THE WILDLIFE SOCIETY
ALASKA CHAPTER

The Alaska Chapter of The Wildlife Society strives to enhance the ability of wildlife professionals to conserve biological diversity, sustain productivity, and ensure responsible use of wildlife resources in Alaska for the benefit of society.

October 24, 2019

Tina McMaster-Goering
Ambler Road Project Manager
Bureau of Land Management
222 W 7th Avenue #13
Anchorage, AK 99513

RE: Alaska Chapter of The Wildlife Society Comments on the Draft Environmental Impact Statement for the Ambler Road Project

Dear Ms. McMaster-Goering,

This letter represents the Alaska Chapter of The Wildlife Society's public comments on the Draft Environmental Impact Statement (DEIS) for the Ambler Road Project. We appreciate the opportunity to comment on this important document for a project that has the potential to greatly transform northern Alaska in many ways.

The Wildlife Society (TWS) was founded in 1937 and is a non-profit scientific and educational association of over 15,000 professional wildlife biologists and managers, dedicated to excellence in wildlife stewardship through science and education. Our mission is to inspire, empower and enable wildlife professionals to sustain wildlife populations and habitats through science-based management and conservation. Our professional membership represents and serves the community of scientists, managers, educators, technicians, planners and others who work actively to study, manage and conserve wildlife and its habitats worldwide. The Alaska Chapter of TWS has about 200 members in Alaska representing wildlife scientists and resource managers including those working for state and federal agencies, Native organizations, universities, non-profit groups and consulting biologists. Our collective knowledge regarding wildlife and its habitat in Alaska is our greatest strength, so we offer these comments in hopes that they will be used to improve the analyses in the DEIS.

We appreciate the attention that has been shown to analyzing the potential benefits and impacts of the Ambler Road Project. Many important issues have been raised that are important for BLM and the public to consider as the decision proceeds regarding permitting of a single-purpose access road between the Dalton Highway and the Ambler mining district. In our review of the DEIS, however, we found several serious flaws in the assumptions that were made and the analyses conducted. In these comments we first describe assumptions in the DEIS that tend to isolate, segment, compartmentalize, and therefore minimize some of the long-term, indirect, and cumulative impacts of the road and the mining projects that it will enable. We then turn to more specific issues regarding the descriptions and analyses of particular resources and species that deserve fuller attention in the EIS. Finally, we briefly address some socio-ecological considerations of the Ambler Road that merit improvement in the EIS.

Issues with DEIS assumptions

1. Life of road.
   The DEIS repeatedly states the road will be removed and the land will be reclaimed when the estimated 50-year life of the mines in the Ambler District play out. In our experience, Alaska does not have a record of removing and reclaiming roads in remote areas once they are built. Whether it is the 414-mile long Dalton Highway, or some of the shorter placer mine access roads stemming from the Dalton Highway or other major highways, the fact is that pioneer roads in Alaska usually do not get removed and reclaimed because other purposes appear which the road then enables. For example, the DEIS Maps 3-8 in Volume II Appendix H, show significant high-potential mineral resources (rare earth elements, gold, platinum, copper, uranium, tin-tungsten-molybdenum) along each of alternatives A, B, and C, that could be made available by this access. Appendix H states: "Outside the District, there is potential for additional mining development to occur along the 3 alternative routes. This would include access to the mining claim clusters near the Zane Hills and Ray Mountains for Alternative C and other locations along all 3 alternative routes" (p.H-4). As exploration of these areas proceeds during the 50-year Ambler District time span, owners of those mining claims could show a need for the road to remain open.

   Furthermore, as has been experienced along the Dalton Highway, other commercial uses such as guided tourism, guided and/or outfitted hunting and fishing, telecommunications, etc, will be proposed and considered. In our experience these uses may initiate and increase without the benefit of road access, but eventually road access would be requested and could get approved. If some communities end up being dependent on commercial freight deliveries, what will happen to those deliveries at the end of 50 years? The DEIS acknowledges that "AIDEA's proposed reclamation of the road at the end of its useful lifespan could have great impact on communities that have become dependent on commercial access and fiber optic service" (p.3-103). The pressure on agency administrators and politicians to keep the road open beyond 50 years will likely be enormous.

   In our view, the DEIS' failure to consider an alternative with a longer life than 50 years, or possibly in perpetuity, represents a segmentation of the overall project such that a significant portion of future impacts are not analyzed. The BLM should disclose in the final EIS how many miles of mining road they manage in Alaska that have actually been "put to bed" and reclaimed. TWS attempted a search, and could only find a few examples of a few short roads (e.g. Frying Pan Creek and Acme Creek) that were reclaimed. Rather, the record is one in which there is the continued existence and evolving uses of many short mining roads (e.g. Prospect Creek, Chapman Creek, Slate Creek, and Marion Creek off the Dalton, and Hogatza-Aloha Creek off the Koyukuk). To our knowledge there have been no *major* BLM- or State-permitted mining roads that have been reclaimed in Alaska. TWS therefore recommends that the final EIS include a scenario in which the road is planned to be open for a period much longer than 50 years, and in which it will not be removed and reclaimed.

2. Public road access.
   The DEIS repeatedly states that the road will be a private road and will never be opened to the public. Volume II, Appendix H states:

   > "...the BLM is not considering issuance of a ROW [right-of-way] for a public road, and a public road is not among the alternatives being considered for analysis in the EIS. The proposed road would be closed to the general public. Modifying a restricted access industrial road to one capable of supporting public access would require a new ROW application and authorization process. It would have a different purpose and need. No such application has been submitted. For these reasons, general public access is not reasonably foreseeable and thus a public access road is not considered to be a contributing factor to indirect or cumulative impacts." (p.23)

   TWS strongly disagrees with this approach. Just as for the 50-year life mentioned above, once constructed, in our judgement it is reasonably foreseeable that economic, social justice concerns, and

political pressure will likely cause the Ambler road to be made public, eventually. This is not speculative -- it is reality in rural Alaska and is based on historic observations. TWS therefore strongly urges that BLM add an alternative scenario in which the Ambler Road is eventually opened for public use.

