

Sterling Highway MP 45–60 Final EIS and Final Section 4(f) Evaluation

Chapter 4 *Final Section 4(f) Evaluation*



**Federal Highway Administration
Alaska Division
P.O. Box 21648
Juneau, AK 99802**

and

**Alaska Department of Transportation
and Public Facilities
P.O. Box 196900
Anchorage, AK 99519-6900**

March 2018

Note to Reader:

Changes in this document since the Draft SEIS was published in March 2015 have been highlighted in grey for easy identification by the reader. Deletions and spelling corrections are not shown for clarity purposes.

Table of Contents

4	Final Section 4(f) Evaluation	4-1
4.1	Introduction.....	4-1
4.1.1	Project and Legal Background.....	4-1
4.1.2	Project Purpose and Needs Summary.....	4-2
4.1.3	Alternatives.....	4-3
4.1.4	Section 4(f) Properties Considered and Process Used.....	4-3
4.2	Descriptions of Section 4(f) Resources.....	4-6
4.2.1	Background Regarding Section 4(f) Resources in the Project Area.....	4-6
4.2.2	Kenai River Special Management Area.....	4-7
4.2.3	Kenai National Wildlife Refuge	4-11
4.2.4	Resurrection Pass National Recreation Trail	4-17
4.2.5	Bean Creek Trail.....	4-19
4.2.6	Stetson Creek Trail	4-21
4.2.7	Forest Service Kenai River Recreation Area	4-22
4.2.8	Juneau Falls Recreation Area.....	4-24
4.2.9	Cooper Landing Boat Launch and Day Use Area	4-25
4.2.10	Historic Properties Introduction.....	4-26
4.2.11	Sqilantnu Archaeological District.....	4-26
4.2.12	Sqilantnu Russian River Confluence Site	4-28
4.2.13	Bean Creek Trail/Original Resurrection Pass Trail	4-32
4.2.14	Stetson Creek Trail	4-33
4.2.15	Charles G. Hubbard Mining Claims Historic District	4-34
4.2.16	Kenai Mining and Milling Co. Historic Mining District	4-35
4.3	<i>De minimis</i> Impact Findings	4-35
4.4	Potential Avoidance Alternatives	4-38
4.4.1	Overview of Avoidance Analyses	4-38
4.4.2	Ability to Avoid All Section 4(f) Properties.....	4-39
4.4.3	Ability to Avoid Individual Section 4(f) Properties	4-41
4.5	Impacts of the Build Alternatives on Section 4(f) Resources.....	4-42
4.5.1	Overview of Alternatives and their Impacts	4-42
4.5.2	Impacts of the Cooper Creek Alternative	4-44

4.5.3	Impacts of the G South Alternative	4-52
4.5.4	Impacts of the Juneau Creek Alternative and Juneau Creek Variant Alternative.....	4-58
4.6	Individual Section 4(f) Resource Avoidance and Minimization Options.....	4-71
4.6.1	Introduction.....	4-71
4.6.2	Kenai River Special Management Area.....	4-74
4.6.3	Kenai National Wildlife Refuge	4-81
4.6.4	Resurrection Pass Trail	4-86
4.6.5	Bean Creek Trail	4-91
4.6.6	Stetson Creek Trail	4-96
4.6.7	Forest Service Kenai River Recreation Area	4-98
4.6.8	Juneau Falls Recreation Area.....	4-101
4.6.9	Cooper Landing Boat Launch and Day Use Area	4-102
4.6.10	Sqilantnu Archaeological District.....	4-104
4.6.11	Confluence Site.....	4-107
4.6.12	Charles G. Hubbard Mining Claims Historic District	4-109
4.6.13	Kenai Mining and Milling Co. Historic District.....	4-111
4.7	Coordination Summary.....	4-112
4.7.1	Coordination: General Public	4-113
4.7.2	Coordination: Officials with Jurisdiction.....	4-113
4.8	Least Overall Harm Analysis.....	4-115
4.8.1	The Seven Factors of Analysis	4-115
4.8.2	Factors i and ii: Ability to Mitigate Impacts, and Magnitude of Remaining Impact.....	4-117
4.8.3	Factor iii: Relative Significance of Each 4(f) Property	4-128
4.8.4	Factor iv: Views of Officials with Jurisdiction.....	4-135
4.8.5	Factor v: The Degree to which Each Alternative Meets the Purpose and Need	4-140
4.8.6	Factor vi: Magnitude of Impacts to Non-4(f) Resources	4-145
4.8.7	Factor vii: Substantial Differences in Cost	4-148
4.8.8	Evaluation of Least Overall Harm	4-149
4.8.9	Least Overall Harm Conclusion.....	4-156

List of Maps

Map 4-1. Project vicinity and Section 4(f) properties..... 4-179

Map 4-2. Kenai River Special Management Area [Updated]..... 4-181

Map 4-3. Kenai National Wildlife Refuge in the MP 55 to MP 58 area [Updated] 4-183

Map 4-4. Sportsman's Landing and Russian River Ferry 4-185

Map 4-5. Resurrection Pass Trail..... 4-187

Map 4-6. Bean Creek Trail 4-189

Map 4-7. Bean Creek Trail reroute—detail for G South Alternative 4-191

Map 4-8. Stetson Creek Trail and Cooper Creek Campground..... 4-193

Map 4-9. Forest Service Kenai River Recreation Area 4-195

Map 4-10. Juneau Falls Recreation Area..... 4-197

Map 4-11. Cooper Landing Boat Launch and Day Use Area..... 4-199

Map 4-12. Sqilantnu Russian River Confluence Site—treated as a Traditional Cultural Property [Updated]..... 4-201

Map 4-13. Likely Section 4(f) properties in the Cook Inlet area..... 4-203

Map 4-14. Measures to minimize harm [Updated]..... 4-205

List of Figures

Figure 4.5-1. Simulated before (top) and after (bottom) views of proposed bridge crossing site of Juneau Creek Canyon, as it might be seen from the Resurrection Pass Trail as the trail passed beneath the bridge..... 4-61

Figure 4.5-2. Simulated view of proposed bridge crossing of Juneau Creek Canyon, as seen from the existing informal Juneau Falls overlook area. From this location, the view of the falls is upstream, and the view of the bridge would be downstream..... 4-67

Figure 4.6-1. Bean Creek Trail, surrounding Section 4(f) properties, and potential realignment of the G South Alternative 4-91

Figure 4.6-2. Bean Creek Trail, surrounding Section 4(f) properties, and potential realignment of the Juneau Creek Alternatives 4-95

Figure 4.6-3. Cooper Landing Boat Launch and Day Use Area, Cooper Creek Alternative, and surrounding properties 4-103

List of Tables

Table 4.1-1. Section 4(f) resources used by Sterling Highway alternatives..... 4-5

Table 4.3-1. Findings regarding *de minimis* impact 4-37

Table 4.5-1. Overview of acreage of Section 4(f) resources used	4-43
Table 4.5-2. Section 4(f) use and the Juneau Creek alternatives	4-58
Table 4.8-1. Section 4(f) use ^a , accounting for <i>de minimis</i> impact	4-116
Table 4.8-2. Cooper Creek Alternative use overview.....	4-117
Table 4.8-3. G South Alternative Section 4(f) use overview.....	4-120
Table 4.8-4. Juneau Creek Alternative use overview	4-124
Table 4.8-5. Juneau Creek Variant Alternative use overview	4-124
Table 4.8-6. Use and recognition of 4(f) properties affected by alternatives	4-130
Table 4.8-7. Categories of relative significance among 4(f) properties	4-133
Table 4.8-8. Factors relating to congestion (Need 1).....	4-141
Table 4.8-9. Factors relating to design standards (Need 2)	4-142
Table 4.8-10. Predicted numbers of crashes (2043) (MP 45–60).....	4-143
Table 4.8-11. Factors relating to protection of the river (purpose statement) [New]	4-144
Table 4.8-12. Costs by alternative	4-149
Table 4.8-13. Summary of Section 4(f) use for Sterling Highway alternatives	4-163
Table 4.8-14. Least Overall Harm Factor i, ability to mitigate adverse impacts to Section 4(f) properties.....	4-165
Table 4.8-15. Least Overall Harm Factor ii, severity of impacts to Section 4(f) properties after mitigation.....	4-167
Table 4.8-16. Least Overall Harm Factors iii and iv, relative significance of Section 4(f) properties, and views of officials with jurisdiction regarding Section 4(f) properties	4-169
Table 4.8-17. Least Overall Harm Factor v. degree to which alternative meets purpose and need.....	4-171
Table 4.8-18. Least Overall Harm Factor vi, magnitude of impacts to non-4(f) resources.....	4-173
Table 4.8-19. Least Overall Harm Factor vii, substantial cost difference analysis in 2014 dollars.....	4-177

4 Final Section 4(f) Evaluation

4.1 Introduction

4.1.1 Project and Legal Background

Section 4(f) of the Federal Department of Transportation Act prohibits use of certain parks, recreation areas, wildlife refuges, or historic properties for transportation projects unless there is “no prudent and feasible alternative” or the impacts are “de minimis.” This chapter further explains the law and analyzes properties in the project area protected by Section 4(f) and the impacts to those resources that would be caused by the various alternatives.¹ The project area is depicted on Map 4-1 at the end of this chapter.

Section 4(f) Maps

The numbering convention for maps in this chapter is different than the numbering used in other chapters. While maps in other chapters are labeled according to the subsection in which they appear, all maps in this chapter are numbered simply as Map 4-1, Map 4-2, and so on, and all appear together at the end of the chapter.

Section 4(f) of the Department of Transportation Act of 1966 (as amended), 49 United States Code (USC) § 303(c), states:

The Secretary (of Transportation) may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if—

- (1) there is no prudent and feasible alternative to using that land; and
- (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Also, 49 USC 303 states requirements related to minimal impacts to a Section 4(f) resource:

[Section 4(f)] requirements...shall be considered to be satisfied...if the Secretary (of Transportation) determines, in accordance with this subsection, that a transportation program or project will have a *de minimis* impact on the area.

49 USC 303(d)(1)(B)

¹ Some information in this chapter is based on *Background for FHWA Determination of Section 4(f) Applicability (Background; HDR 2008c)*, a report on file with the Federal Highway Administration (FHWA) and Department of Transportation and Public Facilities (DOT&PF). The *Background* document contains confidential information on historic properties and therefore is not published for general distribution, but information from the report is summarized in this chapter and in Chapter 3 of this Final Environmental Impact Statement (EIS).

The Secretary may make a finding of *de minimis* impact for historic sites only if—

- (A) the Secretary has determined, in accordance with the consultation process required under Section 106 of the National Historic Preservation Act (16 USC 470f), that—
 - (i) the transportation program or project will have no adverse effect on the historic site; or
 - (ii) there will be no historic properties affected by the transportation program or project;
- (B) the finding of the Secretary has received written concurrence from the applicable State historic preservation officer or tribal historic preservation officer (and from the Advisory Council on Historic Preservation if the Council is participating in the consultation process); and
- (C) the finding of the Secretary has been developed in consultation with parties consulting as part of the process referred to in subparagraph (A).

-49 USC 303(d)(2)

The Secretary may make a finding of *de minimis* impact for parks, recreation areas, and wildlife or waterfowl refuges only if—

- (A) the Secretary has determined, after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- (B) The finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.

-49 USC 303(d)(3)

The term “feasible and prudent (avoidance) alternative” (from the first quoted block above) is defined in the Federal Highway Administration (FHWA) Section 4(f) regulations in 23 Code of Federal Regulations (CFR) 774.17: an alternative is not feasible if it cannot be built as a matter of sound engineering judgment and is not prudent if it compromises the project to the degree that it is unreasonable to proceed with the project in light of its stated purpose and need or creates extraordinary impacts.

This chapter evaluates Section 4(f) resources, the impacts of the proposed alternatives, alternatives that could avoid use of Section 4(f) resources, and all possible measures to minimize harm to these resources (see the “Process” box in Section 4.1.4 and in subsequent sections).

4.1.2 Project Purpose and Needs Summary

The summary presented here is based upon the detailed purpose and need description in Chapter 1.

The Sterling Highway is part of the National Highway System and the Interstate Highway System, but in the greater Cooper Landing area it also functions like a rural collector road. The purpose of the project is to bring the highway up to current standards for a rural principal arterial to efficiently and safely serve through-traffic, local community traffic, and traffic bound for recreation

destinations in the area, both now and in the future. In achieving this transportation purpose, the Alaska Department of Transportation and Public Facilities (DOT&PF) and FHWA recognize the importance of protecting the Kenai River corridor.

DOT&PF and FHWA have identified three interrelated needs to resolve problems in the Milepost (MP) 45–60 project area:

- ***Need 1: Reduce Highway Congestion.*** The construction of multiple driveways and connecting side streets over time, combined with a curvy, constrained alignment with little passing opportunity and increasing traffic volumes, has led to considerable congestion that is forecast to worsen in future years. As a result, the highway performs below a desirable level of service for a rural principal arterial that is a component of the National Highway System.
- ***Need 2: Meet Current Highway Design Standards.*** Existing characteristics of the Sterling Highway do not meet current design standards for a rural principal arterial road. The existing highway contains curves, grades along Kenai Lake, shoulders, guardrail, and clear zones² that do not meet current design standards.
- ***Need 3: Improve Highway Safety.*** Due to the interrelated effects of highway congestion and outdated highway design characteristics, the project area has a higher-than-average number of traffic crashes and a greater severity of crashes when compared to the statewide average.

4.1.3 Alternatives

Chapter 2 of **this Final** Environmental Impact Statement (EIS) describes the project area and alternatives, including the alternatives development process, and alternatives previously considered but determined not reasonable. These alternatives figure into the discussion of potential ways to minimize harm to Section 4(f) properties that appears in Section 4.6. Section 4.6 provides greater detail on various past alternatives than does Chapter 2, so no additional detail is provided here.

4.1.4 Section 4(f) Properties Considered and Process Used

All build alternatives would use land from multiple Section 4(f) properties in the project area. Those 4(f) properties for which there is a use by any of the build alternatives appear in Table 4.1-1. There are several other Section 4(f) properties in the project area for which no use would occur—Sportsman’s Landing Boat Launch near MP 55; Cooper Creek Campground near MP 51; several adjoining and overlapping Forest Service, U.S. Department of Agriculture (Forest Service) properties along the Russian River, namely the Russian River Recreation Area, Forest Service Russian River Campground, Russian River Trail, and Russian River Angler’s Trail; a New Village Site treated as a Traditional Cultural Property (TCP); and several historic buildings, including

² Clear zone: A clear zone is an unobstructed, relatively flat area that runs the length of a highway beyond the edges of the outer lanes. Such an area allows a driver to stop safely or regain control of a vehicle that leaves the traveled way (FHWA (U.S. Federal Highway Administration) 2006a).

Broadview Guard Station, Gwin’s Lodge, and historic structures along the existing highway in the community of Cooper Landing.

Map 4-1 at the end of this chapter illustrates the Section 4(f) properties in the project area. The map includes all the properties listed in Table 4.1-1 plus the other Section 4(f) properties³ for which there would be no Section 4(f) use. This document includes these other properties because they have been central to the analysis for this project and their context is important in later discussion (particularly in discussion of rerouting alternatives to avoid or minimize harm to individual Section 4(f) properties). Map 4-2 through Map 4-12 provide detail on the properties that would be used by one or more of the alternatives. The mosaic of Section 4(f) properties in the project area, coupled with the mountain and river geography of the Kenai River Valley, creates a particularly complex set of Section 4(f) properties through which to thread any transportation alignment. All four build alternatives would use land from multiple properties subject to Section 4(f) protection.

Process used in this Section 4(f) Evaluation

Because the Sterling Highway project area presents a complex set of Section 4(f) properties, informational boxes like this one will be used to outline the steps employed and to indicate where the reader is in the process. The process outline, with the current step in bold, is as follows.

- 1. Identify Section 4(f) properties.**
2. Evaluate whether any impact is likely to be a *de minimis* impact.
3. Identify any alternatives that would avoid all Section 4(f) properties.
4. Present the impacts of proposed alternatives on Section 4(f) properties.
5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.
6. Evaluate least overall harm.

This chapter examines potential impacts to the Section 4(f) properties by the project alternatives, as well as the potential to avoid Section 4(f) properties or to minimize harm to the properties (see the accompanying “Process” box above). Table 4.1-1 also indicates generally which alternatives would affect each Section 4(f) property. Sites not subject to Section 4(f) protection are generally not discussed in this chapter, and unaffected sites usually are mentioned only in the context of potential avoidance alternatives. For information on the effects to parks, recreation resources, and other properties not subject to Section 4(f) (or for which no use occurs), see Section 3.8, Park and Recreation Resources. Section 3.9, Historic and Archaeological Preservation, provides information regarding historic properties and may be useful as a guide to the more detailed discussion contained in this chapter.

The process concludes with an analysis to assist in determining which alternative would have the “least overall harm.” That analysis serves as a summary of the rest of the chapter and incorporates the most important issues from the rest of the Final EIS (see Section 4.8). Table 4.8-14 through Table 4.8-19 at the end of this chapter present a summary of the least overall harm factors.

³ Some historic properties, including archaeological sites and sites treated as traditional cultural properties, are not shown to protect historic resources.

Table 4.1-1. Section 4(f) resources used by Sterling Highway alternatives

Property type and name	Ownership (management, if different)	Property Size (acreage)	Alternatives that would use this 4(f) property
Park			
Kenai River Special Management Area	State	720.0 ^a	CC, GS, JCV
Wildlife Refuge			
Kenai National Wildlife Refuge	USFWS	1.92 million	JC
Recreation Area			
Resurrection Pass Trail	Forest Service	4,600.0	JC, JCV
Bean Creek Trail (recreation portion) ^b	Forest Service, State (Forest Service)	31.0 ^b	GS
Stetson Creek Trail ^b	Forest Service, Borough (Forest Service)	51.0 ^b	CC
Forest Service Kenai River Recreation Area	Forest Service	282.0	CC, GS, JCV
Juneau Falls Recreation Area	Forest Service	320.0	JC, JCV
Cooper Landing Boat Launch and Day Use Area	State	5.3	CC
Historic/Archaeological Area			
Sqilantnu Archaeological District ^c	Multiple	12,600.0	All
Confluence Site ^d	Multiple	1,187.0	All
Bean Creek Trail (historic portion) ^b	Forest Service	26.0 ^b	GS, JC, JCV
Stetson Creek Trail ^b	Forest Service, Borough (Forest Service)	51.0 ^b	CC
Charles G. Hubbard Mining Claims Historic District	Forest Service, State	444.0	CC, GS
Kenai Mining and Milling Co. Historic District	Forest Service, State, Borough	29.1	CC

^a The KRSMA encompasses 105 river miles from the east end of Kenai Lake nearly to the mouth of Kenai River. Full acreage is not reported by Alaska State Parks. In the project area, the park is the submerged lands of the Kenai River and Kenai Lake only, and within the boundaries of KNWR it is the water column only. The submerged lands portion under State ownership is calculated for this document at 720 acres.

^b Both the Bean Creek and Stetson Creek trails qualify for Section 4(f) protection for their recreation qualities *and* historic qualities. The portion of Bean Creek Trail that is recreation only and does not overlap the historic route is approximately 6 acres; the portion that is historic is about 26 acres; the total is about 31 acres.

^c The Sqilantnu Archaeological District includes thousands of individual features within 64 confirmed historic sites that contribute to the district and more than 100 other historic properties. All alternatives pass through the district boundaries.

^d The Sqilantnu Russian River Confluence Site is wholly contained within the Sqilantnu Archaeological District and contributes to the district, but also is individually eligible for the National Register of Historic Places.

Note: Borough = Kenai Peninsula Borough; CC = Cooper Creek Alternative; GS = G South Alternative; JC = Juneau Creek Alternative; JCV = Juneau Creek Variant Alternative; KRSMA = Kenai River Special Management Area; USFWS = U.S. Fish and Wildlife Service

4.2 Descriptions of Section 4(f) Resources

4.2.1 Background Regarding Section 4(f) Resources in the Project Area

Preparation of this Section 4(f) Evaluation involved investigation of all parks, recreation areas, wildlife and waterfowl refuges, and historic and archaeological properties in the project area. The focus was on those that could be affected by project alignments and their proposed right-of-way areas. For historic and archaeological properties, preparation considered all known properties within the Area of Potential Effect (APE) under Section 106 of the National Historic Preservation Act (NHPA). FHWA, in consultation with the State Historic Preservation Officer (SHPO) and other consulting parties, determined which additional sites were eligible for the National Register of Historic Places (NRHP) and documented those previously determined eligible. Any individually eligible property or any property that contributes to an eligible historic or archaeological district is subject to Section 4(f) protection. Section 3.9 of this Final EIS discusses historic properties and the applicability of Section 106 of the NHPA and Executive Order 13175. Section 3.8 contains information regarding park, recreation, and wildlife refuge resources in and around the project area.

To help determine which properties were subject to Section 4(f) protection and which were not, DOT&PF prepared a document titled *Background for FHWA Determination of Section 4(f) Applicability (Background; (HDR 2008c))* that presented the features, ownership, attributes, and current uses of the different properties. The document examined the particulars of each property that had potential to be subject to Section 4(f) protection. The *Background* document includes confidential information about cultural sites, so is not published for general distribution. FHWA's decisions regarding applicability are reflected in Section 4.1.4 and Table 4.1-1, above. The properties listed are those that FHWA has determined are subject to Section 4(f) protection and that were considered in light of impacts by the four main build alternatives or by potential avoidance alternatives. Section 3.8 of this Final EIS discusses park- and recreation-oriented lands to which Section 4(f) protection does not apply, as well as impacts to these non-4(f) properties. Both Sections 3.8 and 3.9 discuss certain properties that may be protected by Section 4(f) but for which there is no Section 4(f) use by any of the alternatives.

Public Land Orders. Within the project area, on Chugach National Forest (CNF) lands, there are several areas withdrawn for recreation purposes by public land order. Often they are called “recreation areas.” Withdrawals by public land order on a national forest are undertaken by the Secretary of the Interior with the concurrence of (usually at the request of) the Secretary of Agriculture. Public land order withdrawals are undertaken under the authority of Executive Order 10355, “Delegating to the Secretary of the Interior the authority of the President to withdraw or reserve lands of the United States for public purposes” (May 26, 1952). The executive order also specifically delegates to the Secretary of Interior “the authority to modify or revoke withdrawals and reservations of such lands heretofore or hereafter made.” The public land orders withdraw the subject lands from mineral entry and prevent their conveyance to other uses, such as conveyance to the State of Alaska under the Statehood Act or conveyance to Alaska Native corporations under the Alaska Native Claims Settlement Act (ANCSA). The Forest Service has indicated that the Federal Land Policy and Management Act required a 20-year limit on public land orders. Some of the recreation withdrawals in the project area were established by public land order before passage of the Federal Land Policy and Management Act and had no expiration (e.g., Cooper Creek Camp and Picnic Ground). Others were established after passage of the Federal Land Policy and

Management Act and had an expiration date. The Forest Service considers this a statutory limit, not a limit on the agency's intent to retain the current status of the land (Vaughan, personal communication 2006a, 2006b). The Forest Service indicates that a forest supervisor can request from the U.S. Bureau of Land Management a public land order to revoke or recast a previous land order. Further detail on the application of public land orders to each area is provided under the specific recreation resources in the following pages.

Trail Widths. Trails on CNF land typically do not lie within a legally defined right-of-way or easement. Rather, they were constructed by the Forest Service across CNF lands without alteration of land status. The study team and the Forest Service have documented widths of similar trails and have met to help arrive at a trail width for consideration under Section 4(f), particularly for the Resurrection Pass National Recreation Trail in CNF. (Documentation of this process appears in Attachment C and correspondence in Attachment D of the *Background* document (HDR 2008c).) In addition to their recreation value, the trails in question are eligible for the NRHP. Consultation on these trails did not define a width.

DOT&PF and FHWA initially proposed a width of 50 feet for the Resurrection Pass Trail, which appeared to equal a short section of legal easement at the north end of the trail and to equal or exceed other nearby trail easements held by the Forest Service. The Forest Service countered with a 1,000-foot width, based primarily on the desired width in the *Iditarod National Historic Trail Comprehensive Management Plan* (BLM 1996) for a sister trail in the National Trails System. Therefore, FHWA opted for purposes of the Section 4(f) Evaluation to assess a corridor 1,000 feet wide (500 feet each side of centerline) as the recreation resource for Section 4(f) trail evaluation purposes regarding the Resurrection Pass Trail.

For the Stetson Creek and Bean Creek trails, which are not part of the National Trails System, FHWA has determined that using a uniform width of 100 feet (50 feet each side of centerline) is appropriate to make a balanced assessment of impact among alternatives.

Section 106 and Section 4(f). Section 4(f) protection applies to any historic or archaeological property found eligible for the NRHP. Eligibility for the NRHP is determined through a process laid out under Section 106 of the NHPA (23 CFR 774.11[e]). For purposes of this document, properties protected under Section 4(f) and the determinations of impact on specific cultural sites mirror those made in the determinations of eligibility and determinations of effect under the Section 106 process.

Remainder of Section 4.2. The remainder of this section details each of the Section 4(f) properties listed in Table 4.1-1. The *Background* document provides additional confidential information on cultural properties as well as information on those properties to which Section 4(f) does not apply.

4.2.2 Kenai River Special Management Area

Section 4(f) Property Type: Park

4.2.2.1 Size and Ownership, Including Agreements Related to Ownership

The Alaska Legislature established the Kenai River Special Management Area (KRSMA) as a unit of the State park system. It is managed by the Alaska Division of Parks and Outdoor Recreation (DPOR); a division within the Department of Natural Resources (DNR). It was established in recognition of the importance of the Kenai River for fish habitat and for fishing, both commercial and sport fishing, when development and popularity of fishing were threatening the river.

Generally, the park is owned by the State. Within the boundaries of KNWR, KNWR owns the submerged lands, but DPOR and KNWR both assert management authorities over activities on the water and do so cooperatively. The legislative boundaries within the project area encompass the Kenai River itself and Kenai Lake (shown in crosshatch on Map 4-1, Map 4-2, and Map 4-11; on other maps, Kenai Lake, the river, and visible beaches without vegetation would be part of this park unit, except for the submerged lands within the boundaries of KNWR). The special management area includes “the Kenai River... upstream to and including the waters of the Kenai and Skilak Lakes.” However, there is an unresolved dispute about the submerged lands of Kenai Lake and Kenai River within the CNF. Both the State of Alaska and the United States assert ownership, but there has been no court ruling or final agreement. Current agency management of the river is cooperative. In addition, the agencies work cooperatively to manage the adjacent uplands for the overall health of the river. From the State’s point of view, the KRSMA protects 105 miles of the river system. DPOR does not report a total acreage; within the project area, the river and Kenai Lake comprising the KRSMA encompass approximately 720 acres. In total, the KRSMA is estimated at some 44,000 acres. The Sterling Highway right-of-way in the project area crosses the Kenai River in two locations and extends into the river where the highway parallels the river in several locations. Whether on dry land or submerged lands, any construction activity for transportation within the right-of-way is not considered to be a Section 4(f) use of land. This is because such use would not be a conversion of land use from protected refuge and park property to transportation uses; the land already has been incorporated for transportation uses.

There are areas proposed for addition to the KRSMA, but FHWA has determined that Section 4(f) does not apply to the proposed additions because they are designated in a management plan specifically awaiting legislative action to add them to the park. Without formal status as a “park,” these additions are not subject to Section 4(f) protection.

4.2.2.2 Functions, Available Activities, Existing and Planned Facilities

The KRSMA park unit is an important salmon migration and spawning area and hosts Alaska’s most popular salmon sport fishery. Salmon returning to the Kenai and Russian rivers are important for commercial fishing in Cook Inlet. Within the project area, KRSMA activities include raft and boat trips on the Kenai River for scenic viewing and sport fishing, as well as fishing along the banks. Discussions with land managers, including DPOR, the Forest Service, and U.S. Fish and Wildlife Service (USFWS; the Federal agencies that manage the river corridor) did not indicate plans for substantial changes in management direction or addition of facilities.

DNR (DNR 2017), in its role as a cooperating agency, indicated that the KRSMA management plan has specific policies and standards related to new roads and bridges, namely:

Public road construction on projects in upland areas should be located away from the Kenai River and should employ standard best management practices to preclude siltation to the river and its adjacent wetlands and tributaries, both during and subsequent to construction. Construction activities should avoid or minimize damage or destruction to riverine areas, wetlands, and tributaries, the placing of structures or fill in the aforementioned areas, and direct runoff into these areas. River crossing structures should be minimized to the fewest number possible. The only recognized additional bridge crossing of the Kenai River in the management

plan is the proposed Funny River bridge⁴, should this facility be approved for construction by the State and the FHWA.

-Kenai River Comprehensive Management Plan, p. 60

4.2.2.3 Access and Use Levels

Access to the Kenai River and Kenai Lake is generally from the Sterling Highway and from public boat launch ramps such as those at Sportsman’s Landing and Cooper Landing in the project area (see Map 4-4 and Map 4-11). Some rafting and fishing outfitters launch directly from their own property along the river. Use of the Kenai River is high in summer, both for sport fishing and recreational boat trips (rafting, canoeing, kayaking, drift boats). Many commercial sport-fishing and boating outfitters operate on the river. DPOR rangers take occasional counts of river bank use, private boats of any kind, and commercial boats of any kind, mostly counted near the Cooper Landing and Sportsman’s Landing boat launch sites. DPOR uses a formula to extrapolate the number of users throughout the month and throughout the year. The counts are not considered to be highly reliable and are thought to undercount actual use (Carrico, personal communication 2007). For 2005, DPOR reported bank use at 21,034 persons, users of private boats at 29,964, and users of commercial boats at 3,233. Use continues in the winter in low numbers. In 2012, the Forest Service counted 67,069 visitors who stayed overnight in the area, used Forest Service Campgrounds and Russian River day-use parking, or were counted in the Cooper Landing vicinity (HDR and USKH 2013). The estimated number of visitors boating the upper stretch of the river during a typical summer by the Kenai National Wildlife Refuge (KNWR) is around 25,000 (HDR and USKH 2013).

While there is recreational use of both Kenai Lake and the Kenai River for sport fish and harvest, it is the Kenai River that is more heavily used. Over an 8-year period, from 2004 to 2011, Alaska Department of Fish and Game (ADF&G) statewide harvest surveys reported an average of about 120,000 anglers fished the entire Kenai River per year, versus an average of about 500 per year on the lake. The effort expended averaged 51,000 angler-days per year on the upper Kenai River (project area) in the 2004–2011 period (HDR and USKH 2013).

ADF&G (2017), in its capacity as a cooperating agency, provided data on the value of the Northern Kenai Peninsula Management Area⁵ (NKPMA). ADF&G reported that anglers traveling to the NKPMA accounted for an average of about 24 percent of the total statewide sport fishing effort. In 2015, participation was estimated to be 539,480 angler-days in area waters (including the entire Kenai River, the Kasilof River, stocked lakes, and waters of Cook Inlet). Angler participation increased from 457,856 angler-days in 2012 to a high of 577,890 angler-days in 2014. They indicated that the Kenai River alone accounts for the largest sport fishery in the area. From 2011

⁴ The Funny River Bridge was a proposed bridge to connect the community of Sterling with the community of Funny River across the Kenai River. The project had design and environmental work completed in the late 1990s but was never constructed.

⁵ The NKPMA includes all Kenai Peninsula freshwater drainages from the north bank of Ingram Creek south to the south bank of the Kasilof River. Larger communities located within the NKPMA include Kenai and Soldotna. Smaller communities are Hope, Cooper Landing, Moose Pass, and Sterling. This management area is linked to the state's highway system via the Sterling and Seward Highways which provide sport anglers access to many of the area's major fisheries. See more at: <http://www.adfg.alaska.gov/index.cfm?adfg=ByAreaSouthcentralUpperKenai.main>.

to 2015, fisheries on this river accounted for 78 to 82 percent of the NKPMA total sport angling effort, or 365,863 to 455,578 angler-days annually (Begich et al. as cited in ADF&G 2017). Additionally, an average of 312 businesses provide guided fishing trips to anglers on the Kenai River over the decade ending in 2015 (Powers and Sigurdsson as cited in ADF&G 2017).

The University of Alaska Anchorage Institute for Social and Economic Research (ISER) indicated the importance of the Kenai River in studies related to the balance of commercial and sport fisheries of Kenai River salmon (1996). Using 1993 and 1994 data, ISER indicated that residents of Southcentral Alaska made nearly 626,000 fishing trips throughout Southcentral Alaska. Twenty-five percent of all trips were to the Kenai and Russian rivers, “by far the most popular sport-fishing sites in the region,” according to ISER. Also, about 98,000 nonresidents made sport-fishing trips in the region, and 54,000 of these were to the Kenai River system. “Altogether, residents and visitors spent \$136 million in 1993 for sport-fishing trips in Southcentral Alaska, with \$34 million of that for trips to the Kenai and Russian rivers.”

As an indication of harvest, each year species harvest surveys (1997–2006) indicate that anglers keep about 16,000 Chinook (king) salmon; 225,000 sockeye (red) salmon; 43,000 coho (silver) salmon; 10,000 pink salmon; 3,000 rainbow trout; and 6,000 Dolly Varden (as reported in HDR and USKH (2013)). Although the numbers of Kenai River king salmon caught are far fewer, Kenai River kings have an international reputation for their trophy size—up to 100 pounds. ADF&G (ADF&G 2017) reports that “sport anglers harvest a significant proportion of statewide sport fishery resources from the Kenai Peninsula area and specifically the Kenai River (Alaska Sport Fishing Survey database [Internet]). Average yearly sport harvest of sockeye salmon for the last decade from the Kenai Peninsula area equaled 84% of the statewide sport harvest from freshwaters, and the sport harvest of Chinook salmon from this area equated to 27% of total statewide freshwater sport harvest. The Kenai River alone accounts for 86% and 66% of the Kenai Peninsula area freshwater harvests of sockeye and Chinook salmon, respectively.”

Although fishing is “by far the primary recreation activity” (DNR, ADF&G, KPB 1997), the Kenai River serves many user groups, including anglers (bank, drift-boat, and power-boat) and scenic boaters, and supports other non-angling activities that include rafting, viewing scenery, viewing wildlife, picnicking, and camping (DNR 2010). Of the 24,941 who used the upper Kenai River between Kenai Lake and Skilak Lake in 2004, 38 percent were not anglers. These various recreational opportunities, in addition to the prime fishing, provide the market for guided trips and tours. On average, 388 guides are permitted annually to use the river (DNR 2012), making the river more accessible to those less experienced with the area, while providing stimulus to the local economy.

4.2.2.4 Relationship to Similarly Used Lands in the Vicinity

There are many other lands managed for developed and dispersed recreation in the project area as part of the national forest and the national wildlife refuge. Beyond the immediate project area, the KRSMA downstream also is heavily used for sport fishing. Many other rivers and streams and vast coastal areas also are used for sport fishing, and marine areas are important for commercial and sport fishing. Salmon that spawn in or transit through the project area are important to sport fisheries upstream and downstream and to commercial fisheries in Cook Inlet.

4.2.2.5 Other Factors

The formally designated park unit in much of the project area is submerged land—land below ordinary high water of Kenai River and Kenai Lake. Exposed gravel bars and beaches generally are included, but forested uplands are not part of the park unit. Where the Kenai River flows through the KNWR, the United States of America owns the submerged lands, but both the Federal and State governments manage the water column. Day-to-day management of the corridor is cooperative between USFWS and DPOR, and generally there is no conflict. Both KRSMA and KNWR are Section 4(f) properties, so the distinction between KRSMA and KNWR within the refuge boundaries does not change whether the river is protected under Section 4(f), but the 4(f) “property” associated with the river within the refuge is KNWR property not KRSMA property. See next subsection.

4.2.3 Kenai National Wildlife Refuge

Section 4(f) Property Type: Wildlife Refuge

4.2.3.1 Size and Ownership, Including Agreements Related to Ownership

The KNWR is shown in light green on Map 4-1; see also Map 4-13. The United States of America owns the KNWR, and the USFWS manages it. State law concurrently designates the same area a State game refuge and may apply State refuge status to State-owned lands within the boundaries of the Federally owned KNWR as they existed in 1960. The KNWR is 1.97 million acres, part of 76.8 million acres of Federal wildlife refuges in Alaska. A 2001 agreement regarding a land claim

by Cook Inlet Region, Inc. (CIRI), a regional Native corporation, was put into effect through the Russian River Land Act (RRLA). The RRLA requires the land exchange to be initiated by the U.S. Department of the Interior (DOI) and allows the transfer of up to 3,000 acres. At the time the Draft SEIS was published, the RRLA had not resulted in any substantial change to the KNWR ownership in the project area but had resulted in some 500 acres of “archaeological estate” at the KNWR’s eastern border being transferred to CIRI.

Since the publication of the Draft SEIS, however, CIRI has informed the DOI of their desire and willingness to engage the DOI in a land exchange (CIRI 2017). DOI (DOI 2017) subsequently informed the FHWA that “if the

Reasonably Foreseeable Land Exchange

An agreement ratified by the Russian River Land Act gives CIRI and the USFWS the ability to trade lands that directly affect the project area, and in particular the land status of the KNWR in the area where the Juneau Creek Alternative enters the KNWR. The agreement identifies “lands within the Kenai National Wildlife Refuge located north of, and immediately bordering the Sterling Highway” as the area of KNWR authorized for exchange.

CIRI has requested that DOI initiate the land trade, and DOI has indicated that it intends to execute the trade if the Juneau Creek Alternative is selected. Based on this new information (since the Draft SEIS), FHWA now considers the trade to be reasonably foreseeable, and has evaluated the effects of the trade as a cumulative impact. See Section 3.27.4.3.

The trade is anticipated to swap up to approximately 60 acres of land in the project area north of the highway within the KNWR for approximately 60 acres of land near the confluence of the Killey and Kenai rivers. This trade would effectively move the KNWR and Wilderness boundary to the north, removing the Section 4(f) designation from the traded portion of the KNWR (CIRI property would be private property not subject to Section 4(f)). The boundary shift would also alter or remove the requirement to process the use of this area through ANILCA because the project would no longer be using land from a conservation system unit and designated Wilderness. Under ANILCA, use of Wilderness requires approval by the President of the United States and by Congress.

Juneau Creek Alternative is selected the Service will promptly commence negotiations with Cook Inlet Region, Inc. (CIRI) to enter into the land exchange authorized by the Russian river Land Act, Public Law 107-362.” Because of these commitments, FHWA has determined that the land exchange is a reasonably foreseeable future action, and for the purposes of Section 4(f) analysis has assumed that the land exchange will occur. Consistent with this assumption, FHWA has evaluated the implications of the exchange as a cumulative impact.⁶ Impact, use, and Least Overall Harm Analysis in this chapter is based on understanding that these land ownership changes will occur. See Section 3.27.4.3 for additional details on the exchange and its contribution to cumulative effects.

DOT&PF holds a transportation easement 300 feet wide for highway purposes (the Sterling Highway) for about 20 miles across the KNWR. Because DOT&PF holds an easement for transportation purposes, FHWA has determined that any use of land for transportation purposes within the right-of-way is not a use of Section 4(f) property, unless a constructed refuge recreation facility is affected. In the project area, the trailhead for the KNWR’s Fuller Lakes Trail and the parking and circulation areas associated with a KNWR visitor contact station lie within the DOT&PF Sterling Highway easement. See further discussion in Section 4.2.3.5.

The *Kenai National Wildlife Refuge Comprehensive Conservation Plan* (USFWS 2010a) is the document that guides management of the refuge. The KNWR was first established as the Kenai National Moose Range by executive order 8979 in 1941 to protect the breeding and feeding range of moose. It was re-designated by the Alaska National Interest Lands Conservation Act (ANILCA) of 1980 as the KNWR, and the plan repeats the refuge purposes laid out in ANILCA. The KNWR purposes are to preserve all wildlife populations and their habitats “in their natural diversity,” to protect associated waters, to meet treaty obligations, and—compatible with wildlife and habitat—to provide for science/education and recreation. ANILCA also created designated Wilderness areas within the KNWR totaling 1.3 million acres. The Mystery Creek Unit and Andrew Simons Unit are both within the project area, respectively north and south of the Kenai River. For the proposed project, the Mystery Creek Wilderness is the most pertinent. The unit lies in the project area immediately north of the existing Sterling Highway and comprises 46,086 acres. As noted above, in a letter to FHWA, DOI (DOI 2017) committed to commencing a land exchange that would affect ownership patterns and acreage in the Mystery Creek Unit.

4.2.3.2 Functions, Available Activities, Existing and Planned Facilities

The *Comprehensive Conservation Plan* does not address potential Sterling Highway improvements or propose any changes to the Fuller Lakes Trail. A new visitor contact station is proposed for the west end of Skilak Lake Road in a plan for the Skilak Wildlife Recreation Area (incorporated by reference in the KNWR management plan); it is not clear whether the existing contact station (Map 4-3) would remain or be removed under that scenario. Overall, the plans call

⁶ NEPA requires agencies to consider direct, indirect, and cumulative impacts. A “cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR §1508.7). In this case, the land exchange is being undertaken by DOI and CIRI as authorized by Congress through the RRLA. DOT&PF and FHWA are not parties to the land exchange, but must address the exchange in the NEPA document and disclose the impacts accordingly. Actual acreage of any exchange undertaken would be determined by negotiation between DOI and CIRI.

for little or no change to management of “intensive management” areas such as the Sterling Highway corridor, and no new facilities are planned for the corridor in the project area (Campellone, personal communication 2008; Ernst, personal communication 2011).

Overall, the KNWR functions for protection of wildlife and, although recreation is subsidiary to wildlife conservation purposes in the enabling legislation, the KNWR includes a substantial recreation function. Most of the KNWR is overlain by a Congressional Wilderness designation, including portions of the Mystery Creek and Andrew Simons Wilderness units in the project area (respectively, north and south of the Kenai River and of the highway corridor). Wilderness is managed for its own set of functions under the Wilderness Act, which defines Federal Wilderness as land that

...retains its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres...; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

- 16 United States Code 23

The KNWR provides an opportunity for recreation in a designated Wilderness environment, plus more developed recreation opportunities in non-Wilderness areas, including a visitor center and a separate visitor contact station. The visitor contact station is adjacent to the Sterling Highway within the project area, and lies at the edge of the Skilak Wildlife Recreation Area, a recreation area that is within (and part of) the KNWR. The recreation area includes campgrounds, trails, and boat launch ramps on the Kenai River and Skilak Lake outside the project area. Other foot trails and canoe trails exist across the KNWR, but the Fuller Lakes Trail is the only refuge trail that begins within the project area (see Map 4-3). Except for use of the Fuller Lakes Trail, use of the Mystery Creek Wilderness near the existing highway is relatively rare, comprised of hunting and activities such as searching for antlers or mushrooms (USFWS 2009). Dense vegetation, steep slopes, and lack of trails limit use. This area is characterized as good brown bear habitat, with day beds and cover for sows with cubs that move up off the river for a place to retreat (and to escape from human fishermen) during lulls in fishing. Just outside the project area on the south side of the Kenai River (and accessible only by non-motorized boat) is the Surprise Creek Trail in the Andrew Simons Wilderness. It follows Surprise Creek to alpine elevations, at which point hikers and hunters could travel cross country over a ridge and be within a broad view of the Kenai River Valley and project corridor. Relatively few people are thought to use the trail and fewer still to access views of the existing highway corridor.

For purposes of this Final EIS, any recreation areas and features that are part of the KNWR and on KNWR land are not further discussed as potential separate Section 4(f) recreation properties. They are considered KNWR land and have Section 4(f) protection as parts of the larger refuge. The trailhead for the Fuller Lakes Trail, the KNWR visitor contact station, and the Russian River Ferry (including Sportsman’s Landing Boat Launch) are given extra consideration below because they overlap the highway easement or lie adjacent to the highway easement, and are KNWR-owned recreation facilities.

The USFWS operates a KNWR visitor contact station at the western end of the project corridor, at approximately MP 58 of the Sterling Highway. The site is labeled #1 on Map 4-1 and also appears on Map 4-3. The visitor contact station is within the boundaries of the KNWR, and the site heavily overlaps the highway easement. The site is located on the north side of Sterling Highway and is immediately adjacent to the highway. The facility is located near the junction of Skilak Lake Road and the Sterling Highway, at the edge of the Skilak Wildlife Recreation Area. The site is not located on a separate parcel of land, but measured around the developed features, the site encompasses approximately 1.6 acres, much of which lies within the highway easement. Facilities consist of a small, periodically staffed building with interpretive information, books, and maps; a large parking area; and two separate, small public toilet buildings (vault toilets that were built immediately outside the highway easement). Parking and circulation areas are located partly within the easement. A cul-de-sac turnaround at the western toilet building is fully within the easement.

The visitor contact station is the first staffed facility in the KNWR for travelers coming from the east (Anchorage, Seward). The contact station provides information and education for refuge visitors and serves as a rest stop for travelers. River floaters also park at the contact station site and walk up from Jim's Landing to retrieve their vehicles after completing their float trips; permitted river guides are required to park at the contact station. Jim's Landing is a short walk away across the highway on an apparently unmaintained trail through the woods. Pedestrians cross the highway to move between Jim's Landing and the parking lot.

The Fuller Lakes Trail, managed by the USFWS, is a recreation trail that is fully within the boundaries of KNWR and provides primary access to the KNWR Mystery Creek Wilderness. Its trailhead is located within the Sterling Highway easement, where there is a parking area adjacent to the north side of the Sterling Highway near MP 57 (#2 on Map 4-1; see also Map 4-3). Facilities include a simple gravel parking lot, trailhead sign/register kiosk, and wood-and-earth steps that begin the trail. The site does not have a separate delineated land parcel, but measured from the highway shoulder around the northern side of the level, developed parking lot, the site encompasses 0.2 acre. The entire 0.2-acre area, including the steps, kiosk, and parking lot, are located wholly within the highway right-of-way, as is the beginning of the trail itself. The USFWS has completed minor trailhead improvements.

Another important USFWS recreational feature is the Kenai-Russian River Campground and Russian River Ferry, located south of the highway at the KNWR eastern boundary (Map 4-4). Access is through the Sportsman's Landing Boat Launch. Sportsman's Landing is a State-owned facility, but through an interagency agreement, it is managed by the USFWS in unison with the Russian River Ferry site. The Sportsman's Landing parcel has parking spaces for 50 vehicles or more (or approximately half that number if all are towing boat trailers). The adjacent KNWR parking and camping area at the ferry landing provides for approximately another 80 vehicles. Sportsman's Landing is mentioned frequently in the remainder of this document as a landmark and as a recreation site that is surrounded by other Section 4(f) properties. It is also addressed in Section 3.8, Parks and Recreation Resources. A separate boat launch/landing, owned and managed by KNWR, is located just outside the project area at the eastern end of Skilak Lake Road near MP 58 of the Sterling Highway.

4.2.3.3 Access and Use Levels

Access to KNWR in the project area is principally via the Sterling Highway. Anglers and river enthusiasts also boat through KNWR in the project area on the Kenai River. In the project area, public use and access to KNWR are primarily at the developed sites: the ferry/campground/boat launch complex at Sportsman’s Landing (along with the stream bank on the south side of the Kenai River), the Fuller Lakes Trail, and the visitor contact station. Thousands of visitors fish the Russian River confluence area each summer, moving between KNWR, the State park (KRSMA), and the national forest. As indication of recreational use, the Russian River Ferry and Sportsman’s Landing parking lots are full during peak fishing season in midsummer, and motorists attempt to park on the edge of Sterling Highway, which has little or no shoulder. Another indication of use levels in this area is that the annual harvest in the Russian River (exclusive of the Kenai River) routinely exceeds 50,000 fish and in some years has approached 200,000 fish (ADF&G 2009). The Russian River has a 10-year average of 57,815 angler-days per year (ADF&G 2006). Managers from ADF&G (personal communication 2009) and USFWS (2009) both indicated a huge volume of traffic for up to about 8 weeks each summer, including drivers who have driven for 2 hours or more to fish, and who wait along the highway for spots to open within the Russian River Ferry-Sportsman’s Landing area. USFWS in its role as a cooperating agency indicated that the current limitations of the parking lot and the absence of shoulders or other nearby parking help control the amount of use of the Kenai River at Sportsman’s Landing and Russian River Ferry.

Several thousand visitors stop each year at the visitor contact station. The *Kenai National Wildlife Refuge Final Revised Comprehensive Conservation Plan* estimates that approximately 1.2 million people travel on the Sterling Highway through the Kenai National Wildlife Refuge each year, and an estimated 300,000 visitors spend extended periods of time in KNWR (USFWS 2010a). Refuge-wide, a 2006 study reported that 659,525 “visits” were made to the KNWR, more than any other refuge in Alaska (Carver and Caudill 2006, as reported in HDR and USKH (2013)). The study found that about two-thirds of the visits to the KNWR were made by Alaska residents. Additional data indicate that 393,000 visits were for non-consumptive activities, such as use of nature trails, wildlife observation and birding, and beach/water use; 248,000 visits were for sport fishing; 18,525 visits were for sport hunting, including relatively similar amounts of big game hunting (5,500), small game hunting (5,100), and migratory bird hunting (7,925). The Fuller Lakes Trail is considered a popular hike and connects with the Skyline Traverse route that terminates outside the project area farther west on the Sterling Highway. A month-long summer trail count study in 2004 indicated 540 users in July–August, an intermediate number on KNWR trails studied (the range was 44 users to 962 users in that month, depending on the trail (KNWR 2004)).

4.2.3.4 Relationship to Similarly Used Lands in the Vicinity

KNWR is the only wildlife refuge in the project area and provides the closest designated Federal Wilderness areas to most of Alaska’s population. The CNF adjoins KNWR on its east side and is managed for multiple uses, of which wildlife protection and outdoor recreation are two. These uses are similar (but not identical) to the mandates of KNWR as described in ANILCA, which include purposes “to conserve fish and wildlife populations” and “provide... for fish and wildlife-oriented recreation.” State game refuges and designated critical habitat areas exist near Anchorage, Homer, and Clam Gulch (see Map 4-13).

4.2.3.5 Other Factors

USFWS has indicated during consultation and formal comments a difference of opinion with DOT&PF and FHWA regarding the status of land within the existing Sterling Highway right-of-way where it crosses KNWR. FHWA has determined that use of land within the existing right-of-way would not be a Section 4(f) “use,” even if USFWS retained title to the underlying land. USFWS requested clarification of FHWA’s policy regarding this land.

FHWA maintains written policy that addresses many instances of Section 4(f) applicability. It is from this policy, FHWA regulations, and Federal law that FHWA makes its determinations of whether Section 4(f) will apply to a property and whether a Section 4(f) use would occur.

As previously discussed with USFWS, the State of Alaska does not agree that “the land subject to the right-of-way is owned by the United States and has been part of the Refuge since its creation in 1941.” The State contends that the right-of-way passed from the United States to the State of Alaska with the Omnibus Act Quitclaim Deed shortly after statehood in 1959.

However, from a Section 4(f) standpoint, whether (1) DOT&PF owns all land rights or (2) USFWS owns the underlying land rights and DOT&PF owns sufficient interest in the lands for maintenance, operation, and improvement of the highway, a Section 4(f) approval would not be required for use of land within the right-of-way. In the first instance, the land within the right-of-way would not be considered Section 4(f) property; in the second instance, the proposed improvements would not constitute a use under Section 4(f).

Federal law states that FHWA generally may approve a project “requiring the *use* of any publicly owned land from a public park, recreation area or wildlife and waterfowl refuge...only if...there is no feasible and prudent alternative...” (49 USC 303, emphasis added). FHWA’s Section 4(f) regulations (23 CFR 774.17) define “use” as occurring “when land is permanently incorporated into a transportation facility.” Regarding Section 4(f) “use,” FHWA’s Section 4(f) Policy Paper (2012) states:

The most common form of use is when land is permanently incorporated into a transportation facility. This occurs when land from a Section 4(f) property is either purchased outright as transportation right-of-way or when the applicant for Federal-aid funds has acquired a property interest that allows permanent access on to the property such as a permanent easement for maintenance of other transportation-related purpose.

- Section 4(f) Policy Paper, Section 3.2

The Policy Paper also states, “Generally, the requirements of Section 4(f) do not apply to the ... use of (a) reserved area for its intended transportation purpose” (p. 56). Therefore, by law, regulatory definition, and long-standing policy, a transportation improvement within a permanent easement for transportation purposes does not result in a Section 4(f) use.

In addition, the Policy Paper states, “in making any finding of use involving Section 4(f) properties, it is necessary to have up to date right-of-way information and clearly defined property boundaries.” In this case, there is no dispute about property boundaries. However, right-of-way information has changed during the development of this EIS. A 1971 Sterling Highway easement granted by USFWS to the State of Alaska (USFWS 1971) was believed to be the controlling easement when this project began, and it contains multiple conditions that provide for USFWS oversight and approvals for roadway changes within the easement. However, title research and an

Alaska Attorney General’s legal opinion conducted in support of the adjacent MP 58–79 project (Sullivan and Goldsmith 2014) indicated that the State of Alaska had already owned the right-of-way when the United States conveyed “all lands or interests in lands” associated with the Bureau of Public Roads in Alaska to the new state at the time of statehood in 1959 (Alaska Omnibus Act and a subsequent quitclaim deed). USFWS believes the terms of the 1971 easement continue to apply, while it is the State of Alaska’s position that the 1971 easement does not apply. In absence of a court ruling, this issue is unresolved. As stated above, however, it has no bearing on whether highway improvements within the right-of-way would result in a Section 4(f) “use.”

4.2.4 Resurrection Pass National Recreation Trail

Section 4(f) Property Type: Recreation Area

4.2.4.1 Size and Ownership, Including Agreements Related to Ownership

The Resurrection Pass National Recreation Trail is located entirely within the CNF (shown north of the Kenai River on Map 4-1; see also Map 4-5). The trail is a 38-mile route from the community of Hope to the Sterling Highway. A portion of the trail is historic (see Bean Creek Trail in Section 4.2.13). The trail is part of the National Trails System that includes National Historic Trails and National Scenic Trails, which are designated by Congress, and National Recreation Trails, which may be nominated locally and are designated by Federal agencies.

The CNF lands traversed by the Resurrection Pass Trail are managed for multiple uses. The Forest Service has no separate easement or management corridor for the trail. A buffered trail width of 1,000 feet (500 feet each side of centerline) is assumed for Section 4(f) purposes, except where this width overlaps non-CNF land. This width is based on consultation with the Forest Service. Further information is contained above in Section 4.2.1. This width results in a total acreage of approximately 4,600 acres for the entire trail.

4.2.4.2 Functions, Available Activities, Existing and Planned Facilities

The Forest Service indicates the Resurrection Pass Trail has high recreation value and is the “crown jewel” of the CNF trail system (Forest Service 2009, and Vaughan, personal communication 2006a). The trail has been designated a National Recreation Trail and is managed by the Forest Service as a “conservation system unit” (CSU) under ANILCA. The trail is heavily used by hikers, hunters, skiers, snowmobilers, mountain bikers, anglers, horseback riders, and others year-round. The trail traverses the Kenai Mountains from relatively low forested valleys to high alpine passes. The route links several lakes, designated camping sites, and nine public use cabins. The Forest Service has been incrementally working on improving the trail tread and replacing aging cabins associated with the route. No other planned changes are known.

The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) does not distinguish between management of the trail and lands around the trail. They are managed under three different management prescriptions, including a prescription that provides for developed and dispersed recreation nearer to the existing highway, to those conserving specific fish and wildlife habitats and providing opportunities for primitive recreation, solitude, and challenge farther in the backcountry (starting along Juneau Creek canyon). These prescriptions include various levels of wildlife habitat protection. See also Map 3.2-2 in Section 3.2.

4.2.4.3 Access and Use Levels

Access to the southern end of the trail is directly off the Sterling Highway, immediately west of the highway's Schooner Bend Bridge over the Kenai River. In the project area, the Resurrection Pass Trail is also accessible via the Bean Creek Trail, which is the historic southern end of the Resurrection Pass Trail (see separate entries below both under the recreation section and the historic properties section) and via West Juneau Creek Road (also referred to in this document as West Juneau Road). The northern end of the trail is located near Hope, where there is a separate trailhead with access off the Hope Highway. The trail has been featured nationally (e.g., in *Backpacker* magazine, "Best Hikes Ever," November 2010), and cabins along the route typically are booked far in advance throughout the summer. The trail also is well used in winter. An annual average of 1,321 trail users registered at the south end trailhead from the years 2006 to 2010 (HDR and USKH 2013).⁷ This does not count those who access the trail via the Bean Creek Trail, where there is no register, or who come all the way through from Hope or other connecting side trails (Devils Pass Trail, Summit Creek Trail, and West Juneau Road).

