



March 13, 2019

Attn: Coastal Plain Oil and Gas Leasing Program EIS  
222 West 7<sup>th</sup> Ave., Stop #13  
Anchorage, Alaska 99513

*Hand-delivered (hard copy and thumb drive with electronic copies of all attachments)*

**Re: Comments on Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement**

Dear Acting Secretary Bernhardt,

On behalf of our more than one million members and supporters, The Wilderness Society (TWS) submits these comments on the Bureau of Land Management's (BLM) Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement (DEIS). Because it is one of the wildest and most ecologically and culturally significant undeveloped landscapes in North America, TWS has worked to protect the Arctic National Wildlife Refuge for over 80 years. This pristine and fragile ecosystem is the crown jewel of our national wildlife refuge system. Its protection is a matter of basic human rights because Gwich'in people have relied on the Refuge for their cultural, spiritual, and physical survival for generations. BLM's DEIS lends short-shrift to the significance of this place and the devastating impacts that oil and gas exploration, leasing, and development would have on the unsurpassed wilderness, wildlife, and subsistence values of the Refuge's Coastal Plain. The DEIS is deficient in numerous respects – as documented in detail in the March 13, 2019 technical comments prepared and submitted by Trustees for Alaska, TWS, and numerous other groups (joint technical comments) – and must be revised and reissued for full public vetting.

Since our founding in 1935, TWS has held close ties to what is now the Arctic National Wildlife Refuge. TWS founder Robert Marshall spent time in the Arctic and advocated for its protection at the same time he was establishing our organization. Starting in 1920, renowned biologist Olaus Murie studied caribou in what is now the Arctic National Wildlife Refuge, and later was joined by his wife Mardy Murie for his field research. They documented the area's bountiful wildlife and pristine habitat. After joining TWS, first as a Council Member in 1937, and ultimately as the Executive Director, Olaus, and his wife Mardy, embarked on a campaign in the 1950s to protect this magnificent landscape in northeast Alaska. After years of tirelessly campaigning with the support of TWS and many other people and organizations, Olaus and Mardy were able to secure designation of the area as the Arctic National Wildlife Range in 1960 to "preserv[e its] unique wildlife, wilderness and recreational values."<sup>1</sup>

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<sup>1</sup> Public Land Order 2214, Establishing the Arctic National Wildlife Range (Dec. 1, 1960).



Two decades later, TWS worked with a large coalition of conservation and Alaska Native partners to secure passage of the Alaska National Interest Lands Conservation Act (ANILCA), which designated and expanded the Arctic Range to today's Arctic National Wildlife Refuge to ensure conservation of its unmatched fish, wildlife, habitat, subsistence, and water resources and to fulfill international treaty obligations related to fish, wildlife, and habitat.<sup>2</sup> TWS has worked tirelessly ever since to defend the Refuge from the threat of oil and gas development, including by establishing an Anchorage office in the mid-1980s and, more recently, successfully advocating for the U.S. Fish & Wildlife Service to recommend the Coastal Plain and other areas of the Refuge for wilderness designation in the 2015 Comprehensive Conservation Plan. Throughout every stage, TWS has worked closely with the Gwich'in people to protect their way of life and the resources on which it depends, including healthy fish, plant, and wildlife populations, the over 200,000-animal Porcupine Caribou Herd, clean air and water, and an intact and undisturbed ecosystem.

TWS's mission is to protect wilderness and inspire Americans to care for our wild places. The Arctic Refuge is our nation's wilderness refuge and a national treasure. Protecting the Refuge from industrial development that would forever scar its unparalleled wilderness, wildlife, and subsistence resources is of the highest priority for TWS. Our work to protect the Refuge from devastating and unnecessary fossil fuel development is all the more imperative as the Arctic warms at twice the rate of the rest of the planet, villages erode into the sea, permafrost thaw threatens infrastructure, and subsistence food sources disappear. With emissions from fossil fuels produced on federal lands and waters representing 24% of all U.S. greenhouse gas emissions,<sup>3</sup> our public lands are a critical component of the climate problem – and the climate *solution*.

The December 2017 passage of the Tax Cuts and Jobs Act, which directed BLM to establish an oil and gas leasing and development program for the Arctic Refuge's sensitive Coastal Plain, represents an unprecedented assault on the Refuge, the Gwich'in, our organization, and the millions of Americans who cherish the Refuge as one of the last great expanses of near-pristine wilderness. The Tax Act did not, however, waive any of the Interior Department's obligations to manage the Refuge consistent with its original purposes, or its obligations to Alaska Natives and the American people to fully analyze and mitigate the impacts of all phases of an oil and gas program on Refuge resources through a transparent and meaningful public process. Unfortunately, BLM's deficient analysis, severely limited range of alternatives, and rushed public process utterly fail to live up to those obligations, as catalogued in detail in our joint technical comments.

The failure of the Interior Department and its agencies to provide *any* records in response to twenty pending TWS Freedom of Information Act (FOIA) requests dating back to April 2018 and seeking records relevant to development of the oil and gas program and EIS has further frustrated the public's ability to meaningfully review and comment on the DEIS.<sup>4</sup> Responses to a significant majority of these requests are long overdue under FOIA's 20-day statutory deadline. Just yesterday, Public Employees for Environmental Responsibility (PEER) released scores of documents<sup>5</sup> authored by agency experts that

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<sup>2</sup> See ANILCA § 303(2)(B).

<sup>3</sup> USGS, Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005-14, Scientific Investigations Report 2018-5131 (2018), *available at* <https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf>.

<sup>4</sup> See Attachment 1 (tracker of outstanding TWS FOIA requests).

<sup>5</sup> Available at <https://my.visme.co/projects/6xo09mn7-anwr-drilling-undisclosed-scientific-concerns>.



bear directly on the adequacy of BLM's DEIS and should have been produced in response to TWS's April 5, 2018 FOIA requests, which are now ten months overdue.

One of the many significant deficiencies in the DEIS is the failure to include maps, diagrams, or visuals depicting the reasonably foreseeable extent and location of development and associated infrastructure – including well pads, pipelines, gravel mines, roads, central processing facilities, industrial centers for oilfield service providers, seawater treatment plants, airstrips, powerlines, telecom towers, equipment storage pads, rig laydown areas, and barge landings — that can be expected under each alternative. This critical omission prevents agency decision-makers and the public from understanding and being able to meaningfully analyze and comment on the sprawling and interconnected nature of the infrastructure associated with a realistic development scenario.

The omission of maps, diagrams, or visuals of realistic development scenarios obscures the import of BLM's faulty interpretation of the Tax Act's 2,000-acre surface disturbance limitation, including the agency's decision not to include significant infrastructure such as gravel mines in the acreage limitation.<sup>6</sup> The DEIS also fails to provide clear guidelines for implementing and enforcing the limitation or to consider different geographic and spatial disturbance configurations for the infrastructure. Collectively, these failures have misled some to believe that that only a small portion of the Coastal Plain would contain oilfield infrastructure.

Because BLM failed to produce such a necessary depiction, TWS prepared the attached map, which depicts the sprawling nature of a realistic development scenario under Alternative B.<sup>7</sup> This depiction of hypothetical full-scale development on the Coastal Plain mirrors how North Slope oil development has proceeded (beginning with Prudhoe Bay and its satellite fields, then moving mostly westward to the non-contiguous fields). While the locations of each well pad and other type of oilfield infrastructure shown on the map are not exact due to limited exploration data for the Coastal Plain, and the infrastructure icons are not to scale, the map provides a depiction of the reasonable extent of foreseeable development that could occur under BLM's interpretation of the 2,000-acre limitation and consistent with No Surface Occupancy stipulations in Alternative B.<sup>8</sup>

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<sup>6</sup> See Section III(A)(3) of Joint Technical Comments.

<sup>7</sup> Attachment 2 (includes two versions of the map: one depicting surface infrastructure under a realistic development scenario and a second adding subsurface areas accessible by drilling under the same scenario).

<sup>8</sup> The map was developed using BLM information from Figures B-1 and B-2 in the DEIS, which show the approximate acreage for the different types of oilfield infrastructure, the estimated distances from central processing facilities to satellite well pads based on well drainage area, distance to a seawater treatment plant along the coast for a stand-alone oil development facility, and the number of likely satellite well pads. Additionally, because there is a high hydrocarbon potential area northwest of the Marsh Creek Anticline shown in Map B-1 of the DEIS, the map shows that area with denser infrastructure development than to the southeast of that geologic feature. With less hydrocarbon potential towards the east and south, as shown on Map B-1, there would be fewer well pads and less dense development in those portions of the Coastal Plain, but that development would still be connected to services and export infrastructure to the west. The map also accounts for likely distances before new, duplicative oilfield infrastructure would be needed as development proceeds eastward, including additional central processing facilities, gravel mines, industrial centers, and seawater treatment plants, based on other developments in the Arctic. Moreover, the map locates oilfield infrastructure relatively close to Kaktovik whenever possible to minimize surface disturbance.