3. Segmentation of impacts assessment.
As regards the four large mines that could be built and operated at the end of the Ambler Road, TWS appreciates that BLM did what we believe to be a fairly comprehensive analysis of Reasonably Foreseeable Actions (RFAs) and Cumulative Impacts (CIs) for the four mines considered. However, TWS also believes that BLM artificially and incorrectly limited the scope of the CI analysis. DEIS Volume II, Appendix H indicates that significant mineral resources could be developed if there was access to the Ambler Road (p.H-4, and Maps 3-8) and that "[i]ndustrial mining and authorized commercial uses of the selected alternative are anticipated to spur the construction of additional access roads and facilities" (p.H-35). TWS maintains that it is reasonably foreseeable that other mines outside of the Ambler District and near the road could be developed, given the improved access. Again, this is not speculative, rather it indicates that over the long term, the four hypothetical mines at the end of the Ambler Road represent a *minimum* impact scenario. The DEIS fails to include a more intensive impact scenario that includes the additive and cumulative impacts from the host of other mines, large and small, which may be proposed and approved elsewhere along the routes of Alternatives A, B, or C. It is common in scientific simulation studies to examine a range of possible alternatives (e.g., 5%, median, 95% or 25%, 50%, 75%) to depict the range of variation in expected effects of proposed treatments. TWS therefore recommends that BLM follow such an approach and analyze at least one additional future mine development scenario over and above the four Ambler mines in final analysis of cumulative impacts.

4. Inter-jurisdictional permitting, mitigation, and enforcement issues.
The DEIS includes significant qualifications and caveats that raise questions about the effectiveness of permitting, mitigation and enforcement, given the multiple jurisdictional authorities that will share the Ambler Road. The DEIS indicates that each agency and private Native Corporation land owner/manager along the Ambler Road corridor has differing legal responsibilities and therefore may have differing interpretations of priorities pertaining to wildlife, fisheries and their habitats in the project area. These qualifications indicate to our cadre of professional wildlife biologists and habitat managers that there is potential for significant inter-agency and inter-organizational confusion, and possibly disagreements, on how permits will be approved, managed and enforced. The following quotes from the DEIS exemplify the issue:

    - "The following analyses assume measures committed to by AIDEA will be implemented… The BLM may authorize portions of the project under separate permits, such as an authorization for the road ROW and separate authorizations for material extraction and sales… Only a portion of each alternative would be on BLM-managed land, and therefore BLM's authority to require and enforce specific mitigation measures is limited" (p.3-3).
    - "Restrictions on activity and cessation of traffic on BLM-managed land would have little effectiveness due to the small amount of BLM-managed land on each of alternatives A and B" (p.3-75).
    - "Potential mitigation measures presented in Appendix N (Section 3.4.7, Subsistence Uses and Resources) include a measure to this effect; the BLM would have the authority to enforce such restrictions on BLM-managed lands only, however. AIDEA could adopt this measure as an overall design feature of its own, and it would then apply throughout the length of the project" (3-112).
    - "The Alaska Department of Natural Resources (ADNR), in its role as a cooperating agency for the project, has stated that it must separately evaluate questions related to use of the road and restrictions on use and cannot commit at this time regarding road use and restrictions where the road would cross State of Alaska lands" (p.H-23)

- "Landowners could decide whether to authorize other individual users under separate decision-making processes. For example, if another mine were proposed outside the District, access could be allowed, but authorization would have to come through the underlying landowner(s) and not from AIDEA or its road operator. Landowners issuing such authorization would do so in consultation with AIDEA" (p.H-24).
- "The BLM may authorize portions of the project under separate permits, such as an authorization for the road right-of-way (ROW) and separate authorization for material extraction and sales. *BLM has the authority only to enforce mitigation on BLM-managed lands.* For purposes of the National Environmental Policy Act (NEPA) and this Environmental Impact Statement (EIS), this list is intended to be applicable to the range of activities the Alaska Industrial Development and Export Authority (AIDEA) has proposed. *However, not every requirement listed would be applicable to every activity/permit*....The following are measures that have arisen from law, regulation, and plan policy; have been proposed by AIDEA or by other agencies; or have arisen as the BLM has worked through the analysis in the EIS. These are measures that appear likely to apply and are presented as listings for consideration. No decision will be made until the Record of Decision (ROD) is issued. *Each agency may select measures such as these for inclusion in decisions related to their own jurisdictions*" (p. N-1, italics added).

TWS is extremely concerned that because of multiple jurisdictions there will not be unified and consistent management and enforcement of permits, stipulations, and mitigation measures. In the late 1970s some of our membership worked on environmental monitoring aspects during construction and initial commissioning of the Trans-Alaska Oil Pipeline System (TAPS). There is a significant body of research based on experience from the TAPS mega-project which suggests that a cooperative inter-agency approach is the only feasible means to ensure consistent application of environmental protection measures for a project of the magnitude of the Ambler Road and its associated mining development across multiple land jurisdictions (Morehouse et al. 1978, Pamplin 1979, CGI/Quest 1980). In the case of TAPS, a Joint Fish and Wildlife Assistance Team (JFWAT), consisting of State, Federal, and private consultant-level environmental experts, was formed to work under the Federal Alaska Pipeline Office and State Pipeline Coordinator office (*See also* Mead 1978, Wickwire 1979, McGrath 1977, Hanraban and Gruenstein 1977, and McCracken 1976 for historic descriptions of the chaotic start and effects of TAPS construction on Alaska wildlands and social systems).

Should the Ambler Road project advance to the design phase, TWS strongly urges the proponents, and all involved land owners and managers, to sign a cooperative agreement aimed towards unified permit approval procedures, stipulations, management, mitigation, and enforcement, for the road and ensuing mineral developments. We see a joint inter-organizational permit management field office, similar to JFWAT, as the only way for the Ambler road project and the mineral development along the road to be managed in a manner that adequately protects fish, wildlife, habitats, and the people who depend on them.

Species- and environment-specific issues

5. Water quality and fisheries

TWS appreciates the numerous candid statements in the DEIS, which together concluded that even with expected mitigation actions, water quality and fisheries could suffer from construction of the Ambler Road and from the indirect impacts of associated mines. Such statements include:

- "The greatest indirect impacts would arise from potential mine development...Impacts on water resources quality include increased dust from mining operations, potential spills and containment of ore concentrates, chemicals used in processing ore, fuels, and process water, in addition to

wastewater from operations of facilities and camps, and *may require treatment of toxic mine water in perpetuity*" (p.3-27, italics added).

- "The primary effects to fish and amphibians would result from degrading habitat quality at and downstream of conveyance structures and gravel mine sources near rivers, potentially impeding seasonal habitat connectivity, modifying hydrologic conditions along the entire length of the road embankment, and introducing the potential for accidental spills of petroleum products, mineral concentrates, and other contaminants into aquatic habitats. Of particular concern is the potential for the road to accelerate the predicted rate of climate-driven permafrost degradation, which would further degrade downstream water quality, potentially inhibit fish movement, and may alter species distribution and abundance… While the AIDEA commits to employing a number of design measures outlined in Appendix N, the *implementation of such measures would reduce, but not eliminate, potential impacts to fish and amphibians*" (p.3-54, italics added).
- "Cumulatively, the road and reasonably foreseeable future development has the potential, if not properly constructed or maintained, to have very substantial, long-term impacts to fish and aquatic life at the population level, which could lead to very substantial impacts on subsistence use practices in the region" (p.3-61).

