Bud C. Cribley, State Director
Bureau of Land Management
Alaska State Office
222 West Seventh Avenue, #13
Anchorage, Alaska 99513

5 January 2016

Re: Mitigation actions (by goal) regarding conservation and human health

Dear Mr. Cribley,

Thank you for your continued efforts to offset the impacts of the Greater Mooses Tooth One development project and to create an effective Regional Mitigation Strategy (RMS or Strategy) for the National Petroleum Reserve – Alaska (NPR-A or Reserve). As The Wilderness Society and our partners have communicated before, this is an important effort to effectively balance conservation and development so that globally significant Special Areas and unique conservation and subsistence values are protected.

In this letter we discuss BLM's document "Mitigation Actions (by goal) – Nominations to Date". While BLM's document captures how the conservation of areas with special values (including Special Areas) helps to ensure access to subsistence use areas, the table fails to recognize that the conservation of Special Areas and values also positively contributes to human health.

This correspondence specifically focuses on how durable conservation actions can have positive and protective benefits for human health. Below we offer a basic overview of some of the primary connections between conservation and rural residents' health. With this information, which is supported by a substantial body of literature, we encourage BLM to think more holistically about the necessity and benefits of protecting subsistence and conservation values for the public's health and wellness. Additionally, attached to this letter, as Appendix A, is a question and answer document on ecosystems, subsistence, and human health that we hope you find helpful.

Conservation Actions and Human Health

To fully understand the relationship between human health and the ecosystems that support subsistence resources and practices, it is first necessary to understand what "health" formally

entails. The World Health Organization's (WHO) defines health as the "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[1] This comprehensive understanding of "health" is particularly true and necessary within the context of intact ecosystems and their importance to subsistence-based communities in the remote Arctic.

While ecosystems are a foundational determinant of the public's health and wellness everywhere, in subsistence-based communities in Alaska this factor is particularly important. Research published by Loring and Gerlach (2008) has shown how many determinants of health in Alaska are directly related to the ecosystem in which people live.[2] Here, the ecosystem is connected to, among many other factors, social and cultural institutions, communities, social relationships, and diet and lifestyle. The harvest, preparation, sharing, and consumption of subsistence resources directly relates to many of these drivers and mediators of health outcomes.

The health benefits derived from subsistence resources and practices are contingent upon intact and functioning ecosystems. Many subsistence resources in Arctic Alaska require a landscape to complete their life cycles, be self-sustaining, and abundant enough to allow for significant harvest levels. The Western Arctic and Teshekpuk Lake caribou herds, for example, occupy and utilize a major area of the North Slope in order to calve, find insect relief areas, migrate, forage, and overwinter. Similarly, aquatic systems, that permeate the entire region, support a variety of highly migratory fish species that are important subsistence resources. These fish require features throughout the watersheds to overwinter, feed, and breed. Without an intact ecosystem, the health benefits of subsistence resources and practices would not be possible.

Subsistence resources and practices provide a number of important health benefits for residents of the North Slope. Some of these benefits, which I will discuss in greater detail below, include food security, social networks, mental health, and physical fitness.

Food Security

Food security is a multifaceted condition that takes a breadth of social, economic, and nutritional components into account. The WHO defines food security as having three distinct pillars: food availability, food access, and food use.[3] Within this framework, food availability can be understood as having sufficient quantities of food available on a consistent basis.[4] Food access is the condition of having sufficient resources to obtain appropriate foods for a nutritious diet.[5] And food use is defined as appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.[6]

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[1] See: Callahan, D. (1973) The WHO Definition of Health. *The Hastings Center Studies*, 1(3): 77-87.
[2] See: Loring, P.A. and Gerlach, S.C. (2009). Food, culture, and human health in Alaska: an integrative health
[2] See: Loring, P.A. and Gerlach, S.C. (2009). Food, culture, and human health in Alaska: an integrative health approach to food security. *Environmental Science and Policy*, 12: 466-478.
[3] See: World Health Organization. (2014). Trade, Foreign Policy, Diplomacy, and Health: Food Security. Available at: http://www.who.int/trade/glossary/story028/en/.
[4] Ibid.
[5] Ibid.
[6] Ibid.

