledgement and incorporation of historically documented PCH calving areas in the draft EIS and the attempt to recognize some of the effects that development will have on the sustainability of the PCH. However, the PCMB notes that the anticipated effects have generally been understated, and therefore, insufficient recognition has been given to the long-term impacts on the PCH and traditional subsistence harvesters in Canada.

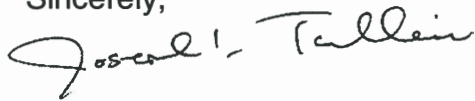
The PCMB asserts that the draft EIS has not given adequate “effective consideration” (per item 3b from the International Porcupine Caribou Agreement) to the PCH and affected Canadian user communities and that a more detailed scientific analysis should be conducted using the most recent science. Also, traditional user communities in the Canadian range of the PCH should be consulted and no further steps should be taken in terms of oil and gas development activities in the Arctic National Wildlife Refuge until a supplementary draft EIS is published for further comment.

While the PCMB acknowledges the statement on page 1-3 of the draft EIS noting that requests for keeping the Coastal Plain closed to oil and gas leasing are out of scope, the PCMB’s position is that the goal of the EIS should be to achieve the highest level of environmental protection and conservation in the Arctic National Wildlife Refuge while meeting the requirements of Public Law 115-97.



To this end, and in keeping with the principles of conservation and international treaty obligations for the Arctic National Wildlife Refuge as described in ANILCA Public Law 96-487 and the principle to “avoid or minimize activities that would significantly disrupt migration or other important behavior patterns of the Porcupine Caribou Herd” in the International Porcupine Caribou Agreement, the PCMB requests: that the alternatives presented in the EIS be adjusted so that they do, in fact, reflect the **minimum** lease area offering required by law; that the seismic activities be accordingly coordinated and harmonized with the leasing program, thus **avoiding** unnecessary disturbance to the PCH and its habitat; and that the lands outside of leased areas be assigned a form of permanent protection.

Sincerely,



Joe Tetlich  
Chair

Attach. (1)

**References:**

Russell, D., and A. Gunn. 2019. *Vulnerability analysis of the Porcupine Caribou Herd to potential development of the 1002 lands in the Arctic National Wildlife Refuge, Alaska*. Report submitted to: Environment Yukon, Environment and Climate Change Canada, and GNWT Environment and Natural Resources.

Griffith, D. B., 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." Pp. 8-37. In: D. C. Douglas, P. E. Reynolds, and E. B. Rhode, editors. Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries. US Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001