The key to avoiding these impacts is strict enforcement of permit stipulations and mitigation requirements consistently applied over the entire project (see our comment above regarding a cooperative agreement aimed at unified project management). The DEIS references several studies (Kuipers et al. 2006, Maest et al. 2005; and Woody et al. 2010) which suggest that non-compliance with water law is to be expected as a result of mine development (H-37 - 38). Kuipers et al. (2006) found that the EISs of 25 recent large mine projects predicted compliance with water quality standards, yet in actuality "76% of the case study mines had mining related exceedances in surface water or groundwater" standards (p.ES-10 in Kuipers et al. 2006). They concluded that "[m]itigation frequently fails to perform according to plan. It is important to consider the likelihood and consequences of mitigation failure in EISs and identify additional mitigation measures that can be installed if failure occurs" (p.ES-15 in Kuipers et al. 2006). If the Ambler Road is built, TWS implores all agencies and land managers involved in permitting the road and mines to create and enforce a *consistent* set of strict permit stipulations and mitigation actions.

Beyond the mitigation steps to avoid impact are reclamation requirements aimed at restoring the landscape, vegetation and habitats that were altered for construction and mining. Sadly, the track record for reclamation in Alaska and neighboring Canadian Yukon is not good. For example, in a study of ten stream reaches in eastern Alaska that were "reclaimed" after placer mining, 9 were non-functioning, or functioning-at-risk for channel incision and riparian vegetation complexity. None of the ten stream reaches were functioning properly for bank cover and stability (Brady et al. 2018). In Alaska, of five large mines operating in the last two decades, three received good marks from permitting agencies, but two had a history of water quality violations (Spindler, PowerPoint presentation 2019). In neighboring Yukon Territory, four of five large mines still operating, or closed in the last two decades, have left behind major contamination problems to the government, with minimal reclamation work done by the mine operator (Keevil 2017).

Appendix N mentions that culverts will meet "ADFG standards" (p.N-20, #4). It also states, "Culverts would be designed and installed using stream simulation principles with embedded culverts filled with substrate to replicate natural channel characteristics and function" (p.N-21). These are laudable goals, which TWS believes should always be adhered to. However, while Appendix N repeatedly addresses appropriate sizing of culverts and fish "passage," it does not explicitly state that culverts will allow continual and adequate upstream and downstream movement for relevant life stages of fish, aquatic invertebrates, and wood frogs. Furthermore, the DEIS states that "While AIDEA proposes to provide fish passage for all perennial and some well-defined ephemeral streams, the road would cut off and/or reduce

access to important wetland and off-channel habitats that may support rearing and feeding fish" and that "The majority of crossing structures proposed by AIDEA would likely not be adequate to maintain fish passage" (p.H-47). TWS questions why the mitigation portion of the DEIS would have very good fish spawning and passage protection goals, but elsewhere in the document, BLM would then back-track to provide caveats for AIDEA stating that this may not always happen as there will be unavoidable impacts that are not mitigated. TWS believes that all stream crossings must be adequate for fish passage and that they must be maintained regularly so that fish passage is not impeded. Protection of fish spawning, rearing, migration paths, and wintering habitats should be among the highest priorities on the project, if it is to be built.

In addition to the above, we make the following specific recommendations:

- The DEIS lists a suite of important fish species in the Project Area, stating that, "Pacific salmon, sheefish, broad and humpback whitefish, Arctic grayling, northern pike, and burbot are major targets of a subsistence, sport, or commercial fishery in the study area" (p.3-50). TWS recommends that least cisco also be included as a key species (F. Adams, USFWS fish biologist, retired, pers. comm.).
- The DEIS acknowledges the negative effects of calcium chloride on water quality and fish, but does not prohibit its use (p.3-57). Because road dust is a major issue, the DEIS should have researched and presented several alternatives for dust control and included strong mitigation actions in Appendix N. TWS recommends that calcium chloride should not be used at any time.
- Gravel that is mined from active or abandoned main and side channel habitats will likely change the quality and quantity of surface and hyporheic flows (p.3-58). One potential mitigation measure is offered: "Gravel and other construction materials would not be taken from streambeds, riverbeds, active floodplains, lakeshores, or outlet of lakes unless the taking is approved by the Authorized Officer" (p.N-7, #1). This allows too great a possible exception without clarifying any standards that the Authorized Officer would use to make such a decision. Standards for such a decision need to be clarified and supported using the best available science. Furthermore, TWS recommends that gravel should never be mined within floodplains.
- The DEIS lists as a potential design feature that bridges and culverts will emulate "natural channel functions" but does not mention measures to provide for these functions during installation (p.N-12, #6). Executive Order (EO) 11988 requires the proponent to design and size the spanning structures to avoid, minimize, protect and restore floodplain function. The DEIS should comply with the requirements of the EO.
- One potential design feature proposed by AIDEA includes placement of riprap around culvert ends (p.N-12, #12). However, riprap provides little to no fish or wildlife habitat (F. Adams, USFWS fish biologist, retired, pers. comm.). The final EIS should require AIDEA to universally adopt mitigation actions featuring bioengineered approaches with native vegetation, as described on p.N-13, #15c.
- While the goal of Potential BLM Mitigation Measure 13, that "AIDEA would ensure that the temperature of natural surface or groundwater would not be changed" by the Project or associated activities (p.N-13) is laudable, no description is given about how this would be accomplished. Additional details, supported by the best-available science, are needed.

6. Birds.

The DEIS states, "It is unlikely that wetlands would recover to their unaltered, pre-project conditions after construction (p.3-42) and that, "Once disturbed, permafrost-supported wetlands are unable to be rehabilitated to their original condition" (p.3-43). The DEIS admits that "some of these impacts to wetlands and vegetation may not be reversed and would be permanent" (p. C-94), which is disturbing for this apparent unavoidable loss of habitat. We appreciate the ROW wetland avoidance and hydrologic mitigation measures listed in Appendix N (p.N-17 - N-18). It is important that the FEIS also state, however,

that if the road project is completed compensatory mitigation for wetland loss be negotiated in the final permits. This is not stated in the DEIS and we request that it be added.

