Alaska Wilderness League
Northern Alaska Environmental Center
The Wilderness Society[1]

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Bureau of Land Management
Alaska State Office
222 West Seventh Avenue, #13
Anchorage, Alaska 99513

29 December 2016

Re: Comments on draft regional mitigation strategy and draft technical companion for the northeastern National Petroleum Reserve-Alaska

Dear Mr. Cribley,

Thank you again for your continued efforts to complete an effective and meaningful regional mitigation strategy ("RMS" or "Strategy") for the National Petroleum Reserve-Alaska ("NPR-A" or "Reserve"). The novelty and complexity of this effort is challenging and we appreciate the good work that your staff and the bureau's contractors, particularly at Argonne National Laboratory, are putting into this important undertaking. The RMS is a necessary step in truly balancing oil development and conservation values, while ensuring continued subsistence practices within the NPR-A.

Throughout our engagement in this process we have worked to find solutions and improve outcomes for all stakeholders, including the oil industry. As we have discussed with you before, the RMS has the potential to provide greater certainty and predictability for industry by helping to outline mitigation expectations and costs upfront. Planning for unavoidable impacts and ways to offset them should also improve federal agencies' permitting efficiencies for companies operating within the region. Similarly, the Strategy should help ensure continued subsistence practices by employing necessary conservation actions on areas of cultural and ecological importance, i.e., by recognizing the extensive overlap of subsistence activities and conservation. It is our hope that these efforts will reduce conflict between stakeholders and ensure that the NPR-A is administered in a sound and balanced manner.

In this letter, we respond to the draft RMS and its draft technical companion documents. Our comments are organized thematically and numbered by topic. We address the following priority

[1] Letter prepared with assistance from Trustees for Alaska.

areas: 1) effectively introducing the regional mitigation strategy; 2) goals of the regional mitigation strategy; 3) mitigation actions; 4) compensatory mitigation pools; 5) prioritization assessment; 6) mitigation tools; 7) impacts that warrant compensatory mitigation; 8) economic considerations; 9) increasing clarity on RMS implementation to maximize its utility; 10) the reasonably foreseeable development scenario; 11) mitigation hierarchy; 12) monitoring and adaptive management; and 13) working across political boundaries. Finally, in the last section of this letter, we offer short comments on a variety of disparate topics. In completing the final documents, we encourage BLM to refer to our earlier comments for additional feedback on how to make the NPR-A's RMS a useful document.

1) Effectively introducing the regional mitigation strategy

As we discussed in our earlier comments, clearly and effectively introducing the Regional Mitigation Strategy to readers is a crucial element for this document's success. Within the final document, we suggest that BLM incorporate a more comprehensive explanation of the Strategy's overarching objectives and include the goals of national mitigation policy pertaining to land management. An ideal place for this would be within the section "Why the BLM created a Regional Mitigation Strategy" (p. 4) in the draft materials. Specifically, we encourage BLM to incorporate an explanation for how the NPR-A's RMS can help improve management of the landscape and achieve the five primary tenets of Secretarial Order 3330. These principles include:

a) The use of a landscape-scale approach to identify and facilitate investment in key conservation priorities in the region;
b) Early integration of mitigation considerations in project planning and design;
c) Ensuring the durability of mitigation measures over time;
d) Ensuring transparency and consistency in mitigation decisions; and
e) A focus on mitigation efforts that improve the resilience of our Nation's resources in the face of climate change.[2]

Moreover, BLM should strongly emphasize the strategy's benefits to all stakeholders. As mentioned above, these goals include: reducing conflicts through increased stakeholder buy-in; providing certainty and predictability for development, subsistence and conservation interests; improving permitting efficiencies and mitigation expectations; and ensuring continued access to subsistence use areas and abundant subsistence resources. By explaining these benefits and aspirations upfront, all stakeholders will have a better understanding of the Strategy's intent and what the document hopes to achieve.

2) Goals of the regional mitigation strategy

We find the five goals of the draft RMS (p. 2) to be very strong. These goals largely capture the complex context of the northeast NPR-A and set the document on the appropriate course to achieve the principles and objectives of the Department of the Interior's mitigation policies.

[2] See: Secretarial Order 3330: Improving Mitigation Policies and Practices of the Department of the Interior, October 31, 2013. Available at: http://on.doi.gov/1SgmxXf.

In reviewing and editing the final document, we encourage BLM to regularly refer back to these goals so the RMS and technical companion are framed in the most meaningful way. Additionally, we ask BLM to include language on climate change and ecosystem and community resilience within the goals section preamble. As you know, the effects of climate change make the Arctic one of the most vulnerable regions on the planet. Framing these goals within the context of climate change is necessary for these documents' ultimate success.

3) Mitigation actions

The Naval Petroleum Reserves Production Act of 1976 (NPRPA) gives BLM broad authority to protect the Reserve's globally significant surface values from the impacts of oil development. This fact was included in the GMT-1 ROD and similar language also should be included within the final RMS document. The GMT-1 ROD reads:

> *"The NPRPA provides BLM with additional mitigation authority specific to oil and gas operations in the NPR-A, directing the Secretary to include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the National Petroleum Reserve in Alaska…."* (42 USC § 6506a(b)).[3]

As we have commented before, oil and gas activities within the region have a ripple of ecological, social, and cultural impacts. BLM should include language in the final RMS that clarifies that the root cause of these impacts is the authorized land use changes that disrupt these systems. An understanding of the fundamental cause of impacts will allow industry and BLM to more effectively take actions to offset deleterious effects to conservation, subsistence, environmental justice, and socio-cultural values, among others.

We do not believe that the "primary impact" label is a constructive element of BLM's "mitigation action" table (p. 17-20). This categorization is subjective and detracts from the fact that a particular mitigation action can effectively improve or offset a variety of impact categories. For example, as we communicated in our January 5, 2016 letter on mitigation actions regarding conservation, subsistence, and human health, there are significant connections between a healthy and functioning ecosystem and social and cultural systems in the Arctic.

Earlier in the Strategy's development process, BLM used a matrix to organize mitigation actions by goal. Within this framework, the proposed actions were plotted against the RMS's goals. Through this layout, it was easy to see which actions met which goals and which actions succeeded in achieving more than one goal. This was a helpful tool in thinking about how to prioritize mitigation actions and we encourage BLM to include a similar matrix within the forthcoming final RMS.

What follows is a list of mitigation actions that BLM should include in the final RMS document:

[3] Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project, Record of Decision, February 2015, Page 58.

A. The use of conservation easements and other mitigation/durability tools to ensure conservation and subsistence values on the landscape

To effectively offset the significant unavoidable impacts that development will have on the landscape, the use of conservation easements or other "mitigation / durability tools" should be employed. Easements, which should last the life of the development's impact (i.e., 70 or more years) or in perpetuity, would be held by an entity outside of the federal government – which is subject to political changes – to ensure conservation durability. We propose that easements be used on high conservation and subsistence value lands, including the Teshekpuk Lake and Colville River Special Areas, and areas of importance around Fish Creek. The size of areas protected by easements should be proportional and compensate for the significant landscape-level disturbance that oil production activities have on subsistence and conservation values in the region. (*See also below: Compensatory mitigation pools and rationale, p. 5.*)

B. Lease buybacks / lease relinquishments

A significant amount of high conservation and subsistence value land has been leased by BLM. These lands include important subsistence use areas around Nuiqsut (like Fish Creek), vulnerable aquatic systems, portions of the Colville River and Teshekpuk Lake Special Areas, and migratory caribou corridors between the Teshekpuk Lake Special Area and the Brooks Range. Additionally, there are currently three stranded leases within the Teshekpuk Lake Special Area; and these leases are incompatible with the values of this management unit.

In the right context, compensatory mitigation funds should be used to buy back leases in important areas so that necessary landscape processes, including subsistence practices, are protected and managed in a holistic manner. Such buybacks must be worth the use of compensatory funds and lead to a meaningful conservation outcome. As part of a compensatory mitigation action, these lease buyback areas should not be leased again for the duration of the impact of the development or in perpetuity. Similarly, voluntary lease relinquishments of high conservation or subsistence value lands should count towards a company's compensatory mitigation obligations, and should remain free of leasing for the duration of the impact of the development or in perpetuity. If leases are bought-back or relinquished as part of a compensatory mitigation action, these areas must also be protected with a conservation easement or other durability tool to ensure their protection for the life of the impacts they are mitigating.

C. Special area management plans

To improve the stewardship of the NPR-A's designated Special Areas, BLM should utilize mitigation funds to complete formal management plans for the Teshekpuk Lake and Colville River Special Areas. While the 2013 Integrated Activity Plan (IAP) established these areas for their high conservation and subsistence values, this document did not offer formal management prescriptions and resource management goals. In the face of increasing development pressures in Smith Bay to the northwest of Teshekpuk Lake resulting in exploration activities occurring within Special Area boundaries, and climate change, such plans would help BLM more actively manage the landscape to ensure ecosystem health and subsistence resources into the future.

A discussion of the effectiveness and feasibility of Special Area management plans in Appendix G (p. G-8) does not accurately capture this mitigation action's benefit. These plans would have significant value in helping BLM avoid, minimize, and compensate for actions that occur within the boundaries of these units. BLM's only form of avoidance in the NPR-A at this time are areas closed to leasing and permanent, non-subsistence infrastructure in the IAP. However, as evidenced by the Caelus Smith Bay exploration activity, BLM still allows significant impacts, like snow road development and the associated traffic, through these ecologically sensitive places. Special Area Management plans would ensure that Special Area values would be appropriately managed and that impacts would be mitigated. Moreover, regarding feasibility, we believe the goals of these management plans would be established by subject matter experts based on the best available science and traditional knowledge.

D. Monitoring studies and effective adaptive management

In the face of increasing oil development and the unknown effects of a changing climate and coastal erosion, BLM will need to effectively monitor and adaptively manage the NPR-A. These efforts, which can be enhanced through compensatory mitigation funds, will help to evaluate the effectiveness of mitigation actions in light of compounding impacts. This monitoring also will help ensure necessary management changes are made to best steward the Reserve's natural resources and cultural practices. (*See also below: Monitoring and adaptive management, page 36-37*.)

4) Compensatory mitigation pools

As we wrote in our April 27, 2016 comments, the creation of compensatory mitigation pools[4] is a necessary component of a successful final RMS. Despite the inclusion of "conservation pools" in Appendix F (p. F-7), we feel the draft materials do not capture the goals and purpose of having compensatory mitigation pools within the final document.

The GMT-1 Record of Decision states:

> *"This strategy, which will be developed in consultation with Federal, state, Native, and other relevant stakeholders, will identify those additional areas within the Northeastern NPR-A region that are reasonably foreseeable for development and will identify those areas most suitable for conservation, mitigation, or other activities while ensuring continued use for subsistence activities, and building climate resilience of communities and ecosystems."*[5]

While BLM has included a reasonably foreseeable development scenario within the draft RMS and draft technical companion, nowhere in these materials has the agency "identified areas most suitable for conservation, mitigation, or other activities." Similarly, while the sidebar on page 1

[4] In these comments, pools are defined as, "Avoidance areas where compensatory mitigation actions, such as easements or Rights-of-Way (ROWs), would occur." These pools would be similar to traditional wetlands banks.
[5] Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project, Record of Decision, February 2015, page 33.

of the draft RMS reiterates other language from the GMT-1 ROD and states that the document will "identify priority areas within the Northeastern NPR-A for avoidance and future compensatory mitigation actions", the draft documents do not contain this information.[6] And finally, while Appendix G is titled "BLM Rankings of Candidate Regional Mitigation Sites," this section (p. G-1 to G-16) does not contain any actual locations.

As part of the final RMS document, BLM should designate candidate lands of high conservation and subsistence importance as compensatory mitigation "pools." These "pools" should include lands of ecological and subsistence importance that may warrant additional protections and improved stewardship to offset the unavoidable impacts of future oil and gas development.

Having compensatory mitigation "pools" is an important first step in a functional RMS and would work similarly to traditional wetland mitigation banks. In this case, when there are unavoidable impacts from development in the region, the project applicant would compensate for these adverse effects by financing more durable protections of areas within the pools. Proactively planning where and how effective compensatory mitigation actions can take place is critical to improving permitting efficiencies, ensuring balance on the landscape, and reducing conflicts between stakeholders. Compensatory mitigation pools help achieve these ends.

It is also important to note that identifying compensatory mitigation pools are not so much durability tools as a framework to use durability tools. While compensatory mitigation pools should have an interim level of protection to ensure their viability as locations for future offsets, by themselves they are not a true mitigation tool. Instead, durability tools, such as easements or rights-of-way, would be used within these areas to effectively offset land-use changes caused by permitted development activities in other locations.

Identifying locations where compensatory mitigation actions can take place is also consistent with other regional mitigation strategies. For example, the recently completed Solar Energy Zone (SEZ) Regional Mitigation Strategy in Arizona specifically accomplishes this objective. A stated element of the SEZ Regional Mitigation Strategy was to: "Evaluate and recommend appropriate mitigation investment locations, objectives, and/or actions."[7] Within this document, BLM identifies a series of locations where compensatory mitigation actions can take place. Similarly, we encourage BLM to identify the Teshekpuk Lake and Colville River Special Areas as compensatory mitigation pool locations.

- **Compensatory mitigation pool locations and rationales**

If BLM intends to incorporate a landscape-level approach and make this a meaningful *regional* mitigation strategy, locations for potential mitigation actions need to be identified. Below we offer the locations and rationales for compensatory mitigation "pools" within BLM's geographic region and within the Reserve's recognized Special Areas. These "pools," with a description of their purpose, location and rationale, should be included with the final RMS.

[6] *Ibid*. at page 39.
[7] For more information on the Solar Energy Zone Regional Mitigation Strategy in Arizona, see: http://www.blm.gov/az/st/en/prog/energy/solar/arizona_regional_mitigation.html.

A. Teshekpuk Lake Special Area Pools:

The Teshekpuk Lake Special Area has three distinct levels of management pertaining to conservation and development. These differing levels of protection offer varying levels of additionality and create the following pools: Pool A) lands are unavailable for leasing and no new non-subsistence permanent infrastructure or exploratory drilling; Pool B) lands are unavailable for leasing but open to new oil and gas permanent infrastructure like roads and pipelines; and Pool C) lands recognized as part of a Special Area for their high conservation and subsistence values but without protections from leasing or infrastructure restrictions outside of some best management practices requiring no surface occupancy buffers along certain streams and rivers. Below we describe the three pools' locations and offer brief rationales:

Pool A: Lands, as defined by the 2013 Integrated Activity Plan, within the Teshekpuk Lake Special Area, that are unavailable for leasing and do not allow any new non-subsistence permanent infrastructure.

