

## Chapter 5 SUMMARY OF MITIGATION MEASURES

For each resource discussed in Chapter 3, Table 5-1 provides a list of mitigation measures that would be a part of the Proposed Action to avoid, minimize, or mitigate for potential impacts.

**Table 5-1. Summary of Mitigation Measures**

Environmental Resource	Mitigation Measure(s)
<b>Transportation</b>	<ul style="list-style-type: none"> <li>• Signage will be installed in advance of and during construction to inform the public regarding any traffic delays or interruptions.</li> <li>• Public advertisements will be completed (through direct mailers, newspaper advertisements, and local posters) regarding construction activities and potential closures along the existing Shotgun Cove Road.</li> </ul>
<b>Land Use</b>	<ul style="list-style-type: none"> <li>• Any proposed land use activities will be subject to applicable local land use permit requirements and will follow standards described in the City of Whittier Comprehensive Plan.</li> <li>• Any proposed activities subject to the Chugach Forest Plan will be consistent with the Forest Plan.</li> </ul>
<b>Recreation</b>	<ul style="list-style-type: none"> <li>• Approximately 13 acres of land will be reserved along the corridor for public recreation access as shown in Figure 3-3 and Appendix A.</li> <li>• Nine new parking lots will be constructed along the roadway and access roads as part of the Proposed Action. These parking lots will be constructed as construction of the roadway progresses from mile 2.0 to 4.5, with parking lots closer to mile 4.5 potentially not scheduled to be constructed until the last year of construction.</li> <li>• To mitigate for the loss of Emerald Cove Trail, at a few of these parking lots segments of the existing trail will remain and undergo minor improvements (and at one parking lot a new trail segment will be constructed) to lead to recreational resources or to shoreline access (Figure 3-3 and Appendix A). While the portions of Emerald Cove Trail to be left in place would not be widened or realigned, minor improvements will include:               <ul style="list-style-type: none"> <li>○ removing deteriorated or deficient puncheons and rebar;</li> <li>○ hardening the trail surface with gravel base or surface course, wood retainers, and/or puncheons;</li> <li>○ installing short-span (less than 10 feet) wood structures across small drainages;</li> <li>○ pruning of branches impeding on the trail; and</li> <li>○ removing old bridges in these sections.</li> </ul> </li> <li>• New wayfinding signs will be installed to direct travelers to Trinity Point, Emerald Cove, viewpoints, parking areas, beach access, hiking, and picnic areas.</li> </ul>
<b>Wetlands</b>	<p><i>Avoidance:</i></p> <ul style="list-style-type: none"> <li>• Fill area boundaries will be clearly delineated in the field to avoid accidental impacts from equipment operation and fill material placement.</li> <li>• In wetlands, the contractor will not place fill, clear vegetation, or run equipment outside the delineated clearing zone.</li> </ul>

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	<p><i>Minimization:</i></p> <ul style="list-style-type: none"> <li>• The clearing zone widths are the minimum necessary for project construction and safe operation on segments crossing wetlands.</li> <li>• Steep (5:1) road embankment slopes will be used on wetland crossings to minimize the footprint width while providing long-term stability.</li> <li>• Culverts and drainage mats will be installed in wetland areas as appropriate to minimize road effects on natural drainage patterns and to maintain hydrologic flow.</li> <li>• All BMPs and conditions identified in the USACE permit and ADF&amp;G Fish Habitat permit will be implemented.</li> </ul> <p><i>Mitigation:</i></p> <ul style="list-style-type: none"> <li>• Approximately 6.4 acres of wetlands within the project corridor will be excluded from public recreation areas, private land sales, or future development and protected in perpetuity.</li> <li>• A restoration project in wetlands or waters of the U.S. within the same watershed as the Proposed Action will be designed and executed to compensate for unavoidable wetlands losses.</li> <li>• Informational signage focused on wetlands education will be installed at key locations along the corridor such as parking areas and trailheads.</li> </ul>
<p><b>Fish, Wildlife, and Vegetation</b></p>	<ul style="list-style-type: none"> <li>• Clearing size will be kept to a minimum to reduce permanent forested habitat loss.</li> <li>• The project will follow USFWS guidance regarding migratory birds (including eagles and their nests) for Southcentral Alaska and would avoid vegetation and tree cutting/clearing between May 1 and July 15 or between March 1 and August 31 if within 660 feet of an active eagle nest (USFWS 2017). Blasting should not be performed within 0.5 mile of an active eagle nest during the breeding season.</li> <li>• The project design team has worked and would continue to work closely with ADF&amp;G biologists to determine stream crossing locations that would require design meeting ADF&amp;G fish passage criteria. An ADF&amp;G Fish Habitat Permit will be obtained prior to work involving streams containing fish.</li> <li>• In-water work in resident fish streams for culvert installations and stream rerouting will take place between late winter and mid-July as per ADF&amp;G recommendations.</li> <li>• Any blasting near resident fish streams will take place between late winter and mid-July as per ADF&amp;G recommendations. If determined by the contractor that blasting would be needed near the anadromous reach of the waterbodies, blasting will occur from November to March or May to July to minimize impacts to fish as per ADF&amp;G recommendations.</li> <li>• The contractor will draft a blasting plan which will adhere to the requirements of ADF&amp;G’s Alaska Blasting Standards for the Proper Protection of Fish (Timothy 2013), particularly:             <ul style="list-style-type: none"> <li>○ Blasting overpressures and peak velocities will be below the manual’s specifications (instantaneous pressure rise in the water column less than 7.3 pounds per square inch and peak particle velocities less than 2.0 inches per second).</li> </ul> </li> </ul>