## Appendix A – EIS Deficiencies identified by PCMB

Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>The importance of the Arctic National Wildlife Refuge for PCH calving, post-calving, and migration routes</p>	<p>International agreement on conservation of PCH</p> <p>Demonstrated consistent use of the 1002 Area and adjacent lands based on historical scientific migration and movement data (maps) and aboriginal traditional knowledge</p>	<p>EIS acknowledges the importance of the area but provides no details or analyses to help understand potential impacts. Only non-current Sensitive Habitat maps are provided in their most basic form. For example: migration routes are only described in the context of insect relief and described as along the coast only, which is incorrect. Impacts to habitat and displacement of caribou are only based on 2,000 acres which is a small component of actual development.</p>
<p>Methods and procedures that ensure the long-term <b>productivity and usefulness</b> of the PCH be utilized within the Arctic National Wildlife Refuge</p>	<p>International agreement on conservation of PCH</p> <p>Demonstrated consistent use of the 1002 Area and adjacent lands based on historical scientific migration and movement data (maps) and aboriginal traditional knowledge</p>	<p>EIS provides no real analysis to assess impacts to productivity (eg. calf survival, pregnancy) and no extension to population or distribution impacts. EIS attempts to address this via Lease Stipulations, Required Operating Procedures, and “properly designed infrastructure”. <b>Effectiveness of these mitigations is unclear and no evidence is provided.</b></p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>The risk of irreversible damage or long-term adverse effects on PCH habitat should be minimized via international cooperation</p>	<p>International agreement on conservation of PCH</p> <p>Historical scientific migration and movement data demonstrating PCH use of the 1002 Area and adjacent lands (maps)</p>	<p>The EIS does not address the international aspect of PCH management and barely acknowledges Canada’s role in managing the herd and its habitat, nor does it adequately acknowledge the herd’s transboundary distribution.</p>
<p>Activities that would significantly disrupt migration or other important behavior patterns should be avoided or minimized via international cooperation</p>	<p>International agreement on conservation of PCH</p> <p>Historical scientific migration and movement data demonstrating consistent repeated PCH use of the 1002 Area and adjacent lands (maps)</p>	<p>To date no efforts have been made through the International Porcupine Caribou Board or other means to address this.</p> <p>The EIS attempts to address this via Lease Stipulations, Required Operating Procedures, and “properly designed infrastructure”.</p> <p>Analyses of impacts are qualitative and very general (F.4.15). Allowance of hunting on industry roads could compound effects. Main mitigations are pipeline height (7’), separation of roads and pipelines, timing of major construction and “no surface occupancy”. <b>The effectiveness of these mitigations is unclear.</b></p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
Continuation of subsistence uses is essential	<p>References to “users” in the International agreement on conservation of PCH</p> <p>Principles of conduct in the field of the environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States</p> <p>Historical harvest data of adjacent First Nation and Inuvialuit user communities</p>	<p>The EIS presents the range-wide harvest in Figure 3-7 which is the allocation of historic use from the PCH Harvest Management Plan. However, the EIS limits its considerations to Kaktovik when discussing potential impacts to harvest.</p> <p>(See comment below about harvest data.)</p> <p>The potential impact on Canadian “users” is not acknowledged and Canadian traditional user communities are not being consulted.</p>
Recognition of the traditional dependence on caribou and that in some cases no other practical alternative to replace food supplies are available	<p>Recognition in the PCMA that Old Crow has a unique dependence on PCH</p> <p>Demonstrated cultural importance of PCH for Inuvialuit and other Yukon First Nations.</p>	<p>EIS only addresses Kaktovik and Alaskan use.</p> <p>Potential impact on Canadian users is not acknowledged. No aboriginal traditional knowledge is referenced.</p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>When evaluating the environmental consequences of a proposed activity, the Parties will consider and analyze potential impacts, including cumulative impacts, to the Porcupine Caribou Herd, its habitat and affected users of Porcupine Caribou</p> <p>Ensure opportunities for customary and traditional uses of the Porcupine Caribou Herd ... in Yukon and the Northwest Territories, Native users as defined by sections A8 and A9 of the PCMA</p>	<p>International agreement on conservation of PCH (Item 2c)</p> <p>Historical harvest data of adjacent First Nation and Inuvialuit user communities</p> <p>Cultural significance of PCH to Canadian traditional user communities</p>	<p>EIS mainly addresses impacts to Kaktovik and acknowledges four other Alaskan Arctic communities. It also provides caribou data for 10 Alaskan communities (most are not PCH harvesters) in terms of numbers and in pounds of meat (Appendix M); however, the potential impact on Canadian users is not acknowledged</p> <p>The EIS outlines the International Porcupine Caribou Agreement in Appendix D but does not address international aspects of herd management.</p>
<p>The EIS should consider how the objectives of the international agreement can be met and analyze potential impacts and cumulative impacts to the PCH and its habitat</p>	<p>International agreement on conservation of PCH</p> <p>PCMB submission re EIS, dated June 19, 2018</p>	<p>EIS provides categories of acres of different frequencies of use for calving and post-calving (Table J-13). There is no real assessment of cumulative impacts other than a descriptive paragraph that references some other factors that may be impacting the herd. The draft EIS fails to meet requirements set out in the National Environmental Policy Act.</p> <p>Climate change impacts are identified by stating that limiting development to a smaller portion of calving range would provide flexibility for the herd, but otherwise the EIS suggests impacts of climate change on the herd are impossible to predict (3-109).</p>



Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>Sensitivity of the PCH during calving and recognition of historic use of 1002 Area and potential impacts on herd and subsistence users must be acknowledged</p>	<p>PCMB submission re EIS, dated June 19, 2018</p>	<p>Most of the data presented in the draft EIS on this topic is related to the Central Arctic Herd (CAH). Data that does reference the PCH is not the most recent (e.g., Griffith et al 2002 is main citation that is actually pertinent).</p> <p>Potential impacts of development are downplayed in the EIS.</p>
<p>Meetings should be held in PCH user communities in Canada to consider how subsistence harvesters may be adversely affected</p> <p>Enable users of Porcupine Caribou to participate in the international co-ordination of the conservation of the Porcupine Caribou Herd and its habitat;</p> <p>Encourage cooperation and communication among governments, users of Porcupine Caribou and others</p>	<p>PCMB submission re EIS, dated June 19, 2018</p> <p>International agreement on conservation of PCH</p>	<p>Meetings have only occurred in Alaskan communities. Any future hearings that are alluded to are only in reference to Alaskan communities (e.g., Arctic Village, Venetie).</p> <p>Potential impact on Canadian users is not acknowledged or assessed to any real extent.</p> <p>Participation of Canadian users in meetings or consultations is not mentioned.</p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>Avoid or minimize activities that would significantly disrupt migration or other important behavior patterns of the Porcupine Caribou Herd</p>	<p>International agreement on conservation of PCH  Russell &amp; Gunn 2019</p>	<p>A key assumption used in the draft EIS is a 2.49 mile zone of influence (ZOI) surrounding oil and gas infrastructure. There is inadequate evidence to support the use of 2.49 miles for the displacement of calving PCH cows. The 2.49 mile value was derived from research on the CAH which has important differences when assessing responses to disturbance. Research shows that distance from disturbance or the ZOI of a development can be higher (Russell &amp; Gunn 2019). The draft EIS acknowledges that the PCH will likely be more sensitive to disturbance given their historical lack of exposure to infrastructure (3-114). Therefore, the impact on the PCH should be anticipated to be higher than for the CAH.</p>
<p>Avoiding or minimizing activities that would significantly disrupt ... behavior patterns of the Porcupine Caribou Herd would involve appropriate mitigations</p>	<p>International agreement on conservation of PCH  Russell &amp; Gunn 2019</p>	<p>The draft EIS states what the planned mitigations for the presence of caribou will be via Required Operating Procedures but there is no mention of how lease operators are to monitor for or have advance awareness of the imminent arrival or presence of caribou.</p> <p>Expectations for on-site monitoring programs or relationships with government biologists who manage PCH satellite location data are not mentioned.</p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
<p>Increased hunting pressure on new roads will affect mortality and behavior of PCH and add to cumulative impacts on the herd</p> <p>Studies have shown that caribou response distance related to roads (ZOI is greater when caribou are hunted. Hunting associated with roads increases the road ZOI from 0-3 km to 15 km (Plante et al. 2018)</p>	<p>Russell and Gunn 2017 and Plante et al. 2018</p> <p>Item 3.g. from the international agreement on conservation of PCH states that potential impacts, including cumulative impacts, to the Porcupine Caribou Herd and affected users will be considered and analyzed.</p>	<p>The EIS states that the most common stimulus associated with roads is vehicle traffic; however, it also indicates that harvesting would be allowed along gravel roads.</p> <p>No analysis has been provided to consider the cumulative and behavioral impacts of additional harvesting on the PCH.</p>
<p>Cumulative impact of roads and traffic during summer</p> <p>Maternal caribou are more sensitive than at other times of the year</p>	<p>Russell and Gunn 2017 and 2019</p> <p>Item 3.g. from the international agreement on conservation of PCH states that potential impacts, including cumulative impacts, to the Porcupine Caribou Herd and affected users will be considered and analyzed</p>	<p>The EIS claims that caribou will be less affected by roads and traffic from mid to later summer (page E-7); however, it does not indicate how timing limitations and operating procedures will be monitored and implemented.</p> <p>No references to scientific analyses have been provided related to the effect of human activity on maternal caribou.</p> <p>ZOIs are in question (see previous points above)</p>

Benchmarks & Criteria	Established References	Draft EIS deficiency
Methods and procedures that ensure the long-term productivity and usefulness of the PCH should be utilized within the Arctic National Wildlife Refuge	Russell & Gunn 2019	On pages E-11, E-13 and E-15 the EIS states that habitat loss or alteration from activities would not affect the availability or abundance for subsistence use. This statement is incorrect. The cumulative impacts of development predict a negative impact on herd size and therefore abundance for subsistence use will be affected.

**REFERENCES**

Russell, D., and A. Gunn, 2019. Vulnerability analysis of the Porcupine Caribou Herd to potential development of the 1002 lands in the Arctic National Wildlife Refuge, Alaska. Report prepared for: Environment Yukon, Canadian Wildlife Service, and GNWT Department of Environment and Natural Resources.

Plante et al. 2018. Human disturbance effects and cumulative habitat loss in endangered migratory caribou.

Don Russell and Anne Gunn, March 2017. Assessing caribou vulnerability to oil and gas exploration and development in Eagle Plains, Yukon. A report submitted to Yukon’s Department of Energy, Mines and Resources.