In the section on road impacts to birds (p.3-63), the DEIS fails to address how garbage will be managed to minimize impacts to birds. Some bird groups including corvids, gulls, and raptors are attracted to anthropogenic foods in refuse dumps (Elliott et al. 2006, Weiser and Powell 2010, Weiser and Powell 2011, Baltensperger et al. 2013, Plaza and Lambertucci 2017). If left unmanaged, this could significantly alter the behavior of these birds. These bird groups can also spread uncovered garbage away from its source and into other environments (Savory, G. pers. comm.). Description of the steps that will be taken to reduce such impacts should be added.

We appreciate the well informed summary of possible impacts on landbirds and shorebirds. However, there are a few additional points we would like to raise and request be included in the EIS and its analysis of impacts under each Alternative:

Loss of breeding habitat and ancillary disturbances associated with roadside development (noise, dust, increased predation through road corridors) could have a significant negative cumulative impact on populations of several species that have been undergoing significant population declines in interior and northern Alaska. Those species marked with an asterisk below have also suffered a significant population decline at the continental level. These species are variably associated with boreal wetland habitats, mesic spruce forests, upland shrublands, and alpine tundra, all of which would be affected to varying degrees in the three alternatives. The shorebird and landbird species with significant population declines within interior Alaska (all species) and across North America (*) include the following (Alaska Shorebird Group 2019, Handel and Sauer 2017, Sauer et al. 2017):

- American Golden-Plover (alpine tundra)*
- Lesser Yellowlegs (boreal wetlands)*
- Red-necked Phalarope (boreal wetlands)*
- Olive-sided Flycatcher (boreal wetlands)*
- Western Wood-Peewee (boreal wetlands)*
- Violet-green Swallow (boreal wetlands)*
- Bank Swallow (riparian sand banks and bluffs)*
- Cliff Swallow (riparian bluffs and cliff faces)
- Ruby-crowned Kinglet (mesic spruce forests)
- Orange-crowned Warbler (shrublands)
- Blackpoll Warbler (boreal wetlands)*
- Wilson's Warbler (boreal wetlands, shrublands)
- Savannah Sparrow (boreal wetlands, shrublands, alpine meadows)*
- White-crowned Sparrow (shrublands)
- Rusty Blackbird (boreal wetlands)*

In addition, the Surfbird and Wandering Tattler are two species of shorebirds of particular concern because they have small population sizes and breed in alpine habitats throughout interior Alaska. Their population trends are unknown because they are so difficult to study. These species would be most negatively affected by Alternatives A and B (Handel and Sauer 2017).

The Lesser Yellowlegs, Olive-sided Flycatcher, Rusty Blackbird, and Blackpoll Warbler are of particular conservation concern because of marked continental population declines, their restricted breeding

distribution to boreal wetlands, and their relatively low population sizes. They would most likely be more negatively affected by Alternative C (Handel and Sauer 2017).

The Olive-sided Flycatcher is listed as a Threatened Species in Canada and as a Near-threatened Species by the IUCN (note that this designation is incorrect in Table 1.3 of the EIS, p. E-18). The Bank Swallow is also listed as a Threatened Species and the Red-necked Phalarope is listed as a Species of Concern in Canada. These official listings by Canada should be taken into account because they lend further evidence of continental conservation concern for these boreal-wetland species.

The Gray-headed Chickadee (*Poecile cinctus*) is listed incorrectly as 'relatively common' in the study area (p.61). This species is extremely rare in North America, occurring only in northern and western Alaska and northwestern Canada, and there is evidence of recent population decline and range contraction for the unique subspecies (*P. c. lathami*) that occurs in North America. Because of its small population size, limited distribution, and apparent population decline, the Gray-headed Chickadee should be the subject of intensive surveys throughout any proposed road corridor in this region. It has been recorded using narrow belts of riparian shrubland and forest habitats along the southern Brooks Range for breeding within the region, and thus the species could be at great risk from any of the alternatives, but particularly A and B (DeCicco et al. 2017, Hailman and Haftorn 1995).

7. Bats.

Chapter 3.3.4 on Small Mammals is not up to date on the current state of knowledge on little brown bats (*Myotis lucifugus*) in interior Alaska (Jochum et al. in prep., Gotthardt et al. 2013, Tessler et al. 2014, Savory 2016, Shively 2016, Savory et al. 2017, Shively and Barboza 2017, Testerman and Jochum 2018). It depicts the potential distribution of little brown bats in the project areas as "limited by the lack of preferred roosting habitat of buildings and forested areas" (p.3-72) based on one manuscript published over 20 years ago (Parker et al. 1997). However, from recent research, bats have been detected throughout interior Alaska, including near the project area in Bettles, Alaska (Shively and Barboza 2017). Bats have been also detected on U.S. Army Garrison Alaska Fort Wainwright (Jochum et al. in prep., Savory 2016, Savory et al. 2017, Testerman and Jochum 2018). In Donnelly Training Area, habitat use probability is estimated to be 0.82 (SE ± 0.08) in forested habitats from mid-July through the end of August (Testerman and Jochum 2018). Maternity roosts have been identified at anthropogenic sites (e.g., buildings; Jochum et al. in prep., Shively 2016, Shively and Barboza 2017) and in natural sites (e.g., trees; Jochum et al. in prep.). Many of the tree roosts are located in open canopy (25-59% cover) of deciduous and mixed forests near open water bodies such as rivers and ponds.

Furthermore, the Small Mammals section does not address potential listing of little brown bats as a Threated or Endangered Species under the Endangered Species Act. Little brown bats are scheduled for discretionary status review by U.S. Fish and Wildlife Service by FY 2023 (USFWS National Listing Workplan, 5-Year Workplan. May 2019 Version. https://www.fws.gov/endangered). The listing of the little brown bat as Threatened or Endangered species prior to or during construction of the road could impact construction activities and/or road placement, especially if the land in the project area is declared as critical habitat. Discussion of this and its implications for the Project and its impacts to bats needs to be included in the DEIS.

Finally, the Small Mammal Impacts section of the DEIS does not address impacts of project on little brown bats and their roosts (p.3-78). Destruction of tree roosts during little brown bat pup birth and rearing time (i.e., June through early August) could kill many bats. Tree roosts should be identified as to avoid destruction during the land clearing phase of road project, or land clearing should be conducted outside the little brown bat pup rearing period from June through early August.

8. Caribou

Caribou (*Rangifer tarandus*) are a key species in Alaska both ecologically and for Alaska Native subsistence and culture. Given the importance of this species and the multitude of potential impacts from the Ambler road, we appreciate the attention caribou received in the DEIS. There are, however, additional areas for improvement where the best-available scientific information relating to caribou is not considered or is conflicted by statements in the DEIS. Such issues need to be addressed.