- Rationale:
  - Recognized Special Area for almost 40 years by both Democratic and Republican administrations
  - Includes Teshekpuk Lake, the largest lake in Arctic Alaska
  - Globally significant Arctic wetlands complex
  - Vital area for the Teshekpuk Caribou Herd: Calving grounds, insect relief area, overwintering site for a large portion of the herd, late summer foraging habitat, and two caribou migratory corridors
  - Vital area for waterfowl and shorebird nesting and molting and site of proposed East Asian/Australasian Flyway Network Site
  - Important subsistence use area, including many subsistence cabins

Pool B: Lands, as defined by the 2013 Integrated Activity Plan, within the Teshekpuk Lake Special Area that are unavailable for leasing but open to new oil and gas permanent infrastructure like roads and pipelines.

- Rationale:
  - Globally significant Arctic wetlands complex, particularly for waterfowl and shorebirds
  - High value habitat for the Teshekpuk Caribou Herd
  - Important subsistence use area
  - Will be increasingly important for ecosystem resilience in the face of coastline erosion and climate change

Pool C: Lands, as defined by the 2013 Integrated Activity Plan, within the southeast corner of the Teshekpuk Lake Special Area that are available for leasing, exploratory drilling, and new oil and gas permanent infrastructure.

- Rationale:

- These lands are formally recognized as part of a Special Area for their high conservation and subsistence values
- Help maintain necessary habitat connectivity between the Teshekpuk Lake and Colville River Special Areas
- High quality calving habitat for the Teshekpuk Caribou Herd
- Important subsistence use area
- Include the headwaters of the Fish Creek and Inigok Creek watersheds

B. Colville River Special Area Pool

All of the Colville River Special Area is open to oil and gas leasing, development and permanent oil and gas infrastructure. As mentioned above, while there are best management practices that aim to guide development away from important setbacks, these buffers can be compromised with BLM's permission and offer no true protections. Below is this pools' description and rationale:

i. All unleased lands of the Colville River Special Area, as defined by the 2013 IAP, between Nuiqsut and Umiat, including the Kikiakrorak and Kogosukruk Rivers and their 2-mile setbacks.

   - Rationale:
     - Recognized Special Area for almost 40 years
     - Important subsistence use area for fish, waterfowl, and caribou, particularly as development has compromised subsistence use areas to the north, east, and west of Nuiqsut
     - Important raptor habitat
     - Low oil potential area
     - Important migratory corridor for the portion of the Teshekpuk Caribou Herd that overwinters in the Brooks Range

5) Prioritization assessment

As we have discussed in earlier comments, ecologists at The Wilderness Society (TWS) have been working to complete a quantitative geospatial analysis to help prioritize where increased protective actions should take place on the landscape. Knowing where values and vulnerabilities occur across landscapes and regions should be a first step in developing conservation and management strategies (Dickson et al. 2014). Effective conservation planning depends on assessing and mapping values we hope to sustain through natural resource management and long term protection. Spatial data depicting various environmental, climatic, vegetation, cultural, and land use characteristics are increasingly available to the public, which allows scientists, resource managers, and other stakeholders to overlay data and investigate multiple values simultaneously (e.g., Aplet et al. 2000, Leu et al. 2008, Theobald 2010).

We have developed an approach that uses the principles of conservation biology to identify areas of overlapping conservation values that can be prioritized for increased protective actions. The discipline of conservation biology emphasizes the development of networks of protected areas

and strategies focused on large landscapes spanning a range of human land use and ecological conditions (Lindenmayer et al. 2008). It emphasizes certain principles, such as protection of large, intact, functioning ecosystems, maintenance of connectivity, preservation of biodiversity, and inclusion of human values. Based on these principles, we selected five values and compiled spatial data mapping them across the North Slope, which for this purpose we define as all areas north of the crest of the Brooks Range (see Figure A.1 in Appendix A). The combined values within our assessment were used to identify conservation priorities across the Arctic (Figure A.2).

The five values included in the prioritization assessment are:

Wildness
Wildness indicates how well an area reflects an intact ecosystem free of intentional human effects (Aplet et al. 2000). Areas with high wildness represent ecosystems with an absence of direct human control over ecological processes (Figures A.3 and A.4). Such areas not only provide natural resources and processes, but also offer people solitude and remote experiences. Wildness is a compilation of two equally-weighted components: freedom from human control and ecological condition. Freedom from human control represents the degree to which an area is affected by people based on its ease of access and the likelihood of encountering humans. It takes into account proximity to features like roads, airstrips, industrial facilities and communities. Ecological condition reflects the degree to which an ecosystem has been degraded from its natural state and includes components such as contaminated sites, invasive species, and light pollution. Data for creation of the wildness input was drawn heavily from the BLM's Rapid Ecoregional Assessment (REA) of the North Slope (Trammell et al. 2015) as well as other publicly-available sources.

Subsistence use areas
Areas heavily used for subsistence hunting and fishing provide important cultural human values. They represent the intersection of important wildlife habitat and human use near communities (Figures A.3 and A.4). Subsistence activities have occurred in the Arctic for thousands of years (Anderson 1968) and depend upon intact ecosystems, aligning well with conservation priorities. Subsistence use areas were drawn from the North Slope REA and were summed, with each resource used by a given community given a value of one. Thus, high subsistence use areas depict those locations where multiple resources are used by one or more communities.

Connectivity
Ecological and evolutionary processes require large connected landscapes to ensure seasonal migrations, gene flow and range shifts (Beier et al. 2011). The importance of connectivity is well-recognized (Taylor et al. 1993; Cushman et al. 2013), as movement of individuals is essential both for short-term persistence of populations (Fahrig 2003; Cushman 2006) and for longer-term shifts in species range in response to climate change (Heller and Zavaleta 2009). In the Arctic, connectivity is particularly important because resources are sparse, requiring many species to migrate long distances to maximize growth, reproduction and survival. Connectivity was evaluated in a species-neutral manner, based on the approach of Koen et al. (2014), which assumes that areas with a higher degree of human modification (lower wildness) have an

increased cost to movement or risk of mortality for species. The resulting maps (Figures A.3 and A.4) depict areas of relatively higher and lower expected connectivity for multiple species.

Ecosystem representation

Protected areas can best meet conservation goals if they represent all ecosystems (Dietz et al. 2015). This approach assumes that protected areas more fully conserve genetic, species, and community diversity when they encompass the full variety of ecosystem types across their geographic range (Olson and Dinerstein 1998; Margules and Pressey 2000). Ecosystem representation was calculated as the area of ecosystem types represented in the North Slope Science Initiative land cover map (Ducks Unlimited 2013) that occur within USGS Gap Analysis Program category I and II protected areas (areas that permanently protect natural land cover from conversion and have a management plan in operation to maintain a natural state; Gergely and McKerrow 2013), divided by the total area of each ecosystem type across the North Slope. Representation indicates how well various ecosystem types are included in existing protected areas (Figures A.3 and A.4) and emphasizes where underrepresented ecosystems (those with lower percentage representation) occur that may be prioritized for future protection (Dietz et al. 2015).

Wildlife biodiversity

In order to conserve future wild ecosystems it is necessary to protect wildlife biodiversity so that the biological building blocks are sustained into the future. By protecting "hotspots" of species diversity, we protect genes, species and communities, helping preserve functioning ecosystems that are more resilient to disturbance (Harris et al. 1996; Poff et al. 1997) and that reduce the risk of large extinctions (Schindler et al. 2010). One aspect of species diversity was represented by mapping the species richness of mammals and birds on the North Slope (Figures A.3 and A.4). Species distribution maps were obtained from the Alaska Gap Analysis Project (Gotthardt et al. 2014) and were summed to depict relative species richness.

Combined conservation priority

The five values above were used within our assessment to identify lands with conservation priority (Figure A.2). The combined conservation priority map is based upon an equal weighting of the five conservation values used as inputs. Our approach provides a flexible framework to seamlessly assess landscape values across the North Slope. We have used the best available spatially distributed information to assess values across our study area. While it is possible to add a suite of additional information to the analysis, the values that we included are based on the core principles of conservation biology. Each layer has been carefully constructed and thoughtfully included within the analysis to help identify areas that are wild, diverse, connected, under represented and important for subsistence.

Across the North Slope (Figure A.2, upper map), areas of highest conservation priority tend to occur in the northwest along coastal areas and near communities. Areas of lower conservation priority tend to occur near areas of concentrated development and within existing protected areas like Gates of the Arctic National Park and the Arctic National Wildlife Refuge. These latter areas have lower conservation priority because they are already have GAP category I and II protective status.

When zooming in to the northeast planning area (Figure A.2, lower map) the same general patterns are evident, but with a finer degree of variation in priority distinguishable. The highest combined conservation priority areas occur along the western boundary of the planning area but there are also areas of relatively high priority to the west and southwest of Nuiqsut. The area to the northeast of Nuiqsut outside the NPR-A boundary and within the Colville River Delta exhibits relatively low priority, in part due to the preponderance of hydrocarbon development occurring in the area.

Subsistence and ecological values

Our prioritization approach also provides flexibility to focus on certain values and use different techniques to synthesize data and visually display results. As an example, we created a map (Figure A.5) that compares subsistence values against all other combined values (termed here ecological values) to identify where subsistence and ecological landscape values align. Figure A.5 was created by dividing the subsistence layer and combined ecological values layer into four bins each using Jenks Natural Breaks. These were assigned values from 1-4 and combined to identify areas where both subsistence value and ecological value are high (red), areas where subsistence is high but ecological value is low (blue), areas where ecological value is high but subsistence value is low (green), and areas where both are low (grey).

High ecological and subsistence values tend to overlap in areas near communities and areas along river corridors. Across the study area, the greatest concentration of high subsistence and ecological value lands are located south of Utqiaġvik (Barrow) and east of Atqasuk. These lands occur in undeveloped locations and are utilized by large numbers of subsistence users from Utqiaġvik (Barrow), Wainwright and Atqasuk. Areas where ecological values are highest exist in areas that lack development such as the remote foothills and Brooks Range Mountain regions. Not surprisingly, areas with the highest subsistence use occur very close to communities.

Within the northeast planning area (Figure A.5, lower map) it is also possible to assess where subsistence and ecological values align in relation to the entire study area. Across the planning unit, areas where ecological and subsistence values are highest occur near the western portion of the planning unit near the Chipp River. Values likely are highest here because of the large number of Utqiaġvik (Barrow) residents that have cabins and use the area for multiple subsistence resources. Near Nuiqsut, areas where both values are high selectively exist near Fish Creek and the lower Colville River near Ocean Point (Figure A.5). These river corridors are ecologically important and heavily used by Nuiqsut residents year round to access subsistence resources. Areas where only ecological values are high occur to the west of Nuiqsut from the Teshekpuk Lake to the southern boundary of the planning unit. Areas with highest subsistence use occurs along the lower Colville River from the Nigliq Channel to Ocean Point. Areas to the northeast of Nuiqsut have low subsistence and ecological values, likely due to hydrocarbon development and infrastructure.

The northeast planning area map (Figure A.5, lower map) reinforces an important point regarding our approach. Purely selecting the highest overlap in values would prioritize the dark red region in the west of the planning area for increased protective action. However, if the user's primary objective were to mitigate subsistence impacts in proximity to Nuiqsut while also preserving a functioning environment to support subsistence hunting near the village, one might

prioritize the light red areas to the northwest and southwest of Nuiqsut as these are more heavily used by hunters from Nuiqsut. As development proceeds within the NPR-A and future compensatory mitigation actions are proposed, the same framework and data could be applied with different criteria to prioritize other areas for future action.

Next steps
TWS currently is working to finalize the North Slope prioritization assessment and to see it submitted for publication in a peer-reviewed scientific journal in early 2017. Thus, at this stage the maps in Appendix A should be considered drafts that are indicative of the type of inputs and outputs possible with our prioritization tool. One strength of our approach is that it can be updated as new input data layers become available. Once the assessment is finalized and published, results will be shared with BLM and made publicly available.

6) Mitigation tools

The inclusion and discussion of mitigation tools is an encouraging component of the draft RMS and its Appendices, and an essential element of the final documents. Both Appendix F (p. F-1 to F-8) and Appendix G (p. G-1 to G16) present valuable and necessary information on how various authorities and policy mechanisms can be put into action to achieve successful mitigation outcomes. Below we offer our thoughts for how information pertaining to mitigation tools within the draft RMS and draft technical companion can be improved.

- **BLM's obligation to protect surface resources and subsistence use in the Reserve**

BLM's responsibilities in the Reserve include the protection of the Reserve's exceptional ecological and other values. BLM has broad authority to use these tools to protect the subsistence and other surface values in the Reserve, including ecological values. The NPRPA provides the Secretary with the authority to grant "rights of way, licenses, and permits as may be necessary to carry out . . . responsibilities under this Act."[8] The provisions related to competitive leasing of oil and gas also make it clear that the Secretary has broad authority to mitigate against impacts from oil and gas to the ecological resources in the Reserve: "Activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the [Reserve]."[9]

BLM is required to take actions, including monitoring, "deem[ed] necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the reserve to the extent consistent with the requirements of the Act for the exploration of the reserve."[10] These measures can be taken to "protect fish and wildlife breeding, nesting, spawning, lambing or calving activity, major migrations of fish and wildlife, and other environmental, scenic, or historic values."[11] The regulations also specify that "[m]aximum protection measures shall be taken on all actions within the Utukok River Uplands, Colville River, and Teshekpuk Lake

[8] 42 U.S.C. § 6502.
[9] 42 U.S.C. § 6506a(b).
[10] 43 C.F.R. § 2361.1(a).
[11] *Id.*

special areas, and any other areas identified by the Secretary as having significant subsistence, recreational, fish and wildlife, or historical or scenic value."[12] These maximum protections include, but are not limited to, requirements for when and where activities take place, restrictions on the types of vehicles and loadings, limits on the types and use of aircraft, and provisions related to fuel handling.[13] BLM is also able to "limit, restrict, or prohibit use of and access to lands within the Reserve, including special areas."[14] Under these provisions, BLM has both the authority and obligation to use mitigation to protect subsistence and ecological values in the Reserve.

- **BLM Must Implement the Mitigation Tools Now to Meet Its Obligations Under the GMT-1 Record of Decision, the NPRPA, and ANILCA.**

BLM can and should use the mitigation tools included in the RMS, such as conservation easements and rights-of-way, to achieve meaningful mitigation in the Reserve, including as one of the mitigation measures to offset the impacts from GMT-1. These tools should be implemented now to ensure that areas that are important for subsistence and wildlife are protected prior to additional development moving forward in the Reserve, and in order to achieve the mandates of the GMT-1 ROD. This is particularly crucial in light of the most recent lease sale (December, 2016), which greatly expanded the quantity of leased acreage in the Reserve, particularly near the community of Nuiqsut.

BLM's use of conservation easements and rights-of-way to mitigate the impacts from development on subsistence and ecological resources will also help BLM to meet its obligations for purposes of Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA).[15] Section 810 requires BLM to evaluate the effects of its development decisions on subsistence uses and needs.[16] If BLM finds that its decision will restrict subsistence uses significantly, it is required to take reasonable steps to minimize adverse impacts to subsistence uses and resources from that action.[17] When authorizing GMT-1, BLM found that its decision would significantly restrict subsistence uses. In light of the increasing number of cumulative impacts to subsistence users in the region from industrial development, the adverse impacts to subsistence users will only increase as additional development moves forward in the region. BLM should proactively use conservation easements and rights-of-way as tools to minimize adverse impacts to subsistence and ensure the protection of vital subsistence areas, wildlife, and other surface values. Doing so will ensure that BLM meets its obligations under both the NPRPA and ANILCA.