The Forest Service, in its capacity as a cooperating agency for this EIS, indicated it estimates total use of the Resurrection Pass Trail system, including north and south trailheads and the Devils Creek and Summit Creek trails, at 10,000 visitors annually. (The southern 4–5 miles of the trail is in the project area; the rest, while connected, lies outside the project area.) The trail sees a great deal of use for day hikes and single overnights, as well as through-hikers or bikers completing the entire trail. The public stated during this project that Cooper Landing residents enjoy the lower portion of the trail for recurring day hikes.

The West Juneau Road route follows old Forest Service logging roads/administrative roads that are closed to vehicles except snowmobiles in winter (logging has not occurred for many years). The Forest Service holds a 60-foot-wide easement for these roads where they cross State land in Unit 395. The route is used as alternate access to the Resurrection Pass Trail for horses in summer and snowmobiles in winter, and the Forest Service encourages horse and snowmobile access via West Juneau Road to minimize conflict on the lower Resurrection Pass Trail and because winter conditions generally are better (DOT&PF 2009). However, the existing Forest Service trailhead is not designed to accommodate vehicles with trailers, and the Forest Service does not plow it in winter. Parking occurs in a long, informal gravel pullout at the driveway for the Resurrection Pass trailhead and at the beginning of West Juneau Road. West Juneau Road is classified by the Forest Service as a road, not a trail, and there is a gap between the road system and the Resurrection Pass Trail where the route is marked but there is not a constructed roadbed or trail tread. For these reasons, the Forest Service considers the West Juneau Road route a road (Forest Service 2002a) and temporary route used for recreation, but it is not considered part of the Resurrection Pass Trail and is not considered a separate recreational trail in its own right.

⁷ The *Recreation Analysis* (HDR and USKH 2013) indicates that these data come from voluntary registration kiosks and likely under-represent participation. The *Recreation Analysis* cites a Forest Service 2009 Observational Use Study at Multi-Use Trailheads during the summer season, reporting that 19 to 40 percent of user groups signed in to the trail registration system.

4.2.4.4 Relationship to Similarly Used Lands in the Vicinity

The Resurrection Pass Trail is one of several trails on CNF and in KNWR in the project area. The Resurrection Pass Trail is the only National Recreation Trail in the project area. The Johnson Pass Trail to the east of, but outside, the project area (with trailheads along the Seward Highway) is also part of the National Trails System as a segment of the Iditarod National Historic Trail.

4.2.4.5 Other Factors

The status of the Resurrection Pass National Recreation Trail as a CSU under ANILCA is unclear. The trail itself is not specifically named in ANILCA as a CSU (like other CSUs designated by Congress in the law). The Forest Service indicates that the trail is a CSU and reportedly has a federal legal opinion on the matter. The Alaska Attorney General disputes that designation with its own legal opinion. For the purposes of this EIS, DOT&PF and FHWA have provided information necessary for the Forest Service to make determinations within their authority regarding the trail with respect to ANILCA (see Section 3.2.1.4).

4.2.5 Bean Creek Trail

Section 4(f) Property Type: Recreation Area

4.2.5.1 Size and Ownership, Including Agreements Related to Ownership

The Bean Creek Trail connects Slaughter Ridge Road on the northern edge of Cooper Landing with the Resurrection Pass National Recreation Trail on the east side of Juneau Creek (see Map 4-1 and Map 4-6). The Bean Creek Trail is designated for recreation in the *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a). It is also an historic route (see separate entry below in the Historic Properties section). Besides Federal land, it also uses public lands owned by the State. FHWA has determined that, for Section 4(f) purposes, the trail begins where it enters State public lands. The unimproved access road (platted public right-of-way for the extension of Slaughter Ridge Road and Cecil Road) serves as part of the trail in winter and at other times when the road is not easily passable by vehicles; the road easement is owned by the Kenai Peninsula Borough (Borough). See “Other Factors” below.

Slaughter Ridge Road is a gravel-surface road maintained by the Borough that “ends” at a small cul-de-sac but also continues as an old Forest logging road that is unimproved and in poorer condition as it proceeds toward its terminus. Because the multiple agencies involved have not yet established a formal trailhead, the ultimate length of the trail could change. Based on starting at the State boundary, it is approximately 2 miles long.

There is no formal trailhead at the State boundary; it is merely an area where conditions limit the ability of street vehicles, even many four-wheel-drive street vehicles, from proceeding and where there is space to park nearby on public (State) land.

The trail begins as an old logging road on State land; the initial portion of the continuing logging road on State public land is open to the public but is without a dedicated public trail or road easement (see Map 4-6). The Bean Creek Trail uses about 1,800 feet of the road extension where there is no easement and then descends to cross Bean Creek and join the historic Bean Creek Trail. A Forest Service 25-foot public trail easement exists on the historic Bean Creek Trail alignment on an adjacent unit of State land (State Unit 393). The connection between the beginning of the trail and the Forest Service Bean Creek Trail easement is approximately 3,500 feet total and

crosses State public land that is open to the public but is without a dedicated public corridor easement.

As indicated above in Section 4.2.1, FHWA in consultation with the Forest Service decided a uniform trail width of 100 feet (50 feet each side of centerline) is a reasonable width for Section 4(f) impact assessment purposes for this trail, and this width is used throughout the length of the trail regardless of the presence or absence of trail easement. The trail is recorded by the Forest Service as 2.02 miles long.

4.2.5.2 Functions, Available Activities, Existing and Planned Facilities

The trail functions principally for recreation, accommodating snowmobiling, hiking, mountain biking, skiing, and dog mushing. The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) designates the trail for these uses and prohibits summer motorized uses. The Bean Creek Trail currently functions as an alternative to the southern portion of the Resurrection Pass Trail (i.e., south of the Juneau Falls area) and an alternative access to the falls. It does not have notable intermediate destinations along its length but likely is used for relatively short out-and-back hike or ski trips. Both the Forest Service and the Borough indicated they are actively working, albeit slowly, to establish a dedicated Forest Service trail easement on State and Borough land to allow for Forest Service maintenance of the trail (Mueller, personal communication 2006; O’Leary, personal communication 2006).

The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) does not distinguish between management of the trail and of the lands around the trail. They are managed under a “Fish and Wildlife Conservation Area Management Area” (sic) prescription and a “Backcountry Management Area” prescription. The first of these emphasizes conservation of specific wildlife habitats and allows for primitive recreation; the second emphasizes primitive backcountry recreation (with trails, camp sites, and cabins) and opportunities for solitude and challenge. See also Map 3.2-2 in Section 3.2.

4.2.5.3 Access and Use Levels

The Bean Creek Trail is used year-round both by nearby residents who can walk to it or drive a short distance and by people who travel long distances to reach the trailhead. The Forest Service, State, and Borough do not maintain a trail register or other method of tracking use numbers, so actual use levels are not known. The Bean Creek Trail is used as an alternative access to the Resurrection Pass Trail, particularly in winter when snow, ice, and cross-slope conditions on the southern portion of the Resurrection Pass Trail make traversing the main trail difficult.

4.2.5.4 Relationship to Similarly Used Lands in the Vicinity

The Bean Creek Trail is one of several recreational trails managed by the Forest Service in the project area. It is used less and managed or maintained less than the Resurrection Pass Trail and nearby Russian Lakes Trail.

4.2.5.5 Other Factors

There is no exact location that can be pinpointed as the end of the Slaughter Ridge Road and the beginning of the trail. If weather conditions make the road less drivable, the “trail” on that given day starts farther back on Borough land within the road easement. If the weather is dry and the road is in reasonable condition, standard vehicles may drive to State land. In winter, the unimproved portion of Slaughter Ridge Road is not plowed at all, and trail users park their cars

where maintenance ends; thus the winter trail starts farther back than in summer. The Forest Service has worked with the State and Borough to ensure automobile access and a trailhead, and has made minor improvements to eroded areas of the Slaughter Ridge Road (on the Borough-owned road right-of-way). As stated above, for Section 4(f) purposes, the point at which Slaughter Ridge Road enters State land is considered the beginning of the trail. Jurisdiction over the trail and its maintenance is not placed solidly with any one agency and is not clearly delineated in management plans, but FHWA determined that it functions primarily for public recreation.

4.2.6 *Stetson Creek Trail*

Section 4(f) Property Type: Recreation Area

4.2.6.1 Size and Ownership, Including Agreements Related to Ownership

The Stetson Creek Trail is located primarily in the CNF, but its lower segment is located on Borough land within a 50-foot-wide Forest Service right-of-way easement. It is listed by the Forest Service as 5.24 miles long in the Revised Land and Resource Management Plan (2002a). Map 4-1 and Map 4-8 show the trail. The Forest Service has given it a recreational trail number (Forest Trail #322). For Section 4(f) evaluation purposes, FHWA in consultation with the Forest Service has determined a width of 100 feet is appropriate for defining the recreation resource (see trail width discussion in Section 4.2.1). The trail is historic; see the separate entry in Section 4.2.14.

4.2.6.2 Functions, Available Activities, Existing and Planned Facilities

The Stetson Creek Trail is an historic route to mining areas along Cooper and Stetson creeks. The trail starts at the southern end of the Cooper Creek Campground and heads uphill in a southerly direction, roughly parallel to Cooper Creek for 3 miles and Stetson Creek for 2 miles. The trail is drivable by all-terrain vehicles (ATVs; four-wheelers) over much of its length but is a hiking path at its upper end. The trail is used today for access to mining claims and for recreation. There is no Forest Service trailhead or trailhead sign; the trail simply begins behind a gate. Separately, off the Sterling Highway just west of the campground, there is a cleared area for trailhead parking on CNF land. The trail is closed to public motorized access. However, the Forest Service manages the trail for mining access, allowing ATV and motorcycle access for miners with properly located and staked mining claims and with an approved plan of operations allowing motorized access. The trail is listed among other recreation trails in the *Revised Land and Resource Management Plan* (Forest Service 2002a) and is managed to be open to the general public for horses, bicycles, hiking, snowmobiles, and dog sledding but not to motorized vehicles in summer (except for access to mining claims). Discussions with land managers did not indicate plans for substantial changes.

The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) does not distinguish between management of the trail and of the lands around the trail. They are managed under a “Fish, Wildlife, and Recreation Management Area” prescription that emphasizes variety in fish and wildlife habitats and recreational opportunities in developed and dispersed settings.

4.2.6.3 Access and Use Levels

Access to the trail is from the Sterling Highway through the south side of the Forest Service Cooper Creek Campground and then as an easement across Borough land. Alternate informal access is available directly off the Sterling Highway on CNF land. The alternative access then ties into the main trail as it crosses Borough land. The Forest Service does not maintain a trailhead register to

estimate use but has said the use level is considered low to very low (Forest Service 2009) or low to moderate (Vaughan 2007).

4.2.6.4 Relationship to Similarly Used Lands in the Vicinity

There are several other recreational trails in the project area, including the Forest Service Bean Creek Trail, Resurrection Pass Trail, Russian Lakes Trail, and Russian River Angler’s Trail, and KNWR Fuller Lakes Trail. The Cooper Lake Dam Road, which provides maintenance access up Cooper Creek to a hydroelectric dam, functions as a trail for some users. It parallels much of the Stetson Creek Trail on the opposite side of Cooper Creek (see Map 4-1 and Map 4-8).

4.2.6.5 Other Factors

There is no formal trailhead or parking provided by the Forest Service. There is only an informal parking area on CNF land.

4.2.7 Forest Service Kenai River Recreation Area

Section 4(f) Property Type: Recreation Area

4.2.7.1 Size and Ownership, Including Agreements Related to Ownership

The Kenai River Recreation Area is located entirely within CNF (350 acres) and is owned by the Federal government. It is shown in red-orange color on Map 4-1 and Map 4-9. The area parallels the Kenai River and the existing Sterling Highway from the CNF western boundary approximately 4.3 miles east to Cooper Creek Campground, where there is another recreation area withdrawal (see Cooper Creek Public Camp and Picnic Ground). The recreation area was designated with the highway as a reference point. That is, the area is defined as:

- All land between the highway and the Kenai River
- On the side of the highway opposite the river, all lands in a strip between the highway and a line set 400 feet from the highway and parallel to the highway

See Section 4.2.7.5 (“Other Factors”), below.

The Forest Service considers this area a “special place” recognized by the public (Vaughan 2007). The recreation area generally encompasses the Kenai River at and upstream of the Russian River confluence, an area popular for sport fishing from CNF land for decades. The Forest Service had also, during earlier coordination, indicated the importance of the Kenai River Recreation Area as a buffer and as a Federal holding that prevented transfer of the land for other purposes, such as State or Native corporation selection and potential private development (Forest Service 2009, Vaughan, personal communication 2006a)).

4.2.7.2 Functions, Available Activities, Existing and Planned Facilities

Much of the recreation area along the highway is not developed. The Forest Service has indicated the main recreation function of the area is to allow the public to access land along the Kenai River (Forest Service 2009). Portions of the recreation area that are developed include the driveway entrance that leads to the Russian River Campground and to the trailhead for the Russian Lakes Trail. Located off the driveway and within the recreation area is a large overflow parking area used principally at the height of fishing season. The parking area also serves as the winter trailhead for the Russian Lakes Trail, when the continuing driveway is not plowed. The Forest Service has entered into an agreement with FHWA for the redesign of the entrance and access road to the

Russian River Campground. This redesign for traffic entering and exiting the campground from the Sterling Highway (current alignment) has been included in the proposed alternatives for this project. Construction is expected to be complete well before construction of any Sterling Highway MP 45-60 Project improvement.

The Resurrection Pass Trail’s trailhead and its driveway and a small parking area and informal trail near MP 53.7 also are located within the Kenai River Recreation Area.

Besides these access and parking facilities, the K’Beq Footprints Heritage Site is a developed feature within this recreation area. The K’Beq Footprints Heritage Site encompasses approximately 34 acres and is managed by the Kenaitze Indian Tribe through an agreement with CNF. While it is focused primarily on cultural interpretation, it is also available for recreation that is not related to archaeology or the Tribe: there are picnic tables, people fish from the site, and people pay to park there and walk offsite to hike or fish nearby, and do so particularly when other parking is full. The Forest Service mandates that the Tribe allow this kind of use, and the Tribe is actively working to increase use of the site by others, such as boaters stopping for lunch. The Tribe is working for slow expansion of services and facilities offered at the K’Beq site, including potential of new trails and facilities. See further discussion below under the Sqilantnu Archaeological District.

CIRI Tract B (20.5 acres), adjacent to the K’Beq site, was transferred from the national forest in 2012, removing 20 acres of Kenai River Recreation Area land from Federal ownership. However, the Forest Service retained a public easement along the river through this parcel for recreational access to the river, and this easement retains Section 4(f) protection as part of the recreation area.

The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) does not distinguish between management of the recreation withdrawal and of the lands around the withdrawal; they are managed primarily under a “Fish, Wildlife, and Recreation Management Area” prescription that emphasizes variety in fish and wildlife habitats and recreational opportunities in developed and dispersed settings.

4.2.7.3 Access and Use Levels

Access to the recreation area is directly from the Sterling Highway and from boaters on the Kenai River. Short driveways lead from the highway to the K’Beq interpretive site and Resurrection Pass trailhead, and a longer driveway leads to the Russian River Campground. Use of the Kenai River Recreation Area is dispersed and not formally counted.

4.2.7.4 Relationship to Similarly Used Lands in the Vicinity

This recreation area abuts the Russian River Campground Area and Cooper Creek Public Camp and Picnic Ground, both designated for recreation purposes. It also abuts the Sportsman’s Landing Boat Launch and KNWR. The heritage site, in addition to providing interpretation of area archaeology (see Sqilantnu Archaeological District, below), offers some recreation amenities similar to those offered at nearby campgrounds and the KNWR visitor contact station (short trails, information, public toilets, public parking, river access).

4.2.7.5 Other Factors

The public land order that created the recreation area (Public Land Order 6884) defines the area boundaries in terms of a distance from the highway, but does not define “the highway,” so it is not clear whether the 400-foot measurement is meant to be taken from the centerline of the highway,

the edge of the constructed highway, or the edge of the highway right-of-way. Title research (Robinson 2006) indicated that the recreation area was established “subject to valid existing rights,” and the highway right-of-way predated the 1991 establishing public land order. The State of Alaska believes the edge of the right-of-way is the appropriate point of reference. The maps for this EIS portray the recreation withdrawal based on this belief. The public land order indicates that the recreation withdrawal area is 350 acres. Since that time, two large parcels have been transferred to CIRI, and recreation area boundaries also encompass other private parcels. Calculations for this project using geographic information systems result in a total of 282 acres. It appears that the acreage originally was estimated based on inclusion of all lands adjacent to the highway, including the parcels in private hands today. Even then, the total does not reach 350 acres.

4.2.8 Juneau Falls Recreation Area

Section 4(f) Property Type: Recreation Area

4.2.8.1 Size and Ownership, Including Agreements Related to Ownership

The Juneau Falls Recreation Area is a 320-acre area entirely within CNF boundaries withdrawn for recreation purposes by Public Land Orders 6888 and 7769 and originally “segregated” from other lands in 1968 for its recreation potential (Forest Service 1990). This rectangular parcel lies well north of the Kenai River and about 700 feet higher. It is shown in an orange color on Map 4-1 and is the subject of Map 4-10. The Forest Service considers the area defined in the public land order to be a “special place.” The Forest Service has indicated that the area was defined to protect the general area of the Juneau Creek Falls (Vaughan, personal communication 2006a, 2006b).

4.2.8.2 Functions, Available Activities, Existing and Planned Facilities

The site encompasses a long reach of Juneau Creek, the Juneau Creek Falls, an informal falls viewing point, a Forest Service-designated tent camping site with two bear-resistant food lockers, the junction of the Resurrection Pass and Bean Creek trails, and portions of both trails (1.5 to 2 miles of trail, total). The primary activity is trail use, with the falls and canyon as a visual draw along the trail. Trail use is described under Sections 4.2.4 and 4.2.5 (“Resurrection Pass National Recreation Trail” and “Bean Creek Trail,” respectively) above.

The *Chugach National Forest Revised Land and Resource Management Plan* (Forest Service 2002a) does not distinguish between management of the recreation withdrawal and the lands around the withdrawal; both are managed under a “Fish and Wildlife Conservation Area Management Area” (sic) prescription and a “Backcountry Management Area” prescription. The first of these emphasizes conservation of specific wildlife habitats and allows for primitive recreation; the second emphasizes retention of the natural environment (with trails, camp sites, and cabins) and opportunities for solitude and challenge. See also Map 3.2-2 in Section 3.2.

4.2.8.3 Access and Use Levels

There is no direct road access to the Juneau Falls Recreation Area. Developed access is entirely from the Resurrection Pass Trail and Bean Creek Trail via foot, mountain bike, snowmobile, skis or snowshoes, or horse. A winter route, marked by the Forest Service and using old Forest Service logging roads west of the recreation area as alternate winter access to the Resurrection Pass Trail, also provides access. The Forest Service indicates that Juneau Falls, or the trail bridge across Juneau Creek a short distance upstream of the falls, is a destination or turnaround point for many day hikers and mountain bikers. Except for camping at the backcountry camp site and likely some

hunting and other dispersed use of the undeveloped forest areas, little or no use of the recreation area separate from trail use is known.

4.2.8.4 Relationship to Similarly Used Lands in the Vicinity

There are other recreation areas throughout the project area. Most others are adjacent to the Sterling Highway. Only the Lower Russian Lake Recreation Area, which lies upstream of the Russian River Campground described above, is away from the road system like the Juneau Falls Recreation Area.

4.2.9 Cooper Landing Boat Launch and Day Use Area

Section 4(f) Property Type: Recreation Area

4.2.9.1 Size and Ownership, Including Agreements Related to Ownership

The Cooper Landing Boat Launch is a 5.3-acre parcel of State-owned land, shown as #9 on Map 4-1; see also Map 4-11). The land is located adjacent to the Sterling Highway's Cooper Landing Bridge at the Kenai Lake outlet. ADF&G owns the parcel, which was acquired with Federal fisheries enhancement funds. However, DPOR manages the parcel jointly with ADF&G through an Interagency Land Management Assignment. The concrete boat launch ramp is located wholly within the Sterling Highway right-of-way and adds 0.55 acre to the site. The ramp was developed along with the rest of the site and was funded as a Federal Transportation Enhancement Activity. It was jointly undertaken by DOT&PF, DPOR, and ADF&G, with participation by FHWA in funding (Robinson 2006). Technically, the Federal government still has title to the land within the right-of-way and CNF still has some management authority over this land as provided in the highway easement.

4.2.9.2 Functions, Available Activities, Existing and Planned Facilities

The site is a boat launch at the upper end of the Kenai River, providing river access downstream to Skilak Lake and upstream into Kenai Lake. Site amenities include two latrines, a water well and septic system, a viewing platform, informational signs, and a caretaker's cabin that is occupied year-round. The launch ramp principally provides access for recreational boating and sport fishing on the Kenai River, which is a State park unit. Discussions with land managers did not indicate plans for substantial changes.

4.2.9.3 Access and Use Levels

Access to the boat launch area from the land side is directly off the Sterling Highway. The facilities are also accessible from the water. The DPOR has a mechanical vehicle counter at the entrance, and the agency uses a formula to derive user numbers from the mechanical counts. Reported use was 73,848 vehicles in 2003, 62,529 in 2004, and 83,396 in 2005. Under the DPOR formula, these numbers translate to 221,544 persons, 187,587 persons, and 250,188 persons, respectively (Carrico, personal communication 2007). The mechanical counter does not distinguish between vehicles that launch boats, park at picnic tables, or stop only at the restroom. Those who do launch boats may be counted also in river use counts for the upper Kenai River (see KRSMA). Use is steady at the boat launch throughout the year, with a substantial summer peak (17,761 vehicles in July 2005 alone).

4.2.9.4 Relationship to Similarly Used Lands in the Vicinity

Sportsman’s Landing, another boat launch in the project area, is located downstream at the confluence of the Kenai and Russian rivers. Jim’s Landing is located just beyond the project’s western end in the KNWR. Boat access is also available from Quartz Creek Campground just outside the project’s eastern end. All provide access to the KRSMA, a State park unit.

4.2.9.5 Other Factors

The land ownership and management are somewhat unusual, because the parcel is a recreation area but effectively managed as a State park. It is not legislatively designated as a park or proposed for designation. The parcel is designated in an adopted plan and functions for recreation purposes and for access to the legislatively designated park unit.

4.2.10 Historic Properties Introduction

There are many archaeological sites in the project area and several historic features associated with mining activity. These sites have been subject to evaluation under Section 106 of the NHPA. This document addresses those sites identified as being located within the APE for any of the project alternatives and qualified for Section 4(f) protection. The following subsections provide summary information pertinent to each of these sites, beginning with the Sqilantnu Archaeological District. See also the Section 106 documentation for the project (Section 3.9, Historic and Archaeological Preservation). For historic properties, Section 4(f) applies to those on or eligible for inclusion in the NRHP.

4.2.11 Sqilantnu Archaeological District

Section 4(f) Property Type: Historic property

4.2.11.1 Eligibility and Significance

The Sqilantnu Archaeological District encompasses a large portion of the entire project area (see Map 4-1). It was originally determined eligible for the NRHP in November 1981 by the Alaska Office of History and Archaeology. At that time, the Sqilantnu District was found eligible under Criterion D of Section 106 of the NHPA,⁸ for the potential of the district to reveal important information about Dena’ina Indian occupation of the area. In 2012, FHWA found the district eligible under Criterion A as well, for association with significant events in the prehistory of the Dena’ina and other Native people (HDR 2012). All the individual historic properties⁹ that contribute to the district are assumed to be eligible based on Criteria A and D, but most have not had individual eligibility determinations. The Alaska Heritage Resource Survey maintained by the Alaska Office of History and Archaeology formally lists 64 contributing archaeological sites within the District. There are literally thousands of known cultural features in several hundred historic properties within the Sqilantnu Archaeological District. The individual historic properties are not mapped for this document, to help protect their locations.

⁸ Criteria A–D for determining eligibility of historic sites for the NRHP ((NPS 2002); see also Section 4.2.10 of this chapter).

⁹ “Historic property” is a general term used in the NHPA to encompass both historic and prehistoric areas or structures, including archaeological sites. In this specific instance, the “historic properties” are all archaeological.

The district as a whole can be characterized as a late prehistoric-early historic Dena'ina occupation with associated smaller sites. The district is considered to have extensive archaeological data that document the nature of Dena'ina use and occupancy of this part of the Kenai Peninsula during the 19th century. For this reason, contributing historic properties within the district should be considered:

...collectively, rather than as individual properties, because of their cultural and geographical unity.... It is important to include summer and winter village sites, burials, cemeteries, camp sites, and cache pit clusters within the District because they represent different aspects of the seasonal round, a broad range of former activities, and changes in the patterning of these activities through time.

– Eligibility Determination, 1981

Cultural features listed in the 1981 Sqilantnu Archaeological District nomination include house pits, pit features, depressions, cache pits, and burials. Numerous other cultural features, including house pits, cache pits, burials, middens, and surface depressions, have been documented since 1981 and added as contributing to the district. Regarding significance, the SHPO indicated in a letter to FHWA for this project (Bittner, Letter from DNR-SHPO to Tim Haugh, FHWA 2007) that the collective pattern of sites makes up the information potential of the district as a whole and that adverse impacts to individual historic properties would compromise the information potential of the whole.

Within the Sqilantnu Archaeological District and within the areas of potential effects of the project alternatives, there are two areas—one large, one small—that have been delineated separately and that FHWA has determined to be individually eligible for the NRHP as Traditional Cultural Properties (TCPs). SHPO requested further documentation before concurring on the TCP status and before concurring that they are contributing elements of the larger Sqilantnu District, but suggested these sites be treated as TCPs for purposes of this project. FHWA has agreed to treat the sites as TCPs. The sites are:

- Sqilantnu Russian River Confluence Site (Confluence Site), 1,187 acres
- New Village Site, 4.5 acres

While the entire district is considered significant and subject to Section 4(f) protections, FHWA's determination that these two sites should be treated as TCPs added a layer of significance to these areas. They are discussed further in the following pages under their own subheadings. The sites, however, are contributing elements of the Sqilantnu District. Within the large Confluence Site are multiple other sites of note for their roles in interpretive and cultural activities by the Kenaitze Indian Tribe, a Dena'ina tribe currently based in the Kenai/Soldotna area. These include the Beginnings and K'Beq Footprints Heritage Sites. Also, one contributing historic property is associated with human burials and has particular importance to the Kenaitze Indian Tribe. Lands within the Confluence Site selected by CIRI under ANCSA and the Russian River Land Act also are important. These areas and the individual archaeological features within them are further discussed in following pages under the heading for the Russian River Confluence Site. They are important both to the Confluence Site and to the broader Sqilantnu Archaeological District.

4.2.11.2 Size and Ownership, Including Agreements Related to Ownership

The original boundaries of the Sqilantnu District were described in 1981. The researchers at that time considered the cultural and geographic center of the district to be the Russian River from Lower Russian Lake to the river’s confluence with the Kenai River, and therefore defined the eastern and western boundaries as being where there is “a decrease in the concentration of cultural features that relate directly to the sites at the confluence.” Since the original nomination in 1981, many more historic properties found outside of the original boundaries have been determined to contribute to the Sqilantnu Archaeological District. For this project, Section 106 consultation between DOT&PF, FHWA, SHPO, the Forest Service, USFWS, and tribal entities has resulted in a revised boundary, as shown on Map 4-1. This area covers the majority of the project area up to about elevation 1,000 feet on both the north and south sides of the Kenai River Valley. The total area within the boundaries is 12,600 acres. Consulting parties have agreed that all of the mapped area is part of the archaeological district.

Ownership of the lands in question is by the KNWR downstream of the Kenai River-Russian River confluence and by the CNF upstream of the confluence. Within the CNF boundary, there are many land owners, including the Borough, the State of Alaska, and private owners. Most of the district encompasses public lands.

The RRLA ratified an agreement to transfer the “archaeological estate” of some 500 acres within the KNWR boundary to CIRI, an Alaska Native corporation and tribal entity, and assigned ownership of found artifacts throughout the district to CIRI. The agreement also provided means to convey a 42-acre “Tract A” and a 20.5-acre “Tract B” within the district to CIRI. Under terms of the agreement, the larger parcel is slated to become an archaeological/cultural interpretive center for the district in the future.

Finally, the agreement ratified by the RRLA resulted in a memorandum of understanding (MOU) between CIRI, the Kenaitze Indian Tribe, the Forest Service, and USFWS for ongoing management of cultural and natural resources within the Sqilantnu Archaeological District. These entities are known informally as the RRLA MOU Group.

4.2.11.3 Other Factors

Virtually all other park, recreation area, refuge, and historic properties in the project area that are protected under Section 4(f) fall at least partly within the boundaries of the Sqilantnu District, creating an overlapping mosaic of Section 4(f) properties. Also, the Confluence Site and the multiple important cultural and archaeological sites within it are contributing elements of the Sqilantnu District. Separating consideration of the Confluence Site and the archaeological district is not possible. The heavy overlap and nesting of Section 4(f) recreational and archaeological properties within the Sqilantnu District is unusual. As an example: there are features important to the Kenaitze Indian Tribe in small sites contained within CIRI Tract A, which is an important part of the Confluence Site, which in turn falls within the greater Sqilantnu District.

4.2.12 Sqilantnu Russian River Confluence Site

Section 4(f) Property Type: Historic Property

4.2.12.1 Eligibility and Significance

FHWA in consultation with the Kenaitze Indian Tribe and others have determined that the Sqilantnu Russian River Confluence Site is culturally significant for its association with the

confluence of the Kenai and Russian rivers and the broader cultural practices and tradition of the Kenaitze community as a place of village life, fishing, and burial and that it qualifies as a TCP. See Map 4-1 and Map 4-12. The area is delineated to encompass multiple sites of particular importance to the Kenaitze Indian Tribe and CIRI.¹⁰

- CIRI conveyances Tract A and Tract B
- A 500-acre area of archaeological estate (cultural resource rights) within KNWR
- A winter village and ceremonial house site, and similar sites nearby
- Beginnings Heritage Site
- K’Beq Heritage Site

These are significant cultural places that have an integral relationship with the beliefs and practices of the Kenaitze community. These sites are significant for the performance of historically rooted practices, and for the continued education and cultural identity of the Kenaitze.

FHWA considers the Confluence Site eligible under Criterion A of the NRHP for its association with a broad pattern of events or trends. Further, the significance of this area is indicated by CIRI’s selection of portions of this area as places of cultural and historical significance under provisions of Section 14(h)(1) of ANCSA. Significance also is indicated by the identification of the confluence area in the Russian River Land Act: “Congress (finds that these lands) contain abundant archaeological resources of significance to the Native people of the Cook Inlet Region, the Kenaitze Indian Tribe, and the citizens of the United States.” The archaeological historic properties (approximately 103 have been delineated within the site boundaries) are considered a rich source of information that mostly has yet to be investigated, and FHWA also considers the site eligible for the NRHP under Criterion D, for its information potential.

FHWA considers the Confluence Site an integral part of the greater Sqilantnu Archaeological District, which is eligible under both criteria A and D. For this project, Section 106 consultation has resulted in preliminary documentation of the Confluence Site as a TCP. SHPO indicated that further documentation would be necessary for SHPO concurrence on the eligibility of the Confluence Site as a TCP and for concurrence regarding whether the site contributes to the larger Sqilantnu District. However, SHPO indicated that consideration of the site as “having the overlying significance as [a] Traditional Cultural Propert[y]...is...clearly warranted.” Further, SHPO wrote, “We do not intend for the consultation process to get ‘hung up’ on the issue of eligibility.... If acceptable, we propose that the [Confluence site] be considered eligible for the purposes of Section 106 (and Section 4(f)) and that additional research be conducted as we move toward resolution of adverse effects” (Bittner 2013). DOT&PF and FHWA found this approach acceptable and proceeded under this understanding. A commitment to provide further documentation, as requested by SHPO, is included as part of the measures to minimize harm under all alternatives (see Section 4.6.11). DOT&PF and FHWA have treated the property as a TCP in all dealings with the consulting parties throughout the Section 106 process and determined that it

¹⁰ Several of these are not mapped to protect sites sensitive to the Kenaitze Indian Tribe and CIRI, and because several of them are removed from any of the proposed alignments.

is protected as an historic property under Section 4(f). It is typically referred to within this document as the Confluence Site.

4.2.12.2 Size and Ownership, Including Agreements Related to Ownership

The Confluence Site, shown on Map 4-1 and Map 4-12, encompasses a total of 1,187 acres and generally follows the Kenai River from the K’Beq Heritage Site near MP 51.3 of the existing Sterling Highway downstream about 4.4 miles to about MP 55.7. The Confluence Site includes the last mile of the Russian River. The portion west of the river confluence and southwest of the Russian River is KNWR land. The portion east of this area is CNF land, interspersed with a few private properties, including the two CIRI tracts.

The Russian River Land Act ratified an agreement related to Federal and CIRI ownership, including agreements to transfer the archaeological estate on more than 500 acres of KNWR land to CIRI, grant ownership of found artifacts (archaeological resources) to CIRI, and lay out the framework for cooperative management for cultural purposes and ultimately for a planned complex with archaeological interpretation, cultural center, and lodging components on CIRI Tract A. The RRLA also allows CIRI to exchange up to 3,000 acres with the DOI to settle their land claims under ANCSA. This would affect ownership patterns in the project area. See Section 4.2.3.

4.2.12.3 Functions, Available Activities, Existing and Planned Facilities

The land is culturally important to the Kenaitze Indian Tribe. The Beginnings Heritage Site (now closed as a public interpretation site) and K’Beq Heritage Site have been used for culture camps, archaeological investigation, and ongoing public interpretation of Kenaitze history and culture. Other sites also have been subject of archaeological research by the Kenaitze and others. Besides these activities and functions, the area is heavily used for sport fishing, camping, and outdoor recreation. Other Section 4(f) properties, including the Russian River Campground, Sportsman’s Landing, Russian River Ferry, Forest Service Kenai River Recreation Area, and recreational trails, all center on the confluence area. The KRSMA (a State park) is the Kenai River running through a portion of this area. CIRI, in cooperation with USFWS and the Forest Service, eventually plans to develop a cultural center and lodge on Tract A.

4.2.12.4 Specific Properties within the Confluence Site

K’Beq Footprints Heritage Site. The K’Beq Footprints Heritage Site is completely within the Confluence Site and Sqilantnu Archaeological District. The 34-acre¹¹ site, labeled #6 on Map 4-1 and shown on Map 4-12, is located on the north side of the Sterling Highway across from the entrance to the Forest Service Russian River Campground. The land is owned by the Federal government (Forest Service) and is part of the Kenai River Recreation Area discussed above. The site is operated by the Kenaitze Indian Tribe (Tribe) under a special use permit from the Forest Service. Within the permitted area are two contributing historic properties, one 6.2 acres in size and one 0.6 acre. The smaller historic property is the one used for interpretive activities. Facilities on the site include a paved parking lot capable of handling pull-through traffic (buses,

¹¹ The special use permit held by the Kenaitze Indian Tribe for the K’Beq site notes the permitted site as “approximately 16 acres.” When mapped, the result was 34 ac. Subsequent correspondence with the Forest Service indicated that the site boundaries used appeared correct and that if the result was 34 ac., that acreage should be used.

motorhomes, trailers), a paved road, a small visitor center and gift shop building, interpretive signs, and a boardwalk/pathway running to and through a house pit and five associated archaeological features. The Tribe charges a modest fee for guided and unguided tours. In 2006, according to the Kenaitze Indian Tribe cultural and educational director (Lindgren, personal communication 2007), the Tribe created four reconstructions of cache pits on the site, using them to preserve salmon over the winter. The Tribe and the Forest Service have discussed plans to reconstruct a full-sized replica Dena'ina house on the site. CIRI in 2012 took ownership of adjacent land (Tract B) and could develop complementary facilities there.

The general public, including tour groups (Elderhostel (Road Scholar) tours regularly stop) and school groups, use the site. Presentations are made to three to four youth groups and two to three school groups per year. The Tribe uses the site for cultural activities and summer camps, and the site employs tribal youth.

The Tribe considers K'Beq significant for interpreting and experiencing Dena'ina culture, both prehistory and modern culture, to the public in general and within the Tribe. The Tribe also considers the site important for interpreting natural history and for recreation (Lindgren, personal communication 2006).

Section 4(f) protections apply to the area in general as part of the Confluence Site and part of the larger Sqilantnu District, but there is no extra protection afforded the permitted area. The 34-acre site is part of the Kenai River Recreation Area and is afforded Section 4(f) protection as part of a recreation property as well.

Beginnings Heritage Site. The Beginnings Heritage Site was the original cultural interpretive site operated by the Kenaitze Indian Tribe. The Tribe's governing council voted in 2008 that the site should be closed to reduce foot traffic and resulting erosion of the site along the Kenai River (Lindgren, personal communication 2008). The use of the site for interpretive activity predated the larger and more developed K'Beq Heritage Site. The area known as "Beginnings" is larger than the area once used for interpretation and includes nine individual delineated archaeological sites. The existing Sterling Highway right-of-way runs through and overlaps the Beginnings area. Those portions of Beginnings not overlapping the highway right-of-way are within the Forest Service Kenai River Recreation Area. The Beginnings Heritage Site is used in part for non-cultural recreation, including access to the Kenai River (see also the separate entry above under Kenai River Recreation Area).

The Kenaitze Indian Tribe indicated that the site was significant for the same reasons as the K'Beq Heritage Site: for experience and education of Dena'ina culture, both prehistory and modern culture, for the general public (in the past), and for the Tribe itself (Lindgren, personal communication 2006; HDR (2012)).

CIRI Tract A. Tract A is a 42-acre irregular polygon owned by CIRI. It is located within CNF immediately north of the Sterling Highway and immediately east of the CNF border with KNWR (see Map 4-12). Tract A overlooks the confluence of the Kenai and Russian rivers from a bluff. It was an ANCSA 14(h)(1) selection, indicating special selections for culturally valued places away from present-day communities. It is currently undeveloped except for a minor power line at its southern edge. Tract A was a key part of the Russian River Land Act, giving CIRI title to Federal land with provisions for creating a cultural and archaeological research and interpretive center, in cooperation with USFWS and the Forest Service, and a lodge in the heart of the area considered culturally important.

Burial Site. This is an archaeological historic property that contains substantial burials of human remains, likely indicating long use of the site for burials using different burial methods. The site includes both Eskimo and Dena'ina Indian burials. Modern burials of repatriated remains have occurred on this site as well. The burial portion, in particular, is sensitive, and important to the Kenaitze Indian Tribe. The Forest Service has completed substantial subsurface work at this site, but the full extent of the burials has not been determined with finality. Because of the human remains, importance to the Kenaitze, and location on Federal land, the Native American Graves Protection and Repatriation Act likely would apply to any items found at this location.

CIRI Tract B. Tract B is a 20.5-acre polygon owned by CIRI. It is located adjacent to the Sterling Highway, Kenai River, and K'Beq Heritage Site and across from the entrance to the Russian River Campground (see Map 4-12). Besides association with archaeological sites, the cultural significance of Tract B is due principally to its location and adjacency to K'Beq and its value for interpreting the cultural heritage of the area to modern visitors. CIRI selected Tract B from national forest lands that were part of the Kenai River Recreation Area, and the Forest Service retained a public access recreation-related easement on this parcel adjacent to the river banks. The easement area has Section 4(f) protection as part of the Confluence Site and larger Sqilantnu District, and as part of the Kenai River Recreation Area.

4.2.12.5 Other Factors

The heavy overlap and nesting of Section 4(f) recreational and archaeological properties within the Confluence Site is unusual.

4.2.13 Bean Creek Trail/Original Resurrection Pass Trail

Section 4(f) Property Type: Historic Property

4.2.13.1 Eligibility and Significance

The historic Bean Creek Trail/Resurrection Pass Trail, also once known as the Juneau Creek Trail, is located east of Juneau Creek and west of the small drainage of Bean Creek (see Map 4-1 and Map 4-6). It is an historic route used originally by prospectors and miners and is the original route of the Resurrection Pass Trail. The Forest Service determined in 1987 that the trail was eligible for the NRHP under Criterion A for its association with 19th century exploration and settlement of the northern Kenai Peninsula and with the Alaska gold rush on the northern Kenai Peninsula (McMahan, D.J. and R.G. Buzzell 1986). McMahan and Buzzell (1986) stated that the trail exhibits integrity north of Cooper Landing. It is also significant for its association with Joseph Cooper, a miner of local significance who was the first to record use of the trail in the 1880s.

4.2.13.2 Size and Ownership, Including Agreements Related to Ownership

The historic Bean Creek Trail lies mostly in the CNF, partly on State land within a Forest Service easement and partly on State public land without any easement, and once existed on what is now developed private land and roads (likely including portions of driveways and Bean Creek Road). Most of the historic Bean Creek Trail also is used and managed as a recreation trail (see separate entry for Bean Creek Trail as a recreation area, above). Portions of the recreational trail have been rerouted to avoid conflict with local homeowners. The rerouted portion is not historic, but provides public access because it is located on public land. The southern end of the historic route crosses State land and once crossed private land, but there is no dedicated public access on a portion of the State land and no dedicated public access on private land (the Forest Service relinquished an

easement once held on private land to reduce conflicts). The eligibility documentation indicated the trail probably once continued south to the mouth of Bean Creek. The Bean Creek Road may overlie part of the historic route. From the edge of private property upstream, the historic trail is about 1.9 miles long to its junction with the Resurrection Pass Trail.

The entire Bean Creek/Resurrection Pass historic trail is more than 35 miles long, terminating at its north end near Hope. The historic segment within the project's APE is the Bean Creek Trail. The historic Bean Creek Trail's southern end is assumed to be at the edge of the private residential subdivision. The northern end is at the Resurrection Pass Trail northeast of Juneau Falls. The historic portion of the Bean Creek Trail and Resurrection Pass Trail (i.e., the portion north of its junction with the Bean Creek Trail) is the trail that has been determined eligible for listing in the NRHP. The rerouted southern end of the Bean Creek Trail leading to Slaughter Ridge Road is not part of the historic route determined eligible for the NRHP.

On CNF, the Bean Creek Trail has no defined right-of-way or easement or management boundary. On one parcel of State land, there is a CNF easement that is 25 feet wide and 0.5 mile long. On an adjacent parcel of State land, the trail is on State land but has no easement. The documentation under Section 106 of the NHPA did not ascribe a resource width to the trail. In consultation with the Forest Service, FHWA determined that a trail width of 100 feet (50 feet each side of centerline) is considered a reasonable width for Section 4(f) impact assessment purposes for this trail. This width is used throughout the length of the trail regardless of the presence or absence of easements (see trail width discussion in Section 4.2.1).

4.2.13.3 Other Factors

The Forest Service relinquished its public trail easement to landowners and, in cooperation with the State of Alaska, rerouted the public trail around the private properties. This removed the southernmost portion of the recreational trail from its historic alignment. This section of this document considers only the historic portion; see the above discussion of the recreational significance of the trail and the non-historic portion.

4.2.14 Stetson Creek Trail

Section 4(f) Property Type: Historic property

4.2.14.1 Eligibility and Significance

The Stetson Creek Trail is an historic route to mining areas along Cooper and Stetson creeks (see Map 4-1 and Map 4-8). The Forest Service determined the Stetson Creek Trail eligible for the NRHP in 2005. The trail includes a section of corduroy road (logs laid side-by-side as a crude pavement) where it crosses an unnamed stream 1.5 miles south of the Sterling Highway. Just south of this stream is the beginning of an old hydraulic mining ditch that both parallels and crosses the trail. After about 4 miles, the trail turns into a barely visible vehicle track route and then into a hiking trail that follows the historic trail for about 0.5 mile, paralleling the large hydraulic ditch that is covered in alders. Once past the alders, the trail continues inside the mining ditch for its duration into Stetson Creek Valley. Ditches in Stetson and Cooper creeks near the trail were reportedly hand excavated between 1898 and 1902.

The trail was found eligible for its association with significant events related to Gold Rush mining (Criterion A) and for the information it could provide (Criterion D). The Forest Service also

considers the route significant as a recreation trail based on its classification of the trail (see the Stetson Creek Trail entry above, Section 4.2.6) as a recreation area.

4.2.14.2 Size and Ownership, Including Agreements Related to Ownership

The Stetson Creek Trail is recorded by the Forest Service as 5.24 miles long in the *Revised Land and Resource Management Plan* (Forest Service 2002a). Although it probably originally began at the mouth of Cooper Creek, the trail now starts near the southern end of the Cooper Creek campground and heads uphill in a southerly direction, roughly parallel to Cooper Creek for 3 miles and Stetson Creek for 2 miles. The trail, designated Forest Trail #322, is located primarily on CNF land, but its beginning is located on State of Alaska and Borough land, within a 50-foot-wide Forest Service right-of-way. There is no right-of-way associated with the trail where the trail is located on CNF land, and Section 106 documentation did not ascribe a resource width. A trail width of 100 feet was considered reasonable to define the resource width for this trail for Section 4(f) evaluation purposes and is used throughout the length of the trail.

4.2.14.3 Functions, Available Activities, Existing and Planned Facilities

The trail is used today for access to mining claims and for recreation (see the Stetson Creek Trail entry above) as a recreation trail.

4.2.15 Charles G. Hubbard Mining Claims Historic District

Section 4(f) Property Type: Historic property

4.2.15.1 Eligibility and Significance

In 1910, at the peak of mining activity on the upper Kenai River, Charles Cunningham found gold on the Kenai River about a mile below the mouth of Cooper Creek (Buzzell 1986, II-8). That same year, Charles G. Hubbard, a mining promoter previously associated with one of the Kennecott copper mines in Alaska, came to the upper Kenai River area and purchased 8 of Cunningham's claims for \$40,000 (Jones 1970, Buzzell 1986). He increased his holdings to 57 claims right away and increased his holdings further over time. Hubbard prospected and mined in the area with various partners until about 1957. As part of this project, the Hubbard mining claims (17 claims) were found eligible for the NRHP in August 2007 for their association with significant events (Criterion A) and for the information they could provide (Criterion D). The district discussed here is not mapped in this document, to protect potentially sensitive sites. The 17 contiguous claims, stretching some 3 miles along the Kenai River valley, meet the definition of a district as "a concentration, linkage, or continuity of site, building, structures or objects united historically or aesthetically by plan or physical development." The cluster of mining features on mining claims named Ava, Ace, and Ada; Fern and Robin; and Alpha; and the Hubbard Cabin are contributing resources to the district. These claims were part of those purchased by Hubbard in 1910. Mining activities on these claims continued up to the 1970s.

4.2.15.2 Size and Ownership, Including Agreements Related to Ownership

The district encompasses 444 acres and includes the Ace and Alice claims (17 mining features); the Fern and Robin mining claims (8 mining-related features); the Alpha mining claim (2 mining features), and a related cabin. Each of these is an individually eligible historic property encompassed within district boundaries that include these and other mining claims held by Charles Hubbard. The land encompassed by these historic claims is mostly CNF land but also overlaps the KRSMA (State park) and some private lands.

4.2.16 Kenai Mining and Milling Co. Historic Mining District

Section 4(f) Property Type: Historic property

4.2.16.1 Eligibility and Significance

The Kenai Mining and Milling Company Historic District is the location of an early 20th century mining camp near Cooper Creek. The district is not mapped in this document, to help protect potentially sensitive sites. In 2005, the Cooper Lake Hydroelectric Relicensing Project (Chugach Electric Association and Federal Energy Regulatory Commission) determined the district eligible for the NRHP for its association with:

- Significant events (Criterion A), namely “Kenai Peninsula and Turnagain Arm Gold Rush 1895–1898” and “Post Gold Rush Mining Activities on the Kenai Peninsula and Turnagain Arm, 1900–1940s.”
- Significant persons (Criterion B). Individuals who worked this area constitute a “Who’s Who” of early 20th century mining in the area. Section 106 documentation lists 14 men, including James Stetson, Joseph Cooper, and Charles Hubbard.
- Information it could provide (Criterion D).

4.2.16.2 Size and Ownership, Including Agreements Related to Ownership

The mining and milling operations inhabited the area at the lower reaches of Cooper Creek, an area used for both mining and logging, and for milling lumber. The boundary for the district extends from Cooper Creek west to the vicinity of the Stetson Creek Trail (a separate historic resource) and from the existing Sterling Highway upstream to the mouth of Cooper Creek Canyon, encompassing approximately 29 acres in and around the Forest Service Cooper Creek Campground. The land ownership in the area is a mix of Forest Service, State, and Borough land, and a small portion of a private parcel.

4.2.16.3 Features

As originally defined, the district was composed of *Tasdliht*, Huecker’s Hovels, and a collection of several nearby mining features. An historic trail segment is an additional contributing element discovered as part of this project. The Stetson Creek Trail, which runs through a portion of the district, was separately determined eligible for the NRHP, also in 2005.

Tasdliht is composed of three rectangular depressions and two berms, while Huecker’s Hovels consists of a cabin foundation and several nearby surface features, a “well,” and two garbage dumps. The collection of mining features is a contributing element and consists of two prospect pits (outside the APE of the alternatives), a flume, and an old roadbed. Also included are two older prospects—a round hole and a “U-shaped” excavation.

4.3 De minimis Impact Findings

Some of the Section 4(f) properties described in the previous section may be used, but have such a minimal impact that avoidance analysis under Section 4(f) is not required. FHWA may make a determination of a *de minimis* impact for any use of a Section 4(f) park, recreation area, or refuge resource that does not “adversely affect the activities, features, and attributes” of a Section 4(f) property under certain circumstances (see legal background in Section 4.1.1). For historic properties, a “no adverse effect” or “no historic properties affected” finding under Section 106

may result in a *de minimis* impact finding under Section 4(f). If FHWA proposes a *de minimis* finding for more than one Section 4(f) property, FHWA must **make** a separate finding for each Section 4(f) resource affected. Following an opportunity for public review and comment, the agency official with jurisdiction must concur in writing that the proposed project’s use of a park, recreation area, or refuge will not adversely affect the activities, features, and attributes of the Section 4(f) property, and in the case of historic properties, the SHPO must concur in writing in the “no adverse effect” or “no historic properties affected” Section 106 finding.

The Draft Section 4(f) Evaluation for this project had proposed *de minimis* impact findings for two properties, as follows:

- **Kenai River Special Management Area.** Based on consultation with the Alaska Division of Parks and Outdoor Recreation over many months, FHWA had proposed that a *de minimis* impact would result for the Cooper Creek Alternative’s use of KRSMA. The Juneau Creek Alternative and Juneau Creek Variant Alternative would have no Section 4(f) use of KRSMA, and the G South Alternative impacts were considered greater than *de minimis*.
- **Forest Service Kenai River Recreation Area.** Based on consultation over several years, FHWA had proposed that a *de minimis* impact would result for the Cooper Creek, G South, and Juneau Creek Variant alternatives’ impacts to the Kenai River Recreation Area. The Juneau Creek Alternative would not use land from the Kenai River Recreation Area.

Process used in this Section 4(f) Evaluation

Because the Sterling Highway project area presents a complex set of Section 4(f) properties, informational boxes like this one will be used to outline the steps employed and to indicate where the reader is in the process. The process outline, with the current step in bold, is as follows.

1. Identify Section 4(f) properties.
- 2. Evaluate whether any impact is likely to be a *de minimis* impact.**
3. Identify any alternatives that would avoid all Section 4(f) properties.
4. Present the impacts of proposed alternatives on Section 4(f) properties.
5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.
6. Evaluate least overall harm.

Public and agency comment received during the comment period on the draft resulted in no comments specific to these proposed *de minimis* findings. However, when DOT&PF subsequently requested written concurrence, the officials with jurisdiction over KRSMA (Alaska Division of Parks and Outdoor Recreation) stated verbally (they did not respond in writing) that they did not concur that the use would be *de minimis*. Due to lack of concurrence, FHWA cannot make a finding of *de minimis* impact. Therefore, this chapter treats the KRSMA as a Section 4(f) property with greater than *de minimis* impacts.

Similarly, the Forest Service stated in a letter dated August 24, 2016 that the agency could not concur regarding the Cooper Creek and G South alternatives’ uses of the KRRRA. In a meeting with the Forest Service, the agency explained that a primary attribute of KRRRA was to provide access to the river. Because the Cooper Creek and G South Alternatives were removing parking (even though the parking was in the highway right-of-way and not a part of KRRRA) they could not concur. Therefore, because of the lack of concurrence by the agency with jurisdiction over KRRRA, FHWA cannot make a finding of *de minimis* impact for the Cooper Creek or G South alternatives’

uses of the KRRRA. As a result, this chapter treats the KRRRA as a Section 4(f) property with greater than *de minimis* impacts.

Regarding the Juneau Creek Variant Alternative and its use of the KRRRA, the Forest Service concurred in writing regarding a *de minimis* impact finding. In a letters dated August 24, 2016, and November 21, 2016, the Forest Supervisor responded with concurrence specific to the Juneau Creek Variant Alternative and its use of the KRRRA.

Section 4.5 discusses impacts of these alternatives in detail. The “Section 4(f) *De Minimis* Finding for Parks, Recreation Areas, and Wildlife & Waterfowl Refuges” form for the Juneau Variant Alternative’s use of KRRRA is found in Appendix F. The form discusses the resource; the impacts and proposed measures to minimize harm, including mitigation and enhancement measures for those impacts; and the results of coordination with the officials with jurisdiction. Attached to the form is the concurrence letter signed by the Forest Service, as the official with jurisdiction, which indicates that the Juneau Creek Variant Alternative would not adversely affect the activities, features, and attributes of the property.

While the analysis indicates there is a use of a Section 4(f) resource by project alternatives that qualifies as a *de minimis* use under 49 USC 303(d) and 23 CFR 774.3(b), all four build alternatives use other Section 4(f) properties where the impacts would be greater than *de minimis*. Table 4.3-1 summarizes the findings.

- Based on the impact and mitigation discussions later in this chapter (Sections 4.5 and 4.6) and the *de minimis* analysis in Appendix F, FHWA has found that the use of the KRRRA by the Juneau Creek Variant Alternative would not adversely affect the features, attributes, or activities of the KRRRA; therefore, the impact would be a *de minimis* impact.

FHWA’s findings regarding *de minimis* impacts are summarized in Table 4.3-1. See Chapter 5 for a description and summary of the public and agency review process and Appendix J for a record of comments received and FHWA responses. FHWA has published the *de minimis* impact findings form and concurrence letter in Appendix F.

Table 4.3-1. Findings regarding *de minimis* impact

“Yes” indicates impacts are *de minimis* impacts

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative (Preferred)	Juneau Creek Variant
KRSMA	No	No	—	—
Kenai National Wildlife Refuge	—	—	No	—
Resurrection Pass Trail	—	—	No	No
Bean Creek Trail	—	No	No	No
Stetson Creek Trail	No	—	—	—
Forest Service Kenai River Recreation Area	No	No	—	Yes
Juneau Falls Recreation Area	—	—	No	No
Cooper Landing Boat Launch and Day Use Area	No	—	—	—

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative (Preferred)	Juneau Creek Variant
Sqilantnu Archaeological District	No	No	No	No
Confluence Site	No	No	No	No
Charles G. Hubbard Mining Claims Historic District	No	No	—	—
Kenai Mining and Milling Co. Historic District	No	—	—	—

Notes: A dash (—) indicates that an alternative will not result in a Section 4(f) use of a given Section 4(f) property. Sportsman's Landing, Cooper Creek Campground, Forest Service Russian River Campground, Broadview Guard Station, New Village Site, and Gwin's Lodge are not included in this table because there is no Section 4(f) use of these lands by any alternative.

4.4 Potential Avoidance Alternatives

4.4.1 Overview of Avoidance Analyses

As quoted in Section 4.1.1, FHWA may not approve an alternative that uses Section 4(f) property unless the impact is *de minimis* or unless there is “no prudent and feasible alternative” that avoids use of Section 4(f) property. For this reason, Section 4(f) *de minimis* impacts do not require an avoidance alternative analysis. This section discusses avoidance alternative analyses for the Section 4(f) impacts that would be greater than *de minimis*.

A “feasible and prudent avoidance alternative” is defined in FHWA regulations at 23 CFR 774.17.¹² For a Section 4(f) avoidance analysis, FHWA’s Section 4(f) Policy Paper (FHWA 2012) says that, for larger highway projects with multiple Section 4(f) properties in the project area, it may be desirable to divide the analysis into “a macro- and micro-level evaluation.” These two levels of avoidance analysis are meant to distinguish end-to-end project alternatives that might avoid using any Section 4(f) properties from alternatives or design options that might avoid using any single Section 4(f) property. The guidance notes there is a duty to try to avoid the individual Section 4(f) properties within each alternative.