The "zone of influence" (ZOI) has been defined for caribou as the distance from infrastructure or human activity in which caribou change their behavior, habitat selection, and/or distribution due to disturbance (Boulanger et al. 2012). While the DEIS discusses changes to caribou behavior and displacement from infrastructure and disturbance, it fails to reference and discuss recent studies, some of which indicate larger ZOIs than those referenced in the DEIS. For example, the DEIS says that studies have shown that caribou displacement may span up to 9.6 km from disturbance, citing papers published up to 2013 (p. 3-74). However, Plante et al. (2018) found displacement from roads up to 15 km and from human settlements up to 18 km. Similarly, Appendix H in the DEIS describes avoidance of mines. Citing a single study from 2007, it describes avoidance of mines by caribou up to 4 km away (p. H-51). More recent studies, not cited in the DEIS, however, have found larger areas of avoidance by caribou around mines, ranging from 11-14 km (Boulanger et al. 2012) to 20-23 km (Plante et al. 2018). These sections should be updated to include such studies and to align with the best-available science.

The recent studies cited above also should be incorporated into calculations of potential project impacts on caribou. Displacement effects do not appear to be included in the impacts assessment depicted in Appendices E and H. For example, Table 20 in Appendix E indicates the loss of caribou habitat in acres by herd and season under each alternative (p. E-22). It appears, however, that these account only for the physical footprint of development and do not include expected displacement effects. Similarly, Table 2-11 in Appendix H shows the hypothetical disturbance from each potential future mine in the Ambler Mining District (p. H-22). Once again, only the physical footprint of potential mining development appears to be included in these calculations. The phrase "appears" is crucial here as no clear explanation is given for how these percentages are calculated. This needs to be made explicit in the EIS to enable meaningful public review. As the citations above describe, the habitat area lost to caribou and other species in both cases is likely to be much larger than just that due to direct effects of the physical footprint. Displacement, altered movement and avoidance of high-quality habitat are expected to be project-area wide and long-term (Table 21, p. E-23). In light of this, displacement effects must also be reflected in the Appendix E and Appendix H tables, which will result in much greater acreages of estimated effects.

One major issue in the DEIS is the lack of sufficient discussion and consideration of variability in patterns of space use for caribou and the importance of maintaining such variability for population wellbeing. While caribou generally show high fidelity to calving grounds over time, they may show greater interannual or even decadal variability in use of other seasonal ranges. For example, the Western Arctic Herd (WAH) has displayed multiple long-term (i.e., lasting >10 years) broad-scale shifts in range use going back at least to the 1800s (e.g., Skoog 1968, Burch Jr. 2012), including a shift in primary winter range from the Nulato Hills to the central Seward Peninsula in the mid-1990s (Dau 2001). Simply representing broad range maps and kernel density contours, as is done in the DEIS maps (e.g., Map 3-20; Map 3-23), does not accurately display this variability. In some years, large numbers of WAH caribou use the Ambler project area during the migratory and winter seasons. The EIS needs to better depict such episodic use in its maps, complementing the more general compilations of range use, as well as provide a more robust analysis of the effects of disturbance and displacement from the Ambler road in years when larger portions of the WAH do use the project area, or if another shift in winter distribution causes the area to be more heavily used. It is also worth noting in the EIS that even in years in which relative few caribou pass through the project area, those individuals can be of vital importance to subsistence hunters from the communities in the area.

Treatment of potential habituation of caribou to disturbance associated with the Ambler road is overstated in the DEIS and does not align with the best-available science. The DEIS claims that "experience in the North Slope oil fields indicates that caribou may habituate to some industrial activities" (p. 3-74) and assumes habituation of caribou over time may reduce subsistence impacts (p. 3-112). Notably, no citations are given for these statements in the DEIS. In fact, the evidence in the scientific literature for habituation of caribou to infrastructure and activity is equivocal at best. A search of the scientific database *Web of Science* for studies of caribou habituation revealed only three peer-reviewed studies of caribou habituation to oil and gas activity. Two of these look at habituation within the Central Arctic Herd (CAH; Haskell et al. 2006, Haskell and Ballard 2008). While both claimed to show evidence of habituation, Haskell et al. (2006) base this largely on use of areas closer to infrastructure during the post-calving period, when insect harassment is a dominant driver of caribou space use (Pollard et al. 1996). Calving caribou only moved closer to infrastructure during the calving period in one of the three years evaluated (Haskell et al. 2006). The second study (Haskell and Ballard 2008) found no evidence of habituation across years. They observed greater percentages of calves and numbers of caribou per kilometer surveyed in years with earlier snowmelt and inferred this as evidence that caribou habituated to infrastructure during each year, but point out that "[t]he available data were few, so our results may benefit from further verification or falsification" (Haskell and Ballard 2008, p.628). The third study (Johnson and Russell 2014) used 27 years of location data for the Porcupine Caribou Herd (PCH) to examine winter distribution responses to various human infrastructure and disturbance in Canada, including both seismic lines and well sites as well as non-energy infrastructure. They found a decreasing response of caribou to human infrastructure over time, but concurrent decreases in oil and gas activities made it difficult to determine whether this was due to habituation or to regeneration of natural habitats and processes after the cessation of human activities. They specifically point out that their "measured pattern is neither definitive nor causal" (Johnson and Russell 2014, p.61). A non-peer reviewed report on mitigating oil development effects on caribou acknowledged that "[e]vidence for habituation to anthropogenic stimuli by the CAH in and around the oil fields is fragmentary and anecdotal" (Cronin et al. 1994, p.A-67). The inappropriateness of assuming habituation was recently pointed out to BLM by scientists from the United States Geological Survey (USGS) in their comments on the Arctic National Wildlife Refuge Coastal Plain Oil and Gas Leasing Program DEIS (BLM 2019, p.71).

Studies of caribou and other ungulates also have failed to find strong evidence of habituation to other forms of development and human activity. Boulanger et al. (2012) examined caribou disturbance responses near a diamond mine in Canada and found variation in avoidance responses over time but no clear evidence of habituation. Another recent Canadian study found avoidance of long-established infrastructure, "suggesting that long-term habituation is unlikely." (Plante et al. 2018, p. 138). Similarly, recent research on mule deer (*Odocoileus hemionus*) in the contiguous United States found a lack of habituation to energy development even after a 15-year period and intensive mitigation efforts (Sawyer et al. 2017). A study in Norway found no evidence of habituation by reindeer to ski resorts, trails, and recreational cabins over a 20-year study (Nellemann et al. 2010). This multitude of sources emphasizes that there is not clear evidence for habituation to infrastructure and human activity in caribou. The DEIS' statement that maternal caribou are an exception to the trend of habituation falls far short of accurately reflecting the best-available scientific information. The Ambler Road DEIS should not present greater confidence than that demonstrated in the scientific literature that caribou will habituate to infrastructure and other human disturbances. Relying on this to reduce impacts from the Ambler Road and associated mines is unwise and should be rephrased accordingly in the EIS.