The harvest of wild resources provides an important source of healthy and nutritious food for remote residents. Surveys conducted by the Alaska Department of Fish and Game have documented that hundreds of pounds of wild resources, including fish, game, and berries, are harvested per person per year in remote communities.[7] Moreover, according to the 2014 Final Supplemental Environmental Impact Statement (FSEIS) for the Greater Mooses Tooth One development project, the consumption of subsistence resources is very high in Nuiqsut. According to the FSEIS, greater than 90 percent of Nuiqsut households reported using caribou, broad whitefish, and Arctic cisco.[8] However, despite such high levels of harvest, food security in Nuiqsut is a still a real problem.

According to the Alaska Native Tribal Health Consortium's 2013 report "Climate Change in Nuiqsut, Alaska: Strategies for Community Health," 38% of households are not able to get enough healthy food to meet their needs, 53% of households are unable to get enough subsistence foods, and 25% of households reported that at times they do not have enough food to eat.[9] With considerable development already in the region, additional industrialization may contribute to even greater food insecurity. The conservation of designated Special Areas and other important lands and waters for subsistence resources and practices would protect some of the systems and places that provide valuable dietary benefits.

Social Networks

Social networks contribute significantly to human health. In their review article "Social Networks and Health," Smith and Christakis (2008) explain the numerous health benefits of social networks. These authors specifically write: "Social networks affect health through a variety of mechanisms, including: (a) the provision of social support, (b) social influence, (c) social engagement, (d) person-to-person contacts, and (e) access to resources."[10] These authors conclude their paper by making the point that people's health is "interdependent and that health...can transcend the individual in ways that patients, doctors, policy makers, and researchers should care about."[11] Such an observation is directly relevant to the connection between wild resources conservation and residents' health in remote Alaska.

Harvesting, preparing, sharing, and consuming subsistence resources facilitate important social networks and community structures that benefit rural residents' health. Subsistence resources and practices are mechanisms that bring people together. Here, subsistence drives social interactions that provide a variety of health benefits, like helping to care for elders and mitigating mental health challenges. Within small rural communities, subsistence practices and resources facilitate close and frequent connections between neighbors, friends, and families. People will often share gear, process fish and game together, and share their harvests. Recent efforts by the

[7] See: Wolfe, R.J. (2004). Local Traditions and Subsistence: A Synopsis from Twenty-Five Years of Research by the State of Alaska. Technical Paper No. 284 Alaska Department of Fish and Game, Division of Subsistence, Juneau, Alaska, July 2004. 1-89.
[8] See: Final Supplemental Environmental Impact Statement (FSEIS) for the Greater Mooses Tooth One development project, 2014.
[9] Report available at: http://www.north-slope.org/assets/images/uploads/ClimateChangeIn-Nuiqsut-Alaska-Strategies-for-Community-Health-2.pdf.
[10] See: Smith, K.P. and Christakis, N.A. (2003). Social Networks and Health. *The Annual Review of Sociology*, 34: 405-429.
[11] Ibid.

Alaska Department of Fish and Game have involved mapping the social networks around subsistence resources within particular communities. Results on salmon[12] and work presented at the December 2015 Western Arctic Caribou Herd Working Group meeting have shown that truly extensive networks surround subsistence resources.

BLM should acknowledge this important element of subsistence resources and practices and its benefits to human health. With this information, BLM should take effective actions to durably protect the natural systems that facilitate these beneficial social connections.

Mental Health

The act of procuring and providing traditional subsistence resources has positive psychological health benefits at the individual and community level. As discussed above, social networks enabled by subsistence resources and practices help achieve mental health benefits by facilitating positive relationships, ensuring regular contact with other people, and by establishing important social roles and a sense of self-worth among those involved in subsistence activities and the sharing of wild foods. Additionally, research has shown that a traditional diet based on wild foods can also have positive mental health benefits.

A review article by McGrath-Hanna et al. (2004) titled "Diet and Mental Health in the Arctic: Is Diet an Important Risk Factor for Mental Health in Circumpolar Peoples?" examined how changes away from traditional diets may be partially responsible for mental health challenges.[13] Upon examining the known literature, the authors conclude by writing: "We hypothesize that diet is an important risk factor for mental health in circumpolar peoples. As we have reviewed here, the diet of circumpolar people has changed considerably from a traditional diet high in omega-3 fatty acids and antioxidants, to a Western-style diet high in carbohydrates and saturated fat."[14] The authors go on to say that reduced consumption of nutrients like omega-3 fatty acids may increase depression and associated public health problems.[15]

This research further speaks to the connections between the harvest and consumption of wild resources and its importance to mental health. When considering the importance of conservation actions to mitigate the impacts of development in the NPR-A, BLM should thoughtfully consider the importance of natural areas to mental health.

