

4.5 RECREATION

The Environmental Impact Statement (EIS) analysis area for recreation is defined as the area from Lake Clark National Park and Preserve south to Katmai National Park and Preserve, and from the Nushagak River east to the western Kenai Peninsula (see Figure 3.5-1). Potential impacts include:

- Adverse effects to recreation opportunities and experiences for recreationists participating in hunting, fishing, wildlife viewing, boating, camping, backpacking, beach combing, clamming, and picnicking activities
- Displacement of recreationists participating in hunting, fishing, wildlife viewing, boating, camping, backpacking, beach combing, picnicking activities, and snowmachine use
- Adverse effects to recreation experiences for visitors flying over the EIS analysis area.
- Increased access to recreational areas
- Changes to recreational settings

The magnitude of impact from the project depends on the level of current recreation use that would be impacted, the extent to which the recreation setting, opportunities, and experiences are altered, as well as the ability of recreationists to relocate to another area with similar recreation opportunities, settings, and experiences. The duration and geographic extent of impacts depends on the location and season in which the disturbance occurs during construction, operations, or closure, as well as the audibility and visibility of any changes to the recreation setting. Duration would be considered long term if the effect lasted throughout the life of the project (i.e., years to decades). A short-term effect would be expected to last only through the construction phase (i.e., months to years). The potential for impacts is related to how likely the project would be to alter the recreation setting, opportunities, experiences, and use level.

4.5.1 Summary of Key Issues

Table 4.5-1: Summary of Key Issues for Recreation

Category	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
Permanent Loss of Area Available for Recreation (all components)	Loss of 9,611 acres	Loss of 9,600 acres Kokhanok East Ferry Variant: 9,635 acres Summer-Only Ferry Operations Variant: 9,661 acres Pile-Supported Dock Variant: 9,589 acres	Loss of 9,763 acres Summer-Only Ferry Operations Variant: 9,819 acres Pile-Supported Dock Variant: 9,753 acres Newhalen River North Crossing Variant: 9,783 acres	Loss of 10,130 acres Concentrate Pipeline Variant: 10,132 acres
Recreation Experience	Project-related noise and activities, lasting from construction through operations and closure may adversely affect recreation experiences for recreationists by changing the recreation setting and displacing wildlife	Same as Alternative 1a, except there would be no impacts to visitors of the Lake Clark park unit.	Same as Alternative 1a, but would particularly affect visitors to lodges in the Pedro Bay area. Recreation experiences for visitors to the Lake Clark park unit would be more	Same as Alternative 2

Table 4.5-1: Summary of Key Issues for Recreation

Category	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
	<p>and fish throughout the EIS analysis area.</p> <p>Adverse effects on recreational experiences for visitors within visual and auditory distance may displace visitors that prefer a quiet, undisturbed recreation setting.</p> <p>Recreation experiences for visitors to the Lake Clark park unit may be impacted by the increased sight of human-made development from the roadway and ferry terminal.</p> <p>Recreation experiences impacted for visitors accessing the McNeil River State Game Refuge at Chenik Creek by the site of port facilities and vessel traffic.</p> <p>These impacts would last throughout the life of the project.</p>		<p>impacted due to the increased sight of human-made development from construction of the pipeline.</p> <p>There would be no impacts to visitors to McNeil River State Game Refuge.</p>	
Recreation Setting	<p>Recreationists flying over project components would be adversely impacted, as the project would be visible from planes.</p> <p>The recreational setting from Iliamna Lake would be impacted by ferry traffic and terminals.</p> <p>Vessel traffic may intermittently affect the recreational setting of McNeil River Camp. The port may be visible from a small number of areas near the northern borders of Katmai National Park and McNeil River Game Refuge and from National Wildlife Refuge islands.</p> <p>There would be changes to the recreational setting for visitors to Roadhouse Mountain.</p> <p>These impacts would last throughout the life of the project.</p>	<p>Same as Alternative 1a, except it would not change the recreational setting for visitors to Roadhouse Mountain.</p>	<p>Impacts would be similar to Alternative 1a, except it would not affect the McNeil River State Game Refuge or Katmai National Park, but may affect views from some areas of the Alaska Maritime National Wildlife Refuge.</p>	<p>Same as Alternative 2, except there would be no ferry terminals and no impacts to recreation on Iliamna Lake.</p>

Table 4.5-1: Summary of Key Issues for Recreation

Category	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
Recreation Activities	There would be adverse effects on wildlife viewing, hunting, and fishing opportunities and experiences from displacement of wildlife and fish. Boating and snowmachine use on Iliamna Lake could be displaced or altered. These impacts would last throughout the life of the project.	Same as Alternative 1a.	Same as Alternative 1a, except that more guided fishing opportunities would be impacted. There would also be adverse effects to activities in Ursus Cove and Cottonwood Bay during construction.	Same as Alternative 2, except with additional adverse effects on fishing opportunities and experiences at road river/stream crossings, particularly at Newhalen and Iliamna rivers. There would be no adverse effect to recreation on Iliamna Lake.
Recreation Use	Potential for increase in recreation use due to increase in full-time resident population and potential for additional recreation use along the pipeline ROW. These impacts would last throughout the life of the project.	Similar to Alternative 1a. No additional opportunities or use associated with the pipeline ROW due to the presence of a private road.	Same as Alternative 1a and potential for additional recreation use due to recreation equipment being more readily available and/or less expensive. Additional potential for increased recreation use along the pipeline ROW though motorized use may affect wilderness-type recreation experiences.	Similar to Alternative 1a. No additional opportunities or use associated with the pipeline ROW due to the presence of a private road.

Notes:
EIS = Environmental Impact Statement
ROW = right-of-way

4.5.2 No Action Alternative

Under the No Action Alternative, federal agencies with decision-making authorities on the project would not issue permits under their respective authorities. The Applicant's Preferred Alternative would not be undertaken, and no construction, operations, or closure activities specific to the Applicant's Preferred Alternative would occur. Although no resource development would occur under the Applicant's Preferred Alternative, Pebble Limited Partnership (PLP) would retain the ability to apply for continued mineral exploration activities under the State's authorization process (ADNR 2018-RFI 073) or for any activity not requiring federal authorization. In addition, there are many valid mining claims in the area, and these lands would remain open to mineral entry and exploration by other individuals or companies.

It would be expected that current State-authorized activities associated with mineral exploration and reclamation, as well as scientific studies, would continue at levels similar to recent post-exploration activity. The State requires that sites be reclaimed at the conclusion of their State-authorized exploration program. If reclamation approval is not granted immediately after the cessation of activities, the State may require continued authorization for ongoing monitoring and reclamation work as it deems necessary.

Noise and disturbance from activities such as drilling and aircraft overflights could still occur under the No Action Alternative. The magnitude of helicopter traffic related to exploration activities would remain at the same level it has over the past 10 years, or decrease slightly from current activity. The mine site itself is generally not used for recreation, but helicopter traffic would be noticeable to recreation users of the Newhalen River and the northern shoreline of Iliamna Lake near Iliamna. Any decreases in human-made noise and disturbance would benefit the recreation setting and enhance recreation experiences in these areas by increasing the natural setting. While these activities would also cause noise and disturbance, reclamation would benefit the recreational setting.

4.5.3 Alternative 1a

The following sections describe anticipated project impacts on recreation. This alternative would result in the direct loss of 9,611 acres of area available for recreation activities, including 2,175 acres of wetlands and other waters. This includes the mine site, transportation corridor, port, and natural gas pipeline components. The impact would be long term, lasting through the life of the project and would be certain to occur if this alternative is permitted and built.

Scoping comments related to recreation focused on potential disruption to recreational hunting and fishing near the mine, along river systems, and in the transportation/pipeline corridor during construction and operations. Impacts to lodges in the Iliamna and Lake Clark areas were specifically noted. The following sections consider the potential project impacts on guided hunting and fishing activities, increased access for additional recreationists, and displacement of wildlife viewing, specifically in the McNeil State Game Refuge. For economic impacts related to commercial and recreational fishing, see Section 4.6, Commercial and Recreational Fisheries.

4.5.3.1 Mine Site

Recreational use at the mine site is estimated to be low; use consists of some sport hunting, sport fishing, and occasional snowmachining. Flights taking recreationists to various destinations in the region may pass over the mine site. For potential impacts to subsistence hunting, see Section 4.9, Subsistence.

The extent of impacts on recreation at the mine site would be the alteration and physical removal of 8,391 acres of land (i.e., size of the mine site footprint including material sites) currently available for recreation. This would include the loss of 2,113 acres of wetlands and other waters, which support the fish and wildlife that attract anglers and sport hunters. The impacts would be permanent and certain if the mine is permitted and built. The acres directly impacted do not see much recreational use and the magnitude of impacts would be measured by the small number of users that would be displaced to other nearby state or federal lands where similar recreation opportunities and settings exist.