¹² The definition is long, but states “an alternative is not feasible if it cannot be built as a matter of sound engineering judgment.” It states that an alternative is not prudent if it is “unreasonable to proceed with the project in light of its stated purpose and need; it results in unacceptable safety or operational problems”; it causes several impacts to the social, economic, or natural environment; “it results in additional construction, maintenance, or operational costs of extraordinary magnitude”; or it causes unique problems or has a combination of factors that “cumulatively cause unique problems or impacts of extraordinary magnitude.”

The Sterling Highway build alternatives would affect multiple Section 4(f) properties. An analysis of alternatives that avoid *all* Section 4(f) properties is presented below in Section 4.4.2. Section 4.4.3 addresses the topic of avoidance of *individual* Section 4(f) properties.

4.4.2 Ability to Avoid All Section 4(f) Properties

As described in Sections 4.1 and 4.2, all of the build alternatives considered “reasonable” for the purposes of the National Environmental Policy Act in this EIS would use Section 4(f) resources. These alternatives are the Cooper Creek Alternative, G South Alternative, Juneau Creek Alternative, and Juneau Creek Variant Alternative.

As stated in Section 4.1.1, a “feasible and prudent avoidance alternative” is defined in FHWA regulations 23 CFR 774.17. For a Section 4(f) avoidance analysis, FHWA Advisory Circular T 6640.8a (1987) indicates, “Generally this would include alternatives to either side of the property,” and “design alternatives should be in the immediate area of the property and consider minor alignment shifts” However, DOT&PF and FHWA could not identify any alignment that avoided *all* Section 4(f) properties.

Section 4(f) Across the Region. Map 4-13 shows the extent of some of the known Section 4(f) properties across the Kenai Peninsula and Cook Inlet area. The KNWR adjoins Kenai Fjords National Park south of the project corridor. The park and KNWR both are Section 4(f) properties. The park extends through the Harding Icefield to steep-sided fjords at tidewater of the Gulf of Alaska; KNWR extends northward to tidewater at Cook Inlet/Turnagain Arm. A coastal highway route starting in Anchorage, crossing Turnagain Arm, and following the northern coast of the Kenai Peninsula is not an avoidance alternative because of the presence of the State’s Anchorage Coastal Wildlife Refuge and Chugach State Park on the Anchorage side, both of which extend into tidewater and are Section 4(f) properties. Furthermore, if there were any chance of following the tideline westward toward the city of Kenai while avoiding KNWR, the Captain Cook State Recreation Area (a Section 4(f) property) located at the mouth of Swanson River extends onto State submerged lands of Cook Inlet and further impedes the route as an avoidance alternative.

Within CNF are other Section 4(f) impediments: the coastal Gull Rock Trail and nearby Hope Point Trail, along with the Porcupine Campground, all at Hope; the Russian Lakes Trail and Resurrection River Trail south of Cooper Landing; and several other trails, including several branches of the Iditarod National Historic Trail, farther east.

For all these reasons, no new regional highway alternative is possible that would totally avoid Section 4(f) properties.

Ferry Alternative. An alternative that may entirely avoid Section 4(f) properties would begin at the Port of Anchorage, north of the northern boundaries of the Anchorage Coastal Wildlife Refuge

Process used in this Section 4(f) Evaluation

Because the Sterling Highway project area presents a complex set of Section 4(f) properties, informational boxes like this one will be used to outline the steps employed and to indicate where the reader is in the process. The process outline, with the current step in bold, is as follows.

1. Identify Section 4(f) properties.
2. Evaluate whether any impact is likely to be a *de minimis* impact.
- 3. Identify any alternatives that would avoid all Section 4(f) properties.**
4. Present the impacts of proposed alternatives on Section 4(f) properties.
5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.
6. Evaluate least overall harm.

(use Map 4-13 for reference). It would need to be a ferry alternative, because any road alternative that crossed Knik Arm and paralleled the shoreline westward along Cook Inlet would have to cross the Susitna Flats State Game Refuge or the Little Susitna State Recreation River, both Section 4(f) properties, and would then have to cross Cook Inlet to get back to the highway system in the Kenai Area. Such a crossing would be at an area too wide and deep to bridge practically.

A proposal for a ferry system would be an entirely different proposal than the Sterling Highway MP 45–60 Project, with different purpose and needs. The existing purpose and needs expressed in Chapter 1 of this EIS focus on improving the highway to current standards for a rural principal arterial in the MP 45–60 area. A ferry alternative largely would focus on replacing the existing Sterling Highway as the means of accommodating “through-traffic” between Anchorage and western Kenai Peninsula communities and would not address the problems in the MP 45–60 highway section at all. A ferry alternative would not meet the identified purpose and needs for this project.

The No Build Alternative. The No Build Alternative would avoid Section 4(f) use but would not satisfy the purpose and needs identified for this project.

3R Alternative. A resurfacing-restoration-rehabilitation (3R) alternative that remained almost entirely within the existing Sterling Highway right-of-way was evaluated as a potential avoidance alternative. Section 2.5 of this Final EIS discusses the 3R Alternative evaluated in the 1994 DEIS for the Sterling Highway Project. At the time, such an alternative was thought to avoid all Section 4(f) properties if it stayed within the existing right-of-way. However, it has been determined that (1) the 1994 3R Alternative would not meet the current purpose and need and therefore is not a prudent and feasible avoidance alternative, and (2) any similar alternative would not avoid all Section 4(f) properties.

First, it has been determined that such an alternative would remain too curvy to meet current rural principal arterial standards and therefore would not satisfy the purpose and needs of the project. The most important problem would be continued congestion in the developed portion of the Cooper Landing community, where the existing right-of-way is particularly narrow and where there is a long succession of driveways and side roads. To meet the project’s identified purpose and needs, it was determined that frontage roads or a four- or five-lane facility would be necessary in the Cooper Landing community, and the narrow right-of-way precludes frontage roads or four lanes in this area without going outside the right-of-way and using other Section 4(f) properties. Going outside the right-of-way would impact many parcels of private property and multiple buildings, would expand the highway footprint within the Sqilantnu Archaeological District and the Cooper Landing Historic District (both districts are Section 4(f) properties; see Map 4-1), and likely would impact (destroy or relocate) historic buildings in Cooper Landing that would be protected under Section 4(f). In addition, it would not be possible to bring existing sharp curves on other parts of the alignment to current design standards within the constraints of the existing right-of-way, because flattening such curves would require earth cuts up the hillsides outside the right-of-way (on unstable soils, which was determined to be infeasible from an engineering perspective, or on Forest Service recreation area lands protected by Section 4(f)), or would require fill in the Kenai River, a State park unit protected by Section 4(f).

Second, based on consultation under Section 106, it was determined that the Sqilantnu Archaeological District and the Confluence Site overlap with the right-of-way for the existing Sterling Highway. Thus, any expansion of the existing footprint (even for minor curve

realignments or widening existing lanes or shoulders even a small amount) would be a Section 4(f) use of both of these protected properties. In addition, there are archaeological sites that occur within the existing right-of-way directly adjacent to and under several stretches of the existing highway. Therefore, total avoidance would not be possible.

Conclusion. For the reasons stated above, no alternative that could satisfy the project purpose and needs could also avoid all Section 4(f) properties. The remainder of this Section 4(f) Evaluation therefore focuses on the Section 4(f) impacts associated with reasonable alternatives identified during the National Environmental Policy Act process, all possible planning to minimize harm to Section 4(f) resources, and analysis of the alternative with least overall harm.

4.4.3 Ability to Avoid Individual Section 4(f) Properties

As stated in Section 4.4.1, the FHWA Section 4(f) Policy Paper indicates a Section 4(f) Evaluation should assess the ability to route alignments around any single Section 4(f) property when there are several Section 4(f) properties in the project area. Most Section 4(f) properties were known to the initial highway design engineers, and the build alternatives were routed to avoid many Section 4(f) properties entirely. In some cases, such as Sportsman’s Landing, a great deal of engineering work was undertaken with the specific aim of avoiding impact to an adjacent Section 4(f) property. As a result of all of these efforts, there would be no Section 4(f) use of the following properties in the project area (see Map 4-1):

- Sportsman’s Landing Boat Launch near MP 55
- Cooper Creek Campground near MP 51
- Forest Service Russian River Campground
- Russian River Recreation Area
- Russian River Trail
- Russian River Angler’s Trail
- New Village Site
- Historic buildings: Broadview Guard Station, Gwin’s Lodge, and structures along the existing highway in the community of Cooper Landing

Where the build alternatives would use Section 4(f) properties, alignment shifts of the reasonable alternatives have been thoroughly examined, and it has been found to be impossible to avoid any impacted individual Section 4(f) property without impacting one or more other Section 4(f) properties. In examining ways that the alternative alignments might be shifted on the landscape to avoid any individual section 4(f) resource, the FHWA Section 4(f) Policy Paper states that an “alternative that avoids one Section 4(f) property by using another Section 4(f) property is not an avoidance alternative” (FHWA 2012, p. 13). In the Sterling Highway project area, the Squalantnu Archaeological District is so large that it encompasses almost all of the other Section 4(f) resources (see Map 4-1). The Confluence Site, the Charles G. Hubbard Mining Claims Historic District, and the Forest Service recreation areas also are large enough to overlap each other and to incorporate smaller Section 4(f) properties within their boundaries. The KNWR at the western end of the project area is much larger yet, covering 1.9 million acres (Map 4-13).

Any proposal to shift an alignment to go around a Section 4(f) resource would continue to use land from the Sqilantnu District. Any attempt to avoid the Sqilantnu District and all other Section 4(f) resources contained within its boundaries would result in use of KNWR and the radiating trails. However, the FHWA Policy Paper indicates “a duty to try to avoid the individual Section 4(f) properties within each alternative.” Therefore, Section 4.6 describes potential routes around individual Section 4(f) resources, even though they would continue to use land from other Section 4(f) properties. This analysis is presented in the context of the FHWA’s consideration of all possible planning to minimize harm to an individual Section 4(f) resource by going around it or using less of it.

Section 4.6 includes sections titled “Measures to Minimize Harm—Alignment Options” that are dedicated to this concept of minimizing harm by shifting alignments to route them around individual Section 4(f) properties. The section also addresses other measures to minimize harm and mitigate impacts in separate subsections.

4.5 Impacts of the Build Alternatives on Section 4(f) Resources

4.5.1 Overview of Alternatives and their Impacts

The following sections address acreage and function impacts to Section 4(f) resources that would be anticipated to arise from the reasonable build alternatives described in Chapter 2 of this Final EIS. Impacts to the functions of Section 4(f) properties mean impacts to the activities, features, and attributes of a property that is eligible for Section 4(f) protection.

Table 4.5-1 provides an overview of the acreage of Section 4(f) lands used. The project area includes other Section 4(f) properties not listed in this table. They are not listed because no alternative would have a Section 4(f) use of the properties. However, any concept for avoiding a Section 4(f) property that is listed in the table has the potential to affect other Section 4(f) properties. Avoidance is discussed particularly in Section 4.6.

Impacts resulting from a project’s proximity to a protected property must be considered under Section 4(f). If the project does not take land from the property but nonetheless severely impacts the property indirectly, in rare instances the impact can constitute “constructive use” (23 CFR 774.15). FHWA has made a determination that there would be no Section 4(f) properties substantially impaired by proximity of the project under any of the alternatives. Thus, there would be no constructive use of Section 4(f) property associated with this project. All Section 4(f) use described below is either temporary or permanent use.

Process used in this Section 4(f) Evaluation

Because the Sterling Highway project area presents a complex set of Section 4(f) properties, informational boxes like this one will be used to outline the steps employed and to indicate where the reader is in the process. The process outline, with the current step in bold, is as follows:

1. Identify Section 4(f) properties.
2. Evaluate whether any impact is likely to be a *de minimis* impact.
3. Identify any alternatives that would avoid all Section 4(f) properties.
- 4. Present the impacts of proposed alternatives on Section 4(f) properties.**
5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.
6. Evaluate least overall harm.

Table 4.5-1. Overview of acreage of Section 4(f) resources used

Section 4(f) resource	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Park				
Kenai River Special Management Area ^a	0.9 ^a	2.5 ^a	0	0
Wildlife Refuge				
Kenai National Wildlife Refuge ^a	0	0	14.3 ^a	0 ^a
Recreation Area				
Resurrection Pass Trail ^b	0	0	7.4 ^b	7.4 ^b
Bean Creek Trail ("new" non-historic portion)	0	2.1	0	0
Stetson Creek Trail	See Historic/Archaeological/Cultural Property, below			
Forest Service Kenai River Recreation Area	41.3	31.9	0	1.2
Juneau Falls Recreation Area ^b	0	0	17.1 ^b	17.1 ^b
Cooper Landing Boat Launch and Day Use Area	0.55	0	0	0
Historic/Archaeological/Cultural Property				
Sqilantnu Archaeological District ^c				
Existing highway footprint within district	47.1	47.1	47.1	47.1
New/incremental footprint [4(f) use] within district	165.1	173.0	170.3	169.0
Total footprint within district	212.2	220.1	217.4	216.1
Confluence Site ^c				
Existing highway footprint within district	12.7	12.7	12.7	12.7
New/incremental footprint [4(f) use] within district	29.5	30.2	14.7	20.1
Total footprint within district	42.2	42.9	27.4	32.8
Bean Creek Trail (historic portion) ^d	0	1.0	1.1 ^d	1.1 ^d
Stetson Creek Trail	2.5 ^d	0	0	0
Charles G. Hubbard Mining Claims Historic District ^c				
Existing highway footprint within district	11.6	11.6	11.6	11.6
New/incremental footprint within district	28.5	27.9	0	0
Total footprint within district	40.1	39.5	11.6	11.6
Kenai Mining and Milling Co. Historic District ^{c, d}				
Existing highway footprint within district	0	0	0	0
New/incremental footprint within district	4.3	0	0	0
Total footprint within district	4.3	0	0	0

NOTES: Except for districts and the Confluence Site, impacts are based on the highway right-of-way that would be acquired within the Section 4(f) property boundaries but outside the existing right-of-way. This table has been updated since the Draft Supplemental EIS (SEIS) to include acreage of proposed mitigation such as parking areas and trail realignments and to reflect minor alignment shifts to avoid CIRI Tracts A and B.

^a Acreage recorded is acreage impacted outside the existing highway right-of-way only. Expansion of the road within the right-of-way is not considered to be a conversion of use to transportation purposes and therefore is not considered a 4(f) use except where expansion would impact a developed recreation facility or historic property located within the right-of-way.

^b The Resurrection Pass Trail lies within the Juneau Falls Recreation Area, and acreage reported for the trail is part of the acreage reported for the recreation area. The crossing of the Resurrection Pass Trail footpath is proposed to be overhead (bridge). This table reports the entire area of proposed right-of-way, even where the highway is overhead. Of the impact acreage shown, approximately 4.3 acres of impact to the trail's 1,000-foot recreation resource buffer and approximately 6.2 acres of impact to the Juneau Falls Recreation Area would be included in the right-of-way but would lie beneath the bridge.

^c Acreages presented are reported on three lines: the first line reports the footprint of the existing Sterling Highway within the district. The second line reports acreage associated with the incremental impact of the new construction. The third line reports the total acreage of the existing footprint plus the projected new impact of the alternative. Impacts to individual archaeological sites within the districts are not recorded in this table: the individual historic properties have not been sufficiently delineated to calculate acreage of impact, but acreage of impact to these individual sites would be considerably less than shown. For the two mining districts, only the contributing properties are protected under Section 4(f), not the entire acreage noted here. For the Sqilantnu District and the Confluence Site, the second line is considered to be the Section 4(f) use attributed to this project. For the Confluence Site, note that (1) the existing highway is considered part of the Site, and (2) the Site acreage is a subset of the Sqilantnu District acreage.

^d To display comparable impact acreages, the number shown includes only land incorporated into highway right-of-way. It does not include impact of a temporary construction access road that would cross the Bean Creek Trail (up to an additional 3 acres). It does not include total acreage of trail bypassed by rerouting Bean Creek Trail or Stetson Creek Trail (rerouting is proposed as mitigation).

The acreages reported in Table 4.5-1 and referenced elsewhere in this document indicate the relative involvement of an alternative with various Section 4(f) properties. However, acreages do not fully characterize the potential impacts. This is particularly true for historic and archaeological districts and the sites treated as traditional cultural properties. They are areas, potentially with a patchwork of ownership, in which cultural resources are found. The impact is more closely related to how many specific cultural resource sites would be impacted, the cultural importance of the sites and areas impacted, the type of impact. Impacts to the cultural significance of these properties are difficult to assess and explain. Further discussion of the impacts is presented in the subsections that follow. Also, Section 3.9, Historic and Archaeological Preservation, discusses all historic properties in one consolidated location, but with cross reference to this chapter, which contains the greatest detail.

4.5.2 Impacts of the Cooper Creek Alternative

The Cooper Creek Alternative would use land from several Section 4(f) properties, or occupy the lands temporarily during construction. Table 4.5-1 indicates acreage of impact. The properties are:

- KRSMA
- Stetson Creek Trail
- Forest Service Kenai River Recreation Area
- Cooper Landing Boat Launch and Day Use Area
- Sqilantnu Archaeological District
- Confluence Site
- Charles G. Hubbard Mining Claims Historic District
- Kenai Mining and Milling Co. Historic District

Other Section 4(f) properties exist near the Cooper Creek Alternative, as shown on Map 4-1, but where there is no use of a property. Discussion appears in Sections 4.5 and 4.6 (addressing recreation and cultural sites, respectively).

4.5.2.1 Kenai River Special Management Area

The Cooper Landing and Schooner Bend bridges over the Kenai River would be replaced with wider bridges on slightly different alignments than existing bridges (Map 4-2 and Map 4-11). Table 4.5-1 indicates the acreage of impact. The Cooper Landing Bridge would be replaced substantially within the existing highway right-of-way; the Schooner Bend Bridge would be replaced substantially outside the existing right-of-way but adjacent to the existing location. The existing bridges would be entirely removed, including piers in the river, except for components of the existing Cooper Landing Bridge that may be used in the new bridge. Use of the KRSMA for bridge abutments and piers would be different than with the current bridges, and fewer piers likely would be used than with the existing bridges. Mitigation measures discussed in Section 4.6 are intended to enhance the appearance of the bridges as seen from the river.

Two noise modeling locations in the Kenai River, one near the Russian River confluence and one near the Juneau Creek confluence, each indicated a 1 A-weighted decibel (dBA) increase in 2043 from existing 2012 noise, identical to predicted noise levels for the No Build Alternative. This

change in average noise level is not expected to be perceptible. However, the river parallels the existing highway and proposed highway alignment closely. Under the Cooper Creek Alternative, highway traffic would be readily audible in some locations, as it is today.

Proximity to the river would mean visual effects would continue at levels similar to today. In addition, proximity of all traffic to KRSMA would retain the risk that a spill on the highway could pollute the river. Forty-three percent of the alignment would remain within 300 feet of Tier 1 streams (Section 3.17, Hazardous Waste Sites and Spills, further explains this issue). The Cooper Creek Alternative would include a cut 55 feet high and 350 feet long uphill of the new highway just east of the Russian River Campground entrance. This cut area is depicted on Map 4-9 as a widened area of proposed highway right-of-way on the south side of the highway. Although this cut would be located well outside the KRSMA (across the highway from the river), it likely would be easily visible to boaters from some points on the Kenai River over an area of up to 1 mile. The highway itself in this area would be located up to about 80 feet farther from the river and at slightly higher elevation than the existing highway alignment.

The new highway would provide 8-foot shoulders, and the shoulders could tempt the public to park outside designated river access point parking lots, which charge a fee and often can be full during prime fishing season. Left unmanaged, this additional informal parking could lead to more people on the river, especially in already crowded areas near the confluence of the Russian River and Kenai River, and could increase the need for management by DPOR and other land managers in the river corridor. Enforceable no parking signs would be posted to mitigate such issues, particularly in the Sportsman's Landing area. DOT&PF would monitor parking issues and would add more no parking signs where problems were recurring.

During construction of the bridges, in-water work would be necessary to establish new piers and remove old piers. The construction process likely would require a temporary construction bridge built on multiple pilings at close spacing as a platform for construction of the new bridge. A pile driver would drive the many pilings under the temporary bridge (these would be removed before completion of construction), and would drive the larger pilings under the permanent bridge. Temporary reduction of water quality would result from the driving and removal of pilings as bottom sediments were dislodged. Mitigation measures would minimize the risk of fuel spills and dropping of any material into the Kenai River, but spills, leaks, and minor loss of construction material into the river are possible and could further reduce water quality. In addition, construction would result in intermittent noise from construction equipment, particularly during pile driving, and would result in temporary closure of the river at the bridge location to boats and fishing when cranes were lifting bridge girders into place and during pile driving near the center of the river. Pile driving near the edges of the river likely would allow sufficient space so that boats could safely pass; when pile driving was taking place on one side of the river, the opposite side of the river would remain open (see Section 4.6 for mitigation measures related to bridge construction and river navigation).

The overall effect to KRSMA of the finished bridges would be similar to effects from the existing bridges, and no substantial impact to the functions of KRSMA—including fish habitat and fish movement, river boating, fishing, and viewing—is expected. Because of mitigation (listed in Section 4.6), including timing of construction related to fish movement and timing of river closures related to recreational boating, the KRSMA habitat and recreation functions would continue during construction.

Other impacts common to Cooper Creek Alternative and other build alternatives. Under any of the four build alternatives, in the MP 56–58 area, boaters and anglers on the Kenai River may be more aware of the highway presence following construction than they are today. All build alternatives include retaining walls or riprap erosion protection at several locations along the river west of Sportsman’s Landing (about MP 55). The existing highway is near the river at these same locations, but additional riprap or walls could add an engineered look to those viewing the river banks. It is likely that some of these riprap or retaining wall areas would be built within the edge of the river and therefore within the KRSMA park unit. However, all construction in this area would be within the existing highway right-of-way where it overlaps the river and would not be considered a use of Section 4(f) property. Construction at these locations is not expected to involve diverting water except perhaps at the very edge of the river or on sloughs; no impact to boating and no substantial impact to bank fishing opportunities are expected. The permanent impacts to those portions of the KRSMA outside the existing right-of-way would be substantially similar to impacts today, including views of cars and the highway embankment from some locations and the sounds of vehicles on the highway. Temporary impacts would include construction noise and, in a few locations, construction equipment working on the edge of the river.

The Cooper Creek Alternative would include similar river-edge impacts in two locations, approximately MP 53.3 and MP 54.6, as well. The MP 53.3 area would use a very small portion of the KRSMA along the edge of the Kenai River outside the existing right-of-way, and this is considered a Section 4(f) use. The MP 54.6 location would not involve incorporating park land into the transportation facility and so would not be considered a Section 4(f) impact.

4.5.2.2 Stetson Creek Trail

The Cooper Creek Alternative would cross the lower end of the Stetson Creek Trail at grade, severing it, and would parallel the trail over about 1,600 feet (see Map 4-8). The closest the highway would come to the existing trail in this parallel section would be approximately 80 feet. The new highway would be benched into a hillside in this area, and the cut into the hillside above the new highway would eliminate the existing trail over a length of about 200 feet, requiring trail reconstruction or rerouting. Because the highway would be constructed on a cross slope in the area near the trail, a broad area would be cleared of trees, and the existing trail would be close to this cleared edge, likely providing a different visual experience for trail users. To avoid conflicts between trail users and highway vehicles, and at the Forest Service’s recommendation to resolve a Forest Service management issue, the project as proposed would include a new pullout trailhead on the south side of the highway and extend the trail to it. This proposal is subject to final agreement among Section 106 consulting parties, because this is an historic trail (see Section 4.6 for proposed mitigation and Appendix K for the agreement document).

Traffic noise would be audible to trail users. The Stetson Creek Trail typically is closed to motorized vehicles, but miners with claims and approved plans of operations are allowed access via all-terrain vehicles on the trail, so the expectation for quiet is not as high as on most other Forest Service recreational trails. The *Highway Traffic Noise Assessment* (Appendix D of this Final EIS) completed for this project assumed that undeveloped areas have an average noise level of 40 dBA, based on average noise levels measured at similar locations. Under the Cooper Creek Alternative, the new highway would cross the trail and would parallel its existing route across the hillside. In this area where the highway would parallel the trail, the noise study indicates a noise increase of 17 dBA from a mostly natural quiet background of 40 dBA today to 57 dBA average sound level in 2043. This substantial noise increase is considered an impact under

DOT&PF/FHWA noise abatement criteria. It is expected that in excess of 2,000 feet of today's trail would be affected by highway noise. A second noise modeling location farther up the trail (about 3,500 feet from the existing campground trailhead) indicated an increase of 7 dBA—distinctly noticeable but not exceeding the noise abatement criteria and not a “substantial noise increase.” Even farther up the trail, noise levels likely would be similar to today's levels.

While forest cover limits expansive views from the existing trail, particularly at its lower elevations near the proposed highway bridge site, the new bridge may be visible from some points along the trail upstream of the bridge where views are now more natural. Trail users temporarily would experience construction noise and dust and short-term trail closure while the new trail segment and new highway were under construction. Besides short closures, the contractor would be required to maintain trail access (see Section 4.6 for mitigation). Access for construction of the new Cooper Creek Bridge could use an alternative trail access route that begins on CNF land and crosses Borough land; construction vehicles could skirt the Cooper Creek Campground via this route but cross the existing Stetson Creek Trail. Should this occur, heavy equipment would be expected to cross occasionally and standard vehicles to cross frequently over the course of bridge construction, likely affecting three summer seasons, possibly four. Mitigation described in Section 4.6 would help minimize disruption of trail use. See also Section 4.5.2.3 for related information.

4.5.2.3 Forest Service Kenai River Recreation Area

The existing highway right-of-way would be widened in some locations adjacent to the Kenai River Recreation Area to accommodate the wider, straighter alignment of the Cooper Creek Alternative (see Map 4-9). Table 4.5-1, above in Section 4.5.1, indicates acreage of impact. The recreation area was formed around the highway as a sort of buffer, providing for a natural corridor along the Kenai River and between the highway and the river. Although the Cooper Creek Alternative has a greater acreage of impact to the Recreation Area than the G South Alternative (see Table 4.5-1, above), the effects on the functions of the recreation area would be similar. None of the developed sites within the recreation area that have a recreation function (i.e., the K'Beq Footprints Heritage Site, the Resurrection Pass trailhead, and the entrance and overflow parking area for the Russian River campground) would be permanently affected. Trees and vegetation would be cleared to establish the required clear zone for the wider highway, and clearing would permanently reduce wildlife habitat in a narrow strip along the highway.

A site intended for disposal of unusable soils near the eastern end of the Recreation Area would remove 5.1 acres of trees within the Recreation Area (partially overlapping areas planned for clearing as part of the alignment), but vegetation would re-grow, and habitat would be restored over time. The Forest Service has proposed relocating this site from southwest of a curve of the Cooper Creek Alternative near MP 51 to a location east of the same curve that has been previously disturbed and is currently used as alternate access to the Stetson Creek Trail. Relocating the disposal site would minimize the area of new habitat disturbance within the Recreation Area and would contribute to closing the alternate access to the trail. The alternate access would no longer be needed under this alternative (see Stetson Creek Trail impact discussion in Section 4.5.2.2). For these reasons, DOT&PF would incorporate this proposed relocation and would coordinate with the Forest Service on details of site location, placement of materials, and final revegetation of this site.

Average hourly traffic noise in the recreation area would be similar to noise levels today. Three locations within the recreation withdrawal were modeled at various distances from the highway.

Two showed increases of 1 dBA in average sound levels (not considered perceptible) and one showed an increase of 6 dBA in average sound levels (distinctly noticeable) by 2043. At the site closest to the highway, the location of the parking area and trailhead for the old Beginnings Heritage Site interpretive trail within the recreation area, the change in average sound level would rise from 67 dBA to 68 dBA. While this would be only a 1-dBA increase from existing levels, DOT&PF Noise Policy defines this as a traffic noise impact. The Noise Policy defines an impact as sound that approaches within 1 dBA or exceeds the FHWA noise abatement criteria of 67 dBA. Traffic noise at the site today (67 dBA) meets the definition of impact. The No Build Alternative's predicted noise level (68 dBA at the site closest to the highway) showed the same impact. This site is not used much, but is an access site for the recreation area. Otherwise, it is indicative of near-highway noise levels at the boundary of the recreation area and the highway right-of-way.

The new highway would provide 8-foot shoulders and would eliminate some existing informal pullouts used today for access to the Kenai River banks. This combination could tempt the public to park outside of formal river access point parking lots (including parking at Sportsman's Landing/Russian River Ferry), which charge a fee and often can be full during prime fishing season. This could lead to pedestrians walking on the shoulder and crossing the highway. This presents a safety concern, which was raised by commenters, not only for the pedestrians but for highway traffic. Parking in the highway right-of-way for access to national forest lands (KRRRA) and the Kenai River has been typical for many decades, and land managers and the public have grown accustomed to a given amount of parking availability. The Forest Service indicated the agency could not concur regarding *de minimis* impacts to the KRRRA under this alternative because of the reduction in parking availability, even though the parking that would be lost is not formally provided for, and is located within the highway right-of-way and not in the Section 4(f) property (KRRRA).

On the other hand, the Forest Service and other land managers have also expressed some concern that, with continuous, full shoulders, visitors may park on those shoulders, and thus the river banks (KRRRA) and the river could see more use/uncontrolled use than they do today. Left unmanaged, parking on the shoulder could lead to more people accessing the river informally, especially in already crowded areas near the confluence of the Russian River and Kenai River. This could increase the need for management by the Forest Service (and other land managers in the river corridor). This also could lead to such impacts as bank trampling in new areas. Enforceable no parking signs would be posted by DOT&PF near Sportsman's Landing to mitigate such issues (or other areas as needed).

Finally, if the shoulders along the highway in this area are designated no parking, the Forest Service is concerned that there would not be enough parking for public access. For the Cooper Creek Alternative, a large existing pullout west of Schooner Bend Bridge would be retained and formalized (included in project design, and paved) to help provide parking for river access and for winter access to Resurrection Pass Trail.

There are nine existing informal pullouts in the highway right-of-way adjacent to the Kenai River Recreation Area. The Cooper Creek Alternative would avoid one pullout entirely near MP 51 (nine spaces), would eliminate seven of the smaller pullouts, and would rebuild the largest pullout, located near MP 53.1 at the driveway for Resurrection Pass Trail access. Of an estimated total of 54 parking spaces in the eight affected pullouts, 26 would be retained, with potential for further parking on Forest Service land, depending on Forest Service desires (see also Section 4.6.7).

During construction, noise, dust, and the visual clutter of construction equipment and freshly cut earth would be impacts to those passing through the recreation area on the highway, and construction noise likely would carry to the trailheads, parking areas, and heritage site developments. Construction activity would be visually screened from all these sites by trees, except at the former Beginnings Heritage Site, where the existing parking and trailhead are located immediately adjacent to the highway. Temporary traffic delays, closures, and detours would occur (see Section 4.6 for mitigation). The contractor would be required to maintain access to these sites during construction, except the Beginnings Heritage Site, which is now closed as a public interpretive site and is used only as an ancillary, informal river access point.

Some of the contributing historic properties from the Sqilantnu Archaeological District and the Charles G. Hubbard Mining Claims Historic District are within the boundaries of the Kenai River Recreation Area. Impacts to historic properties are addressed below.

4.5.2.4 Cooper Landing Boat Launch and Day Use Area

The Cooper Creek Alternative includes replacing the Cooper Landing Bridge with a new, wider bridge on a slightly different alignment. The boat launch ramp is built within the existing Sterling Highway right-of-way immediately adjacent to the existing bridge abutment (see Map 4-11). No permanent effect on the boat launch and day use area is anticipated. The recreation facilities are presently located immediately adjacent to the highway. During construction, the new, wider portion of the bridge would be built on the upstream side of the existing bridge (the opposite side from the boat launch). Through-traffic on the highway and access to the boat launch would be maintained via an upstream temporary bridge while the new, wider bridge was built.

During construction of the retaining wall that would be part of the proposed new bridge abutment, the contractor is likely to need to use the boat launch ramp while excavating the edge of the existing highway embankment and to park equipment while building the wall. This may require a temporary construction permit for access through the day use site, but the actual work would take place within the existing highway right-of-way on the boat launch ramp. The ramp would be closed to public use at that time. Closure of the boat launch ramp also may result over the course of several days during pile driving.

Except for these temporary impacts to the use of the boat launch ramp for construction staging and work immediately adjacent to the ramp, blocking the boat launch ramp for construction would be prohibited; the construction contractor would be required to maintain public access to the ramp. Although these uses would be temporary, and although there would be no physical change to the boat launch ramp, recreational activities such as boat launching may be hindered by noise of pile driving nearby on the Kenai River, even deemed far enough away to be safe. General construction noise nearby (heavy equipment operation; pile driving for bridge piers) also may hinder use of the boat launch and day use area over a longer period, as the site may not be desirable for activities such as picnicking, when noisy. The impacts, while temporary and relatively minor, would amount to a use of recreation property under Section 4(f) because the impacts likely would interfere with the normal recreational activities of the facility. However, there would be no permanent impacts to the boat ramp. The new highway would be immediately adjacent to the ramp, as the existing highway is today.

4.5.2.5 Sqilantnu Archaeological District

The build alternatives would impact the Sqilantnu Archaeological District, although in somewhat different ways. Total acreages of use of the district by the Cooper Creek Alternative are shown in Table 4.5-1. However, acreage is only a partial measure of impact. The Cooper Creek Alternative would use land from 28 historic properties that contribute to the district by partially or completely eliminating them, or by burying them with highway embankment material. A few of the sites affected already lie partially under the existing highway embankment. Among the 28 sites, the Cooper Creek Alternative would use land from historic properties associated with the Beginnings Heritage Site (use would be identical to that of the G South Alternative). The Cooper Creek Alternative also would affect the contributing Confluence Site; see the discussion in the following paragraph. Indirectly, the Cooper Creek Alternative would provide new public foot access (e.g., by people parking on the shoulder) to high bench lands south of the Cooper Landing community and within the Sqilantnu Archaeological District. No historic properties are currently documented in this area. The change in public access could result in additional foot traffic in the district, which could indirectly impact unknown features. Changes in the setting of this portion of the district would occur, but because the specific area is generally part of the valley-wide setting associated with Dena'ina prehistory but not known to be directly associated with important sites or events, impacts to the setting are considered relatively minor. Mitigation is proposed, per a programmatic agreement among consulting parties (agencies and tribal entities; see Section 4.6).

4.5.2.6 Confluence Site – Impacts Common to Cooper Creek Alternative and G South Alternative

The Confluence Site is wholly contained within the Sqilantnu Archaeological District and is a contributing element of the district; therefore, impacts discussed here are a subset of the impacts discussed above for the broader district. The Cooper Creek Alternative (along with the G South Alternative) would follow the existing road alignment through the Confluence Site and would expand the existing right-of-way and pavement width to accommodate a straighter alignment and shoulders, lane widths, and clear zones that meet current standards. The widening and straightening would impact archaeological sites and would have the following impacts to sites within the Confluence Site noted by consulting parties as having particular importance in the tradition and culture of the Kenaitze Indian Tribe:

- **K'Beq Heritage Site and CIRI Tract B.** The highway would remain parallel to the K'Beq site. Ingress and egress to the site would be improved with turning lanes or acceleration lanes. Future access to CIRI Tract B would be through the K'Beq driveway. No delineated archaeological sites would be affected in this area.
- **Beginnings Heritage Site.** Widening of the highway would use portions of archaeological historic properties formerly used for cultural interpretation. The highway would pass through the length of the Beginnings site as it does today. The small parking area at Beginnings would be eliminated.
- **CIRI Tract A.** The widened highway would not require acquisition of land from CIRI Tract A. Future access to Tract A would be possible from the upgraded “old” highway at approximately the location agreed upon by CIRI and the Forest Service near MP 54; DOT&PF may require that it be combined with a private driveway in that area.

The setting, feeling, and association of the Confluence Site would be slightly altered in this area, because the highway would be wider and straighter, and average traffic speeds would be somewhat higher on the better road. The road would feel more like a highway and would have a more engineered and formal feel. It would be less like a winding rural road. This would somewhat alter the character of the Confluence Site and take it a step further from its pre-road condition of river, trails, and forest, and thereby further reduce the association of the current environment with the traditional Dena'ina culture in this area. Because the existing highway presently passes through the Confluence Site, the changes would be incremental—a small change in character.

4.5.2.7 Charles G. Hubbard Mining Claims Historic District

FHWA has determined that widening of the existing highway under both the Cooper Creek and G South alternatives would result in similar impacts to several historic features within the district:

- Ava, Ace, and Ada mining claims: two features likely would be fully or partially eliminated by construction (G South Alternative only).
- Alpha mining claim: two contributing features would be fully or partially eliminated by construction (both alternatives).
- Fern and Robin mining claims: one contributing feature would be fully or partially eliminated by construction (both alternatives).

Full and partial elimination of these sites constitute a “use” of the district under Section 4(f). Because the highway already exists through the district, little impact to the setting or feeling of the district is anticipated, and most of the value of the contributing sites is in their information potential. Acreage of use of the district as a whole is shown in Table 4.5-1, above in Section 4.5.1. Impacts to the individual contributing features amount to a large percentage of the known features within the district, but most features are not designed and constructed structures and are most important for their relationship to one another and for the information they provide. Because none of the features is frequented by the public, noise and other construction effects would not affect public use of these sites. Impacts to features on the Charles G. Hubbard Claims Historic District would be mitigated as discussed in Section 4.6.

4.5.2.8 Kenai Mining and Milling Company Historic District

This historic district, located near the Cooper Creek Campground (Map 4-8), would be affected by construction of the proposed Cooper Creek Bridge and the western approach to the bridge. Acreage of use of district land is presented in Table 4.5-1, above in Section 4.5.1. Partial or complete elimination of contributing historic properties would be a “use” of the district under Section 4(f). FHWA has determined that there would be an impact on an historic flume and on a short historic trail, now overgrown. Some features would be wholly eliminated by earth moving during construction, and others may be partially eliminated. Mitigation for impacts to the Stetson Creek Trail under this alternative would create some new trail within this historic district. The trail would be routed to avoid known contributing features. The proposed Cooper Creek Bridge and its approaches would be inconsistent with the surrounding natural setting; however, none of the contributing features is particularly dependent on its visual setting. Most of the value of these sites is in their information potential. It is possible that bridge construction and material hauling during the construction phase could eliminate other known features of the district, but mitigation measures, such as marking areas to avoid, would minimize the risk. Because none of the features

is well known to the public, and because public use is low, noise and other construction effects would not affect public use of these sites (see Section 4.6 for discussion of mitigation).

4.5.3 Impacts of the G South Alternative

The G South Alternative would use land from several Section 4(f) properties. Table 4.5-1, above in Section 4.5.1, indicates acreage of impact. The properties are:

- KRSMA
- Bean Creek Trail
- Forest Service Kenai River Recreation Area
- Sqilantnu Archaeological District
- Confluence Site
- Charles G. Hubbard Mining Claims Historic District

4.5.3.1 Kenai River Special Management Area

The G South Alternative includes a new bridge over the KRSMA west of the Kenai Princess Lodge in an area without any existing bridge (see Map 4-1 and inset 2 on Map 4-2). This alternative also includes a replacement bridge across the Kenai River near Schooner Bend, adjacent to the existing bridge but on a slightly different alignment (inset 1 on Map 4-2).

The new bridge would add a third Kenai River Bridge in the project area, a substantial visual impact at that particular point in the river and an intrusion of an engineered structure on a river corridor valued for its mountain and forest scenery.

Also, people recreating on the Kenai River would hear traffic noise as they approached and passed the bridge. The character of the sound would be similar to road noise today for people using the river near the existing two bridges and at other locations where the highway is immediately adjacent to the river. Two noise modeling locations were located in the Kenai River, one near the Russian River confluence and one near the Juneau Creek confluence (and near G South Alternative's proposed bridge). The downstream site indicated a 1-dBA increase in average sound level in 2043 from existing 2012 sound levels, identical to predicted noise levels for the No Build Alternative. This increase in average noise level is not expected to be perceptible. The upstream site near the proposed new G South Alternative bridge indicated a 5-dBA change, from 49 dBA to 54 dBA, an increase that would be readily noticeable by people on the river. However, it would not approach or exceed FHWA noise abatement criteria and would be similar to the experience at the river's other two existing highway bridges. This would be a permanent new impact to the river users in a new location. In general, the river parallels the existing highway and proposed highway alignment closely. Under the G South Alternative, highway traffic would be readily audible in some locations, as it is today.

In addition to noise, proximity to the river would continue visual effects similar to those today, and proximity of all traffic to KRSMA would retain risks that a spill on the highway would potentially pollute the river. Thirty-three percent of the alignment would remain within 300 feet of Tier 1 streams (Section 3.17, Hazardous Waste Sites and Spills, further explains this issue). The bridge abutments and piers would use portions of the KRSMA. Boaters in this corridor are aware today that they are not on a pristine wilderness river but are paralleling a highway, but a new bridge

would increase awareness of the development in the valley. At the Schooner Bend replacement bridge, the resulting impact would be much the same as existing effects of the highway crossing the Kenai River. The bridge would be wider than the existing bridge, but likely there would be fewer piers in the river, and certainly no more piers than exist today. The existing bridge would be removed, including all piers and abutments.

The new highway would provide 8-foot shoulders, and the shoulders could tempt the public to park outside designated river access point parking lots, which charge a fee and often can be full during prime fishing season. Left unmanaged, this additional informal parking could lead to more people in already crowded areas near the confluence of the Russian River and Kenai River and increase the need for management by DPOR and other land managers in the river corridor. Enforceable no parking signs would be posted to mitigate such issues, particularly in the Sportsman's Landing area. DOT&PF would monitor parking issues, and DOT&PF would add no parking signs where problems were recurring.

During construction of both bridges, in-water work would be necessary to establish new piers. The construction process would require a temporary construction bridge built on multiple pilings at close spacing as a platform for construction of the new highway bridge. A pile driver would drive the many pilings to support the temporary bridge (these would be removed before completion of construction), and would drive the larger pilings under the permanent bridge. No de-watering is anticipated. Temporary reduction in water quality would result from the driving and removal of pilings as bottom sediments were dislodged. Mitigation measures would minimize the risk of fuel spills and dropping of any material into the Kenai River, but spills, leaks, and minor loss of construction material or tools into the river are possible and could further reduce water quality. In addition, construction would result in the noise of construction equipment, particularly during pile driving, and would result in closure of the river at the bridge location to boats and fishing when cranes were lifting bridge girders into place and during pile driving near the middle of the river. Pile driving near the edges of the river would allow sufficient space so that boats could safely pass on the opposite side of the river. Section 4.6 discusses mitigation measures related to bridge construction to minimize impacts to the river flow, fish habitat, fishing, and boating.

Besides the bridges, and besides the retaining walls and riprap noted as a visual impact under all build alternatives, the G South Alternative would include a road cut 55 feet high and 350 feet long on the uphill side of the new highway just east of the Russian River Campground entrance. This cut would be easily visible to boaters on the Kenai River for perhaps a mile. The highway in this area would be located up to about 80 feet farther from the Kenai River and at slightly higher elevation than the existing highway alignment.

Other KRSMA impacts common to the G South and other build alternatives. Under all four build alternatives, in the MP 56 to 58 area, boaters and anglers on the Kenai River likely may be more aware of the highway presence following construction than they are today. All build alternatives include retaining walls or riprap erosion protection at several locations along the river west of Sportsman's Landing (about MP 55). The existing highway is near the river at these same locations, but additional riprap or walls could add an engineered look to those viewing the river banks. It is likely that some of these riprap or retaining wall areas would be built within the edge of the river and therefore within the KRSMA park unit. However, all construction in this area would be within the existing highway right-of-way where it overlaps the river and would not be considered a use of Section 4(f) property. Construction at these locations is not expected to involve diverting water except perhaps at the very edge of the river or on sloughs; no impact to boating

and no substantial impact to bank fishing opportunities is expected. The permanent impacts to those portions of the KRSMA outside the existing right-of-way would be substantially similar to the types of impacts today, including views of cars and the highway embankment from some locations and the sounds of vehicles on the highway. Temporary impacts would include construction noise and, in a few locations, construction equipment working on the edge of the river.

The G South Alternative includes similar river-edge impacts in two locations in the MP 53.3 and MP 54.6 areas as well (identical to the Cooper Creek Alternative). The alternative, in the MP 53.3 area, would use a very small portion of the KRSMA along the edge of the Kenai River outside the existing right-of-way, and this is considered a Section 4(f) use. The MP 54.6 location would not involve incorporating new park land into the transportation facility and would not be considered a Section 4(f) impact.

4.5.3.2 Bean Creek Trail

The G South Alternative would cross the non-historic portion of the trail twice and the historic alignment once, resulting in a Section 4(f) “use” (see Map 4-6 and Map 4-7). The highway crossing of the non-historic trail near its trailhead would create a substantial interruption to recreational trail use and to the trailhead area. However, the alternative would include a new summer trailhead north of the highway and would reroute the trail in a tunnel beneath the new highway and across Bean Creek north of the highway to maintain continuity. At the Forest Service’s request, DOT&PF also proposes to add a pullout in this area that would serve winter users of the Bean Creek Trail. Without these measures, crossing of the new highway could be dangerous both to trail users and to drivers on the highway (see Section 4.6 for complete discussion of measures to minimize harm).

The result would be a culvert under the highway that would allow passage by horseback riders, snowmobilers, and hikers. Snowmobilers and other winter recreationists use this route and would be able to continue their use without crossing the highway at grade. However, beneath the highway there would be little or no snow. Snowmobiles can operate on “dry” ground, but a snowless stretch would change the experience. Skiers on this route would need to take off skis and walk through the tunnel. For the historic route, which begins in a neighborhood, direct access to the trail would be eliminated. The Forest Service estimates that weekly use is 50-75 in the summer, 30-50 in the fall, and 15-30 in the winter (Forest Service 2017). Some of these trail users from the neighborhood may cross the highway at-grade or may attempt to use the proposed wildlife underpass (likely an oversized culvert) at Bean Creek.

The Bean Creek Trail currently has no formal trailhead and parking area, and three agencies (Forest Service, State of Alaska, and Kenai Peninsula Borough) own and manage land on the approach to the trail and at the lower end of the trail. Creating a trailhead for the Bean Creek Trail would resolve a long-standing issue for the trail and formalize it as a Forest Service trail. Providing a summer trailhead and a pullout for winter access would mean that some trail use would be anticipated to shift from the Resurrection Pass Trail access point to the Bean Creek Trail access point. Because the Bean Creek Trail would start at higher elevation than the existing trailhead for Resurrection Pass Trail, and because it would provide shorter access to higher elevations, open views, lakes, and Forest Service recreational cabins, it is possible that this would become the favored access point for the Resurrection Pass Trail, which could require management changes by the Forest Service. Opportunities for solitude and primitive recreation on the trail system or near it could change if use increased. However, the distance traversed on the Bean Creek Trail to its

intersection with the Resurrection Pass Trail is relatively short, and the Resurrection Pass Trail system already is popular. A change in use patterns is more likely than a change in overall use levels. That is, the Bean Creek Trail is likely to see more use if users shift their access from the existing Resurrection Pass trailhead to the new Bean Creek trailhead. See also mitigation discussion for **Bean Creek Trail** in Sections 4.6.4 (with Resurrection Pass Trail) and 4.6.5.

The *Highway Traffic Noise Assessment* (Appendix D of this EIS) completed for this project modeled a site along the Bean Creek Trail near the proposed crossing of the G South Alternative. The Bean Creek Trail crossing area is undeveloped except for the old logging road, and Bean Creek is not a fast-running stream (which would add noise), so the noise model assumes background noise levels of 40 dBA, as measured at a similar undeveloped location. With the curving alignment of the trail, the road would cross the existing trail three times, and users of nearly 3,500 feet of the existing trail would be quite noticeably affected by road noise. The modeled change, from 40 to 61 dBA, would be a substantial increase resulting in a noise impact (an increase in average sound level of 21 dBA at the edge of the highway right-of-way). Because of nearby private property, the creek, and topography, it is likely that any rerouted trail segment from the neighborhood to the main trail also would lie close enough to the highway to be affected, although likely at slightly lower noise levels. At the undercrossing itself, the noise level would be reduced because the trail tunnel would insulate trail users from traffic noise. In general, however, users of the lower end of the trail would experience these substantial noise increases compared to today's noise levels. Except for rerouting the trail, no noise abatement measures were considered practical in this location, and none are proposed. During construction, the noise and dust of construction equipment would impact trail users. Mitigation includes measures to maintain trail user access across the construction area while the new trail is being built (see Section 4.6).

4.5.3.3 Forest Service Kenai River Recreation Area

The existing highway right-of-way would be widened in some locations adjacent to the Kenai River Recreation Area (Map 4-9) to accommodate the wider, straighter alignment of the G South Alternative, and the new highway would cross the recreation area on its approach to the southern end of the new bridge over the Kenai River. The recreation area was formed around the highway as a sort of buffer, providing for a natural corridor along the Kenai River and between the highway and the river. Although the G South Alternative has a lower acreage of impact than the Cooper Creek Alternative (see Table 4.5-1), the effects on the functions of the recreation area are similar. None of the developed sites within the recreation area that have a recreation function (i.e., the K'Beq Footprints Heritage Site, the Resurrection Pass Trail trailhead, and the entrance and overflow parking area for the Russian River Campground) would be affected. Trees and vegetation would be cleared to establish the required clear zone for the wider highway, and clearing would permanently reduce wildlife habitat in a narrow strip along the highway. Average hourly traffic noise in the recreation area would be similar to noise levels today.

Three locations within the recreation area were modeled at various distances from the highway. Two showed increases of 1 dBA in average sound levels (not likely perceptible) and one showed an increase of 6 dBA in average sound levels (distinctly noticeable) by 2043. At the site closest to the highway, at the location of the parking and trailhead for the old Beginnings Heritage Site interpretive trail within the recreation area, the change in average sound levels would increase from 67 dBA to 68 dBA by 2043. While this would be only a 1-dBA increase from existing levels, DOT&PF Noise Policy defines this as a traffic noise impact. The Noise Policy states that a sound level that approaches within 1 dBA or exceeds the FHWA noise abatement criteria of 67 dBA is

an impact. The site today (67 dBA) is impacted. The No Build Alternative's predicted noise level (68 dBA at the site closest to the highway) showed the same impact. This site is not well used, but is an access site for the recreation area. Otherwise, it is indicative of near-highway noise levels at the boundary of the recreation area and the highway right-of-way.

The new highway would provide 8-foot shoulders and would eliminate some existing informal pullouts used today for access to the Kenai River banks. This combination could tempt the public to park outside of formal river access point parking lots (including parking at Sportsman's Landing/Russian River Ferry), which charge a fee and often can be full during prime fishing season. Parking in the highway right-of-way for access to national forest lands (KRRRA) and the Kenai River has been typical for many decades, and land managers and the public have grown accustomed to a given amount of parking availability. The Forest Service indicated the agency could not concur regarding *de minimis* impacts to the KRRRA under this alternative because of the reduction in parking availability, even though the parking that would be lost is not formally provided for, and is located within the highway right-of-way and not in the Section 4(f) property (KRRRA).

On the other hand, the Forest Service and other land managers have also expressed some concern that, with continuous, full shoulders visitors may park on those shoulders, and thus the river banks (KRRRA) and the river could see more use/uncontrolled use than they do today. Left unmanaged, parking on the shoulder could lead to more people accessing the river informally, especially in already crowded areas near the confluence of the Russian River and Kenai River. This could increase the need for management by the Forest Service (and other land managers in the river corridor). This also could lead to such impacts as bank trampling in new areas. Enforceable no parking signs would be posted near Sportsman's Landing to mitigate such issues (or other areas as needed).

Finally, if there is no parking allowed along the highway in this area, the Forest Service is concerned that there would not be enough parking for public access. For the G South Alternative, a large existing pullout west of Schooner Bend Bridge would be retained and formalized (included in project design, and paved) to help provide parking for river access and for winter access to Resurrection Pass Trail.

There are nine existing informal pullouts in the highway right-of-way adjacent to the Kenai River Recreation Area encompassing an estimated total of 63 parking spaces. The G South Alternative would avoid one pullout entirely near MP 51 (nine spaces), would eliminate seven of the smaller pullouts, and would rebuild the largest pullout, located near MP 53.1 at the driveway for Resurrection Pass Trail access. Of an estimated total of 54 parking spaces in the eight affected pullouts, 26 would be retained, with potential for further parking on Forest Service land, depending on Forest Service desires (see also Section 4.6.7).

During construction, noise, dust, and the visual clutter of construction equipment and freshly cut earth would impact those passing through the recreation area on the highway, and construction noise likely would carry to the trailheads, parking areas, and heritage site developments. Construction activity would be visually screened from all these sites by trees, except at the former Beginnings Heritage Site, where the existing parking and trailhead are located immediately adjacent to the highway. Temporary traffic delays, closures, and detours would occur (see Section 4.6 for mitigation). The construction contractor would be required to maintain access to these sites

during construction, except the Beginnings Heritage Site, which is now closed as a public interpretive site and is used only as an ancillary, informal river access point.

Some of the historic properties from the Sqilantnu Archaeological District and the Charles G. Hubbard Mining Claims Historic District lie within the boundaries of the Kenai River Recreation Area. Impacts to cultural sites are addressed below.

4.5.3.4 Sqilantnu Archaeological District

The build alternatives all would use land from the Sqilantnu Archaeological District and its contributing properties, although in somewhat different ways. Total acreage of impact to sites protected by Section 4(f) is shown in Table 4.5-1. However, acreage is only a partial indicator of impact. The G South Alternative would impact 26 archaeological historic properties by partially or completely eliminating them, or by burying them with highway embankment material. A few of these sites already are partly located under the existing highway. The G South Alternative would impact contributing historic properties associated with the Beginnings Heritage Site (impacts would be identical to those from the Cooper Creek Alternative). The G South Alternative also would impact the Confluence Site (same as Cooper Creek Alternative), which contributes to the Sqilantnu District; see further discussion in the following paragraphs.

Indirectly, the G South Alternative would provide new public foot access across lands north and west of the Cooper Landing community and within the Sqilantnu Archaeological District. However, no historic properties have been identified in this area besides ones already directly impacted. The change in public access could result in additional foot traffic in the District, which could indirectly impact unknown features. Changes in the setting of this portion of the district would occur, but because the specific area is generally part of the valley-wide setting associated with Dena'ina prehistory and not known to be directly associated with a collection of important sites or events, impacts to the setting are considered relatively minor. Mitigation specifics for this alternative are documented in an agreement developed between FHWA and consulting parties (agencies and Tribes; see Section 4.6 and Appendix K).

4.5.3.5 Confluence Site

The Confluence Site is wholly contained within the Sqilantnu Archaeological District and is a contributing element of the district; therefore, its impacts are a subset of the impacts discussed above for the broader district. The impacts of the G South Alternative to the Confluence Site would be identical to those described more fully above for the Cooper Creek Alternative. Important impact issues common to the Cooper Creek and G South alternatives are discussed above in Section 4.5.2.6.

4.5.3.6 Charles G. Hubbard Mining Claims Historic District

FHWA has determined that widening of the existing highway under the G South Alternative would impact several historic features within the district:

- Ava, Ace, Ada mining claims: Of 17 features, one contributing historic feature would be fully or partially eliminated by construction.
- Alpha mining claim: one contributing feature would be fully or partially eliminated by construction.

- Fern and Robin mining claims: two contributing features would be fully or partially eliminated by construction.

Partial or complete elimination of these sites constitutes a Section 4(f) use of the sites. Acreage of use of the district as a whole is shown in Table 4.5-1. Because the highway already exists through the district, little impact to the setting or feeling of the district is anticipated. Most of the district’s features are mining prospect pits (holes and trenches in the earth) that are important for the information contained in their location and distribution pattern and their association with gold mining. Because none of the features is well known to the public, noise and other construction effects would not affect public use of these sites. Impacts to prospect pits on the Charles G. Hubbard Mining Claims Historic District would be mitigated (see Section 4.6).

4.5.4 Impacts of the Juneau Creek Alternative and Juneau Creek Variant Alternative

The Juneau Creek and Juneau Creek Variant alternatives are identical over most of their length, but diverge in the area of Sportsman’s Landing. The two are discussed together. Where differences occur, those differences are highlighted with a text box.

Both of these alternatives would use land from several Section 4(f) properties. Table 4.5-1 indicates acreage of impact. These alternatives would use land from properties, some in common and some not, as indicated in Table 4.5-2.