Physical Activity

Finally, it is important to briefly note that subsistence activities have positive physical health benefits. Engaging in subsistence practices is hard work and physically demanding. Significant walking, bending, lifting, and carrying are all part of participating in subsistence practices. It is also noteworthy to consider that a subsistence way of life occurs throughout the year as remote residents are regularly harvesting a variety of different resources depending on the season and

[12] See: Fall, J.A. (2009). Alaska Department of Fish and Game, Division of Subsistence: An Updated Overview of is Research and Findings. PDF of a poster presentation accessed at: http://seagrant.uaf.edu/conferences/2011/wakefield-people/presentations/fall-division-subsistence.pdf.
[13] See: McGrath-Hanna, N.K. et al. (2003). Diet and Mental Health in the Arctic: Is Diet an Important Risk Factor for Mental Health in Circumpolar Peoples? – Review. *International Journal of Circumpolar Health*, 63(3): 228-241.
[14] Ibid.
[15] Ibid.

particular resource availability. Thus, the fitness requirements and benefits of a subsistence-based lifestyle must be considered when seeking to comprehensively understand the connection between human health and people's connections to wild resources.

Conclusion

The United States Arctic Research Commission (USARC) identified five priority research goals for 2013-2014, and one of these goals was to improve human health. Substance abuse, obesity, diabetes, cancer, and suicide are all found to be increasing in rural Alaskan communities, and infant mortality, fetal alcohol syndrome, and accidental injury are serious ongoing health challenges.[16] Despite the severity of these health problems, limited attention is being paid to the beneficial connections that exist between human health and wellness, and the natural environment in which Arctic residents reside.

As we have briefly discussed above, subsistence resources in the Arctic are contingent upon an intact and functioning ecosystem. These resources and associated subsistence practices positively contribute to food security and benefit social networks, mental health, and physical fitness. Conservation actions that protect subsistence resources, subsistence use areas, and subsistence practices ensure that these and many other determinants of health are maintained. Moving forward with offsetting the impacts of the Greater Mooses Tooth One development project and completing an effective Regional Mitigation Strategy, we encourage BLM to think comprehensively about the health benefits that durable conservation actions will have for the residents of the North Slope.

Thank you again for your continued efforts and hard work on mitigation. Please do not hesitate to contact us if you have any questions.

Sincerely,

David R. Krause, MPH, MEM
Arctic Lands Conservation Specialist

Nicole Whittington-Evans, MS
Alaska Regional Director

[16] See: United States Arctic Research Commission. (2013). Report on Goals and Objectives for Arctic Research 2013-2014 for the U.S. *Arctic Research Program Plan*, 1-15.

Appendix A:
Questions and Answers on Ecosystems, Subsistence, and Human Health

Questions and Answers on Ecosystems, Subsistence, and Human Health

Q: What is a basic definition of subsistence?

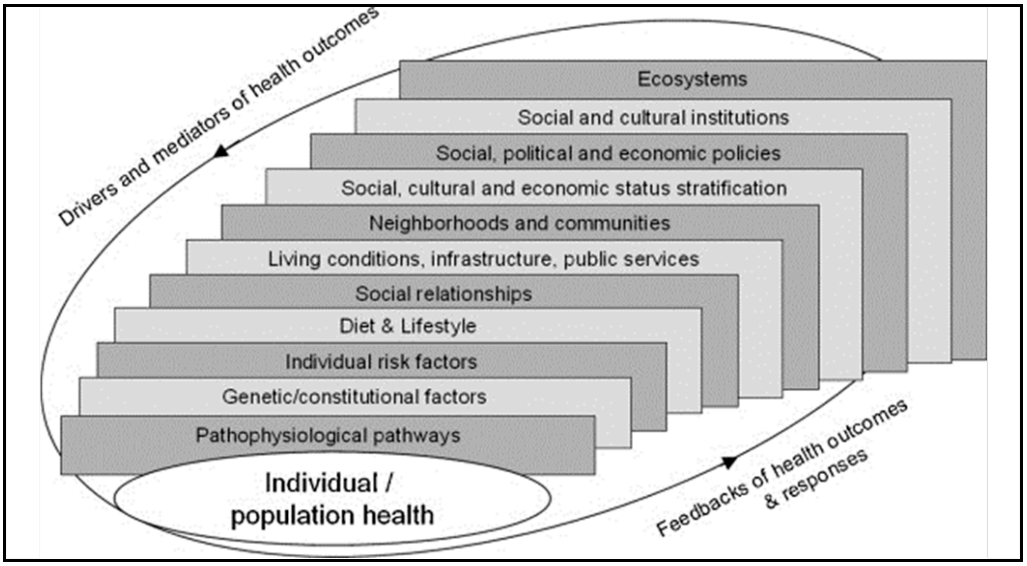
A: Fundamentally, subsistence can be understood as a way of life that involves the harvest, preparation, sharing, and consumption of wild resources for food and other cultural purposes. The Alaska National Interest Land Conservation Act (ANILCA), a law that protects subsistence resources and practices, formally defines subsistence as "the customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for customary trade." Subsistence activities are deeply social and grounded in the natural environment.

