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<p>surface disturbance, and regulatory drilling Conductance test Regulate and spring fish migration near the springs and the hormones</p>	<p>water travel on or near the conductance test spring springs and the hormones could impact natural feeding events and have negative impacts on downstream fish Regulate and spring fish migration near the springs and the hormones</p>		<p>Protect unique populations and habitat associated with springs.</p>	<p>No winter travel coverage 1,000 ft up or downstream from the hormones, and downstream fish habitat. No winter water withdraw from springs. No winter travel, surface disturbance, or regulatory drilling within 5 miles of springs and aulis associated with the following: Lathropville Spring Creek and Fish Lake 1 Spring on the Middle River. No winter travel surface disturbance, or regulatory drilling within 5 miles of springs and aulis associated with the following springs: Balspar Creek and Canyon, Thompson and Thompson West Fish Lake. No winter travel, surface disturbance, or regulatory drilling within 2 miles of springs and aulis associated with the following rivers: Chipmunk, Noddy and Kendall.</p>	<p>Special protection for springs and associated water travel habitat and aulis is necessary because these areas are rare and can provide particularly important habitat for overwintering fish, vegetation, invertebrates, birds, and terrestrial mammals (see papers by Hargis et al., Childers, etc.)</p>
<p>bridges and culverts - rivers, streams, and wetlands</p>	<p>bridges and culverts can cause adverse impacts to surface water flows, stream flows, fish passage, natural recharge of aquifers and floodplains.</p>	<p>1.4</p>	<p>Reduce the potential for nitrogen loading, impacts to wetlands and floodplains, erosion, alteration of natural drainage patterns, and reduction of fish passage.</p>	<p>Stream and reach crossings shall be designed and constructed to ensure free passage of fish, reduce erosion, maintain natural drainage, and minimize adverse effects to natural stream flow. Some bridges, culvert (and culverts), are the preferred method for crossing rivers. When necessary, culverts can be constructed on smaller streams. If they are large enough to avoid restricting fish passage or severely affecting natural stream flow. The point of entry on river flow and point of exit on stream flow, natural patterns to take connectivity, and about flow shall be collected prior to placing bridges and culverts. These data will be stored in a centralized database available to the general public.</p>	

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21	<p>2.4 – Reduce the potential for oil spill burning, impacts to seabirds and Benthopods, impacts, alteration of natural drainage patterns, and restriction of fish passage</p>	<p>Design and marsh crossings shall be designed and constructed to ensure free passage of fish, reduce erosion, restrict natural drainage, and minimize adverse effects to natural stream flow. Some bridges, other than culverts, are the preferred method for crossing rivers. When necessary, culverts can be constructed to smaller diameters. If they are large enough to avoid restricting fish passage or adversely affecting natural stream flow.</p>		