Each of the Juneau Creek alternatives would use land from six Section 4(f) properties. The impacts to each Section 4(f) property are discussed in turn below.

Table 4.5-2. Section 4(f) use and the Juneau Creek alternatives

Section 4(f) Property	Juneau Creek Alternative	Juneau Creek Variant Alternative
Kenai National Wildlife Refuge	Yes	No
Resurrection Pass Trail	Yes	Yes
Bean Creek Trail	Yes	Yes
Forest Service Kenai River Recreation Area	No	Yes
Juneau Falls Recreation Area	Yes	Yes
Sqilantnu Archaeological District	Yes	Yes
Confluence Site (discussed with Sqilantnu)	Yes	Yes

4.5.4.1 Kenai National Wildlife Refuge—Impacts specific to the Juneau Creek Alternative

The four build alternatives share a common alignment through KNWR from approximately MP 56 to the end of the project near MP 58.5 (see Map 4-1 and Map 4-3). There is no Section 4(f) use of land associated with this common alignment because all alternatives remain within the existing Sterling Highway right-of-way. No impact is anticipated to KNWR facilities located within the right-of-way: the parking area and trailhead for the Fuller Lakes Trail, and the parking area for the visitor contact station.

The Juneau Creek Alternative would use land from KNWR in the area immediately east of MP 56. The acreage of KNWR land used by the alternative outside the existing right-of-way is shown in Table 4.5-1, above.

Differences between the Juneau Creek Alternative and Juneau Creek Variant Alternative: The Juneau Creek Alternative would use land from a corner of the KNWR to make the connection at the west end back to the old highway. The Juneau Creek Variant Alternative would not require acquisition of land from the KNWR outside the existing highway right-of-way and therefore would have no Section 4(f) use of the KNWR.

Under the Juneau Creek Alternative, as was described in the Draft SEIS and Draft Section 4(f) Evaluation, the new highway would deviate from the existing highway right-of-way for about 2,500 linear feet within KNWR, and a new connection to the existing highway would further use KNWR land (see Map 4-1 and Map 4-3). While the Juneau Creek Alternative would use land from this corner of the KNWR, the area in question is part of the land trade between DOI and CIRI. The land exchange would remove the refuge and Wilderness status of the land north of the existing highway within the proposed right-of-way of the Juneau Creek Alternative. This would have the effect of removing the Juneau Creek Alternative's use of Section 4(f) in the KNWR north of the existing highway. With the proposed boundary changes no use of Wilderness land is anticipated by the Juneau Creek Alternative. To acquire the property north of the current Sterling Highway and west of the current KNWR-CNF boundary, DOT&PF would instead need to acquire that property from CIRI. The acquisition would follow standard right-of-way acquisition procedures per the Uniform Relocation Act.

An extension of the "old" Sterling Highway (south of the current highway alignment) would still be necessary to provide access to recreation sites and to Cooper Landing from the west side of the project area. The area south of the highway would use 14.3 acres of KNWR and would be subject to Section 4(f). This area, however, is not designated Wilderness, and therefore is approvable under ANILCA Title XI by the involved Federal agencies (USFWS, USACE, and FHWA) rather than needing to go to the President and Congress.

See more on the land trade in Section 3.27.4.3 in the Cumulative Impacts chapter.

The Juneau Creek Alternative would use a total of 14.3 acres of land out of 1.94 million total KNWR acres. Within the area that would be incorporated into the new highway right-of-way south to the highway, cover for brown bears and other wildlife would be reduced and habitat permanently lost. Wildlife movement would be inhibited because there would be two roads to cross, the existing and the new highways, and animal mortality from vehicle collisions could increase. Highway noise would be similar to the current character, but would be spread over a larger portion of this corner of KNWR. See Sections 3.15, Noise, and 3.22, Wildlife, for more specific additional information about noise effects to wildlife.

Besides the wildlife impacts in the immediate area of the new highway right-of-way, there are other impacts to KNWR wildlife that cross back and forth between KNWR and CNF, particularly to bears traveling between salmon fishing areas in the project area (lower Juneau Creek on CNF lands, and the Kenai River-Russian River confluence area on CNF and KNWR lands) and tributaries of the Chickaloon River such as Thurman Creek (KNWR, well to the north of the project area). The long segment built on a new alignment under this alternative would fragment bear habitat and has potential to create a substantial barrier to bear movement (although some of the land along this stretch would no longer be public refuge, the impacts to bears and their habitat would still occur). The same is true of moose movement through the topographic bench areas on

either side of Juneau Creek that have seen forest treatments by CNF to reduce wildfire fuels and enhance moose habitat. These impacts are common to the Juneau Creek and Juneau Creek Variant alternatives and similar to G South Alternative impacts. These are discussed also in Section 3.22, Wildlife.

The Juneau Creek Bridge located in CNF would include abutments set about 200 feet from the edges of Juneau Creek Canyon. The space along the rim of the canyon under the bridge is important wildlife movement habitat, and the bridge would be designed to allow for ample clearance for wildlife movement from the bear concentration areas downstream to other habitat outside the project area and in KNWR. The width beneath the bridge would be enough to allow for wildlife and for the trails that would be routed near the bridge abutments. The base of the canyon, where bears may pursue salmon, would not be affected by bridge construction. Two crossings of the highway at Forest Service roads west of the canyon, while not meant as wildlife crossings, may serve as a supplemental means for bears to avoid highway traffic and still cross the Juneau Creek Alternative when passing between KNWR habitats and CNF habitats, in addition to dedicated wildlife crossings (see Sections 3.22 and 4.6.3 and Appendix I for information on wildlife crossings).

Construction of the Juneau Creek Alternative would result in a new cleared swath of land through forest, mostly on CNF land. This swath would appear as an engineered line in a largely natural landscape, and it likely would be visible from portions of the Andrew Simons Wilderness south of the Kenai River. The Surprise Creek Trail begins across the Kenai River from Jim's Landing and provides access up Surprise Creek through forest to alpine terrain above treeline (and outside the project area). Russian Mountain, at an elevation of about 3,500 feet, would block views from the trail, but anybody who ventured across country to the north side of Russian Mountain or to its summit would be able to view the Kenai River valley, including existing highway and power transmission line cuts, Sportsman's Landing and Russian River Ferry parking areas, the Forest Service Russian River Campground, and the new highway. The new highway would be an additional and permanent engineered element to the view, and it would detract from the sense of wilderness and isolation in this designated Wilderness area. However, because other development already exists in the view, the character of the view would change incrementally but would not be a dramatic change. Also, because Surprise Creek Trail requires boating across the Kenai River, with risk of entering rapids downstream, and because of the distance and elevation gain required to reach the alpine ridges from which these views would be visible, relatively few people access these views. It is anticipated that the change in the view would affect few individuals. See also Section 3.16.2.5.

4.5.4.2 Resurrection Pass Trail

The Juneau Creek Alternative and Juneau Creek Variant Alternative would cross the Resurrection Pass National Recreation Trail near Juneau Creek Falls (see Map 4-5 and Map 4-10 and the Figure 4.5-1 photo simulation). The impact would be identical under both alternatives. The recreation resource associated with the trail is considered to be a corridor 1,000 feet wide. Table 4.5-1 reports the acreage of use within this corridor. The highway would cross over the trail (typically about 3 feet wide) on a proposed new bridge. It is likely that there would be 15 feet or more of clearance beneath the bridge. Depending on the ultimate bridge design, there may or may not be piling supports between the trail and the canyon rim. Where the trail crossed the new highway, it would lie within the new highway right-of-way (crossing under the highway bridge at a right angle), but

there would be no permanent physical use of the trail. It is anticipated the Forest Service would retain a trail easement 100 feet wide up to perhaps 1,000 feet wide.

As discussed below under Section 4.5.4.5 (Juneau Falls Recreation Area), there would be temporary impacts to the trail during construction. While construction was occurring over the trail, trail users would be rerouted through a detour that would be provided (see mitigation detail in Section 4.6.4). This would be an inconvenience to trail users but would ensure that the trail stayed open to trail users. Trees along the trail directly under the bridge would be felled with hand tools and removed carefully to retain understory vegetation as much as possible, to preserve the natural corridor to the extent possible. Bridge construction activities and associated noise, dust, and visual impacts of disturbed earth could last up to 5 years (HDR 2006e), but more likely would take 3 to 4 years, before the highway opened to traffic.

The highway would cross the trail 3.4 miles northeast of the trail’s existing Sterling Highway trailhead via the bridge that would also span the Juneau Creek Canyon. Once the bridge was complete, trail users could continue to use the trail without crossing the highway at-grade. Because of the curving alignments of the trail and also of the proposed highway, the highway west of the trail crossing would roughly parallel the trail over most of the 3.4-mile segment leading up to the crossing (see Map 4-5). While background sound level in these undeveloped areas was measured at a low average sound level (40 dBA), there is sufficient distance—2,200 to 4,200 feet—between the trail and highway that noise and visual impacts associated with the highway would be negligible compared to current conditions, once the distance between the highway and trail was greater than several hundred feet.

Snowmobilers use West Juneau Creek Road, which crosses the proposed highway alignment, as an alternate route because the main Resurrection Pass Trail often is less suitable for winter travel. Use of the alternate route would be changed by the new highway, and it is possible that parking on the highway shoulder would occur where the Forest road would cross the new highway. For these reasons, trailhead and underpass mitigation is proposed; see Section 4.6.4. It is likely that trail users, whether bound for the far end of the trail at Hope or for shorter trips to public use cabins, lakes, or the crest of Resurrection Pass, would use the new trail crossing location along the highway alignment for access and would create a new *de facto* trailhead if a formal trailhead were not provided. This could result in many cars and snowmobile trailers parking along the highway shoulder during



Figure 4.5-1. Simulated before (top) and after (bottom) views of proposed bridge crossing site of Juneau Creek Canyon, as it might be seen from the Resurrection Pass Trail as the trail passed beneath the bridge

popular periods, a potential safety issue for highway users and the hikers and snowmobilers parking there. As a result, mitigation is proposed as described in Section 4.6.4.

There is a Section 4(f) use of the trail corridor and other associated impacts that affect the entire trail. The use occurs in the immediate vicinity of the new highway crossing of the trail. The broader impacts are effects to the 3.4 miles downhill from the crossing site and to the remainder of the trail north of the crossing, especially the additional mile to the Bean Creek Trail junction and also the 9 miles of the upper Juneau Creek valley. There are several interrelated impacts of crossing the trail:

- Placing a planned trailhead on the new highway corridor, 3.4 miles uphill from the existing trailhead, would effectively reduce the overall trail trip length by 9 percent for those using the entire trail, most of whom would no longer start at the existing, lower trailhead if a new trail access point were available. Those who desired still could use the entire trail.
- The 3.4-mile length is approximately half of a typical moderate hike that might be attractive to average hikers.¹³ The existing 7- to 8-mile round-trip hike to the Juneau Creek Falls area from the Sterling Highway trailhead would remain but likely would not be used, as a practical matter for many hikers, because the falls would be effectively road accessible, with a walk of one-half mile or less, round-trip. For local residents who use the lower segment of trail for day hikes, the experience at the upper end of the day hike would change and may discourage some users. Local users would have the option of starting at the new trailhead for Resurrection Pass Trail and hiking up Juneau Creek Valley to areas previously inaccessible for day hiking.
- The trail over its lower 3.4 miles would remain, but use likely would change substantially. Use of the lower trail would be more incidental and no longer particularly relevant as part of a longer journey along the Resurrection Pass Trail for most users. It is possible that mountain bikers would use this trail segment along with old logging roads (accessible at the existing Resurrection Pass trailhead) to form a loop route, possibly including the new highway as a link, or that people staying in the area would drive to the top and hike down, to be picked up at the existing trailhead.
- The trail portion north of the new highway would become much more accessible. The highway would cross the Resurrection Pass Trail at approximately elevation 1,100 feet, in the Juneau Falls area. The existing trailhead on the existing Sterling Highway is at approximately 390 feet. North of the Juneau Falls area, the Resurrection Pass Trail is relatively level for another 9 miles to the Swan Lake area (elevation 1,400 feet). Eliminating the 700-foot climb in the first 3.4 miles of trail would provide direct and easier access to a semi-level trail in relatively open and very scenic terrain. Trout Lake would be 4.4 miles from the new trailhead instead of 7.75 miles from the existing trailhead. Romig

¹³ The Appalachian Mountain Club (www.outdoors.org/lodging/whitemountains) located eight huts for “novice and experienced hikers..., each a day’s hike apart along the Appalachian Trail in New Hampshire’s White Mountains” (White Mountains National Forest). The spacing between these backcountry overnight lodgings ranges from 4.8 mi. to 8.0 mi., with an average of 6.7 mi. This range correlates with trip lengths noted as good for short day hikes to long day hikes in *55 Ways to the Wilderness in Southcentral Alaska* (Nienhueser and Wolfe 2008).

Cabin would be 5 miles instead of 8.75 miles. Juneau Lake Cabin would be 5.9 miles instead of 9.25 miles. Swan Lake Cabin would be 9.6 miles instead of 13 miles. All four of these cabins and all three lakes would be within a day's hike for average hikers, instead of just one cabin and lake. For mountain bikers and snowmobilers, all these cabins and lakes would be much more accessible for an out-and-back day trip. Competition for the cabins and camp sites, and general use of the area, likely would increase. The increased accessibility would be a beneficial impact to some individual users who otherwise might be inhibited from using the forested and steeper first 3.4 miles of trail. However, effectively reducing the long-distance trail experience by 9 percent would be an adverse impact to other users for whom the Resurrection Pass Trail is one of few accessible, point-to-point, long-distance trails in Alaska and to those who value the backcountry camping and cabins experience in the upper Juneau Creek valley precisely because of the effort it takes to reach the area. The backcountry recreation experience overall would be reduced, with more "front country" uses expected. The dispersed recreation experiences available along the trail may seem less "primitive" and remote to some users because of easier accessibility and greater likelihood of encountering other parties. This may be true for remote and "primitive" experiences available from the trail, and off-trail hikers may have a greater chance to encounter other users as well. These impacts would affect not only individuals but permitted Forest Service hiking guides, horse packers, and others who use the trail for its distance, remoteness, and sense of a long journey. That is, because the trail would be relatively flat and destinations closer, more casual uses are likely—a higher percentage of larger groups, tour groups, and day hikers, and a lower percentage of overnight backpackers. This would likely result in a somewhat greater likelihood of fires outside designated fire rings, litter, underage drinking, and other less-desirable activities. The area would likely require greater management by the Forest Service (2009).

- The long-distance trail experience, at 34.6 miles instead of 38 miles without the uphill grade beginning at the existing Cooper Landing trailhead, would be more achievable to more people. Because it already is popular, and because cabins already are completely reserved all summer and much of the winter, the decreased length and decreased difficulty would likely increase pressure on the entire trail, and therefore would increase maintenance needs on both the trail and the public use cabins.
- The new highway alignment would introduce new highway traffic noise, particularly near the point that the highway crossed the Resurrection Pass Trail. A highway traffic noise study completed for this project in 2016 indicated that the average noise level on the trail would increase 11 dBA at a distance of about 300 feet from the highway centerline, from 40 dBA to 51 dBA. This would be a change, but would not approach or exceed the FHWA noise abatement criteria and therefore would not result in a traffic noise impact as defined by FHWA. At greater distance (about 1,000 feet), the change was 3 dB(a), barely perceptible. Users accustomed to average background noise levels of around 40 dBA would be subject to higher noise levels as they approached closer to the highway. Traffic noise would diminish with greater distance and would diminish beneath the bridge. The bridge would be at least 55 feet wide and would shield trail users from the highest noise levels as they passed beneath it (see the discussion below of noise in Section 4.5.4.5 for further detail on noise modeling for this project). Changes to the visual environment coupled with changes in the type and volume of sound at the Juneau Creek Bridge crossing over the

Resurrection Pass Trail would change a quiet natural experience to a near-urban underpass environment for a short stretch.

- Even farther from the highway, new traffic noise effects likely would occur. The National Park Service (NPS), USFWS (including KNWR), and others have studied human-generated noise in natural settings and documented that sound can be audible over many hundreds of yards and up to several miles (Horonjeff and Anderson 2005, Morton 2008). Because the highway would reach the same elevation as the upper Juneau Creek Valley without topographic constraint to block noise, some short-duration loud noises likely would carry well north into upper Juneau Creek Valley—perhaps 1 to 2 miles or more, particularly under certain still conditions. (As an example, per Morton (2008), maximum short-duration sound levels of 120 dBA were measured along the edge of the Sterling Highway in parts of KNWR.) Even though the valley is open to winter snowmobile use in alternating winters, faint highway noise would reduce the sense of a natural or backcountry type environment, particularly in summer and in winters during which the trail was closed to snowmobiles, when the expectation for natural quiet would be highest.
- The concentration of people at a new trailhead, walking to viewpoints of the falls or for a short stroll out the trail, would likely lead to greater littering and vegetation impacts in the falls area. The Forest Service considers the likelihood of meeting other parties and group size to be important parts of its assessment of backcountry recreation impacts and important considerations in its nationwide Leave No Trace backcountry ethics program. Thus, the additional people, particularly those on short, scenic viewing excursions, would constitute an important visual and noise change, compared to current conditions.

There will be changes in use and resulting impacts of the Juneau Creek alternatives (i.e., the increase in access, the ability to bypass the 3.4-mile uphill segment from the existing Cooper Landing trailhead, and the falls being available to a greater cross-section of ages and abilities). Based on consultation with the Forest Service, it is not anticipated that the adverse effects would be so severe that the entire trail would lose its National Recreation Trail status or that the Forest Service would need to close or restrict use on any part of it. The trail is likely to continue to be popular and heavily used, although the use pattern and types of users likely would be different (e.g., trips would be more likely to start at Juneau Falls and/or trail users would have a different experience than previously over the 3.5-4.0 miles at the southern end of the trail).

As noted above, impacts during construction are discussed below under Section 4.5.4.5, Juneau Falls Recreation Area. See also Map 4-10. Mitigation, including trail detours, is discussed in Section 4.6.4.

4.5.4.3 Bean Creek Trail

The Juneau Creek and Juneau Creek Variant alternatives would cross the Bean Creek Trail, resulting in a use under Section 4(f) (see Map 4-6 and Map 4-7). The impact would be identical under both alternatives. The trail crossing would be located about 2,000 feet south of the junction of the Bean Creek and Resurrection Pass trails. The highway would cross the historic trail alignment about 1.75 miles from the existing Bean Creek trailhead (the end of Slaughter Ridge Road). To keep trail users separate from vehicles on the highway, the project would reroute the trail so that it would pass under the new highway bridge at the eastern edge of Juneau Creek Canyon. About 2,900 feet of trail would be rerouted as shown on Map 4-6 (see Section 4.6 for

details regarding mitigation of trail impacts). For trail users, the bridge would introduce a massive engineered structure in what had been a natural environment.

With the severing of the historic alignment and rerouting of the trail, the bypassed segment of the historic alignment could fall into disuse and might be lost over time as an identifiable trail. Use of the rerouted segment, however, would ensure that the trail continued to function well for recreation.

The highway would pass within 950 feet of the Bean Creek trailhead at Slaughter Ridge Road and then roughly parallel the Bean Creek Trail at distances of approximately 1,800 feet (closing gradually to zero as the highway approached the trail crossing). The trail is used particularly in winter as alternate access to the Resurrection Pass Trail and upper Juneau Creek drainage (O’Leary, personal communication 2006). It is anticipated that virtually all users from outside the local area would gravitate to the Resurrection Pass Trail, and that trail would get the most use for access up the valley if a new trailhead were in place. The lower 1.75 miles of the Bean Creek Trail would remain useful primarily for local traffic.

The *Highway Traffic Noise Assessment* (Appendix D of this EIS) completed for this project modeled a site along the Bean Creek Trail near the area where the proposed highway alignment would cross the trail. The Bean Creek Trail crossing area currently is undeveloped, so the noise report indicates background noise levels should be assumed to be 40 dBA, as measured at a similar undeveloped location. The modeled noise level for 2043 was 62 dBA, an estimated increase of 22 dBA from existing and from the No Build Alternative. A noise increase of 15 dBA or more is considered a substantial noise increase by DOT&PF. The trail would be rerouted to pass under the highway at the Juneau Creek Bridge, and beneath the bridge traffic noise levels would be reduced somewhat because the bridge deck would shield trail users from some traffic noise. However, trail users still would approach and cross the alignment, and highway noise would be unavoidable.

Finally, the Juneau Creek and Juneau Creek Variant alternatives include a gravel extraction area and an overburden disposal area west of the existing trailhead for Bean Creek Trail. The portion of the trail that crosses Bean Creek and a portion of the historic/recreation route immediately west of this crossing are the most likely routes to be used for truck access from the proposed highway alignment to these areas. The proposed hauling route and the trail would overlap for about 1,600 lineal feet (about 3 acres of the 100-foot-wide trail corridor would be affected, based on the 80-foot hauling route width mapped for this EIS; it is likely that the footprint of the temporary road actually would be substantially narrower). Trail users would encounter the temporary haul road within about 1,200 feet of the existing trailhead. Without mitigation, trucks and pedestrians would share the route for most of the project construction period—with most activity in summer over at least two summers, and possibly up to five. Winter construction activity on the road also is possible, although likely at reduced activity levels and intermittently. The trail crossing of the creek is currently on an old logging road, and upgrading this route for truck traffic ultimately would improve the existing soft trail with an embankment and replace a rough log bridge with a new bridge. Section 4.6 provides a discussion of proposed mitigation, including temporarily rerouting the trail).

4.5.4.4 Forest Service Kenai River Recreation Area—Impacts Specific to the Juneau Creek Variant Alternative

The Juneau Creek Variant Alternative’s western junction with the existing Sterling Highway right-of-way would occur just east of KNWR/CNF boundary at MP 55 (Map 4-1 and Map 4-9 provide an overview; Map 4-4 shows detail). At the junction, the Juneau Creek Variant Alternative would cross about 300 feet of the Kenai River Recreation Area, and a highway overpass would be placed in this location. The existing Sterling Highway would be routed under the overpass to connect with the new alignment. This would be necessary to accommodate the Sportsman’s Landing-Russian River Ferry entrance, separating the entrance from the main highway. The total acreage of use of Kenai River Recreation Area is reported in Table 4.5-1. None of the developed features of the recreation area would be affected. The area used would be north of the existing highway, where the ground is principally steep and forested. No substantial dispersed recreation use of this area is known to occur. With minimal recreation use, the primary impact would be loss of wildlife habitat and natural forest foreground views as seen from the Kenai River and the existing highway. These impacts would not occur under the Juneau Creek Alternative.

Differences between the Juneau Creek Alternative and Juneau Creek Variant Alternative: The Juneau Creek Variant Alternative would use land from the Kenai River Recreation Area in Chugach National Forest. The Juneau Creek Alternative would not.

Based on consultation with the officials with jurisdiction and the proposed measures to minimize harm (including the avoidance of specific features, mitigation, and/or enhancement), FHWA has found that the use of the property will result in a *de minimis* impact. The Forest Service has concurred in writing that the Juneau Creek Variant Alternative will not adversely affect the activities, features, and attributes of the Section 4(f) property. See Section 4.3. A form for this *de minimis* impact finding and the concurrence letter are located in Appendix F

4.5.4.5 Juneau Falls Recreation Area

The Juneau Creek Alternative and Juneau Creek Variant Alternative would use a portion of the Juneau Falls Recreation Area (Map 4-10). The impact would be identical for both alternatives. The acreage of use, as reported in Table 4.5-1 above in Section 4.5.1, represents the full highway right-of-way width across the entire recreation area. However, as indicated in the Table 4.5-1 footnote, several acres would be under a clear-span bridge over Juneau Creek Canyon. The Recreation Area is not heavily developed for recreational purposes, but does contain portions of the Resurrection Pass Trail and Bean Creek Trail, informal viewpoints, and a designated backcountry campsite associated with the Resurrection Pass Trail. Because most of the impacts to the area are trail-related, there is a great deal of overlap between this discussion and the discussions of the Resurrection Pass Trail and Bean Creek Trail, reported in detail above.

The Forest Service places particularly high value on the Juneau Falls Recreation Area because it surrounds a scenic waterfall. The Forest Service has greater concern about overall impacts to this recreation area than impacts of crossing the Resurrection Pass Trail (Vaughan, personal communication 2006b). The highway would cross the canyon about 1,300 feet downstream of the waterfall and would be a substantial new structural presence in an otherwise natural environment—introducing both visual and auditory changes, as further described in the paragraphs below and in Section 4.5.4.2, above. The Juneau Falls Recreation Area impacts would primarily be the visual impacts of placing a bridge in the down-valley view from the edge of the gorge (see Figure 4.5-1) and the impact of changing the character and use of the area, as further described in the paragraphs

below. The bridge is not expected to provide a direct view of the Juneau Creek Falls. However, the potential for views from the bridge is likely to attract pedestrians to the bridge; the attraction of views could create a hazard to pedestrians and motorists. These issues are considered further in the trails discussions above and under mitigation in Section 4.6.

An area approximately 140 feet wide would be cleared of forest to make way for the highway west of the canyon, permanently altering wildlife habitat. East of the canyon, because of topography, the cleared area would vary from about 100 feet wide to about 280 feet wide, and earth would be removed from a hillside, leaving a cut about 45 feet high.



Figure 4.5-2. Simulated view of proposed bridge crossing of Juneau Creek Canyon, as seen from the existing informal Juneau Falls overlook area. From this location, the view of the falls is upstream, and the view of the bridge would be downstream.

There would be no impacts below elevation 1,060 feet, approximating the rim of the canyon. Several bridge styles and construction techniques were recommended in a project bridge study (HDR 2006e), all of which are capable of being constructed without access below this elevation (some bridge types would require a bridge support anchored into a notch right at the canyon rim, and some bridge types would have abutments set approximately 200 feet back from the canyon rim with no intermediate support). DOT&PF has committed to construction techniques that would not require construction of temporary roads or trails in the canyon.

The only developed campsite in the recreation area, located on the east side of the creek immediately upstream of the falls, would be approximately 2,000 feet from the proposed highway (see Map 4-10). Portions of the new bridge may be visible downstream from view points on the canyon edge, but not likely from the campsite area. Where visible, the bridge would be a substantial new, engineered element in the view. Figure 4.5-2 and the project's visual assessment (HDR and USKH 2012) provide a simulation of the bridge appearance.

The *Highway Traffic Noise Assessment* (Appendix D of this EIS) completed for this project measured sound levels at the Resurrection Pass Trail footbridge over Juneau Creek (near the center of the Juneau Falls Recreation Area) at 65 dBA, with substantial influence from the sound of fast-running water. The study assumed 40 dBA as the average sound level for undeveloped areas not adjacent to running water, based on the level measured in an example area farther west.

The noise study modeled four sites within the Juneau Falls Recreation Area: the backcountry camp site, the Resurrection Pass Trail near the falls area, the Resurrection Pass Trail near the proposed highway crossing of the trail, and the Bean Creek Trail near the proposed crossing. The projected traffic noise levels are reported above under trail headings (see also Appendix D). The campsite lies centrally in the recreation area off the main trails and away from the canyon and creek. The predicted average hourly noise level in 2043 indicates no change from existing noise levels.

Highway traffic from individual vehicles may still be audible from the site, but average hourly noise levels generally would be the same as they are today. This is likely to be the case over much of the recreation area. Some of the recreation area, including the trails, would be located beneath the new highway bridge. Those portions of the recreation area within the canyon would be separated by up to 250 vertical feet from the noise source on the bridge overhead, and the bridge itself would insulate areas under it from much of the automobile noise. Areas near fast-running water of the creek and falls, where the natural sound level is expected to be 65 dBA, may be minimally affected because the water noise would help mask highway noise. The model identifies a traffic noise impact (62 dBA, representing a 22-dBA increase) at the Bean Creek Trail crossing, which is a representative location near the highway in this section of the project area. It is reasonable to assume that any point in the recreation area at similar proximity to the highway would experience noise increases and that the types of sounds heard even at greater distances would be a change from existing conditions. No mitigation is recommended at the Bean Creek Trail crossing consistent with DOT&PF Noise Policy, as noise abatement measures cannot be provided in a cost-effective manner (see Appendix D). Changes in sound level or quality are not expected to prevent use of the campsite for sleeping. Recreationists in the area would hear the new highway, and trail users would hear it more strongly when closest to or crossing the highway.

During construction, noise and dust from operation of heavy equipment, chainsaws, pile drivers or rock drilling equipment, and rock blasting equipment are likely. Bridge construction is anticipated to take four construction seasons, though it may require as few as three seasons or as many as five. The trail and camp sites are expected to remain open for use during the construction period, but the trails would be closed for safety when construction of that portion of the bridge directly over the trail was underway. When the existing Resurrection Pass Trail was closed, the campsites would be accessible via a trail detour and via the Bean Creek Trail. Construction noise and activity may reduce the desirability of the campsites during some periods. Trail closures could last multiple days. (See Section 4.6.4 for discussion of mitigation and see further discussion of trail impacts under Section 4.5.4.2 above; see also Map 4-10). These construction impacts would be temporary but would be substantial to trail users and those intending to camp at the camp sites during portions of the construction period.

Because the Juneau Falls Recreation Area as a whole is not managed differently for recreation than the CNF land around it (see Section 4.2.8), the permanent impacts are primarily to the intrinsic value of the location. The opportunity to experience the area as an almost entirely natural area would be lost (see also Resurrection Pass Trail, Section 4.2.4).

Also related to the trail discussions above is a probable changed use pattern involving the Resurrection Pass Trail, the Bean Creek Trail, and the new highway bridge over the canyon. The Forest Service has indicated that recreationists are likely to use the new highway bridge (HDR 2009c). The Forest Service has suggested that the two trails, linked by the bridge, would make a hiking loop (approximately 1.8 miles), and that it would attract the recreating public. Walkers could be on the highway shoulders to make the connection from one trail to the other. It is difficult to estimate the numbers of people who might make use of the bridge for viewing or make the trail loop connection. However, currently 5,000 users are estimated to use the southern end of the Resurrection Pass Trail each year. It is reasonable to assume that this number would be supplemented by new users attracted to the views and the short trail opportunity, and by normal users of the Bean Creek Trail. A portion of these users likely would hike the loop or venture onto the bridge, perhaps amounting to several hundred people each summer. Such a concentrated use

could pose a greater risk of collision to recreational hikers and viewers, and to drivers, than most segments of rural highway. To mitigate the concern, the highway and bridge would include a pedestrian walkway, parking east and west of the bridge, connecting trails, and signs and fences to promote safe use of the bridge area by pedestrians (see Section 4.6 for further mitigation information).

4.5.4.6 Sqilantnu Archaeological District and Confluence Site

The build alternatives all would impact the Sqilantnu Archaeological District and Confluence Site, although in somewhat different ways. Acreages of highway footprint impacts within the district and Confluence Site boundaries are shown in Table 4.5-1 (above in Section 4.5.1). However, acreage is only a partial measure of impact.

Differences between the Juneau Creek Alternative and Juneau Creek Variant Alternative: The Juneau Creek Variant Alternative would affect a portion of an important archaeological site; part of the site contains prehistoric and repatriated human burials. The graves area, however, would not be affected. The Juneau Creek Alternative would not use land from this archaeological site. The acreages of overall use also differ, and the total number of contributing sites affected differs. See also discussion of the Confluence Site.

The Juneau Creek and Juneau Creek Variant alternatives would have similar types of impacts to the district and Confluence Site, including use of land from nine contributing archaeological historic properties by the Juneau Creek Alternative and use of 20 contributing archaeological historic properties by the Juneau Creek Variant Alternative and use of land within the Confluence Site. The project would impact these contributing properties by partially or completely eliminating them, or by burying them with highway embankment material.

The Juneau Creek Variant Alternative would use land from the northern portion of an archaeological site associated with human burials and located within the Confluence Site. The site in total amounts to 1.6 acres; 0.6 acre would be impacted. The burial area within this 1.6-acre area would not be affected, but a portion of the site would be affected, and possibly non-burial features would be eliminated or buried. The Juneau Creek Alternative would not impact this contributing property.

Both of these alternatives would provide new public foot access across lands north and west of the Cooper Landing community that to date have been mostly undeveloped (but accessible via West Juneau Road, Resurrection Pass and Bean Creek trails, Slaughter Ridge Road, and the Birch Ridge and Slaughter Gulch trails). The alternatives also would provide new public trailhead parking near Juneau Creek. Most of these lands lie within the Sqilantnu Archaeological District, but few historic properties have been identified in this area. Approximately seven known contributing properties have potential for indirect impacts from people walking cross-country through the woods from the highway. (The potentially affected properties would be slightly different for each alternative, but the number of sites would be similar.) Most of these sites are located in the vicinity of the CNF-KNWR boundary and already are near the existing highway. One site is located in the general vicinity of the Juneau Falls Recreation Area and has greater potential for indirect damage through new public access.

These alternatives would result in a new highway through a portion of the archaeological district that is dense with archaeological sites and of particular importance to the Kenaitze Indian Tribe. The setting would be altered, and because of the routing of the Juneau Creek Variant Alternative, this alternative would alter the feeling of a bench area overlooking the Russian River confluence that is considered sacred. The Kenaitze Indian Tribe has indicated a strong association of the tribe

with this area, and both ancient and modern (repatriated) graves in this area retains strong association to the tribe. Tribal members visiting the graves this area would be aware of the existing highway nearby, but the new highway would be closer, would be more evident, and would represent a second highway affecting the area. The Juneau Creek alignment would be farther away and would create less impact to setting, feeling, and association than the Juneau Creek Variant Alternative.

Additionally, the Juneau Creek Variant Alternative could result indirectly in overflow of Sportsman’s Landing-Russian River Ferry traffic parking onto the shoulder of the new highway. Although this would be discouraged through legally enforceable no parking signs, it could occur (as it does today on the existing highway, even without shoulders) and could lead to people wandering into sites important to the Kenaitze Indian Tribe.

Mitigation is proposed for these two alternatives, as noted in Section 4.6.9.

4.5.4.7 Confluence Site

The Confluence Site is wholly contained within the Sqilantnu Archaeological District and is treated as a contributing element of the district; therefore, impacts discussed here are a subset of the impacts discussed above for the broader district. Within the Confluence Site, each of the Juneau Creek alternatives would impact several contributing archaeological historic properties. While the Juneau Creek Alternative would pass along the northern edge of the Confluence Site, the Juneau Creek Variant Alternative would pass through the Site’s central area of importance, as roughly contained in Tract A. Tract A is a core area of importance to CIRI; the Federal government transferred Tract A to CIRI as part of the Russian River Land Act agreement, which resolved Alaska Native land claims in the area (see Section 4.2.12). The Juneau Creek Variant Alternative would require substantial acquisition of land from CIRI Tract A, bisecting the 42-acre parcel from northeast to southwest and passing very close to areas of particular importance in the tradition and culture of the Kenaitze Indian Tribe.

Under the Juneau Creek Variant Alternative, the setting, feeling, and association of the Confluence Site would be substantially altered by these impacts. The Variant would divide the Confluence Site and alter its character. It would reduce the association of the current environment with the traditional Dena’ina culture in this area.

The Juneau Creek Alternative would be aligned farther to the northwest. Its footprint area within the Confluence Site would be similar, but the location of those impacts would avoid Tract A in its entirety, and disruption to the setting, feeling, and association of the Confluence Site would be much less.

For either of the Juneau Creek Alternatives, future access to Tract A would be possible from the “old” highway at approximately the location agreed upon by CIRI and the Forest Service near MP 54; DOT&PF may require that it be combined with a private driveway in that area. Access also would be possible from either of the new alignments, although DOT&PF would encourage access from the “old” highway only.

4.6 Individual Section 4(f) Resource Avoidance and Minimization Options

4.6.1 Introduction

4.6.1.1 Minimizing Harm

“All possible planning” to minimize harm to Section 4(f) properties is defined in FHWA regulations 23 CFR 774.17:

All possible planning means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects must be included in the project.

- (1) With regard to public parks, recreation areas, and wildlife and waterfowl refuges, the measures may include (but are not limited to): design modifications or design goals (sic); replacement of land or facilities or comparable value and function; or monetary compensation to enhance the remaining property or to mitigate the adverse impacts of the project in other ways.
- (2) With regard to historic sites, the measure normally serve to preserve the historic activities, features, or attributes of the site as agreed by the Administration and the official(s) with jurisdiction over the Section 4(f) resource in accordance with the consultation process under 36 CFR Part 800.

This section addresses measures to minimize harm to Section 4(f) properties in two different ways (see adjacent “Process” box):

- “Measures to Minimize Harm—Alignment Options”: Subsections under this heading present analysis of the potential to shift the alignment in ways that would route the highway around individual Section 4(f) properties or otherwise minimize harm to individual Section 4(f) properties (see also discussion of avoidance in Section 4.4). This can include different approaches to bridging over Section 4(f) properties.
- “Measures to Minimize Harm—Design and Construction”: Subsections under this heading describe other proposed mitigation measures for the alternative. If DOT&PF and FHWA were to select the alternative listed, these are environmental commitments proposed to be presented in the Record of Decision.

Under Section 4(f) law [49 USC 303(d)(1)(B)], a finding of *de minimis* impact (see Section 4.3) means there is no requirement to consider total avoidance alternatives. Therefore, the Forest Service Kenai River Recreation Area under the Juneau Creek Variant Alternative is treated differently in this section and is given only brief treatment to list “Measures to Minimize Harm—Design and Construction.”

Process used in this Section 4(f) Evaluation

The process outline, with the current step in bold, is as follows:

1. Identify Section 4(f) properties.
2. Evaluate whether any impact is likely to be a *de minimis* impact.
3. Identify any alternatives that would avoid all Section 4(f) properties.
4. Present the impacts of proposed alternatives on Section 4(f) properties.
- 5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.**
6. Evaluate least overall harm.

The project team was aware of the profusion of Section 4(f) properties from the beginning of the development of the EIS and designed alternatives with the intent of avoiding Section 4(f) properties. For that reason, the analysis that follows is often an explanation of previous design decisions and alignment selections.

FHWA regulations indicate criteria for determining whether measures to minimize harm are reasonable:

(FHWA) will consider the preservation purpose of the statute and:

- (i) The views of the official(s) with jurisdiction over the Section 4(f) property;
- (ii) Whether the cost of the measures is a reasonable public expenditure in light of the adverse impacts of the project on the 4(f) property and the benefits of the measure to the property...; and
- (iii) Any impacts or benefits of the measures to communities or environmental resources outside of the Section 4(f) property.

23 CFR 774.17 Definitions (“all possible planning”)

References to consultation and the views of officials with jurisdiction (i), costs (ii), and the impacts or benefits outside of the individual Section 4(f) property (iii), including both other Section 4(f) properties and non-4(f) resources, appear in the numbered subsections that follow. In addition to these three elements, this analysis considers the following to be not reasonable mitigation measures: alignments that would not satisfy the project purpose and need.

4.6.1.2 Russian River Alternative and Extension of the G South Alternative

The following “Alignment Options” subsections make repeated references to two alignments that have been examined for this project as potential ways of avoiding certain Section 4(f) properties. They are described here in a single place, for reference.

The Russian River Alternative was evaluated during the development of alternatives in 2003 and is discussed in Chapter 2. Like the Cooper Creek Alternative, it was routed around Cooper Landing on the south side of the Kenai River Valley. It was identical to the Cooper Creek Alternative from MP 45 to the proposed new Cooper Creek Bridge (near MP 51). While the Cooper Creek Alternative returned to the existing alignment and crossed back to the north side of the Kenai River, the Russian River Alternative continued westward across high bench lands until it descended on a long crossing of the Russian River. The alignment passed south of the Russian River Campground, traversed the KNWR, crossed to the north side of the Kenai River on a new bridge located downstream of the Russian River Ferry, and rejoined the existing alignment near MP 56. The alternative was found to be not reasonable because of high life-cycle costs, potential impacts to the Kenai River, Russian River, and Cooper Creek, and to recreational uses, particularly the Russian River Campground and fishing in the Sportsman’s Landing area. It also would have resulted in substantial impacts to cultural resources. In addition, the alternative lacked any public or agency support (HDR 2003d).

An extension of the G South Alternative was examined originally in 2001 (R&M Consultants 2001a) and again for this Section 4(f) Evaluation (HDR 2008c). For Section 4(f) purposes, the alignment was conceived as a way to avoid crossings of the Kenai River (KRSMA). It was identical to the G South Alternative from MP 45 to Juneau Creek. Instead of proceeding to a crossing of the Kenai River, the alternative cut across the steep slopes and remained north of the

Kenai River near the base of high steep bluffs. It rejoined the existing alignment around MP 53.5, one-half mile west of the existing Schooner Bend Bridge. It then followed this alignment (the same as the G South Alternative) to MP 60. About 4,000 feet of the highway along the north bank of the river would have been built on pilings (viaduct), and there would have been an estimated 8,000 lineal feet of retaining walls, together amounting to a cost of \$93.8 million (in 2008 dollars) for these structural elements. It was not clear that complete avoidance of the KRSMA was possible, and the visual impact of the long segments of walls, high cuts, and highway on piers would have been a greater visual impact for the Kenai River than a single direct bridge crossing. For all these reasons, this extension of the G South Alternative north of the river was considered to have risks and disadvantages, including high construction costs, that would have outweighed any advantage of avoiding the KRSMA (HDR 2008d). It also would have used land from the Resurrection Pass Trail. All of these reasons make this alignment not a reasonable measure to minimize harm to Section 4(f) properties.

4.6.1.3 Reducing Impacts to Historic Properties, Applicable to Multiple Alternatives

All build alternatives would pass through the Sqilantnu Archaeological District and the Confluence Site, and would use land from historic trails. The G South and Cooper Creek alternatives, in addition, would use land within historic mining districts. This section explains the general process used to develop mitigation measures for historic properties. This discussion is applicable to the “Design and Construction” subsections that follow.

DOT&PF and FHWA, in consultation with SHPO, tribal entities, the USFWS, the Forest Service, and other consulting parties developed a Section 106 Programmatic Agreement to resolve adverse effects (Appendix K). The consultation for the Programmatic Agreement resulted in the measures summarized below. (The signed Programmatic Agreement itself addresses only the preferred alternative.)

- Refinement of final design to ensure the project avoids and/or minimizes impacts to historic properties, delineation of historic properties on plans and in the field as “environmentally sensitive,” and insertion of language prohibiting construction access into such areas.
- Preparation of and, during construction, implementation of an archaeological monitoring plan, including monitoring of the construction process by both qualified archaeologists and observers from Kenaitze Indian Tribe and CIRI, and including regular reporting.
- The development of:
 - A Data Recovery/Historic Properties Treatment Plan for select locations, with data to be recovered prior to start of construction in those locations.
 - A professional publication compiling past and current research on the Sqilantnu District/Confluence Site archaeological resources.
 - A public education booklet on the Sqilantnu District archeological features and area historic features, intended for a general audience.
 - A formal written nomination of the Sqilantnu Archaeological District to the NRHP to be submitted to the Forest Service, USFWS, and tribal entities.

- For historic districts, documentation of historic archaeological features, with a survey of the ground surface and of depth within the earth, with photographs, and with field notes.
 - For affected historic trails, documentation of the historic route with Global Positioning System (GPS), photographs, and field notes. Also, DOT&PF would ensure public access and use during construction; ensure trail re-routing for permanent public access and use where needed; and provide an interpretive display at the trailhead with an historic mining theme in consultation with the managing agency, SHPO, and other consulting parties.
 - Interpretive signs within the Sqilantnu Archaeological District; location and content to be determined in consultation with CIRI, Kenaitze Indian Tribe, and the appropriate land management agency.
 - Measures specific to each alternative, which are listed separately in Sections 4.6.5, 4.6.6, and 4.6.9 through 4.6.12, below.
- Compilation and preservation of existing Kenaitze oral histories into digital format.
 - Treatment of human remains discovered and of inadvertent discoveries of previously unidentified cultural resources, and curation of items discovered, would be per specific terms addressed in the Programmatic Agreement.
 - The Programmatic Agreement also addresses review of the agreement, dispute resolution, amendments to the agreement, duration of the agreement, and termination of the agreement.

For Section 4(f) purposes, the mitigation measures included in the Programmatic Agreement are included here as measures to minimize harm. Additional description is provided in the following “Design and Construction” subsections.

4.6.2 Kenai River Special Management Area

4.6.2.1 Cooper Creek Alternative

Anticipated Use

The Cooper Creek Alternative would include minor uses of submerged lands of the Kenai River (KRSMA lands), mostly to replace the Schooner Bend Bridge on a new alignment, as described in Section 4.5. The Cooper Landing Bridge also would be replaced, but almost entirely within the existing highway right-of-way. It is discussed below because a small right-of-way expansion is anticipated into the KRSMA.

Avoidance Options

Because the affected portion of the KRSMA occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would still result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm to KRSMA through design changes could mean (a) creating clear-span bridges with no piers in the river, (b) using longer spans to minimize the number of piers in the river, (c) narrowing the bridge to minimize its effects on the river, or (d) routing the alignment so that it stayed north of the river throughout. See Map 4-1, Map 4-2, and Map 4-11 for reference.

Summary: For KRSMA and the Cooper Creek Alternative, the minimization options presented here are not considered reasonable. Therefore, no “alignment option” minimization measure is proposed.

Option (a), creating clear-span bridges, is not considered a reasonable mitigation measure because of cost (ii) and impact (iii). The Schooner Bend Bridge would be 325 feet long and the new Cooper Landing Bridge would be 670 feet long. Bridges more than about 145 feet long are beyond the limits for use of single-span standard concrete girders, and bridges more than 300 feet long are beyond the limits of steel girders. A clear span bridge in these locations therefore would require a

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

tall superstructure or deep substructure at greater expense, combined with visual impacts to KRSMA and the community. The costs difference between the clear-span bridge type and the standard multi-span bridge type supported on piers is estimated at \$800/square foot (sq. ft.) versus \$450/sq. ft., or 78 percent higher (HDR 2011b). As a general rule, the height of a steel truss that would support the bridge deck in place of piers can be estimated at one-fifth the length of the span (HDR 2011b), so for the Cooper Landing Bridge over the Kenai River, the

height would be about 130 feet, the height of a 13-story office building and the Schooner Bend replacement bridge would be 65 feet tall. These structures would occur in an area where mature trees may reach 50–70 feet tall. In addition, a “tied arch” bridge might be the most likely type of clear-span bridge, and it is considered a “fracture-critical” structure type, meaning that if one part of the bridge were to break, the entire bridge would be subject to failure. Such bridges are built, but they have much greater inspection requirements, increasing the operations and maintenance costs, so they are built only when there is a particularly compelling need.

At each of the replacement bridge locations, a bridge with piers has existed for decades, and river, habitat, and park functions have not been unduly compromised (in fact, KRSMA was formed around the highway right-of-way and bridges). For these reasons, the increased construction and operating costs and the visual impacts of a tall structure (all as discussed in the preceding paragraph) outweigh any benefit of eliminating the piers; therefore, a clear-span bridge is not considered reasonable. A visually low-profile bridge at lower cost, as is proposed, appears to be the most reasonable balance of expenditure and impact (lower visual impact combined with minimum in-water piers that would have minor effects to navigation, river hydrology, and fish movement).

Option (b), limiting the number of piers by using steel girders, is not considered a reasonable mitigation measure because of cost (ii) and also because of relative lack of impact (iii). This option would mean longer span lengths and greater girder depths. The increased cost, estimated at \$625/sq. ft. versus \$450/sq. ft. (39 percent increase) (HDR 2011b), is not considered a reasonable method of reducing impact from three in-water piers to two, especially for the replacement bridge where piers already exist.

Option (c), narrowing the bridge, was examined and found to be not reasonable as a minimization measure because of impact (iii) to highway operation. In the preliminary design, the bridge carries a 12-foot eastbound passing lane, a 16-foot westbound left-turn lane, and a 6-foot allowance for a pedestrian pathway, in addition to the two standard 12-foot lanes. Removing the passing lane is not reasonable because the eastbound traffic starts up a long steep grade before reaching the bridge (the bridge is sloped), and to be effective the lane needs to start before larger, heavier vehicles slow down. The left-turn lane is for the intersection of the existing Sterling Highway with the G South Alternative, which occurs immediately south of the Kenai River. Eliminating the lane would require relocating the intersection at least 1,600 feet to the west. The base of the mountain slope is a topographic constraint to the south (forcing the two parallel highways, which is not recommended, and requiring a large cut), and continuing the “old” highway on its current alignment beneath the new highway and intersecting from the north would require raising the bridge 8-10 feet. The bridge already has been raised to better accommodate wildlife along the river banks, and each foot of raise typically means 4 feet of additional footprint because of the side slopes. This could add 40 feet to the width of the footprint north of the river in valuable wetlands and would raise the cost (ii) of retaining walls planned to keep the fill footprint out of the New Village Site. Raising the bridge modestly for wildlife appeared reasonable. Raising it even more, in conjunction with other issues, was determined not reasonable.

In addition, moving the intersection to the west involves widening the highway to the west for turning lanes in that area, and such widening risks impacts at a constriction, where the existing and planned highway pass between the historic Gwin’s Lodge property and the Kenai River. The proposed right-of-way becomes extremely narrow at that location, and any footprint expansion beyond the minimum planned would remove parking from the popular lodge or result in fill in the river, or both. Finally, DOT&PF and FHWA have committed to the extra space for a pedestrian pathway, as requested by the Forest Service (i), which has jurisdiction over the Kenai River Recreation Area where the southern bridge abutment would be located. Also, the pathway generally is consistent with the community desires expressed in the Cooper Landing Walkable Community Plan. For all these reasons, option (c), narrowing the bridge, is not considered reasonable.

Option (d), routing north of the river (no bridges), is not considered a reasonable minimization measure because of cost (ii) and impact (iii). This option is represented by the two Juneau Creek alternatives, which would not affect KRSMA but would impact (iii) other Section 4(f) properties. It is also represented by a potential extension of the G South Alternative that would stay immediately north of the Kenai River. The extension is discussed above in Section 4.6.1.2. This alignment would have a greater visual impact to KRSMA than a direct crossing (iii), would have high costs outlined in Section 4.6.1.2 because of long retaining walls and elevated highway segments (ii), and would use land from the Resurrection Pass Trail (estimated minimum 10 acres), which the G South Alternative was designed to avoid. For all these reasons, routing north of the river is not considered a reasonable measure for minimizing harm to KRSMA, except as represented in the Juneau Creek alternatives.

Measures to Minimize Harm—Design and Construction

The replacement Schooner Bend and Cooper Landing bridges over the Kenai River would be designed with aesthetics from the river and its banks in mind, and would be designed to minimize permanent impact to river hydraulics, fish passage, and navigability. In part, this would be accomplished by minimizing the number of in-water piers. Pile driving would be limited to

daytime hours to avoid disrupting residents at night in Cooper Landing and at Russian River Campground. River-closing activities, such as moving girders into place, would be the minimum necessary and outside peak river use periods and would be coordinated with KRSMA managers and area land management agencies. Notice of intent to close the river would be given to permitted river guides and area land managers well ahead of actual closure; would be published in Anchorage and Kenai Peninsula newspapers; and would be posted on changeable signs in the project area and at area campgrounds, boat ramps, and public buildings as appropriate. The replaced bridge, and any temporary construction or detour bridges at both sites, would be removed from the river.

In support of a USCG Section 9 permit, a Kenai River closure and navigation control plan would be written and followed, incorporating such measures as:

- Closing only one side of the Kenai River at a time, using a buoy line with information posted on the buoys and at boat launch ramps, whenever partial closing was possible.
- Limiting complete closures of Kenai River navigation to approximately August 15 to June 15, whenever possible, and to nighttime hours in summer.
- Ensuring a motorized emergency response boat, with qualified operators, would be available on site at all times during active construction to inform Kenai River users of emergency closures and assist boaters to shore, if necessary.

The Kenai River navigation plan and anticipated closure schedule would be developed a year in advance of implementation, to give notice to commercial river guides for planning the following season. The public would be given an opportunity to comment on the navigation plan. The pilings for the spans of temporary construction bridges would be placed to allow for continued navigation of the river, and sufficient vertical clearance would be provided on the temporary bridge and the permanent bridge for ease of navigation. Navigation clearances for the permanent bridges would be the same as or greater than the existing bridges.

Enforceable no parking signs would be posted near Sportsman's Landing to keep the new highway shoulders from becoming additional parking and, therefore, to keep numbers of people accessing the Kenai River through the Sportsman's entrance at manageable levels.

A site intended for disposal of unusable soils near the eastern end of the Recreation Area would remove 5.1 acres of trees within the Recreation Area. The Forest Service has proposed relocating this site from southwest of a curve of the Cooper Creek Alternative near MP 51 to a location east of the same curve that has been previously disturbed and is currently used as alternate access to the Stetson Creek Trail. Relocating the disposal site would minimize the area of new habitat disturbance within the Recreation Area and would contribute to closing the alternate access to the trail. For these reasons, DOT&PF would incorporate this proposed relocation and would coordinate with the Forest Service on details of site location, placement of materials, and final revegetation of this site.

In addition, standard best practices and permit stipulations would be followed to prevent stream bank erosion, siltation or pollution of water, and disruption of Kenai River recreation. These would include measures such as:

- Keeping tracked or wheeled equipment out of the Kenai River.
- Stabilizing exposed earthwork during construction, protecting vegetation to the extent possible, and revegetating exposed or damaged areas following construction.

- Ensuring that any imported rock material for placement in and along the Kenai River was clean.
- Fueling and servicing equipment only at distances of more than 100 feet from wetlands and waters, except for low-mobility equipment such as pile drivers, and specifying detailed fueling and fuel spill contingency plans.
- Retaining adequate spill containment and cleanup equipment and supplies on site.
- Avoiding use of preservatives or chemicals in bridge construction that could pollute the Kenai River.
- Using vegetated riprap where practicable.

4.6.2.2 G South Alternative

Anticipated Use

The G South Alternative would include a new bridge over the Kenai River and a replacement of the Schooner Bend Bridge on a slightly different alignment. Both would require use of the submerged lands of the Kenai River (KRSMA lands), as described in Section 4.5.

Avoidance Options

Because the affected portion of the KRSMA occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm to KRSMA through design changes could mean (a) creating clear-span bridges with no piers in the river, (b) using longer spans to minimize the number of piers in the river, or (c) routing the alignment so that it stayed north of the river throughout. See Map 4-1, Map 4-2, and Map 4-11 for reference.

<p>Summary: For KRSMA/G South Alternative, the minimization options presented here are not considered reasonable. Therefore, no “alignment option” minimization measure is proposed.</p>

Option (a), creating clear-span bridges, is not considered a reasonable mitigation measure because of cost (ii) and impact (iii). The Schooner Bend Bridge would be 325 feet long and the new Kenai River Bridge would be 486 feet long. Bridges more than about 145 feet long are beyond the limits for use of single-span standard concrete girders, and bridges more than 300 feet long are beyond the limits of steel girders. A clear span bridge in these locations therefore would require a tall superstructure or deep substructure at greater expense, combined with visual impacts to KRSMA and the community. The costs differences between the clear-span bridge type and the standard multi-span bridge type supported on piers is estimated at \$800/sq. ft. versus \$450/sq. ft., or 78 percent higher (HDR 2011b). As a general rule, the height of a steel truss that would support the bridge deck in place of piers can be estimated at one-fifth the length of the span (HDR 2011b), so for the G South Alternative’s new bridge over the Kenai River, the height would be about 97 feet, the height of a 10-story office building, and the Schooner Bend replacement bridge would be 65 feet tall. These structures would occur in an area where mature trees may reach 50–70 feet tall. In addition, a “tied arch” bridge might be the most likely type of clear-span bridge, and it is

considered a “fracture-critical” structure type, meaning that if one part of the bridge were to break, the entire bridge would be subject to failure. Such bridges are built, but have much greater inspection requirements and operations and maintenance costs, so they are built only when there is a particularly compelling need.

At the Schooner Bend Bridge location, a bridge with piers has existed for decades, and river, habitat, and park functions have not been unduly compromised. For these reasons, the increased construction and operating costs and the visual impacts of a tall structure outweigh any benefit of

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

eliminating the piers, and therefore a clear-span bridge is not considered reasonable. At the new bridge location, there are no existing piers, but a visually low-profile bridge at lower cost appears to be the most reasonable balance of expenditure and impact (lower visual impact combined with minimum in-water piers that would have minor effects to navigation, river hydrology, and fish movement).

Option (b), limiting the number of piers by using steel girders, is not considered a reasonable mitigation measure because of cost (ii) and also because of relative lack of impact (iii). This option would mean longer span lengths and greater girder depths. The increased cost, estimated at \$625/sq. ft. versus \$450/sq. ft. (39 percent increase; (HDR 2011b)), is not considered a reasonable method of reducing impact from three in-water piers to two, especially for the replacement bridge where piers already exist.