Q: Why are intact, whole ecosystems important to subsistence?

A: Many subsistence resources in Arctic Alaska require a landscape to complete their life cycles, be self-sustaining, and abundant enough to allow for significant harvest levels. The Western Arctic and Teshekpuk Lake caribou herds, for example, occupy and utilize a major area of the North Slope in order to calve, find insect relief, migrate, forage, and overwinter. Similarly, aquatic systems, that permeate the entire region, support a variety of highly migratory fish species that are important subsistence resources. These fish require features throughout the watersheds to overwinter, feed, and breed. Without an intact ecosystem, subsistence practices would not be possible.

Q: How are ecosystems, subsistence, and human health related?

A: While ecosystems are a foundational determinant of the public's health and wellness everywhere, in remote Alaska this factor is particularly important. The image below is of an integrated health model from Loring and Gerlach (2008) that illustrates how determinants of health relate to the ecosystem. The harvest, preparation, sharing, and consumption of subsistence resources also directly relates to many drivers and mediators of health outcomes. In addition to the ecosystem, subsistence is connected to social and cultural institutions, communities, social relationships, and diet and lifestyle.



Q: What are some of the health benefits of subsistence resources and practices for remote residents?

A: Subsistence resources and practices provide a number of important health benefits for residents of the North Slope. These benefits include:

- Food Security: The harvest of wild resources provides an important source of healthy and nutritious food for remote residents.

- Mental Health: The act of procuring and providing traditional subsistence resources has positive psychological health benefits at the individual and community-wide level.

- Social Networks: Harvesting, preparing, sharing, and consuming subsistence resources facilitate important social networks and community structure that benefit rural resident's health. Subsistence resources are a mechanism that brings people together.

- Physical Activity: Engaging in subsistence practices is hard work and physically demanding throughout the year. Significant walking, bending, lifting, and carrying are all part of participating in subsistence practices.

Q: Is food security a serious issue in Nuiqsut?

A: Yes. Food security in Nuiqsut is a real problem. According to the Alaska Native Tribal Health Consortium's 2013 report "Climate Change in Nuiqsut, Alaska: Strategies for Community Health," 38% of households are not able to get enough healthy food to meet their needs, 53% of households are unable to get enough subsistence foods, and 25% of households reported that at times they do not have enough food to eat. With considerable development already in the region, additional industrialization may make subsistence food resources and these statistics even more troubling.

Q: What does "access" to subsistence resources mean and why is it important?

A: There are generally two types of "access." *Physical access* is the overall distance that a subsistence resource harvester must travel to obtain wild resources. Typically physical access is obtained through walking, boating, or driving/riding a snow machine or ATV. *Economic access* is the cost of accessing subsistence resources. An individual or groups' economic access often informs their physical access. Here, the greater the distance that an individual or group must travel, the more costly it is in terms of time and resources. Higher costs can impact who is able to participate in subsistence practices and secure subsistence resources. Development around Nuiqsut is impacting peoples' access to subsistence resources.

Q: How high is community participation in harvesting and consuming subsistence resources?

A: The 2014 Final Supplemental Environmental Impact Statement (FSEIS) for the Greater Mooses Tooth One development project found that the consumption of subsistence resources is very high. According to the FSEIS, greater than 90 percent of Nuiqsut households reported using caribou, broad whitefish, and Arctic cisco. Harvest amounts are also noteworthy. The Alaska Department of Fish and Game and the North Slope Borough regularly document that hundreds of pounds of wild food are harvested per person per year.