- **Additional comments on specific mitigation tools**
    - **NPRPA rights-of-way**
        - **Scope of the NPRPA right-of-way authority**

[12] *Id.* § 2361.1(c).
[13] *Id.*
[14] *Id.* § 2361.1(e)(1).
[15] 16 U.S.C. § 3120(a).
[16] *Id.*
[17] *Id.* § 3120(a)(3).

As noted above, the NPRPA provides that the Secretary is authorized to "grant such rights-of-way, licenses, and permits as may be necessary to carry out his responsibilities under [the NPRPA]."[18] The NPRPA does not define rights-of-way. When undefined, terms are typically given their ordinary meanings.[19] Courts may also look to the context in which the term is used in the statute and how other, related statutes define the term to determine the meaning.[20]

The Federal Land Policy Management Act (FLPMA) provides helpful context for the meaning of right-of-way for purposes of the NPRPA.[21] FLPMA outlines BLM's general authority regarding the issuance of rights-of-way on public lands.[22] FLPMA defines the term right-of-way to "*include[] an easement*, lease, permit, or license to occupy, use, or traverse public lands granted for the purpose listed in title V of [FLPMA]."[23] FLPMA's inclusion of easements within the definition of right-of-way indicates that BLM has the authority to grant easements pursuant to its authority to grant rights-of-way under the NPRPA.

BLM's ability to issue rights-of-way, including easements, focused on protecting subsistence and other values is quite broad in light of BLM's authority to protect the surface values in the Reserve and to mitigate against adverse impacts from oil and gas activities. The NPRPA allows BLM to grant rights-of-way as needed to carry out the agency's responsibilities under the statute.[24] Those responsibilities include protection of the surface and ecological values of the Reserve. BLM's issuance of an easement or right-of-way focused on protecting and enhancing subsistence opportunities is consistent with BLM's authority and mandate under the NPRPA to protect surface values.

On p. F-5 of Appendix F, BLM notes under the NPRPA right-of-way procedural considerations that it is "[u]nclear who the right-of-way would be issued to and for what use." We would propose that any easement or right-of-way be held by a third-party to ensure its durability. While use authorizations are not generally required for subsistence uses,[25] the right-of-way or easement could go beyond merely authorizing subsistence use and could affirmatively ensure subsistence use opportunities are preserved and enhanced in the area.

BLM also notes on p. F-5 that the "[r]ight-of-way would need to be consistent with [the Integrated Activity Plan.]" To ensure consistency with the IAP, BLM could use rights-of-way and easements in the Special Areas or in setbacks to increase the durability of existing protections in those areas. For example, BLM notes on p.F-6 that "[v]ariance requests can be considered" for setbacks. The lack of durability for the setbacks was apparent in the GMT-1 decision, where BLM waived the protective buffer around the Fish Creek area to allow

[18] 42 U.S.C. § 6502.
[19] *Ohel Rachel Synagogue v. United States*, 482 F.3d 1058, 1061–62 (9th Cir. 2007); *Microsoft Corp. v. Comm'r of Internal Rev.*, 311 F.3d 1178, 1183 (9th Cir. 2002).
[20] *Gustafson v. Alloyd Co.*, 513 U.S. 561, 569 (1995); *Se. Conference v. Vilsack*, 684 F. Supp. 2d 135, 143 (2010).
[21] *See Guidiville Band of Pomo Indians v. NGV Gaming, Ltd.*, 531 F.3d 767, 776 (9th Cir. 2008) (indicating related acts are contextual evidence).
[22] *See* 43 U.S.C. §§ 1761–1771.
[23] 43 U.S.C. 1702(f) (emphasis added).
[24] 42 U.S.C. § 6502.
[25] 43 C.F.R. § 2361.2(a).

ConocoPhillips to build a road through that area. When appropriate, BLM should utilize durable, protective tools, such as easements or rights of way, in the setback areas to ensure the durability of protections for places that are important for subsistence.

- **Process for Adopting Protective Measures**

Protective NPRPA rights-of-way, including easements, could be used as vehicles for implementing the limitations, restrictions, and prohibitions necessary to protect subsistence uses and other values. BLM is permitted to take these protective measures after providing notice to impacted parties.[26] BLM's exercise of its protective authority is both consistent with and required by the NPRPA and the related regulations.

- **FLPMA Easements and Rights-of-Way**

Page F-5 of Appendix F rates FLPMA easements as only having moderate utility for the RMS. It is unclear from the chart why this mitigation tool was only rated as moderate. We encourage BLM to further explain how it reached this assessment. As with the NPRPA right-of-way, a FLPMA easement could be used to enhance and increase the durability of existing protections in Special Areas and protective setbacks.

BLM also should adjust its assessment of FLPMA rights-of-way on p. F.5. While many of the purposes listed in title V of FLPMA are transportation or infrastructure focused,[27] FLPMA also provides that the Secretary is "authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands for . . . *other systems* or facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands."[28] Additionally, the Secretary has the authority to grant rights-of-way for less infrastructure-based means of transportation, such as trails.[29] Under these provisions, "other systems" includes less traditional systems, such as ecological systems. BLM's authority to grant rights-of-way under FLPMA for trails, therefore, includes game trails (e.g., traditional caribou migration corridors) and/or traditional subsistence transportation or access corridors. BLM should incorporate a broader understanding of its authority to issue FLPMA rights-of-way into Appendix F.

- **Converting Leases to No Surface Occupancy**

Page F-4 of Appendix F includes the tool of converting leases to no surface occupancy (NSO) based on voluntary agreements with leaseholders. BLM has the authority and obligation to prevent adverse impacts to surface resources in the Reserve when making leasing decisions.[30] The NPRPA expressly indicates that BLM has the authority to impose "conditions, restrictions, and prohibitions" necessary to mitigate against adverse effects. Under the regulations, BLM is similarly required to "develop measures to mitigate adverse impacts, including lease stipulations and information to lessees."[31] When issuing leases, BLM has the authority to incorporate special

[26] *Id.* § 2361.1(e)(1).
[27] 43 U.S.C. § 1761(a).
[28] *Id.* § 1761(a)(7).
[29] *Id.* § 1761(a)(6).
[30] *See supra* pp. 3 ("BLM's Obligation to Protect Surface Resources and Subsistence Use in the Reserve").
[31] 43 C.F.R. § 3131.2(b).

stipulations into the leases to mitigate reasonably foreseeable and significant adverse impacts on surface resources.[32] BLM also can impose additional stipulations to protect surface resources and Special Areas when approving the surface use plan and permit to drill.[33]

We believe BLM already has broad authority to restrict surface occupancy as a mitigation measure to prevent adverse surface impacts, without requiring voluntary amendments by leaseholders. To the extent BLM believes that its current lease-form does not provide the agency with this authority absent voluntary amendment with the lessee, BLM should incorporate express surface occupancy restriction authority provisions into lease agreements in the RMS region. This is particularly important given that site-specific proposals and impacts (including cumulative impacts) to subsistence and other resources are likely unknown at the leasing stage.

- **Cooperative Agreements**

Cooperative Agreements are listed in Appendix F (p. F-6) as having low overall utility for the RMS, but as a possible tool for layering with other mitigation options. It is worth noting, however, that cooperative agreements may have the potential to address and mitigate against a range of environmental justice impacts to the community by providing impacted stakeholders and entities, such as the Native Village of Nuiqsut, with a meaningful role in management decisions. Cooperative Agreements also could be used as a tool for setting up conservation pools, as detailed in our April 27, 2016 letter ("Creating compensatory mitigation pools within the NPR-A's Regional Mitigation Strategy").

The Table on p. F-6 of the Draft RMS only lists FLPMA 307(b) and the Sikes Act as authorities for establishing cooperative agreements. BLM also has authority under ANILCA Title VIII to enter into cooperating agreements to effectuate the purposes and policies of Title VIII.[34]

- **Relationship to the Mitigation Hierarchy**

In Appendix F, it is unclear how particular tools relate to specific tiers of the mitigation hierarchy and to the goals of mitigation policy, like additionality and durability. Specifically, we have serious concerns about how the tools' "overall utility for the NPR-A RMS" were determined. In many instances, rankings (very high to low) seem to be arbitrary. The Land Use Plan (LUP) / Integrated Activity Plan (IAP), for example, has an overall utility of "high" but it is unclear why this document receives such a ranking. As we saw with the permitted intrusion into the Fish Creek buffer, the IAP's Best Management Practices lack durability.

- **Consistent terminology is imperative**

There is great inconsistency in the terminology that BLM uses over the course of the document. Within Appendix F, a variety of tools, including but not limited to easements and rights-of-way, are discussed. However, in Appendix H, the term "preservation easements/leases" is used repeatedly but never discussed in Appendix F. BLM should incorporate a discussion of what a

[32] *Id.* § 3131.3.
[33] *Id.*
[34] 16 U.S.C. § 3119.

preservation lease is as a potential mitigation tool into Appendix F. For tools and terms that mean the same thing, only one word or phrase should be used over the course of the document.

7) Impacts that warrant compensatory mitigation

A. Accounting for the impacts of oil exploration

While the presented reasonably foreseeable development scenario may help BLM and stakeholders better understand where commercial oil production is likely to occur, it fails to consider the impacts from oil and gas exploration activities. The GMT-1 ROD specifically says that the RMS will "consider future foreseeable habitat and subsistence-impacting land uses that are enabled or assisted by the presence of GMT-1…".[35] Exploration activities are habitat and subsistence-impacting land uses that will likely be assisted by the presence of GMT-1. Oil and gas exploration on leased lands have significant adverse effects on the region's ecological and social systems and must be addressed as part of the NPR-A's regional mitigation strategy. In addition to the reasonably foreseeable development scenario for commercial production, we also believe mitigation actions should apply to exploration activities in the northeastern NPR-A.

In addition to applying this regional mitigation strategy to GMT-1 and future commercial production projects, the Strategy should extend to exploration activities, which have impacts to habitat, subsistence resources, subsistence practices, socio-cultural systems and other resources. To accomplish this, future activities like seismic testing and exploratory drilling (both with associated logistics impacts) should require a more thorough environmental review, including environmental impact statements, and better opportunities for public input. Greater efforts should be taken to avoid, minimize, and compensate for exploration impacts, and BLM should clarify to the public the actions the agency will take to avoid, minimize and compensate for exploration impacts.

To date, BLM has very poorly accounted for the impacts (including the cumulative impacts) of oil and gas exploration in the region. For example, during the winter of 2016, BLM authorized the construction of lengthy snow roads, an ice airstrip, and the presence of a 250-person camp, among other activities, within one of the most ecologically sensitive areas of the Teshekpuk Lake Special Area. These snow roads transected the winter range of the Teshekpuk Caribou Herd, the most important subsistence herd for communities within and around the NPR-A, at a time of harsh conditions, low resource availability, and gestation. These activities were permitted through a mere environmental assessment (EA) to facilitate exploration activities in the State of Alaska waters of Smith Bay. There was virtually no opportunity for public involvement within this process and no known mitigation actions were required for activities within the region. Similar exploration-related activities are expected to be proposed in the future.

Moreover, activities like seismic exploration on leased lands and waters within and outside of BLM's development area may have significant impacts to the landscape. Geophysical exploration has the potential to damage conservation and subsistence values on federal and

[35] Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project, Record of Decision, February 2015, Page 40.

nearby state lands. Seismic testing has direct and indirect effects, as well as cumulative impacts, on a host of natural, cultural, and historic resources including, but not limited to the following: soils, vegetation (including tundra, which can take decades to recover[36]), wildlife, water (including seeps, springs, and riparian habitat), historic properties, traditional subsistence use areas, subsistence resources, and wilderness values. Research in the NPR-A by Jones et al. (2008), for example, documented some of the impacts of winter exploration. In their paper, the authors described the grids left behind by seismic surveys, as well as markings from trails and campsites from survey crews.[37] Because exploration activities and the associated infrastructure for conducting exploration can have adverse effects on the environment and subsistence use, these activities should be accounted for and addressed in the RMS.

Unlike other regional mitigation strategy contexts, like solar development, where few, if any, impacts occur before the project is constructed, the impacts of oil and gas exploration activities in the NPR-A require more thorough environmental review and appropriate mitigation actions. In addition to commercial production activities that may occur within the proposed foreseeable development scenario, we encourage BLM to include all permitted and reasonably foreseeable future exploration activities within the NPR-A's regional mitigation strategy.

B. Compensatory mitigation criteria

The criteria presented within the draft RMS (p. 9-11) lacks rigor and is overly subjective. This section can be improved by more formally discussing BLM's responsibility to administer the NPR-A for the protection of surface values and to ensure subsistence resources and practices. Moreover, it would be helpful to describe how a resource is specifically determined to have a high level of BLM management significance.

We agree that a scarce resource, a resource trending down in condition, or a sensitive or vulnerable resource should require compensatory mitigation. However, just because a resource is not in a compromised state does not mean that it should not require compensatory actions that can assist in its protection and sustained abundance on the landscape. In fact, it is conceivable that thoughtful compensatory mitigation actions can help many resources from becoming compromised. Knowing the uncertainties of climate change and the true impacts of development, BLM should use compensatory mitigation actions to proactively manage the landscape for the maintenance of healthy resource populations.

C. Lands with wilderness characteristics

The loss of lands with wilderness characteristics is an impact warranting compensatory mitigation. Through the development of the NPR-A's RMS, and particularly within the provided draft documents, BLM has not thoroughly addressed the impacts that oil and gas activities have on lands with wilderness characteristics. Lands with wilderness character are increasingly rare national assets. These lands, which BLM should formally acknowledge within the RMS, also

[36] U.S. Fish and Wildlife Service. Seismic trails. Retrieved 5 June 2016 from Arctic National Wildlife Refuge website: http://www.fws.gov/refuge/arctic/seismic.html.

[37] Jones, B., R. Rykhus, Z. Lu, C. Arp and D. Selkowitz. (2008). Radar imaging of winter seismic survey activity in the National Petroleum Reserve-Alaska. Polar Record 44 (230): 227-231.

largely enable subsistence practices and help to ensure abundant subsistence resources in the region. The conversion of near-pristine Arctic habitat to areas with industrial activities results in unavoidable impacts that warrant compensatory mitigation offsets.