Among its limitations, the map only begins to reveal important, local topographic features of the Coastal Plain that differ significantly from the flat, gently sloping terrain encountered by existing North Slope oil development, which allows for unimpeded pad placement and long straight pipeline and road alignments without numerous bridges,



Because this type of visual has immense value for agency and other decision-makers and the public to understand the possible scale of development and impacts, and is wholly feasible to produce at this stage, BLM should prepare comparable depictions for all alternatives in a revised DEIS.

We are also attaching a series of maps overlaying the visibility analyses performed and submitted to the BLM by Stuart Smith of True North GIS on our map depicting the Coastal Plain topography and geography from an oblique, birds-eye view.<sup>9</sup> As described in detail in our joint technical comments, such a visibility or viewshed analysis that forecasts the extent and severity of impacts on visual resources based on the topography of the program area, locations of visitor use, and general characteristics of anticipated infrastructure is a critical component of an adequate NEPA analysis of the reasonably foreseeable impacts of an oil and gas development program on the Coastal Plain's exceptional wilderness, recreation, wild and scenic river, and aesthetic values.<sup>10</sup> Such an analysis can readily be prepared using established and scientifically sound methodologies, even without information about the precise location of future infrastructure. Mr. Smith's analysis shows that visual resource impacts to the Coastal Plain and adjacent Mollie Beattie Wilderness – and associated degradation of recreation settings and opportunities and wilderness characteristics – are likely to be extensive, regardless of where infrastructure is ultimately located. The attached overlay maps further depict the severity and extent of those impacts.<sup>11</sup> BLM must incorporate Mr. Smith's analysis or prepare its own comparable visibility analysis in a revised DEIS.

In addition, we are attaching a series of maps that overlay important caribou use areas on our birds-eye view map of Coastal Plain topography and geology.<sup>12</sup> Given the inadequacies of the caribou distribution data presented in the DEIS, as detailed in our joint technical comments,<sup>13</sup> TWS digitized historic records of caribou calving and post-calving extents stretching back to the 1960s. That work is fully visualized and shared in Appendix B to the joint technical comments. The attached maps demonstrate use of the entire Coastal Plain by the Porcupine Caribou Herd and Central Arctic Caribou Herd during their sensitive calving, post-calving and insect-relief periods. It is especially notable that use by both herds for calving and post-calving/insect relief overlaps within the area of high hydrocarbon potential, raising serious

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cuts through river embankments, and winding through ravines. The numerous rivers, ridges, and ravines of the Coastal Plain, however, ultimately would dictate the locations of central processing facilities, well pads, roads and pipelines, including likely placement along highly visible ridgelines. The DEIS fails to account for these distinctions and the associated impacts. Nor does the map account for other hugely impactful activities such as seismic exploration and exploratory drilling, which could occur across the entire Program Area under Alternative B. Finally, the map does not account for the distinct possibility of even more extensive development once areas are "reclaimed" and the equivalent amount of disturbed acreage becomes available for additional surface disturbance under BLM's interpretation of the 2,000-acre limitation.

<sup>9</sup> Attachment 3.

<sup>10</sup> See Sections V(R), V(S), V(T), & V(V) of Joint Technical Comments.

<sup>11</sup> Specifically, the maps depict the height of oilfield infrastructure at any given location that would be visible to a person travelling along six popular recreational rivers on the Coastal Plain (the Canning, the Sadlerochit, the Hulahula, the Okpilak, the Jago, and the Aichilik), from Kaktovik, and from fifteen highpoints in the Mollie Beattie Wilderness to the south of the Coastal Plain. They show, among other things, that it will be virtually impossible to locate major oilfield infrastructure to avoid significant viewshed impacts from the six river corridors and that infrastructure of any height located virtually anywhere on the Coastal Plain would be visible from the Wilderness highpoints to the south.

<sup>12</sup> Attachment 4.

<sup>13</sup> See Section V(I) of Joint Technical Comments.



concerns about disruption and displacement of caribou due to leasing and development. BLM must rigorously consider the full extent of space use by caribou, as well as remedy the other deficiencies in its analysis of impacts to caribou identified in the joint technical comments, in a revised DEIS.

The public lands and resources of the Arctic National Wildlife Refuge are an international treasure that simply must be conserved for future generations. It is the very last place we should destroy for oil and gas development – particularly where that development is highly reckless in the face of climate change. Any valid scientific review would show that developing oil and gas on the Coastal Plain will have unavoidable and un-mitigatable destructive impacts on Arctic Refuge wilderness, wildlife, water, habitat, and subsistence uses, and on the climate. BLM may not proceed in holding a lease sale or authorizing damaging seismic exploration activities on the basis of the woefully deficient analysis and alternatives in the DEIS. Given the scope and severity of the deficiencies, it must go back to the drawing board and prepare a revised DEIS.

If you have questions about the information included in this submission, please contact Alison Flint, High Profile Litigation Manager and Senior Policy Analyst, at [alison\\_flint@tw.s.org](mailto:alison_flint@tw.s.org) or 303-802-1404.

Sincerely,



Jamie Williams  
President  
The Wilderness Society



Attachment 1\_TWS Arctic Refuge Leasing DEIS Comments

FOIA Request	Requester	Date Submitted	20-Day Response Due	Control #	Records Requested
BLM: Implementation of Tax Act	TWS	4/5/2018	5/3/2018	BLM-2018-00695	Any documents related to the development of an oil and gas program on the Coastal Plain of the Arctic National Wildlife Refuge pursuant to Title II of Public Law 115-97, including policies, plans, technical or scientific documents, regulations or regulatory documents, National Environmental Policy Act documents, assessments, and any documents related to the subject matter of the law. Any documents related to the development of lands owned by the Kaktovik Inupiat Corporation and the Arctic Slope Regional Corporation within the Arctic National Wildlife Refuge.
DOI: Implementation of Tax Act	TWS	4/5/18	5/3/2018 (10-day extension taken - 5/17/18)	OS-2018-00980	Any documents related to the development of an oil and gas program on the Coastal Plain of the Arctic National Wildlife Refuge pursuant to Title II of Public Law 115-97, including policies, plans, technical or scientific documents, regulations or regulatory documents, National Environmental Policy Act documents, assessments, and any documents related to the subject matter of the law. Any documents related to the development of lands owned by the Kaktovik Inupiat Corporation and the Arctic Slope Regional Corporation within the Arctic National Wildlife Refuge.
USGS: Implementation of Tax Act	TWS	4/5/18	5/3/2018	USGS-2018-00130	Any documents related to the development of an oil and gas program on the Coastal Plain of the Arctic National Wildlife Refuge pursuant to Title II of Public Law 115-97, including policies, plans, technical or scientific documents, regulations or regulatory documents, National Environmental Policy Act documents, assessments, and any documents related to the subject matter of the law. Any documents related to the development of lands owned by the Kaktovik Inupiat Corporation and the Arctic Slope Regional Corporation within the Arctic National Wildlife Refuge.
FWS: Implementation of Tax Act	TWS	6/19/18	7/18/2018 (10-day extension taken - 8/1/18)	FWS-2018-00940	Any documents related to the development of an oil and gas program on the Coastal Plain of the Arctic National Wildlife Refuge pursuant to Title II of Public Law 115-97, including policies, plans, technical or scientific documents, regulations or regulatory documents, National Environmental Policy Act documents, assessments, and any documents related to the subject matter of the law. Any documents related to the development of lands owned by the Kaktovik Inupiat Corporation and the Arctic Slope Regional Corporation within the Arctic National Wildlife Refuge.
DOI: Seismic	TWS	6/27/18	7/26/2018 (10-day extension taken - 8/9/18)	OS-2018-01415	Any documents related to seismic exploration for oil and gas on the Coastal Plain of the Arctic National Wildlife Refuge, excluding documents related solely to the environmental impact statement for the Coastal Plain Oil and Gas Leasing Program.
BLM: Seismic	TWS	6/27/18	7/26/2018	BLM-2018-01011	Any documents related to seismic exploration for oil and gas on the Coastal Plain of the Arctic National Wildlife Refuge, excluding documents related solely to the environmental impact statement for the Coastal Plain Oil and Gas Leasing Program.
FWS: Seismic	TWS	6/27/18	7/26/2018	FWS-2018-1008	Any documents related to seismic exploration for oil and gas on the Coastal Plain of the Arctic National Wildlife Refuge, excluding documents related solely to the environmental impact statement for the Coastal Plain Oil and Gas Leasing Program.
DOI: Meetings & Calendars Bernhardt	Trustees for Alaska, on behalf of TWS	11/7/2018	12/7/18 (10-day extension taken - 12/21/18)	OS-2019-00166	<p>Complete copies of all external meeting requests with Deputy Secretary Bernhardt received since July 24, 2017, including those requests made by the U.S. Department of the Interior – Office of the Deputy Secretary Meeting Proposal Information Form that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms "Arctic," "Arctic National Wildlife Refuge," "ANWR," "1002 Area," "Coastal Plain," "Polar Bear," "Brooks Range," "National Petroleum Reserve-Alaska," "NPR-A," "NPRA," "Alaska Outer Continental Shelf," "Alaska OCS," "Arctic Outer Continental Shelf," "Arctic OCS," "Arctic Ocean," "Chukchi Sea," "Beaufort Sea," "Prudhoe," "Prudhoe Bay," "North Slope," "North Slope Borough," "Utqiagvik," "Barrow," "Integrated Activity Plan," "IAP," "Arctic Slope Regional Corporation," "ASRC," "Kaktovik Inupiat Corporation," "KIC," "Kaktovik," "Kuukpik Corporation," or "Nuiqsut." Any records related to the grant or denial of each meeting request provided above, as well as other calendar items, scheduling items, or other forms related to meeting requests and meetings with the Deputy Secretary that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms "Arctic," "Arctic National Wildlife Refuge," "ANWR," "1002 Area," "Coastal Plain," "Polar Bear," "Brooks Range," "National Petroleum Reserve-Alaska," "NPR-A," "NPRA," "Alaska Outer Continental Shelf," "Alaska OCS," "Arctic Outer Continental Shelf," "Arctic OCS," "Arctic Ocean," "Chukchi Sea," "Beaufort Sea," "Prudhoe," "Prudhoe Bay," "North Slope," "North Slope Borough," "Utqiagvik," "Barrow," "Integrated Activity Plan," "IAP," "Arctic Slope Regional Corporation," "ASRC," "Kaktovik Inupiat Corporation," "KIC," "Kaktovik," "Kuukpik Corporation," or "Nuiqsut."</p> <p>Copies of Deputy Secretary Bernhardt's daily calendar that have not yet been made publicly available online (i.e., calendars since April 2018).</p>