Construction, operations, and closure at the mine site would affect sport hunting, fishing, and other recreation activities on lands surrounding the EIS analysis area. Project-related activities that generate noise, such as blasting and operation of heavy equipment and helicopters, would adversely affect the recreational experience for hunters, anglers, and other recreationists. Recreation would not be allowed in the mine site safety boundary (see Chapter 2, Alternatives). The boundary would be demarcated by signage at regular intervals and at logical locations such as the mine access road and waterways. The boundary would be reduced during the post-closure phase of the project (PLP 2018-RFI 058). The magnitude of the effects would be to change the setting from the current low level of summer exploration activities to a developed year-round industrial area in visual and auditory distance of the mine site. The effects would be certain if the mine is permitted and built and would be long term, lasting throughout the life of the project.

The magnitude and geographic extent of increase in noise from construction and operations at the mine site would be 10 decibels (dBA) higher than the ambient noise level up to 2.3 to 2.4 miles away from the mine site. Based on human perception, an increase of 10 dBA would sound “twice as loud” as the current ambient noise level. Project construction and operations noise would exceed a 30 dBA equivalent noise level up to 3.3 and 3.5 miles from the mine site, respectively. Above this 30 dBA noise level, the project would risk causing sleep disturbance to recreationists sleeping outdoors on lands considered “wilderness ambient.” These adverse effects to recreation experiences generally within 3.5 miles of the mine site would be certain if the project is permitted and built, and may result in minimal displacement of visitors to other areas for the duration of the project. For further analysis, see Section 4.19, Noise.

The noise generated by project construction, operations, and closure activities would also displace wildlife and fish from the immediate mine site area, and likely from lands immediately surrounding the EIS analysis area. The magnitude of this effect would reduce hunting and fishing success close to project components. Therefore, hunters, anglers, or guides who currently use the immediate vicinity would be displaced to other areas during construction, operations, and closure activities. This effect would be certain if the mine is permitted and built (see Section 4.23, Wildlife Values, for further analysis). However, the mine site and immediate surrounding area is not popular for sport hunting, fishing, and other recreation uses, and potential users would be displaced to other state lands in the area with similar habitat.

The removal of acreage at the mine site would impact trout habitat downstream of the project area. It is possible that as habitat changes, trout would be displaced to other areas. The anglers targeting these trout would also be displaced. However, due to the natural dynamic nature of habitat, the change may not be noticeable to recreationists.

Visibility of the mine site would generally be limited to high-elevation areas on Sharp Mountain and Groundhog Mountain, and the upper Stuyahok River Valley. The extensive development at the mine site and contrast of the mine site with the surrounding area would alter the recreation setting. Visual contrast is expected to attenuate to a weak level at a distance of about 20 miles from the mine. There is a lack of existing night lighting in the analysis area and mine facility lighting would result in a strong contrast from high elevation locations. The quality of the night sky would also be impacted in areas where there are no direct views of the mine site by brightening the night sky and reducing the visibility of stars and other astronomical observations. Impacts would be of high magnitude within 8 miles of the mine site and decrease with distance; low magnitude impacts could occur at distances of up to 70 miles from the mine site. Night sky impacts would be less noticeable in the summer months when there is longer daylight. These impacts would occur if the mine is permitted and built. Changes to the recreation setting due to visibility of the mine would alter recreation experiences for visitors within view of the mine for daytime impacts, and further for impacts to night sky. The impacts would last for the duration of the project and after project closure, and may result in displacement of recreation visitors to areas where the mine site is not visible. Displacement of recreation visitors would affect recreation use by potentially decreasing use in areas near the mine site and increasing use in other areas (where the mine site is not visible). For further analysis, see Section 4.11, Aesthetics.

The mine site would be approximately 15 miles from the border of Lake Clark National Park and Preserve, the nearest well-known regional recreation destination and use area to the mine site. Project-related noise and activities would not result in meaningful, direct effects on recreational settings or activities in the park unit. The geographic extent of the impact of the coarse ore stockpile at the mine site would be limited because it would only be visible from high elevations in the southwestern corner of the park near Roadhouse Mountain, which is a small portion of the total park unit (see Section 4.11, Aesthetics, and figures in Appendix K4.11). Visibility from this distance would be low; therefore, the magnitude of impacts to recreation settings and experiences

from increased development in a primitive setting would be low. This impact would be long term to permanent and would occur if the mine is permitted and built.

Mine site construction and operations noise would not affect sensitive receptors in the park unit. Recreational berry-picking, fishing, and drinking water collection in Lake Clark National Park and Preserve would not be affected due to the distance between the mine site and the park unit. The geographic extent of long-term fugitive dust impacts on vegetation, water quality, aquatic ecosystems, and berry-picking would be limited to the area around the mine site and within 330 feet of the mine and port access roads. Therefore, magnitude of impacts from fugitive dust to recreational activities would be low because recreational activities are limited that close to the mine site. These effects would be certain if the mine is permitted and built, but implementation of dust suppression, on-site water treatment processes, and enforcement of slow speed limits at all stream crossings would minimize dust-related impacts to vegetation, water quality, and aquatic ecosystems (see Chapter 5, Mitigation, for additional mitigation for fugitive dust, and Section 4.24, Fish Values, for impacts to fish).

Activities at the mine site would be visible to visitors flying over the area. The presence of the mine, a large industrial facility in an otherwise generally primitive area, would adversely affect the recreational experience for visitors flying over the mine site by causing a change in the recreational setting. Given the mine site's location relative to nearby lodges and airstrips/airports, some unscheduled recreational flight paths would cross the mine site itself. Although the number of visitors flying into the area is relatively low, their experience would be affected by the presence of the project, and the magnitude of impact would be high. Therefore, project construction, operations, and closure are likely to have a noticeable adverse effect on the recreational experience for flightseeing visitors. The mine site may be visible to recreationists taking flightseeing tours in Lake Clark National Park and Preserve, but these tours are not likely to fly over the mine site itself.

Outdoor recreation by construction and operations staff would not be expected to occur because site rules would prohibit hunting, fishing, or gathering on site to minimize impacts on local subsistence resources. The mine would operate on a fly-in, fly-out basis; therefore, non-resident staff members would not likely contribute to an increase in recreational use. However, they may occasionally stay in the area or participate in recreational trips to nearby destinations. Operation of the mine is not expected to generate a large increase in the number of full-time residents (see Section 4.3, Needs and Welfare of the People—Socioeconomics). Therefore, a small increase in recreational use would likely occur during project construction, operations, and closure due to a small increase in the full-time residential population, and local residents may notice slightly more people participating in recreation activities. However, it is not anticipated that the small increase in the number of full-time residents or employees who may use recreational resources would eliminate any existing recreation opportunities or experiences, but may decrease opportunities for solitude. These impacts would be of low to medium magnitude and could occur anywhere in, and potentially beyond, the EIS analysis area.

4.5.3.2 Transportation Corridor

The transportation facilities would directly impact 809 acres of land, including 59 acres of wetlands and other waters, and would remove it from use for recreation opportunities. These impacts would occur for the duration of the project through closure and would be certain if the project is permitted and built. The direct loss of these acres would negatively impact recreational opportunities and experiences as discussed below.

Near the transportation corridor there is recreational use of Roadhouse Mountain to the northeast of Iliamna, as well as use of some all-terrain vehicle (ATV) trails around the Iliamna area for

transportation, subsistence, and recreation. Recreation opportunities also exist in the Gibraltar River and Gibraltar Lake portions of the port access road corridor, where some local lodges advertise guided fishing, hunting, and sightseeing trip options (Haugen, Bush, and Rice 2003). Recreational sport hunting and snowmachine use may occur occasionally in this road corridor. Some boating takes place (motorized and non-motorized) at Iliamna Lake, both as an activity and as a means of accessing other recreation opportunities, primarily fishing, which is the main recreation activity at Iliamna Lake along with boating (ADNR 2013a). Due to its current inaccessibility and location of nearby recreation opportunities, recreational use of the port access road corridor and the Kokhanok spur road is likely low and would have low magnitude impacts.

Noise and activities along the transportation corridor during project construction, operations, and closure would affect the recreation setting and experiences for sport hunting, fishing, and other recreational activities in and surrounding the EIS analysis area by generating potential noise and visual impacts. Those lodges, guides, and clients that use the immediate area in the vicinity of the transportation corridor would experience an adverse effect on the quality of recreation experience. This effect would be long-term and certain if the transportation system is permitted and built. Roadway truck traffic of up to 35 round trips per day would result in noise-related impacts to the recreation setting about 1 to 2 miles from the roadway (see Section 4.19, Noise, for more information). Impacts on recreation opportunities and experiences in this area would be similar to those described above for the mine site but would last beyond the life of the project until the roads are decommissioned and reclaimed.

In addition to roadway traffic, operations would increase aviation traffic at both the Iliamna and Kokhanok airports as discussed in Section 4.12, Transportation and Navigation. Unless the size and/or power of project-related aircraft were substantially different than that of existing aviation traffic, the per-event sound levels associated with aircraft takeoff, landing, and taxiing would not change, and therefore would not be expected to cause an adverse noise effect beyond about 11 additional flights per week. Given the current level of aviation traffic at the Kokhanok airport, the increase in noise at the airport would primarily be due to the increase in aviation traffic from the project. Using a sleep disturbance criterion of 45 dBA L_{max} , the perpendicular distances from which a sleeping recreationist (not within a building) might be awakened is 6.5 miles and 4.5 miles for takeoff and approach, respectively. However, most flights would occur in the daytime. Based on the information above, the geographic extent of aircraft noise adversely affecting the recreation setting and experiences in the Kokhanok airport area by decreasing naturalness and may lead to displacement of recreation from a limited area of around 4.5 to 6.5 miles from the airport for the duration of the project. Based on the slight increase in aviation traffic at the Iliamna airport, noise-related impacts to the recreation setting and experiences surrounding the airport would generally be of low magnitude, expected for the duration of the project. The aircraft used would not fly through Lake Clark Pass and would not be noticeable to Lake Clark visitors.