Congress recognized the significance of wilderness values in the NPR-A in the 1976 Naval Petroleum Reserves Production Act when Congress directed the Interior Department to analyze these values in the 105(C) Values and Resources Study.[38] Virtually all of the NPR-A was found to be suitable wilderness when the study was completed in 1979. While the NPR-A is exempt from Section 603, the wilderness study provision of FLPMA, BLM still has the authority and obligation to incorporate lands with wilderness characteristics into agency planning and management of the NPR-A. BLM has done so in past planning efforts, such as with the development of the 2004 NPR-A Northwest Integrated Activity Plan / Environmental Impact Statement, when BLM analyzed and considered possible wilderness recommendations in the alternatives developed for the plan. More recently, in the Reserve's 2013 Integrated Activity Plan, BLM acknowledged the NPRA's wilderness values when the agency adopted and incorporated the wilderness inventory from the Department of the Interior's 105(C) Values and Resources Study. These planning actions exemplify BLM's responsibility to recognize and mitigate for impacts to these important lands within the NPR-A.

Section 201 of FLPMA also requires the BLM to maintain on a continuing basis an inventory of all public lands and their resources and other values, including lands with wilderness characteristics.[39] Instruction Memorandum (IM) 2011-154 and Manuals 6310 and 6320 contain mandatory guidance on implementing that requirement. The IM directs BLM to "conduct and maintain inventories regarding the presence or absence of wilderness characteristics, and to consider identified lands with wilderness characteristics in land use plans and when analyzing projects under [NEPA]" (emphasis added). Manual 6310 requires BLM to consider whether to update or conduct a wilderness characteristics inventory when a project that may impact wilderness characteristics is undergoing NEPA analysis.[40]

BLM should include analysis of impacts to lands with wilderness character as part of the RMS. Without doing so, documentation of the full extent of the project's impacts is inadequate. Additionally, maintaining an accurate inventory of lands with wilderness characteristics will be important to establish baseline conditions, as required by NEPA,[41] and necessary for future permitting processes.

[38] U.S. Department of the Interior, 105(c) Values and Resources Study (1979).
[39] See also Ore. Natural Desert Ass'n v. BLM, 625 F.3d 1092, 1122 (9th Cir. 2008) (holding that "wilderness characteristics are among the values the FLPMA specifically assigns to the BLM to manage in land use plans).
[40] BLM Manual 6310 at .06(A)(4).
[41] The National Environmental Policy Act, 42 U.S.C. § 4321 et seq., requires agencies to "describe the environment of the areas to be affected or created by the alternatives under consideration." See 40 C.F.R. § 1502.15. Also, in Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." The court further held that "[t]he concept of a baseline against which to compare predictions of the effects of the proposed action and reasonable alternatives is critical to the NEPA process." *Id*.

It is vital for BLM to include consideration of impacts to wilderness lands and values as part of the RMS in order to ensure that the bureau has adequate baseline information for its NEPA analysis and for evaluating the need for potential compensatory mitigation actions. This consideration can be included in Appendix C: Summary of Impacts Expected with Oil and Gas Development (p. C-1 to C-14). As future developments proceed in the NPR-A, BLM should update its inventory of lands with wilderness characteristics, analyze potential impacts to these lands, and avoid and minimize those impacts. Where impacts to lands with wilderness characteristics are not avoided, compensatory offsets for the loss of those wilderness characteristics should be required.

8) Economic considerations[42]

What follows is a discussion of economic principles and concepts that should be considered while completing the final RMS and technical companion documents:

Overview

The draft RMS and draft technical companion are conceptually sound at a very high level and in some of the details. From an economic standpoint, the draft RMS lays out a method by which mitigation actions could potentially offset external costs of oil and gas development in the Northeastern NPR-A.

The draft RMS is unlikely to achieve this potential for one fundamental reason: the scope of adverse impacts is too narrowly defined. This means that important external costs, are left out of consideration, with unmitigated damage to important natural resource values being the likely result of implementing the draft RMS. Indeed, as the technical companion states, the draft RMS "is focused on...some of the impacts of anticipated oil and gas development in the Northeastern NPR-A" (p 3)." Only by focusing on all of the impacts, or at least as many as can be practicably assessed, evaluated, and compensated, will an economically efficient outcome be possible.

Note that we do not object to the importance placed on the intertwined issues of impacts on subsistence, socio-cultural systems, and environmental justice. Rather, we object to the exclusion of important effects on ecosystem services (beyond the food and cultural value associated with subsistence use) and of greenhouse gas emissions without any clear economic rationale. We argue, in other words, that there may be significant economic costs due to changes in ecosystem service value and carbon emissions that, for the sake of economic efficiency, do warrant mitigation.

The Economic Issue

It is a firmly established economic principle that a change in economic organization–in the case at hand, this would be a change in land use/management–that leaves some people better off while harming others can still be said to be worth doing if it is at least *hypothetically* possible for those who gain to compensate those who lose as a result of the change. The reason is that the change produces a net benefit across all of human society. If one considers economic justice as well as

[42] Prepared with assistance from Spencer Phillips, Ph.D., Key-Log Economics LLC.

overall welfare, then we would require that the compensation not only be hypothetical, but that it *actually* be paid so that those who lose something due to the change can at least receive the cash equivalent of what they have lost.

Setting aside for the moment the obvious question of whether any and all types of human suffering, including changes in physical, psycho-social, or cultural well-being could or should be assumed to have a cash equivalent, this compensation principle provides a sound conceptual rationale for mitigating the adverse impacts of oil and gas development in the Northeastern NPR-A. It also suggests the scope and scale of the compensation that should be paid if that development is to be deemed both efficient and just.

In the case of the Northeastern NPR-A, the gainers would include oil and gas companies (including their shareholders and employees), Alaska residents for whom royalties paid to the state help substitute for personal income taxes, and, via the workings of global energy markets, consumers who might otherwise pay more for energy, both directly and as the embedded energy content of the many goods and services we use every day.

The losers in this case are any persons for whom the value of their use, whether direct or indirect, active or passive, of the land and resources of the Northeastern NPR-A would be adversely affected by energy development, as well as anyone for whom the consequences of developing, extracting, transporting, and ultimately burning oil and gas from the northeastern NPR-A would suffer any direct or indirect effects. This group obviously includes Alaska Natives who will experience natural resource damages most acutely. Animals important to subsistence may become less abundant, less healthy, or more costly to find and harvest. Cultural connections to the landscape via subsistence use will be weakened and there will be negative direct and indirect effects of land use change on ecosystem functions like air and water filtration, water quantity regulation, and waste assimilation that support diverse ecosystem benefits like health, safety and psychological well-being.[43]

Other users and potential users will also be harmed, including those who harbor "passive-use" value (also called "non-use value") for the natural landscapes of Alaska, including the NPR-A. Passive use value includes the value to people of simply knowing an unspoiled natural area exists and the value of keeping such places unspoiled for the sake of some future direct or active use. These values can be connected to direct use, such as subsistence hunting, but they can also be significant for people who may never step foot or lay eyes on the NPR-A. These values, like subsistence use itself, are among the "nonmarket environmental values" that BLM refers to in its instructional memorandum titled "Guidance on Estimating Nonmarket Environmental Values."[44] As the memorandum states, "...economic analysis for resource management should consider all relevant values, not merely those that are easy to quantify. Utilizing nonmarket values provides a

[43] See Balmford, et al. (2010) for a full description of this framework that maps ecosystem processes (what happens in ecosystems that is of potential value to humans) to ecosystem benefits (the particular ways in which humans make use of or enjoy the results of what happens in ecosystems).

[44] Stout, J., Winthrop, R., & Moore, R. (2015, January 8). Guidance on Estimating Nonmarket Environmental Values (Instructional Memorandum No. 2013-131, Change 1). U.S. Bureau of Land Management. Retrieved from http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-131__Ch1.print.html

more complete picture of the consequences of a proposed activity than market data alone would allow.[45]

In the context of pursuing what is economically efficient, which from an economic perspective is a major component of what is "best" for society, an action cannot be known to promote efficiency and equity unless ALL market and nonmarket values affected by the action are considered, properly quantified, and incorporated into a sound and robust compensation mechanism. In our opinion, the Draft RMS fails to satisfy any of these conditions. As it stands now, the Draft RMS provides for mitigation of only a fraction of the total economic value put at risk by development in the Northeastern NPR-A.

Figure 1, below presents the standard economic view of external costs and why they are "bad" for society. It also shows the economic rationale for mitigation actions. The quantity of energy (oil in this illustration) is measured along the horizontal axis in units of thousands of barrels. The price per unit ($/MBbl) is measured on the vertical axis. *Demand* for oil (also the marginal benefit, "*MB*", of consuming oil) is shown by the downward-sloping grey line. It slopes downward because people get less additional benefit from the consumption of each successive unit of oil.

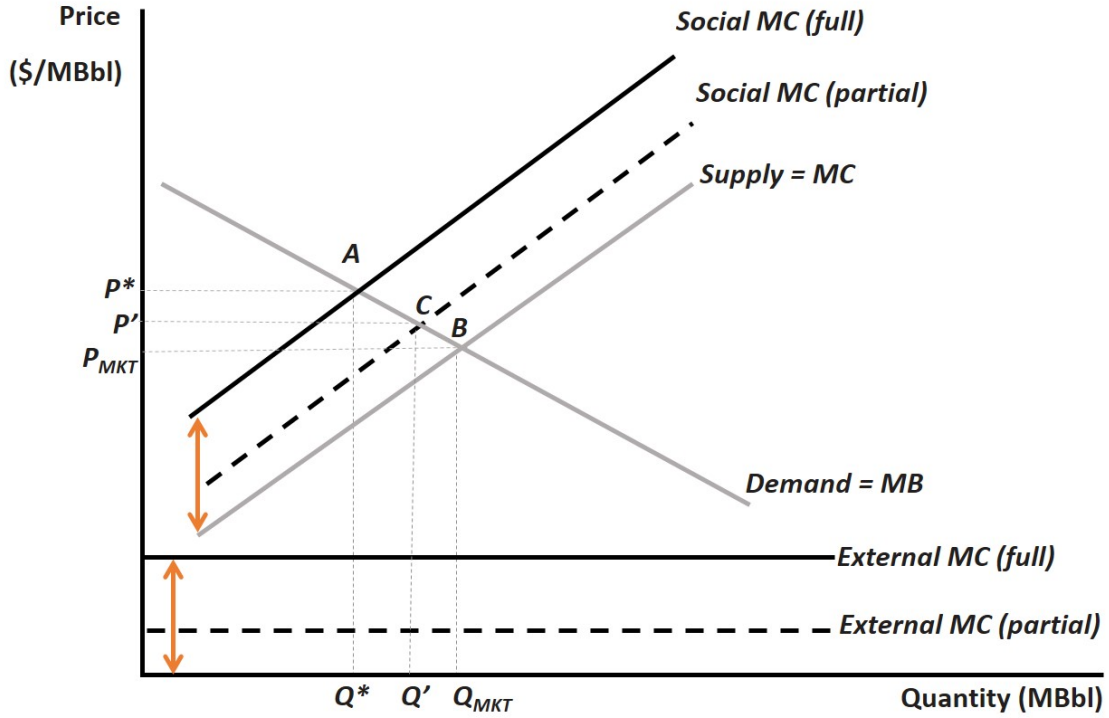

Figure 1: External Costs, Market Failure, and the Pursuit of Economic Efficiency

[45] Stout, J., Winthrop, R., & Moore, R. (2015, January 8). Guidance on Estimating Nonmarket Environmental Values (Instructional Memorandum No. 2013-131, Change 1). U.S. Bureau of Land Management. Page 2. Retrieved from: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-131__Ch1.print.html

The supply of oil is the upward-sloping grey line. Supply is (generally) equal to firms' *marginal cost* of production—that is, it is the cost of producing the last thousand barrels of oil brought to market. This line is therefore labeled "*Supply = MC*". Under ideal conditions, including a lack of any *external costs* (impacts on parties other than oil sellers and oil buyers), societal benefit from oil production would be maximized where demand (marginal benefit of consumption) equals supply (marginal cost of production), or at point "*B*" in the diagram. At this point, buyers value the last thousand barrels of oil consumed at exactly the cost of producing the last thousand barrels. The amount produced/consumed will be Q_{MKT}, and that amount will be sold/bought for P_{MKT}. These are the "market-clearing" quantity and price of oil.

External costs are depicted in the diagram by the horizontal black lines. The dashed line depicts a subset of external marginal costs ("*External MC (partial)*"), such as the impacts of oil production in the NPR-A on subsistence that is considered in the Draft RMS. The solid line depicts the full external costs ("*External MC (full)*"), including the cost of impacts on the full suite of ecosystem services, and the cost of greenhouse gas emissions—i.e., the social cost of carbon. (To keep the diagram as simple as possible, we have depicted these as horizontal lines, implying that the external marginal cost (partial or full) of the first barrel is the same as the external cost of the n^{th} barrel.)

To arrive at level of oil production and consumption that is truly socially optimal, one must add the external marginal costs to the private marginal costs to the get the "Social Marginal Cost" of oil production and consumption. In the diagram, adding the *External MC* (partial or full) to the private marginal cost ("*Supply = MC*") at each quantity gives us the darker upward-sloping "*Social MC*" curves. When external costs are taken into account, the efficient level of oil production is lower, and the corresponding price per MBbl is higher.

In the diagram, this economically efficient level of production and consumption is at point "*A*" with *Q** MBbls produced and sold at a price equal to *P** dollars per MBbl. At any level of production beyond *Q**—at Q_{MKT}, for example—the social cost of producing the extra MBbls is higher than the value of that oil to consumers, and the added production imposes external costs on society that are not worth the benefit derived from the use of the additional energy. (The *Social MC* curves are above the *Demand* curve for any quantity beyond *Q**.)

This excess of social costs over social benefits is, in essence and in economic terms, the problem of "market failure" that the Draft RMS is trying to solve. Production/consumption beyond the point where *Social MC* is the same as *Demand (=MB)* is economically inefficient and unjust in that those gaining from the production/consumption of oil are imposing uncompensated/unmitigated costs on other parties. By requiring mitigation measures of sufficient value so that they offset the (full) external marginal costs of oil production from the NE NPR-A, those external costs are brought to bear on production/consumption decisions, and a lower (and proper) level of production/consumption can be achieved. In addition, the costs of producing/consuming the economically efficient quantity of oil (up to *Q** in the diagram) will be fully mitigated.

The fundamental economic problem with the Draft RMS, then, is that by considering only some of the relevant external costs, BLM has proposed to go only so far as the dashed Social MC curve would suggest. In the diagram, that gets only to point "*C*", corresponding to *Q'* MBbls produced and a price/MBbl of P'. This proposal leaves other external costs out of the equation

and thwarts the opportunity to achieve a better, more economically efficient outcome represented at point "*A*". Every move along the horizontal axis from *Q*' toward *Q*--that is every effort to mitigate more of the external impacts of oil production*--will produce net societal benefits, because the costs avoided will be greater than the benefit foregone.

By considering, and aiming to mitigate, only some of the external costs of development in the NE NPR-A, BLM is leaving net societal benefits on the table. In Figure, this is the error of considering only partial external costs (the dashed line) rather than full external costs (the solid line). The RMS needs to move from "point C" to "point A" in the diagram by expanding the geographic and categorical scope of impacts considered and counted for mitigation.