Attachment 1\_TWS Arctic Refuge Leasing DEIS Comments

DOI: Meetings & Calendars Balash	Trustees for Alaska, on behalf of TWS	11/19/2018	12/18/18 (10-day extension taken - 1/3/19)	OS-2019-00205	<p>Complete copies of all external meeting requests with Assistant Secretary Balash received since December 7, 2017, including those requests made by a U.S. Department of the Interior –Meeting Proposal Information Forms that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.”</p> <p>Any records related to the grant or denial of each meeting request provided above, as well as other calendar items, scheduling items, or other forms related to meeting requests and meetings with Assistant Secretary Balash that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.”</p> <p>Copies of Assistant Secretary Balash’s daily calendars from December 7, 2017.</p> <p>Any ethical pledge(s) or orders Joe Balash wrote or signed associated with his DOI employment.</p>
DOI: Meetings & Calendars Wackowski	Trustees for Alaska, on behalf of TWS	11/29/2018	12/31/18 (10-day extension taken - 1/15/19)	OS-2019-00241	<p>Complete copies of all external meeting requests with Senior Advisor Wackowski received since May 30, 2017, including those requests made by a U.S. Department of the Interior –Meeting Proposal Information Forms that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.” Any records related to the grant or denial of each meeting request provided above, as well as other calendar items, scheduling items, or other forms related to meeting requests and meetings with Senior Advisor Wackowski that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.”</p> <p>Copies of Senior Advisor Wackowski’s daily calendars from May 30, 2017.</p> <p>Any ethical pledge(s) or orders Senior Advisor Wackowski wrote or signed associated with his DOI employment.</p>
DOI: Meetings & Calendars Cason	Trustees for Alaska, on behalf of TWS	12/4/2018	1/3/19 (10-day extension taken -1/17/19)	OS-2019-00261	<p>Complete copies of all external meeting requests with James Cason, acting in either his role as Acting Deputy Secretary or Associate Deputy Secretary, received since January 20, 2017, including those requests made by a U.S. Department of the Interior –Meeting Proposal Information Forms that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.” Any records related to the grant or denial of each meeting request provided above, as well as other calendar items, scheduling items, or other forms related to meeting requests and meetings with James Cason, acting in either his role as Acting Deputy Secretary or Associate Deputy Secretary that are with an entity or individual from or representing issues and/or projects related to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and Alaska Outer Continental Shelf (excluding meeting forms related exclusively to the Central Yukon Resource Planning Area) or that include the terms “Arctic,” “Arctic National Wildlife Refuge,” “ANWR,” “1002 Area,” “Coastal Plain,” “Polar Bear,” “Brooks Range,” “National Petroleum Reserve-Alaska,” “NPR-A,” “NPRA,” “Alaska Outer Continental Shelf,” “Alaska OCS,” “Arctic Outer Continental Shelf,” “Arctic OCS,” “Arctic Ocean,” “Chukchi Sea,” “Beaufort Sea,” “Prudhoe,” “Prudhoe Bay,” “North Slope,” “North Slope Borough,” “Utqiagvik,” “Barrow,” “Integrated Activity Plan,” “IAP,” “Arctic Slope Regional Corporation,” “ASRC,” “Kaktovik Inupiat Corporation,” “KIC,” “Kaktovik,” “Kuukpik Corporation,” or “Nuiqsut.”</p> <p>Copies of James Cason’s daily calendars from January 23, 2018.</p> <p>Any ethical pledge(s) or orders James Cason wrote or signed associated with his DOI employment.</p>
DOI: NEPA doc clearance docs per SO 3355	Trustees for Alaska, on behalf of TWS	12/21/2018	1/24/19 (10-day extension taken - 2/7/19)	OS-2019-00314	<p><i>related to the Arctic National Wildlife Refuge :</i></p> <p>All records, including waiver and extension requests and related communications pertaining to, or seeking guidance on, compliance with page and/or time limits of Secretarial Order 3355.</p> <p>All records, created to coordinate, develop, and comply with the waiver process for the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS as provided for in Deputy Secretary David Bernhardt’s April 27, 2018 Memorandum, re: NEPA Document Clearing Process.</p> <p>All records created to comply with Permanent Instruction Memorandum (PIM) No. 2018-016 related to the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS, including but not limited to those documents specifically identified in the PIM, up to and including the documents prepared for the draft EIS and Notice of Availability.</p>