The ferry terminals would result in long term, direct loss of recreational area during project construction, operations, and closure. This impact would be certain to occur if the ferry terminals were permitted and built, and limited to the immediate areas around the ferry terminals. However, given the low use of these portions of the corridor for recreation and the availability of comparable areas for recreation, the loss of acreage for recreation would likely result in minimal displacement of recreational use to other lands in the general area with similar habitat, and magnitude of impacts would be low.

Project-related construction, operations, and closure activities would result in noise impacts, geographically limited to 0.4 mile from ferry terminals for operations and up to 2 miles for closure activities, which would affect both on and off-water recreation uses surrounding the terminals for the life of the project.

Construction of the pipeline and ferry terminals and operation of the ferry would likely displace boaters from the area immediately surrounding the equipment, ferries, and facilities. Boaters would likely be displaced to other areas of the lake during project construction, operations, and closure to avoid the noise and hazards presented by the equipment and activities. Project-related noise and equipment would particularly affect non-motorized boating, which is generally a quieter activity that requires more time and effort to circumnavigate in-water obstructions, and thus the ferry and infrastructure would be a hinderance. Magnitude of impacts would be medium to high for recreation at Iliamna Lake during construction, but would be low during project operations because there would be just one ferry trip per day, which would not be expected to contribute considerably to boat traffic on the lake. The likelihood of the impact would be high if the ferry terminal is permitted and built. Although recreational lake boat traffic may slow down and avoid the ferry, alternative open water would be available for boating use during ferry operations. The ferry terminals would be visible from portions of the lake (about 3 to 5 miles from the terminal) and would change the recreation setting in these limited areas of the lake to a more developed setting for the duration of the project. However, recreationists could relocate to nearby lake areas and shorelines for a less developed setting. Impacts to night sky from ferry terminal lighting would have a larger geographic extent, affecting visibility of stars up to 12 miles from the ferry terminals. Impacts to land-based recreation opportunities, experiences, and settings would be similar to those described above for recreation near the mine site.

During the winter after adequate ice has formed, there is heavy snowmachine use of Iliamna Lake. Most of this use is considered transportation use; however, there is some recreational snowmachine use of the lake. The operational winter ice-breaking ferry traffic may displace snowmachine use in and adjacent to the ferry route across the lake; however, the remainder of the lake would be available for snowmachine use. For those traversing the lake across the ferry route, there would be alternate routes available; however, there would be an increase in time and distance. Therefore, magnitude of impacts would be high where ice-breaking would occur because it would eliminate recreational snowmachine use or add to the distance traveled, but those impacts would occur over a limited geographic extent. Impacts would be long term, occurring every winter during the life of the project and would be certain to occur if the project is permitted and built. Recreationists may need to take longer routes to avoid open water from the ice-breaking ferry (see Section 4.12, Transportation and Navigation, for more information on snowmachine traffic impacts).

Iliamna Lake provides opportunities for wildlife viewing, although there are no known opportunities specific to the ferry terminal locations, ferry route, or pipeline route. Fishing is the primary recreational use of the lake, and extensive opportunities for fishing are available given the lake's size. The project would likely displace wildlife and fish from the locations of the ferry terminals and ferry route during all phases, thus reducing the likelihood of viewing any wildlife or catching fish in and immediately adjacent to the EIS analysis area. Impacts would be of medium to high magnitude since the recreational experience could be reduced. These effects would be certain and long term if the project is permitted and built. Project noise would also alter the recreation setting of the terminal sites from quiet and remote to developed and active. Although all project phases would adversely affect wildlife viewing and fishing experiences and opportunities on Iliamna Lake, other locations around the lake may be available for displaced wildlife viewing and fishing use.

As stated in Section 4.11, Aesthetics, the magnitude of the effect of mine traffic would be highest when viewed from higher elevations or superior viewer positions, where visual contrast is strongest. Therefore, the presence of the mine and port access roads, mine traffic, and night lighting may adversely affect the recreation setting from visible distances of the transportation corridor by decreasing the naturalness of the area and increasing visible human development of

the area. This may adversely affect recreation experiences for people participating in wilderness or wilderness-type recreation opportunities. These impacts would be certain to occur if the mine is permitted and built, would begin during construction, and would be long term lasting through mine closure.

The mine access road would be visible from Roadhouse Mountain, where there is some known recreational use (see figures in Appendix K4.11). Therefore, the project would alter the setting for recreationists on Roadhouse Mountain by decreasing the naturalness of the area and increasing visible human development of the area. This may adversely affect recreation experiences for people participating in wilderness or wilderness-type recreation opportunities at Roadhouse Mountain. These impacts, though low magnitude, would occur throughout all phases of the project, and would last beyond project closure. Impacts would be certain to occur if Alternative 1a is permitted and implemented.

Similar to the mine site, project-related noise and activities along the Alternative 1a mine access road would not have substantial direct effects on recreational settings or activities in Lake Clark National Park and Preserve, which is 3 miles or farther from the corridor. Roadway traffic would generally result in noise-related impacts to the recreation setting, geographically limited to about 1 to 2 miles from the roadway, and project-related activities would generally result in noise impacts limited to 0.4 and 2 miles of the ferry terminals, for operations and closure activities, respectively. Given the distance of the Lake Clark park unit, noise impacts to recreation settings or activities would not be expected in the park unit.

The road and vehicles associated with the transportation corridor may be intermittently visible from the far northern edges of the preserve at high elevations; however, visibility from this distance would be limited. Similarly, the transportation corridor on the McNeil River State Game Refuge would be visible in some portions of the refuge, at higher elevations (see Appendix K4.11 for complete viewshed figures, and Section 4.11, Aesthetics, for more information on viewsheds and aesthetic impacts). These northern borders of the refuges are generally inaccessible; however, the construction, operations, and closure of the corridor could adversely affect the recreation experience for the few visitors using the northern border of both recreation areas from the change in recreation setting to a more developed and less remote, primitive area. Given the intermittent visibility, and the low level of recreational use of the northern borders of both refuges, the magnitude of impacts to recreation experiences from the transportation corridor would be low and the geographic extent of those impacts would be limited; however, they would be certain to occur and would last through mine operations and closure.

Activities in the transportation corridor would be visible to visitors flying over the corridor. The presence of roads, ferry terminals, and ferries in an otherwise generally primitive area would adversely affect the recreation experience post-closure until facilities are no longer needed and reclaimed. The recreational setting would change from remote and primitive to more developed and seemingly accessible for visitors flying over the corridor; however, because of the narrow road corridor and the small size of land displaced by the ferry terminals (27 acres), the geographic extent of impacts would be limited. The magnitude of impacts would be of medium magnitude, taking into account changes to recreation setting, number of recreationists affected, and the limited extent those impacts would be realized. The impact would be long term (lasting for some time post-closure) and would be certain if the transportation corridor is built.

The project may also have effects on incidental wildlife viewing along the transportation corridor; although the primary recreation use in most of the transportation corridor is likely from other activities, such as hunting and fishing. Movement and distribution of bears and other terrestrial mammals through the transportation corridor to the McNeil River State Game Refuge and Katmai National Park and Preserve may be disrupted; therefore, construction and operations activities

may have indirect adverse impacts on wildlife viewing in those recreation areas. In addition, the behavior of bears may be altered due to human exposure at the project facilities or altering migration patterns to avoid the project, though the nature or extent of behavior changes are unknown. Existing bear viewing facilities are site specific at both recreation areas; therefore, changes to bear behavior that result in changes to their typical feeding and other behavioral patterns could affect the ability of visitors to see bears from existing bear viewing facilities, resulting in direct adverse impacts on wildlife viewing. Changes in bear behavior from human exposure or food conditioning at project facilities could lead to bears that are adversely affected by or habituated to human activity. The magnitude of those impacts to bear viewing areas, to hunting and fishing camps, or in conjunction with other recreational activities, are unknown. These impacts would occur throughout the life of the project (see Section 4.23, Wildlife Values, for more information on impacts to bear movement and distribution and behavior).

Limited access to the roadways and ferry terminals would be available to local residents and businesses only (see Section 4.3, Needs and Welfare of the People—Socioeconomics). Therefore, the transportation corridor facilities would induce a small amount of recreation and could potentially expose some previously inaccessible areas to public access and use from a few residents near the mine and port access roads (PLP 2018-RFI 027). Depending on access agreements, there may be the possibility for non-local recreationists to gain access to the transportation corridor. The magnitude would be unknown.