Geographic Scope

In the draft RMS, BLM correctly notes that "considering a broad region for the RMS provides more flexibility in selecting and siting compensatory mitigation actions" (p. 13). The region considered however, is limited to the Northeastern NPR-A. Some impacts however, including effects of greenhouse gas emissions, and effects on ecosystem benefits and on passive-use value, will be felt (and impose external costs) far beyond the NPR-A, Alaska, or even the U.S. By limiting the geographic scope of the RMS, BLM has limited both the amount that should be allocated to compensatory mitigation and the range of mitigation actions that would be appropriate and beneficial to undertake using those funds.

Broadening the geographic scope for consideration of impacts would allow for a more complete evaluation of the economic consequences of development in the Northeastern NPR-A. It would also place the consideration of adverse impacts on an equal footing with the consideration of the economic benefits of development. The draft RMS lists "Increased economic activity in the state…", "Increased revenue to the State…", and "broad positive impacts of domestically produced energy fuels" among the positive impacts of energy development in the NE NPR-A (p. 6). These benefits, along with company revenues, shareholder value, some, if not most, of employee wages, and lower energy costs for end users accrue almost exclusively to people who live outside the Northeastern NPR-A, but those economic impacts are all counted among the positive results of oil and gas development in the region. Without considering costs that accrue at a similarly broad geographic scale (i.e., across the globe, potentially), BLM will be unable either to determine whether any such development is potentially economically efficient or to establish and execute a mitigation strategy that makes the intended economic efficiency real.

Categories of Impacts

In addition to defining too narrow a geographic scope for the draft RMS, the draft errs in its classification of several impacts, most notably climate change and recreation, as "minor" or "negligible" (p. 19). Moreover, and unless BLM intends that effects on passive-use values are fully included in impacts on "socio-cultural systems" due to changes in the quality of subsistence use, the draft RMS misses entirely the potential for development in the Northeastern NPR-A to diminish passive-use values.

Both of these errors may stem from the error of defining too narrow a geographic scope. It may be true, for example, that the marginal effect on people living in the Northeastern NPR-A of the exacerbation of climate change that results from the extraction and combustion of fossil fuels extracted from that particular corner of the planet may be relatively minor. However, and by the

very same token–that is, the global nature of climate change–actions taken in the Northeastern NPR-A that entail or facilitate greenhouse gas emissions will have some effect on GHG concentrations and the global climate. Those actions—i.e. RFDS projects—will therefore have some effect on people worldwide.

How large a contribution to climate change is made by the extraction, transportation, processing, and ultimately the burning of oil and gas extracted from the Northeastern NPR-A is an open and researchable question. However, BLM has, by adopting an overly narrow scope of inquiry, jumped to a conclusion that the contribution is negligible, and it therefore treats the economic value that could or should be compensated as if it were zero. With new urgency, not to mention a new international agreement, to limit greenhouse gas emissions and keep mean global temperature rise within 2℃, and with U.S. Government recommended estimates of the social cost of carbon ranging from $11 to $212 per metric ton CO_2E[46], shunting climate change impacts to the "negligible impacts" list without any attempt to determine what those impacts might be is concerning.

For example, the Greater Mooses Tooth One ("GMT1") project will produce an estimated 64 million barrels of oil between 2017 and 2050[47], resulting in emissions of approximately 27.6 million metric tons of CO_2 in the 34-year period.[48] Using U.S. EPA's procedures for calculating the social cost of carbon, these emissions translate into a cumulative social cost of between $461 million and $4.4 billion in 2015 dollars.[49] In the Record of Decision for GMT1, the total mitigation funds required is a mere $8 million—less than two percent of what would be required to mitigate the cost of the carbon emissions.[50] (Clearly the difference between the partial and full external costs in Figure 1 is not drawn to scale.)

Similarly, development of the Northeastern NPR-A may affect the value of recreation over a broader geographic area. If development affects populations of migratory species, and if those species are important to hunters and birders along migratory routes, the impact of oil and gas development in the NPR-A will result in changes in human well-being thousands of miles away. We recognize that the biophysical effects, including reductions in bird populations may be small and that the resulting impact on recreational value could be smaller. But we do not agree that such effects should be categorically assumed to be "negligible" and excluded from further consideration as part of the mitigation program.

We recommend that BLM follow guidance from CEQ and from the National Ecosystem Services Partnership ("NESP") and incorporate consideration of the effects of RFDS projects on all

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[46] U.S. EPA, C. C. D. (2016, June 12b). Social Cost of Carbon [Overviews & Factsheets,]. Retrieved June 12, 2016, from https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html.

[47] Bureau of Land Management. (2014). *Final Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project*.

[48] U.S. EPA, OAR. (2016, May 31a). "GHG Equivalencies Calculator - Calculations and References." Data and Tools. Retrieved June 13, 2016 from https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references.

[49] The lower estimate corresponds to a 5% discount rate and the average of climate model outputs. The high end of the range assumes a 3% discount rate and a social cost of carbon at the 95th percentile of the model outputs (U.S. EPA, 2016b).

[50] Schneider, J.M. (2015). Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project: Record of Decision. Washington, DC: U.S. Department of the Interior. February. 110 pp.

ecosystem services, including recreation.[5152] Working through the NESP's *Federal Resource Management and Ecosystem Services Guidebook*, in particular, would aid BLM in evaluating the extent to which some of the effects dismissed in the Draft RMS are truly "negligible."

Finally, impacts on passive use values, while not named among those impacts specifically excluded from consideration, are also not named as impacts that are INcluded for purposes of setting compensatory mitigation amounts. Experience and research dating from the time of the Exxon Valdez oil spill show that loss of passive use value due to such disasters and other consequences of energy development can be as great as or greater than the damages to the direct use of natural resources. (See, for example, Carson et al. (2003) who review studies of the Exxon Valdez spill and find that lost passive use value ranges from $4.87 to 7.19 billion, compared to $3 billion spent on cleanup and to settle lawsuits over lost direct use and restitution for injuries.)

Oil and gas development in the Northeastern NPR-A is part of an energy extraction and transportation system that entails risks of major disasters as well as the more certain but less dramatic year-by-year erosion of natural conditions a relatively pristine landscape. As such, that development will affect passive use values held by people who may one day want to experience that landscape firsthand or who simply value its existence in a relatively healthy condition, regardless of their intentions for future direct use. The effect on passive use value should be included, as a matter of course, in any list of unavoidable adverse impacts considered as part of Northeastern NPR-A development. It is at least possible that such impacts would also warrant compensatory mitigation.

Alternative Approach for Establishing Mitigation Levels and Actions

Given that BLM has thus far excluded important external costs associated with oil development in the Northeastern NPR-A and the importance of counting those costs if the RMS purposes of efficiency and equity are to be achieved, we propose what we believe to be a straightforward and economically (and otherwise) defensible alternative to choosing a dollar-per acre fee based on past decisions. We recommend a two-pronged approach that would address three major categories of impact and move BLM's RMS and on-the-ground outcomes closer to the economically efficient ideal depicted at point "*A*" in Figure 1.

The first prong of this two-pronged approach would mirror BLM's proposed action-based method currently focused exclusively on subsistence values. We strongly urge, however, that the RMS include a thorough review, using the ecosystem services guidebook referenced above (National Ecosystem Services Partnership, 2014), to identify the full range of ecosystem service effects wherever they occur of RFDS projects. Explicit consideration of causal chains linking RFDS projects to effects on, for example, recreation and other experiences of natural resources in or relying on the project area (e.g., migratory bird species) would provide for a more

[51] Donovan, S., Goldfuss, C., & Holdren, J. (2015). *Incorporating Natural Infrastructure and Ecosystem Services in Federal Decision-Making* (No. M-16-01) (p. 5). Executive Office of the President, OMB & CEQ. Retrieved from https://www.whitehouse.gov/blog/2015/10/07/incorporating-natural-infrastructure-and-ecosystem-services-federal-decision-making.

[52] National Ecosystem Services Partnership. (2014). Federal Resource Management and Ecosystem Services Guidebook. Retrieved February 10, 2015, from https://nespguidebook.com/.

systematic and robust basis for decisions about which effects warrant mitigation than that presented in the draft RMS.

BLM and stakeholders would then develop proposed actions and screen and rank them in a manner similar to that proposed in the draft RMS (p. 13) and draft technical companion (p. 22). From an economic standpoint, the iterative nature of BLM's proposed method allows the possibility that action proposals can be developed in ways that take into account the full external costs and, at a minimum, all of the external costs relevant to stakeholders. We do suggest, however, that the RMS should have both stakeholder groups and the applicant, propose an initial set of compensatory mitigation actions as part of the NEPA process. The reason to include stakeholder groups is that the iterative process is essentially a negotiation, the outcome of which could be limited by "anchoring bias". [53] Because the applicant is understandably likely to propose a smaller/less costly set of mitigation actions, it may be difficult to attain a final set of mitigation actions that fully offsets the external costs of the project.

The second prong of this approach would specifically target each RFDS project's contribution to greenhouse gas emission. In brief, BLM would determine the net carbon emissions from each RFDS project and protect from the leasing program other lands in the Northeastern NPR-A (or elsewhere in the NPR-A) for which later development would result in an equivalent release of carbon. For example, since GMT1 will result in 27.6 million tons of carbon emissions, those emissions could be mitigated by leaving in the ground some combination of oil, coal and gas that would, if extracted and used, result in the emission of 27.6 million tons of carbon. BLM and stakeholders could then choose the particular acreage for protection based on (a) how much carbon is embodied in each acres' energy reserves and (b) other criteria, including especially the potential for each acre to contribute to the objectives of a fully developed set of action-based mitigation measures. Many acres would do double or triple (or more) duty as places where carbon will not be released and as places that provide important subsistence, recreation, and other ecosystem service values.

The rationale for this proposal is that each RFDS project will result in the release of a fairly predictable number of tons of carbon into the atmosphere. Given the purposes of the NPR-A, it is reasonable to assume that, over time, much of the carbon stored as economically recoverable fossil fuel under the NPR-A will eventually be released. It is therefore also reasonable to regard the protection of a portion of the NPR-A lands from the leasing program as an additional and permanent reduction in carbon emissions, relative to the status quo. Permanent protections, in other words, would offset emissions from RFDS projects completed on lands not protected from the leasing program.

We would look forward to the opportunity to further develop this proposal with BLM staff and other stakeholders. For now, we suggest that such an approach has several significant benefits relative to the draft RMS. These include:

- Comprehensive consideration of all possible effects—i.e. the full external cost—of RFDS projects.

[53] Anchoring bias is the tendency of people to place too much importance on the first piece of information obtained. In this context, it would be to place too much importance on the opening "offer" of mitigation actions.

- Opportunity to develop mitigation actions that mitigate all or a substantial majority of the external costs, leading to efficient and more equitable outcomes for all stakeholders.
- A clear, relevant metric (carbon emissions) that can be reasonably estimated for RFDS projects and for protected areas. BLM would use the best available information at the time of each RFDS project to estimate carbon emissions from the project and from offset lands.
- Using a carbon-for-carbon mitigation approach avoids complications inherent in using a per-acre fee method, including difficulty in assigning dollar values to some external costs and questions about whether and by how much to discount dollar-valued costs and benefits that will occur in the future.
- Any accounting of the emissions avoided due to permanent protections could—and should, in our opinion—include the direct emissions from development, drilling and transport operations (just as such emissions should be counted for RFDS projects on leased areas). Credit could be taken, in other words, for the direct emissions avoided as well as for the carbon left in the ground.
- Lands for permanent protections can be selected for their capacity to mitigate multiple external costs, not just carbon emissions. Just as external costs of RFDS projects are additive (the cost of carbon emissions is added to the cost of effects on subsistence, on recreation, on water quality, et al.), the benefits secured by permanent protections would be added up. Each acre withdrawn would make a contribution to subsistence, to recreation, to water quality protection, et al., in addition to its contribution to a reduction in future carbon emissions.
- While permanent protections may not satisfy all of the objectives of the action-based prong, it is likely that protections would achieve at least some of the same ends. To the extent that protections allow BLM and stakeholders to check some actions off the list, overall mitigation costs, especially and importantly, out-of-pocket costs, could be lowered under this proposed two-prong approach.

Summary

The fundamental economic problem with the draft RMS for the Northeastern NPR-A is that the scope of adverse effects is too narrowly circumscribed. The draft RMS excludes negative effects on people living outside the Northeastern NPR-A and, consequently, excludes what may be important unavoidable adverse impacts of RFDS projects from consideration for mitigation payments or actions. These include the effects of greenhouse gas emissions, lost passive use values, and, possibly, direct use values stemming from damage to ecosystem processes/ecosystem benefits in the Northeastern NPR-A.

The draft RMS could be greatly improved by:

- recognizing the broader geographic scope of RFDS project impacts;
- incorporating a comprehensive review and consideration of all potential ecosystem service effects of RFDS projects; and
- developing a carbon-offset-based method by which permanent protections of Northeastern NPR-A lands offsets carbon emissions from RFDS projects (and quite possibly also mitigating effects on other ecosystem services and subsistence).

When implemented with input and engagement from all relevant stakeholders and executed accordingly, and applying the analytical and procedural requirements of NEPA and other guidance regarding carbon emission accounting and ecosystem services evaluation, we would expect that such an RMS would promote an orderly, economically efficient, and socially equitable path forward for resource development in the Northeastern NPR-A.

Additional economic considerations:

- **Financing conservation actions**

While quantifying a fair and justifiable compensatory mitigation fee based on unavoidable impacts is important, it is also important to factor in the cost of mitigation actions when calculating compensatory fees. In addition to the cost associated with a robust program for monitoring and adaptively managing the landscape, we encourage BLM to include the cost for conservation actions within their total mitigation fees.

Calculating and including the cost for conservation actions, such as conservation easements, is a relatively straightforward endeavor. Established land trusts and conservation organizations regularly calculate the costs of stewardship. Land trusts or other easement holders typically determine the amount of money needed to seed small endowments based on the returns required to effectively monitor, manage, and ensure the terms of easements or agreements. To effectively offset the impacts of development and to protect surface values, we suggest that BLM include the cost of third-party oversight of conservation actions into the final RMS documents.

- **BLM should clarify compensatory mitigation costs for action based methods**

The language on p. 15 of the draft RMS should be clarified. BLM writes: "Both of the action based methods utilize the cost of the actions to be implemented as the determination of the compensatory mitigation amount. The cost for each action within the Northeastern NPR-A will correspond to the impacts warranting mitigation for that action." BLM should explain in greater detail what this language means. Specifically, we encourage BLM to add that the impacts of development may warrant more than one mitigation action, and that the sum of all mitigation action costs will be the determined compensatory mitigation fee for a particular project.

9) Increasing clarity on RMS implementation to maximize its utility

Establishing clear expectations for how the RMS will be used to inform future decisions regarding mitigation for industrial activities, such as exploration, and development in the NPR-A is crucial for ensuring that the RMS helps BLM comply with its mitigation requirements and achieve the following goals: 1) making future permitting and mitigation obligations more efficient and predictable for developers, and 2) for maximizing the benefits to impacted resources and values.