Attachment 1\_TWS Arctic Refuge Leasing DEIS Comments

BLM: NEPA doc clearance docs per SO 3355	Trustees for Alaska, on behalf of TWS	12/21/2018	1/24/19 (10-day extension taken - 2/7/19)	BLM-2019-00324	<p><i>related to the Arctic National Wildlife Refuge:</i></p> <p>All records, including waiver and extension requests and related communications pertaining to, or seeking guidance on, compliance with page and/or time limits of Secretarial Order 3355.</p> <p>All records, created to coordinate, develop, and comply with the waiver process for the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS as provided for in Deputy Secretary David Bernhardt's April 27, 2018 Memorandum, re: NEPA Document Clearing Process.</p> <p>All records created to comply with Permanent Instruction Memorandum (PIM) No. 2018-016 related to the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS, including but not limited to those documents specifically identified in the PIM, up to and including the documents prepared for the draft EIS and Notice of Availability.</p>
DOI: records schedule	Trustees for Alaska, on behalf of TWS	12/21/2018	1/24/19 (10-day extension taken - 2/7/19)	OS-2019-00315	<p>Complete copies of all records subject to the Department of the Interior's recent proposed records schedule for natural resources planning and development case files (control number DAA-0048-2015-0003) that reference or pertain to the Arctic National Wildlife Refuge, National Petroleum Reserve-Alaska, and/or Alaska Outer Continental Shelf, including but not limited to records that include the terms "Arctic," "Arctic National Wildlife Refuge," "ANWR," "1002 Area," "Coastal Plain," "Brooks Range," "National Petroleum Reserve-Alaska," "NPR-A," "NPRA," "Alaska Outer Continental Shelf," "Alaska OCS," "Arctic Outer Continental Shelf," "Arctic OCS," "Arctic Ocean," "Chukchi," "Beaufort," "Prudhoe," "North Slope," "North Slope Borough," "Teshekpuk," "Utqagvik," "Barrow," "Integrated Activity Plan," "IAP," "Arctic Slope Regional Corporation," "ASRC," "Kaktovik Inupiat Corporation," "KIC," "Kaktovik," "Kuukpik," "Nuiqsut," "Polar Bear," "Spectacled Eider," "beluga whale," "bowhead whale," "walrus," "ringed seal," "caribou," "musk ox," "arctic fox," "grizzly bear," or "wolverine" (excluding records related exclusively to the grizzly bear and wolverine in the lower 48).</p>
DOI: Porcupine Caribou Herd	Trustees for Alaska, on behalf of TWS	1/23/2019	2/21/19 (10-day extension taken - 3/7/19)	OS-2019-00378	<p>All communications and records pertaining to or concerning the Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd (Treaty), and U.S.-Canada International Porcupine Caribou Board (IPCBB), including documents in possession related to the Treaty and Board from contractors such as Alaska Biological Research, and other government agencies, such as the Alaska Department of Fish and Game since January 1, 2017.</p>
BLM - AK DEIS Deliverables	Trustees for Alaska, on behalf of TWS	2/20/2019	3/20/2019 (4/3/2019 IF 10 day extension)		<p>All deliverable documents from contractors, including but not limited to contractor Environmental Management and Planning Solutions I and subcontractors Northern Economics and Stephen R. Braund &amp; Associates, used to develop the draft Environmental Impact Statement (EIS) for the Coastal Plain Oil and Gas Leasing EIS (DOI-BLM-AK-0000-2018-0002-EIS).</p>
DOI: Leasing EIS Correspondence	Trustees for Alaska, on behalf of TWS	2/25/2019	3/25/2019 (10-day extension taken - 4/8/19)	OS-2019-00525	<p>All communications and records from December 1, 2018 to the date of the search related to work on the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS (leasing DEIS) during the December 21, 2018 to January 25, 2019 government shutdown and any anticipated government shutdowns thereafter.</p>
BLM: Leasing EIS Correspondence	Trustees for Alaska, on behalf of TWS	2/25/2019	3/25/2019 (4/8/2019 IF 10 day extension)		<p>All communications and records from December 1, 2018 to the date of the search related to work on the Coastal Plain Oil and Gas Leasing Draft Environmental Impact Statement DOI-BLM-AK-0000-2018-0002-EIS (leasing DEIS) during the December 21, 2018 to January 25, 2019 government shutdown and any anticipated government shutdowns thereafter.</p>
BLM - AK Seismic Comms	Trustees for Alaska, on behalf of TWS	3/8/2019	4/5/2019 (4/19/2019 IF 10 day extension)		<p>All communications and records from April 15, 2018, related to SAEExploration Inc. Seismic Application DOI-BLM-AK-R000-2018-0040-EA (Seismic Application)</p>
FWS - AK Seismic Comms	Trustees for Alaska, on behalf of TWS	3/8/2019	4/5/2019 (4/19/2019 IF 10 day extension)		<p>All communications and records from April 15, 2018, related to SAEExploration Inc. Seismic Application DOI-BLM-AK-R000-2018-0040-EA (Seismic Application)</p>
DOI - Seismic Comms	Trustees for Alaska, on behalf of TWS	3/8/2019	4/5/2019 (4/19/2019 IF 10 day extension)		<p>All communications and records from April 15, 2018, related to SAEExploration Inc. Seismic Application DOI-BLM-AK-R000-2018-0040-EA (Seismic Application)</p>





# The Arctic Refuge Coastal Plain

A realistic surface development scenario under Alternative B  
(consistent with BLM's interpretation of the 2,000-acre surface disturbance limitation)

## Facilities - symbols not to scale

- Central processing facility
- Well pad
- Pipeline and road connections
- Gravel mine
- Industrial center
- Seawater treatment plant
- Barge landing

## Boundaries

- 1002 Program Area<sup>1</sup>
- Areas excluded from 1002 Program Area in DEIS<sup>2</sup>
- Southeastern limit of high hydrocarbon potential<sup>3</sup>

<sup>1</sup> Also available for 3-dimensional seismic exploration.  
<sup>2</sup> Native-conveyed, native-selected, excluded from Public Law 115-97, and native or other mineral ownership.  
<sup>3</sup> Marsh Creek Anticline.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: BLM Coastal Plain Oil and Gas Leasing Program DEIS, Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.





# The Arctic Refuge Coastal Plain

A realistic surface and subsurface development scenario under Alternative B  
(consistent with BLM's interpretation of the 2,000-acre surface disturbance limitation)

## Facilities - symbols not to scale

- Central processing facility
- Well pad
- Pipeline and road connections
- Gravel mine
- Industrial center
- Seawater treatment plant
- Barge landing

## Boundaries

- 1002 Program Area<sup>1</sup>
- Areas excluded from 1002 Program Area in DEIS<sup>2</sup>
- Southeastern limit of high hydrocarbon potential<sup>3</sup>
- Subsurface areas accessible by drilling<sup>4</sup>

<sup>1</sup> Also available for 3-dimensional seismic exploration.

<sup>2</sup> Native-conveyed, native-selected, excluded from Public Law 115-97, and native or other mineral ownership.

<sup>3</sup> Marsh Creek Anticline.

<sup>4</sup> 8 mile diameter, true to scale.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: BLM Coastal Plain Oil and Gas Leasing Program DEIS, Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



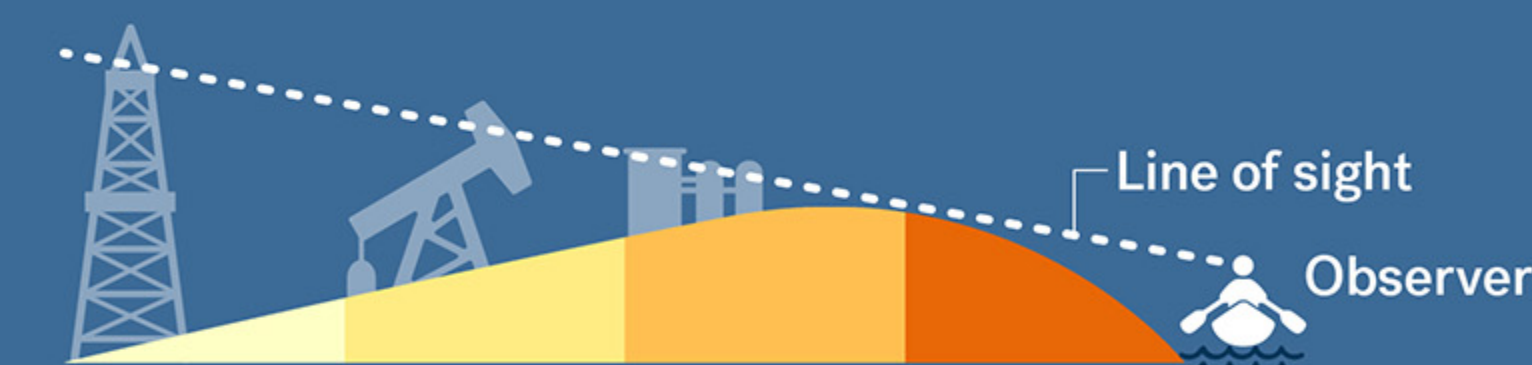


## The Arctic Refuge Coastal Plain: Visibility from six rivers

At any given location, how tall would a structure need to be to be visible to a person traveling along a major river?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation paths used in visibility analysis**
- 1002 Program Area**