Alternative 1a would result in increased air transportation associated with project construction and operations. There would be 20 to 40 flights per month (average of five to 10 flights per week) to Amakdedori port before the Kokhanok airstrip could be accessed by road. Once the Kokhanok spur road is established, there would be approximately 11 flights per week with Twin Otter aircraft to Kokhanok. Temporary impacts to recreational activities due to elevated noise would be of high magnitude and intermittent and could affect recreation opportunities at the Lake Clark or Katmai park units, McNeil River State Game Refuge, Alaska Maritime National Wildlife Refuge, or commercial lodges. During operations, project flights would include those transporting employees on 2-week rotations as well as cargo flights. These operational increases in air traffic have the potential to be observed by visitors to Lake Clark National Park and Preserve, where small aircraft are the primary transportation for park visitors; however, the potential would be reduced because flights from Anchorage to Bristol Bay generally fly over Iliamna Lake or the project area (FAA 2018) rather than the preserve (see Section 3.12 and Appendix K3.12, Transportation and Navigation). In addition, the Pebble-related air traffic would not conflict with small planes, which fly at lower altitudes and use narrow passes such as Lake Clark Pass. Helicopter traffic would remain throughout operations to perform ongoing environmental monitoring (variable of frequency and season) and aerial inspections of the transportation corridor (weekly or monthly) (PLP 2018-RFI 027b). These effects would be long term, occurring throughout the life of the project, and would be definite if the project is permitted and constructed. Operational impacts would be of medium magnitude, intermittent, and could affect recreational opportunities at the Lake Clark or Katmai park units, McNeil River State Game Refuge, Alaska Maritime National Wildlife Refuge, or commercial lodges.

4.5.3.3 Amakdedori Port

The construction and operation of Amakdedori port would directly impact 33 acres, including 2 acres of wetlands and other waters. These acres would be permanently removed from use for recreation opportunities. The impact would be certain to occur if the project and port are permitted and built.

Boat traffic to and from the port would be up to 27 concentrate vessels and 33 supply barges per year during operations. Concentrate vessels would be moored for four to five days at the lightering

locations, which could displace recreational boaters. There would be a larger number of boats used during construction with fewer used during operations. These impacts would be long term and certain to occur if the port is built; however, Cook Inlet is large with expansive shorelines and waters available nearby for any boaters displaced from construction or operation of the port or lightering sites. Construction, operations, and closure activities at Amakdedori port (including lightering) would therefore result in low magnitude adverse impacts on recreational boat traffic, and on boating experiences and opportunities around the port site, lightering locations, and in Cook Inlet. The visual presence of the port would affect the recreational setting for boaters in view of the port for the duration of the project and may adversely affect the recreational experience for boaters preferring a more natural/less developed setting. The geographic extent of these impacts would be limited to a small portion of Cook Inlet.

Construction, operations, and closure of the project may affect wildlife viewing, hunting, and fishing opportunities at the port site to the extent that they occur. Noise and activities would displace wildlife and fish from the immediate area adversely affecting wildlife viewing, hunting, and fishing opportunities and experiences. Recreationists would be less likely to see wildlife or catch fish for the duration of the project. There is known bear hunting at the port site, which would be eliminated for the duration of the project due to port activities and noise. Hunters would be displaced from the area. Although hunting is allowed in other nearby bear hunting locations, such as State lands farther north, there may not be areas of equal habitat and access. These impacts would be of low to medium magnitude because opportunities for known recreational activities would be reduced, to a limited geographic extent. In addition, similar activities could be experienced in nearby locations. Impacts would be long term, lasting for the duration of the project, and would be certain to occur if the port is permitted and built.

In addition, project-related noise and activities during construction, operations, and closure at Amakdedori port would adversely affect the recreational experiences of visitors in view and earshot of the port site due to the change from a quiet, undeveloped area to a developed site with visible facilities, generators, and in-water facilities. The extent of the impact would be those areas in view and earshot of the port. For the duration of the project, the adverse effects would displace visitors preferring a quiet, undisturbed recreation setting, or visitors who participate in recreation opportunities such as wildlife viewing, hunting, and fishing, which typically require a quiet, undisturbed recreation setting. Displacement of these visitors would shift recreation use to other areas or result in decrease of opportunity if suitable alternatives are not available. Magnitude of impacts would be higher in summer months during the peak visitation period for McNeil River State Game Refuge and the Alaska Maritime National Wildlife Refuge.

The port site, including construction, operations, and closure activities, would be visible from the Cook Inlet shoreline area farther north of the port, but visibility would decrease with distance out to about 10 miles. The port would be visible from some portions of the McNeil River State Game Refuge and Alaska Maritime National Wildlife Refuge islands and may be visible from flights over the site to regional recreation destinations such as Katmai National Park and Preserve, or towns farther west such as King Salmon or Naknek. The port site would be visible from the Chenik Creek area of the McNeil River State Game Refuge and would affect views from this recreation area. The lighting at the port would be visible to Chenik Creek, although long daylight hours in the summer would limit impacts. The port would not be visible from McNeil River Camp (see Appendix K4.11, Aesthetics), which is the main recreation area in the McNeil River State Game Sanctuary; therefore, views from this recreation site would not be affected, though vessel traffic may be evident and may intermittently affect the recreation setting at the camp during project construction and operations. The port would not be visible from the shore of Augustine Island and would not be discernable from elevated portions of the island. Impacts to night sky affecting visibility of stars could affect a small portion (about 2 percent) of McNeil River State Game Refuge.

These impacts on views would be long term and certain to occur if the port is permitted and built. On-water sightseeing and/or wildlife viewing may occur in these locations, but recreational use of McNeil River State Game Refuge shoreline areas is limited by access. Construction, operations, and closure at Amakdedori port could adversely affect the recreational experience for visitors participating in sightseeing or wildlife viewing opportunities in these surrounding areas by causing a change in the recreational setting to a more developed and less remote, primitive area; however, impacts would be of low magnitude due to the low number of visitors to the port site.

The project would not result in changes in access to McNeil River State Game Refuge or Sanctuary. Visitors fly in to the sanctuary where the main recreational use areas are located. McNeil River Camp, the main access point to the sanctuary and refuge, is 12 miles south of the Amakdedori port site. The main recreational use and access point of the McNeil River State Game Refuge is at Chenik Creek and Chenik Bay. Although the project may be visible from that point, there would not be displacement from that area.

4.5.3.4 Natural Gas Pipeline Corridor

The construction and operation of the compressor station on the Kenai Peninsula and materials sites for the pipeline would directly impact an area 308 acres in size, including 1 acre of wetlands and other waters. Potential impacts on recreation are described above for the transportation corridor where it shares a footprint with the natural gas pipeline. The construction of the pipeline between where it would come ashore north of Newhalen and the junction with the mine access road would temporarily disrupt recreation along that area. The noise and activity would displace hunting and fishing opportunities along that corridor, particularly fishing on the Newhalen River. During operations, the right-of-way (ROW) would follow roughly parallel to an existing road and would not open new areas to recreation, although it is possible that the ROW would be used by snowmachines and ATVs to avoid road traffic. These impacts to recreation use and experiences would be long term and continue beyond project closure. They would occur if Alternative 1a is implemented and the gas pipeline is permitted and built. Impacts to visitors flying over the pipeline would be the same as those described under the transportation corridor for this alternative.

Existing recreational use along the pipeline alignment in Cook Inlet and on the Kenai Peninsula consists of boating in the inlet; beach combing, clamming, fishing, and hunting in and around the area where the compressor station is located; and recreational use at the state park sites on the Kenai Peninsula. Boating in Cook Inlet is both an activity in itself and a means of accessing other recreation opportunities such as fishing, wildlife viewing, birdwatching, and beach combing.

Visible and audible effects from equipment present in Cook Inlet during project construction and closure would occur over a limited geographic extent to recreational boaters (motorized and non-motorized) about 2 to 3 miles from the activities and would be short term, lasting only during construction and closure activities. These impacts would temporarily displace any boating and fishing use from the area immediately surrounding the equipment and construction activity; however, alternate open water would be available for use by displaced boaters or anglers. This temporary displacement would cease upon completion of construction and closure activities, and the types of vessels and construction activities used for the project would be typical of the types of activities already occurring in the Cook Inlet. Impacts would be medium magnitude, since it would completely displace some recreational activities, but the activities could occur in other locations nearby. The impacts would be certain to occur if the pipeline is permitted and constructed.

Noise and activities during project construction and closure may temporarily adversely affect recreation experiences for visitors to the Stariski State Recreation Site approximately 1.5 miles north of the compressor station. Visitors participating in camping and picnicking may be

temporarily adversely affected by the change in recreation setting caused by noise from project activities, which would adversely affect their recreation experiences. Some visitors may be temporarily displaced from the site to other state parks or locally managed recreation sites along the Kenai. The campground at the state recreation site would be far enough away that temporary noise-related impacts to sleeping at the campground would not be expected. The compressor station would not be seen from Anchor Point State Recreation Area or Stariski Campground. Overall, the magnitude of impacts would be low and limited in their geographic extent. These temporary effects would be certain to occur during construction and closure if the pipeline and compressor station is permitted and built.

The recreation facilities including the boat launch and boat use at the Anchor River State Recreation Area are over 5 miles from the compressor station and pipeline; no visual impacts or noise impacts to Anchor River State Recreation Area are expected.