<p>low and medium intensity activities</p>	<p>low intensity, a small effect on fish</p>	<p>5</p>	<p>Minimize the effects of high intensity, intense, energy from seismic surveys on fish</p>	<p>Monitor and logging are sensitive to small scale Transients may be between 100 and 500 hertz with peak summation between 80-200 Hz and peak source pressure volume summation threshold is 0.120 dB (see Data And Impact Finding for North Slope 03 development 2012, page 8-16). Logs are more sensitive than fish. Also see studies by McCalum 1980 and 800 hertz (page 7)</p>
<p>Final Resource Management for fish</p>			<p>Protect closed resources in rivers deemed as suitable for designation as Wild Rivers based on their outstanding resource value</p>	<p>Manage suitable Wild Rivers and rivers and streams with high recreational value in Wild Class 1.</p>
<p>Designing/Mapping permanent facilities</p>	<p>Development coupled with the lack of ecological data in the Refuge could result in unnecessary loss of sensitive and/or important habitats</p>	<p>12</p>	<p>Use ecological mapping to avoid or minimize wildlife habitat before development of permanent facilities to conserve important habitat types during development</p>	<p>An ecological land classification map of the development area shall be developed before approval of facility construction. The map will integrate geomorphology, surface form, vegetation, digital elevation models, and hydrology (WQI) grid at a scale, level of resolution and positional accuracy adequate for detailed analysis of development alternatives and also allow for assessment of ecological values in the proposed area compared to a larger scale as determined by resource specialists. The map shall be prepared in time to plan five years of hydrologic, fish and other wildlife surveys before approval of the exact facility location and facility construction. Paleontological data and ecological forecasting should be taken into account as well.</p>
<p>Development associated with a lack of scientific information</p>	<p>Without 3-5 years of baseline data and design direction estimates for key indicators prior to development it will be impossible to detect and adaptive manage adverse impacts to aquatic ecosystems and to ensure these ecosystems are maintained in natural conditions</p>		<p>Ensure adequate data and analysis for science-informed development planning that permits water resources and allows for adequate effective monitoring and adaptive management.</p>	<p>Before surface disturbing activities and permanent facilities are authorized, the following are required from the permittee: a description of current status and current variability of water quality and quantity based on 3 years of data and observations and inventory database of macroinvertebrates, diatoms, and fish based on 3 years of data of waterbirds in the proposed development area and surrounding watershed that may be impacted, an adaptive downlisting change detection capabilities for monitoring impacts to these resources, a monitoring work plan and/or other approved fishery monitoring plan, an adaptive address impacts to water resources immediately, a restoration plan that includes methods to ensure full restoration of areas that may impact aquatic habitat and associated fish and wildlife within 3 years following completion of the project, and an approved statistically valid long-term monitoring plan for aquatic resources that ensure restoration is effective for at least 10 years following completion of restoration activity. Annual reports of current status and detection of change must be submitted annually. Data must be stored in an accessible centralised database.</p>
<p>Central restoration</p>		<p>15</p>	<p>Ensuring long-term restoration of offland and water to its previous condition, health, sustainability, ecological function, and water quality, and quality</p>	<p>We need to work on this, but definitely need to state that restoration and associated monitoring and long-term monitoring plans must be submitted and approved prior to approval of any regulation and development plans.</p>
<p>Water activities, bridges and cultural, recreational, and development</p>	<p>Any activities that impact water need be prohibited because activities play such an important role in hydrology and ecological processes in the Refuge.</p>		<p>Define unique qualities of water, including water temperatures, contribution to lake water levels, role in hydrology processes such as flooding, insect-related habitat for caribou, and habitat for fish.</p>	<p>Development and exploration that alters water's role in providing habitat and controlling hydrology, and ecology of processes in the Refuge that not be permitted.</p>

2.4. Minimize the effects of high-intensity acoustic energy from seismic surveys on fish.	<p>6. When conducting offshore-based surveys above a critical fish overwintering area (Section 5), first stop or pause, as plus input depth), operators shall follow recommendations by Morris and Morris (2002) only a single set of acoustic data should be collected if possible. If multiple shot locations are required, these should be conducted with minimal delay, multiple days of vibratory activity above the same monitoring area should be avoided if possible.</p> <p>8. When conducting air gun-based surveys in freshwater, operators shall follow standard marine mitigation measures that are equivalent to this (e.g., Marine Management Service 2008). Operators will use the lowest sound levels feasible to accomplish their data collection needs, using no more than 100 air gun array modules the greatest increase in vertical sound levels beginning with firing a single air gun and gradually adding air guns until the desired operating level of the full array is achieved.</p> <p>9. When conducting explosive-based surveys, operators shall follow critical distance from fish-bearing assemblages based on requirements outlined by Alaska Department of Fish and Game (2003).</p>		
6.12. Use ecological mapping as a tool to assess wildlife habitat before development of permanent facilities, to ensure important habitat types during development.	<p>Acronyms of land classification maps of the development area shall be developed before approval of facility construction. The map will integrate geomorphology, surface form, and vegetation at a scale, level of resolution, and level of precision to serve as a baseline for critical analysis of development alternatives. The map shall be prepared in time to plan one season of ground-based wildlife surveys, if deemed necessary by the authorized officer, before approval of the exact facility location and facility construction begins during development.</p>		
6.15. Documenting basic information of wildlife by previous condition and use.	<p>Prior to final abandonment, land used for oil and gas infrastructure—including but not limited to well pads, production facilities, access roads, and pipelines—shall be reseeded to ensure essential restoration of ecosystem function. The leaseholder shall develop and implement an abandonment and reclamation plan approved by the BLM. The plan shall describe short-term stability, visual, hydrological, and productivity objectives and steps to be taken to ensure essential ecosystem restoration to the land's previous hydrological, vegetative, and habitat conditions. The BLM map-guest reclamation to satisfy stated environmental or public purposes.</p>		