To try to minimize impacts associated with the width of the new Kenai River Bridge, engineers examined moving the intersection of the “old” Sterling Highway and the G South Alternative west to avoid the need for a westbound left turn lane (16 feet wide) on the bridge.

DOT&PF examined extending the old highway along the south side of the new highway, but this has topographic challenges with the toe of the slope on the south side of the valley. An extension of the old highway on the south side would eliminate the proposed large mammal underpass at the location where the old highway would be brought up in height to meet the new highway. Moving the intersection, would add 1,600 feet or more of additional roadway, which in turn would remove further wildlife habitat.

DOT&PF examined extending the old highway on its existing alignment beneath the new highway, but this would require the bridge (already raised to provide space for wildlife to cross beneath) to be raised an additional 8–10 feet. This, in turn, would require raising the retaining wall along one side of the highway that is required to avoid impact to the New Village cultural site (an expensive component) and would expand the fill footprint still further in the area north of the Kenai River, in wetlands. A 10-foot height addition would expand the fill width by 40 feet in an area where the footprint is already well in excess of 200 feet wide. An extension beneath the new highway would mean the old highway would not be reclaimed as habitat and would exist adjacent to a wildlife crossing and wildlife corridor, rendering the crossing ineffective.

In either case, there are technical challenges farther west, where the existing and planned highway are pinched between the Gwin’s Lodge property boundary/parking area and the Kenai River. As the design is currently, there is just enough room to avoid fill in the Kenai River and avoid impacts to the private property of the popular commercial enterprise where parking already is constrained. The log lodge building is an historic property, and there are multiple other buildings on the property. Widening the road in this area to make room for turning and acceleration lanes to the east would cause impacts to that property.

In either case, extending the old highway would put an additional roadway on the landscape in this area. In general, there are also multiple important cultural sites in this area. Because this area is an important north-south and east-west wildlife movement area and because of the multiple issues listed here, it was determined the best alignment was to retain the intersection as planned, despite the shading that would occur to the river.

Option (c), routing north of the river (no bridges), is not considered a reasonable minimization measure because of cost (ii) and impact (iii). This option is represented by the two Juneau Creek alternatives, which would not affect KRSMA but would impact other Section 4(f) properties. It is also represented by a potential extension of the G South Alternative that would stay immediately north of the Kenai River. It is discussed above in Section 4.6.1.2. This alignment would have a greater visual impact to KRSMA than a direct crossing, would have high costs outlined in Section 4.6.1.2 because of long retaining walls and elevated highway segments, and would use land from the Resurrection Pass Trail (estimated minimum 10 acres), which the G South Alternative was designed to avoid. For all these reasons, the extension of the G South Alternative is not considered a reasonable measure for minimizing harm to KRSMA.

Measures to Minimize Harm—Design and Construction

The one replacement bridge and one new bridge over the Kenai River would be designed with aesthetics from the river and its banks in mind, and would be designed to minimize permanent impact to river hydraulics, fish passage, and navigability. In part, this would be accomplished by minimizing the number of in-water piers. Pile driving, would be limited to daytime hours at the new Kenai River Bridge (downstream of the Cooper Landing community and near the Cooper Creek campground) to avoid disrupting residents and campers at night. River-closing activities, such as moving girders into place, would be the minimum necessary and outside peak river use periods to the greatest extent possible and would be coordinated with KRSMA managers and area land management agencies. Notice of intent to close the river would be given to permitted river guides and area land managers well ahead of actual closure; would be published in Anchorage and Kenai Peninsula newspapers; and would be posted on changeable signs in the project area and at area campgrounds, boat ramps, and public buildings as appropriate. The replaced bridge, and any temporary construction or detour bridges at both sites, would be removed from the river.

In support of a USCG Section 9 permit, a Kenai River closure and navigation control plan would be written and followed, incorporating such measures as:

- Closing only one side of the Kenai River at a time, using a buoy line with information posted on the buoys and at boat launch ramps, whenever partial closing was possible
- Limiting complete closures of Kenai River navigation to fall-winter-spring, approximately August 15 to June 15, whenever possible, and to nighttime hours in summer
- Ensuring a motorized emergency response boat, with qualified operators, would be available on site at all times during active construction to inform Kenai River users of emergency closures and assist boaters to shore, if necessary

The Kenai River navigation plan and anticipated closure schedule would be developed a year in advance of implementation, to give notice to commercial river guides for planning the following season. The public would be given an opportunity to comment on the navigation plan. The pilings for the spans of temporary construction bridges would be placed to allow for continued navigation of the river, and sufficient vertical clearance would be provided on the temporary bridge and the

permanent bridge for ease of navigation. Navigation clearances for the permanent bridges would be the same as or greater than the existing bridges.

Enforceable no parking signs would be posted near Sportsman’s Landing to keep the new highway shoulders from becoming additional parking and therefore to keep numbers of people accessing the Kenai River through the Sportsman’s entrance at manageable levels. DOT&PF would monitor parking issues. If, in conjunction with the area land management agencies, it appeared that further no parking signs were warranted, DOT&PF would post additional signs.

In addition, standard best practices and permit stipulations would be followed to prevent stream bank erosion, siltation or pollution of water, and disruption of Kenai River recreation during construction. These would include measures such as:

- Keeping tracked or wheeled equipment out of the Kenai River
- Stabilizing exposed earthwork during construction, protecting vegetation to the extent possible, and revegetating exposed or damaged areas following construction
- Ensuring that any imported rock material for placement in and along the Kenai River was clean
- Fueling and servicing equipment only at distances of more than 100 feet from wetlands and waters, except for low-mobility equipment such as pile drivers, and specifying detailed fueling and fuel spill contingency plans
- Retaining adequate spill containment and cleanup equipment and supplies on site
- Avoiding use of preservatives or chemicals in bridge construction that could pollute the Kenai River
- Using vegetated riprap where practicable

4.6.3 Kenai National Wildlife Refuge

4.6.3.1 Juneau Creek Alternative

Anticipated Use

The Juneau Creek Alternative would use KNWR lands near the KNWR boundary with CNF, as described in Section 4.5.

Avoidance Options

Because the affected portion of KNWR occurs within the overlapping Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District. The KNWR is vast, and any other alignment option that attempted to avoid the KNWR would be an all-new highway outside the project area and not address the project’s purpose and need. See the discussion of overall avoidance alternatives (Section 4.4) and Map 4-14. See also Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm to KNWR through design changes could mean (a) routing the Juneau Creek Alternative onto the existing highway right-of-way through the KNWR. See Map 4-1 and Map 4-3 for reference.

Summary: For KNWR/Juneau Creek Alternative, minimization option (a) is considered reasonable but is represented in another alternative.

Option (a) is represented by the Juneau Creek Variant Alternative. Such use of the existing right-of-way would eliminate Section 4(f) use of KNWR lands, but at the expense of greater impact to the Sqilantnu Archaeological District and Confluence Site, as further described in the least overall harm analysis (Section 4.8).

In final design, it may be possible to alter how the new highway and old highway would connect to reduce the footprint on KNWR lands where wetland habitat exists, thereby minimizing harm. The Juneau Creek Variant Alternative was created as an option that would eliminate the use of refuge lands altogether and minimize harm to the refuge.

Measures to Minimize Harm—Design and Construction

Only the Juneau Creek Alternative would have a Section 4(f) use of KNWR lands. The only use of KNWR would be for the short connecting road south of the highway. To minimize harm, the following design and construction measures are proposed.

DOT&PF would continue to coordinate closely with the USFWS during the design phase to ensure access to and use of KNWR facilities in the project area during construction. These facilities are: Sportsman’s Landing-Russian River Ferry, the visitor contact station, the Fuller Lakes Trailhead, and Jim’s Landing. To the extent possible, construction activities that would conflict with access would be scheduled outside high-use summer periods. Access to these facilities would be maintained, especially during the primary public use period. During summer, any short closures (e.g., for paving at the entrance) would be at night unless agreed to by the KNWR manager. Similarly, the construction contract would not allow construction staging and parking of construction-related vehicles at these facilities during the busy summer visitor season and not at other times unless agreed to by the KNWR manager.

The **Juneau Creek Alternative and the Juneau Creek Variant Alternative** differ in that the Juneau Creek Alternative has a Section 4(f) use of KNWR lands and the Juneau Creek Variant Alternative does not. However, the same general measures to reduce harm to wildlife movement and KNWR facilities are proposed under both alternatives. See Section 3.22, Wildlife, for discussion of other alternatives.

Other measures such as steepening side slopes would be accomplished wherever practical, within the bounds of accepted engineering practice, to reduce the footprint impact of the alternative.

The following paragraphs reflect measures proposed to reduce impacts to wildlife movement in and out of KNWR, as described in Section 4.5.4.1. Similar language appears in Section 3.22.3.2 (Wildlife) for all other build alternatives. The long segment built on a new alignment under this alternative would fragment bear habitat and has potential to create a barrier to bear movement between feeding areas in the KNWR and outside the KNWR (e.g., lower Juneau Creek). The same is true of moose movement through topographic benches on either side of Juneau Creek that have seen forest treatments by CNF to reduce wildfire fuels and enhance moose habitat.

Measures to minimize harm to vegetated habitat (considered a proxy for wildlife habitat) are documented in Section 3.20. Timing windows for construction activities within the Kenai River

(e.g., pile driving; see Section 3.21) would reduce temporary impacts to a brown bear food source. Additional avoidance and minimization measures to reduce impacts to brown bears and brown bear habitat would be pursued during the design phase, and in collaboration with the resource agencies.

Wildlife Mitigation Study

To address the project's potential for mitigating impact on the movement of wildlife (a feature or resource of KNWR) in and out of the KNWR and specifically to identify the best locations for mitigation measures that would help to retain wildlife movement patterns, DOT&PF sponsored a wildlife mitigation study (Suring, Gaines and Begley 2017) in collaboration with wildlife management agencies. The scope of the study (the study plan) was developed in consultation with an interagency wildlife team (USFWS, Forest Service, and ADF&G). The results of the study, initiated in 2014, were used in refining the location of wildlife crossings (further addressed below) and other measures to accommodate wildlife movement for brown bears and moose, as well as for other species, including black bear, Dall sheep, wolverine, and Canada lynx. The study identified locations where animals are most likely to want to cross the highway during different times of the year.

The wildlife mitigation study was designed to identify wildlife movement patterns while considering public and private land, with a goal of identifying locations for potential wildlife crossings that would be incorporated into the highway design and remain effective for wildlife movement over the long term. The wildlife mitigation study included a desktop modeling phase and a year-long field verification phase. The study was formally peer-reviewed and finalized in 2017. The field verification effort used camera-capture technology to indicate frequency of appearance of different species throughout the year to verify and adjust the desktop model results that predict wildlife corridors, including where animals are likely to cross the existing and proposed highway alignments. These data were coupled with data from multiple other studies both within the project area and at other locations around the world. Data inputs included, for example, past bear and moose tracking studies using collars that transmit location and movement data, existing wildlife collision data for the project area, and data on wildlife movement habits from outside the project area. This information helped project biologists predict wildlife concentrations and movement areas, and to recommend locations where wildlife would be anticipated to cross the proposed alternatives.

DOT&PF and FHWA have completed the study and have modified the locations of proposed wildlife crossing structures identified in this EIS and in Appendix I based on results of the final study.

Wildlife Crossings

The primary mitigation proposal under any alternative is to provide dedicated wildlife crossings under the highway. See further detail in Appendix I. For the Juneau Creek Alternative, DOT&PF and FHWA would:

- Provide dedicated large mammal underpasses with clearance for wildlife of 23 to 32 feet horizontally and, unless topography makes it unreasonable, 18 feet vertically (round steel pipe partly filled, with ends cut to match the fill slope, and with partial wing walls, or similar, to be determined in consultation with wildlife agencies), and provide a dedicated large mammal overpass 130 feet wide. As proposed, the Juneau Creek Alternative would

include three dedicated large mammal underpasses and one large mammal overpass. In addition, the Juneau Creek Bridge would be a long, high bridge that would provide relatively free wildlife movement beneath it. The wildlife mitigation for this alternative is estimated to cost \$9.7 million,¹⁴ in addition to the wildlife study already completed. Refer to the maps in the Wildlife chapter; Map 3.22-4 shows the locations of the proposed wildlife crossings.

- Add small-diameter wildlife crossings (<23 feet), principally intended for black bear, wolf, wolverine, and other smaller animals, with the number and placement informed by results of the wildlife mitigation/movement study. Where possible, this would be accomplished by “oversizing” drainage culverts.
- Add natural barriers such as boulders, as a first choice, or fencing as determined necessary to reasonably direct animals to the wildlife crossings and bridge underpasses without unreasonably limiting current popular access for people to the Kenai River, trails, and other recreation sites.
- Install wildlife crossing caution signs for drivers in areas where the wildlife mitigation study and previous collision history suggest higher expected use by wildlife, on both “old” highway (if not already signed) and new highway.

DOT&PF, FHWA, and the wildlife agencies (USFWS, Forest Service, and ADF&G) would agree during final design on the details for any wildlife crossing structures, based on the information in Appendix I. Field visits also would be scheduled for the wildlife agencies as part of final design. Criteria to be used in determining which specific types of crossings and specific locations, specific extent of fencing, and other exact mitigation measures to implement include:

- Expected effectiveness (or use by species).
- Concentration of use by multiple species/usefulness of the measure for multiple species.
- Technical feasibility and terrain.
- Current and projected land use and ownership.
- Cost and prudent expenditure of public funds.
- Consideration of input from the public and other agencies.

The process to be used to make final wildlife mitigation decisions is anticipated to be a continuing cooperative effort and negotiation among ADF&G, USFWS, the Forest Service, DOT&PF, and FHWA through the final design process. This Final EIS and associated Appendix I include as much detail as is available at this time. A commitment to further refinement of the design and locations of the crossings during final design will be included in the Record of Decision.

Mitigation commitments are binding, and mitigation funding will be allocated for the selected alternative. Wildlife mitigation measures will be designed, constructed, and maintained as primary

¹⁴ Appendix I reports somewhat lower costs. The cost presented here was based on an earlier version of Appendix I and was carried forward as a conservative cost figure. This amount matches wildlife mitigation costs used in overall project cost estimates and in the Financial Plan (Appendix H).

components of the new highway, not as “enhancements” that could be later cut if funding shortfalls were to occur. Project construction cost estimates in Sections 3.5.2.2 and 3.27.7.5, and in this chapter in Section 4.8.7, include wildlife mitigation.

Wildlife Corridor/Habitat Preservation and Restoration

- The proposed dedicated wildlife underpasses and overpasses would be located adjacent to KNWR and CNF lands. The underpass located east of Bean Creek would be located on the border of CNF and State of Alaska lands. State lands in this area currently are managed under the *Kenai Area Plan* for habitat and dispersed recreation, and specifically are managed as if they were part of the Kenai River Special Management Area (State Park unit); however, they have not been formally protected by legislation. Therefore, DOT&PF would work with the Alaska Department of Natural Resources and ADF&G during final design to investigate the need for additional protection for a green space/wildlife corridor serving principally east-west wildlife movement on State lands.
- At MP 57, in final design, DOT&PF would examine the potential of moving the highway farther north to provide a narrow strip of land between the highway and the river that wildlife could use to connect areas of habitat east and west without crossing the highway. The mountain slope north of the highway may not allow for highway movement, but the potential will be examined.
- All areas affected by construction activities under any of the build alternatives would be re-vegetated with native species following construction. Vegetation on temporary access road corridors would be restored through seeding with native seed mix. Temporary access roads would be removed and the corridors blocked with a barrier and signed to minimize the chance that these areas would become off-road vehicle or pedestrian trails, which would effectively increase road density and provide increased access for hikers and hunters that could lead to increased human-bear encounters.
- Section 3.15, Noise, addresses FHWA’s noise abatement policies. Noise abatement measures (noise barriers) are not proposed for large habitat or dispersed recreation areas, based on established DOT&PF and FHWA noise policy. Noise barriers can have negative impacts such as requiring additional habitat clearing, interrupting scenic views, and decreasing wildlife mobility. According to the noise analysis completed for the EIS, they are also not cost effective in the wide open spaces associated with the project area (see Appendix D). However, at the time of final pavement design, DOT&PF will consider traffic noise abatement through the use of rubberized asphalt throughout the project area, if testing shows it is durable and if DOT&PF approves it for use (currently it is in testing and is not approved for use).

Other

- Install bear resistant trash containers, where trash containers are requested by agencies that will be managing pullouts or parking areas established as part of the project. The final decisions about locations for such trash containers will be identified during design coordination with these agencies.
- Install bear-awareness signs at two locations within each DOT&PF pullout established as part of the project—conveying clear, concise, consistent, and motivating messages

regarding food storage regulations and proper human behavior, to be developed with the land management and wildlife agencies.

- Develop mitigation measures specific to fish and essential fish habitat that would benefit bears by reducing impacts related to food availability. Timing windows for construction activities near and within anadromous fish streams would avoid and minimize displacing bears and other wildlife foraging for these food sources. These measures are discussed in Section 3.21, Fish and Essential Fish Habitat.
- Install project lighting at the intersections of the alternative and the “old” highway that would incorporate shielded and directional lighting fixtures to direct most light downward. During final design, DOT&PF would consult with the wildlife agencies regarding the potential use of long-wavelength tinted lights, to meet both wildlife mitigation needs and standards for highway safety at intersections outside the community of Cooper Landing.

In addition, DOT&PF has committed to building underpasses on West Juneau Creek and Chunkwood Roads, little-used Forest Service roads (see Section 2.6). These crossings of the highway west of the canyon are not meant as wildlife crossings but may serve as a supplemental means for wildlife to avoid highway traffic and still cross the Juneau Creek alternatives, in addition to dedicated wildlife crossings, when passing between KNWR habitats and CNF habitats (see Sections 3.22 and Appendix I for information on wildlife crossings). While these underpasses are not intended as wildlife mitigation, their proposed locations and context were a consideration in evaluating the effects on wildlife.

Agency coordination has been ongoing on the topic of wildlife and brown bears in particular; see Section 3.27.24 of Cumulative Impacts and Chapter 5, Comments and Coordination, for more information.

Summary: For Resurrection Pass Trail/Juneau Creek alternatives, alignment shifts are represented by other reasonable alternatives. The current design minimizes harm by bridging over the trail. No further alignment shifts or design changes are proposed.

4.6.4 Resurrection Pass Trail

4.6.4.1 Juneau Creek and Juneau Creek Variant Alternatives

Anticipated Use

The Juneau Creek and Juneau Creek Variant alternatives would bridge over the trail itself but would use a portion of the 1,000-foot-wide corridor that surrounds the trail, as described in Section 4.5.

Avoidance Options

Because a segment of the Resurrection Pass Trail’s 4(f) corridor (1,000 feet wide) occurs within a portion of the larger Sqiłantnu Archaeological District and within a portion of the Juneau Falls Recreation Area, any attempt to avoid the trail corridor would result in Section 4(f) impacts to the other 4(f) resources. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm through design changes could mean using the existing highway alignment or another alignment south of the southern end of the trail. See Map 4-5 for reference.

These options are represented by the G South and Cooper Creek Alternatives, which avoid the trailhead to the south by using the existing alignment, and by the Russian River Alternative, which was located south of the Kenai River and therefore still farther south of the trailhead. While all of these alternatives would avoid the Resurrection Pass Trail, each would use multiple other 4(f) resources, including KRSMA (at bridges), the Kenai River Recreation Area, either the Stetson Creek Trail or the Bean Creek Trail, the Russian River Campground, and KNWR. These are not realistic alterations to either of the Juneau Creek alternatives; they are completely separate alternatives. The Russian River Alternative is discussed above in Section 4.6.1.2.

Measures to Minimize Harm—Design and Construction

The Resurrection Pass Trail, Bean Creek Trail, and Juneau Falls Recreation Area overlap, and impacts are concurrent or interrelated. This section presents all measures to minimize harm to all three properties.

Bean Creek Trail, Resurrection Pass Trail, and Juneau Falls Recreation Area. Several measures would be employed to reduce and compensate for impacts to the Juneau Falls Recreation Area and to the Resurrection Pass and Bean Creek trails. The proposed mitigation, developed in consultation with the Forest Service, would apply equally to the Juneau Creek Alternative or the Juneau Creek Variant Alternative. The Forest Service has pointed out that it is not possible to meaningfully reduce the impact to the Resurrection Pass Trail and that most of the mitigation offered is meant to keep the trail open in a new form and to compensate for impacts but not literally reduce impacts. The issues involved are indicators of the level of impact, agency concern, and relative challenge to meaningfully mitigate impacts. Mitigation measures are depicted on Map 4-10 and Map 4-13 and include the following:

- The proposed highway bridge over the Juneau Creek Canyon would be designed to span completely over the Resurrection Pass Trail, although it would not span the entire 1,000-foot width of the recreation buffer associated with the trail. The western bridge abutment would be placed as far as practical from the existing trail. Bridge design features such as height above the trail and finished appearance would be reviewed with the Forest Service during the final design phase. These design features and related construction commitments for the area around the trail would minimize harm to the trail.
- The Bean Creek Trail would be rerouted about 450 feet to the west of its current location to pass under the Juneau Creek Bridge at its eastern abutment. The length of rerouted trail would be approximately 2,900 feet. The abandoned section of the historic trail would be documented with GPS (surveyed), photographs, and field notes. Bridge design features such as height above the trail and finished appearance would be reviewed with the Forest Service during the final design phase. The rerouted trail alignment would be subject to an archaeological survey to ensure no archaeological sites would be impacted; if such sites were discovered, the trail would be routed to avoid them. The trail would be routed as close to the bridge abutment as possible to leave as much space as possible between the trail and canyon rim for wildlife movement.
- A formal trailhead for Resurrection Pass Trail would be constructed on the north side of the highway west of the Juneau Creek Bridge. The Forest Service has stated that placement of the trailhead inside the Juneau Falls Recreation Area would cause less harm to the recreation area than placement outside the recreation area. A bridge construction staging area is proposed just outside the western edge of the Juneau Falls Recreation Area; based

on direction from the Forest Service, this staging area would be co-located with the new Resurrection Pass trailhead site to minimize vegetation clearing and wetland impact in the area, and the staging area would be partially converted to a trailhead when staging was complete. The concept would be a trailhead built by DOT&PF but owned and operated by the Forest Service. It would have parking for 45 standard vehicles plus four pull-through spaces for buses or large campers and four spaces for vehicles with trailers, an improvement in capacity and layout over the trailhead on the existing Sterling Highway, which is designed for about 24 standard vehicles. Trailhead development would include a pit toilet and a kiosk for posting maps, trail information, and interpretive displays (see below). Associated development would include a walking trail and a horse trail, each connecting the parking area to the existing Resurrection Pass Trail. The trailhead parking area would not be plowed by DOT&PF in winter and is expected to be closed by the Forest Service in winter. Plowing and winter management at this trailhead could be considered by the Forest Service under an agreement with the State, local community or group that funds winter maintenance, including plowing.

- For skiers in winter, a long pullout would be located east of the new bridge within the highway right-of-way. It would be plowed by DOT&PF road crews, and would be designed for efficient plowing. It would be located north of the highway to eliminate the need for skiers to pass under a bridge without snow cover. A simple connecting trail would be built to connect the pullout to the Bean Creek Trail in summer, but no formal trailhead sign or accommodations would be established on this side of the canyon, based on consultation with the Forest Service. Skiers would find their way to the trail. Snowmobilers would have the same access they have today, via the existing shared trailhead area for the Resurrection Pass Trail and West Juneau Road, an old logging road commonly used for winter access to the Resurrection Pass Trail. The access point is along the existing Sterling Highway just west of MP 53 (Schooner Bend Bridge). It is likely that some snowmobilers would use the new pullout east of Juneau Creek Bridge, and over time the pullout could become the favored winter access point for the Resurrection Pass Trail. Others might park on the highway shoulders farther west to access the old logging roads that provide alternate access to the Resurrection Pass Trail. For this reason, no parking signs and signs directing such traffic to the established winter trailhead would be installed.
- To encourage use of the existing snowmobile access and parking area, the highway design would provide a tunnel or bridge at crossings of the new highway so that access could continue without need to cross the new highway at grade.
- To mitigate the potential impacts of pedestrians walking onto the highway bridge to see views from the bridge, to accommodate the public desire to view the falls, and to minimize pedestrians crossing the traffic lanes, a set of trails and viewing areas would be constructed. These would include:
 - A formalized canyon overlook constructed near the falls, with an Americans with Disabilities Act-accessible trail to connect the trailhead to the overlook. Safety features, as needed, would be incorporated in the overlook at the canyon edge. Signs would direct people to the viewpoint.
 - A separate horse trail from the trailhead to the Resurrection Pass Trail, connecting north of the falls overlook, to separate horses from the busiest pedestrian segment of trail.

- A pedestrian walkway on the south side of the new highway bridge, connected to both the Resurrection Pass Trail and Bean Creek Trail to provide passage across the highway and beneath the bridge. A safety barrier would separate traffic from the pedestrian walkway.
- Full highway shoulders to accommodate bicyclists on the bridge.
- Signs posted to direct pedestrians to safely access the bridge walkway, to indicate Juneau Creek Falls viewing access via the trail and overlook, and to indicate that there is no view of falls from the bridge.
- Access for users of both trails would be maintained during construction. Routes through the construction area would be along the existing trail alignments or via temporary detour trails. Detours would be needed particularly during brief times when bridge girders were being placed overhead, above the trails. The Resurrection Pass Trail would never be closed to public use; either its established route or a detour route would always be available. For the Bean Creek Trail, users may be able to use the permanently rerouted trail during most of the construction process. The final temporary detour route of either trail would be constructed by the contractor in a location determined in coordination with the Forest Service. A conceptual detour for the Resurrection Pass Trail is shown on Map 4-10. Any temporary detour trail created would be removed/revegetated when no longer needed.
- The Juneau Creek Bridge would be designed in consultation with landscape architects for aesthetics, with the views from both trails in mind. As a major element in the down-valley view from the falls area, the bridge would be designed to be aesthetically pleasing.
- A basic sign interpreting mining history and Bean Creek Trail and Resurrection Pass Trail history would be placed at the new trailhead parking lot west of Juneau Creek and on the trail near the pullout/trailhead located east of Juneau Creek, or at locations preferred by the Forest Service. Any interpretive material would be developed in consultation with the Forest Service and other consulting parties.
- Any other mitigation measures formalized in a Section 106 Programmatic Agreement among consulting parties would be implemented for the historic trail (see Sections 4.6.1.3 and 4.5.1).
- Bridge drainage design would direct storm water runoff beneath the bridge to the extent possible to promote retention of a natural vegetation buffer between the trails and the bridge abutments.

Construction Measures Common to Juneau Creek and Juneau Creek Variant Alternatives. The following measures to minimize harm would occur as part of the construction process:

- For some periods during construction of the bridge over Juneau Creek, when it would be necessary to temporarily re-route the Resurrection Pass Trail for safety, trail users would be directed onto a detour trail that would cross the highway alignment to the west. The Bean Creek Trail would not need to be detoured until the bridge was complete enough for safe passage on the new trail alignment. In both cases, a safe designated trail crossing site would be established across the construction zone. Notice of the reroute and construction zone crossings would be provided to land managers and trail users and posted well in advance at trailheads for the Resurrection Pass Trail (both ends), Bean Creek Trail, Summit

Creek Trail, Devils Pass Trail, and at area campgrounds and public buildings. Notices also would be published in Anchorage and Kenai Peninsula newspapers.

- Use of the Resurrection Pass Trail for construction would be minimized. Construction access along the trail would not be allowed except for construction of trail improvements. Understory vegetation would be left undisturbed within the 1,000-foot-wide trail corridor to the extent possible to preserve the natural appearance of the corridor. Use of the trail corridor by vehicles would be minimized, and damaged areas would be replanted with native species seed mix and native trees after construction. Such restoration planning would take place in conjunction with the Forest Service.
- Where a construction access road between the new highway alignment and material extraction and overburden disposal sites would overlap a 1,600-foot stretch of the southern Bean Creek Trail, the construction contractor would provide a temporary, rerouted trail alignment for recreation users to separate them from truck traffic. The rerouted trail would make use of existing old logging roads and portions of loop trails on the east side of Bean Creek, and would include a new bridge crossing of the creek to connect with the historic Bean Creek Trail alignment. The temporary trail would be rehabilitated in conjunction with the Forest Service when construction was completed and it was no longer needed. DOT&PF would coordinate and develop a construction traffic management plan with the Forest Service to best accommodate summer and winter trail users crossing the construction access road. A portion of the road embankment would be left after construction as the trail surface, and the road culvert/bridge over Bean Creek would be designed to be left in place for trail use following construction, or would be replaced with a footbridge. The main Bean Creek Trail would be rerouted back onto its historic alignment at the end of construction. The area would be revegetated following construction where embankment material was removed or trail-side vegetation was disturbed.

Compensatory Mitigation for Resurrection Pass National Recreation Trail Outside the Project Area. The Juneau Creek Alternative and Juneau Creek Variant Alternative would cross the Resurrection Pass Trail at approximately trail mile 3.4 and would provide easier access to the 9-mile valley upstream, changing the character and experience currently available on the trail. To compensate for the break in the long-distance character of the Resurrection Pass Trail, the Forest Service proposed construction, and DOT&PF would fund construction, of an important link in another long-distance trail nearby—the Iditarod National Historic Trail, as described in the following paragraph. See the inset on Map 4-13.

DOT&PF would provide a pedestrian walkway on the Snow River bridges (Snow River West Channel: 188 feet long, and Snow River Center Channel: 649 feet long) near MP 17 of the Seward Highway. This link would serve to connect existing and planned portions of the “Iditarod National Historic Trail—Southern Trek” route, a trail segment approved in the Forest Service’s *Seward to Girdwood Iditarod National Historic Trail Environmental Assessment* (2003) but not yet built. Providing pedestrian facilities on the Snow River bridges would offset impacts to the Resurrection Pass Trail by creating an important connection in another long-distance trail in the National Trails System within the Kenai River watershed. To the extent that segments of the Iditarod National Historic Trail would need to be placed within the Seward Highway right-of-way in the Snow River area, DOT&PF would agree to Forest Service construction of trail segments in the right-of-way on the condition that the trail would meet current highway and trail safety and design standards

and on the condition that DOT&PF would have the ability to relocate the trail within the right-of-way as needed to accommodate highway transportation needs in the future.

If the Juneau Creek Alternative or the Juneau Creek Variant Alternative is selected, DOT&PF and FHWA would ensure that the compensatory mitigation of providing pedestrian walkways for the Snow River West and Snow River Center Channel Bridges would be completed by the time the Sterling Highway Project construction has been completed.

4.6.5 Bean Creek Trail

4.6.5.1 G South Alternative

Anticipated Use

The G South Alternative would cross the winding Bean Creek Trail three times in close succession, as described in Section 4.5.3.

Avoidance Options

Because the affected portion of the Bean Creek Trail occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District (see Section 4.4.3).

Measures to Minimize Harm—Alignment Options

Minimizing harm through design changes could mean (a) routing the G South alignment south of the southern end of the trail, or (b) shifting the highway alignment slightly north, crossing the trail only once, and substantially maintaining the existing trail alignment through use of a trail bridge over the highway. For reference, see Figure 4.6-1, which shows a realignment under option (a) in gray. See also Map 4-6 and Map 4-7 at the end of this chapter.

Summary: For Bean Creek Trail/G South Alternative, the minimization options presented here are not considered reasonable. Therefore, no alignment shift or design change is proposed as a minimization measure.

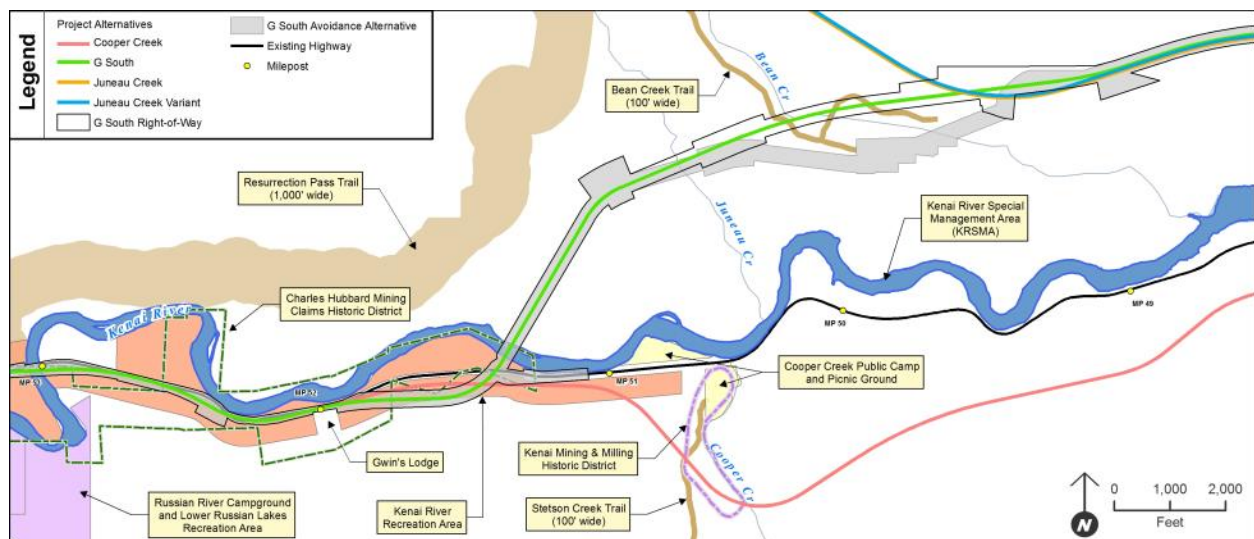


Figure 4.6-1. Bean Creek Trail, surrounding Section 4(f) properties, and potential realignment of the G South Alternative

Option (a) would route the alignment immediately south of the two southern terminal spurs of the Bean Creek Trail. This alignment is not reasonable as a measure to minimize harm because of the

cost (ii) and impact (iii) of the alignment. Such an alignment would route the highway through an existing neighborhood, requiring full acquisition of eight lots, including five residential homes to be relocated, and partial acquisition of a ninth developed residential lot. The impacts are in the context of 161 occupied households and another 207 seasonally occupied residences in the community (see Section 3.4, Housing and Relocation). The nine properties had a borough assessed value of \$1.08 million at the beginning of 2012. Fair market value for acquisition is generally accepted to be higher than assessed value, plus there would be costs for relocation.

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

This route would be technically feasible and within current standards, and it would minimize harm to the Bean Creek Trail. However, by removing neighborhood homes and placing the highway alignment adjacent to the western spur and trail terminus (the historic route), neighborhood access and a good part of the neighborhood would be eliminated. While this alignment technically would minimize harm to the trail, it is not considered to be a reasonable measure to minimize harm because of the impacts to the community of Cooper Landing and to individual property owners (iii), and the costs of relocating residents

and compensating for property losses (ii).

As indicated in Section 4.8.3, the Bean Creek Trail overall is not one of the most important Section 4(f) properties in the project area, and as indicated under option (b) immediately below, the officials with jurisdiction (i) have been more interested in formalizing the trail and providing for continuity of the trail across the new highway than in keeping to the existing alignment (the officials had previously shifted the trail off its historic alignment to the east to avoid user-conflict impacts within the neighborhood). Finally, any alignment shift around the southern end of the trail would remain within the Sqiłantnu Archaeological District in an area that has not been fully surveyed for archaeological resources. Based on estimated right-of-way, the shifted alignment would use 414 acres of the district, compared to 417 acres for the proposed G South Alternative alignment. It is possible that archaeological sites would be discovered along the shifted alignment and that impacts to the District would be greater than the alignment proposed.

Option (b), shifting the alignment north and putting the trail over the highway on a bridge was considered but found to be not reasonable as a measure for minimizing harm because of a combination of cost (ii) and impact (iii). It was determined that a bridge over the trail would be feasible without substantially altering the existing trail alignment. Such an approach theoretically could minimize harm to the trail. However, the cost (ii) of the bridge would be substantially higher than the combination of placing the trail in a tunnel, replacing the trail bridge over Bean Creek, and rerouting the trail. Cost of a pedestrian bridge over the highway is estimated at \$427,500, while the proposed cost of trail realignment, a pedestrian tunnel under the highway, and a pedestrian bridge over the creek together would total \$116,475. The estimated bridge cost therefore would be about 3.7 times higher. This cost is not considered reasonable, especially in light of consultation with the officials with jurisdiction (i), described in the following paragraph.

As further described in the following paragraphs, measures are proposed to maintain continuity of the trail by rerouting the trail and placing it under the highway. DOT&PF and FHWA consulted with the Forest Service (primary trail manager), the Alaska Department of Natural Resources (DNR; land owner), and the Borough (owner of adjacent land and access route) about these proposed measures to minimize harm, and these officials with jurisdiction agreed with the measures. The primary advantage of bridging over or tunneling under the trail would be to leave

the trail on its precise existing alignment rather than rerouting it slightly to create an undercrossing for the trail. The officials with jurisdiction expressed no concerns about the minor reroute proposed. The trailhead and southern end of this trail are not highly managed or fixed in place at this time, and the proposed measures would help to formalize the southern end of the trail. Finally, a trail bridge over the new highway would be a large engineered structure in an area lightly forested with only moderate-sized trees. The bridge would stand out in an otherwise mostly natural-appearing environment. Therefore, based on consultation (i), costs (ii), and impacts outside the trail in question (iii), options for bridging and tunneling were determined to be not reasonable.

Measures to Minimize Harm—Design and Construction

For the historic portion of the Bean Creek Trail, mitigation measures were negotiated with consulting parties during the Section 106 process (see Section 4.6.1.3). A formalized summer trailhead/parking area would be established as part of the G South Alternative at a location acceptable to the Forest Service and DNR. The new trailhead would be located near the trail on the north side of the new highway (see Map 4-7) and would be maintained by the Forest Service. The highway would pass over the existing trail (Slaughter Ridge Road extension), rerouting the trail/road beneath the highway in a tunnel, to maintain access to the trail from the community of Cooper Landing via Slaughter Ridge Road. The trail would pass under the highway with no connection between the highway and the trail at the crossing location. The Bean Creek Trail would be rerouted on the north side of the highway, across Bean Creek on a new pedestrian bridge, and past the new trailhead. To accomplish the highway crossing, the trail would be given sufficient clearance for passage by trail users and wildlife.¹⁵

The trail would remain accessible via Slaughter Ridge Road, as it is today, without the need to cross the new highway at grade. DOT&PF would coordinate the new trailhead design with the Forest Service, DNR, and the Borough, and would prepare the parking spaces and a trailhead sign/kiosk. However, resolving easements and upgrading the unimproved portion of Slaughter Ridge Road south of the new highway would not be part of the mitigation. The trailhead is proposed as a summer-only trailhead (i.e., not plowed by DOT&PF in winter). A winter pullout/parking area would be established along the highway close to the summer trailhead to provide winter access to the Bean Creek Trail. This long pullout would likely be designed with distinct entry and exit points. It would be plowed by DOT&PF road crews, and would be designed for efficient plowing. The pullout would be sized to accommodate multiple trucks with snowmobile trailers.

Bean Creek Trail would likely become the favored access to the Resurrection Pass Trail in winter (and possibly by most users in summer) instead of remaining a secondary access (it would be shorter than the distance from the existing trailhead for Resurrection Pass Trail, with somewhat less elevation gain). Based on consultation with the Forest Service, signs would be provided at the trailhead to direct non-motorized summer overflow traffic to the existing trailhead for the

¹⁵ The Bean Creek Trail in this location is coincident with the extension of the platted but unbuilt Slaughter Ridge Road and Cecil Road. This extension on State lands, beyond the platted area on Borough lands, is an old logging road created by the Forest Service. The Forest Service retained public access easements on portions of these logging roads when the land transferred to the State. The new tunnel under the highway for Bean Creek Trail would be designed to pass trucks and wildlife, although current uses are primarily for foot traffic and for snowmobiles in winter.

Resurrection Pass Trail. No parking signs would be posted along the highway shoulder in the area of the trailhead near MP 53.1.

In addition to the new trailhead, the following measures would be instituted to minimize harm to the trail and its users:

- The contractor would be required to maintain access for trail users across the construction zone throughout the construction process via marked detours. The rerouted trail and new highway bridge over the trail would be constructed as early as possible to allow trail users to use it and avoid crossing the construction zone at grade.
- DOT&PF would document the impacted portion of the historic route with GPS, photographs, and field notes.
- An archaeological survey of the rerouted trail alignment would be completed to ensure no archaeological sites would be impacted. The trail alignment would be adjusted to avoid any discovered archaeological sites.
- A permanent sign interpreting trail and mining history would be placed at the new trailhead. Any interpretive material would be developed in consultation with the Forest Service and other consulting parties.
- Other measures such as steepening side slopes would be accomplished wherever practical, within the bounds of accepted engineering practice, to reduce the footprint impact of the alternative.

4.6.5.2 Juneau Creek and Juneau Creek Variant Alternatives

Anticipated Use

The Juneau Creek and Juneau Creek Variant alternatives would cross the Bean Creek Trail near the proposed Juneau Creek Bridge, as described in Section 4.5.4, and would result in rerouting the historic trail more than 1,500 feet to pass under the eastern end of the bridge.

Avoidance Options

Because the affected portion of the Bean Creek Trail occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm through design changes could mean (a) creating a new alignment south of the southern end of the trail, or (b) placing the trail on a bridge over the highway to retain its existing alignment. See Figure 4.6-2, which illustrates a potential realignment under option (a) in gray. See also Map 4-6 at the end of this chapter.

Summary: For Bean Creek Trail / Juneau Creek alternatives, the minimization options presented here are not considered reasonable. Therefore, no alignment shift or design change is proposed as a minimization measure.

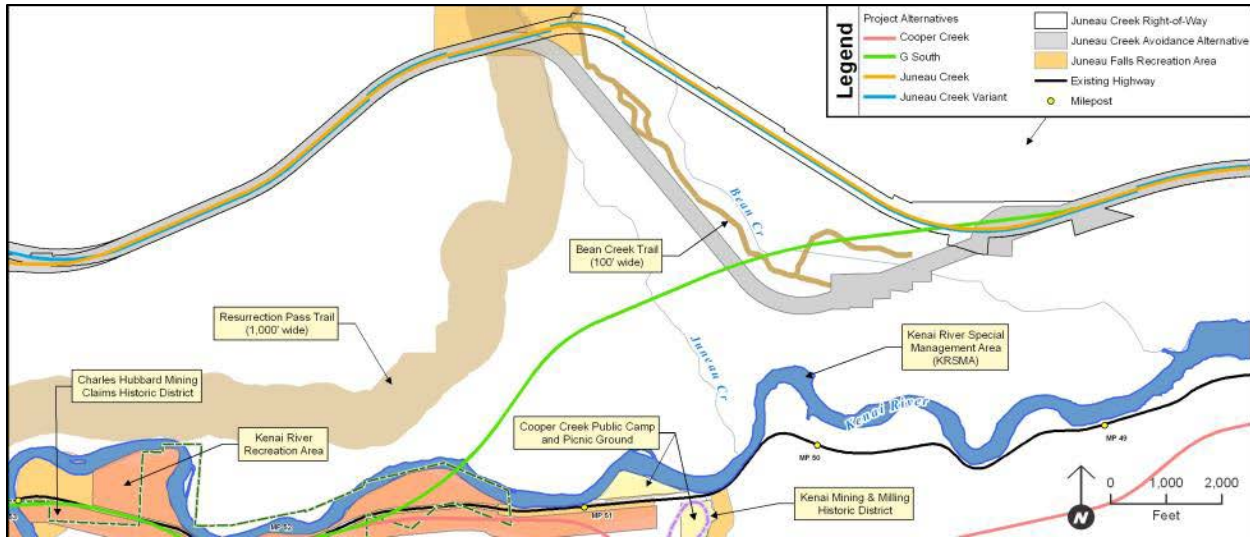


Figure 4.6-2. Bean Creek Trail, surrounding Section 4(f) properties, and potential realignment of the Juneau Creek Alternatives

Option (a), shifting the Juneau Creek alignments to the south and west, would avoid the Bean Creek Trail entirely and would follow the same alignment through a neighborhood as indicated above for the G South Alternative. Based on estimated right-of-way, the use of land from the Sqi-lantnu Archaeological District would be 391 acres under the shifted alignment versus 414 acres for the proposed alignment. However, this option was found to be not reasonable as a mitigation measure principally because of impacts (iii) and engineering feasibility, and associated cost

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

implications (ii). The alignment around the southern termini of the trail would result in full acquisition of eight properties, including relocation of five homes and cabins, and partial acquisition of a developed ninth residential lot, an impact to the owners and additional cost to the project (see G South Alternative description above in Section 4.6.5.1).

Further, the alignment would constrain the alternative between the edge of the Juneau Creek Canyon (to the west) and the Bean Creek Trail (to the east). This narrow corridor, about 6,600 feet long, would be right at a 6 percent grade throughout (the maximum grade allowed under rural principal arterial standards). This constrained corridor would not allow for a curve to match the bridge crossing location currently proposed, suggesting a clear-span bridge some 500 feet longer than the 825-foot-long long bridge already proposed (the bridge as proposed already would be the longest clear span in Alaska) and built on a curve with its abutment farther south than currently proposed. The rock in a zone along the canyon edge was found to be unstable in a portion of this area, removing the potential of moving the entire bridge south and calling into question the viability of the canyon-edge alignment. If the alignment were pursued, the impacts (iii) could include catastrophic failure of the highway or bridge abutment. A curved clear-span bridge approximately 1,300 feet long theoretically possible but is outside common bridge engineering practice and would cost more (ii) than the bridge otherwise proposed because of its extra length and because of the curve. While such a bridge theoretically would be possible, the combination of factors described here did not warrant complex preliminary design and cost estimating for such a bridge; the alignment in whole was considered not reasonable even without this data.

For this combination of cost (ii) and impact (iii), this alignment shift was not considered a reasonable measure to minimize harm to the Bean Creek Trail.

Option (b), placing a trail bridge over the highway, was determined to be not reasonable as a way to maintain the existing, historic alignment and to minimize harm, primarily because of cost (ii). A bridge approximately 100 feet long would be required to meet horizontal and vertical clearance requirements for a rural principal arterial. The trail would need to be realigned slightly at the approaches to the bridge, but would otherwise retain its existing historic alignment. Based on engineering completed for this Final EIS, realigning the trail over 2,900 feet as proposed under the two Juneau Creek alternatives is expected cost less than \$9,000, while construction of a trail bridge, instead of realigning the trail, would cost approximately \$427,500, approximately 50 times more. Because of cost (ii), bridging over the highway is not considered reasonable as a measure to minimize harm.

As further described in Section 4.6, rerouting the trail and placing it under the eastern end of the proposed Juneau Creek Bridge is a better option for minimizing harm. DOT&PF and FHWA consulted with the Forest Service (i), the officials with jurisdiction as land owner and trail manager, about these proposed measures to minimize harm, and the Forest Service raised no objection to these measures. Section 4.6 describes how these measures would combine with measures proposed for the Resurrection Pass Trail and Juneau Falls Recreation Area to create a system of recreation facilities in the Juneau Creek Falls area.

Measures to Minimize Harm—Design and Construction

Measures proposed to minimize harm to the Bean Creek Trail are discussed together with the Resurrection Pass Trail and Juneau Falls Recreation Area above in Section 4.6.4, Resurrection Pass Trail.

4.6.6 Stetson Creek Trail

4.6.6.1 Cooper Creek Alternative

Anticipated Use

The Cooper Creek Alternative would cross the lower end of the Stetson Creek Trail, truncating it and creating a small new pullout trailhead south of the highway and a small interpretive loop for Cooper Creek Campground north of and below the highway, as described in Section 4.5.2.

Summary: For Stetson Creek Trail/Cooper Creek Alternative, the minimization options presented here are not considered reasonable. Therefore, no alignment shift is proposed as a minimization measure. The proposed design in this area reflects a Forest Service proposal to minimize harm that appears reasonable.

Avoidance Options

Because the affected portion of the Stetson Creek Trail occurs within the larger Sqilantnu Archaeological District, any attempt to avoid the trail would result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimization through design changes could mean (a) routing the highway alignment around the lower end (north end) of the trail, or (b) maintaining trail continuity and the existing historic trail

alignment by placing the trail in a tunnel under the new highway. See Map 4-8. See also Section 4.5.2.2 for related discussion about realignments in this area.

Option (a), routing the Cooper Creek Alternative around the northern end of the trail, is not considered a reasonable way of minimizing harm primarily because of impacts (iii) associated with steep topography, known poor soils within the steep slopes, and use of the Cooper Creek Camp and Picnic Ground. It would not be possible for the Cooper Creek Alternative to go around the trail immediately to the north without using land from the campground, a Section 4(f) resource. The slopes that constitute the eastern bluff above Cooper Creek are about 200 feet high and have failed in the past, leaching silt and mud into Cooper Creek and the Kenai River. Multiple geotechnical studies done in this area by DOT&PF and consulting engineers noted the fine-grained soils in the area that are subject to failure, advised against tall cuts into such slopes, and stated that walls above 100 feet tall have not previously been constructed (HDR 2014a). Some of these slopes

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

are already considered steeper than can be naturally maintained, so material continually sloughs. Alignments farther north are represented by the G South Alternative and the Juneau Creek alternatives.

Option (b), placing the trail in a tunnel or under a bridge, may be technically possible but this was rejected based on consultation with the officials with jurisdiction (i). DOT&PF originally proposed placing the trail in an oversized culvert and maintaining its existing historic alignment. However, during consultation, the Forest Service indicated

that separating the trailhead from the campground would resolve existing management challenges, because most trail users are separate from campground users and because miners use the trail for legal motorized access to mining claims, and motorized use may conflict with campground use. Based on the consultation to date, and based on the balance of adverse impacts to the trail itself created by the project (truncating the trail), the benefits to the trail (formalizing a trailhead, interpreting trail history), and impacts to the trail and nearby campground that occur today without the project (motorized conflicts, indistinct trailhead), it appears the Forest Service proposal is a reasonable measure to minimize harm to the trail and would benefit the campground as well. Measures to minimize harm are described in Section 4.6.

Measures to Minimize Harm—Design and Construction

Mitigation measures formalized in a Section 106 Programmatic Agreement among consulting parties would be implemented to minimize impacts of the Cooper Creek Alternative on the Stetson Creek Trail (see Section 4.6.1.3). As proposed by the Forest Service, a new pullout trailhead would be established for the trail at a location south (uphill) of the new highway at or near the point that the new alignment would cross the existing trail. The trail would end at the new pullout trailhead and would not extend to the Cooper Creek Campground. There would be no trailhead facilities built at the new pullout trailhead except for an interpretive sign explaining mining and trail history. Subject to agreement of the Borough and the Forest Service (land owners), the historic trail on the campground side of the new highway would be combined with a portion of the existing informal access track and a segment of new trail to create a short interpretive loop for campground users. The existing alternate access to the trail, currently used by ATV users, would be physically closed by using the existing informal parking area as a disposal site for unusable soil (see discussion in Section 4.5.2.3). The Forest Service proposed this scenario as the best recreation scenario because it would resolve an existing issue of two access points for the trail, which is difficult to manage. The Forest Service stated that campground users are focused mostly on fishing and not on trail

hiking, so there would be little recreation loss to campground users by separating the trail and campground. The new trails would be owned and maintained by the Forest Service, and the new pullout trailhead parking would be owned and maintained by DOT&PF.

The trail would be rerouted from its existing historic alignment where a cut above the new highway would eliminate the trail (see Map 4-8). Beyond this segment (some 500 feet long), the trail would rejoin the existing (and historic) route. A trail sign and basic historic interpretive material would be posted near the new trailhead and on the new interpretive loop trail. Design details would be coordinated with the Forest Service and the SHPO during the final design phase. During construction, access along the trail would be maintained or a temporary alternative route would be provided; trail closure would occur temporarily only during placement of the highway embankment across the trail, and during realignment of the trail. Notice of any detour and of trail closures would be given to the Forest Service and to registered mining claimants who have claims accessible via the trail. Notice of any detour or closure would be prominently displayed at the Cooper Creek Campground and both the gated trailhead and the existing informal alternate trailhead. The new segments of trail alignment near the campground would be subject to archaeological surveys to ensure no archaeological sites would be impacted; if such sites were discovered, the trail would be routed to avoid them. The impacted portions of the historic trail would be documented with GPS (surveyed), photographs, and field notes.

DOT&PF would incorporate design shifts or narrowing of the embankment width at contributing features during final design wherever practical to further minimize harm.

4.6.7 Forest Service Kenai River Recreation Area

4.6.7.1 Cooper Creek and G South Alternatives

Anticipated Uses

The Cooper Creek and G South alternatives would have similar uses throughout the length of the Kenai River Recreation Area, where the existing highway and its right-of-way through the recreation area would be widened and straightened. These uses are described in Section 4.5.

Avoidance Options

Because the affected portion of the Kenai River Recreation Area occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimization of harm to the recreation area through alignment changes would mean routing the highway well away from the existing alignment either (a) to the north or (b) the south between approximately MP 51 and MP 55.

Option (a) is represented best by the Juneau Creek Alternative, which impacts the Resurrection Pass Trail, KNWR Wilderness, and Confluence Site. The Juneau Creek Variant Alternative would not avoid the Kenai River Recreation Area but would have minimal use and impact. However, the Juneau Creek Variant Alternative would have important impacts to the Confluence Site as well as the Resurrection Pass Trail. The Extension of the G South Alternative also likely could avoid the Kenai River Recreation Area, but is not considered a reasonable alternative, as described in Section 4.6.1.2. A north-side alignment would be practical only as an option for the G South Alternative;

a variation on the Cooper Creek Alternative descending Cooper Creek valley would have to pass through the Cooper Creek Campground and cross KRSMA, both of which are Section 4(f) properties, to get to the north side, and topography would limit reasonable connection to the Juneau Creek alignment.

Option (b) is best represented by the Russian River Alternative. However, it would use multiple other Section 4(f) resources, including crossing and further shortening the Stetson Creek Trail, passing through the Lower Russian Lake Recreation Area and/or the Russian River Campground Area (including crossings of the Russian Lakes Trail and Russian River Anglers Trail), passing through KNWR close to the popular fishing area at the confluence of the Russian and Kenai Rivers, and passing through a portion of the Confluence Site. The Russian River Alternative was not considered a reasonable alternative, as discussed in Chapter 2 and above in Section 4.6.1.2, and is not a reasonable way to minimize harm to the Kenai River Recreation Area.

Measures to Minimize Harm—Design and Construction

DOT&PF would incorporate design shifts or narrowing of the embankment width during final design wherever practical to further minimize harm. Segments of the old highway and its right-of-way, where no longer needed, would be offered to CNF to be reincorporated into the recreation area, off-setting a portion of the recreation land used. The old highway pavement and any culverts in these areas would be removed and the surface reseeded with native seed mix, per a revegetation plan that will be prepared for the project in consultation with the Forest Service.

- For the Cooper Creek Alternative, 3.8 acres of unused right-of-way would be available to return to CNF.
- For the G South Alternative, approximately 5 acres of unused right-of-way would be available to return to CNF.

Under both alternatives, to help retain parking that had occurred at informal pullouts within the highway right-of-way, and which had provided parking for access to the Kenai River Recreation Area, DOT&PF would rebuild and formalize (include in project design, and pave) a large pullout near MP 53.1 and would work with the Forest Service as appropriate through the design process regarding potential other parking (up to 28 additional spaces). Potential locations offered for this parking include (1) expansion of the existing summer trailhead for Resurrection Pass Trail (as suggested by the Forest Service) to accommodate more and longer vehicles and to consolidate two driveways in this area, (2) parking on CNF land off the administrative access road west of Schooner Bend Bridge, (3) remnant highway right-of-way returned to the Forest Service. Other locations suggested by the Forest Service could be used as well. In addition, DOT&PF would work with the Forest Service during design to potentially add other parking mutually agreed upon. The intent is to work with the Forest Service at a level the agency desires to replace up to the total of 54 total parking spaces in the Kenai River Recreation Area at locations satisfactory to both the Forest Service and DOT&PF while minimizing driveway connections to the main highway.

To address potential random parking on the highway shoulder by the public for access to the KRRRA and the Kenai River, no parking signs would be posted, particularly near Sportsman's Landing. If, in conjunction with the Forest Service, it appeared that further no parking signs were warranted, DOT&PF would post additional signs.

Also, the public land order that withdrew the recreation area for recreational uses defines the recreation area boundary in reference to “the highway” (see also Section 4.2.7.5). This has been

interpreted to mean measurements that define the recreation area should be taken from the edge of the highway right-of-way. Absent any other administrative action on the part of the Federal government, or if the public land order is next renewed using the same language, the expansion of the right-of-way under the Cooper Creek and G South Alternatives may work to push out the boundaries of the recreation area into other CNF lands, minimizing loss of recreation withdrawal acreage.