Recreation activities also occur in the general area surrounding the gas pipeline and compressor station outside of the two state park units, including beach combing, clamming, fishing, and hunting. Project construction and closure noise and activities would temporarily displace wildlife and fish from the area and could discourage hunting and fishing. Project construction may temporarily close a portion of the beach for recreation activities; but this impact would be short term, occurring only during the construction phase. Noise and activities from general project construction and closure would also temporarily adversely affect the recreation setting for beach recreation in view and earshot of the construction activities and thus may temporarily adversely affect recreational experiences for people in the area surrounding the compressor station and gas pipeline. Long-term impacts from the visual presence of the compressor station on the recreational setting and experiences would be low magnitude because it would introduce weak visual contrast against the existing landscape. The likelihood of these impacts would be certain if the pipeline and compressor station are permitted and built.

The pipeline would be south of Augustine Island in Cook Inlet. Some recreation occurs on the island itself; sightseeing of the island's volcano and wildlife occurs from the water. Therefore, equipment and noise associated with construction and closure would temporarily adversely affect sightseeing opportunities and experiences along the southwestern side of the island. These impacts would be low magnitude because of the low number of recreationists affected and because displaced boats would be able to view the island from other locations around the island that would not be affected by project equipment and noise. Noise impacts would be limited to approximately 2 to 3 miles from construction activity, with the exception of helicopter support, which would have further reaching effects.

The pipeline would not be visible above ground and would not remove any acreage from use for recreation opportunities. Recreation experiences for on-water or state park unit visitors during pipeline operations would be minimally impacted because of the presence of boat traffic during pipeline maintenance. These impacts would extend along the pipeline ROW. Their likelihood to affect recreation activities would depend on the timing of maintenance activity. Although there would be anchoring restrictions along the pipeline, recreation use could continue; the area around the pipeline in Cook Inlet, except for the width of the pipeline, would be available for anchoring.

4.5.4 Alternative 1

This alternative would result in the direct loss of 9,600 acres of area available for recreation activities, including 2,188 acres of wetlands and other waters. This includes the mine site, transportation corridor, port, and natural gas pipeline components. The impact would be long term, lasting through the life of the project and would be certain to occur if Alternative 1 is permitted and built.

Transportation facilities would directly impact 1,143 acres of land, including 60 acres of wetlands and other waters, and would remove those acres from use for recreation opportunities. The magnitude of impacts on recreation from the mine site would be the same as discussed under Alternative 1a. These impacts would be long term and would be certain to occur if Alternative 1 is permitted and built.

Noise and activities along the transportation corridor during project construction, operations, and closure would be the same as discussed for the port access road of Alternative 1a and would affect the recreation setting and experiences for sport hunting, fishing, and other activities in and surrounding the EIS analysis area by generating potential noise and visual impacts. These impacts would occur where the transportation corridor crosses the Gibraltar River. Along the mine access road, there are recreational use opportunities in the general road area, particularly along the Newhalen River and Upper Talarik Creek (UTC). Due to its current inaccessibility and location of nearby recreation opportunities, recreational use of the mine access road corridor and the Iliamna spur road is likely low and would have low magnitude impacts. The types of impacts would be the same as described under Alternative 1a.

Project-related noise and activities would not affect recreational settings or activities in Lake Clark National Park and Preserve, which is over 8 miles at its closest point from the transportation corridor (along the Iliamna spur road). The geographic extent of impacts from the transportation corridor would be limited because it would only be visible from high elevations in the southwestern corner of the park near Roadhouse Mountain (see Section 4.11, Aesthetics). Due to the distance of the park unit from the transportation corridor, roadway, ferry, and aviation noise during all project phases, it would not be expected to affect recreation settings or experiences for park users.

Impacts to boating and snowmachine use on Iliamna Lake would be the same as those discussed under Alternative 1a.

As discussed for Alternative 1a, movement and distribution of bears and other terrestrial mammals through the transportation corridor to the McNeil River State Game Refuge and Katmai National Park and Preserve may be disrupted and may have some indirect adverse impacts on incidental wildlife viewing in those areas. Bears' behavior may be altered due to human exposure at the project facilities or altering migration patterns to avoid the project, though the nature or extent of behavior changes are unknown. Impacts would be the same as discussed for Alternative 1a.

Impacts to recreation activities near Amakdedori port would be the same as Alternative 1a; some activities may be displaced in the immediate area, and the port would be visible from offshore. Barge traffic may be noticeable to recreationists in Cook Inlet.

Impacts on recreation from construction and operation of the natural gas pipeline would be the same as the transportation corridor where they are co-located. Impacts of the natural gas pipeline through Cook Inlet and on the Kenai Peninsula would be the same as discussed under Alternative 1a.

4.5.4.1 Alternative 1—Kokhanok East Ferry Terminal Variant

The magnitude of impacts from the Kokhanok East Ferry Terminal Variant would be similar to those described above for Alternative 1. The geographic extent of impacts would be a direct loss of 9,599 acres including 3,504 acres of wetlands and other waters available for recreation activities. This includes all project components. The loss would be long term and certain to occur if this Alternative 1 ferry terminal variant is chosen, permitted, and built.

4.5.4.2 Alternative 1—Summer-Only Ferry Operations Variant

The Summer-Only Ferry Operations Variant would avoid impacts to snowmachine use of the lake (see Section 4.12, Transportation and Navigation, for impacts to non-recreational lake traffic). The magnitude of impacts during summer months would be higher than Alternative 1 due to daily truck traffic between the mine site and the port that would double to 78 round-trips per day on either side of the ferry route, or approximately 5.5 trucks per hour crossing in each direction (PLP 2018-RFI 065). In addition, a summer-only ferry operation would double to require two daily ferry trips. The geographic extent of impacts would be the direct loss of area available for recreation activities would be 9,661 acres. This includes all project components. These impacts would be long term lasting for the life of the project and would be realized if the Summer-Only Ferry Operations Variant is chosen and implemented.

4.5.4.3 Alternative 1—Pile-Supported Dock Variant

The impacts from the Pile-Supported Dock Variant would be similar to those described above, except the dock footprint would be smaller (i.e., 22 acres). There would be a direct loss of 9,589 acres available for recreation.

4.5.5 Alternative 2—North Road and Ferry with Downstream Dams

This alternative would result in the direct loss of 9,763 acres of area available for recreation activities, including 2,268 acres of wetlands and other waters. This includes the mine site, transportation corridor, port, and natural gas pipeline components. The impact would be long term, lasting through the life of the project and would be certain to occur if Alternative 2 is permitted and built.

4.5.5.1 Mine Site

Project construction, operations, and closure at the mine site would result in the physical removal of 8,478 acres of land currently available for recreation. This would include the loss of 2,135 acres of wetlands and other waters. Magnitude of impacts on recreation from the mine site would be the same as discussed under Alternative 1a although the geographic extent would be slightly larger. These impacts would be long term and would be certain to occur if Alternative 2 is permitted and built.

4.5.5.2 Transportation Corridor

The transportation corridor under this alternative would result in the direct loss of 887 acres of area available for recreation activities, including 60 acres of wetlands and other waters. Visitors would likely be displaced to other lands in the general area with similar habitat. These impacts would be long term and would occur if Alternative 2 is permitted and built. Impacts along the mine access road to Roadhouse Mountain would be the same as Alternative 1a.

There are opportunities for hunting bear and moose in and adjacent to the transportation corridor. Magnitude of impacts on sport hunting opportunities and experiences from project-related noise and activities would be similar to those described above for the mine site under Alternative 1a; geographic extent of impacts would be slightly less.

Impacts to visitors flying over the corridor would be the same as those described under the transportation corridor for Alternative 1a, with fly-in visitors to the lodges in the Pedro Bay area in particular being affected by the change in recreation setting with the additional road, ferry terminal, and gas pipeline development.

Northern Iliamna Lake and the surrounding area provide opportunities for wildlife viewing. There are no known opportunities specific to the ferry terminal locations, ferry route, or road corridor. However, the movement and distribution of bears and other marine and terrestrial mammals throughout the transportation corridor may be disrupted by project activities over the long-term. Thus, construction and operations activities may have some indirect adverse impacts on wildlife viewing, including viewing of the Iliamna Lake harbor seals, in the transportation corridor. These impacts would occur if Alternative 2 is chosen, permitted, and built (see Section 4.23, Wildlife Values, for more information on impacts to wildlife movement and distribution).

Impacts to recreational fishing under Alternative 2 would be the same as those described under Alternative 1a; however, there are more guided fishing operations that could be impacted by Alternative 2.

Impacts to boating and snowmachine use on Iliamna Lake would be the same as those discussed under Alternative 1a (see Section 4.12, Transportation and Navigation, for impacts to non-recreational lake traffic); however, the impacts to these activities would occur in the northeastern side of the lake. The opportunities for hunting and fishing in these areas are different from those under Alternative 1a, and therefore would disrupt different boat and snowmachine traffic for those uses.