<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



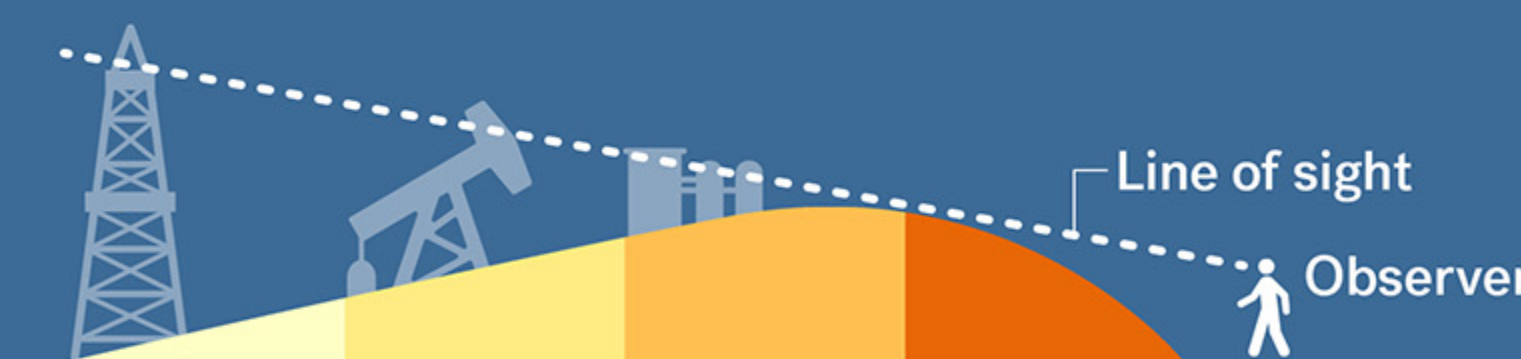


## The Arctic Refuge Coastal Plain: Visibility from Wilderness Summits

At any given location, how tall would a structure need to be to be visible from peaks within the Mollie Beattie Wilderness?

### Minimum height for visibility<sup>1</sup>

- 0 meters  
A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m  
Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m  
Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m  
Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation points used in visibility analysis
- 1002 Program Area

<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



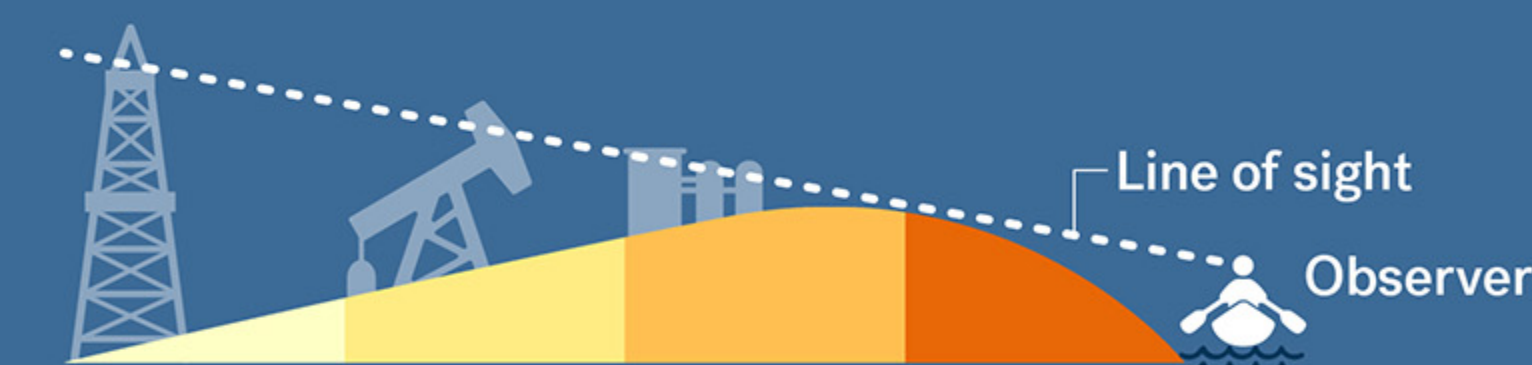


## The Arctic Refuge Coastal Plain: Visibility from the Aichilik River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Aichilik River?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation path used in visibility analysis**
- 1002 Program Area**

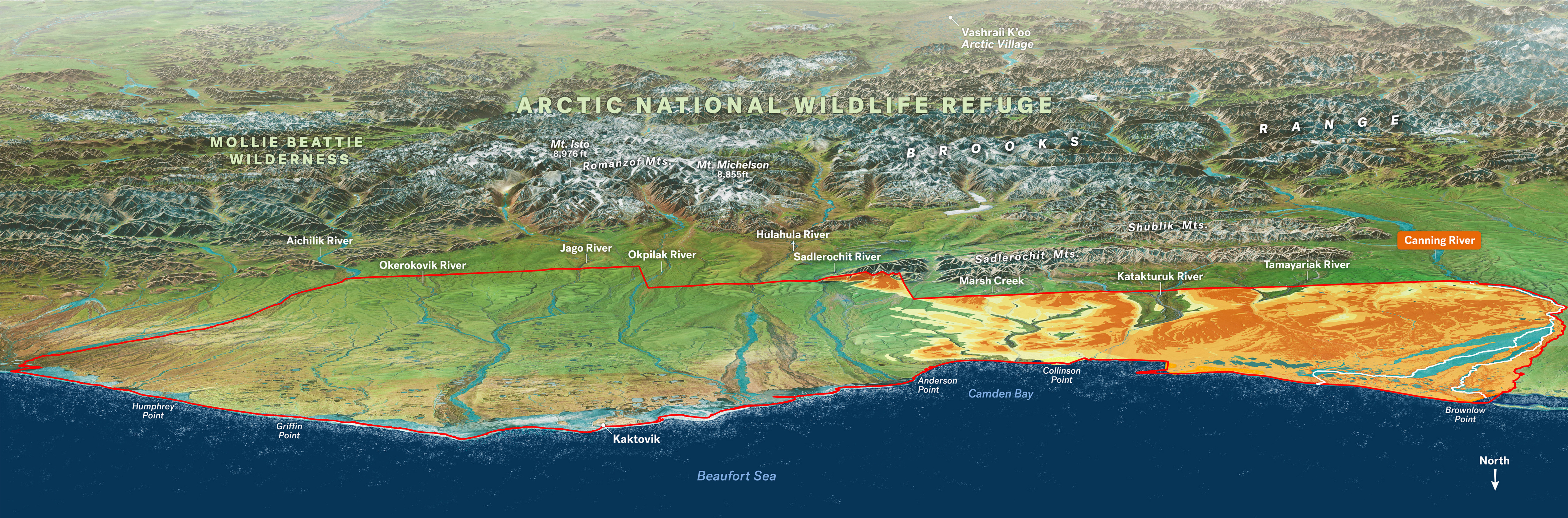
<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



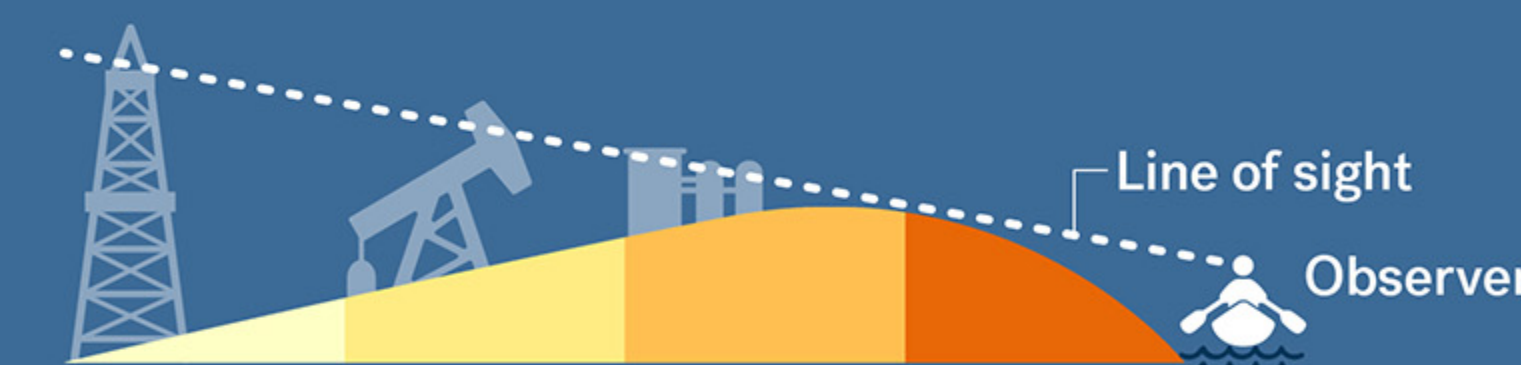


## The Arctic Refuge Coastal Plain: Visibility from the Canning River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Canning River?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation paths used in visibility analysis**
- 1002 Program Area**