4.6.7.2 Juneau Creek Variant Alternative

Anticipated Uses

The Juneau Creek Variant Alternative would have a *de minimis* impact at the far northwest corner of the recreation area. This use is described in Section 4.5. See Section 4.3 for *de minimis* discussion.

Avoidance Options

Under Section 4(f) law [49 USC 303(d)(1)(B)], a finding of *de minimis* impact (see Section 4.3) means there is no requirement to consider total avoidance alternatives of the KRRRA for Juneau Creek Variant Alternative. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimization of harm to the recreation area through alignment changes would mean routing the highway (a) slightly farther to the north to avoid the western end of the KRRRA, or (b) to the south between approximately MP 51 and MP 55.

Option (a) is represented by the Juneau Creek Alternative and would avoid use of the KRRRA but would use land from the KNWR. The Juneau Creek Variant Alternative was designed specifically to avoid use of the refuge. The Juneau Creek Alternative also would use land from the Resurrection Pass Trail and Juneau Falls Recreation Area. Option (b), bypassing to the south, would not be a variation on the Juneau Creek Variant alternative but would be a wholly new alternative represented by a combination of the G South Alternative and Russian River Alternative. It would use multiple other Section 4(f) resources, including passing through the Lower Russian Lake Recreation Area and/or the Russian River Campground Area (including crossings of the Russian Lakes Trail and Russian River Anglers Trail), passing through KNWR close to the popular fishing area at the confluence of the Russian and Kenai Rivers, and passing through a portion of the Confluence Site. The Russian River Alternative was not considered a reasonable alternative, as discussed in Chapter 2 and above in Section 4.6.1.2, and is not a reasonable way to minimize harm to the Kenai River Recreation Area.

Measures to Minimize Harm—Design and Construction

DOT&PF would incorporate design shifts or narrowing of the embankment width during final design wherever practical to further minimize harm.

For the Juneau Creek Variant Alternative, there would be no unused right-of-way to return to CNF. The roadway embankment and overpass at MP 55, where the “old” highway would pass under the new highway, would be prominent in the view from the existing Sterling Highway through the recreation area; the overpass would be designed to minimize visual impact, particularly through landscaping and revegetation, including tree plantings as well as seeding with native seed mix. The overpass bridge would be designed with aesthetics in mind.

See also Appendix F for the *de minimis* impact finding form.

4.6.8 Juneau Falls Recreation Area

4.6.8.1 Juneau Creek and Juneau Creek Variant Alternatives

Anticipated Use

The Juneau Creek and Juneau Creek Variant alternatives would use land from the southern edge of the Juneau Falls Recreation Area on identical alignments, as further described in Section 4.5.

Avoidance Options

Because the affected portion of the Juneau Falls Recreation Area occurs partially within the larger Sqilantnu Archaeological District and within the protected corridor for the Resurrection Pass Trail (1,000 feet wide), any attempt to avoid this resource would result in Section 4(f) impacts to the trail or Sqilantnu District or both. See Section 4.4.3.

Summary: For Juneau Falls Recreation Area/Juneau Creek alternatives, the minimization options presented here are not considered reasonable. Therefore, no alignment shift is proposed as a minimization measure.

Measures to Minimize Harm—Alignment Options

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

The alignment of these two alternatives was placed at the southern edge of the recreation area and not near the falls, in order to minimize harm to the area. Further minimizing harm through design changes could mean (a) routing the alignment south of the recreation area boundary, or (b) routing north of the recreation area boundary. See Map 4-1, Map 4-5, and Map 4-10 for reference.

Option (a) is not considered reasonable as a measure to minimize harm primarily because of impacts (iii). Avoiding the recreation area to the south is represented by the previous Juneau Creek Alternative alignment originally proposed in about 2001 (called the Juneau Creek “F” Alternative). It was proposed specifically because it would not have used land from the recreation area. However, because of the magnitude of the large bridge required over Juneau Creek Canyon, DOT&PF had geotechnical engineers complete a preliminary field investigation of the canyon crossing area. This investigation resulted in discovery of a recent landslide within the canyon and evidence of instability in the canyon walls in that area. The nearest location with better rock was located slightly to the north—just inside the recreation area. Use of the original bridge site could result in catastrophic failure of the bridge and was not recommended by geotechnical engineers. The canyon is too wide to reasonably bridge at locations a short distance south of the original crossing site. Locations still farther south are represented by the G South alignment, which avoids the Juneau Falls Recreation Area but uses land from several other Section 4(f) properties, including the Kenai River Recreation Area and Charles G. Hubbard Mining Claims Historic District, that the current Juneau Creek alternatives do not affect.

Option (b), avoiding the recreation area to the north, is not considered a reasonable measure to minimize harm because it would provide relatively poor level of service, combined with other impacts (iii), as described below. This concept was represented in the 1994 DEIS and early in the current effort (2001–2003) by a Juneau Creek alignment that headed north, made a large arcing curve north of Juneau Creek Canyon, and turned south again. It was not carried forward for full analysis in this EIS because of impacts to the recreation area and to the Resurrection Pass and Bean

Creek trails, coupled with roadway design issues that would degrade the level of service such as steep grades to reach higher elevations (compared to the alignment of the two Juneau Creek alternatives currently proposed) and rolling terrain (which adds to grade issues). In addition, winter maintenance would become more difficult and costly to provide safe driving conditions at higher elevations. This means it did not satisfy the project purpose and need as well as the more direct route across the canyon.

An alignment that would completely avoid the recreation area to the north would necessarily extend more than 1 mile farther north, and would be squeezed against the mountain walls (particularly to the east), would have steeper and more sustained grades, and would have a longer curve making a full 180-degree turn from north back to south. This implies its level of service would be the same or worse than previously analyzed, and it would not satisfy the purpose and need as well as the alignment proposed. It also would cross the Resurrection Pass and Bean Creek trails farther into their lengths. The result could be similar or greater acreage of use of the trails and greater impacts to the activities and attributes of these long-distance backcountry trails and to the recreation area, concerns discussed at multiple consultation meetings (i) with the Forest Service. Such an alignment also would surround the recreation area on three sides rather than passing through its southern edge, arguably rendering more of the area into a “front country” recreation area than backcountry recreation area than the proposed alignment. For these reasons, an alignment to the north is not a reasonable measure for minimizing harm to the recreation area.

Measures to Minimize Harm—Design and Construction

Measures proposed to minimize harm to the Juneau Falls Recreation Area are discussed together with the Resurrection Pass Trail and Bean Creek Trail above in Section 4.6.4, Resurrection Pass Trail.

4.6.9 Cooper Landing Boat Launch and Day Use Area

4.6.9.1 Cooper Creek Alternative

Anticipated Use

The Cooper Creek Alternative would use land from the boat launch ramp portion of the Cooper Landing Boat Launch and Day Use Area, but only during construction. The ramp is located within the existing highway right-of-way (see Section 4.5.2 and Figure 4.6-3).

Avoidance Options

Because the affected portion of the Cooper Landing Boat Launch occurs within the larger Sqilantnu Archaeological District and overlaps KRSMA, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District or KRSMA or both (see Section 4.4.3).

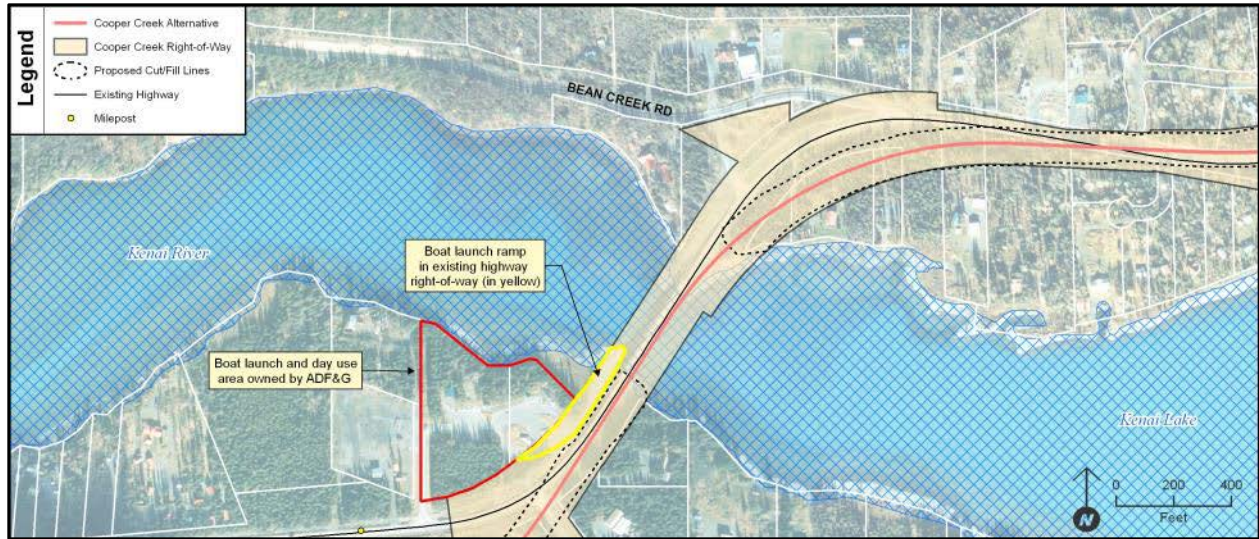


Figure 4.6-3. Cooper Landing Boat Launch and Day Use Area, Cooper Creek Alternative, and surrounding properties

Measures to Minimize Harm—Alignment Options

The alignment of the Cooper Creek Alternative has been routed and readjusted to minimize impacts to the Boat Ramp and Day Use Area and to surrounding private properties within the community of Cooper Landing. Further minimizing harm to the Section 4(f) property through alignment shifts could mean (a) routing the alignment completely around the Boat Launch and Day Use Area to the northwest or (b) to the southeast. See Map 4-1 and Figure 4.6-3, above (also Map 4-11 for reference).

Summary: For Cooper Landing Boat Launch and Day Use Area/Cooper Creek Alternative, the alignment as proposed has been adjusted to minimize harm to the Section 4(f) property. No other alignment shift or design change is proposed as a minimization measure.

Options (a) and (b) are not considered reasonable ways to minimize harm, because they would take the alignment through the middle of Cooper Landing, where multiple private homes and a church would need to be acquired. The alternative in the bridge area has been redesigned from early alignments, which used a large portion of the Boat Launch and Day Use Area, and the preliminary design of the current alignment was redesigned to use a retaining wall to ensure no fill

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

resulted in permanent impacts to the boat launch ramp. Because of costs (ii) and impacts (iii), no further design change is considered to be a reasonable measure to minimize harm to the boat launch and day use area. Consultation (i) with DPOR and ADF&G indicated relatively little concern about these impacts as long as they were timed to occur outside the prime summer boating season and were temporary. Proposed mitigation measures were found acceptable.

The current alignment is considered optimal for balancing temporary impacts to the boat launch ramp on one side of the highway against permanent private property impacts on the other side of the highway. The alignment would use land from several private parcels near both ends of the bridge, without full acquisition and without removing homes or a church. Shifting the alignment to the northwest of the Boat Launch and Day Use Area (option (a)) would be a dramatic change. It would require a bridge crossing the river at an angle at a minimum

of 900 feet long, versus just less than 600 feet long, as proposed under the Cooper Creek Alternative. This would increase bridge structure costs (ii) by about 50 percent and increase use of the Kenai River (KRSMA, another Section 4(f) property), by requiring additional permanent piers. Furthermore, private waterfront properties would be used on both sides of the river (assessed value of three lots, including at least one guiding business, of \$1.2 million, plus use of a developed corner of a substantial resort property with assessed value of \$1.16 million). These acquisitions would require additional costs for relocation and would disrupt or relocate two businesses. Costs and permanent community/business impacts make this option unreasonable as a way to minimize temporary impacts to the boat launch ramp.

Shifting the alignment farther upstream (option (b)) to eliminate any use of the boat launch ramp would mean full acquisition of a waterfront home on the north side of the bridge (assessed value in 2013: \$313,100), with relocation required, plus greater acquisition of several parcels on both ends of the bridge, including potential relocation of a church near the south side of the bridge. Further minimizing harm to the boat launch ramp through realignment was not deemed reasonable in light of these costs and impacts.

Measures to Minimize Harm—Design and Construction

Temporary impact to the boat launch ramp would be minimized by requiring construction contractors to stage construction equipment and materials elsewhere, unless they were required to be on the boat launch ramp for construction immediately adjacent to the ramp. Access to the day use area and boat launch ramp would be maintained during the peak summer use season: approximately June 15 through August 15. Notice of intent to temporarily close the ramp outside the peak season would be given to permitted river guides and land management agencies; posted on site and at area campgrounds and other boat launch ramps; displayed on changeable message signs in the project area; and published in Anchorage and Kenai Peninsula newspapers. The potential for provision of temporary boat ramp facilities was discussed with DPOR, but no suitable location was identified. Further consultation with the DPOR would be undertaken to determine if a reasonable site can be located on public or private land.

Other measures such as steepening side slopes would be accomplished wherever practical, within the bounds of accepted engineering practice, to reduce the footprint impact of the alternative.

4.6.10 *Sqilantnu Archaeological District*

4.6.10.1 All Build Alternatives

Anticipated Use

All alternatives would use land from the Sqilantnu Archaeological District. They would impact the district in different ways, as described in Section 4.5. In all cases, the alignments pass through the district boundaries, and in all cases several individual archaeological historic sites and the contributing Confluence **Site** would be affected.

Avoidance Options

Because the Sqilantnu District extends into the larger KNWR, any attempt to avoid the Sqilantnu District by going around it would result in impacts to the KNWR. Avoiding one Section 4(f) resource by using another is not a Section 4(f) avoidance alternative. See also discussion of the Sqilantnu District in Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimizing harm through alignment changes could mean routing the alignment above or near the 1,000-foot elevation contour line (a) at the northern edge of the archaeological district or (b) at the southern edge of the district, or (c) rerouting the highway on a completely different alignment outside the project area. A theoretical option (d) would snake any of the alternatives around individual archaeological sites that contribute to the Sqilantnu District, potentially minimizing harm to the district overall by reducing impacts to important features of the district. See Map 4-1 for reference.

Summary: For the Sqilantnu Archaeological District, the four reasonable build alternatives represent different reasonable ways to minimize harm. Options discussed that would further minimize harm are not reasonable and therefore not proposed, principally because of steep topography and avalanche hazard. Minor design shifts and design changes have been incorporated to minimize harm to contributing elements of the district. DOT&PF would examine small design shifts or narrowing of the embankment width at contributing features during final design for potential to further minimize harm.

Option (a), routing north, is not considered reasonable because of impacts (iii) to other Section 4(f) properties and avalanche risk. Routing north would impact the Resurrection Pass Trail and KNWR (including Federal Wilderness), both 4(f) resources. An Avalanche Hazard Evaluation for this project (Fesler 2001) indicated avalanche hazard on slopes in the Bean Creek area, which noted approximately 26 avalanche paths that terminate near elevation 900 feet near Bean Creek. Other steep slopes occur above the Sqilantnu District between MP 54 and 58, with a break in cliffs and steep slopes only at Fuller Creek. Avalanches are likely in this area as well. A road on such

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

slopes would be difficult to build and at such elevations would be subject to long winter driving conditions and a long snow-clearing season. From a 4(f) perspective, 4.5 miles of right-of-way 300 feet wide through KNWR would amount to at least 164 acres of impact. Also, this land is designated Wilderness, and the alignment would isolate a large island of land between the old and new highways that could no longer be considered Wilderness. For all these reasons, the alignment is not considered reasonable as a minimization alternative. The cost (ii) of construction and maintenance would be higher than the Cooper Creek Alternative as proposed, but impacts alone were determined to make this routing not reasonable, and specific costs were not calculated.

Option (b), routing south, is considered not to be reasonable as a measure to minimize harm because of cost (ii) and impacts (iii). The portion of the Sqilantnu District that extends farthest to the south is in the Russian River Valley; to avoid this portion, the alignment would have to extend 1.5 miles to 2 miles up the Russian River Valley beyond the district boundary to also avoid Lower Russian Lake Recreation Area (a Section 4(f) property) and lower Russian Lake. Such an alignment still would use land from Stetson Creek Trail, Russian Lakes Trail, and KNWR—all Section 4(f) properties—and would use federally designated Wilderness lands south of the Kenai River in the KNWR. The Russian River in this crossing area is managed by the Forest Service as a Wild and Scenic River, although it is not formally designated as such by Congress, and a highway crossing would not be considered compatible.

A routing south of the district also would be subject to avalanche on steep slopes. This hazard was indicated in the bench area east and west of Cooper Creek in an Avalanche Hazard Evaluation for

this project (Fesler 2001). The report noted “approximately a dozen steep, snow-filled gullies and bowls that produce sizeable avalanches relatively frequently....Two of these paths reach the current 115 kv powerline right-of-way.” The report recommended that any alignment in this area specifically occur below the 1,000-foot elevation contour, which would place it within the Sqilantnu District. In the Russian River Valley, such an alignment necessarily would cross avalanche paths that are known to impact the Russian Lakes Trail in the valley bottom, substantially lower than 1,000 feet, and would traverse likely avalanche-prone slopes west of Lower Russian Lake. A road on steep slopes would be difficult to build, and for a sustained distance at such elevations would be subject to long winter driving conditions and a long snow-clearing season.

Avoiding the district to the south would require a very long bridge across Kenai Lake—KRSMA, resulting in a use of a Section 4(f) resource. The bridge likely would be located at the eastern terminus of the project near MP 45 (Quartz Creek). In that area, the minimum crossing length would be about 1,800 feet. The longest bridge otherwise proposed is the Juneau Creek Bridge under the two Juneau Creek alternatives, at 1,200 feet. A bridge in the Quartz Creek area would be at least 50 percent longer and, at a similar cost per square foot, would be expected to be approximately 50 percent more costly than the proposed crossing.

From a Section 4(f) perspective, an alignment south of the district would impact (iii) land from KRSMA/Kenai Lake, Stetson Creek Trail, Russian Lakes Trail, and nearly 4.5 miles of KNWR land (164 acres). Also, at least 3.5 miles of the alignment would be within designated Wilderness. A longer route on steep slopes would also cost more to construct and maintain (ii), but impacts alone were sufficient to determine this route not reasonable, and therefore specific costs were not calculated. For all these reasons, an alignment routed south of the Sqilantnu District is not reasonable as a minimization alternative.

Option (c), routing outside the Kenai River Valley would not meet the purpose and need of this project and would impact other 4(f) resources, as discussed under avoidance of all 4(f) resources in Section 4.6.

Option (d), routing around individual archaeological features, theoretically would be possible. Within the Sqilantnu District, relatively small, individual, archaeological historic properties that contribute to the district are quite dense in some areas, particularly at lower elevations, where hundreds of the properties have been documented. In these areas, it is impossible to meet current highway standards for relatively broad curves and for grades less than 6 percent and to route around all of these contributing properties. Routing around most of them is possible. There are two basic ways of minimizing harm—going around as many known archaeological sites as possible, and threading through the known archaeological sites by using the existing alignment as much as possible. The four alternatives presented in this Final EIS already represent these approaches. “Going around as many as possible” is represented best by the Juneau Creek Alternative, which would cross nine of these contributing properties. “Threading through” on the existing alignment is represented best by the Cooper Creek and G South alternatives, which respectively would cross 28 and 26 of these contributing properties. The Juneau Creek Variant Alternative would minimize harm by going around many historic sites on most of its alignment and threading through as many sites as possible on the western end of the alignment (it would cross 20 contributing properties). As noted previously, the western end of the Juneau Creek Variant Alternative was developed to avoid impacts to the KNWR and the Mystery Creek Wilderness. Finally, during consultation (i), officials with jurisdiction indicated that all land within the district boundary was important to the

district, not just the documented individual archaeological sites. For this reason, even routing around individual sites does not eliminate impact to this culturally sensitive area.

In summary, the present alternatives illustrate a reasonable mix of approaches to minimizing harm to the Sqilantnu Archaeological District. During final design, small shifts may be possible to further minimize harm at individual sensitive archaeological historic sites, and all effort will be made to reduce the “footprint” width of the selected alternative where it crosses or is adjacent to an individual archaeological site. Other measures to minimize harm to affected archaeological sites are addressed in the following paragraphs.

Measures to Minimize Harm—Design and Construction

Measures applicable to all build alternatives. Measures formalized in a Section 106 agreement among consulting parties would be implemented. The Advisory Council on Historic Preservation participated with other consulting parties in formation of the agreement. The agreement document spells out the measures to minimize harm. The measures and the entire agreement document are environmental commitments of the project, and Section 4.6.1.3 summarizes the mitigation measures that would apply. Appendix K contains the Programmatic Agreement. Other measures, such as steepening side slopes, would be accomplished wherever practical, within the bounds of accepted engineering practice, to reduce the footprint impact of the alternative.

Other measures specific to the Cooper Creek and G South alternatives. Access would be maintained to the K’beq Heritage Site during the summer while construction was ongoing. If FHWA and DOT&PF, in consultation with Kenaitze Indian Tribe and the Forest Service, determined that construction-related noise was disturbing interpretation activities at this site, DOT&PF would provide temporary interpretation at the Russian River Campground. Such assistance would include signs, relocation of displays or artifacts, or other related support to temporarily relocate the interpretation.

4.6.11 Confluence Site

4.6.11.1 All Build Alternatives

Anticipated Use

All build alternatives would use land from the Confluence Site, as described in Section 4.5.

Avoidance Options

Because the affected portion of the Confluence Site occurs within the larger Sqilantnu Archaeological District and partly within the larger KNWR, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District and Refuge. See Section 4.4.3. However, it may be possible to minimize harm to the Confluence Site through design changes, as described below.

<p>Summary: For the Confluence Site, and for all build alternatives, options of routing around the Site are not considered to be reasonable ways to minimize harm. Therefore, no alignment shift is proposed as a minimization measure.</p>
--

Measures to Minimize Harm—Alignment Options

Minimizing harm to the Confluence Site through design changes could mean (a) routing to the north of the Site, or (b) routing to the south. See Map 4-1 and Map 4-12 for reference.

Option (a) is not considered reasonable as a measure to minimize harm primarily because of impact (iii) to other Section 4 (f) properties. This option would route any alternative north of the Confluence Site and would necessitate going through KNWR for about 1 mile, using a minimum of about 36 acres of KNWR land. This option also would isolate a portion of Mystery Creek Wilderness land that likely may no longer qualify as federal Wilderness (typical minimum is 5,000 acres).

Option (b), routing to the south of the TCP, is not considered reasonable as a measure to minimize harm primarily because of impact (iii) to other Section 4 (f) properties. This option would route

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

any alternative through the KNWR for 4.6 miles (using about 167 acres) and would require a new long bridge over the Russian River. It is theoretically possible that this option could avoid the Andrew Simons Wilderness unit that lies south of the Kenai River, but careful engineering would be required to ensure a bridge over the Kenai River, a bridge approach in a narrow area between the river and the Wilderness boundary, and tie-in to the existing Sterling Highway in the MP 55.5–55.7 area would be feasible. Otherwise, this option would use a small

corner of Wilderness. An alignment south of the Confluence Site also would impact the Russian River Campground, Russian River Trail, and Russian River Angler’s Trail—all Section 4(f) properties. Also, the large bridges over the Russian and Kenai Rivers would be expected to increase costs (ii), but impacts alone were sufficient to determine this option was not reasonable as a measure to minimize harm, and specific costs were not calculated.

Under either scenario (a) or (b), the alignments would use a larger amount of the KNWR and as much or more acreage from the Sqilantnu District as any of the build alternatives. In addition, the Kenaitze Indian Tribe has indicated that all existing uses and features of the Confluence Site, not just Kenaitze uses, are part of the access to and use of the area for cultural exchange. The existing highway and sport fishing are features and activities of the area that are included as part of the Confluence Site. While changes to the highway through the Confluence Site would have an adverse effect on the Site, the effects are in the context of an acknowledged continual series of changes to the area. Routing around the Confluence Site to the north would minimize harm to the Site but would increase harm to KNWR. Routing around the Confluence Site to the south would minimize harm to the Site but would substantially increase harm to the Sqilantnu District (because more contributing archaeological properties would be impacted) and to the KNWR. Based on consultation (i) with the Kenaitze Indian Tribe, CIRI, and SHPO (officials with jurisdiction) about the importance of the Confluence Site, its features, and its boundaries, and based on the balance of impacts and benefits, neither of these options is considered a reasonable way to minimize harm to the Sqilantnu District.

Measures to Minimize Harm—Design and Construction

The Confluence Site is a sub-set of the greater Sqilantnu Archaeological District. Similarly, the measures to minimize harm to the Confluence TCP are the same as those discussed conceptually above in Section 4.6.1.3 for the Sqilantnu district, but focused more tightly on the TCP area. All alternatives would affect the TCP. The mitigation measures developed with the consulting parties in the Programmatic Agreement address the issues for the Sqilantnu District and the TCP. Section 4.6.1.3 summarizes the mitigation measures that would apply. Appendix K contains the Programmatic Agreement.

Other issues specific to the Juneau Creek Variant Alternative. For the Juneau Creek Variant Alternative, mitigation of impacts to cultural resources is estimated to cost \$4 million. Consulting parties, including the Forest Service, CIRI, and Kenaitze Indian Tribe, have stated that the impacts of this alternative on the Confluence Site “cannot be mitigated.” DOT&PF and FHWA agree that the central area of cultural importance, represented by CIRI Tract A, cannot be fully mitigated because there is no replacement property that overlooks the confluence of the Russian and Kenai Rivers and no monetary or other compensation would eliminate impacts to the setting, feeling, and association of the tribe to the area of human burials. However, DOT&PF undertook a substantial engineering effort including multiple meetings with Kenaitze Indian Tribe to create the best possible alignment through this area from a cultural resources perspective. Three alignments were presented, each with somewhat different effects to archaeological sites of varying importance. The alignment agreed upon and now called the Juneau Creek Variant Alternative avoided known burials and was preferred by Kenaitze Indian Tribe. This was an effort to minimize harm. The mitigation measures offered for other alternatives are offered for this alternative as well. These include preparing a formal nomination of the Sqilantnu Archaeological District to the NRHP and completing data recovery at select archaeological sites that would be impacted. This is not meant to imply that the dollar amount above or the list of measures in Section 4.6.1.3 would reduce cultural impacts to zero. These mitigation measures address certain impacts but not the central impacts of bisecting Tract A and placing the highway close to areas central to Kenaitze Indian Tribe culture.

4.6.12 Charles G. Hubbard Mining Claims Historic District

4.6.12.1 Cooper Creek and G South Alternatives

Anticipated Use

The Charles G. Hubbard Mining Claims Historic District largely follows the Kenai River from about MP 51 to MP 54.5, in the same area that the Cooper Creek and G South alternatives would follow the existing Sterling Highway alignment along the river. Widening the highway and improving curves would expand the highway into portions of the historic district, as described in Section 4.5.

Avoidance Options

Because the affected portion of the Hubbard Claims Historic District occurs within the Forest Service Kenai River Recreation Area and larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the recreation area and Sqilantnu District. See Section 4.4.3.

<p>Differences between the alternatives: See Map 4-1. The Cooper Creek and G South alternatives share the same alignment through the historic district, except within the last few dozen feet at the eastern end of the district. The issues associated with realignment to minimize harm to the district are identical, so the alternatives are discussed together.</p>

Measures to Minimize Harm—Alignment Options

Minimization of harm through design changes could mean routing the highway (a) north or (b) south of the historic district. In addition, minor shifts could result in minimizing harm to individual contributing features (e.g., mining features) located within the historic district. The district is not mapped in this document, to help protect potentially sensitive sites.

Option (a) is not considered to be a reasonable measure to minimize harm because of costs (ii) and impacts (iii). Routing north would mean placing the alignment

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

Summary: For Hubbard Mining Claims Historic District / Cooper Creek and G South alternatives, minimization options (a) and (b) presented here are not considered reasonable. Therefore, no alignment shift is proposed as a minimization measure. Option (c) would entail minor changes in design to minimize the project footprint and will be considered during final design.

north of the Kenai River on the extension of the G South Alternative addressed in Section 4.6.1.2. For the Cooper Creek Alternative, this would mean creating a new crossing (1.7 acres) of the Kenai River/KRSMA, a State park protected under Section 4(f). For both alternatives, it would mean using land from the Resurrection Pass Trail (minimum 10 acres). As indicated in Section 4.8.3, both the KRMSA and the Resurrection Pass Trail are considered generally important 4(f) properties. Option (a) is not considered a reasonable measure to minimize harm to the Hubbard District because of these impacts, coupled with the design issues associated with the G South extension alignment, including large cuts, long retaining walls and/or long road segments on pilings, and the associated costs (ii) and impacts (iii) described above in Section 4.6.1.2.

Option (b), avoidance to the south, is not considered to be a reasonable measure to minimize harm because of costs (ii) and impacts (iii). This option is represented by the previously studied Russian River Alternative, described in Section 4.6.1.2, which would use land from the Forest Service Russian River Campground, Russian Lakes Trail, Russian River Anglers’ Trail, and KNWR, all of which are Section 4(f) resources. These and other issues are addressed in more detail in Section 4.6.1.2.

Option (c), smaller shifts to route around known individual mining features within the district, may be reasonable as a measure to minimize harm. If the Cooper Creek or G South alternative were selected, DOT&PF would examine small design shifts or narrowing of the embankment width at contributing features during final design for potential to further minimize harm.

Measures to Minimize Harm—Design and Construction

Measures to minimize harm for the Hubbard Mining Claims District apply to the Cooper Creek and G South alternatives. Mitigation measures formalized in a Section 106 agreement among consulting parties would be implemented (see Section 4.6.1.3). DOT&PF would document any affected historic features in three dimensions (survey), with photographs, and with field notes before disturbing any mining features.

DOT&PF would incorporate design shifts or narrowing of the embankment width at contributing features during final design wherever practical to further minimize harm.

4.6.13 Kenai Mining and Milling Co. Historic District

4.6.13.1 Cooper Creek Alternative

Anticipated Use

The Cooper Creek Alternative would use land from Kenai Mining and Milling Co. Historic District (KMM District) as described in Section 4.5, including use of some contributing mining features within the district.

Avoidance Options

Because the affected portion of the KMM District occurs within the larger Sqilantnu Archaeological District, any attempt to avoid this resource would result in Section 4(f) impacts to the Sqilantnu District. See Section 4.4.3.

Measures to Minimize Harm—Alignment Options

Minimization of harm to the KMM District through design changes would mean (a) routing the alignment slightly farther to the south and west to route around or minimize impact to the district, or (b) route an alignment north of the district.

Option (a) is not considered reasonable as measure to minimize harm because of costs (ii) and impacts (iii). The discussion that follows includes multiple components. The concern about soil instability is based on reasonable inference from nearby soils investigations. However, the size of earth cuts, length of bridge, and impacts to other Section 4(f) properties were sufficient to determine this alignment was not reasonable as a measure to minimize harm to the KMM District.

Summary: For the KMM District/ Cooper Creek Alternative, minimization options (a) and (b) presented here are not considered reasonable. Therefore, no alignment shift is proposed as a minimization measure.

Note on numbers. These sections repeatedly refer to three criteria (i), (ii), (iii) in the definition of “all possible planning” to minimize harm. See Section 4.6.1.1.

The topography of the Cooper Creek valley is not conducive to moving the Cooper Creek alignment farther upstream. The new bridge over Cooper Creek would be forced into headland on the west side of the creek, requiring very large cuts in material of poor quality (based on well-known soil conditions on the opposite side of Cooper Creek valley). The alignment would require a higher and longer bridge—1,400 feet long versus the proposed 846 feet. Even if the bridge were able to be two lanes wide instead of the proposed three lanes (because of a passing lane on the proposed grade), the bridge would be 65 percent

longer, and this would translate to about 33 percent greater costs for the bridge, or approximately \$8 million. The realignment would not be able to take advantage of an existing lower terrace on the western side of Cooper Creek.

Rather than fitting the alignment to the topography in this area, the steep slopes in this area would require large cuts and fills. The cuts were calculated at up to 160 feet deep at the highway centerline (the height of a 16-story office building), and, while not calculated, likely would be substantially higher on the uphill side. The cuts would be in soils assumed to be similar to those on the opposite side of Cooper Creek known to include fine-grained soils that could be subject to erosion and slope failure. The DOT&PF soils engineers recommend designing terraces in the large cut that would occur on the east side of the creek to account for these soils; applying similar methods west of the creek would require greater soil removal and a higher cut height. These cuts likely would be visible from the Kenai River and from points across the river, including from Resurrection Pass Trail, a

visual impact in part affecting Section 4(f) properties. The grade would be right at the 6 percent maximum allowed by standards for more than a mile, suggesting that a climbing/passing lane should be added, which would widen the road and therefore further increase the depth of the cuts on the uphill side. The new alignment would cross Stetson Creek Trail farther up the valley. Inserting a trailhead parking area at this point and rebuilding the trail would shorten the trail, widen the footprint of the road-trail-parking, and thus increase the height of the earth cuts still farther. Such an alignment would minimize harm to the historic district and would reduce the acreage of impact to the Forest Service Kenai River Recreation Area, but the large volume of material to be removed, extra costs associated with the longer bridge and large cuts, and effects to the Stetson Creek Trail combine to render this option not reasonable as a measure to minimize harm to the KMM District.

Option (b), continued use of the existing alignment, is considered not reasonable as a measure to minimize harm because of impacts (iii). Use of the existing alignment east of Cooper Creek is represented by the Kenai River Walls Alternative examined earlier in the alternatives development process. This would require the construction of unusually high walls (180+ feet) in documented poor soils that could be subject to failure, and therefore could not be constructed as a matter of sound engineering judgment. However, at the point the existing right-of-way passes the KMM District, these issues do not occur; at that point it would be possible to avoid the KMM District if the alignment were not constrained to continue east within the existing right-of-way. Therefore, engineers also examined an alignment that would proceed straight east from the KMM District into a large cut and up onto a high bench to rejoin the Cooper Creek Alternative alignment. However, the cut in the hillside would be even larger than the cuts under option (a), with a maximum height of 220 feet. This single cut would require excavation of several million cubic yards of poor quality soils if done without retaining walls or would require walls higher than have been built in the U.S. The walls would be as tall as or taller than those examined for the Kenai River Walls Alternative and indicated by engineers as beyond the norms of standard engineering practice, and not recommended because of potential failure. For these reasons, option (b) is not considered a reasonable measure to minimize harm to the KMM District.

Measures to Minimize Harm—Design and Construction

Mitigation measures formalized in a Section 106 agreement among consulting parties would be implemented for the KMM District (see Section 4.6.1.3). Mitigation measures for this historic district apply only to the Cooper Creek Alternative. DOT&PF would document all affected historic features of the site, with photographs, diagrams, and field notes before disturbing any mining features.

DOT&PF would incorporate design shifts or narrowing of the embankment width at contributing features during final design wherever practical to further minimize harm.

4.7 Coordination Summary

Chapter 5, Comments and Coordination, addresses public and agency coordination and consultation extensively. Many of the general issues in the project area such as wildlife habitat fragmentation, water quality and fish habitat in the Kenai River, cultural sites impacts, and impacts to public recreation are Section 4(f)-related impacts, so the majority of the consultation addressed in Chapter 5 is relevant to Section 4(f). The following summarizes key points, with emphasis on efforts specific to Section 4(f) properties.

4.7.1 Coordination: General Public

Coordination began in 2000 with the general public and project stakeholders. This coordination has included residents of Cooper Landing and the project area as well as interested people outside the project area in interviews, five Stakeholder Sounding Board meetings, nine “Listening Post” meetings, and other meetings. Public meetings have been held in Anchorage and Kenai/Soldotna as well as in the project area. Meetings and interviews have included many interested non-governmental organizations. Some among the public and organizations have been highly interested in potential effects to the Kenai River, sport fishing, camping, trails, and other park and recreation issues. These typically are Section 4(f) resources. The public process continued through a formal comment period and public hearing process on the Draft SEIS, the proposed Section 4(f) *de minimis* impact findings, the Draft Section 4(f) Evaluation, and other public outreach efforts prior to publication of this Final EIS and Final Section 4(f) Evaluation. A public Notice of Availability has been published for this Final EIS in the *Federal Register* (Washington, D.C.), *Anchorage Daily News*, and Kenai Peninsula newspapers, with a comment period of 30 days prior to approval of the Record of Decision. Open house meetings are scheduled in Anchorage, Cooper Landing, and Soldotna to provide information and outreach during the comment period. Section 5.3 discusses public coordination in greater detail.

4.7.2 Coordination: Officials with Jurisdiction

Consultation with officials with jurisdiction began in 2001, during the EIS scoping process. Agency representatives, including land managers of the Borough, the State of Alaska, and the Federal government, were interviewed in 2001 to better understand area issues. An Agency Consultation Committee met six times between 2001 and 2006 and included the Section 4(f) land-managing agencies: DNR/SHPO, the Borough, the Forest Service, ADF&G, USFWS, and several tribal entities, including the Kenaitze Indian Tribe and CIRI, which have been most involved among tribal entities. Concerns of the land-managing agencies addressed refuge, park, recreation area, and cultural resource issues, often without necessarily specifying Section 4(f). Section 5.2.5 includes a summary of agency issues raised at that time.

A separate consultation track following the procedures of Section 106 of the NHPA included nearly 20 meetings of consulting parties between 2002 and 2016 (see also Sections 3.9.1.4 and 5.4). Some of the consulting parties, such as CIRI, SHPO, the Forest Service, and USFWS, are officials with jurisdiction over historic properties that have Section 4(f) protection. The consultation process has resulted in substantial advances—among which are expansion of the Sqilantnu Archaeological District boundaries and preparation of a Programmatic Agreement for the project.

Meetings specifically focused on Section 4(f) refuge, park, and recreation lands and issues occurred in 2007 and each year 2009–2016 (these were separate from the NHPA meetings). Some meetings were specific to one agency at a time, and some meetings occurred with multiple agencies. Those involved were:

- USFWS/KNWR (KNWR, its wildlife, and its facilities located in the project area): Nov. 28, 2007; April 30, 2009; June 2, 2009; Sept. 27, 2010; Aug. 30, 2012; Nov. 29, 2012; Jan. 20, 2015; Oct. 25, 2016 (teleconference); and May 18, 2017.
- Forest Service /CNF meetings (recreational trails, recreation areas/campgrounds): April 8, 2009; June 9, 2009; Aug. 19, 2010; Feb. 9, 2011; Sept. 1, 2011; April 10, 2012; Aug. 6,

2012; Nov. 29, 2012; Oct. 4, 2014; Aug. 11, 2015; Sept. 25, 2015; July 6, 2016; and May 18, 2017. Important correspondence includes a letter from the Forest Service to DOT&PF (Vaughan 2007) regarding significance and lack of significance of several properties under Forest Service jurisdiction and a summary of discussions and mitigation (DOT&PF 7/12/2009).

- Alaska DPOR (Kenai River/KRSMA, proposed KRSMA additions, boat launch ramps, Bean Creek Trail): April 9, 2009. Important correspondence includes an exchange of letters regarding significance of DPOR-managed property (Sinclair 2007) and a summary of discussions and mitigation (DOT&PF 7/12/2009).
- ADF&G, Sport Fish Division (boat launch ramps): April 30, 2009. Correspondence includes a summary of discussions and mitigation (DOT&PF 7/12/2009). Note also the ADF&G Habitat Division has participated extensively in wildlife meetings, which have been related to the wildlife/KNWR and KRSMA resources. Teleconference with Sport Fish Division Oct. 25, 2016.
- The Borough (trails, KRSMA, Borough lands): Nov. 30, 2012, Jan. 22, 2013.

DOT&PF and FHWA consulted with managing entities to develop an understanding of the location and boundaries of Section 4(f) properties, to understand the management direction governing those properties and the significance of the properties, and to discuss potential avoidance and measures to minimize harm to Section 4(f) resources. See also Factor (vi) in Section 4.8.1, below.

Coordination revealed that DOT&PF and FHWA had not overlooked any Section 4(f) properties or misunderstood the general significance of the project area's wildlife refuge, park, or recreation areas. DOT&PF and FHWA have accepted the opinions of the officials with jurisdiction regarding significance and impacts and have reflected these discussions in the description of impacts in this Section 4(f) Evaluation. DOT&PF's and FHWA's understanding of the severity of impacts and the findings of *de minimis* impact also reflect agency input, and the one remaining instance of *de minimis* impact reflects the opinions of the managing agency. Mitigation proposals presented in this Section 4(f) Evaluation typically are the result of discussion with the officials with jurisdiction. Mitigation proposals sometimes were proposed by DOT&PF and FHWA and sometimes proposed by the officials with jurisdiction, but all have been discussed with the officials. DOT&PF and FHWA have confidence that the mitigation measures to minimize harm to Section 4(f) properties are considered acceptable and reasonable by the land managers as measures to minimize harm.

The mitigation measures intended to facilitate animal movement and those intended to compensate for loss of cultural information have been topics of agency discussion. A wildlife mitigation study has been completed to generate data that has been used to refine the proposed wildlife mitigation (see Appendix I). The consultation process under the NHPA has resulted in a Programmatic Agreement document with the consulting parties regarding mitigation measures included as Appendix K. DOT&PF and FHWA are committed to coordination on these topics during design.

As indicated above, coordination is addressed in greater detail in Chapter 5.

4.8 Least Overall Harm Analysis

If project analysis concludes that there is no feasible and prudent alternative that would avoid Section 4(f) properties entirely, FHWA may approve only the alternative that causes the least overall harm in light of the Section 4(f) statute’s preservation purpose¹⁶ [23 CFR 774.3(c)].

The preceding sections of this Section 4(f) Evaluation, particularly Section 4.4, described efforts undertaken to identify feasible and prudent avoidance alternatives. Based on the information, analysis, and consultation conducted to date, no alternative that avoids all Section 4(f) properties has been identified. Therefore, this section of the Section 4(f) Evaluation presents information for consideration in identifying which alternative may cause the least overall harm.

4.8.1 The Seven Factors of Analysis

FHWA regulations [23 CFR 774.3(c)] state that:

The least overall harm is determined by balancing the following factors:

- (i) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- (ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- (iii) The relative significance of each Section 4(f) property;
- (iv) The views of the official(s) with jurisdiction over each Section 4(f) property;
- (v) The degree to which each alternative meets the purpose and need for the project;
- (vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- (vii) Substantial differences in costs among the alternatives.

The following sections provide background on each factor and summarize these issues for each alternative in turn. Much of the material in this section summarizes material that is presented in more detail earlier in this Section 4(f) Evaluation chapter. This analysis incorporates all previous sections, which are included in FHWA’s analysis. Related factors are discussed together.

Process used in this Section 4(f) Evaluation

The process outline, with the current step in bold, is as follows:

1. Identify Section 4(f) properties.
2. Evaluate whether any impact is likely to be a *de minimis* impact.
3. Identify any alternatives that would avoid all Section 4(f) properties.
4. Present the impacts of proposed alternatives on Section 4(f) properties.
5. Identify alignment shifts that could avoid individual Section 4(f) properties or minimize harm to individual properties, and identify other measures to minimize harm.
- 6. Evaluate least overall harm.**

¹⁶ Preservation purpose: “It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites” (49 USC 303[a]).

A preliminary Least Overall Harm Analysis was published in the Draft Section 4(f) Evaluation to provide an opportunity for public and agency comment. FHWA considered all comments and testimony, and considers the following documentation of the analysis its final Least Overall Harm Analysis. Note that not all Section 4(f) properties in the project area are included in the Least Overall Harm Analysis. Only those for which there would be a use by one or more of the build alternatives are included.

The analysis in the following pages incorporates the results of the *de minimis* impact analysis in Section 4.3, assumes the implementation of the minimization and mitigation measures discussed in Section 4.6, and incorporates the results of the agency consultation to date, as indicated in Section 4.1 and Chapter 5.

Table 4.8-1 lists those Section 4(f) properties included in the discussions that follow—including one *de minimis* impact determination that has been made. Table 4.8-12 through Table 4.8-18, which appear at the end of this section, summarize the principal issues addressed in this Least Overall Harm Analysis.

Table 4.8-1. Section 4(f) use^a, accounting for *de minimis* impact

Section 4(f) Property	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
KRSMA (Park)	Use	Use	—	—
Kenai National Wildlife Refuge	—	—	Use	—
Resurrection Pass National Recreation Trail	—	—	Use	Use
Bean Creek Trail ^b	—	Use	Use	Use
Stetson Creek Trail ^b	Use	—	—	—
Forest Service Kenai River Recreation Area	Use	Use	—	<i>de minimis</i>
Juneau Falls Recreation Area	—	—	Use	Use
Cooper Landing Boat Launch	Temporary Use	—	—	—
Sqilantnu Archaeological District (contributing sites protected by 4[f])	Use (28 sites)	Use (26 sites)	Use (9 sites)	Use (20 sites)
Confluence Site	Use	Use	Use	Use
Charles G. Hubbard Mining Claims Historic District	Use	Use	—	—
Kenai Mining and Milling Co. Historic District	Use	—	—	—

^a “Use” expressed in this table is somewhat separate from “impact” of Section 4(f) property. Properties noted as “*de minimis*” involve use of Section 4(f) property, but the use does not adversely affect the activities, features, and attributes of the Section 4(f) property. Because the impact is so small, this use would not have a determinative effect on the decision to select one alternative over another.

^b Bean Creek Trail has both historic segments and recreation segments. This table does not distinguish.

— = Not applicable or not affected

Notes: Table does not include properties to which Section 4(f) does not apply, or for which there has been determined to be no use. The Confluence Site is listed on its own row. It also is part of the Sqilantnu District.

4.8.2 Factors i and ii: Ability to Mitigate Impacts, and Magnitude of Remaining Impact

The ability to mitigate impacts (Factor i) and the magnitude of remaining impact after mitigation (Factor ii) are closely related and are discussed together for each alternative. Section 4.6 presents measures to minimize harm in greater detail than this section. FHWA considers the full suite of mitigation measures proposed for each alternative in its Least Overall Harm Analysis. The term “mitigation” as used in this document includes measures that would reduce impacts and measures that would compensate for impacts.

4.8.2.1 Cooper Creek Alternative

Table 4.8-2 summarizes impacts to the eight properties affected by the Cooper Creek Alternative. The following paragraphs address the Cooper Creek Alternative in relation to these Section 4(f) properties. Section 4.5.2 provides detail on impacts.

Table 4.8-2. Cooper Creek Alternative use overview

Impacts to Park, Recreation Area, Refuge Properties	
Kenai River Special Management Area	0.9 acre/0.02%
Stetson Creek Trail ^a	2.5 acres / 4.9% of the total
Cooper Landing Boat Launch and Day Use Area	0.55 acre / 10.4% of the total area (100% of the boat launch ramp area), but impact would be temporary
Forest Service Kenai River Recreation Area	41.3 acres/14.7%
Impacts to Historic Properties^a	
Sqilantnu Archaeological District	<ul style="list-style-type: none"> • 28 contributing historic properties buried or excavated • 165 acres / 1.3% of the total
Confluence Site	29.5 acres / 2.5% of the total
Kenai Mining and Milling Co. Historic District	<ul style="list-style-type: none"> • 2 contributing historic properties buried or excavated • 4.3 acres / 14.8% of the total
Charles G. Hubbard Mining Claims Historic District	<ul style="list-style-type: none"> • 7 contributing historic properties buried or excavated • 28.5 acres / 6.4% of the total

^a Acreage of impact is not a complete indication of impact, but provides a gauge of the extent of involvement of an alternative with a Section 4(f) property. The Sqilantnu Archaeological District and Confluence Site are different than the two historic mining districts: all land within the Sqilantnu District boundary or Confluence Site boundary is protected by Section 4(f). Only the contributing properties in the mining district boundaries are protected by Section 4(f).

KRSMA

Ability to Mitigate Impact. The Cooper Creek Alternative would replace two existing bridges over the Kenai River. DOT&PF and FHWA have the ability to mitigate permanent impacts, as fully explained in Section 4.6.2. Mitigation proposed would ensure minimal permanent in-water impacts (likely fewer piers than older bridges, and no more piers than exist today) and would ensure that the bridge was designed with aesthetics in mind as seen from the KRSMA. Construction impacts would be minimized through careful crafting of a river closure and navigation plan that accommodates boaters to the greatest extent possible, but temporary river closures to drift boats and rafts and temporary disturbance of the river bottom and river banks, causing siltation, are not

avoidable. DNR (DNR 2017) has expressed concern that according to the KRSMA management plan, public road construction on projects in upland areas should be located away from the Kenai River (Kenai River Comprehensive Management Plan, p. 60). The Cooper Creek Alternative would have the most alignment constructed within 300 feet of the Kenai River (43 percent) compared to other alternatives. They indicated that if Cooper Creek was selected, additional consultation would be needed relative to this prescription.

Magnitude of Remaining Impact. Mitigation would not eliminate the impacts of construction or permanent placement of new, wider bridges. Also, there are a few locations where the right-of-way would expand slightly into the river's edge, and where fill or riprap armoring would be placed along the high water line and be clearly visible to river users. Most of these locations are areas where the existing highway currently is visible. Overall, the permanent effect would be very similar to existing conditions. However, the road construction would be located within 300 feet of the river for 43 percent of its length.

Stetson Creek Trail

Ability to Mitigate Impact. The Cooper Creek Alternative would cross the Stetson Creek Trail. Mitigation proposed would include a new trailhead for the Stetson Creek Trail on the south side of the new highway and would include a short interpretive loop using the historic trail for campground users on the north side of the new highway. The ability to mitigate for trail connectivity and continuity is good. For example, a trail could be placed in a tunnel beneath the new highway. However, the Forest Service has indicated that doing so would perpetuate an existing management challenge stemming from two trailheads in the campground and conflicts between campground users and motorized trail users. At the request of the Forest Service, the two would not be physically linked. Interpretive signs explaining the historic significance of the trail would help to offset impacts to the historic trail's alignment and continuity.

Magnitude of Remaining Impact. Based on analysis above in this chapter, the creation of a new interpretive loop trail near the campground and new trailhead for the Stetson Creek Trail at the new highway is likely to create better recreation/access experience for trail users, but the historic trail alignment would be severed permanently. Mitigation in the form of interpretation could make clear to the public (campground users, trail users, and highway travelers stopping at the pullout/trailhead) the history of the trail and the prior connection between the lower portion and upper portion, replacing the physical through-connection of the trail with historic context that is not evident today. The specifics of this interpretation would be developed among consulting parties in the Section 106 process as part of a comprehensive agreement regarding mitigation.

Forest Service Kenai River Recreation Area

Ability to Mitigate Impact. Based on consultation, the primary function of the recreation area is to maintain a public lands buffer to the river for public access from the highway to the river, so the highway is integral to the purpose of the recreation area. The Forest Service indicated that minor changes to the existing right-of-way through the Kenai River Recreation Area likely would be found compatible (HDR 2007b). This outcome indicates that the Forest Service recognizes the highway as a long-standing adjacent use and recognizes that the magnitude of impact from construction and operation of the road in this area would be low. However, for the impacts that

would occur¹⁷—principally removal of forest buffer—there would be little ability to mitigate. DOT&PF would formalize (include in project design, and pave) the largest of the nine informal pullouts used for parking within the right-of-way adjacent to the recreation area and would avoid one other pullout. This would retain 35 of the estimated 63 current informal parking spaces along the recreation area. In addition, DOT&PF would work with the Forest Service during design to potentially add other parking mutually agreed to by the agencies, as described in Section 4.6.7.1. DOT&PF would also offer to return a small portion of existing right-of-way, no longer needed once the highway was straightened, to the Forest Service to be added to the recreation area. This land could be used to enhance public access or be allowed to regrow as part of the forest buffer. The ability to mitigate parking impact is good.

Magnitude of Remaining Impact. Much of the loss of land and vegetation to new road right-of-way and wider highway footprint would not be mitigated, although a small amount of existing right-of-way no longer needed would be made available to the Forest Service. Parking that would have been lost has been substantially retained, but some parking would be in a different location than the parking that currently exists. The character of the recreation area as a buffer between the highway and the river would remain quite similar to the character today. Overall, permanent impacts would be low.

Cooper Landing Boat Launch and Day Use Area

Ability to Mitigate Impact. The Cooper Creek Alternative would use the boat launch ramp area for the construction process and would limit public use of this area temporarily. However, the only impacts would be temporary impacts. There would be no permanent impact following construction. Therefore, overall ability to mitigate impact is good. The immediate proximity of the concrete boat launch ramp to the highway embankment means there would be no practical way to keep the boat ramp open at all times during the construction process. Impacts would be much reduced by timing intrusive construction stages outside of popular recreation times, but closures or restrictions on use would be likely during parts of the summer season.

Magnitude of Remaining Impact. Based on the analysis above in this chapter, FHWA believes the temporary use of the boat launch ramp during construction would cause adverse disruptive impacts for a short time but would not result in any permanent impacts.

Historic and Archaeological Districts

Ability to Mitigate Impact. The Cooper Creek Alternative would impact more cultural districts than the other alternatives, using property from the Sqilantnu Archaeological District, the KMM District, and the Charles G. Hubbard Mining Claims Historic District. Types of impact principally would be destruction or burial of sites or features that contribute to the districts. The ability to mitigate impacts is moderate. Mitigation includes partial recovery of data using qualified specialists, publications for professional and general public audiences about the archaeological district, and use of interpretive materials to raise public awareness. These efforts would partially

¹⁷ Through consultation on the Final EIS and Final Section 4(f) Evaluation, the Forest Service indicated they could not concur that the project would not adversely impact the activities, features, and attributes of the KRRR. As a result, the impacts are considered greater than *de minimis*. This change has affected the least overall harm analysis related to the Cooper Creek and G South alternatives.

mitigate impacts. There is potential for cultural material to remain after data recovery is completed, given that 100 percent recovery is rarely possible and is unlikely to be proposed. Any cultural material remaining after data recovery is generally accepted as lost, so the ability to fully mitigate impacts is not expected. The types of mitigation listed should, however, substantially raise public awareness of these cultural resources, which are now virtually unknown to the public.

Magnitude of Remaining Impact. Based on the analysis in Section 4.5, in other sections above in this chapter, and in Section 3.9, FHWA believes the impact to historic and archaeological districts after mitigation would be adverse but that public awareness of the resource would be higher than it is today.

Confluence Site

Ability to Mitigate Impact. Like all other build alternatives, the Cooper Creek Alternative would impact the Confluence Site. The type of impact includes changes to the “setting, feeling, and association” of the property. The existing highway is considered part of the Confluence Site, and the Cooper Creek Alternative would follow the existing alignment in this area, widening shoulders and improving curves. Mitigation includes partial recovery of data using qualified specialists, publications for professional and general public audiences about the area, including the Confluence Site, and an effort to interpret the archaeological and cultural importance of the area for the public. These efforts are expected to mostly compensate for the impacts. The ability to mitigate impacts is high.

Magnitude of Remaining Impact. Although the Cooper Creek Alternative would have a larger acreage of impact within the Confluence Site boundaries, the actual effect could be considered less than the two Juneau Creek alternatives because this alternative would follow the existing alignment. Based on the analysis above in this chapter and in Section 3.9, Historic and Archaeological Preservation, FHWA believes that the anticipated mitigation would not directly change impact to the setting, feeling, and association but would largely compensate for the impact.

4.8.2.2 G South Alternative

Table 4.8-3 summarizes impacts to the six properties affected by the G South Alternative. The following paragraphs address the G South Alternative in relation to these Section 4(f) properties. Section 4.5.3 provides detail on impacts.

Table 4.8-3. G South Alternative Section 4(f) use overview

Park, Recreation Area, Refuge Properties	
Kenai River Special Management Area	<ul style="list-style-type: none"> • 2.5 acres / 0.3% • One new bridge over the river
Bean Creek Trail ^a	1.0 acre / 3.2%
Forest Service Kenai River Recreation Area	31.9 acres/11.3%
Historic Properties ^a	
Sqilantnu Archaeological District	<ul style="list-style-type: none"> • 26 contributing historic properties buried or excavated • 173 acres / 1.4%
Confluence Site	30.2 acres / 2.5%
Charles G. Hubbard Mining Claims Historic District	<ul style="list-style-type: none"> • 4 contributing historic properties buried or excavated • 27.9 acres / 6.3%

^a Acreage of impact is not a complete indication of impact, but provides a gauge of the extent of involvement of an alternative with a Section 4(f) property. The Sqilantnu Archaeological District and Confluence Site are different than the historic mining district. All land within the Sqilantnu District boundary or Confluence Site boundary is protected by Section 4(f). Only the contributing properties in the mining district boundaries are protected by Section 4(f).