Similar to the mine site, project-related noise and activities along the Alternative 2 transportation corridor would not have substantial direct effects on recreational settings or activities in Lake Clark National Park and Preserve, which is 3 miles or farther from the corridor. Project-related construction, operations, and closure activities under Alternative 2 would result in similar noise impacts to those described for the Alternative 1a transportation corridor. Roadway traffic would generally result in noise-related impacts to the recreation setting, geographically limited to about 1 to 2 miles from the roadway; project-related activities would generally result in noise impacts limited to 0.4 and 2 miles of the ferry terminals for operations and closure activities, respectively. Given the distance of the Lake Clark park unit, noise impacts to recreation settings or activities would not be expected in the park unit.

The magnitude of effect of the transportation corridor, including the roads and the ferry terminals, would be highest from higher elevation or superior viewer positions located in the west end of the Lake Clark park unit (see Section 4.11, Aesthetics). Visitors to these few locations in the park would be able to see the transportation corridor, which would adversely affect recreation experiences, particularly wilderness experiences, due to the increased sight of human-made development (see Appendix K4.11 for project viewshed models). These impacts would occur through all phases of the project and would last beyond project closure. They would be certain to occur if Alternative 2 is permitted and built.

Transportation corridor facilities would not expose previously inaccessible areas to public access and use for some area residents as roads would either be for private use only, used by some residents in coordination with PLP, or would be located near an existing roadway. The improved Williamsport-Pile Bay Road would be in the vicinity of the current Williamsport-Pile Bay Road and would not create access to a previously inaccessible area. The mine access road and new portions of the port access road would have controlled access with scheduled public or shipping use. This would enhance the economic and logistic appeal of shipping supplies to villages so that recreational equipment (such as an ATV or a kayak) may be more readily available and/or less expensive to obtain. Thus, the road may increase recreation use on or around Iliamna Lake. Use of the transportation corridor and Pile Bay ferry terminal site may impact the annual transport of boats from Homer to Bristol Bay (see Section 4.12, Transportation and Navigation).

Construction of the natural gas pipeline along the port access and mine access roads would result in similar impacts to those described below for the Alternative 3 transportation corridor.

Frequency and impacts of flights to and from Iliamna would be the same as Alternative 1a. Construction cargo and passenger flight frequencies to the airstrip in Pile Bay would be similar to flight frequencies to Kokhanok under Alternative 1a. Impacts to Pedro Bay would be similar to those discussed for Kokhanok under Alternative 1a, including the use of the airport at Pedro Bay during construction. PLP would not construct a new airstrip at Diamond Point but would improve the existing airstrip near Pile Bay for limited use during construction.

4.5.5.3 Diamond Point Port

The construction of the Diamond Point port would result in the direct loss of 113 acres of area that is currently partially available for recreation, including 72 acres of wetlands and other waters. However, there are already some industrial activities occurring in the area; some authorized fill has already been placed for the Diamond Point Quarry project. Therefore, the magnitude and extent of recreational impacts in Cook Inlet would be less under Alternative 2 than Alternative 1a. The loss of recreational area would be permanent and would be certain to occur if the Diamond Point port is permitted and built.

Construction, operations, and closure noise and activities would displace wildlife and fish from the Diamond Point port area, thus adversely affecting wildlife viewing, hunting, and fishing opportunities and experiences by reducing the likelihood of seeing wildlife or catching fish. Project-related noise and activities during construction, operations, and closure at Diamond Point port would add to current adverse effects to recreational experiences of visitors in the port area due to existing activity at the quarry site and may lead to additional displacement of visitors from increased noise and visual disturbance in the area and reduced opportunities for wildlife viewing, hunting, and fishing. Geographic extent of effects would be limited to a relatively small portion of Cook Inlet. There are nearby alternate locations where such recreational activities could occur; therefore, impacts would be low magnitude but would be long term, lasting for the life of the project and would occur if the Diamond Point port is permitted and built.

Impacts to boating from the Diamond Point port would be similar to those described under Alternative 1a for the Amakdedori port, except during the period of time when commercial fishing boats are transported from Williamsport to Pile Bay. During this transport, boats can get backed up in Iliamna Bay. Project-related boat traffic, particularly during construction when more boats may be accessing the port site or during lightering activities, would be more noticeably affected during this time.

The Alaska Maritime National Wildlife Refuge is the only designated recreation area where the port site, including construction, operations, and closure activities, would be visible. The recreational setting in affected areas of the refuge would change from a natural, undeveloped setting with mostly fishing boat traffic, to a setting with visible developed facilities and larger vessel traffic. Therefore, project construction, operations, and closure may adversely affect recreation experiences for refuge visitors who desire a more natural (less human-made development) view for recreation activities such as wildlife viewing and nature photography. There would be no new access to the refuge created, but the US Fish and Wildlife Service has expressed concern over trespass in the refuge. However, because the Alaska Maritime National Wildlife Refuge would be approximately 13 miles from the port, magnitude of impacts would be low and geographic extent limited to portions of the refuge with views toward the port. These effects would be long term and would be realized if the Diamond Point port is permitted and built.

4.5.5.4 Natural Gas Pipeline

Impacts on recreation from construction of the natural gas pipeline through Cook Inlet (except near Ursus Cove) would be the same as discussed under Alternative 1a; however, the pipeline would pass north of Augustine Island.

Under Alternative 2, the natural gas pipeline would come into Ursus Cove and then cross land north to reach Cottonwood Bay and the Diamond Point port site. Ursus Cove is a known bear hunting location (H&H Alaskan Outfitters 2018); both Ursus Cove and Cottonwood Bay are known commercial fishing locations (ADNR 2001) and are used for recreational fishing as well. Both Ursus Cove and Cottonwood Bay may also be used for other hunting activities and wildlife viewing.

Project-related noise from construction of the natural gas pipeline would occur during construction and may result in temporary impacts to recreation settings and experiences. These impacts would be short term, lasting only through construction of the transportation corridor. The loudest anticipated noise would be from general activities and utility equipment with helicopter support. The noise level from this activity would exceed 30 dBA, which could cause sleep disturbance for recreationists up to 3.7 miles from the roadway. Therefore, recreation users in this area, including Lake Clark park unit users in the Roadhouse Mountain and Tazimina River areas, could be temporarily affected by noise from the construction of pipeline and roads. Temporary impacts to recreation from the increased noise level would include low magnitude adverse effects on the recreation setting and recreation experiences, particularly wilderness experiences due to increased human-made sounds. These impacts would be certain to occur if Alternative 2 is permitted and built.

The magnitude and extent of noise and activities related to construction of the natural gas pipeline would be sufficient to temporarily displace wildlife and fish from the vicinity of the construction area, thus reducing the likelihood of viewing or hunting any wildlife or catching fish in and immediately adjacent to the EIS analysis area. These temporary construction impacts would occur along the rivers and areas in the northern Iliamna Lake area crossed by the pipeline, as well as the Diamond Point port site, Cottonwood Bay, and Ursus Cove. The impacts would occur if Alternative 2 is built and permitted. Hunters, anglers, or guides who currently use these areas would likely stop using these areas and would be displaced to other areas during construction activities.

During operations, the pipeline ROW between the two ferry terminals may create a route for ATV or snowmachine traffic (see Section 4.12, Transportation and Navigation). The most likely users of this new route along the ROW would be the residents in the communities of Pedro Bay, Nondalton, Iliamna, and Newhalen. Therefore, low magnitude impacts would result from an increase in recreation use along the ROW, in particular to gain access to hunting and fishing areas along the ROW, which previously would have been more difficult to access. If recreation use were to increase along the ROW via motorized vehicles, this may adversely affect recreation experiences for current visitors to the pipeline ROW area desiring solitude and other wilderness-type experiences. These impacts to recreation use and recreation experiences would be long term and continue beyond project closure; they would occur if Alternative 2 is implemented and the gas pipeline is permitted and built. Impacts to visitors flying over the pipeline would be the same as those described under the transportation corridor for this alternative.

The magnitude of impacts would be highest from the cleared pipeline ROW between the junction with the mine access road and port access road, which would contrast with the existing natural landscape (see Section 4.11, Aesthetics). This would adversely affect recreation experiences for visitors that could see this contrast due to a decrease in naturalness, particularly from nearby higher elevations where a larger portion of the entire cleared ROW would be visible. These

impacts to the recreation setting and recreation experiences would be long term, extending beyond project closure. They would be realized if Alternative 2 is permitted and built.

Impacts to boaters on Cook Inlet and Iliamna Lake would be similar to those described for Alternative 1a.

4.5.5.5 Alternative 2—Summer-Only Ferry Operations Variant

The Summer-Only Ferry Operations Variant would avoid the winter impacts to snowmachine use of the lake (see Section 4.12, Transportation and Navigation, for impacts to non-recreational lake traffic). The magnitude of impacts of this variant would be higher in summer due to doubling the daily truck traffic between the mine site and the port to 78 round-trips per day on either side of the ferry route, or approximately 5.5 trucks per hour crossing in each direction (PLP 2018-RFI 065). In addition, a summer-only ferry operation would require two daily ferry trips instead of one. The extent of impacts to recreation would be the direct loss of 9,819 acres that would otherwise be available to recreationists. This includes all project components. These impacts would be long term, lasting through the life of the project and would be realized if the Alternative 2, Summer-Only Ferry Operations Variant was chosen, permitted and built.