The DEIS acknowledges reports of altered movement behavior, delays and displacement of caribou approaching the DeLong Mountain Transportation System (DMTS) that services the Red Dog Mine (e.g., Dau 2013, Wilson et al. 2016). It attempts to minimize these reported impacts, however, by including a statement that "similar deflections and delays are reported along rivers and other natural linear features" (p.3-75). Unlike the cited reports of altered behavior near the mining road, no references are given for

this later statement. A scientific reference needs to be provided for this statement or it should be removed. It is crucial that BLM support its statements with citations to the scientific literature, especially those that are taken to show reduced potential effects of the proposed actions.

There are also concerns about misleading phrasing in the DEIS with regards to traffic volume effects on caribou. The DEIS states that "[m]oderate to high traffic volumes (more than 15 vehicles per hour) have been shown to delay or deflect large groups of caribou" (p.3-74). While this is an accurate statement, the way it is presented in the DEIS seems to imply that traffic will only have an effect at volumes above 15 vehicles per hour. In fact, the same references the DEIS cites for this statement (e.g., Curatolo and Murphy 1986, Cronin et al. 1994) also show that caribou movement behavior may be altered at traffic levels below 15 vehicles per hour, leading to caribou avoidance of roads (cf., BLM 2019, p.151). BLM should clarify their statement to indicate that road disturbances are expected to increase at higher traffic volumes but likely will also be present for lower traffic volumes. It is also important that BLM acknowledge that the referenced studies were conducted on oilfield roads. It is possible that disturbances from large ore-hauling trucks like those depicted in Appendix A, Figure 2-2 may be greater than those from typical oilfield road vehicles. This should be clearly stated in the DEIS, making previously reported traffic effects a minimum expectation for the Ambler road.

Another potentially misleading statement is that "Fullman et al. (2017) found that terrain and land cover characteristics were a greater influence on WAH [Western Arctic Herd] caribou movement than aircraft" (p.3-74). The referenced study examined the effects of environmental features on WAH fall migration through Noatak National Preserve. Commercial transporter aircraft landing sites were combined with sport hunter camp locations into a single hunting activity layer. At the scale considered they found caribou movement responses to terrain ruggedness, river size and land cover, but not to sport hunting activity. The combined sport hunting activity layer, however, should not be considered to represent all aircraft effects. Thus, it is inappropriate to conclude from this that aircraft have little effect on caribou movement. Traditional knowledge from subsistence hunters in the northern Alaska has indicated concerns about aircraft influences on caribou for decades (e.g., Georgette and Loon 1988, Jacobson 2008, Halas 2015).

Additional description and analysis is needed for the potential facilitating role the Ambler road could play for predation on caribou. The DEIS states that "[p]redators may use the road corridor to more efficiently gain access to caribou, which could increase predation" (p.3-76). No citations are given for this statement, despite an extensive body of work relating to the facilitative effects of linear features for predators. Linear corridors such as roads and seismic lines can alter the distribution of wolves (*Canis lupus*) and caribou (James and Stuart-Smith 2000). Linear features act like highways for wolves, allowing them to travel faster and farther, as well as altering their habitat selection patterns, increasing their contact with and predation of caribou (e.g., Dickie et al. 2017, DeMars and Boutin 2018). Other relevant papers that should be considered/discussed in the DEIS include Latham et al. (2011), Whittington et al. (2011), McKenzie et al. (2012), Hervieux et al. 2013, Serrouya et al. (2017) and Dabros et al. (2018). Wolf predation, facilitated by linear corridors, is thought to be one factor driving recent declines in woodland caribou in Canada (McLoughlin et al. 2003; Hervieux et al. 2013; Hebblewhite 2017). The BLM preferred alternatives, A and B, are relatively linear corridors from west-east, especially AIDEA's preferred Alternative A. Risk of increased predation by wolves and other predators on caribou as a result of road creation should be further discussed and potential impacts quantified in the Ambler road EIS.

One topic of importance for determination of potential effects of the Ambler road on caribou is the efficacy of proposed mitigation measures. Unfortunately, insufficient information is provided in the DEIS to evaluate these measures. The primary means proposed for avoidance of road impacts to caribou is employing similar mitigation protocols as those employed on the DMTS that services the Red Dog Mine (e.g., p.3-76, p.N-23). These protocols are not included in the DEIS, however, preventing review of their potential effectiveness at minimizing disruption and displacement of caribou. If these are going to be

relied upon to reduce impacts to caribou, they should be presented to the public in the EIS and scientific justification for their effectiveness should be provided. Furthermore, additional discussion is needed of the differences between the road servicing the Red Dog Mine and those proposed for the Ambler Mining District and what the implications of these differences are for impacts to caribou. With at least four mines likely to feed into the Ambler road, compared to a single Red Dog Mine, impacts to caribou will likely be substantially greater. Differences in terrain ruggedness and degree of tree cover will lead to reduced visibility along the Ambler road and greater potential for collisions and disturbance. Additional differences likely exist. It is imperative that the EIS explain these differences and how mitigation measures employed for Red Dog will be adapted to the different context of Ambler if they are to be relied on to reduce impacts.

The Alaska National Interest Land Conservation Act (ANILCA) 810 Analysis in Appendix M inaccurately states that "The proposed road may deflect or delay the migration of caribou of the WAH by up to 33 days" under the BLM preferred alternatives (p.M-13, M-22). This statement references Appendix L, however, it does not correctly interpret the information presented in Appendix L, nor the underlying research. Wilson et al. (2016) found that satellite-collared WAH caribou were delayed an average of 33 days by the DMTS during their 2011 fall migration. This finding was correctly described in Appendix L (p.L-165) and even in the opening of the ANILCA 810 Analysis (p.M-6), but not in the Findings section of the ANILCA 810 Analysis. This is troubling as the findings are what are used to determine whether there will be a significant restriction of subsistence opportunities or resources. Some caribou studied by Wilson et al. (2016) were delayed much longer than 33 days, including four that failed to cross the road at all and died that winter. The ANILCA 810 Analysis findings need to be updated to align with the reported literature in Appendix L and to accurately reflect the potential impacts of the proposed road on caribou. Furthermore, as is described above, potential for greater impacts with the Ambler road compared to the DMTS due to differences between the two and their associated mines should be clarified and included in the ANILCA 810 findings.