KRSMA

Ability to Mitigate Impact. The G South Alternative would replace the existing Schooner Bend Bridge over the Kenai River (KRSMA) in a location adjacent to the existing bridge. The G South Alternative would add a new bridge over the Kenai River near existing MP 51.2 (see Map 4-2, panel 2). This would add a third bridge to the two existing bridges over the upper Kenai River (project area). This new bridge would not be consistent with the Kenai River Comprehensive Management Plan, which identifies that the only recognized additional bridge crossing of the Kenai River in the management plan is the Funny River Bridge¹⁸ (Kenai River Comprehensive Management Plan, page 60). The mitigation proposed in Section 4.6.2 would ensure minimal permanent in-water impacts. The replacement bridge likely would have fewer piers than the older bridges, and no more than exist today, but there likely would be an overall increase in piers to support the three bridges instead of two. Mitigation also would ensure the bridges were designed with aesthetics in mind as seen from the KRSMA. The new and replacement bridges would change fish habitat, with piers in different locations and new shading of the river, riverbed, and shoreline (the replacement bridge would be wider than the existing bridge). Also, as an alternative with greater river-side mileage than the two Juneau Creek alternatives, there would be greater risk of potential hazardous substance spills into the Kenai River. Also, there are a few locations where the right-of-way would expand slightly into the river's edge, and where fill or riprap armoring would be placed along the high water line and would be clearly visible to river users. Most of these are areas where the existing highway is already visible. Overall, the impact of adding a third bridge would be impossible to eliminate and would be a permanent impact to fish habitat, river hydraulics, river navigation, and noise and visual impacts to river users. Guide services that operate on the river and general public users of the river downstream of Cooper Landing would be unable to avoid the visual impact of a new bridge. It is possible to mitigate impacts to the KRSMA, but the ability to mitigate is limited.

Magnitude of Remaining Impact. While impacts to KRSMA would be greater than those for other alternatives, principally because of the addition of a third bridge over the Kenai River, DOT&PF and FHWA are committed to considering the aesthetics of the bridges during design and that flooding and other hydraulic risks would be minimized. Both ADF&G and USFWS recommended using a clear span structure (this design was previously considered as described in Section 4.6.2.2 and determined not reasonable) and requested removing turn lanes and climbing lanes from the bridge. Given the steep grades and multitude of other sensitive resources, it is not reasonable to reduce the bridge footprint any further. Based on the analysis above in this chapter, FHWA believes the river would continue to function as a park for recreation, as a visual resource, as a free-flowing river navigable by small craft, and as fish habitat. However, the bridge would create a new risk for potential spills into the river, if a crash were to occur on or in the east and west approaches to the bridge. The intersection with the "old" Sterling Highway southwest of the bridge adds somewhat to this risk. DNR (DNR 2017) has expressed concern that according to the KRSMA management plan, public road construction on projects in upland areas should be located away from the Kenai River (Kenai River Comprehensive Management Plan, p. 60). The G South

¹⁸ The Funny River Bridge was a proposed bridge to connect the community of Sterling with the community of Funny River across the Kenai River. Design and environmental work for the bridge were completed in the late 1990s but it was never constructed.

Alternative would have one third of its alignment constructed within 300 feet of the Kenai River and its major tributaries. Furthermore, the new bridge across the Kenai River would not be consistent with the plan. If this alternative were selected additional consultation would be needed relative to the consistency with the plan.

Bean Creek Trail

Ability to Mitigate Impact. The G South Alternative would cross the Bean Creek Trail. Mitigation for the Bean Creek Trail would include establishing a formal summer trailhead north of the new highway, and rerouting the recreational spur of the trail under the new highway to maintain continuity. A winter pullout near the new trailhead for Bean Creek also would be constructed. The pullout would be sized to accommodate multiple trucks with snowmobile trailers. Mitigation also would include installation of interpretive signs explaining the trail’s historical significance. These measures would retain the trail as a working route, and therefore indicate good ability to mitigate impact to trail connectivity. However, there would be no way to eliminate the impact of the new highway and trail tunnel introducing an engineered structure in what had been a mostly natural (if formerly logged) environment. The historic alignment would be permanently severed at its southern end. The ability to mitigate these impacts is low.

Magnitude of Remaining Impact. Traffic noise levels would be relatively high for a short distance along the rerouted trail, but most trail use likely would start at the new trailhead and move quickly away from the highway. Based on the analysis above in this chapter, FHWA believes that mitigation will not eliminate or entirely compensate for impacts to the trail but that formalizing the trailhead will resolve long-standing management difficulties on the lower end of the trail. The historic route that terminates in the adjoining neighborhood would not be retained, so the small number of users who can access the trail from these lots today would no longer have a direct connection. There is potential that these summer and winter parking areas would make this the trailhead of choice for access to the entire Resurrection Pass Trail, which could require increased management for the Forest Service related to maintenance and operation of the lower parts of the two trails.

Forest Service Kenai River Recreation Area

Ability to Mitigate Impact. Based on consultation, the primary function of the recreation area is to maintain a public lands buffer to the Kenai River for public access from the highway to the river, so the highway is integral to the purpose of the recreation area. The Forest Service indicated that minor changes to the existing right-of-way through the Kenai River Recreation Area likely would be found compatible (HDR 2007b). This outcome indicates that the Forest Service recognizes the highway as a long-standing adjacent use and recognizes that the magnitude of impact from construction and operation of the road in this area would be low. However, for the impacts that would occur—principally removal of forest buffer—there would be little ability to mitigate. DOT&PF would formalize (include in project design, and pave) the largest of the nine informal pullouts used for parking within the right-of-way adjacent to the recreation area and would avoid one other pullout. This would retain 35 of the estimated 63 current informal parking spaces along the recreation area. In addition, DOT&PF would work with the Forest Service during design to potentially add other parking to the extent mutually agreed to, as described in Section 4.6.7.1. DOT&PF would also offer to return a small portion of existing right-of-way, no longer needed once the highway was straightened, to the Forest Service to be added to the recreation area. This

land could be used to enhance public access or be allowed to regrow as part of the forest buffer. The ability to mitigate parking impacts is good.

Magnitude of Remaining Impact. Much of the loss of land and vegetation to new road right-of-way and wider highway footprint would not be mitigated, although a small amount of existing right-of-way no longer needed would be made available to the Forest Service. Parking that would have been lost has been substantially retained. The character of the recreation area as a buffer between the highway and the river would remain quite similar to the character today. Overall, permanent impact would be low. However, while overall numbers of parking spaces would be retained, parking would be more concentrated than the current informal parking, which is likely to change use patterns and concentrate river impacts.

Historic and Archaeological Districts

Ability to Mitigate Impact. The G South Alternative would impact fewer cultural districts than the Cooper Creek Alternative but more than either of the Juneau Creek alternatives, using property from the Sqilantnu Archaeological District (including impacts to 26 contributing sites) and the Charles G. Hubbard Mining Claims Historic District. The types of impact would be principally destruction or burial of sites. Mitigation includes principally the recovery of data using qualified specialists, publications for professional and general public audiences about history of the area, and raising public awareness via interpretive materials. These measures indicate partial ability to mitigate impacts. There is always a potential for cultural material to remain after data recovery is completed, given that 100 percent recovery is rarely possible. Any cultural material remaining after data recovery is generally accepted as lost, and full mitigation of impacts would not be expected. Mitigation should, however, substantially raise public awareness of these cultural resources, which are now virtually unknown to the public.

Magnitude of Remaining Impact. Based on the analysis in Section 4.5, in other sections above in this chapter, and in Section 3.9, FHWA believes the impact to historic and archaeological districts after mitigation would be adverse but that public awareness of the resource would be higher than it is today.

Confluence Site

Ability to Mitigate Impact. Like all other alternatives, the G South Alternative would impact the Confluence Site. The type of impact for the Confluence Site includes changes to the “setting, feeling, and association” of the property. The existing highway is considered part of the Confluence Site, and the G South Alternative would follow the existing alignment through this area, widening shoulders and improving curves. Mitigation includes partial recovery of data using qualified specialists, publications for professional and general public audiences about the area, including the Confluence Site, and an effort to interpret the archaeological and cultural importance of the area for the public. These efforts are expected to mostly compensate for the impacts. The ability to mitigate impacts is high.

Magnitude of Remaining Impact. Although the G South Alternative would have a larger acreage of impact within the Confluence Site boundaries than the Juneau Creek alternatives, and although it would impact more sites, it would follow the existing alignment, which would change the setting less. However, the Kenaitze Indian Tribe indicated that “the G South Route provides the most potential for a multitude of events that could be catastrophic to the river and the life it supports both during and after construction.” They further indicated that “the Kenaitze Indian Tribe opposes

the G South Route as the preferred route and encourages Federal Highways to reconsider the selection.” They said that their “world view that does not acknowledge a difference between cultural and natural resources” and that they are “committed to protecting the Kenai River and all life that it supports, which is the primary reason we favor the Juneau Creek Route” (Kenaitze Indian Tribe 2016). CIRI also expressed support for the Juneau Creek Alternative, stating, “Of the realignment scenarios being considered for the area, the Juneau Creek Alternative appears to be the best fit with CIRI’s development and cultural resource protection goals” (CIRI 2015). Other consulting parties did not express views with regard to preferences on the alternatives. Based on the analysis above in this chapter and analysis reflected in Section 3.9, Historic and Archaeological Preservation, FHWA believes that the anticipated mitigation would not directly change impacts to the setting, feeling, and association but largely would compensate for them.

4.8.2.3 Juneau Creek and Juneau Creek Variant Alternatives

Table 4.8-4 and Table 4.8-5, respectively, summarize impacts to the six properties affected by the Juneau Creek and Juneau Creek Variant alternatives, including one property that would have a *de minimis* impact. The paragraphs following the tables address the Juneau Creek alternatives in relation to these Section 4(f) properties. Section 4.5.3 provides detail on impacts.

Table 4.8-4. Juneau Creek Alternative use overview

Park, Recreation Area, Refuge Properties	
Kenai National Wildlife Refuge	14.3 acres/0.00074%
Resurrection Pass Trail	7.4 acres/0.16%
Bean Creek Trail ^a	1.1 acres/3.55%
Juneau Falls Recreation Area	17.1 acres/5.3%
Historic Properties ^a	
Sqilantnu Archaeological District	<ul style="list-style-type: none"> • 9 contributing historic properties buried or excavated • 170.3 acres/1.4%
Confluence Site	<ul style="list-style-type: none"> • 14.7 acres/1.2%

^a Acreage of impact is not a complete indication of impact, but provides a gauge of the extent of involvement of an alternative with a Section 4(f) property.

Table 4.8-5. Juneau Creek Variant Alternative use overview

Park, Recreation Area, Refuge Properties	
Resurrection Pass Trail	7.4 acres/0.16%
Bean Creek Trail ^a	1.1 acres/3.55%
Forest Service Kenai River Recreation Area	<i>de minimis</i>
Juneau Falls Recreation Area	17.1 acres/5.3%
Historic Properties ^a	
Sqilantnu Archaeological District	<ul style="list-style-type: none"> • 20 contributing historic properties buried or excavated • 169 acres/1.3%
Confluence Site	<ul style="list-style-type: none"> • 20.1 acres/1.7%

^a Acreage of impact is not a complete indication of impact, but provides a gauge of the extent of involvement of an alternative with a Section 4(f) property.

KNWR

Ability to Mitigate Impacts. The Juneau Creek Variant Alternative would have no Section 4(f) use of the KNWR. The Juneau Creek Alternative would use KNWR land outside the existing highway right-of-way near the eastern refuge boundary to construct access back to the “old” Sterling Highway. For the purposes of this analysis, the FHWA assumes that the CIRI-DOI land trade will take place, resulting in a change of ownership of the area north of the existing highway, currently designated as KNWR/Federal Wilderness, needed to construct this alternative. The land area or percentage of KNWR that the Juneau Creek Alternative would affect is small compared to the millions of acres in the KNWR. Based on the analysis above in this chapter and in the cumulative impact analysis presented in Section 3.27.4.3, FHWA believes that the ability to mitigate land use and land management impacts to the KNWR is high, given that the land trade would eliminate the applicability of Section 4(f) on the north side of the highway.

In addition, there is the potential that wildlife movement in and out of KNWR would be affected under the Juneau Creek Alternative, because the alignment would cross the length of the topographic bench areas on both sides of Juneau Creek, an area that is important habitat and a movement area for both moose and bears. These impacts¹⁹ would occur mostly outside KNWR but would affect wildlife that moves across the KNWR boundary. The study of wildlife movement and potential crossing sites has refined mitigation regarding the proposed placement of wildlife crossings of the highway and other methods of protecting wildlife and wildlife movement. Such techniques would help to retain movement in and out of KNWR and help to reduce risk of vehicle-wildlife collisions. DOT&PF and FHWA are optimistic that implementing the mitigation identified in Appendix I and continued coordination with the resource agencies during design would minimize impacts to wildlife movement.

Magnitude of Remaining Impact. Because of the anticipated change in KNWR and designated Wilderness boundaries north of the existing highway, the magnitude of impact from the Juneau Creek Alternative would be minor.²⁰ The acreage and percentage of land used south of the existing highway would be small.

Mitigation measures such as the dedicated wildlife crossings of the highway would reduce impacts to wildlife movement in and out of the KNWR, but increased levels of habitat fragmentation,

¹⁹ The Juneau Creek Variant Alternative would have almost the same effects on wildlife movement in and out of the KNWR, and the G South Alternative would have similar but lesser impacts, also affecting movement to and from lower Juneau Creek. The Cooper Creek Alternative also would impact wildlife movement, but in a different area with less importance for wildlife movement (based on consultation with agencies). However, none of these alternatives would have a Section 4(f) use of property from the KNWR, so the wildlife movement impacts under these alternatives are discussed in Chapter 3.22.

²⁰ The USFWS, in its capacity as a cooperating agency for this EIS and as the official with jurisdiction over lands currently designated Wilderness, stated the following: “While designated Wilderness would not be directly affected by the JC alternative following a land exchange, visual and noise-related impacts to adjacent Wilderness would remain. We believe these impacts will be substantial enough to be classified as ‘moderate.’” DOT&PF and FHWA carefully considered this point of view and responded that the EIS is meant to assess impacts compared to existing conditions. Existing conditions include the Wilderness boundary coincident with the highway right-of-way and noise and visual effects as seen and heard from Wilderness, which was established around the pre-existing highway. While there would be new impacts (slightly new areas affected; incremental changes to views of non-Wilderness lands), and while the position of the USFWS is acknowledged, DOT&PF and FHWA have retained the characterization of these impacts as minor,

habitat loss, and animal mortality from vehicle-animal collisions would remain for the Juneau Creek Alternative at a higher level than exists today—impacts that are unlikely to be fully mitigated.

Resurrection Pass Trail

Ability to Mitigate Impact. The Juneau Creek and Juneau Creek Variant alternatives would affect the Resurrection Pass Trail identically. The alignment would cross the Resurrection Pass Trail overhead, and a new trailhead would be constructed near this crossing. The use pattern of the trail would change substantially. Measures to minimize harm that have been incorporated into the alternatives include the proposed passage of the Resurrection Pass Trail under the new highway bridge, which would keep the trail from being segmented for users who want to use the existing trailhead or experience the full length of the trail. The new trailhead would provide off-highway parking to minimize safety concerns related to users walking and parking along the new highway. Addressing bridge aesthetics during design by consulting Forest Service landscape architects would reduce but not eliminate the visual intrusion of the structure on the landscape. Proposed mitigation includes construction of pedestrian walkways for crossing the Snow River bridges on the long-distance Iditarod National Historic Trail²¹; this would compensate for the loss of the long-distance Resurrection Pass Trail experience. These measures indicate a moderate ability to minimize and compensate for project impacts. However, it would not be possible to eliminate impacts or reduce them to near zero. The reason for this is that there would be no way to eliminate the new highway and bridge from intruding as engineered structures crossing the trail 3.4 miles from the existing trailhead, in what had been a natural, backcountry environment. Such an intrusion would substantially change the southern portion of the full 38-mile trail experience.

Magnitude of Remaining Impact. Based on the analysis above in this chapter, FHWA believes that mitigation measures would make the new highway and the trail mesh well in a new configuration but that impacts to the existing character of the trail could not be eliminated or substantially reduced. See also the related discussion below under Juneau Falls Recreation Area, indicating the enhancements to the recreation area near the location where the highway would cross the trail. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

Bean Creek Trail

Ability to Mitigate Impact. The Juneau Creek and Juneau Creek Variant alternatives would cross the Bean Creek Trail. Mitigation would include rerouting a substantial section of the trail off of its historic route to pass under the eastern end of the proposed Juneau Creek highway bridge (avoiding an at-grade crossing of the new highway), and interpreting trail history for the public. These measures would retain the trail as a highly functional working route.

Magnitude of Remaining Impact. There would be no way to eliminate the impact of the new highway and bridge introducing an engineered structure in what had been a natural environment.

²¹ DOT&PF and FHWA are committed to completing this by the time the Sterling Highway MP 45-60 project construction has been completed.

With the severing of the historic alignment and rerouting of the trail, the bypassed segment of the historic alignment likely would fall into disuse and might be lost over time as an identifiable trail. Based on the analysis in earlier sections of this chapter, FHWA believes the main mitigation proposed—trail rerouting—would retain the trail’s recreational function but that remaining aesthetic impact and impact to the historic route could not be well mitigated.

Forest Service Kenai River Recreation Area

Ability to Mitigate Impact. No impact to the Kenai River Recreation Area would occur under the Juneau Creek Alternative. The Juneau Creek Variant Alternative would use a small corner of the recreation area, at its western end. The type of effect would be similar to effects from the Cooper Creek and G South alternatives—removal of forest buffer—but the amount would be substantially less. Mitigation of the visual impact of the new highway from the existing highway would occur, and would focus on making the new highway as attractive as possible within the recreation area. Such measures might include revegetation, landscaping, and attractive treatments of retaining walls. These measures indicate substantial ability to mitigate impacts to the recreation area, but would not eliminate all impact.

Magnitude of Remaining Impact. Based on consultation with the officials with jurisdiction, and the proposed measures to minimize harm, the FHWA has found the magnitude of impact remaining to the recreation area after mitigation would be a *de minimis* impact, and officials with jurisdiction have concurred in writing that this alternative would not adversely affect the activities, features, or attributes of the Kenai River Recreation Area. See Section 4.3. A finding form and the concurrence letter appear in Appendix F.

Juneau Falls Recreation Area

Ability to Mitigate Impact. The Juneau Creek and Juneau Creek Variant alternatives would affect the Juneau Falls Recreation Area identically. The impacts and measures to minimize harm overlap heavily with those discussed above for the Resurrection Pass Trail, because the trail passes through the recreation area. The highway alignment would cross the southern portion of the recreation area and bridge the canyon that is a central geographic feature of the area. The use pattern of the trail/recreation area/falls/backcountry campsites is expected to change substantially. Extensive mitigation is proposed. Besides the new trailhead, a walkway would be included on the bridge, with trails on each end that would connect respectively to the Resurrection Pass Trail and the Bean Creek Trail. This walkway would allow for safe pedestrian crossings of the highway and safe passage on the bridge, with access to broad views of the Kenai River Valley. These connections would create a loop trail around the falls. These measures would substantially compensate for impacts. The recreation area would function differently than it does today but would serve an important recreation function within CNF—as a highway-related recreation area instead of a backcountry recreation area.

Magnitude of Remaining Impact. Based on the analysis in earlier sections of this chapter, FHWA believes the magnitude of remaining impact to the recreation area as a whole would be moderate, because there would be a mix of change to the existing recreational environment and development of new recreational opportunity. FHWA believes the mitigation measures proposed would substantially help the recreation area to function well given its change to front-country status, compared to placing the highway through the recreation area without the measures proposed.

Historic and Archaeological Districts

Ability to Mitigate Impact. The Juneau Creek and Juneau Creek Variant alternatives would cross the Sqilantnu Archaeological District but would not affect any other historic district. The predominant impact would be destruction of, respectively, 9 and 20 contributing archaeological sites or features. Although there are human burials within an area affected by the Juneau Creek Variant Alternative, no graves would be disturbed. Mitigation to be proposed is likely to include principally the recovery of data using trained specialists, publications for professional and general public audiences about the area, and raising public awareness via interpretive materials. There is always a potential for cultural material to remain after data recovery is completed, given that 100 percent recovery is rarely possible and is unlikely to be planned. Any cultural material remaining after data recovery is generally accepted as lost, so the ability to fully mitigate impacts is not expected. Mitigation should, however, substantially raise public awareness of these cultural resources, which are now virtually unknown to the public.

Magnitude of Remaining Impact. Based on the analysis in Section 4.5, in other sections above in this chapter, and in Section 3.9, FHWA believes the impact to historic and archaeological districts after mitigation would be adverse but that public awareness of the resource would be higher than it is today. Based on the number of sites impacted and the Confluence Site discussion below, the remaining impact would be higher for the Juneau Creek Variant Alternative than for the Juneau Creek Alternative.

Confluence Site

Ability to Mitigate Impact. Like all other alternatives, the two Juneau Creek alternatives would impact the Confluence Site. These two alternatives would pass through the northern edge of the Confluence Site on different alignments in an area not currently affected by development. The Variant would pass through CIRI Tract A, which represents the heart of the Confluence Site. Consulting parties (CIRI, the Kenaitze Indian Tribe, USFWS, and Forest Service) have indicated it is not possible to mitigate impacts to Tract A. The Juneau Creek Alternative would avoid Tract A. The impact for the Confluence Site includes changes to the “setting, feeling, and association” of the property. Mitigation includes partial recovery of data using qualified specialists, publications for professional and general public audiences about the area, including the Confluence Site, and an effort to interpret the archaeological and cultural importance of the area for the public.

Magnitude of Remaining Impact. Based on the analysis above in this chapter and analysis reflected in Section 3.9, FHWA believes that the anticipated mitigation would not directly change impacts to the setting, feeling, and association but would partially compensate for them. FHWA accepts the consulting parties’ opinion that it is not possible to completely mitigate for effects to Tract A under the Juneau Creek Variant Alternative.

4.8.3 Factor iii: Relative Significance of Each 4(f) Property

The “relative significance” of Section 4(f) properties refers to a comparison of different Section 4(f) properties to each other (see Table 4.8-6 and Table 4.8-7). The comparison presented is a DOT&PF and FHWA judgment based on consideration of the apparent importance of a property depending upon its use levels, how it was established, consideration of management plans, consultation with the officials managing the properties, and research about the project area. Table 4.8-6 presents three ways of considering relative significance. Table 4.8-7 indicates a final

interpretation of significance based on the information in Table 4.8-6 and other considerations described below.

In general, referring to Table 4.8-6, indication of greater relative significance would be properties that have public use above 50,000²² (column 1), protection under Federal law (named in law; column 2), and/or an expression of strong concern by the managing agency or engagement and interest by multiple agencies (column 3).

Indications of moderate significance would be properties with public use important enough to be counted but counted at under 50,000, protection under State law (named in the law), and/or expression of concern by the managing agency but not of highest concern.

Indications of lower relative significance would be properties with public use quite low or not important enough to agencies to track and record, protection enabled principally by administrative decisions, and/or relatively little expression of concern by the managing agency.

The KRSMA in the project area sees the most use of any of the properties—many times more than the other properties under consideration. This reflects the Kenai River’s value not only for direct recreation (e.g., fishing and boating) but also for its protection of habitat for salmon, which are important as prey species for wildlife, and for Cook Inlet commercial fishing, sport fishing in the inlet, and tourism, affecting not only the Borough economy but the statewide economy (see also the background information in Section 4.2.2). In addition, KNWR and the Forest Service have signed a memorandum of agreement regarding the State’s *Kenai River Comprehensive Management Plan*, indicating the river’s significance to all area land-managing agencies. Note that it is the river that is prominent among the public, not its status as a legislatively designated “special management area” or as a unit of the State park system.

In comments on the EIS and Section 4(f) Evaluation, multiple agencies, the Kenaitze Indian Tribe, and members of the public indicated that FHWA should elevate the significance of the Kenai River in the decision making process. For example, DNR (which manages KRSMA through DPOR) said “...the overall value of the Kenai River has not been given adequate consideration in the Section 4(f) conclusions, which form the basis for the selection of the preferred alternative.” DNR further stated, “the Kenai River is widely known as one of the most outstanding recreation resources in Alaska, and receives more recreational use than the rest of the state combined.” ADF&G (which manages the fish and related resources in the river) said “the 4(f) decision process and the final EIS would be improved by more adequately weighting the fisheries importance of the Kenai River.”

²² 50,000 is not an absolute number indicating significance. It is a round figure evident in the table as a break point. Some properties have use levels in the 4,000-5,000 range, and some have 10 times as much use. The higher levels of use are one measure of greater significance.

Table 4.8-6. Use and recognition of 4(f) properties affected by alternatives

Property	(1) Annual use	(2) Protection/ Recognition	(3) Agency indicators of significance
KRSMA (Park)	25,000 boaters and 51,000 angler days (upper river), with 365,863 to 455,578 angler-days annually between 2011 to 2015 in the River overall.	Established by State law	Comprehensive Plan memorandum of understanding is signed by Forest Service, USFWS, State, and Borough. Comments from DNR, ADF&G, Forest Service, EPA, and Tribal entities suggest that the Kenai River is the most used and important resource.
KNWR	300,000 or more across the entire refuge; fewer in project area. A substantial portion of the boaters and angler days reported above use KNWR in the project area.	Established by Federal law (ANILCA)	Considerable concern expressed by USFWS during this project. Concern for wildlife that enters and leaves KNWR expressed also by ADF&G and Forest Service.
Resurrection Pass National Recreation Trail	4,000–5,000 on the impacted (southern) portion of the trail (10,000 on the overall trail system, including both ends of the trail and side trails).	Established by nomination/Federal decision under National Trails System, + protected under ANILCA ^d	Forest Service stated for this project that it considers the trail to be the “crown jewel” of CNF trail system.
Bean Creek Trail ^a	<4,000 ^b	Protected by State and Federal decision under federal law (NHPA 106), + in Forest Service management plan	Forest Service, State, Borough cooperate for lower trail. Low maintenance and no user tracking; SHPO general interest.
Stetson Creek Trail ^a	<4,000 ^b	Protected by State and Federal decision under Federal law (NHPA 106), + in Forest Service management plan	Forest Service during this project indicated this trail less important than its other trails. Low maintenance and no user tracking. SHPO general interest.
Forest Service Kenai River Recreation Area	Well used by people focused on the river and viewed by drivers on highway, but not known as a formal recreation area.	Designated by Federal Agency by Public Land Order to prevent other uses	Concern expressed by Forest Service for this project.
Juneau Falls Recreation Area	<4,000 ^b Known for waterfall; not known as a formal recreation area.	Designated by Federal Agency by Public Land Order to prevent other uses	Considered more important/sensitive by Forest Service than Kenai River Recreation Area.

Property	(1) Annual use	(2) Protection/ Recognition	(3) Agency indicators of significance
Cooper Landing Boat Launch and Day Use Area	+/-200,000	Established by State under Federal fishing access law	Concern expressed by State for this project.
Sqilantnu Archaeological District	<4,000 ^b	Protected by State and Federal decision under Federal law (NHPA 106), + recognized in Federal law (Russian River Land Act)	Considered important by Tribes, CIRI, Forest Service, and USFWS, which have signed an MOU, and by SHPO.
Confluence Site	Conscious use of the Site: <4,000 ^b However, much of the KRSMA use (above) is part of the cultural exchange “treated-as” TCP status. ^c	Protected by State and Federal decision under Federal law (NHPA 106), + recognized in Federal law (Russian River Land Act)	Considered important by SHPO, Kenaitze Tribe, CIRI, USFWS, and Forest Service, which have signed a Russian River Lands Act MOU, and by SHPO.
Charles G. Hubbard Mining Claims Historic District	<4,000 ^b	Protected by State and Federal decision under Federal law (NHPA 106)	SHPO/Forest Service expressed general interest during this project. Much less concern than Sqilantnu District.
Kenai Mining and Milling Co. Historic District	<4,000 ^b	Protected by State and Federal decision under Federal law (NHPA 106)	SHPO/Forest Service expressed general interest during this project. Much less concern than Sqilantnu District.

Note: The public use numbers cannot be completely separated. For example, people who put in a raft at Cooper Landing Boat Launch and take out at Jim’s Landing may be counted for the Cooper Landing Boat Launch, KRSMA, and KNWR, and could be counted on trails on the same day.

^a Bean Creek Trail has both historic segments and recreation segments, and Stetson Creek Trail throughout has both recreation and historic values. This table does not distinguish between the two.

^b For many properties, there are no counts or estimates of use, but officials with jurisdiction indicate use is relatively low. This table uses “< 4,000” to indicate lower use than the Resurrection Pass Trail—the property with the lowest counts in the project area. Active human use is not considered a definitive marker of significance for historic properties or waterfowl and wildlife refuges, as they may have inherent significance even when human use is limited or prohibited.

^c The Kenaitze Indian Tribe indicated they considered Confluence Site a TCP in part because of its ongoing function as a gathering place for cultural exchange among all people, centered around the river confluence and fishing. Thousands of people pass through the Site on the highway and thousands stop for fishing, viewing, hiking the banks, etc., but the vast majority is unlikely to be aware that they are in a culturally rich area in which similar activities have been occurring for hundreds or thousands of years.

^d The Alaska Attorney General provided an opinion indicating that the Resurrection Pass Trail is not a CSU under ANILCA. The Forest Service believes it is. In any case, DOT&PF and FHWA have provided the requisite information and analysis for the Forest Service to make a decision.

The Sqilantnu District and Confluence Site also have national significance, and the interpretive sites are important to the public. The district and Confluence Site are of particular importance to the Kenaitze Tribe, the SHPO, and CIRI (which expended great effort to secure the “archaeological estate” in the Russian River Ferry area as part of its land claims under ANCSA). While the

archaeological sites, the district as a whole, and the Confluence Site are not generally known to the public, the Confluence Site incorporates portions of both the Kenai and Russian rivers and is significant not only for its archaeology and landmarks of Alaska Native culture, but for its ongoing cultural exchange among many cultures. This specifically includes the dominant culture that sees the river as a sport fishing attraction and that creates media attention for the rivers. In this way, the Confluence Site could be thought of as combining the significance of KRSMA and of the Sqilantnu District.

The Kenaitze Indian Tribe, which has co-management jurisdiction over the Sqilantnu District and Confluence Site, echoed this sentiment and weighed in on the relative significance of the various Section 4(f) properties (Kenaitze Indian Tribe 2016). The Kenaitze Indian Tribe acknowledged “the history and use of the Resurrection Trail as a premier backcountry experience” but asked that consideration be paid to the numbers of those who hike the trail compared to “the number who depend on the health of the Kenai River for subsistence and recreational use.” The tribe went on to add that “the Kenai River offers premier recreational opportunities and the number of people who utilize this as compared to the Resurrection Trail is significantly higher.”

Despite the tribe’s concerns over effects to specific archaeological/cultural sites affected by the alternatives expressed through the Section 106 consultation efforts, the Kenaitze Indian Tribe views its management role more holistically, and their management view toward their cultural heritage is closely tied to the river. The Kenaitze Indian Tribe explained that according to “Kenaitze-Dena’ina values, traditions and culture are based on a world view that does not acknowledge a difference between cultural and natural resources.” They indicated that “the term ‘4F properties’ [sic] is incompatible with our holistic approach to serving as stewards of our ancestral lands and the voice of the fish, animals, and our past and future generations.” Because of this worldview, the Kenaitze Indian Tribe indicated that the tribe is “committed to protecting the Kenai River and all life that it supports” and commented that that was the “primary reason” the tribe favors the Juneau Creek Alternative.

The Resurrection Pass Trail is designated as a National Recreation Trail, is known nationally, and is among the most-used long-distance hiking trails in the state. The Forest Service, as manager of the trail, indicated it as the “crown jewel” of the CNF trail system and expressed strong concern over impacts to the trail. Nevertheless, in discussing the relative significance of the various Section 4(f) properties, the Forest Service, which manages the trail (and also claims the Kenai riverbed as part of CNF and manages substantial portions of the riverbanks and adjacent uplands) noted that the “...KRSMA sees the most use of any of the 4(f) resources listed and is the main economic driver of the Region.”

KNWR is vast, nationally important, and the most visited of the Federal refuges in Alaska. In the project area, a key KNWR attribute is the sport fishing activity that centers on the confluence of the Kenai and Russian rivers and KNWR’s Russian River Ferry. Other important KNWR features and attributes are the wildlife that moves in and out of the refuge and across the highway within the refuge, Wilderness recreation opportunities, and the visitor contact station that is the first contact point for travelers coming from points east.

The Juneau Falls Recreation Area has high value to the Forest Service although it is known to the public not as a “recreation area” but as a scenic view of a waterfall along the trail. It appears to have less value than the KRSMA, KNWR, or the Resurrection Pass Trail. The use level of the recreation area separate from the Resurrection Pass Trail is unknown, but likely is much less than

trail use and a small fraction of KRSMA use. The Cooper Landing Boat Launch and Day Use Area is a smaller, site-specific recreational facility on a different scale than KNWR, KRSMA, or the Resurrection Pass Trail, but it has high use levels and is important to the public and managers of the river corridor as the upstream put-in point for boating trips on the upper Kenai River.

Because different people and different agencies place different values on different types of Section 4(f) properties, it is difficult to rank each of the properties individually in order of significance. However, DOT&PF and FHWA grouped the properties into categories based on their relative significance, as shown in Table 4.8-7. The interpretation of significance is based on the analysis presented in this section, on input from the officials with jurisdiction (DNR, ADF&G, Forest Service, USFWS, the Kenaitze Indian Tribe, and CIRI), and public comments during the review of the Draft Section 4(f) Evaluation. Based on the information and analysis, FHWA has determined that the Kenai River, managed as KRSMA, is the most significant Section 4(f) resource in the project area. Among other things, this ranking reflects the fact that the river draws many more visitors than other properties in the project area and has a substantial influence on the economy in the project area, Kenai Peninsula, and statewide. The ranking is supported by the agencies with direct jurisdiction over the resource (DNR/DPOR and ADF&G) and by managers of other properties, including the Forest Service. Additionally, multiple other agencies, including the local government and members of the public, commented on the importance of the river. Tribal entities (CIRI and the Kenaitze Indian Tribe) have similarly expressed strong support for protection of the river as their top priority for protecting their cultural resources and land interests.

Table 4.8-7. Categories of relative significance among 4(f) properties

Highest significance	Higher significance	Moderate significance	Lower significance
<ul style="list-style-type: none"> • KRSMA 	<ul style="list-style-type: none"> • Resurrection Pass Trail • Kenai National Wildlife Refuge • Sqilantnu Archaeological District • Confluence Site 	<ul style="list-style-type: none"> • Juneau Falls Recreation Area • Cooper Landing Boat Launch and Day Use Area • Kenai River Recreation Area • Bean Creek Trail 	<ul style="list-style-type: none"> • Stetson Creek Trail • Kenai Mining and Milling Co. Historic District • Charles G. Hubbard Mining Claims Historic District

The relative Section 4(f) use of each alternative on the more important properties is discussed below.

4.8.3.1 Cooper Creek Alternative

The Cooper Creek Alternative would use land from the following “highest significance” property:

- KRSMA (two replacement bridges)

Additionally, the Cooper Creek Alternative would use land from the following “higher significance” properties:

- Sqilantnu Archaeological District
- Confluence Site

Finally, the Cooper Creek Alternative would use land from the following “moderate significance” properties:

- Cooper Landing Boat Launch and Day Use Area
- Forest Service Kenai River Recreation Area

4.8.3.2 G South Alternative

The G South Alternative would use land from the following “highest significance” property:

- KRSMA (one replacement bridge, one new bridge)

Additionally, the G South Alternative would use land from the following “higher significance” properties:

- Sqilantnu Archaeological District
- Confluence Site

Finally, the G South Alternative would use land from the following “moderate importance” properties:

- Bean Creek Trail
- Forest Service Kenai River Recreation Area

4.8.3.3 Juneau Creek Alternative

The Juneau Creek Alternative would not use land from KRSMA, the “highest significance” property. The Juneau Creek Alternative would use land from the following “higher significance” properties:

- KNWR
- Resurrection Pass Trail
- Sqilantnu Archaeological District
- Confluence Site

Additionally, the Juneau Creek Alternative would use land from the following “moderate significance” properties:

- Juneau Falls Recreation Area
- Bean Creek Trail

4.8.3.4 Juneau Creek Variant Alternative

The Juneau Creek Variant Alternative would not use land from KRSMA, the “highest significance” property. The Juneau Creek Variant Alternative would use land from the following “higher significance” properties:

- Resurrection Pass Trail
- Sqilantnu Archaeological District
- Confluence Site

Additionally, the Juneau Creek Variant Alternative would use land from the following “moderate significance” properties:

- Juneau Falls Recreation Area
- Bean Creek Trail
- Forest Service Kenai River Recreation Area (however, the impact is *de minimis*)

4.8.4 Factor iv: Views of Officials with Jurisdiction

The following paragraphs provide an overview of the views expressed by the officials with jurisdiction over each property. Section 4.7 provides further information about consultations, including meeting dates specific to Section 4(f)-related discussions, and Chapter 5 provides a broader detailed summary of agency coordination for the entire project.

KRSMA. The DNR/DPOR agreed that the Kenai River/KRSMA is an important park resource and that land areas proposed as KRSMA additions, although significant resources, would not be subject to Section 4(f) protection unless formally added to the KRSMA by the Alaska Legislature. DNR/DPOR indicated that the Cooper Creek Alternative appeared less favorable overall because of soil stability questions, and the Juneau Creek alternatives appeared likely the most realistic alternatives, with Juneau Creek Alternative appearing to be most favorable to the river, because of a higher degree of separation from the river.

In its review of the preliminary Final EIS, DNR (DNR 2017) reiterated its view that protecting the river should be a primary consideration in the decision, indicating that “the impacts to the Kenai River, a resource of significant social and economic importance to the State of Alaska, have not been appropriately factored into the selection of the G South Alternative as the preferred alternative”²³. DNR went on to indicate that, “while we understand many factors are taken into consideration in that determination, we are concerned that the overall value of the Kenai River has not been given adequate consideration.” DOT&PF and FHWA have carefully considered this input and comments from other cooperating agencies and the public and have taken a fresh look at this least overall harm analysis and the conclusions presented in Section 4.8.8 and Section 4.8.9. Additional information provided by DNR was added to Section 4.2.2.

ADF&G indicated that the Juneau Creek and Juneau Creek Variant alternatives would have the least impact to the Kenai River and important fisheries resources. Both agencies felt that non-point-source pollution from road runoff and potential risk of spills would be less under the Juneau Creek and Juneau Creek Variant alternatives due to the greater distance between large portions of the main highway (most traffic) and the Kenai River, including portions of tributaries that provide habitat for anadromous fish. ADF&G also stated that the Juneau Creek and Juneau Creek Variant alternatives would have fewer temporary in-river impacts during construction. The new bridge proposed under the G South Alternative was a concern for both agencies because of permanent visual impact, increased impact to riparian habitat (because of the addition of a new bridge), and construction impact that could mean temporary closure of the river to guides and other river users.

²³ In December 2015, DOT&PF and FHWA identified the G South Alternative as the preferred alternative. Based on input and additional data provided since that time, the Final Section 4(f) Evaluation has been updated and revised.

ADF&G said that all build alternatives would be improvements over the current conditions because they would move **most traffic** away from the Kenai River and construct safer traffic corridors.

In comments during cooperating agency review of the Preliminary Final EIS, ADF&G (ADF&G 2017) indicated: “After assessing...the potential impacts each alternative has on fish habitat, fisheries, and wildlife, ADF&G recommends one of the Juneau Creek Highway Alternatives as the preferred route.” ADF&G also indicated that the Section 4(f) decision process would be improved by more adequately weighting the fisheries importance of the Kenai River. DOT&PF and FHWA have carefully considered this input and comments from other cooperating agencies and the public, and have taken a fresh look at this Least Overall Harm Analysis and the conclusions presented in Sections 4.8.8 and 4.8.9. Additional information provided by ADF&G related to the importance of the fishery has been added to Sections 4.2.2 and 4.8.6.2.

In its comments on the Draft SEIS, EPA (EPA 2015) rated the Cooper Creek alternative with “Environmental Objections” primarily due to impacts associated with the Kenai River, stating “For the Cooper Creek and G South alternatives, we believe the potential impacts to the Kenai River and associated floodplain are likely serious and should be avoided...” They went on to indicate that their primary environmental concern was with potential impacts to water quality and aquatic resources in the Kenai River and its floodplain, stating that, “given that the Juneau Creek and Juneau Creek Variant move impacts away from the Kenai River and its associated floodplain, we have identified these alternatives as environmentally preferable to the other build alternatives.” They felt that based on the information presented in the Draft SEIS, “it appears that one of the Juneau Creek alternatives, or a variation of the two, may be the (least environmentally damaging practicable alternative, or LEDPA).”

KNWR. In multiple meetings, the greatest concerns of USFWS were about impacts to designated Wilderness (Juneau Creek Alternative), Sportsman’s Landing/Russian River Ferry facilities (Cooper Creek, G South, and Juneau Creek Variant alternatives), brown bear habitat (particularly in the MP 55–58 (KNWR) area), and movement of wildlife across the highway in general (applicable to all alternatives, but a Section 4(f) issue only for the Juneau Creek Alternative). USFWS characterized the visual impacts of the Juneau Creek Variant Alternative at Sportsman’s Landing (and the boundary of the refuge) as “drastically altered views” and “avoidable in light of the fact that there are other viable alternatives” that would not pose the same adverse impacts to refuge visitors. Parking along the highway near Sportsman’s Landing also was a concern. USFWS indicated relatively little concern about potential impacts to KNWR facilities within the existing right-of-way: the visitor contact station and trailhead for the Fuller Lakes Trail. The USFWS indicated general satisfaction with plans adjacent to Sportsman’s Landing and ongoing concern about wildlife movement. USFWS is participating in the wildlife movement study that is intended to address wildlife movement impacts. ADF&G and the Forest Service also have jurisdiction that pertains to wildlife and also are participating. At a February 2013 “agency summit,” these wildlife agencies indicated that it appeared the Cooper Creek Alternative would have the least impact to wildlife movement, the G South Alternative would have more impact to habitat and movement, and the two Juneau Creek Alternatives would have the greatest impact to wildlife (HDR 2013b).

The USFWS, in its capacity as a cooperating agency for this EIS and as the official with jurisdiction over lands currently designated Wilderness, stated the following: “While designated Wilderness would not be directly affected by the JC alternative following a land exchange, visual and noise-related impacts to adjacent Wilderness would remain. We believe these impacts will be

substantial enough to be classified as ‘moderate.’” DOT&PF and FHWA carefully considered this point of view and responded that the EIS is meant to assess impacts compared to existing conditions. Existing conditions include the Wilderness boundary coincident with the highway right-of-way and noise and visual effects as seen and heard from Wilderness, which was established around the pre-existing highway. While there would be new impacts (slightly new areas affected; incremental changes to views of non-Wilderness lands), and while the position of the USFWS is acknowledged, DOT&PF and FHWA have retained the characterization of these impacts as minor.

Based on earlier consultation, DOT&PF and FHWA had been under the impression that USFWS had “strong objections” to the Juneau Creek alternatives. That understanding was a part of the consideration that led to the identification of the G South Alternative as the preferred alternative in December 2015. In their review of a preliminary version of the Final EIS and Final Section 4(f) Evaluation, USFWS requested that the record be corrected, stating:

The USFWS has never strongly objected to any of the Build Alternatives, and this statement mischaracterizes our coordination on this project. Our responsibilities as a cooperating agency under the Fish and Wildlife Coordination Act as well as NEPA require us to rigorously explore and objectively evaluate all of the alternatives presented in the EIS to ensure fish and wildlife impacts, and in the case of the Kenai NWR, impacts to Wilderness, are identified, disclosed and objectively evaluated. We therefore request any reference to the USFWS having objections, “strong” or otherwise, be removed from the record.

Based on this comment and other key input, DOT&PF and FHWA have revised the Least Overall Harm Analysis.

Resurrection Pass Trail. The Forest Service, as manager of the trail, indicated it is considered the “crown jewel” of the CNF trail system. The Forest Service indicated that the crossing of the trail by the two Juneau Creek alternatives likely would considerably reduce the value of the lower 3.4 miles of the trail. The Forest Service indicated the project under these alternatives likely would fundamentally change the use of the trail, making the falls area a more “front country” experience than the “backcountry” experience it is today. Extensive discussion took place regarding measures to minimize harm in the trail crossing area and regarding compensatory mitigation outside the project area. The Forest Service proposed compensatory mitigation on the Iditarod National Historic Trail, which DOT&PF and FHWA considered and agreed to should either of these alternatives be advanced to construction. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives. See Section 4.6.4 for information on the mitigation commitments.

Bean Creek Trail. The Forest Service agreed that for Section 4(f) purposes, the trail begins at a public lands boundary. The agency requested a trailhead under the G South Alternative north of the new highway at Bean Creek and indicated agreement to own and manage the trailhead even though the land at that location is State of Alaska land overlain by a Forest Service trail easement. The existing easement would need to be negotiated and enlarged. The Forest Service, DNR, and the Borough have discussed the trail principally as a recreation resource. Section 106 consulting parties, including the Forest Service and SHPO (a subdivision of DNR), have commented little on the trail as an historic resource compared to their comments on the Sqilantnu Archaeological District and the sites treated as TCPs. However, the consulting parties have agreed there would be adverse effects to the trail as an historic resource.

Stetson Creek Trail. The Forest Service noted that construction of the Cooper Creek Alternative could increase access to and use of the Stetson Creek Trail. The Forest Service suggested mitigation, which DOT&PF agreed to, should the alternative be advanced to construction. The Forest Service has discussed the trail principally as a recreation resource. Section 106 consulting parties, including the Forest Service, have commented little on the trail as an historic resource compared to their comments on the Sqilantnu Archaeological District and the sites treated as TCPs. However, the consulting parties have agreed there would be adverse effects to the trail as an historic resource.

Forest Service Kenai River Recreation Area. The Forest Service indicated that the recreation area was established to retain public ownership of the Kenai River banks and public access to the Kenai River at the important (high-use) segment of the stream in the Russian River confluence area. The Forest Service indicated relatively little concern about widening the highway where it passes through this recreation area (compared, for example, with greater concern of the Juneau Falls Recreation Area, a similar recreation withdrawal). The Forest Service indicated that impacts appeared minimal because the highway already exists in this area and because the recreation area was defined in part by the highway.

Leading up to the publication of the Draft SEIS and Draft Section 4(f) Evaluation, the Forest Service had expressed concern about reduction of pullouts in the highway right-of-way that serve as parking for people accessing the KRRR. Despite these concerns, DOT&PF and FHWA believed that the Forest Service continued to agree that the use and impacts of G South and Cooper Creek Alternatives on KRRR would be *de minimis*. That understanding was a part of the consideration that led to the identification of G South as the preferred alternative in December 2015. In follow-up consultation, after the formal comment period on the Draft SEIS and Draft Section 4(f) Evaluation, the Forest Service indicated that the loss of informal parking within the highway right-of-way adjacent to the recreation area under the Cooper Creek and G South Alternatives meant they could not concur that the alternatives would not adversely impact the activities, features, or attributes of the KRRR.

Based on this more recent consultation, the use of KRRR by the Cooper Creek and G South Alternatives has been modified to be discussed as “greater than *de minimis*.” The more recent and thorough understanding of the Forest Service’s concerns regarding the effect that the Cooper Creek and G South alternatives would have on access to the KRRR has been reflected in this Least Overall Harm Analysis and in the conclusions presented in Sections 4.8.8 and 4.8.9.

Juneau Falls Recreation Area. The Forest Service indicated that the Juneau Falls Recreation Area has high value to the agency and to the public, and that the entire area was established around the falls and upper canyon because the falls and creek are a scenic attraction, and that waterfalls are rare in the region. The Forest Service indicated the project under either of the Juneau Creek alternatives likely would change the use of the trail, making the falls area a more “front country” experience than the “backcountry” experience it is today. The Forest Service suggested trailhead mitigation and provided a conceptual design. The Forest Service also indicated the new trailhead should be located within the Juneau Falls Recreation Area and co-located with a bridge construction staging area; according to a Forest Service letter to FHWA dated November 22, 2011, such a parking area would minimize wetland impact, maximize ability to promote growth of forested buffers to separate the trailhead from the highway, pose the least harm to and be most consistent with the Juneau Falls Recreation Area withdrawal, and contribute to a quality

experience for all users. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

Cooper Landing Boat Launch and Day Use Area. The Sport Fish Division of ADF&G administers access at boat launch ramps; DPOR manages the site. ADF&G stated that the highway improvements should improve river access. Concerns included damage to asphalt in the parking area and to concrete boat ramp planks from heavy equipment during highway construction. ADF&G acknowledged impacts to use of the area that would occur during construction and suggested using spring and early summer for major construction efforts in this area to minimize impact to users during the height of summer and fall salmon and trout fishing seasons. DOT&PF has agreed to avoid the high use period. DPOR was most concerned about impacts to access and river/ramp closures at this location, but indicated that mitigation measures for construction similar to those used for the Soldotna Bridge over the Kenai River, as is proposed by DOT&PF, should be adequate to reasonably minimize impact.

Sqilantnu Archaeological District. The Sqilantnu District and Confluence Site are of particular importance to the Kenaitze Tribe, SHPO, and CIRI (which expended great effort through Federal legislation to secure the “archaeological estate” in the Russian River Ferry area as part of its land claims under ANCSA). Meetings and correspondence to date with consulting parties have resulted in identification of much-expanded district boundaries, agreement regarding a determination of adverse effect, and formal consultation on mitigation concepts (presented in the Programmatic Agreement published in Appendix K).

CIRI was transferred the “archaeological estate” for a large portion of the District and cooperates in the management of the area through the RRLA MOU group (Forest Service, USFWS, CIRI, and the Kenaitze Indian Tribe). In their comments on the Draft SEIS and Draft Section 4(f) Evaluation, CIRI indicated that the Juneau Creek Variant Alternative would bisect Tract A and would make development of the facilities agreed to and ratified by the RRLA infeasible and would “...contravene the Congressional intent when it enacted the Russian River Land Act in December 2002.”

The RRLA MOU Group as a whole also commented on the Draft SEIS and Draft Section 4(f) Evaluation. Their comments focused on the impacts of the four build alternatives’ impacts on cultural resources. Their joint letter indicated that it was the Kenaitze Indian Tribe’s and CIRI’s position that the Juneau Creek Variant was “unacceptable and should be removed from future consideration” because it bisects Tract A. The Forest Service and USFWS acknowledged and supported the Kenaitze Indian Tribe’s and CIRI’s position. The group expressed their belief that the Juneau Creek Variant Alternative is counter to the intent of Congress in resolving CIRI’s land claims under ANSCA. They noted that “for all build alternatives the significance of cultural and sacred sites varies” and that a quantitative acreage approach needs to be supplemented with a qualitative analysis to understand the significance of the sites affected. They suggested that once a preferred alternative was identified, additional consultation should occur to “garner a better understanding of the cultural resources present and to concur on mitigation measures.” DOT&PF and FHWA have updated this Least Overall Harm Analysis and the conclusion presented in Sections 4.8.8 and 4.8.9 to recognize CIRI’s views relative to CIRI’s management responsibilities under the RRLA.

In December 2015, DOT&PF and FHWA had identified G South as the preferred alternative, and commenced with consultation to mitigate the effects to Section 106 resources in the Sqilantnu

District. Multiple meetings were held with the Forest Service, USFWS, CIRI, and the Kenaitze Indian Tribe to resolve adverse effects via a programmatic agreement under Section 106; Government to Government meetings were also held between the Kenaitze Indian Tribe and FHWA. In response to the consultation and identification of G South as the preferred alternative, the Kenaitze Indian Tribe sent a letter to FHWA (Kenaitze Indian Tribe 2016); The Kenaitze Indian Tribe indicated that they are “committed to protecting the Kenai River and all life that it supports” and indicated that was the “primary reason” they favor the Juneau Creek Alternative.

Due to this more recent consultation, DOT&PF and FHWA have a better sense of the Kenaitze Indian Tribe’s view on the importance of the Kenai River as central to the tribe’s history and culture. These views have been reflected in the updated Least Overall Harm Analysis in Sections 4.8.8 and 4.8.9.

Confluence Site. The Sqilantnu District and Confluence Site are of particular importance to the Kenaitze Tribe, SHPO, and CIRI (which expended great effort to secure the “archaeological estate” in the Russian River Ferry area as part of its land claims under ANCSA). Meetings and correspondence to date with consulting parties have resulted in determination of basic significance of the site as a TCP, definition of the site boundaries, agreement regarding a determination of adverse effect, and discussion of mitigation concepts leading to a Programmatic Agreement (see Appendix K). Comments received from CIRI and the Kenaitze Indian Tribe related to the Sqilantnu Archaeological District are also applicable to the Confluence Site. See input summarized for the Sqilantnu Archaeological District above.

Charles G. Hubbard Mining Claims Historic District. Meetings and correspondence with consulting parties have resulted in identification of district boundaries and agreement regarding a determination of adverse effect. Consulting parties have commented little on this historic district in comparison to the Sqilantnu Archaeological District or sites treated as TCPs.

Kenai Mining and Milling Co. Historic District. Meetings and correspondence with consulting parties have resulted in identification of district boundaries and agreement regarding a determination of adverse effect. Consulting parties have commented little on this historic district in comparison to the Sqilantnu Archaeological District or sites treated as TCPs.

4.8.5 Factor v: The Degree to which Each Alternative Meets the Purpose and Need

As a reminder, “the purpose of the project is to bring the highway up to current standards for a rural principal arterial to efficiently and safely serve through-traffic, local community traffic, and traffic bound for recreation destinations in the area, both now and in the future. In achieving this transportation purpose, DOT&PF and FHWA recognize the importance of protecting the Kenai River corridor.”

There are three interrelated needs that the project would address:

- Need 1: Reduce Highway Congestion.
- Need 2: Meet Current Highway Design Standards.
- Need 3: Improve Highway Safety.

All of the build alternatives would satisfy the purpose of and need for the project. However, there are gradations in the ability of the alternatives to satisfy the project purpose and need. These are further described below.

Need 1—Reduce Highway Congestion. The Purpose and Need chapter indicates that the project is intended to provide the opportunity for free-flowing traffic at highway speeds, to improve the level of service to the greatest extent practical, and to achieve Level of Service (LOS) C or better wherever practical at the end of the project’s design life (2043, the design year). Table 4.8-8 provides LOS ratings.

Table 4.8-8. Factors relating to congestion (Need 1)

		Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Passing lanes					
Percent (%) of length with passing lane		28	25	43	40
Intersections					
Number of intersections of side roads and driveways		47	23	12	13
Level of Service (LOS)					
Segment	Direction				
1	EB	D	D	D	D
	WB	C	C	C	C
2	EB	D	C	C	C
	WB	C	B	B	B
3	EB	C	C	C	C
	WB	C	B	B	B
4	EB	C	C	C	C
	WB	C	B	C	C
5	EB	D	D	C	C
	WB	C	C	C	C
6	EB	D	D	D	D
	WB	C	C	C	C
Percentage of alignment at or better than LOS C ^a		60.8	69.2	83.2	82.0

LOS source: *Traffic Study Update* (Lounsbury 2014). Note that in the Lounsbury report, Tables 21A and 21B, the segments are numbered in the opposite order from those in this Final EIS.

Numbers of Intersections are updated since the Draft SEIS based on addition of pullouts and parking areas (see Section 3.6), and both Passing Lanes and Intersections have been updated as a result of ensuring consistent counting methods.

EB = eastbound; WB = westbound. Entire table is calculated on 100th highest hour for traffic volume in the year.

^a The project area is about 15 miles long. The “alignment” in “percentage of alignment” includes both directions of travel and therefore is approximately 30 miles long for this calculation.

Chapter 1 thoroughly explains LOS; in brief, it is an A through F rating system, based on traffic modeling that grades traffic congestion from best to worst. LOS A represents free-flowing traffic, LOS C represents heavy volumes but acceptable traffic flow that maintains reasonable speeds, and LOS F represents failure of the roadway, in which traffic demand exceeds the capacity of the road.

All build alternatives would provide for less traffic congestion even as traffic increased over time. However, the LOS differs between the alternatives and is a distinguishing feature among the alternatives (see Table 4.8-8). The table indicates the percent of alignment length with passing lanes (passing lanes contribute to traffic flow efficiency) and identifies the number of intersections (intersections inhibit efficiency when traffic enters the highway from a side road or slows to turn into a driveway).