4.5.5.6 Alternative 2—Pile-Supported Dock Variant

The magnitude of impacts from the Pile-Supported Dock Variant would be similar to those described above but 102 acres at the port site would be impacted. There would be a total loss of 9,753 acres available for recreation.

4.5.5.7 Alternative 2—Newhalen River North Crossing Variant

The magnitude of impacts from the Newhalen River North Crossing Variant would be similar to those described above but would occur at the location of the bridge and 907 acres of the transportation corridor would be impacted. There would be a total loss of 9,783 acres available for recreation.

4.5.6 Alternative 3—North Road Only

This alternative would result in the direct loss of 10,130 acres of area available for recreation activities, including 2,231 acres of wetlands and other waters. This includes the mine site, transportation corridor, port, and natural gas pipeline components. The impact would be long term, lasting through the life of the project and would be certain to occur if Alternative 3 is permitted and built.

Under Alternative 3, the extent and duration of impacts on recreation would be the same as discussed under Alternative 2 for the mine site, Diamond Point port, and portions of the north access road that overlap with the transportation corridor of Alternative 2. The magnitude of impact would be greater than Alternative 2 because the port site is currently undeveloped and does not have authorized fill as a quarry. Impacts from construction of the natural gas pipeline would be the same as Alternative 2; however, operational impacts from potential ATV or snowmachine use of the ROW would not occur as the pipeline would be in the ROW of the north access road, which would be a private use road. Therefore, public use of the road would be limited as would the magnitude of impacts. Impacts to the recreation setting and experiences from the road would be similar to those described for other alternatives.

Impacts from the north access road on recreation settings, opportunities, and experiences from project-related noise and activities would be similar to those described above for the mine site under Alternative 1a and under Alternative 2 for the natural gas pipeline. Impacted visitors would

likely be displaced to other lands in the general area with similar habitat. Impacts to visitors flying over the corridor would be the same as those described under the transportation corridor for Alternative 2. Impacts to recreational settings, experiences, and activities in Lake Clark National Park and Preserve would be the same as those described for Alternative 2.

The project may also affect incidental wildlife viewing along the transportation corridor; although most recreational use in the corridor is from other activities, such as fishing. Movement and distribution of bears and other terrestrial mammals through the corridor may be disrupted; therefore, construction and operations activities may have some adverse impacts on wildlife viewing along the transportation corridor. These impacts would be long term and would occur if Alternative 3 is permitted and built (see Section 4.23, Wildlife Values, for more information on impacts to bear movement and distribution).

There are fishing opportunities on the rivers and streams that cross the Alternative 3 transportation corridor, particularly along the Newhalen and Iliamna rivers due to the quality of fishing on these rivers and the presence of lodges in the Pedro Bay area. Construction noise and activities would displace fish at river/stream crossings, which would particularly affect fishing at the road crossings on the Newhalen and Iliamna rivers. Project noise would also change the recreation setting of the north access road corridor from quiet and remote to developed and active. Therefore, all project phases would adversely affect fishing experiences and opportunities along the transportation corridor. These impacts would occur where the transportation corridor crosses the Newhalen River; impacts would be long term and would occur if Alternative 3 is permitted and built. Impacts would be of medium magnitude because other portions of the streams crossed by the transportation corridor would be available for anglers that prefer a remote experience away from the roadway (see Section 4.6, Commercial and Recreational Fisheries, for more information on the economic impacts to fishing, and Section 4.12, Transportation and Navigation, for information on how structures would impact boat traffic).

The transportation corridor facilities would not expose previously inaccessible areas to public access and use as roads would either be for private use only, used by some area residents in coordination with PLP, or would be located near an existing roadway. Impacts to recreation from the Williamsport-Pile Bay Road would be the same as described under Alternative 2.

Impacts to boat portaging on the Williamsport-Pile Bay Road would be similar to those described for Alternative 2 (see Section 4.12, Transportation and Navigation).

Frequency and associated magnitude of effects from flights to and from Iliamna would be the same as under Alternative 1a. Flight frequencies to Pedro Bay and associated magnitude of effects would be similar to Alternative 2, but the connecting of Pedro Bay by road to the Cook Inlet would affect frequency of flights after construction if the road leads to more traffic through Pedro Bay. Potential effects from flights on Pedro Bay would be limited to resident crew change flights.

4.5.6.1 Alternative 3—Concentrate Pipeline Variant

The Concentrate Pipeline Variant would result in impacts of similar magnitude to those described above for Alternative 3. A total of 10,132 acres would be unavailable for recreation.

4.5.7 Cumulative Effects

Potential cumulative impacts to recreation include reduction of recreational opportunities and changes in recreational setting and experiences. The cumulative effects analysis area for recreation is the same as the EIS analysis area.

Past, present, and reasonably foreseeable future actions (RFFAs) in the cumulative impact analysis area have the potential to contribute to impacts on recreation. Section 4.1, Introduction to Environmental Consequences, details the past, present, and RFFAs considered for evaluation. Of the RFFAs detailed in this section, all types are considered to have the potential to cumulatively impact recreation in the analysis area because they would all introduce people and/or structures into the environment that could degrade or reduce the recreation setting and experience. Some listed RFFAs that were removed from further consideration include those outside the analysis area or those with temporary impacts, such as during construction.

4.5.7.1 Past and Present Actions

Past and present actions that have affected or are currently affecting recreation in the analysis area are minimal. Current development consists of a small number of towns, villages, and roads. Present activities include mining exploration and non-mining related projects, such as transportation, oil and gas development, or community development actions. These actions have resulted in displacement of recreation activities and adversely affected the recreation setting. While these actions have affected localized areas, they are also additive to other actions, increasing the total areas affected and compounding impacts to the recreation setting, opportunities, and experiences. Around the mine site, current and past exploration drilling at the Pebble deposit has disturbed some wildlife that attracts hunters and anglers, which has displaced some recreationists as well.

Recreation and subsistence activities are currently the most prevalent uses of the land in the region, including several lodges and opportunities for guided recreation activities. Participation in recreation and subsistence activities may be increasing slightly, which increases the number of people in the area and can detract from the recreation experiences of people looking for opportunities for solitude and wilderness.

4.5.7.2 Reasonably Foreseeable Future Actions

The RFFAs identified in Section 4.1, Introduction to Environmental Consequences, that could contribute cumulatively to recreation impacts and are carried forward in this analysis include mining claims; oil and gas development in Cook Inlet; road improvement projects; and continuance of recreation activities in the greater regional area.

The No Action Alternative would not contribute to cumulative effects on recreation.

Collectively, the project alternatives with RFFAs' contribution to cumulative effects on recreation are summarized in Table 4.5-2.

Table 4.5-2 Contribution to Cumulative Effects on Recreation

Reasonably Foreseeable Future Actions	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
<p>Pebble Mine Expanded Development Scenario</p>	<p>Mine Site: An expanded development scenario for this project would include additional years of mining and processing, and involve a larger mine site and transportation system footprint. In addition to removing the footprint acreage from potential recreation use, the expanded mine would also displace wildlife over a larger area than the project and thus opportunities for hunting, fishing, and wildlife viewing would be reduced. Recreation opportunities in the footprint and wildlife-related recreation opportunities surrounding the mine site area would be displaced to other lands in the region, although there are few recreationists in this area. Mineral exploration activities associated with expansion of the Pebble mine would increase the developed/modified area of the region, which would affect the recreation setting and thus recreation experiences for visitors in view and earshot of the mine site by reducing the naturalness of the area. There would also be additive effects to recreation experiences for visitors flying over the region because the landscape as a whole is more visible from a higher elevation, and the mine site would be more noticeable as it expanded. Due to the increase in development at the mine site, there would also be decreased opportunities for solitude in the area and increased recreation experience degradation for visitors participating in wilderness or wilderness-type activities or experiences.</p> <p>Mine expansion would place waste rock storage and water management into the headwaters of the UTC watershed; the expansion of the open pit and bulk tailings facility would increase the amount of disturbance in the North Fork Kuktuli and South Fork Kuktuli rivers. The potential effects of mine site expansion would affect fish habitat, distribution, and numbers; therefore, sport fishing in the immediate vicinity of the facilities would also be affected. Even under routine operations, there could be project-generated noise and perceived impacts</p>	<p>Mine Site: Similar to Alternative 1a.</p> <p>Other Facilities: Similar to Alternative 1a, except that the portion of the access road from the Eagle Bay ferry terminal to the existing Iliamna area road system would not already be constructed. The north access road would be constructed from the mine site to Iniskin Bay. A concentrate pipeline and a diesel pipeline would be constructed along the Alternative 3 road alignment and extended to a new deepwater port site at Iniskin Bay.</p> <p>Magnitude: Overall expansion would affect 32,148 acres that would be unavailable for recreation (more than the other alternatives), given that portions of the north access road and gas pipeline would not already be constructed. Impacts to recreation from mine expansion would be more than those under Alternative 1a.</p> <p>Duration/Extent: The duration/extent of cumulative impacts to recreation would be similar</p>	<p>Mine Site: Similar to Alternative 1a.</p> <p>Other Facilities: Expanded mine site development and associated contributions to cumulative impacts would be the same as Alternative 1a, although there would not be concurrent operations activities and traffic associated with Amakdedori port and the southern transportation corridor. Under Alternative 2, there would be a road constructed between the ferry terminals, resulting in impacts to recreation opportunities, experiences, and the recreation setting described above. Impacts from the Diamond Point port would also continue. Development in Iniskin Bay would result in impacts to recreation described under Alternative 1a, but would cumulatively contribute to impacts to recreation, and there would be existing impacts at the port site and in Iniskin Bay. The addition of a service road to both Iniskin Bay and between the ferry terminals would increase adverse impacts to recreation opportunities,</p>	<p>Mine Site: Similar to Alternative 1a.</p> <p>Other Facilities: Expanded mine site development and associated contributions to cumulative impacts would be the same as described under Alternative 1a. Under Alternative 3, additional project facilities would have the same impacts to recreation as discussed under Alternative 2, with the exception that there would be no ferry operations associated with Alternative 3 and that the north access road would already be constructed and in operation.</p> <p>Magnitude: Overall expansion would affect 31,541 acres that would be unavailable for recreation (fewer acres than Alternative 1a, and Alternative 1, but more than Alternative 2), given that the north access road and gas pipeline would already be constructed. Impacts to recreation from mine expansion would be less than those under Alternative 1a.</p> <p>Duration/Extent: The duration/extent of</p>