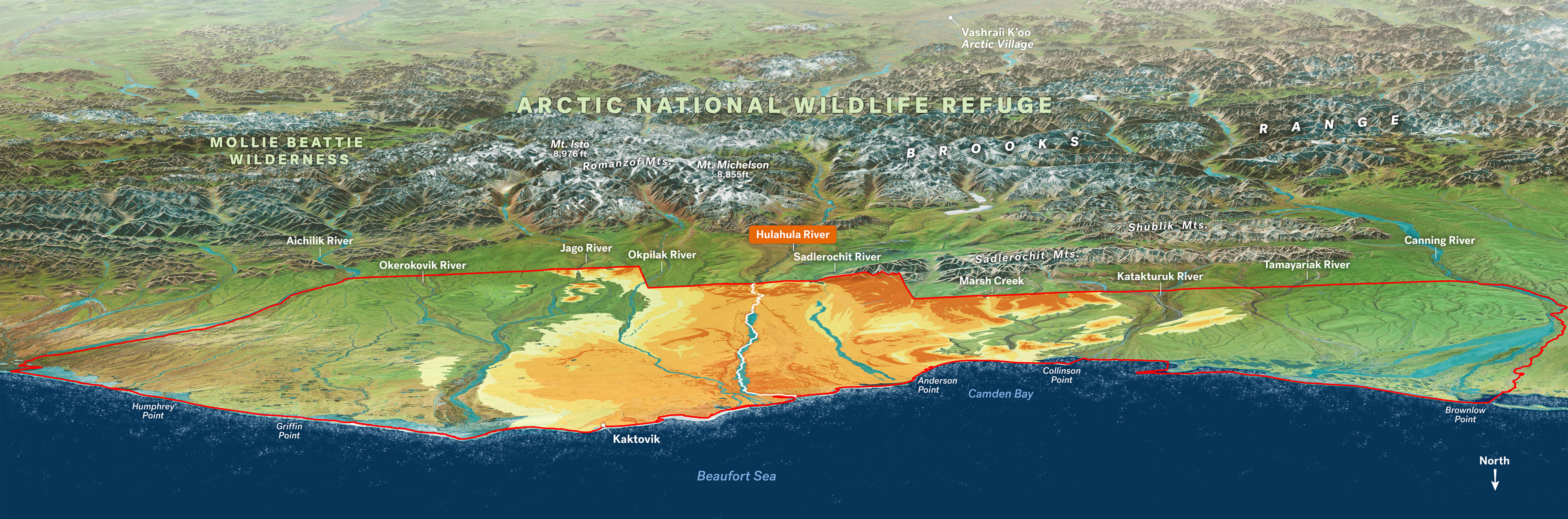
<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



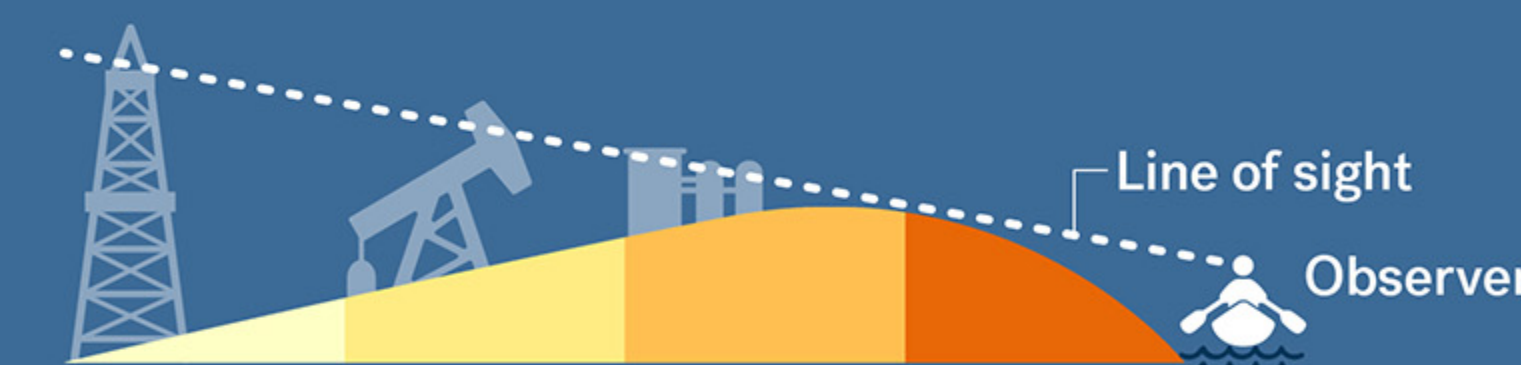


# The Arctic Refuge Coastal Plain: Visibility from the Hulahula River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Hulahula River?

## Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation path used in visibility analysis**
- 1002 Program Area**

<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



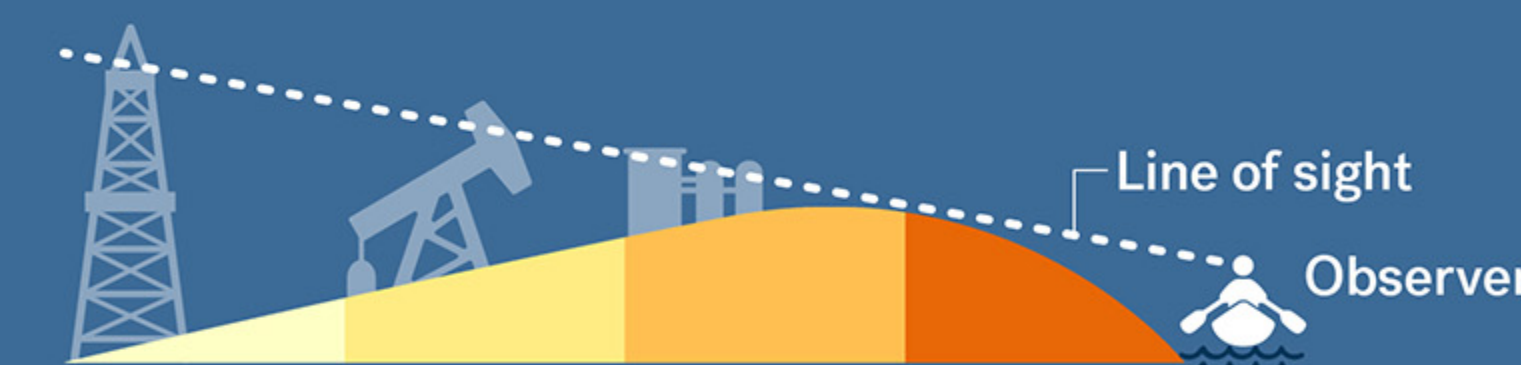


## The Arctic Refuge Coastal Plain: Visibility from the Jago River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Jago River?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation path used in visibility analysis**
- 1002 Program Area**

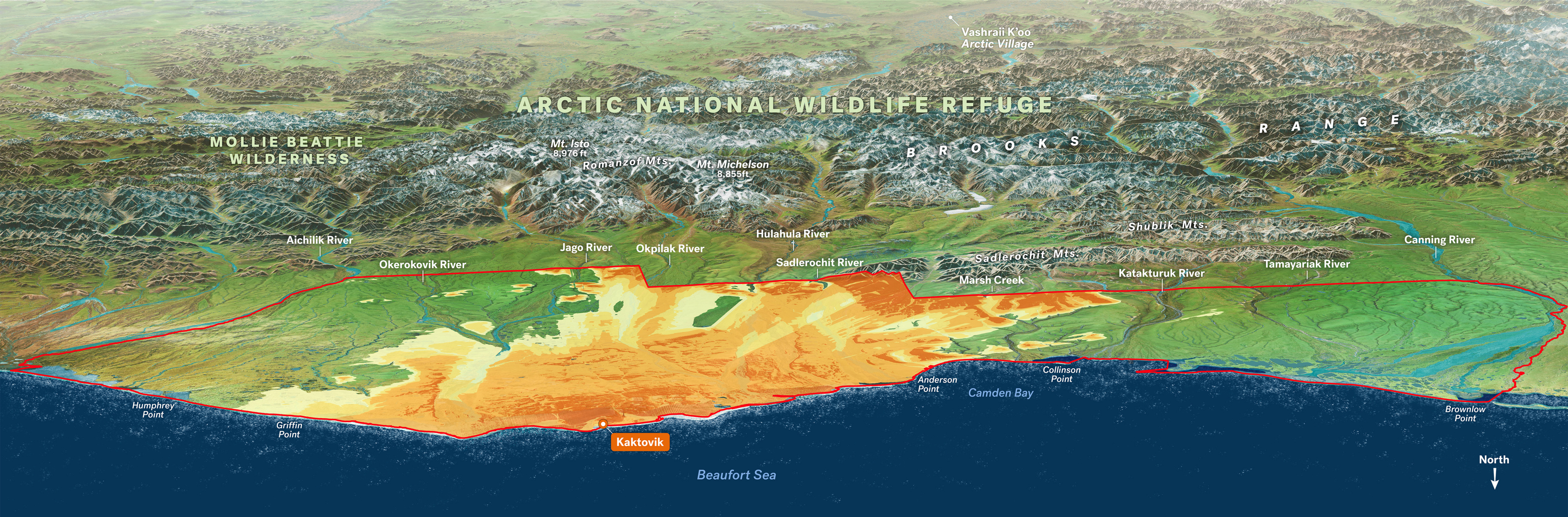
<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