While the draft RMS and draft technical companion include some helpful details on implementation that should be maintained in the final RMS documents, there are numerous inconsistencies within and between the two documents, as well as areas where additional details are needed.

A. BLM should carry forward to the final RMS documents helpful implementation language from the draft RMS and draft technical companion

The draft materials include helpful language in several places that should be carried forward into the final RMS documents. In some cases, language is present in the draft RMS and not in the relevant section of the draft technical companion or vice versa, or the language is similar but inconsistent; BLM should ensure consistency between the final RMS and the final technical companion.

Helpful language that should be carried forward in the final RMS documents includes the following (recommendations for changes to increase clarity and consistency *in italics*):

- Applicant-Proposed Compensatory Mitigation Section
    - As mentioned above, both the applicant and stakeholders should propose an initial set of compensatory mitigation actions as part of the NEPA process.
    - "If the applicant determines that there will be no residual impacts, then they will need to provide detailed rationale in support of this determination as part of their application." (Draft RMS p. 13.)
        - *BLM should add this language to the draft technical companion on p. 22*
    - "Table 2-1 and the associated ranking criteria should be used by the applicant to identify the potential actions that are commensurate to the residual impact identified. The applicant will also be required to describe the level of local resident input and coordination, and stakeholder involvement carried out in determining the actions to propose." (Draft RMS p. 13, draft technical companion p. 22.)
    - "The applicant-proposed action(s) will then be considered as part of their proposal in the NEPA analysis in order to determine the adequacy of the compensatory mitigation to offset residual impacts to the anticipated affected resources." (Draft RMS p. 13, draft technical companion p. 22.)
        - *BLM should add "as part of the Draft EIS review" to this sentence to increase clarity and make it consistent with the language from the relevant section on BLM-Determined Compensatory Mitigation on p. 15.*
    - "Through the NEPA process, the BLM will ensure additional stakeholder involvement through an iterative process of reviewing and assessing the adequacy of the actions to address the impacts identified, including the opportunity to suggest alternative actions that could better address the unavoidable, adverse impacts. The Final EIS will include the selected compensatory mitigation actions to be carried [out] in conjunction with the Preferred Alternative." (Draft RMS p. 13, draft technical companion p. 22.)
    - "The decision will include a determination of the required compensatory mitigation action(s). An implementation plan must be submitted prior to any application associated with the development being approved." (Draft RMS p. 13.)

        - The language addressing this issue from the draft technical companion on p. 22 is more clear than the relevant language from the draft RMS because it uses the term "notice to proceed with construction." Specifically, the draft technical companion language is as follows: " . . . the decision will include a determination of the required compensatory mitigation action(s). An implementation plan must be submitted by the permittee and approved by the BLM prior to a notice to proceed with construction." *BLM should replace the language in the draft RMS on p. 13 with this language from p. 22 of the draft technical companion. BLM should also add "and shared with the public" to this sentence in both locations.*
- BLM-Determined Compensatory Mitigation Section
    - This section includes much of the helpful language from the section on Applicant-Proposed Compensatory Mitigation; this material should be carried forward into the final RMS documents.

B. BLM should make it clear that project-level mitigation must adequately compensate for the residual impacts that warrant compensatory mitigation and should follow the recommendations of the RMS as much as possible.

The draft RMS includes important language on p.16, clearly stating that: "Regardless of the method used, any mitigation actions must adequately compensate for the identified residual impacts that warrant compensatory mitigation." BLM should carry this language forward into the final RMS documents.

We also recommend that BLM add the following text: "Although the RMS is not a decision document, the BLM authorized officer should ensure that compensatory mitigation identified as part of the BLM's project authorization decision is as consistent as possible with the recommendations for mitigation types and amounts in the RMS, as well as demonstrating how they meet the RMS mitigation goals." The BLM, industry, and stakeholders have invested significantly in the RMS, and the final RMS documents should emphasize the importance of using the recommendations in the RMS to the maximum extent possible.

In addition to including both of these sentences on p. 16, we also recommend that BLM add these sentences at the top of p. 13, at the end of the introduction of the section on different compensatory mitigation methods. This will make the ultimate standards more clear to the reader as they go through the various compensatory mitigation methods. These additions should also be made at the relevant places in the draft technical companion (p. 22, 27, 28).

BLM should also make the implementation requirements for use of the Per-Acre Fee Method more clear. BLM should add language to end of this section on p. 15 of the draft RMS and on p. 28 of the draft technical companion that is similar to the sections on Applicant-Proposed and BLM-Determined Compensatory Mitigation, such as:

> "BLM will include the proposed per-acre fee in the Draft EIS. BLM also will consider the list of compensatory mitigation opportunities identified in Table 2-1 as well as the ranking criteria, and propose compensatory mitigation actions that could be funded by the per-acre fee and are commensurate to the impacts identified, and include this information

in the Draft EIS. Through the NEPA process, the BLM will ensure additional stakeholder involvement through an iterative process of reviewing and assessing the adequacy of the per-acre fee and associated mitigation actions to address the impacts identified. Determining which actions would mitigate the impacts would be done in close collaboration with the impacted stakeholders as part of the Draft EIS review, including the opportunity to suggest alternative actions that could better address the unavoidable, adverse impacts. The Final EIS will include the proposed per-acre fee and selected compensatory mitigation actions to be carried out in conjunction with the Preferred Alternative.

The decision will include a determination of the required per-acre compensatory mitigation fee and associated compensatory mitigation action(s). An implementation plan must be submitted by the permittee and approved by the BLM and shared with the public prior to a notice to proceed with construction."

C. BLM should specify that any NEPA analysis required to implement mitigation actions will be conducted as part of the NEPA analysis for the proposed development

One of the key lessons learned from the Dry Lake SRMS pilot was that NEPA analysis necessary to permit selection of mitigation sites and approval of mitigation actions should be completed concurrently (or before) NEPA analysis approving project development. This was not done at Dry Lake – additional NEPA analysis must now be conducted to create an Areas of Critical Environmental Concern (ACEC) management plan for the Piute-El Dorado ACEC and approve mitigation actions in the ACEC, resulting in a significant time gap between when the impacts from solar development will occur and when the bulk of the mitigation actions will occur. (*See also above: Special Area management plans, p. 4.*)

BLM should avoid this issue with the NPR-A RMS by adding the following language at the end of p. 12 in the draft RMS: "Any NEPA analysis needed to approve compensatory mitigation sites and actions will be completed as part of the NEPA analysis for the development." This language should also be added to the flowchart on p. 14, the "Other Considerations" section on p. 16, and to the draft technical companion on pages. 21 and 28.

D. BLM should clarify the relationship between mitigation requirement decisions in the ROD and additional details to be provided in the Implementation Plan

We support BLM requiring that the applicant develop an implementation plan (IP) after the ROD and before the agency issues a notice to proceed for development. We have seen the value of a more detailed implementation plan for the Dry Lake Solar Regional Mitigation Strategy, and believe that implementation plans for development in the NPR-A can similarly increase the effectiveness of mitigation to offset impacts. However, the language in the draft RMS and draft technical companion regarding implementation plans should be clarified.

For example, p. 25 of the draft RMS states: "Once the mitigation actions or fees have been determined in the decision, the next step is to create an implementation plan that will specify the

compensatory mitigation actions to be completed and how the actions will be carried out for the life of the development."

BLM should use clearer language, such as "Once the mitigation fee and suite of appropriate potential mitigation actions are determined in the ROD, the next step is to create an implementation plan that will specify which particular compensatory actions will be completed and how they will be carried out for the life of the development."

To add clarity for implementation, BLM should also add language to the final RMS documents stating that BLM will specify in the ROD the total amount of mitigation required to offset each unavoidable impact (e.g. how much mitigation would be required for each potential action if that action were selected as the only action – developers could mix and match but this would allow BLM and stakeholders to more clearly and easily see that the developer-proposed mix in the implementation plan is adequate). BLM should add language such as "BLM will specify in the ROD the total amount of mitigation required to offset each residual impact (e.g. how much mitigation would be required for each potential action if that action were selected as the only action)."

Another example of language that should be clarified in the draft RMS is, "The plan will include detailed information regarding the mitigation actions that will be carried out, focusing on how they will be implemented on-the-ground and the costs of the mitigation action, which comprise the mitigation fund" (p. 25). The ROD should determine the fee and total mitigation fund amount; the implementation plan should detail what the specific actions cost and how they will be implemented using the fund. BLM should clarify the language in the final RMS documents to better explain the agency's intent regarding compensatory mitigation fees/fund and actions.

This section of the draft RMS also states that "The implementation plan will also include the administrative and contingency fees, and details on reporting requirements" (p. 25). The administrative and contingency fees should be required and specified in BLM's decision document, the ROD, and BLM should add language to make that clear.

BLM should also make it more clear at what point in the process the adaptive management strategy is developed. On p. 27 of the draft RMS it states: "Every implementation plan should include an adaptive management strategy specific to the mitigation actions to be implemented." The draft materials go on to say: "Since mitigation actions are identified in project-specific NEPA analysis, it follows that the development of an adaptive management strategy must occur during project-specific NEPA analysis." This disagrees with the language on p. 38 of the draft technical companion which says it must occur after project-specific NEPA analysis: "Since mitigation actions are identified in project-specific NEPA analysis, it follows that the development of an adaptive management strategy must occur after project-specific NEPA analysis." We recommend that the adaptive management plan and the associated commitments be developed as part of the NEPA analysis. Through this framework, the NEPA process, including the record of decision, will identify impacts, compensatory mitigation actions to offset these impacts, and the strategy to ensure that those actions are effective at truly offsetting the project's impacts. (*See also below: Monitoring and Adaptive Management, p. 27.*)

On p. 25 of the draft RMS it states, the "implementation plan will be created by the applicant and approved by the BLM in close consultation with the affected residents and local stakeholders, in order to ensure that mitigation goals are achieved." BLM should clarify what the public process will be for development of the implementation plan and adaptive management strategy. It is unclear how BLM is defining "affected residents and local stakeholders." BLM should involve the public more broadly and in a robust way in the review of the implementation plan and adaptive management strategy to ensure that these plans are adequate to achieve identified mitigation goals.

Finally, the draft technical companion does not include a section on development of implementation plans. At a minimum BLM should add to the final technical companion a reference to the section on implementation plans in the final RMS; alternatively, BLM could add a section on implementation plans to the final technical companion.

10) Reasonably foreseeable development scenario

We are appreciative of BLM following through with this condition of the GMT-1 ROD. This is a constructive, forward-thinking feature of the RMS and allows all stakeholders to have a better understanding of where exploration and development will likely occur within the NPR-A over the coming years.

In preparing the final documents, we encourage BLM to include all contiguous leased areas in the region. Additionally, to make the final RMS as timely and relevant as possible, we strongly urge BLM to include all leases sold at the December 14, 2016 lease sale. In that sale, industry acquired a significant new block of leases that extend southwest of the existing leases and Nuiqsut, and that run along the boundary of the Teshekpuk Lake Special Area. ConocoPhillips also acquired a significant number of leases on state lands south of Nuiqsut. Industry interest in this area and the potential for development to further surround the community are not adequately reflected in the existing reasonably foreseeable development scenario map.

Moreover, since the release of the draft RMS and draft technical companion, Caelus Energy Alaska has actively publicized a very large oil find in the State of Alaska's waters of Smith Bay, a find that will require extensive new infrastructure to develop and transport oil. This announcement has important implications for how BLM manages the landscape, including the Teshekpuk Lake Special Area. As such, we believe that this potential development, and its associated potential impacts to the region, should be discussed within the final RMS documents' reasonably foreseeable development scenario. It is essential to include any aspects of Caelus Energy's infrastructure and operations likely to occur in the development area as part of the RMS.

How the reasonably foreseeable development scenario will maintain its value and relevance after its final publication is a question that BLM needs to answer. We suggest that BLM use this section of the final RMS (p. 7) to commit to yearly updates of the reasonably foreseeable development scenario based on additional lease sales or lease relinquishments, including those located on nearby state lands.

11) Mitigation Hierarchy

As we outlined in December 9, 2015 comments, BLM's approach to the mitigation hierarchy in the NPR-A is often inconsistent and presents some confusion. Within the draft Strategy's executive summary, BLM writes that the document "is focused only on the compensatory mitigation aspects as it relates to anticipated development in the Northeastern NPR-A" (p. iii). While compensatory mitigation should certainly be a focus of this document, we strongly believe that the other tiers of the hierarchy are also necessary inclusions within the final documents.

Avoidance, minimization, and compensatory action build on one another and are successive. As such, a holistic understanding of compensatory requirements cannot fully be garnered if the mechanisms for effective avoidance and minimization are not well articulated. In the final RMS, we encourage BLM to include discrete sections on how each of the tiers of the mitigation hierarchy are and will be achieved as development within the region moves forward. What follows are our recommendations for avoidance, minimization, and compensatory action:

Avoidance Recommendations:

- Through the RMS, BLM must: 1) articulate existing avoidance areas and their durability; and 2) take steps to achieve durable avoidance. These steps to achieve durability include: identifying high value conservation and subsistence areas, such as the Teshekpuk Lake and Colville River Special Areas, that should be avoided, as well as describing the mechanisms for how avoidance will be achieved.
- To better balance conservation and development, avoidance areas should be identified within the RMS and then durably operationalized through the next National Environmental Policy Act (NEPA) review and ROD within the NPR-A, likely the Greater Mooses Tooth Two (GMT-2) development project.

Minimization Recommendations:

- Through the RMS, BLM should articulate existing minimization efforts within the Reserve.
- To ensure conservation and protection of subsistence and ecological resources, BLM should complete formal management prescriptions for the Teshekpuk Lake and Colville River Special Areas, and sign an MOU with the U.S. Fish and Wildlife Service and the U.S. Geological Survey.
- The RMS should ensure that future NEPA analyses address landscape level effects, i.e., cumulative impacts, areal extent, and connected landscape elements.
- BLM should utilize a full Environmental Impact Statement process for all projects affecting the NPR-A, including state offshore drilling projects with onshore components, so that road and pipeline projects receive a full review of alternative designs and operating standards, along with public input.
- Connected landscape elements must be protected in their entirety, which may require development avoidance or minimization/modification to prevent adverse impacts, such as no surface occupancy restrictions on leases.

Compensatory Mitigation Recommendations:

- BLM should identify and protect pools of federal land within the NPR-A where future compensatory mitigation actions can take place. These lands would have detailed conservation management plans, also potentially paid for through compensatory funds, to ensure their viability as effective offsets for the impacts of development-related activities.
- To address the large, interconnected nature of the resources and values in the NPR-A, the nature of the mitigation tools available, and the need for compensatory mitigation areas to be manageable in the context of ecosystem and resource functionality, the compensatory mitigation for a given development must encompass an area of several factors of magnitude greater than the area of direct, indirect and cumulative impacts from development.
- To offset the unavoidable impacts to subsistence from GMT-1, BLM needs to durably protect the systems and places that make subsistence possible.