9. Invasive species.

The DEIS indicates that the introduction of non-native invasive (NNIS) plant species seems inevitable: "Proposed measures to prevent the introduction and spread of NNIS require regular monitoring and eradication measures, and are likely to slow the procession of NNIS but not prevent it" (p.C-42). TWS is concerned that the DEIS states that there could be permanent damage to habitats because of infestation by invasive weeds. For example, "[s]ome of these impacts to wetlands and vegetation may not be reversed and would be permanent" (p.C-94).

Chapter 3 in the DEIS states that the Dalton Highway is highly infested with invasive weeds. The DEIS properly calls attention to the serious nature of *Elodea* infestations near Fairbanks, and the damage that could result if this aquatic weed makes its way north to the project area (p.3-45). However, the reader must search through all the references and appendices to find mention of two terrestrial NNIS which are also of significant concern because of their proximity on the Dalton Highway (Appendix E, Table 8). McMillan and Callear (2014) indicate that along the Dalton Highway white sweet clover (*Melilotus alba*) and bird vetch (*Viccia cracca*) are the two terrestrial NNIS with greatest abundance, and that they have high invasion potential to move beyond the highway. Greater discussion is needed for all three species because of their highly aggressive nature and extreme difficulty in removal of infestations, once established. All three species have the ability to alter habitats permanently (Gucker 2009, Graziano et al 2016).

We appreciate that the DEIS calls out the need for several mitigation actions:

> "Because the action alternatives connect to the Dalton Highway, which has large densities of NNIS, it is likely that, without mitigation, over time the alternatives would result in similarly high densities of NNIS along them (Volume 4, Map 3-11). NNIS infestations could result in alteration to

native vegetation, including wetland vegetation, and plant community composition, by increasing competition and reducing species diversity. NNIS establishment could also result in degradation of wildlife and fish habitat, degradation or reduction of subsistence food, and degradation of visual resources. If commitments in Appendix N are consistently applied along the proposed alignment, NNIS infestations may remain localized and small enough to be eradicated during seasonal monitoring and removal efforts" (p.3-44).

Furthermore, we appreciate that mitigation measures spelled out in Appendix N include a prevention and management plan, early detection and rapid response, equipment cleaning and certification of weed-free equipment. It is important to emphasize in the EIS, however, that besides the vehicle washing that is to be implemented to mitigate fugitive dust on ore trucks (p.3-41), similar washing should be *required* on ALL vehicles entering the Ambler Road from the Dalton Highway year-round. The DEIS states that, "[a]s part of a vehicle inspection protocol, equipment and vehicles using the Ambler Road for any purpose would be inspected for weeds and cleaned" (p.N-19). We recommend that all vehicles be washed, winter and summer, rather than only inspected because the seeds of the most invasive species on the Dalton, white-sweet clover, *Melilotus alba*, are only about 1/16" in diameter and could easily be missed in some embedded tire treads (or other places) during an inspection. While mentioned as strategy in Appendix N, we also emphasize that a mitigation requirement should be for directional road grading and snow plowing to ALWAYS be Eastbound, away from the Dalton Highway. Grading and plowing should never occur westbound from the Dalton toward Ambler. This has been a major cause of the northward spread of *Melilotus alba* along the Dalton (T. Craig, BLM and C. Harwood, USFWS, pers. comm 2015 and 2019).

10. Permafrost thaw.
We are concerned about road construction-induced permafrost thaw because of the ultimate effects it could have on wildlife and fisheries habitats near and downstream from the road. The DEIS indicates that permafrost thaw will be an issue for all alternatives, and that Alternative C might have significantly more problems in this area than alternatives A and B. The proposed mitigation efforts to minimize thaw problems are important and should be employed in the Final EIS. These include that, "[g]eotechnical field studies and detailed thermal modeling would be completed, and specific measures to be incorporated in specific areas would be identified during final design after the alignment has received approval from the appropriate federal and state agencies to control permafrost thawing" (p.N-5) and that "[p]otential methods for addressing permafrost concerns include embankment insulation, air convention embankment, thermosyphons, sunsheds, snowsheds, or air ducts. For example, 6 inches of rigid insulation board could be installed under culvert bedding material for increased insulation. Design features related to this mitigation would be determined during the design/permitting phase and would be incorporated into ROW authorization and permit stipulations" (p.N-6).

It is important to note that the DEIS' assumption of lesser permafrost thaw potential on A & B, compared to C may not be valid. This might have been true two or three decades ago, but it is likely not valid now. Significant, and increasing thaw activity has been reported at about the same latitude as Alternatives A and B along the Selawik River (USFWS 2014), and the Kanuti River (C. Harwood, USFWS, pers comm, Spindler USFWS retired, pers comm). Indeed, reports of significantly increased thaw activity extend farther north than the Alternative A and B routing - along the Noatak River (Balser et al 2014), in Canada along the Peel River (Kokelj et al 2013), and along the Porcupine River east of Old Crow, Yukon (Elders in the latter community report greatly increased riverbank thaw activity in the last decade [Esau Shafer 2019, pers. comm. to M. Spindler]). This should be accurately reflected in the EIS.

11. Air Quality.
The DEIS provides no in-depth analysis of the likely impacts to air quality in the region. The BLM does not provide existing background data for the project area, and instead relies on air quality data from Denali National Park and Preserve, hundreds of miles away. This is important because Hecla CEO Phillips S. Baker, Jr. has a poor track record for maintaining acceptable air quality on previous mining projects in

Alaska, particularly at the Rock Creek mine near Nome, AK. In a comment letter to the Alaska Department of Environmental Conservation (ADEC) the issue of potential problems with dust along the road from the Big Hurrah mine to the Rock Creek mill was raised, citing both dust from pit blasting at both Rock Creek and Big Hurrah, and general truck traffic to the mine. The mine plan noted that dust should not be a problem at temperatures below freezing, and that pit wall seepage should keep dust levels down during blasting. The commenter retorted that when temperatures are below freezing or even sub-zero the dust situation is at its worst (Comment letter to Patrick Dunn, Alaska Department of Environmental Conservation, regarding Permit Application AQ978MSS01, Nova Gold/Alaska Gold RockCreek/Big Hurrah Project, 20 November 2006). During the fall of 2008, dust was judged to be a significant problem, and neither the state not the company had attempted to mitigate the issue (Chris Rowe, pers. comm. to David Chambers, 8 Jan, 2009). The precedent of ignoring impacts to air quality is particularly alarming because the EIS does not have baseline air quality data to determine if a change in air quality occurs.