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Reasonably Foreseeable Future Actions	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
	<p>on the quality of the sport fishing experience in the upper portions of those drainages.</p> <p>Other Facilities: Because the Amakdedori port facility and the transportation corridor (including ferry) would continue to be used through the life of mine expansion, impacts to recreation in those areas would continue, although with levels of truck traffic reduced to 21 round trips per day after 20 years. The construction and operation of additional facilities in Iniskin Bay, along with concentrate and diesel pipelines and the north access to Diamond Point, would further reduce recreational opportunities, displace recreation opportunities to other areas and waters, and reduce the naturalness of the area, thus impacting the recreation setting and recreation experiences for those visitors desiring or requiring a natural setting. A new road from Pile Bay to Eagle Bay would result in impacts similar to those described for Alternative 3 and would cumulatively affect recreation opportunities and experiences in the region, as well as adversely affecting the overall recreation setting of the area by increasing development.</p> <p>Magnitude: The Pebble mine expanded development scenario project footprint would impact approximately 31,892 acres that would be unavailable for recreation.</p> <p>Duration/Extent: Potential cumulative effects on recreation associated with the expanded Pebble project would be longer in duration (78 total years of mining, with another 20 to 40 years of processing) than Alternative 1a. The extent would include the Amakdedori port and mine access road of Alternative 1a, and the port access road and Diamond Point/Iniskin Bay ports of Alternatives 2 and 3.</p> <p>Contribution: Recreation opportunities in the footprint and wildlife-related recreation opportunities surrounding the project area likely would be displaced to other lands in the region.</p>	<p>to those under Alternative 1a, although affecting more acres.</p> <p>Contribution: The contribution to cumulative effects would be slightly more than that under Alternative 1a and Alternative 2 and Alternative 3.</p>	<p>experiences, and the recreational setting, although it is likely that the ferry would cease operations once the access road was constructed. The use of the concentrate pipeline would reduce truck traffic associated with transporting copper/gold concentrate to Diamond Point.</p> <p>Magnitude: Overall expansion would affect 31,528 acres that would be unavailable for recreation (fewer acres than the other alternatives), given that a portion of the north access road and all of the gas pipeline would already be constructed. Impacts to recreation from mine expansion would be less than those under Alternative 1a.</p> <p>Duration/Extent: The duration/extent of cumulative impacts to recreation would be similar to those under Alternative 1a, although affecting fewer acres.</p> <p>Contribution: The contribution to cumulative impacts would be similar to that under Alternative 1a, although affecting fewer acres.</p>	<p>cumulative impacts to recreation would be similar to those under Alternative 1a, although affecting fewer acres.</p> <p>Contribution: The contribution to cumulative impacts would be similar to that under Alternative 1a, although affecting fewer acres.</p>

Table 4.5-2 Contribution to Cumulative Effects on Recreation

Reasonably Foreseeable Future Actions	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
Other Mineral Exploration Projects	<p>Magnitude: Mineral exploration is likely to continue in the analysis area for the mining projects listed above and involve summer drilling as well as helicopter and camp support. Mineral exploration activities could contribute cumulatively to degradation of recreation experiences, particularly wilderness experiences, through noise in the immediate vicinity of drilling, the presence of aircraft, and increases in landscape disturbance. Exploration activities would also reduce acreage available for recreation and displace wildlife, thereby reducing opportunities for hunting, fishing, and wildlife viewing in remote areas during the summer season. There would be additive effects to recreation experiences for visitors flying over the region because there would be more noticeable development in this remote area.</p> <p>Duration/Extent: Exploration activities typically occur at a discrete location for one season, although a multi-year program could expand the geographic area affected in a specific mineral prospect. Section 4.1, Introduction to Environmental Consequences, identifies seven mineral prospects in the EIS analysis area where exploratory drilling is anticipated (four are relatively close to the Pebble Project).</p> <p>Contribution: This contributes to cumulative effects of reduction or degradation of recreational experiences, although the areal extent of disturbance is a relatively small portion of the Kvichak and Nushagak watersheds.</p>	Similar to Alternative 1a.	Similar to Alternative 1a.	Similar to Alternative 1a.
Oil and Gas Exploration and Development	<p>Magnitude: Onshore oil and gas exploration activities could involve seismic and other forms of geophysical exploration, and exploratory drilling in limited cases. Impacts to recreation would be similar to those discussed for mining exploration. Noise, aircraft traffic, and the sight of exploration equipment would all affect the recreation experience in the immediate vicinity of activities.</p>	Similar to Alternative 1a.	Similar to Alternative 1a.	Similar to Alternative 1a.

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Reasonably Foreseeable Future Actions	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
	<p>Offshore oil and gas exploration could detract from marine recreation experience in the immediate vicinity, although recreation activity in lower Cook Inlet is limited. Potential impacts from ship traffic associated with the ASAP and Alaska LNG projects would be similar.</p> <p>Duration/Extent: Seismic exploration and exploratory drilling are typically single season temporary activities. Ship traffic associated with the Alaska LNG or ASAP projects would occur for the construction and operational life of those projects.</p> <p>Contribution: Oil and gas projects in Cook Inlet could contribute cumulatively to temporary adverse impacts to boating, fishing, and boat traffic in the Cook Inlet if construction periods overlapped. Note that there would not be development of both the Alaska LNG and ASAP projects; only one of these two projects would be carried forward. Onshore exploration and development would affect the recreation experience in the immediate vicinity of activities.</p>			
<p>Road Improvement and Community Development Projects</p>	<p>Magnitude: Anticipated road improvement projects in the region, such as the Williamsport-Pile Bay Road upgrade, could create new access to recreation areas and/or improve current access, thereby increasing opportunities for recreation but reducing opportunities for solitude and adversely affecting wilderness experiences. The most likely road improvements are in the development footprint of existing communities and would not affect recreation. Development in the vicinity of Stariski Creek could reduce the effect of the natural gas compressor station on the recreation setting by increasing development, thus decreasing the noticeability of the station. However, this development would also reduce the naturalness of the area, cumulatively affecting the recreation setting.</p> <p>The Diamond Point rock quarry could adversely contribute to cumulative impacts to recreational</p>	<p>Similar to Alternative 1a and Alternative 2; with greater impacts than Alternative 3</p>	<p>Cumulative impacts would likely be less under Alternative 2 due to commonly shared project footprints with the quarry site.</p>	<p>Similar to Alternative 2; less than Alternative 1a and Alternative 1.</p>

Table 4.5-2 Contribution to Cumulative Effects on Recreation

Reasonably Foreseeable Future Actions	Alternative 1a	Alternative 1 and Variants	Alternative 2 and Variants	Alternative 3 and Variant
	<p>opportunities and experiences, boat traffic, and changes to the recreation setting in Iliamna Bay.</p> <p>Duration/Extent: Disturbance from road construction would typically occur over a single construction season. The geographic extent would be limited to the vicinity of surrounding communities and Diamond Point.</p> <p>Contribution: Road construction could create new access to recreation areas and/or improve current access, thereby increasing opportunities for recreation but reducing opportunities for solitude and adversely affecting wilderness experiences.</p>			
Summary of Project contribution to Cumulative Effects	Overall, the contribution of Alternative 1a to cumulative effects to recreation, when taking other past, present, and reasonably foreseeable future actions into account, would be minor in terms of magnitude, duration, and extent, given the limited acreage and small number of recreationists that would be affected.	Similar to Alternative 1a, although slightly more acres would be affected by expansion of the Pebble Mine.	Similar to Alternative 1a, although slightly fewer acres would be affected by expansion of the Pebble Mine.	Similar to Alternative 1a, although fewer acres would be affected by expansion of the Pebble Mine.

Notes:
 ASAP = Alaska Stand Alone Pipeline
 LNG = Liquefied Natural Gas
 UTC = Upper Talarik Creek