12) Monitoring and Adaptive Management

- **Baseline Conditions**

The inclusion of accurate and meaningful baseline conditions is an important part of a successful RMS. However, the utility and value of baseline conditions are largely based on long-term trends and the inclusion of the most recent data. A considerable amount of the information included within the technical companion is old. The most recent caribou harvest data, for example, is from 2006 (p. B-7). We encourage BLM to include the most recent data in the baseline conditions section of the technical companion.

- **Monitoring studies**

There are a number of monitoring programs listed as possible mitigation measures in the draft RMS (p. 24) and in Appendix G. It is not clear how those monitoring programs fit with the compensatory mitigation criteria filter BLM discusses within the documents. While monitoring studies are actions we support, it is unclear how they are compensatory in nature or will be effective absent of a clear adaptive management plan that will take them beyond just monitoring. In the final RMS and technical companion, we encourage BLM to discuss how required monitoring studies, funded by the project applicant, will: contribute to the overall administration of the landscape, and exist outside of the specific framework to directly offset the impacts of a development project.

- **Data and information access**

The transparency of scientific data and information associated with the stewardship of the NPR-A is problematic and hinders effective monitoring and adaptive management. Currently, it is extremely challenging to get access to data and information pertaining to the resources and values of the region. BLM should describe mechanisms within the final RMS and technical companion that improve the administration of information and data on public resources

occurring on these public lands. This information is typically part of a public processes yet it is often not available for review or use.

We propose that BLM reorganize how required studies are managed. Under this framework, a project applicant would still fund necessary studies but BLM would become the primary contractee. Such reorganization will ensure greater transparency on the region's resources, increase stakeholder understanding of the region's ecological and social systems, and improve the utilization of existing data.

- **Riverside East Solar Energy Zone Long-Term Monitoring Effort**

We encourage BLM to follow the example of the Riverside East Solar Energy Zone Long-Term Monitoring and Adaptive Management Program.[54] This framework offers a constructive starting point for a meaningful monitoring and adaptive program for the NPR-A. Hallmarks of this monitoring strategy that should be captured for the NPR-A context include:

- Identifying management questions and monitoring objectives related to potential landscape-scale impacts from development as well as specific monitoring indicators for measuring success in meeting those objectives;
- Identifying existing data relevant to management questions as well as key data gaps;
- Public outreach and stakeholder involvement.[55]

13) BLM should work across political borders with the Army Corps of Engineers

As we presented in our earlier comments on the Strategy's geographic scope, we continue to encourage BLM to work across political boundaries and management jurisdictions to ensure that mitigation is successful in effectively offsetting the impacts of oil and gas-related activities on social and ecological systems within the region. Conservation and subsistence values exist across borders and greater effort should be made within and between governments to ensure the management of these resources, values, and rights.

Language within the draft materials, for example, discusses how the area impacted by GMT-1 includes BLM-administered land, Native patents, Native-selected land, and state land. We agree that impacts can transcend borders and we encourage BLM to explore creative solutions for how impacts that originate on and off BLM land can best be avoided, minimized, and offset. While all of the solutions and mechanisms to achieve these objectives may not be known by the time the RMS is completed, we urge BLM to lay the groundwork for effective cross-jurisdictional management within the RMS. Here a solid, aspirational foundation can help facilitate constructive actions in the future.

While we understand that BLM does not have authority on lands outside of its jurisdiction, the Army Corps of Engineers, another federal entity, does have wetlands authority across the

[54] See: https://www.blm.gov/style/medialib/blm/ca/pdf/pa/energy/solar.Par.91859.File.dat/Riverside%20East%20SEZ%20LTMS%20Workshop%20DAY%201%20PRESENTATIONS.pdf.
[55] See: http://blmsolar.anl.gov/sez/ca/riverside-east/monitoring/.

landscape. Wetlands authority presents a unique and promising opportunity to achieve true regional mitigation strategy success.

The Nanushuk Project, a proposed oil development complex approximately 7.5 miles northeast of Nuiqsut, offers a timely potential opening to couple BLM's regional mitigation strategy with the Army Corps of Engineers (ACOE) wetland program. The Nanushuk project is on State of Alaska lands and the ACOE is currently working to complete an environmental impact statement (EIS) under the National Environmental Policy Act process. Like with GMT-1, with its close proximity to Nuiqsut, this project will further reduce the community's traditional subsistence use area and have similar effects on socio-cultural values, environmental justice, and ecological systems. This project, with an estimated 288 acres of wetland fill, will also require significant compensatory mitigation. We propose that BLM work closely with the ACOE to develop solutions for directing compensatory mitigation funds generated from this development and others on North Slope state lands toward the preservation of high value wetlands habitat important for subsistence uses and resources within the NPR-A. Under such an arrangement, effective wetlands offsets would be achieved while also ensuring that Nuiqsut's subsistence use areas and resources are protected. This plan would maximize mitigation's impacts within the region and meet the goals of both BLM's and the ACOE's mitigation efforts. A formal MOA/MOU between BLM and the ACOE could help accomplish this objective.

While we support the use of compensatory wetland mitigation funds generated from actions on State of Alaska or private lands being used on federal public lands, we strongly believe that mitigation actions for impacts to federal public lands in the NPR-A should occur on federal public lands within the NPR-A. Compensatory mitigation funds derived from impacts on federal lands should be directed to actions that ensure the viability of the Reserve's globally significant natural resources and continued access to abundant subsistence resources.

14) Additional comments on the draft RMS and draft technical companion documents

- **Greater Mooses Tooth One (GMT-1)**

Since the GMT-1 ROD was issued, there has been substantial confusion about the relationship between the RMS and the $7 million compensatory mitigation fund. BLM has repeatedly given mixed messages about how decision-making will occur related to this money, and how it will be spent. As we have stated before, we believe this money should stay in the impacted region to compensate and mitigate the people and resources most effected by the development of GMT-1. We are generally supportive of what the community of Nuiqsut, and particularly Native Village of Nuiqsut, sees as best helping to address and compensate for the impacts to subsistence and other resources from the GMT-1 project. However, BLM should still review and select appropriate mitigation measures for GMT-1 using the framework of the RMS to ensure that such actions are both durable and meaningful. Additionally, the RMS framework should inform GMT-1 compensatory mitigation actions.

We are extremely concerned that the RMS will not be used as part of a process to effectively mitigate the impacts specifically caused by the GMT-1 development project. BLM should use the finalized RMS as a guide to inform how the GMT-1 compensatory mitigation funds will be spent. The entire purpose of the RMS is to ensure that meaningful mitigation measures are identified and effectively implemented. Selection of compensatory mitigation measures outside of this framework would set a poor precedent for future mitigation decisions in the RMS region. In addition, because BLM already made the GMT-1 permit decision, it should clarify in the RMS how it plans to move forward with selecting mitigation actions to compensate for the impacts from GMT-1.

The ROD specifically states: "The permittee will provide $8 million to establish a compensatory mitigation fund that will facilitate the development and implementation of a regional mitigation strategy (RMS) and finance mitigation projects identified through the RMS process to offset unavoidable impacts of the project as described in Appendix A- Compensatory Mitigation and Appendix D – Compensatory Mitigation Determination."[56] Such a statement clearly infers that the completed RMS will inform how the $7 million of compensatory mitigation will be put into action. Clarifying this somewhere in the RMS will be important to establish the right precedent for mitigation actions regarding future NPR-A development.

- **NPR-A Impact Fund**

While complementary to the RMS, the NPR-A Impact Fund was established through federal legislation and is an entirely separate program. As such, we encourage BLM to elaborate within the final documents on how the NPR-A's regional mitigation strategy and its associated policies are different from the Impact Fund's administration. This effort would not only help clarify confusion about the RMS and the Impact Fund, but would also better focus the goals of BLM's landscape-level mitigation efforts.

It is important to note that the Impact Fund does not absolve BLM from effectively carrying out its statutory requirement to administer the NPR-A for the protection of important conservation and subsistence (surface) values. As such, BLM cannot rely on this State of Alaska-run process to carry out the goals and objectives of regional mitigation.

- **Management of Compensatory Mitigation Funds**

Compensatory mitigation funds must be managed and administered in a constructive and meaningful way to ensure their effectiveness and that their impacts are maximized. We recommend and support the use of a competent, independent third-party, overseen by BLM, to administer these funds. This entity also should have low overhead expenses to ensure that compensatory resources are constructively utilized to offset impacts from development-related activities.

- **Errata**

[56] Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project, Record of Decision, February 2015, Page 7.

BLM should address these errors in the final RMS documents:

- Draft RMS: Step 2 in the flowchart (visible on p. 9, 12, 25 and 27) is "Apply the compensatory mitigation amount" but Step 2 in the narrative on p. 12 is "Apply a compensatory mitigation method". BLM should make these consistent, using "Apply a compensatory mitigation method" in the flowcharts.
- Draft RMS: The word "out" should be added to page 13. Here, the sentence should read: "The Final EIS will include the selected compensatory mitigation actions to be carried [out] in conjunction with the Preferred Alternative."
- Terminology for methods is inconsistent. "Action-Based Method" is described on pages 12 and 13, but the flowchart on p. 14 is titled "PROJECT BASED METHOD" and actually includes both the Action-Based Method and the Fee-Based Method. BLM should adjust for clarity – one way would be to title the flowchart "MITIGATION METHODS". The ROD step should read "Contains approved compensatory project or fee" instead of "Approval of Application(s)." Finally, the last step should read "Notice to Proceed for Development."
- P. G-1 in the draft technical companion: This section is titled "BLM RANKING OF CANDIDATE MITIGATION SITES." As mentioned above, these are not mitigation sites, rather they are actions. Mitigation sites should be included in the final documents and the section should be titled accordingly.

15) Conclusion

An effective regional mitigation strategy is crucial to the successful administration of the NPR-A. Managing complex and fragile ecological systems, culturally important subsistence resources, and Arctic oil development in a warming world presents an extremely challenging set of circumstances. Meaningfully implementing the mitigation hierarchy, particularly robust compensatory mitigation actions, will be needed if all values are to be ensured. We look forward to working with BLM and other stakeholders to put the RMS into action. Thank you for considering these comments and please let us know if you have any questions.

Sincerely,

Nicole Whittington-Evans
Alaska Regional Director
The Wilderness Society

On behalf of:

Leah Donahey
Senior Campaign Director
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Appendix A:

Prioritization Assessment

Figure A.1. Conservation priority for the North Slope of Alaska

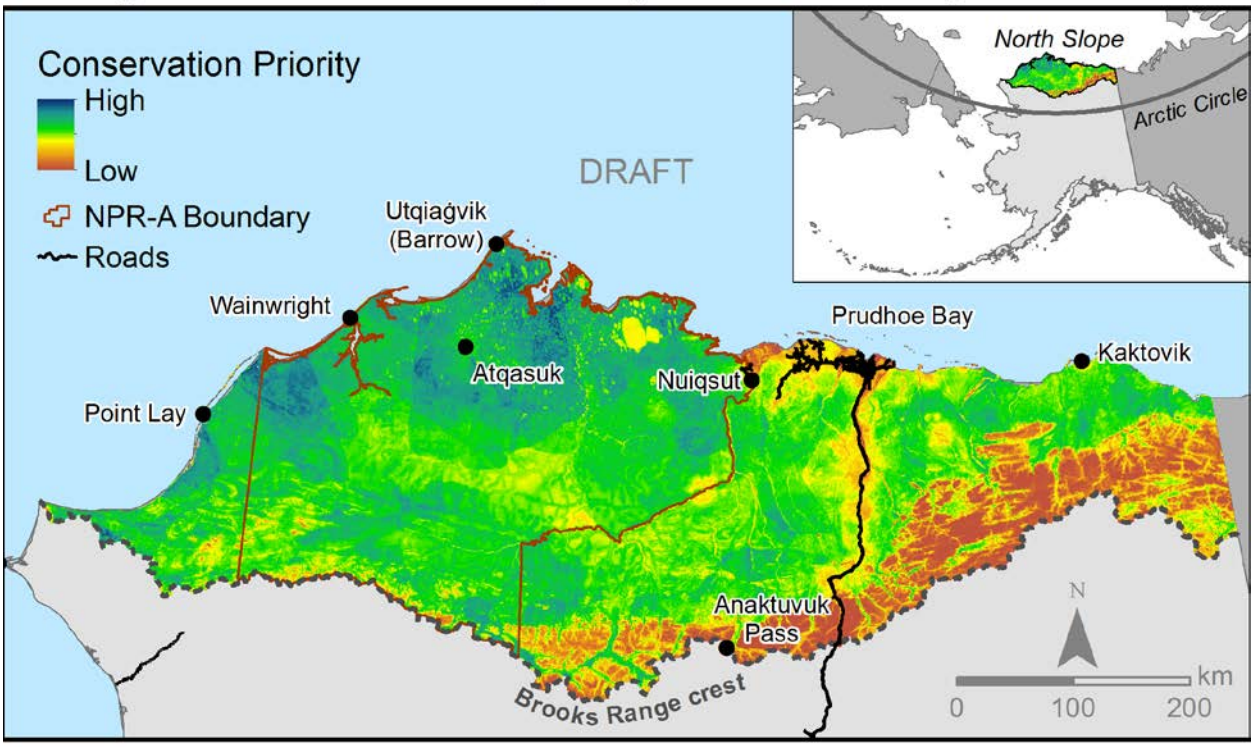


Figure A.2. Conservation priority for the northeastern NPR-A RMS

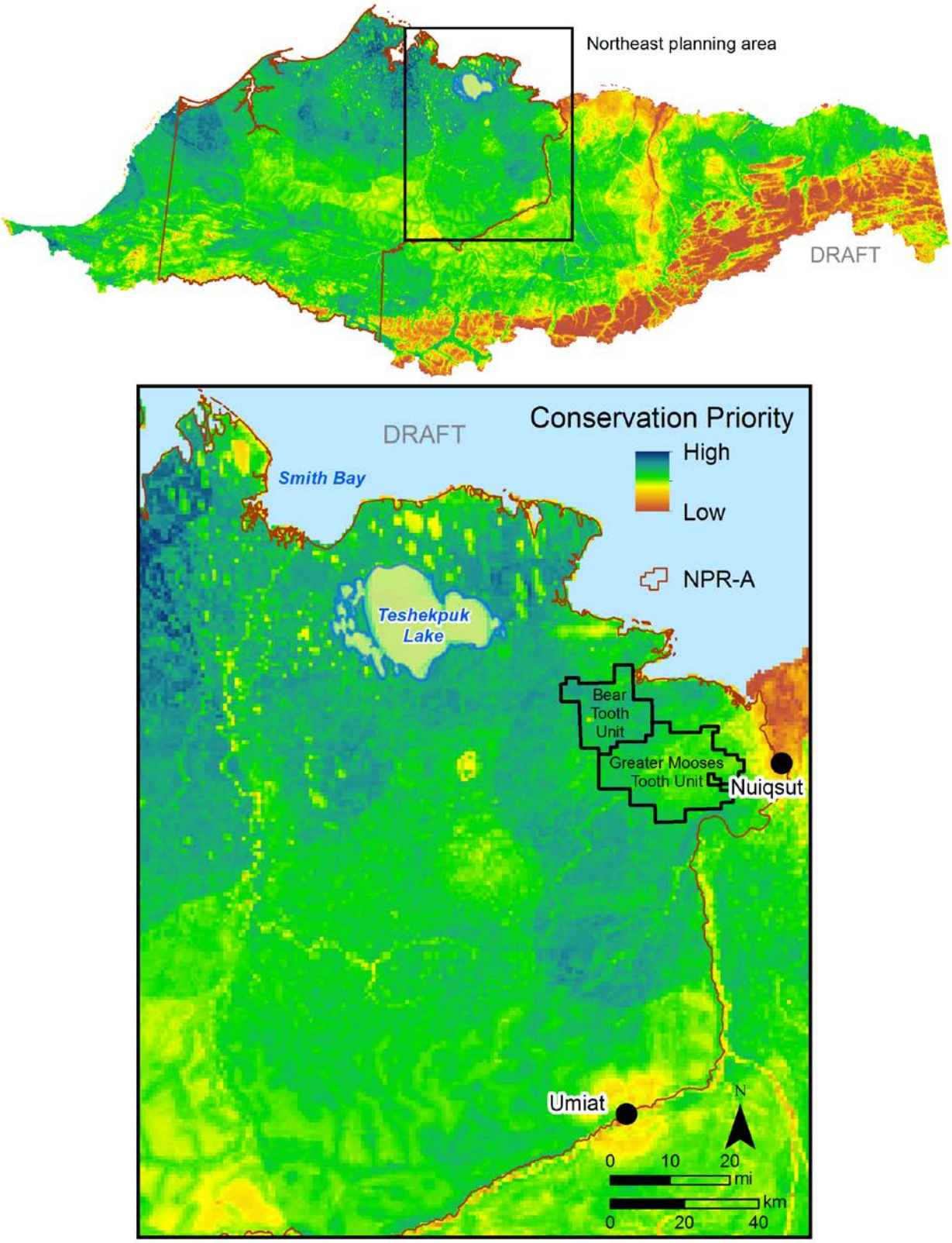


Figure A.3. Conservation values for the North Slope of Alaska

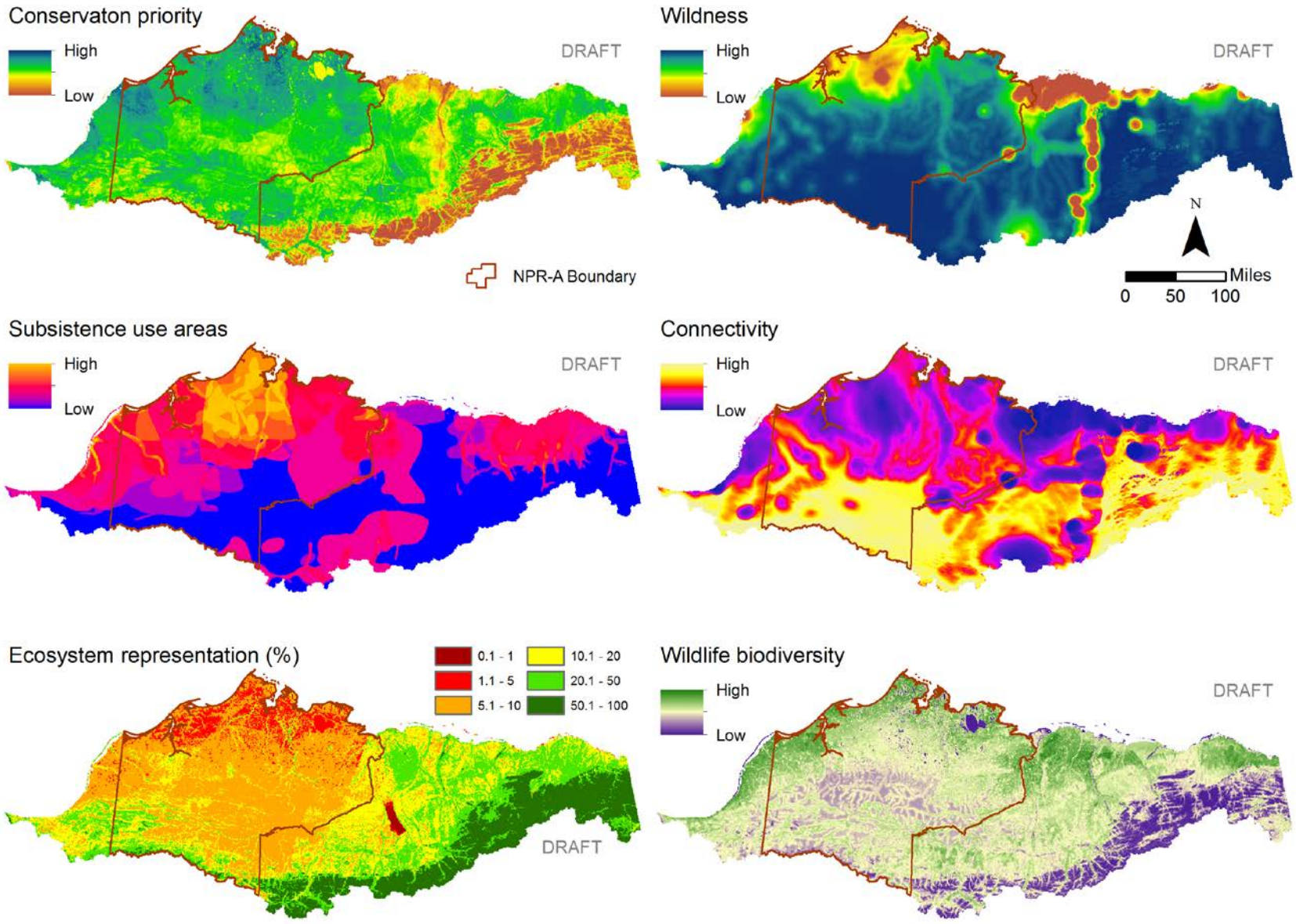


Figure A.4. Conservation values for the northeastern NPR-A

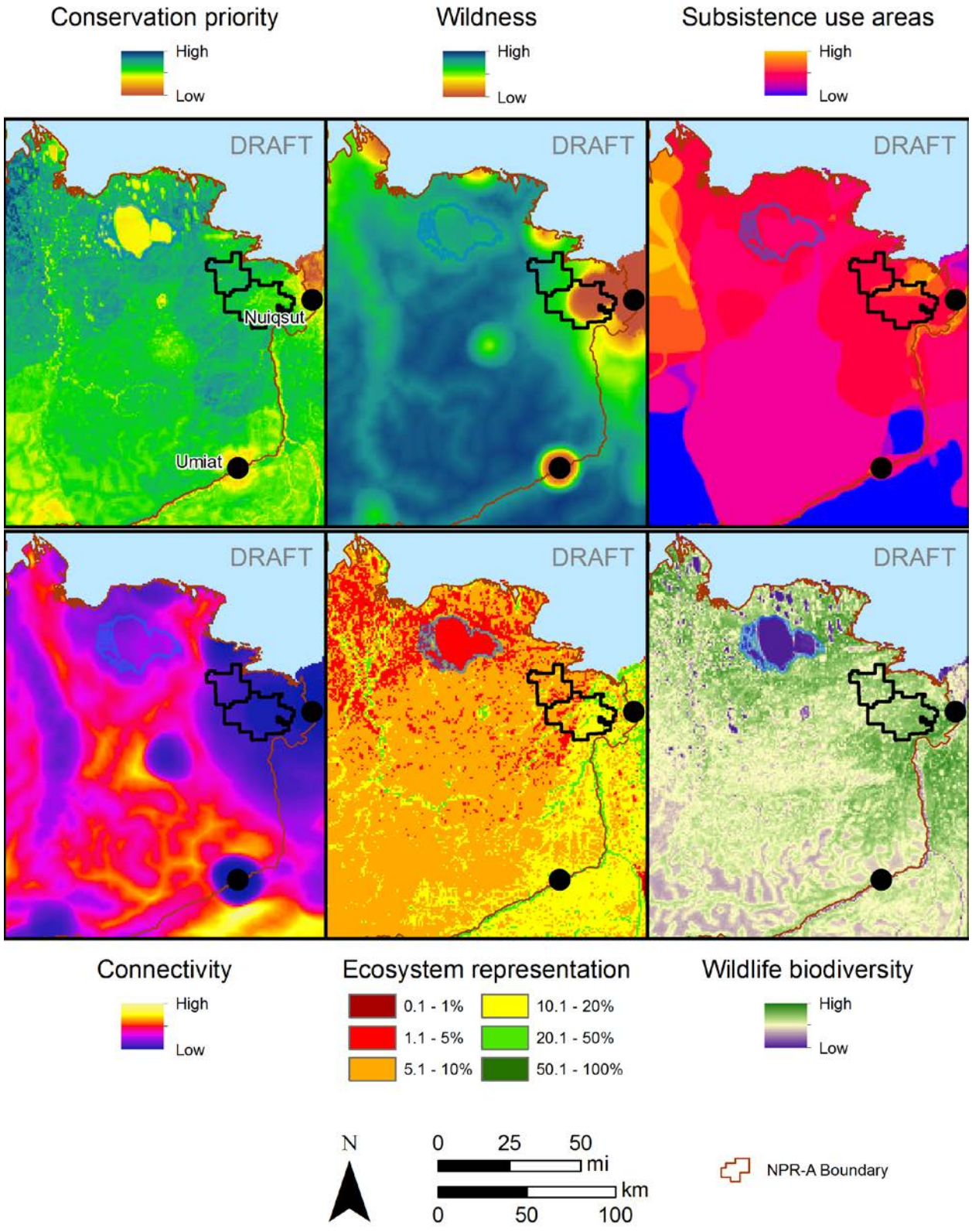
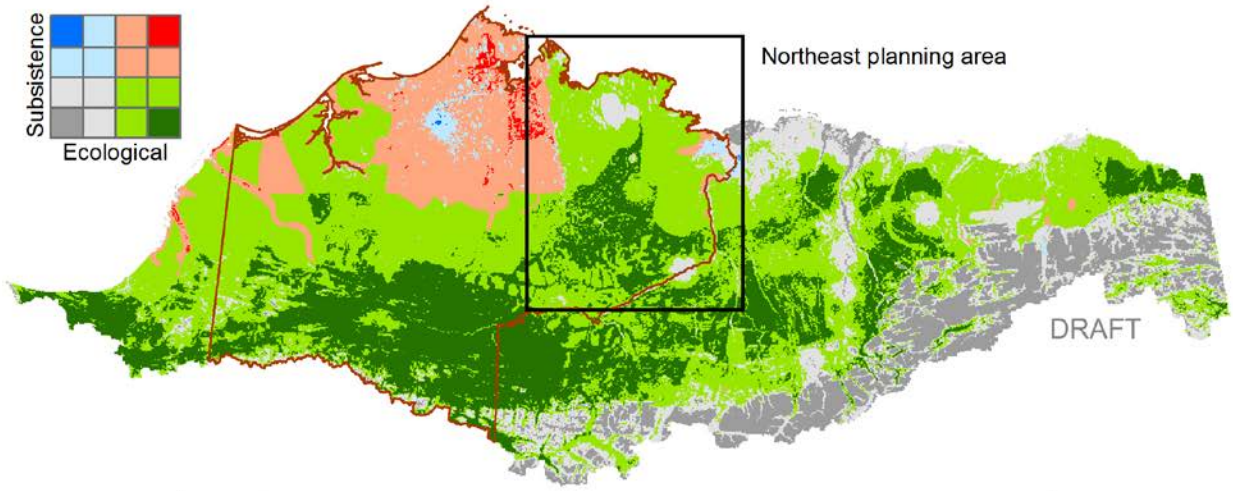
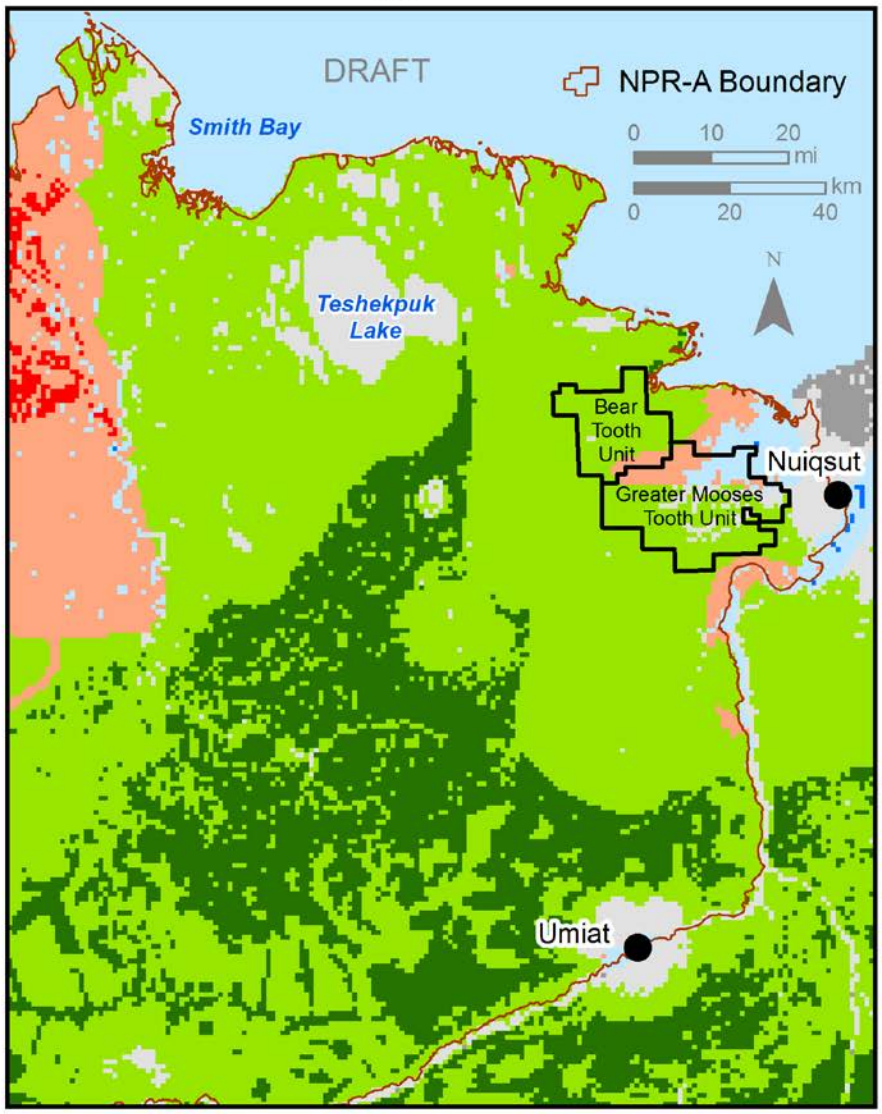


Figure A.5. Comparison of subsistence and ecological values





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