Socio-ecological concerns

12. Access to subsistence resources.

    In the DEIS findings for the ANILCA Section 810 Analysis (Appendix M) BLM concluded that the direct road impacts, and cumulative impacts from the hypothetical four-mine scenario enabled by the Ambler Road, may cause a significant restriction to subsistence uses for 10-16 villages, depending on the alternative (p.M-13, M-14, M-18, and M-21). The DEIS specifically called out potential serious long-term impacts to sheefish (p.H-49, p.M-18) and caribou (p.H-51 - H-52) subsistence resources, which have a high degree of reliance in the region. We agree that the Ambler Road Project will likely have a tremendous impact on the ability of rural Alaskans to harvest fish, wildlife and vegetation from public lands and Alaska Native Claims Settlement Act (ANCSA) corporation lands. This is especially a concern given that Alaskan subsistence hunters already are concerned about how climate change will impact availability of subsistence resources (Brinkman et al. 2016). Cumulative effects of the Ambler Road on top of these changes are of grave concern and should be more explicitly analyzed in the EIS.

    Both State and Federal law have means to address a subsistence priority in times of shortage due to lack of abundance or lack of access, but they are complex and sometimes not successful. Some of our professional membership have dealt with the imposition of management strategies that included complex additional restrictions that have become necessary to manage the wildlife harvest along the Dalton Highway (c.f. regulations for the Dalton Highway Corridor, Unit 24A moose, and/or Unit 26B caribou compared to adjacent units; ADFG 2018, USFWS 2018). Indeed, both the Alaska State Department of Fish and Game, Alaska Board of Game, and the Federal Subsistence Board have had to take special actions, and/or create a special management area along the Dalton Highway, as a result of the increased access and harvest pressures on these resources (ADFG 2018, USFWS 2018).

    The DEIS indicates in several places that access control points at both ends of the Ambler road, and frequent patrols of the road, would deter unauthorized users from accessing the region via the project. TWS professionals are experienced in wildlife and habitat management, including coordination with enforcement, and we strongly state that number of existing state and federal wildlife and fish enforcement personnel are currently woefully inadequate to cover even basic patrols of this huge area. TWS questions whether the proponent will be able to make an adequate long-term commitment of staff and funds to effectively enforce road usage for harvest of fish and wildlife. It is our understanding that similar provisions were originally established for the DMTS, but that this policy was changed after several years of Red Dog Mine operation when local area residents continued to use the road for hunting in spite of prohibitions. Such past experience should be discussed in the EIS and used to inform analysis of the feasibility of proposed mitigation.

The DEIS lists possible ways subsistence opportunities to harvest caribou may be affected (e.g., direct impacts that cause habitat loss or alteration, disturbance and displacement [p.3-81], or cumulative impacts that may result from changes in predation, survival or productivity [p.H-51]). We are concerned about these potential impacts because the largest caribou herds in North America, including the WAH, have generally inhabited areas with relatively *intact home ranges*. If the Ambler Road results in an expanding network of mines and roads, and additional roads are eventually built that link to the Red Dog Mine-to-Port Road, the proposed Arctic Strategic Transportation and Resources (ASTAR) roads, or the Nome road system, the total extent of habitat fragmentation may mean the WAH might never again reach the previous peak population levels of the late 1990s, which could mean significant impacts on subsistence users, especially those living in communities in or near the peripheral WAH range. The DEIS statement that cumulative impacts tend to be more severe than short-term impacts is insufficient to represent the potential severity and persistence of impacts to caribou subsistence hunting opportunity posed by the proposed project.

Studies considered by BLM in preparing the DEIS suggested a declining trend in caribou harvest (Appendix L, p.L-138 – L-149). It is important that this not be mistaken as a long-term decline in local dependence on caribou. A long-tenured Kotzebue ADF&G Area Biologist (now retired) and member of TWS, Jim Dau, suggested the decline may have been due to increasing gas prices, closer access of caribou during a time of superabundance in earlier decades, and changes in spatial and temporal fall caribou patterns. Dau states (2019, *in lit*.): "Since around 2000, WAH caribou have initiated the fall migration progressively later. Additionally, since about 2000, fall WAH movements have become less predictable than during the 1980's and 1990's. These changes in WAH movements have affected caribou harvests by local subsistence users (as well as commercial operators and nonlocal recreational hunters)."

Impacts of increased access to subsistence resources because of the road should be discussed in more detail, as enforcement of road use is unlikely to stop access to the road for off-road vehicles accessing only portions of the road through fly-in or from villages. Studies have been developed to analyze this impact and make suggestions on how to develop frameworks that account for such concerns (Brinkman et al. 2013, Johnson et al. 2016, Shanley et al. 2013). As Brinkman et al. (2013) point out, "It is an over-simplification to assume that higher game numbers (abundance) equals more harvest opportunities, because this model ignores two other key variables of success: hunter access and game distribution. To get a more accurate picture, we have spent several years (from 2005 to 2011) analyzing the interplay of abundance, access, and distribution in different parts of Alaska" (p.38). A study analyzing this impact is feasible and should be conducted, in our opinion, using these existing tools and resources.

Finally, we agree with the DEIS statement about a significant potential for the Ambler road project and associated mines to impact subsistence opportunity over the long-term: "Any changes to residents' ability to participate in subsistence activities, to harvest subsistence resources in traditional places at the appropriate times, and to consume subsistence foods could have long-term or permanent effects on the spiritual, cultural, and physical well-being of the study communities by diminishing social ties that are strengthened through harvesting, processing, and distributing subsistence resources, and by weakening overall community well-being" (p.L-185). TWS therefore urges BLM to consider the permanent nature of the changes this project could bring about to the 10-16 villages in which the finding of potential significant subsistence restrictions was made by BLM in the ANILCA 810 determination, as well as the 40 communities that rely upon the WAH for subsistence. Our professional judgement is that mitigation measures and special fish and game management regulations may not be sufficient to avoid such serious impacts to subsistence harvest opportunity.

13. <u>Economics.</u>

The BLM's draft EIS does not acknowledge or discuss AIDEA's proposed financing of the road and the potential effects on the State of Alaska's economy. The total cost of building, operating, and maintaining

this project is projected by BLM to be between over $875 million to over $1.5 billion, depending on the Alternative (Appendix C, Table 1, p.C-3). If the mines are not built, or go bankrupt, the State of Alaska – and thus all Alaskans – will be on the hook for these costs. This is a glaring deficiency in the DEIS that must be corrected in order for the public to understand the potential impacts to Alaskan taxpayers and residents.

Thank you for your review and consideration of these comments and requests. We look forward to your response.

Sincerely,

Nathan Svoboda
President
Alaska Chapter of The Wildlife Society

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