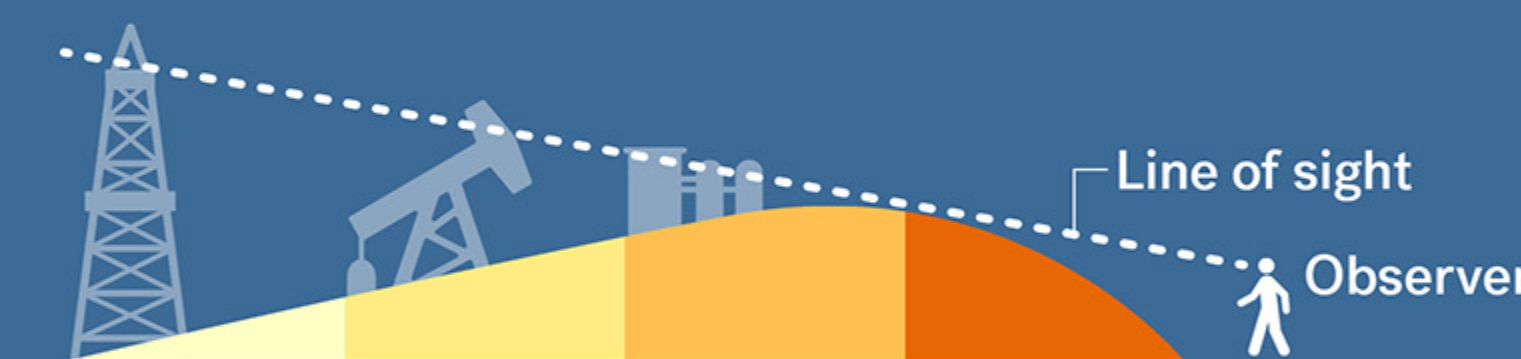


## The Arctic Refuge Coastal Plain: Visibility from Kaktovik

At any given location, how tall would a structure need to be to be visible from the village of Kaktovik?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation path used in visibility analysis**
- 1002 Program Area**

<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



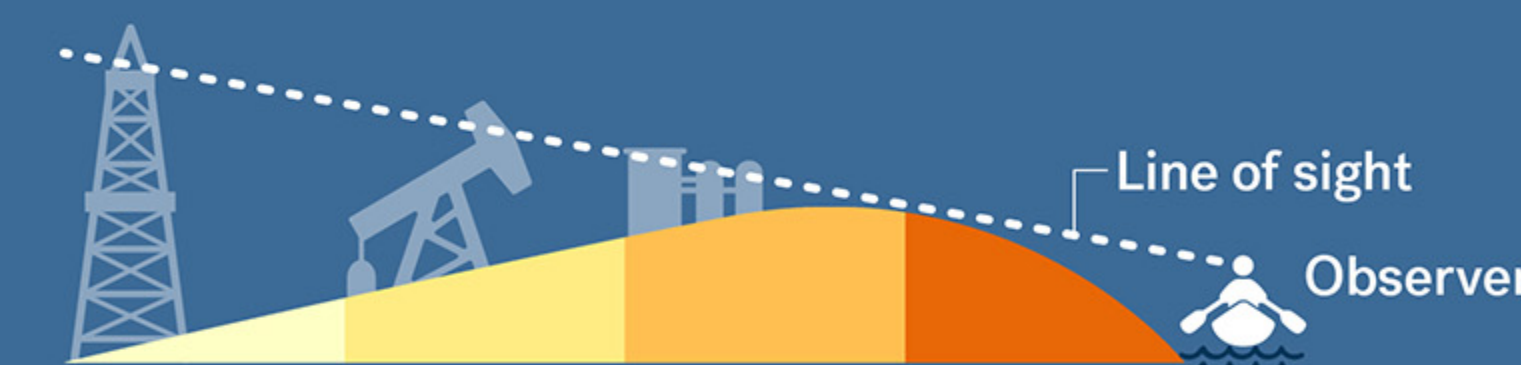


## The Arctic Refuge Coastal Plain: Visibility from the Okpilak River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Okpilak River?

### Minimum height for visibility<sup>1</sup>

- 0 meters** A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible.
- >0 - 15 m** Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).
- >15-30 m** Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).
- >30-45 m** Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).



- Observation path used in visibility analysis**
- 1002 Program Area**

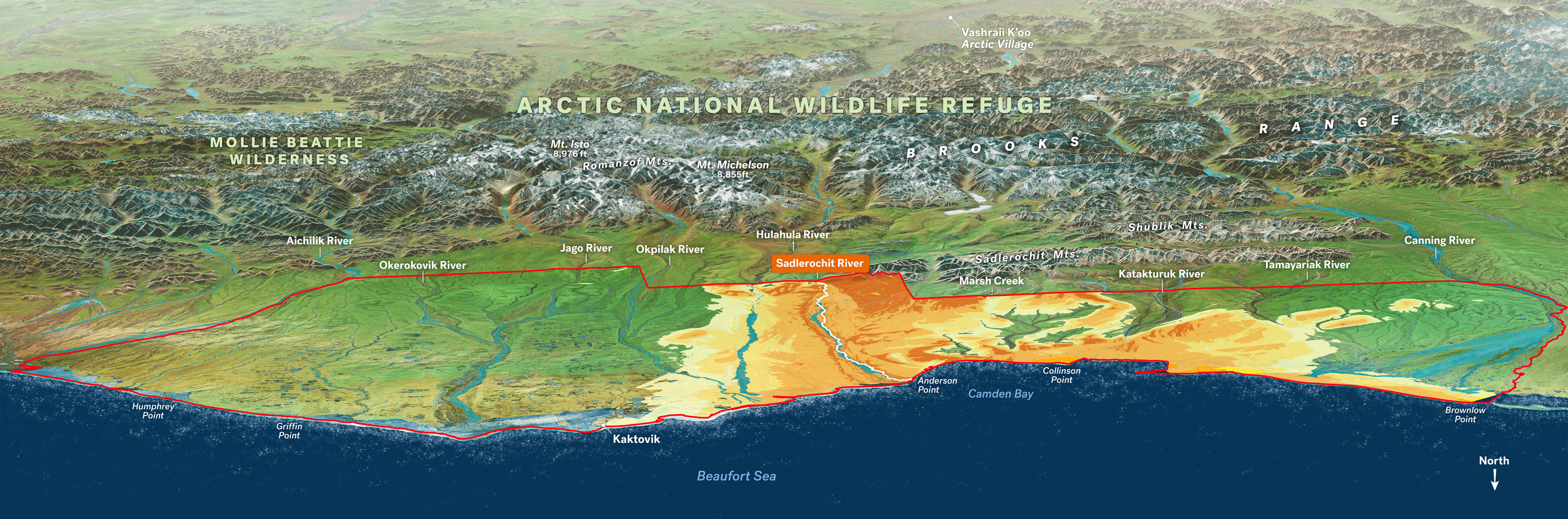
<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.

Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.