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	<ul style="list-style-type: none"> <li>• Any culverts proposed for installation on NFS lands should be reviewed by Chugach National Forest staff prior to design approval to ensure consistency with best management practices.</li> <li>• Marine mammals will be protected from construction-related blasting noise through the use of protected species observers and shutdowns, as needed, during blasting. See Appendix C.</li> <li>• All construction equipment will be inspected and cleaned prior to entering and exiting the construction site to minimize spread of vegetative materials and invasive species.</li> <li>• The construction contractor will be provided with “Selected Invasive Plants of Alaska” (2009) booklet and black slug handout to assist in the identification, treatment, avoidance, and reporting of invasive species.</li> <li>• All footwear, gear, and equipment will be cleaned and free of invasive plant materials and slugs and slug eggs prior to entering the construction site. Work in or near invasive infestations will be avoided where practicable, especially where invasive plants have gone to seed as these seeds can contaminate gear and be spread to other sites (e.g., dandelions).</li> <li>• Ground disturbance will be limited to the existing site footprint where practicable. Trampling and ground disturbance that could create favorable seed beds for non-native plants or trample sensitive plant species would be prevented.</li> <li>• All invasive species will be reported to the permit administrator who will report the location information, species, and infestation size (for plants) immediately to the 1-877- INVASIV (1-877-468-2748) hotline.</li> <li>• To avoid spread of invasive species, exposed slopes will be stabilized using clean shot rock (riprap) or shredded wood mulch from cleared trees on site.</li> <li>• If revegetation is needed on NFS lands, approval will be requested from the permit administrator who will consult the Forest Service zone or forest ecologist to discuss and recommend seed mixes or materials prior to approval.</li> <li>• Informational signage focused on the importance of protecting native vegetation and wetlands and preventing the spread of invasive species will be installed at key locations along the corridor such as parking areas and trailheads.</li> </ul>
<p><b>Cultural and Historic Resources</b></p>	<ul style="list-style-type: none"> <li>• Project BMPs will limit the ground disturbance to within the clearing limits.</li> <li>• If previously unknown archeological materials or human remains are discovered during construction, all activities will cease in the immediate area of the finds pending further recommendations from the FHWA in consultation with the SHPO.</li> </ul>
<p><b>Soils and Geology</b></p>	<ul style="list-style-type: none"> <li>• Appropriate sediment and erosion control BMPs will be installed before construction begins and will be maintained in working order throughout the construction period, including:             <ul style="list-style-type: none"> <li>○ The contractor will be required to develop a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the Alaska Department of Environmental Conservation (ADEC) Alaska Pollutant Discharge Elimination System (APDES) to control and prevent soil erosion and sedimentation from the construction site.</li> </ul> </li> </ul>

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<b>Environmental Resource</b>	<b>Mitigation Measure(s)</b>
	<ul style="list-style-type: none"> <li>○ Erosion control measures (e.g., silt fence or other means) will be placed and maintained. These devices will remain in place until fill and other exposed earthwork attributable to the project are stabilized.</li> <li>○ Construction limits will be staked and clearly demarcated.</li> <li>○ Natural vegetation will be retained wherever possible.</li> <li>○ Temporary and permanent stabilization measures will be initiated as soon as practicable by the contractor, but within at least 14 days on all portions of the site where construction activities have temporarily or permanently ceased.</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>● None proposed</li> </ul>
<b>Visual Quality</b>	<ul style="list-style-type: none"> <li>● Project design includes a conservative clearing area (roughly 80 feet) to minimize disturbance to visual aesthetics.</li> <li>● No roadway lighting is proposed in conjunction with the Proposed Action.</li> <li>● Vegetation buffers will be left intact as much as possible along the project corridor.</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>● All equipment will be operated in accordance with manufacturers' recommendations to minimize emissions.</li> <li>● Idling heavy equipment will be shut down when not in use.</li> <li>● BMPs will be implemented during construction activities to mitigate fugitive dust and reduce particulate matter emissions, e.g., apply water as needed to control fugitive dust emissions.</li> </ul>
<b>Water Resources, Water Quality, and Floodplains</b>	<ul style="list-style-type: none"> <li>● The City may create approximately 8.5 acres of setback protection "non-disturbance zones" around select watercourses on City-owned land through the adoption of code. These zones will be defined in a future USACE permit application for the project.</li> <li>● Drainage ditches will be installed along the roadway, with wider ditches in muskeg areas (5 feet wide) to control surface water infiltration into the roadway.</li> <li>● The contractor would be required to develop a SWPPP in compliance with ADEC's APDES and BMPs will be implemented to control and prevent stormwater runoff from causing sedimentation in wetlands, and turbidity in open waters. Erosion control measures would be left in place until exposed areas are stabilized.</li> <li>● All equipment operated in or adjacent to water bodies or wetlands will be clean of oil and grease and properly maintained. Equipment operators will carry absorbent pads and spill response kits, provide containment and cleanup for portable fuel tanks (including hose and nozzle), follow approved disposal methods for waste products and repair leaky equipment promptly.</li> <li>● No fuel storage, vehicle fueling, or maintenance will be conducted within 100 feet of water bodies.</li> </ul>

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<b>Environmental Resource</b>	<b>Mitigation Measure(s)</b>
<b>Social, Community, and Environmental Justice</b>	<ul style="list-style-type: none"><li>• Construction schedules and other relevant information will be posted in public areas around Whittier such as the City office and the bulletin board at Begich Towers.</li><li>• Project information materials in languages other than English will be provided, if requested.</li></ul>