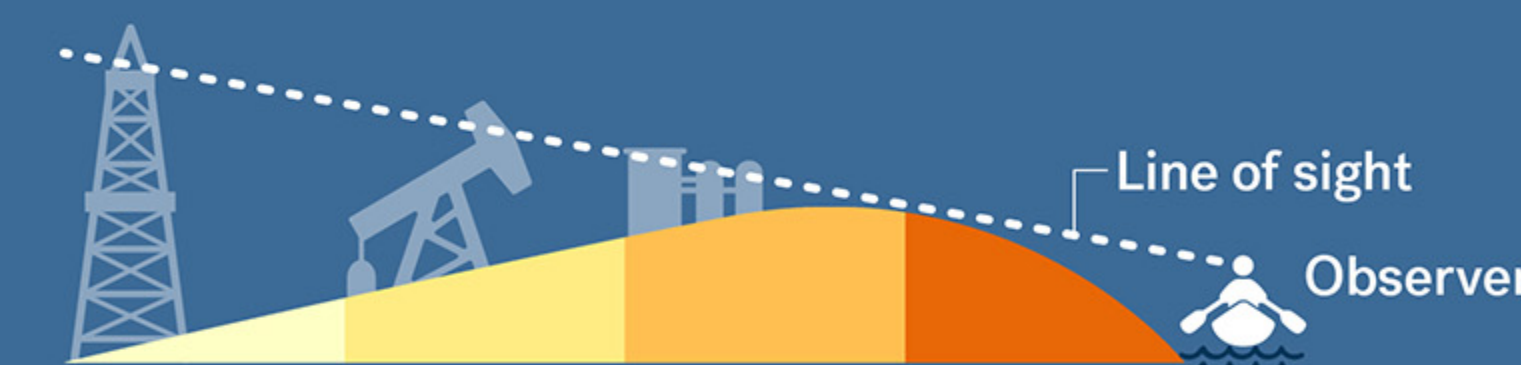


## The Arctic Refuge Coastal Plain: Visibility from the Sadlerochit River

At any given location, how tall would a structure need to be to be visible to a person traveling along the Sadlerochit River?

### Minimum height for visibility<sup>1</sup>

- |           |  |
|-----------|--|
| 0 meters  | A structure of any height would be visible. Any changes to the ground's surface, such as roads, pads, or seismic grid marks would also be visible. |
| >0 - 15 m | Structures with a minimum height ranging from above the ground surface up to 15 meters tall would be visible (e.g. processing facilities).         |
| >15-30 m  | Structures with a minimum height of 15-30m would be visible (e.g. towers and derricks).  |
| >30-45 m  | Structures with a minimum height of 30-45m would be visible (e.g. mobile drill rigs and communications towers).                                    |



- Observation path used in visibility analysis
- 1002 Program Area

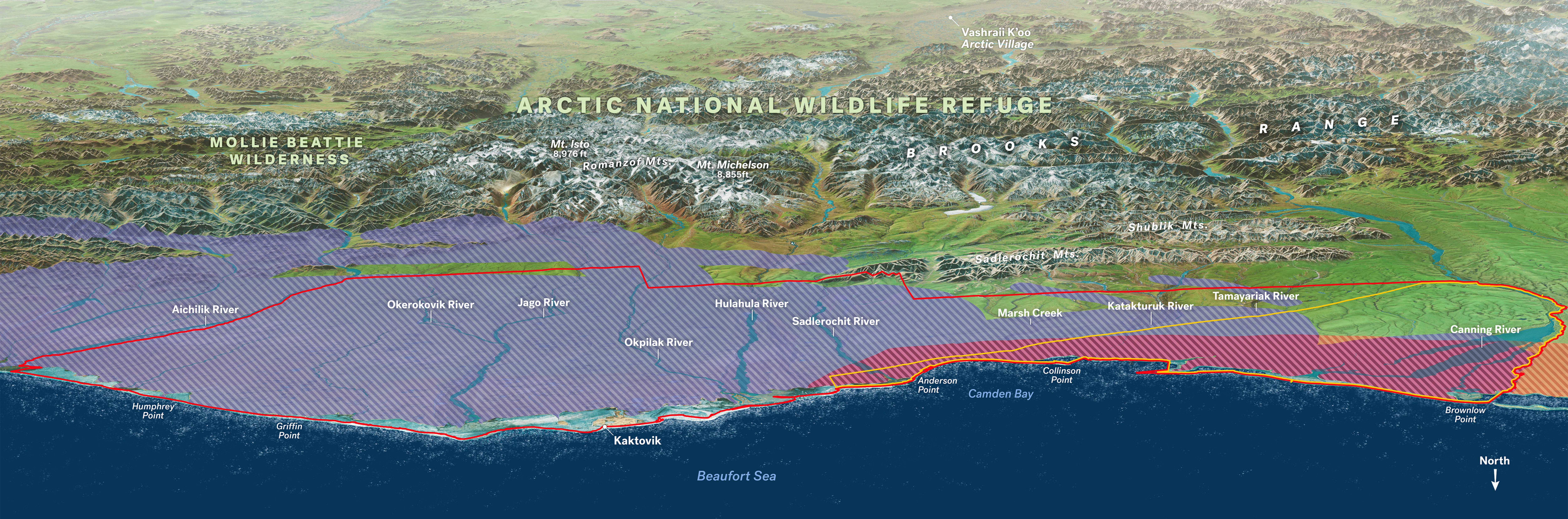
<sup>1</sup>Objects taller than the upper height value of each group (0, 15, 30, 45m) located within that group's area will also be visible.



Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.




Sources: Stuart Smith/True North GIS (visibility analysis), BLM (1002 Program Area), Polar Geospatial Center (DEM), Esri (satellite image). Map by Marty Schnure, Mar. 2019.






# The Arctic Refuge Coastal Plain

Post-calving and insect-relief areas of the Porcupine and Central Arctic caribou herds

-  Porcupine Caribou Herd post-calving and insect-relief area
-  Central Arctic Caribou Herd post-calving and insect-relief area
-  Overlap between Porcupine and Central Arctic herd post-calving and insect-relief areas

-  Area of high hydrocarbon potential
-  1002 Program Area

Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.



Sources: BLM (1002 Program Area); Polar Geospatial Center (DEM); Esri (satellite image); Elison, et al 1986 (insect-relief). Full caribou data citations can be found in Appendix B of the technical comments prepared and submitted by Trustees for Alaska, The Wilderness Society, and many other groups. Map by Marty Schnure, Mar. 2019.





# The Arctic Refuge Coastal Plain

Calving areas of the Porcupine and Central Arctic caribou herds

- Porcupine Caribou Herd calving area
- Central Arctic Caribou Herd calving area
- Overlap between Porcupine and Central Arctic herd calving areas

- Area of high hydrocarbon potential
- 1002 Program Area

Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.



Sources: BLM (1002 Program Area); Polar Geospatial Center (DEM); Esri (satellite image); Elison, et al 1986 (insect-relief). Full caribou data citations can be found in Appendix B of the technical comments prepared and submitted by Trustees for Alaska, The Wilderness Society, and many other groups. Map by Marty Schnure, Mar. 2019.





# The Arctic Refuge Coastal Plain

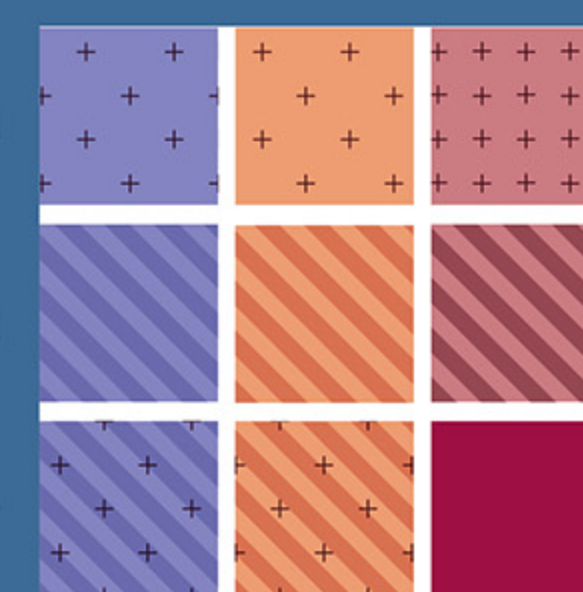
Calving, post-calving, and insect-relief areas used by the Porcupine and Central Arctic caribou herds

Post-calving and insect-relief area

Calving area

Overlap in use

Porcupine Caribou Herd  
Central Arctic Caribou Herd  
Overlap between herds



Area of high hydrocarbon potential

1002 Program Area

Scale varies in this perspective. The 1002 Program Area extends approx. 100 miles east to west. This map is to be printed at 11x17in.



Sources: BLM (1002 Program Area); Polar Geospatial Center (DEM); Esri (satellite image); Elison, et al 1986 (insect-relief). Full caribou data citations can be found in Appendix B of the technical comments prepared and submitted by Trustees for Alaska, The Wilderness Society, and many other groups. Map by Marty Schnure, Mar. 2019.