Need 2—Meet Current Design Standards. All of the build alternatives would meet the current design standards for a rural principal arterial. It is therefore difficult to distinguish between alternatives based solely on achieving the standards. While all alternatives equally achieve the standard, there is a distinction that can be made between “desirable” levels of meeting the standards, and acceptable or minimum levels. The desirable design speed for the National Highway System is 65 mph or greater, and this project’s design speed is 60 mph because of rolling terrain. While all curves meet the minimum standard, many curves can accommodate the more desirable 65 mph speed or higher. These are not indications of the speed limit that would be posted but of how safe the curves would be and how easily drivers could maintain consistent highway speeds. Table 4.8-9 notes various measures for each alternative to indicate how well the alternative meets the standard indicated—that is, whether it is achieving the minimum acceptable standard, or performing better than the standard.

Table 4.8-9. Factors relating to design standards (Need 2)

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Horizontal Curves^a				
Total number of horizontal curves (existing highway = 43)	27	25	21	22
Number of curves at or better than the “desirable” standard	23	24	20	21
Number below “desirable”	4	1	1	1
Grades				
Percent (%) of length above maximum grade (>6% grade)	0	0	0	0
Percent (%) of length at 5.9%-6% grade (steep)	9	8	2	0
Percent (%) of length at >5% grade (hilly)	9	14	16	26

^a “Minimum” is curves designed for 60 mph design speed, which is the design criteria for this project in rolling terrain. “Desirable” is curves designed for 65 mph or that could handle higher speeds.

Need 3—Improve Highway Safety. Each of the build alternatives would be expected to improve highway safety, as follows:

- Segments built on a new alignment would separate slower-moving local traffic (on the “old” highway) from faster-moving through-traffic (on the new highway). (Note: length of new highway segment varies by alternative.)
- The highway would better match the driving experience on the Sterling Highway to the west of the project area and the Sterling and Seward highways to the east, providing drivers with a consistent driving experience with fewer surprises.

More description of the safety issue appears in Chapter 1 and in Section 3.6 and Appendix A. Table 4.8-8 and Table 4.8-9 present information on passing lanes, intersections, and desirable versus minimum achievement of standards. Passing lanes generally help make the highway safer by providing opportunities to pass without entering the oncoming lane. More intersections generally make the highway less safe, because they present conflict points with traffic entering the highway at low speeds, or traffic suddenly slowing to turn from the highway. Curves that not only meet standards but reach a “desirable” level or better are curves that are easier to negotiate and are generally safer.

Safety engineering analysis completed for each alternative predicted the number of crashes of different types for 2043. Table 4.8-10 reports the results. The numbers of crashes are statistically

Table 4.8-10. Predicted numbers of crashes (2043) (MP 45–60)

	No Build Alt.	Cooper Creek Alt.	G South Alt.	Juneau Creek Alt.	Juneau Cr. Variant Alt.
For the new highway (NHS) only					
Total Crashes/Year	33.2	12.4	11.4	9.8	10.0
Fatal and Injury Crashes/Year	10.9	4.1	3.7	3.2	3.3
Property Damage Only Crashes/Year	22.3	8.3	7.6	6.6	6.8
Percent Difference From Total No-Build Crashes	--	-62.5%	-65.7%	-70.5%	-69.7%
Overall System (new highway and old highway ¹)					
Total Crashes/Year	33.2	15.5	15.6	16.8	16.9
Fatal and Injury Crashes/Year	10.9	5.1	5.1	5.5	5.5
Property Damage Only Crashes/Year	22.3	10.3	10.5	11.3	11.4
Percent Difference From Total No-Build crashes	--	- 53.4%	-53.1%	-49.3%	-48.9%

¹ The Highway Safety Manual method shows that each of the alternatives provides substantial improvements compared to the No-Build alternative – a 49 to 53% reduction in total crashes (for each category). The analysis shows that the Cooper Creek alternative would have slightly fewer total and fatal/injury crashes in 2043 as compared to the other alternatives when both the old highway and new highway are evaluated. This is because more of the old highway is reconstructed as part of the build alternatives and therefore more of the traffic benefits from improvements that meet standards. However, this prediction method does not consider the influence of mixed through and local travel on conflicts, accessibility, and mobility in the Cooper Landing developed area – it is a prediction that identified benefits only based on the design upgrades.

based on analysis of road features such as shoulders, clear zones, passing lanes, and turning lanes and are not based on actual number of crashes in the corridor (as examples, collisions with wildlife and collisions solely related to icy conditions are not considered). Design standards are principally meant to enhance safety, and the evaluation indicates substantial decreases in the number of crashes, no matter which alternative is selected. The differences between the build alternatives are smaller, but important.

Protection of the Kenai River. As indicated in Chapter 1 and summarized in Section 4.7, Section 4.8.4, Chapter 5, and Appendix J, protection of the Kenai River has been a key issue raised by agencies, tribal entities, and the public. As a result of consultation during scoping (2000-2006), DOT&PF and FHWA included protecting the Kenai River as an objective of the project in the purpose statement for the project, stating “In achieving this transportation purpose, DOT&PF and FHWA recognize the importance of protecting the Kenai River corridor.” FHWA generally does not include non-transportation elements in the purpose and need statements of its projects. Non-transportation elements typically do not determine whether an alternative is reasonable; however, such factors can be important in weighing the relative benefits among the reasonable alternatives. In including this element in the overall purpose statement of the project, FHWA recognized the unique importance of the Kenai River and acknowledged their responsibility for protecting this special resource in considering the development of any transportation improvement. In its role as a cooperating agency, DNR (DNR 2017) stressed this aspect of the purpose and need statement and suggested greater consideration be given to “the overall value of the Kenai River” in the Section 4(f) analysis. As a result of these suggestions, DOT&PF and FHWA have further considered protection of the river relative to the Purpose and Need and have summarized information from elsewhere in the EIS in Table 4.8-11.

Table 4.8-11. Factors relating to protection of the river (purpose statement) [New]

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Essential Fish Habitat Impacts	1.2 acres altered Crossings: • 4 culverts • 2 bridges 1 creek rerouted	1.0 acre altered Crossings: • 2 bridges • 5 culverts	0.8 acre altered Crossing: • 1 culvert	0.8 acre altered Crossing: • 1 culvert
Number of new bridge crossings (location)	1(Cooper Creek)	2 (Juneau Creek; Kenai River)	1 (Juneau Creek)	1 (Juneau Creek)
Number of replacement bridge crossings (location)	2 (Kenai River)	1 (Kenai River)	0	0
Approximate number of small stream crossings ^{a,b}	58	73	63	63
Total water body crossings	61	76	64	64

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Approximate area of stream replaced by culvert or bank stabilization (acres)	0.6	0.7	0.8	1.3
Number of crossings, anadromous fish streams ^{c,d}	8	8	2	2
Percent length within 500 feet of Kenai River and major tributaries ^d	56	45	25	26
Percent length within 300 feet of Kenai River and major tributaries ^d	43	33	15	16

^a The number of stream crossings does not include the bridge crossings listed above.

^b Minor crossings of seeps and other small drainages were identified in the field for all other alternatives; however, portions of the Juneau Creek Variant Alternative have not yet been field-reviewed. Because the Juneau Creek Variant Alternative occupies the same hill slope as the Juneau Creek Alternative, the same number of small crossings is assumed.

^c Includes crossings that would completely span the stream with bridges more than 100 feet above the water, i.e. Cooper Creek and Juneau Creek.

^d The proximity of all traffic to the Kenai River would increase the risk that a spill on the highway could pollute the river. The risk of a potential spill entering the Kenai River diminishes the farther from the river the spill occurs, and additional time is available for cleanup should a spill enter a tributary to the river. The percentage of the alignment length within a 500-foot buffer zone of the Kenai River and its major tributaries (Kenai Lake, Cooper Creek, Juneau Creek, and Russian River) is one metric to assess the environmental sensitivity of each alternative to water quality risks associated with hazardous materials. A 300-foot buffer setback is advocated by the *Kenai River Comprehensive Management Plan* and is also presented. For comparison, 77% of the existing highway/No Build Alternative lies within 500 feet of the Kenai River, and 56% lies within 300 feet. See Section 3.17 for additional discussion of spills and risk of pollutants reaching the Kenai River.

4.8.6 Factor vi: Magnitude of Impacts to Non-4(f) Resources

Regulations at 23 CFR 774.3(c) indicate that the balancing of factors for a Least Overall Harm Analysis must include consideration of non-4(f) resources—specifically, FHWA must consider, “after reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).” DOT&PF and FHWA have thoroughly considered the impacts of the project alternatives on all resource categories. Chapter 3 of this Final EIS presents resource categories covering the human and natural environment. Most of the resources addressed in Chapter 3 are not protected by Section 4(f). This Least Overall Harm Analysis incorporates in whole the analysis in Chapter 3. Table 4.8-14 through Table 4.8-19 (at the end of this chapter) summarize impacts from Chapter 3 and present them in comparative form for the Least Overall Harm Analysis.

Chapter 3 indicates *some* adverse impact after mitigation for most of resources addressed, but the impacts typically are low, particularly following mitigation. Also, Chapter 3 indicates that some

resources categories typically addressed in FHWA EISs do not exist in the project area. These no-impact or low-impact categories are listed at the end of this section.

Resources with greater/substantive adverse impacts. A few resource categories addressed in Chapter 3 include somewhat greater impacts for one of more of the alternatives. These resource categories are listed below (with their section numbers for easy reference). A brief summary of the impacts is presented in Sections 4.8.6.1 through 4.8.6.3). Note that not every topic is pertinent to each alternative.

- 3.1 Land Ownership
- 3.2 Land Use Plans and Policies
- 3.3 Social Environment
- 3.4 Housing and Relocation
- 3.5 Economic Environment
- 3.13 Water Bodies and Water Quality
- 3.15 Noise
- 3.16 Visual Resources
- 3.17 Hazardous Waste Sites and Spills
- 3.20 Wetlands and Vegetation
- 3.21 Fish and Essential Fish Habitat
- 3.22 Wildlife

The following sections summarize key impacts to non-Section 4(f) resources by alternative. As mentioned above, not every topic is pertinent to each alternative.

4.8.6.1 Cooper Creek Alternative

The Cooper Creek Alternative would have impacts to private property and relocation of households and businesses, because the alignment would traverse part of the community of Cooper Landing. See more in on these topics in Sections 3.1 Land Ownership, 3.2 Land Use Plans and Policies, 3.3 Social Environment, and 3.4 Housing and Relocation.

This alternative would result in a wider highway through a portion of the community designed for faster traffic than occurs currently in the community. This would create greater physical division between parts of the community and traffic noise impacts to sensitive receivers like homes. However, routing the alignment through the community would result in lower impact to local highway-dependent businesses under the Cooper Creek Alternative, because highway traffic still would be routed through a portion of the community, and businesses would be more visibly evident to motorists. It would have somewhat greater visual impacts to Cooper Landing homes and lodges located north of the river. See more in Sections 3.5 Economic Environment, 3.15 Noise, and 3.16 Visual Resources.

During construction in the community, community character would be adversely altered by construction noise, construction traffic, unpaved surfaces, dust, and difficulties navigating the

community by car or on foot. This would affect quality of life for residents and frequent visitors for the duration of construction—at least two construction seasons in town and up to four additional seasons to complete the entire project. See more in Sections 3.3, Social Environment; 3.6, Transportation; and 3.15, Noise.

Being located south of the Kenai River for a long segment, this alternative would have lower impacts to resources such as vegetation and wetland loss, wildlife habitat, and effects to important wildlife movement areas. See more in Sections 3.20 Wetlands and Vegetation, and 3.22 Wildlife.

Several agencies (DNR, ADF&G, EPA) stressed that keeping highway traffic near the river would be less desirable because of risk of potential spills and that alignments near the river would have adverse water quality impacts. See more in Sections 3.13 Water Bodies and Water Quality, and 3.17 Hazardous Waste Sites and Spills. Additionally, ADF&G, as manager of fish habitat and sport fishing, indicated that retaining all traffic near the river in the river corridor (primary river access area) would negatively affect a number of interrelated features of the overall recreational experience. Issues include effects to habitat, visual and noise impacts experienced by recreationalists, management of recreationalists by the agencies, and more difficult congestion, recreational access, and safety conditions.

4.8.6.2 G South Alternative

The G South Alternative would be anticipated to reduce traffic impacts within the community, including traffic noise and property impacts, but would have greater natural environment impacts than the Cooper Creek Alternative, including impacts to brown bear habitat and wildlife movement areas in the lower Juneau Creek area, and to forested wetlands and moderate functioning wetlands. See Sections 3.20 Wetlands and Vegetation, and 3.22 Wildlife for information on these more substantive impacts.

Avoiding the community would mean greater effect to businesses within the community because most traffic would be anticipated to follow the main highway around the community, but impacts of construction within the community would be minimized, when compared with the Cooper Creek Alternative. See Section 3.5 Economic Environment.

Visual impacts would be less than those of the Cooper Creek Alternative and more than the two Juneau Creek alternatives (see Section 3.16, Visual Environment).

While the direct footprint impacts to Kenai River are relatively small under this alternative, the public and multiple agencies have indicated great concern for the potential impacts of the G South Alternative to the river (to resources more than just the impacts to the State Park). Multiple agencies (DNR, ADF&G, EPA, KPB) stressed that keeping highway traffic near the river would retain the risk of potential spills and would have adverse water quality impacts. ADF&G (2017) indicated that completion of the G South Alternative may result in additional and unnecessary impacts to sport fishery resources of the Kenai River and would create the greatest impact to riparian habitat. See more in Sections 3.13 Water Bodies and Water Quality, and 3.21 Fish and Essential Fish Habitat.

4.8.6.3 Juneau Creek and Juneau Creek Variant Alternatives

For the Juneau Creek Alternative only, it had been anticipated that a substantial change in land use and management would occur because of the need to use federally designated Wilderness. Since the Draft EIS was released, FHWA has determined that the land trade, referenced in Section 3.27.4, is reasonably foreseeable. As a result, the Wilderness designation and the KNWR land required

for the Juneau Creek Alternative will be converted to private (CIRI) ownership. See more in Section 3.1 Land Ownership, and 3.2 Land Use Plans and Policies for information on land use and wilderness impacts. The land trade itself is discussed in Section 3.27.4.3.

For the Juneau Creek Variant Alternative only, DOT&PF would acquire approximately 12 acres of the 42-acre CIRI Tract A parcel, as well as bisect it, impacting CIRI's development plans for the parcel (see Section 3.1.2.6 for detail). Additionally, the connection point to the "old" Sterling Highway would occur at Sportsman's Landing, creating traffic congestion concerns and parking concerns for USFWS and ADF&G, which manage this popular sport fishing location.

The Juneau Creek and Juneau Creek Variant alternatives, like the G South Alternative, would reduce traffic impacts within the community to private property and homes and would present greater impacts than the Cooper Creek Alternative to highway-dependent businesses. However, impacts of construction within the community would be minimized, when compared with the Cooper Creek Alternative. These alternatives also would result in lower visual and traffic noise impacts to sensitive community receptors than the Cooper Creek Alternative (again because they would avoid sensitive receptors in the community).

Multiple agencies (EPA, DNR, and ADF&G) agree that the Juneau Creek alternatives would have the least impact to riparian habitat. EPA indicated that based on the information presented in the Draft SEIS, it appeared that one of the Juneau Creek alternatives, or a variation of the two, may be the least environmentally damaging practicable alternative (EPA 2015).

The two Juneau Creek alternatives, however, would have the greatest impacts to wetlands, vegetation, wildlife habitat (loss and fragmentation), and wildlife movement. See more regarding these substantive impacts in Sections 3.20 Wetlands and Vegetation, and 3.22 Wildlife.

By removing through traffic, access to recreational uses along the old highway would be safer for turning traffic and pedestrians walking along the road, and the potential to create access improvements by others to implement Cooper Landing's "Walkable Community Plan" would be improved.

4.8.7 Factor vii: Substantial Differences in Cost

Factor vii indicates that "substantial differences in cost" must be considered. The discussion below presents the costs of each alternative, and examines the percentage difference in costs in different categories, including construction costs, maintenance costs, and total expenditures over 20 years (see Table 4.8-12).

"Construction" cost includes direct construction costs, such as labor, materials, and utility relocations, as well as project development costs such as overhead, design, right-of-way, and property acquisition. The "Total Expenditures" combines the "Construction" subtotal with operations and maintenance costs (including annual costs such as snow plowing and periodic major activities such as pavement overlays) to arrive at a total cost over the 20-year design life of the project.

The construction cost differences between the alternatives are largely the result of differences in the number of bridges. The Juneau Creek and Juneau Creek Variant alternatives each have one major bridge. The G South Alternative has three major bridges. Nonetheless, as indicated in Table 4.8-12, the range of total expenditures to DOT&PF and FHWA over the 20-year life of the project for the build alternatives falls within 20 percent of each other. DOT&PF and FHWA also have

considered the cumulative costs to DOT&PF of maintaining both the “old” highway and the new highway under each alternative, as discussed in Section 3.27 (Table 3.27-4), and the cost differences are also within around 20 percent.

Each of the alternatives has been engineered to a similar level, and the results show meaningful differences in cost between the least expensive and most expensive alternatives. The Juneau Creek Alternative is estimated to be the lowest cost alternative and the G South Alternative is estimated to be the most expensive alternative; the G South Alternative is estimated to cost \$59.2 million more to construct and require \$58.8 million more in total expenditures over 20 years when compared to the Juneau Creek Alternative. Because the State of Alaska’s financial situation has become more tenuous, the difference in costs between the G South and Juneau Creek alternatives has become a greater concern.

Table 4.8-12. Costs by alternative
(costs in millions of dollars, except annual O&M^a)

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Project Development ^b	64.3	61.1	58.9	60.7
Direct Construction	244.3	250.9	221.2	227.6
Construction Subtotal	308.6	312.0	280.1	288.2
O&M and Periodic Major Activities (over 20 years)^b	23.7	23.8	24.2	24.3
<i>Annual O&M^b</i>	<i>\$593,400/year</i>	<i>\$585,400/year</i>	<i>\$608,600/year</i>	<i>\$611,700/year</i>
Total Expenditures, 20 years	332.3	335.8	304.3	312.6
Percentage less than the most costly alternative (G South)	-1%	0%	-9%	-7%
Percentage more than the least costly alternative (Juneau Creek)	9%	10%	0%	3%

^a O&M = Operations and maintenance; includes annual costs such as snow plowing, crack sealing, and other basic maintenance on the alignments. Periodic major activities include projects such as replacement of guardrail and pavement overlays that are reasonably anticipated over a 20-year span.

^b Project development costs include mitigation, design, right-of-way acquisition, and indirect costs. The right-of-way cost estimate is for the real estate payment portion only of right-of-way acquisition. It does not address the other per-parcel costs of right-of-way acquisition, including relocation benefits.

Notes: Many numbers are rounded and do not add up exactly. All dollar figures represent 2015 dollars. This table has been updated since publication of the Draft SEIS to account for correction of errors and refinement of mitigation costs.

4.8.8 Evaluation of Least Overall Harm

Combining the information in the sections above (summarized in Table 4.8-13 through Table 4.8-19 at the end of this chapter) is inherently difficult because different individuals, groups, or agencies each may place higher values on different kinds of resources than others might. The

following discussion for each alternative summarizes impacts and presents some of the complexities and trade-offs in determining least overall harm.

4.8.8.1 Use, Significance, Ability to Mitigate, Agency Views

This section summarizes the key differences in use of and impacts on properties, the ability to mitigate those impacts, and the views of agencies with jurisdiction over those resources. The analysis lays out the considerations, tying those considerations to the available data and consultation record.

Cooper Creek Alternative. The Cooper Creek Alternative would replace two bridges over the KRSMA (the property having the highest significance) and has the greatest length along the river (i.e., 56 percent of the alternative by length is within 500 feet of the river – a higher percentage than other alternatives). Because the Cooper Creek Alternative would remain on the existing alignment along the Kenai River for the longest stretch, the risks of potential hazardous spills directly entering the river would be greater than that of other alternatives. Several agencies and the public identified this as a concern. With greater length near the river, more traffic would occur near KRSMA, a somewhat greater visible and audible impact to KRSMA users than alternatives that would remove 70 percent of traffic from along the river. EPA gave a rating of “Environmental Objections” to this alternative due to concerns for potential impacts to the river. Despite having a greater length traversing alongside the river, the Cooper Creek Alternative has less direct KRSMA use and is less harmful to KRSMA than the G South Alternative because it does not add a third bridge over the river. The ability to mitigate for the river impacts is problematic because its alignment follows the river for a greater length. DNR indicated that if the Cooper Creek Alternative were to be selected, additional consultation would be required relative to its consistency with the KRSMA management plan.

The Cooper Creek Alternative would impact archaeological historic properties within the Sqilantnu Archaeological District that have relatively greater importance than other historic properties because of their relationship to the Beginnings Heritage Site. It also would impact the Confluence Site, Charles G. Hubbard Mining Claims Historic District, KMM District, and Stetson Creek Trail. This means the Cooper Creek Alternative would impact the greatest number of cultural properties of the four build alternatives. Regarding the Sqilantnu District, the Cooper Creek Alternative would follow the existing alignment more than any of the other alternatives. This means relatively little new highway would be constructed across the archaeological district; however, the existing highway runs through some of the highest concentrations of contributing archaeological sites, and widening the existing highway would result in impacts to more known sites.

Regarding the Confluence Site, however, the alternative would follow the existing highway corridor through the Site and therefore would change the status quo relatively little. The existing highway in this area is considered part of the Confluence Site. By comparison, the two Juneau Creek alternatives each would construct a new route through the Site. The Cooper Creek Alternative arguably would have less impact to the Confluence Site setting than the Juneau Creek alternatives, especially the Juneau Creek Variant Alternative. However, from another perspective, the Cooper Creek Alternative has the most length close to the river, with the greatest risk of potential spills directly into the river, and the Kenaitze Indian Tribe indicates that protecting the river is tied culturally to their world view as stewards of their ancestral lands.

The Cooper Creek Alternative avoids use of the Resurrection Pass Trail and the KNWR (higher significance properties) but uses land from Cooper Landing Boat Launch and Day Use Area and the Forest Service Kenai River Recreation Area (both moderately significant properties). Agencies did not provide substantive comment on these uses.

G South Alternative. The G South Alternative would use land from KRSMA (the property having the highest significance), resulting in impacts to some of the activities, features, and attributes of the park. The other build alternatives would have less impact to the river and consequently the G South Alternative was ranked as having the most harm with respect to KRSMA. The primary reason is because it requires a new bridge over the Kenai River. Several agencies and stakeholders (ADF&G, DNR, CIRI, the Kenaitze Indian Tribe, KPB, and EPA), including those with jurisdiction over KRSMA, identified the new bridge and the continued risk of potential spills in the Kenai River as their reasons for not supporting the G South Alternative. Agencies such as ADF&G and USFWS question the ability to mitigate for the impacts of the new bridge, and the EPA gave a rating of “Environmental Objections” to this alternative due to their concerns for potential impacts to the river.

Because the G South Alternative would remain on the existing alignment along the river for a considerable length, the risks of hazardous spills directly entering the river would be greater than the risks from alternatives that would route most traffic farther away from KRSMA. Also, more traffic would occur in the areas near KRSMA compared to the Juneau Creek Alternatives, a somewhat greater visible and audible impact to KRSMA users than alternatives that would remove 70 percent of traffic from this area.

The G South Alternative, like the Cooper Creek Alternative, would impact the Sqilantnu District and the Confluence Site, including archaeological historic properties of relatively high importance because of their relationship to the Beginnings Heritage Site. Regarding the Confluence Site, however, the alternative would follow the existing highway corridor through the Site and therefore would change the setting relatively little. Recall that the existing highway in this area is considered part of the Confluence Site. By comparison, the two Juneau Creek alternatives each would construct a new route through the Confluence Site, affecting the setting, but they would impact fewer known cultural sites. The G South Alternative arguably would have less impact to the TCP setting than the Juneau Creek alternatives, especially the Juneau Creek Variant Alternative.

The G South Alternative’s impact on the Sqilantnu District would be similar to the impact from the Cooper Creek Alternative. It would follow the existing alignment in some of the highest concentrations of contributing archaeological sites and therefore would impact more known sites than the Juneau Creek Alternative (and a few more than the Juneau Creek Variant Alternative). It would impact a few less than the Cooper Creek Alternative. Given the effects on the river, the G South Alternative was expressly not preferred by some consulting parties (CIRI and the Kenaitze Indian Tribe). The Kenaitze Indian Tribe indicated that protecting the river is tied culturally to their world view as stewards of their ancestral lands. The ability to mitigate for the cultural impacts to develop a programmatic agreement covering the G South alternative proved challenging given CIRI’s and the Kenaitze Indian Tribe’s objections to that alternative.

The G South Alternative avoids use of the KNWR and the Resurrection Pass Trail (other properties of higher significance).

The G South Alternative also would impact the Forest Service Kenai River Recreation Area and Bean Creek Trail (both moderately significant properties). The Forest Service did not concur that

G South would not adversely affect the activities, features, or attributes of the KRRRA due to concerns with the reduction in parking and access. The ability to mitigate parking impact is good. G South also uses land from the Charles G. Hubbard Mining Claims Historic District but would not affect the KMM District. Agencies did not provide substantive comment on that use.

Juneau Creek Alternative. The Juneau Creek Alternative would not use KRSMA (the property having the highest significance). The Juneau Creek Alternative is ranked as having less harm based in part on input from the agencies with jurisdiction (DNR/DPOR and ADF&G) and others including CIRI, the Kenaitze Indian Tribe, and the KPB). Furthermore, it removes traffic from along the river for the greatest length, thereby reducing, to the greatest degree of any of the alternatives, the risk of potential spills directly into the river.

The Juneau Creek Alternative would use land from the Resurrection Pass Trail corridor, KNWR, Sqilantnu Archaeological District, and the Confluence Site, all of which are Section 4(f) properties of higher importance,

The Juneau Creek Alternative would affect the least number of known cultural sites in the Sqilantnu District. It would impact approximately half the number of known Sqilantnu Archaeological District contributing sites as the Cooper Creek and G South alternatives. It would, however, create more miles of new road on a new alignment, disturbing land and the setting across the Sqilantnu district. In much of this area, however, there are few known sites (Native peoples tended to congregate closer to the river). Similarly, this alternative would result in a new alignment through the Confluence Site, but it is the alignment preferred by some consulting parties (CIRI and the Kenaitze Indian Tribe, who advocated to designate the Confluence Site a TCP and who have a strong stake in Tract A, which is considered the heart of the Confluence Site. This alternative would run closer to the edge of the Confluence Site than any of the alternatives, impact fewer archaeological sites within the Confluence Site, and use less acreage. Some consulting parties (CIRI and the Kenaitze Indian Tribe) have identified the Juneau Creek Alternative as their favored alternative because they felt it best protects the river and reduces the risk of potential spills in the river. The Kenaitze Indian Tribe indicates that protecting the river is tied culturally to their world view as stewards of their ancestral lands. For these reasons, the ability to mitigate is less problematic than for the Juneau Creek Variant Alternative, which was identified by several consulting parties as unmitigatable, and less problematic than the G South and Cooper Creek alternatives, which have greater potential to impact the river.

The Resurrection Pass National Recreational Trail is valued by the Forest Service, and the agency has expressed concern about the impacts of the two Juneau Creek Alternatives on the trail. While the Juneau Creek Alternatives would use land from the trail, it would bridge over the trail tread, and DOT&PF and FHWA have proposed detailed mitigation. Mitigation includes providing features such as a new trailhead, and making improvements off site to the commemorative Iditarod National Historic Trail. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

The Juneau Creek Alternative is the only alternative that would use land from KNWR, however, given the assumed land trade between DOI and CIRI, the only use of KNWR would be south of the existing highway (needed to construct the road connection to the “old” Sterling Highway). The property required to construct the alternative on the north side of the highway will be converted to private (CIRI) property prior to this project’s right-of-way acquisition, so land in this area would be acquired from CIRI and not from the USFWS.

The Juneau Creek Alternative would use land from the following “moderate significance” properties: Juneau Falls Recreation Area and Bean Creek Trail. DOT&PF and FHWA have proposed detailed mitigation. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

Juneau Creek Variant Alternative. The Juneau Creek Variant Alternative would not use KRSMA (the property having the highest significance).

The Juneau Creek Variant Alternative would have impacts similar to those of the Juneau Creek Alternative. The main distinguishing feature between the two is that the Juneau Creek Variant Alternative would avoid use of KNWR land, but in doing so would also impact more sites within the Sqilantnu Archaeological District and Confluence Site.

The Juneau Creek Variant Alternative is ranked lower than the Juneau Creek Alternative because the agencies with jurisdiction and others did not favor it. Consulting parties such as CIRI, the Kenaitze Indian Tribe, USFWS, and the Forest Service found this alternative unacceptable because it would bisect Tract A, the heart of the Confluence Site, which was selected for its geographic location and cultural association with the confluence of the Kenai and Russian Rivers. The alignment would also cross a site that is particularly valued by the Kenaitze Indian Tribe (note that the most important locations within the site would not be buried, excavated, or disturbed). Consulting parties indicated that the loss of Tract A could not be mitigated, because the location is unique and the land is not replaceable. Also, the variant has a slightly higher percentage of its length adjacent to the Kenai River, thus having a slightly higher risk of potential spills directly into the river compared to the Juneau Creek Alternative. The Juneau Creek Variant Alternative also directly affects 20 known cultural and historic sites – a relatively high number.

The Juneau Creek Variant Alternative would use land from the Resurrection Pass National Recreation Trail. This Section 4(f) property is valued by the Forest Service, and the agency has expressed concern about the impacts of the Juneau Creek Alternatives on the trail. Based on consultation, trail mitigation includes a new trailhead and improvements off site to enhance the commemorative Iditarod National Historic Trail. These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

4.8.8.2 Purpose and Need

Purpose and Need: Transportation Considerations

While all alternatives satisfy the purpose and need, some perform better than others. This section summarizes pertinent differences in metrics related to the purpose and need for the project.

Cooper Creek Alternative. The Cooper Creek Alternative is the worst at resolving congestion problems. It would provide the second to lowest opportunity for passing, the greatest number of driveways and side roads, and the smallest percentage of its alignment predicted to operate at LOS C or better of any of the alternatives. It would have the most curves (with four remaining below desirable curvature) and has the greatest percentage of its length at steep grades (above 5.9 percent) compared to the other alternatives.

G South Alternative. The G South Alternative is marginally better than the Cooper Creek Alternative at resolving congestion problems. It provides 3 percent less opportunity for passing, and 8.4 percent more of its alignment is predicted to operate at LOS C or better. It has better geometry, with fewer curves than the Cooper Creek Alternative (all curves except one would be in the desirable range). A greater percentage of the alignment is steep (8 percent is above 5.9

percent grade) compared to the Juneau Creek alternatives (which have 2 percent or less of those alignments above 5.9 percent).

Juneau Creek Alternative. The Juneau Creek Alternative would best resolve congestion problems by providing the most opportunity for passing, the least number of intersections and driveways, and the greatest percentage of the alignment predicted to operate at LOS C or better. It has the least number of curves overall (with only one below desirable). A lower percentage of its length is at grades at or above 5.9 percent compared to the G South and Cooper Creek alternatives. While less of its alignment has the steepest grades (compared to the G South and Cooper Creek alternatives), more of its alignment would have grades above 5 percent, as compared to those two alternatives.

Juneau Creek Variant Alternative. The Juneau Creek Variant Alternative is nearly as good at resolving congestion problems as the Juneau Creek Alternative. In comparison to the Juneau Creek Alternative, however, it has just slightly less opportunity for passing, one more intersection, slightly less of its alignment operating at LOS C or better, and one additional curve. While it does not have any stretches at or above 5.9 percent grade, it is the most “hilly” of the alternatives, with 26 percent of the alignment above 5 percent grade.

Purpose and Need: Protecting the Kenai River

The statement of purpose and need for the project indicates that, in achieving their transportation purpose, DOT&PF and FHWA would “recognize the importance of protecting the Kenai River corridor.” Based on this input, this section presents key distinguishing considerations related to protection of the Kenai River.

Cooper Creek Alternative. The Cooper Creek Alternative is third overall in avoiding impacts on/protecting the Kenai River. It would have the most length close to the river (thereby increasing the risk of potential spills directly into the river). It would add two wider replacement bridges, but it would not add a third (new) bridge over the Kenai River like the G South Alternative would. While it would have the fewest number of small stream crossings and overall waterbody crossings, it would affect the most essential fish habitat, replace two bridges over the Kenai River (the most), and have the most anadromous stream crossings (eight – tied with the G South Alternative for the most).

G South Alternative. The G South Alternative was rated the worst at avoiding impacts/protecting the Kenai River.²⁴ Primary to this determination would be the need for a new bridge over the Kenai River. Several agencies identified this third (new, additional) bridge as a concern (DNR, ADF&G, EPA, KPBB) and one that would be difficult to mitigate (ADF&G, USFWS, USFS). It would have the most small stream crossings and total waterbody crossings of any of the alternatives, would tie the Cooper Creek Alternative as having the most anadromous stream crossings, and would have nearly as many impacts to essential fish habitat. USFS in particular expressed concern regarding the ability to mitigate the crossing of Juneau Creek (an anadromous stream that supports bears). While it would have more of its length away from the river as compared to the Cooper Creek

²⁴ In December 2015, DOT&PF and FHWA identified the G South Alternative as the preferred alternative. Since that time, considerable input was received from cooperating agencies, local government, stakeholders, and the public providing additional information on the significance of the Kenai River and the impacts associated with the G South Alternative.

Alternative, it would have roughly twice the percentage of its length proximate to the river compared to the Juneau Creek Alternative.

Juneau Creek Alternative. The Juneau Creek Alternative was rated the best at avoiding impacts on/protecting the Kenai River. It would tie with the Juneau Creek Variant Alternative for the fewest essential fish habitat impacts and lowest number of anadromous stream crossings. It would have only one new bridge crossing (of Juneau Creek), which would occur in a stretch that is not anadromous. Furthermore, that bridge would require no piers in the water. This alternative would not require any new or replacement bridge crossings of the Kenai River. It is considered slightly better than the Juneau Creek Variant Alternative in that it would have a somewhat higher percentage of its length away from the Kenai River and its tributaries—thereby minimizing the risk of a potential spill into the river. It was also preferred by several agencies and tribal entities.

Juneau Creek Variant Alternative. The Juneau Creek Variant Alternative is nearly as good at avoiding impacts on/protecting the Kenai River as the Juneau Creek Alternative; however, it would have slightly more of its length near to the Kenai River, thus having a slightly higher risk of potential spills directly into the river.

4.8.8.3 Impacts to Non-Section 4(f) Resources

This section presents a summary of the non-Section 4(f) resource impact considerations. This section demonstrates the difficulty and tradeoffs between the community/social impacts (e.g., relocations, noise, construction) associated with the Cooper Creek Alternative at one end of the spectrum and the natural environment impacts (wildlife, wetlands, vegetation) presented by the Juneau Creek alternatives at the other end of the spectrum.

Cooper Creek Alternative. The Cooper Creek Alternative's overall impacts to wetlands and vegetation would be the lowest among all build alternatives. Its impacts to wildlife are also the lowest, including both direct impacts to vegetated habitat and indirect impacts from traffic noise and disturbances from new sources of dispersed recreation originating with the highway. However, the social and community impacts would be the highest of the alternatives; impacts to private property would be the highest, as would traffic noise and construction (dust and traffic) impacts to the community. On the other hand, because all traffic still would be routed through a portion of Cooper Landing, fewer permanent impacts to highway-dependent businesses are likely.

G South Alternative. Impacts to wildlife would be greater than impacts from the Cooper Creek Alternative, because of the introduction of a new highway alignment and bridge through the lower Juneau Creek habitat area, but the acreage of habitat lost and fragmented would be less than impacts from the two Juneau Creek alternatives, and the ability to mitigate for wildlife movement appears good. The G South Alternative would affect more acreage of wetlands than would the Cooper Creek Alternative, but these two alternatives' effects on the most highly functioning wetlands would be similar; both would affect a smaller area of wetlands than would either of the Juneau Creek alternatives. Because it would route most traffic around Cooper Landing, the G South Alternative would have greater business impacts, but less private residential property impacts than the Cooper Creek Alternative.

Juneau Creek Alternative. The Juneau Creek Alternative would result in greater habitat fragmentation effects on bears, moose, and other wildlife than the Cooper Creek Alternative and more than the G South Alternative because it would include a long new alignment through known areas of good habitat for bears and moose. Because it would route most traffic around Cooper

Landing, it would have more impact to highway-dependent businesses than the Cooper Creek Alternative and G South Alternative, but less private residential property impacts than the Cooper Creek Alternative.

Juneau Creek Variant Alternative. The Juneau Creek Variant Alternative would have impacts to non-Section 4(f) resources very similar to those of the Juneau Creek Alternative. The differences would occur on the west end of the project. The Juneau Creek Variant Alternative would adversely affect CIRI's Tract A (a private property impact), which would have a Section 4(f)-related impact associated with the Confluence Site and the Sqilantnu District, but it would also affect CIRI's development plans on Tract A anticipated and authorized under the RRLA. Additionally, the Juneau Creek Variant would reconnect to the Old Sterling Highway at Sportsman's Landing, adding to traffic congestion at this popular fishing location. While the traffic and parking impacts would be mitigated through the use of a bridge, turn lanes, and no parking signs, traffic at this location would be heavy during fishing season, and congested conditions would be anticipated.

4.8.8.4 Cost Differences

This section summarizes the relative cost of the alternatives in comparison to each other. The Juneau Creek Alternative would be the least expensive to construct, and would have the lowest cost in terms of total expenditures over 20 years, followed by the Juneau Creek Variant Alternative, and then the Cooper Creek Alternative. The G South Alternative is projected to be the most expensive to construct and would cost the most in terms of total expenditures over 20 years. The difference in costs between the lowest cost alternative (Juneau Creek) and the highest cost alternative (G South) is estimated at \$32 million.

4.8.9 Least Overall Harm Conclusion

FHWA has determined the Juneau Creek Alternative to be the alternative that would have the least overall harm, and therefore it is the preferred alternative for this project. This determination is based on:

- A balancing of the seven factors discussed in the preceding subsections of Section 4.8.
- The material contained in this Final EIS and Final Section 4(f) Evaluation, as updated since the Draft SEIS and Draft Section 4(f) Evaluation was published.
- Public and agency comments received since the publication of the Draft SEIS and Draft Section 4(f) Evaluation and on DOT&PF's announcement of a preferred alternative in December 2015, including those comments received from Cooperating Agencies assisting in review of the Preliminary Final EIS and Final Section 4(f) Evaluation.
- Public and agency input received through the Section 106 and Government to Government consultation processes.

The following summarizes the reasons the Juneau Creek Alternative would have the least overall harm:

Factors i and ii: Ability to Mitigate Impacts, and Magnitude of Remaining Impact

Although the Juneau Creek Alternative would place human development, traffic, vehicle noise, and non-natural views near the current Wilderness boundary, because of the land trade between CIRI and DOI, it would not require a use of federally designated Wilderness. The Juneau Creek

Alternative would result in a second highway on the landscape inside and outside the Wilderness boundary, and the new alignment of the Juneau Creek Alternatives would be visible from higher elevations within Wilderness on both sides of the Kenai River Valley. The Juneau Creek Alternative would use property from the KNWR to construct the connection from the new highway to the old highway on the south side of the current highway's alignment. FHWA has conducted all possible planning to minimize the harm to that use. Despite these impacts, the Juneau Creek Alternative avoids impacts to the Kenai River and the Community of Cooper Landing, which tipped the balance against the G South and Cooper Creek alternatives. Agency and public comments identified concerns with impacts to the Kenai River (for the G South and Cooper Creek alternatives) and community impacts (noise, traffic, and relocations) associated with the Cooper Creek Alternative, which lend support to this consideration.

While the Juneau Creek Alternative would impact the Sqilantnu Russian River Confluence Site and Sqilantnu Archaeological District in substantive ways affecting its setting, this alternative would have the least impact on the Sqilantnu Archaeological District and Confluence Site, both of which are "higher significance" properties in the project area. This alternative would use less acreage from these properties than the G South Alternative, and it would affect the least number of known sites. Moreover, the Juneau Creek Alternative is preferred by the tribal entities (CIRI and the Kenaitze Indian Tribe) that have co-management jurisdiction over these resources. Both the G South and Cooper Creek alternatives would affect nearly three times as many known sites, and those alternatives are not supported by some consulting parties (CIRI and the Kenaitze Indian Tribe) due to concerns about impacts to the Kenai River (the river is included as a part of the Confluence Site and Sqilantnu Archaeological District). The Kenaitze Indian Tribe considers protection of the Kenai River an important aspect of the tribe's cultural heritage. DOT&PF and FHWA will mitigate the Section 106 effects through the implementation of a programmatic agreement (Appendix K).

Even though the Juneau Creek and Juneau Creek Variant alternatives affect the Sqilantnu Archaeological District and Confluence Site in similar ways, the Forest Service indicated, in comments on the Draft SEIS and in subsequent consultation meetings, that impacts to land transferred from the Forest Service to CIRI (Tract A) were of particular concern because Tract A was a 14(h)(1) selection (for cemetery and sacred sites) under ANCSA and is a central property within the Confluence Site. The Juneau Creek Variant Alternative would bisect Tract A. While the alignment was carefully placed to avoid known human burial sites, it would be close to those sites. It would substantially alter the setting and feeling of the location, and would substantially alter CIRI's plans agreed to in the RRLA, which would establish an archaeological curation site and visitor center. The RRLA MOU group stated that impacts to the Confluence Site at Tract A cannot be mitigated, and CIRI has similarly expressed a high degree of concern regarding permanent and unavoidable impacts at this location for their development plans. Both CIRI and the Kenaitze Indian Tribe, which have important roles in managing the cultural resources of the area, have expressed support for the Juneau Creek Alternative.

The Juneau Creek Alternative would impact the Resurrection Pass National Recreation Trail in a substantive way that is not easy to mitigate. The trail is one of relatively few long-distance hiking and single-track mountain biking trails in the state and is recognized as part of the National Trails System. It is well used and important to the public, as evidenced in some public comments, as well as to the Forest Service. While the Juneau Creek Alternative would use property from the

Resurrection Pass National Recreation Trail (a property with “higher significance” in the project area), FHWA has undertaken all possible planning to minimize harm to the trail. Although the use and impacts cannot be avoided, proposed mitigation has been jointly developed with the Forest Service (the agency with jurisdiction). These measures have been agreed to and incorporated in the project mitigation for the two Juneau Creek alternatives.

Factor iii: Relative Significance of Each 4(f) Property

The Juneau Creek Alternative would avoid use of KRSMA, the Section 4(f) property with “highest significance” in the project area. This alternative also would have the least length along the river (thereby minimizing the risk of potential spills directly into the KRSMA as compared to other alternatives). Both the G South and Cooper Creek alternatives would use KRSMA property and have impacts associated with new or replacement bridges, and both would have considerably greater length along the river and therefore would have greater potential risk of spills directly into KRSMA. While the Juneau Creek Variant Alternative also would avoid using KRSMA, it has greater length near the river and therefore would have a higher risk of spills directly into KRSMA than the Juneau Creek Alternative. The Juneau Creek Alternative is preferred by DNR (DPOR) and ADF&G, the agencies with direct management jurisdiction over KRSMA. It is also supported by the EPA, because it avoids impacts to the river and reduces the risk of spills into the river.

KRSMA is managed by DNR (DPOR) according to the Kenai River Comprehensive Management Plan. The Juneau Creek Alternative is consistent with the policies and standards of the plan, which recommend that “public road construction on projects in upland areas should be located away from the Kenai River.” This policy indicates that the Cooper Creek Alternative would be the least consistent with the plan. The plan further identifies that the “only recognized additional bridge crossing of the Kenai River in the management area is the proposed Funny River Bridge.” This indicates that the G South Alternative, which would require a new bridge across the Kenai River, would be inconsistent with the approved management plan for KRSMA.

Factor iv: Views of Officials with Jurisdiction

In general, agencies and tribal entities expressed concern for alternatives that kept highway traffic near the river (G South and Cooper Creek alternatives) or required a new bridge crossing of the river (G South Alternative). Several agencies and tribal entities expressed directly that the Juneau Creek Alternative was their preferred alternative. No agencies or tribal entities indicated that any of the other build alternatives as preferred. On the contrary, several point out impacts that were of great concern or unmitigatable associated with the other build alternatives. The following is a summary of the pertinent comments.

- DNR (DNR 2017) reiterated its view that protecting the river should be a primary consideration in the decision, indicating that “the impacts to the Kenai River, a resource of significant social and economic importance to the State of Alaska, have not been appropriately factored into the selection of the G South Alternative as the preferred alternative.”
- ADF&G (ADF&G 2017) indicated: “After assessing...the potential impacts each alternative has on fish habitat, fisheries, and wildlife, ADF&G recommends one of the Juneau Creek Highway Alternatives as the preferred route.”

- EPA (EPA 2015) rated the Cooper Creek alternative with “Environmental Objections” primarily due to impacts associated with the Kenai River, stating that “For the Cooper Creek and G South alternatives, we believe the potential impacts to the Kenai River and associated floodplain are likely serious and should be avoided...” They went on to indicate that their primary environmental concern was with potential impacts to water quality and aquatic resources in the Kenai River and its floodplain, stating that, “given that the Juneau Creek and Juneau Creek Variant move impacts away from the Kenai River and its associated floodplain, we have identified these alternatives as environmentally preferable to the other build alternatives.” EPA also indicated that, based on the information presented in the Draft SEIS, it appeared that one of the Juneau Creek alternatives, or a variation of the two, may be the least environmentally damaging practicable alternative (EPA 2015).
- The RRLA MOU Group indicated that it was the Kenaitze Indian Tribe’s and CIRI’s position that the Juneau Creek Variant Alternative was “unacceptable and should be removed from future consideration” because it bisects Tract A. The Forest Service and USFWS acknowledged and supported the Kenaitze Indian Tribe’s and CIRI’s position. The group expressed their belief that the Juneau Creek Variant Alternative is counter to the intent of Congress in resolving CIRI’s land claims under ANSCA.
- In a separate letter, CIRI indicated that the Juneau Creek Variant Alternative would bisect Tract A and would make development of the facilities agreed to and ratified by the RRLA infeasible and would “...contravene the Congressional intent when it enacted the Russian River Land Act in December 2002.” CIRI also expressed support for the Juneau Creek Alternative, stating that “Of the realignment scenarios being considered for the area, the Juneau Creek Alternative appears to be the best fit with CIRI’s development and cultural resource protection goals” (CIRI 2015).
- The Kenaitze Indian Tribe (2016) indicated that they are “committed to protecting the Kenai River and all life that it supports” and indicated that was the “primary reason” they favor the Juneau Creek Alternative.
- Multiple agencies (DNR, ADF&G, EPA, KPB) stressed that keeping highway traffic near the river would retain the risk of potential spills and would have adverse water quality impacts.
- ADF&G (ADF&G 2017) indicated that completion of the G South Alternative may result in additional and unnecessary impacts to sport fishery resources of the Kenai River and would create the greatest impact to riparian habitat.

Factor v: The Degree to which Each Alternative Meets the Purpose and Need

The Juneau Creek Alternative would best satisfy the Purpose and Need for the project. It would have the highest percentage of its length predicted to operate at or better than LOS C as compared to the other alternatives. It would have the most opportunities for passing to occur using dedicated passing lanes. This would reduce the percentage of time spent following other vehicles (a measure of congestion) by the greatest amount, and it would best improve safety by reducing the tendency for drivers to make unsafe passes. Safety analysis shows that the new highway would result in the fewest total crashes per year, the fewest fatal and injury crashes per year, and the fewest property damage only crashes per year. It would have the least number of intersections and driveways (which cause congestion and create conflict points that reduce highway safety). It also would have

the lowest number of curves, which have been a concern and the cause of accidents on the existing highway. The Juneau Creek Alternative would also best protect the Kenai River by moving 70 percent of the traffic farther away from the Kenai River for a longer distance as compared to the other alternatives.

Factor vi: Magnitude of Impacts to Non-4(f) Resources

Beyond Section 4(f) impacts, both the Juneau Creek alternatives would have impacts in other impact categories that are greater than the impacts under the Cooper Creek and G South alternatives. Both Juneau Creek alternatives would impact substantially greater acreage of wildlife habitat, and would fragment and isolate larger areas of habitat than the other alternatives. While the Juneau Creek Alternative would have the greatest impact on wildlife in terms of habitat acreage (because of the length of new roadway across important habitat), DOT&PF and FHWA believe that these impacts can be adequately mitigated. At the request of cooperating agencies, DOT&PF and FHWA conducted a wildlife study (Suring 2017) to identify effective locations for placing wildlife crossings, fencing, and other measures and have reviewed those mitigation measures with wildlife professionals from the managing agencies. The proposed measures based on the study are presented in Appendix I.

Similarly, the Juneau Creek Alternative impacts a higher acreage of wetlands and associated wetland functions than the other alternatives, including bisecting extensive high-functioning wetlands both east and west of Juneau Creek. However, when the potential impacts to all waters of the U.S., including potential impacts to the Kenai River and Kenai Lake, are considered, both the G South and Cooper Creek alternatives were found to present a greater risk.

The Juneau Creek Alternative would have the least impact on the community of Cooper Landing. It would have the lowest number of relocations and private parcel acquisitions (tied with the G South and Juneau Creek Variant alternatives). It would route the majority of traffic completely out of the developed area of Cooper Landing, thereby avoiding noise, traffic, dust, and construction impacts to the community and destinations along the existing highway (many of which are Section 4(f) properties) better than the other alternatives. However, by routing highway traffic out of the community, it will have business impacts, especially to highway dependent businesses like gas stations.

The Juneau Creek Alternative would be easiest to construct, because it would have the most work taking place off of the existing highway; other alternatives would require greater use of construction detours and pilot cars on the existing highway and would require working in and around community and recreation destinations with heavy traffic, thereby affecting travelers and businesses to a much greater degree and creating greater construction challenges and costs.

Factor vii: Substantial Differences in Cost

The Juneau Creek Alternative is projected to cost the least to construct and would have the lowest total costs over the 20-year design life of the project. This cost is projected to be less than any of the other build alternatives.

Conclusion

Balancing all seven least overall harm factors, FHWA finds that the Juneau Creek Alternative would result in the least overall harm of the four build alternatives.

In addition, based on all of the foregoing sections of this chapter, FHWA finds that:

- There is no feasible and prudent alternative to the use of land from multiple Section 4(f) properties (see Section 4.4).
- For each of the alternatives, all possible planning to minimize harm to affected Section 4(f) properties has been incorporated into that alternative (see Section 4.6).

This page intentionally left blank.

Table 4.8-13. Summary of Section 4(f) use for Sterling Highway alternatives

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Number of 4(f) properties with “use”^a	8	6	6	6 (5 have greater than <i>de minimis</i> impact)
Summary of impact for properties with Section 4(f) “use” greater than <i>de minimis</i> (acres)^b	<ul style="list-style-type: none"> • KRSMA (0.9) • Forest Service Kenai River Recreation Area (41.3) • Stetson Creek Trail (2.5) • Cooper Landing Boat Launch and Day Use Area (0.55, temporary) • Sqilantnu Archaeological District (165), 28 contributing properties • Confluence Site (29.5) • Hubbard Claims District (28.5), 6 contributing properties • Kenai Mining and Milling District (4.3), 3 contributing properties 	<ul style="list-style-type: none"> • KRSMA (2.5) • Forest Service Kenai River Recreation Area (31.9) • Bean Creek Trail (1.0) • Sqilantnu Archaeological District (173), 26 contributing properties • Confluence Site (30.2) • Hubbard Claims District (27.9), 4 contributing properties 	<ul style="list-style-type: none"> • Kenai National Wildlife Refuge (14.3) • Resurrection Pass Trail (encompassed within Juneau Falls Recreation Area) (7.4) • Bean Creek Trail (1.1) • Juneau Falls Recreation Area (17.1) • Sqilantnu Archaeological District (170.3), 9 contributing properties • Confluence Site (14.7) 	<ul style="list-style-type: none"> • Resurrection Pass Trail (encompassed within Juneau Falls Recreation Area) (7.4) • Bean Creek Trail (1.1) • Juneau Falls Recreation Area (17.1) • Sqilantnu Archaeological District (169), 20 contributing properties • Confluence Site (20.1)

^a The number of properties with *de minimis* impacts has changed since the Draft SEIS because officials with jurisdiction were unable to concur in a *de minimis* impact finding. This also resulted in properties being added to the next row below and in other tables below.

^b The acreages reported in this row are not a complete indicator of Section 4(f) impact. Many of the properties overlap (virtually all are within the Sqilantnu Archaeological District). Use of portions of the *historic* districts that do not contribute to the district is not considered to be a Section 4(f) use, while use of any portion of the *archaeological* district or Confluence Site is considered to be a Section 4(f) use. Acreage and number of contributing properties reported for the Confluence Site are a subset of those reported for the Sqilantnu District.

This page intentionally left blank.

Table 4.8-14. Least Overall Harm Factor i, ability to mitigate adverse impacts to Section 4(f) properties

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
<p>Mitigation at Affected properties Note: ability to mitigate impacts does not apply to the “de minimis” property in Table 4.8-13. That is why the Kenai River Recreation Area under the Juneau Creek Variant Alternative is not addressed here. Note: the term ‘Mitigation’ as used in this table includes measures that would reduce impacts and measures that would compensate for impacts.</p>	<p>KRSMA Ability to mitigate is moderate-low given the length of the alternative along the river. Mitigation: Minimize piers in Kenai River; accommodate river users and river hydraulics; best practices during construction. Very little new permanent impact.</p> <p>Stetson Creek Trail Ability to mitigate is good. Mitigation: Reroute trail; new trailhead/parking; loop trail at campground; interpretive signs. However, historic alignment would remain severed and character of lower trail would change.</p> <p>Kenai River Recreation Area Ability to mitigate is moderate. Mitigation: Return portions of unused right-of-way, provide parking area near MP 53.1. Mitigation opportunity limited, but remaining impact low.</p> <p>Cooper Landing Boat Launch and Day Use Area Ability to mitigate is good. Mitigation: Timing restrictions.</p> <p>Sqilantnu Archaeological District, Confluence Site, Hubbard Claims District, and Kenai Mining District Ability to mitigate is moderate. Mitigation for each district & Confluence Site has been documented in a Section 106 agreement process that includes data recovery from a portion of affected contributing features; interpretation; preparation of a Sqilantnu NRHP nomination, and publication of research. However, some loss of data is expected.</p>	<p>KRSMA Ability to mitigate is low/problematic given the length along the river and the introduction of a new bridge over the river. Mitigation: Minimize piers in Kenai River; accommodate river users and river hydraulics; best practices during construction. However, the permanent visual, noise, recreation, and minor hydraulic/fish impacts of a new bridge remain as an incremental impact.</p> <p>Bean Creek Trail Ability to mitigate is moderate. Mitigation: Formalize trailhead parking; reroute trail to cross under highway at Bean Creek; interpretive sign for trail history. However, highway visual/noise/recreation intrusion remain.</p> <p>Kenai River Recreation Area Ability to mitigate is moderate. Mitigation: Return portions of unused right-of-way, provide parking area near MP 53.1. Mitigation opportunity limited, but remaining impact low.</p> <p>Sqilantnu District, Confluence Site, and Hubbard Claims District Ability to mitigate is moderate. Mitigation for both districts and the Confluence Site has been documented in a Section 106 agreement process that includes data recovery from a portion of affected contributing features; interpretation; preparation of a Sqilantnu NRHP nomination, and publication of research. However, some loss of data is expected.</p>	<p>Kenai National Wildlife Refuge Ability to mitigate is good given the reasonably foreseeable change to refuge/Wilderness boundaries north of the highway. Mitigation: Coordinate with KNWR regarding construction access to adjacent KNWR facilities; wildlife movement study and separated wildlife crossings as recommended by the study.</p> <p>Resurrection Pass Trail Ability to mitigate is moderate. Mitigation: Route highway over trail on bridge; provide summer and winter trailheads; fund construction pedestrian access to support the Iditarod Trail at Snow River bridge; maintain access during construction. However, long-distance character would be reduced/trail effectively shortened by 3.4 mi., character of use would change.</p> <p>Bean Creek Trail Ability to mitigate is moderate. Mitigation: Provide pullout parking; reroute trail to cross under Juneau Creek bridge; interpretive sign for trail history. However, highway visual/noise/recreation intrusion at a point 1.75 miles into trail, and severing and likely disuse of the historic alignment, remain.</p> <p>Juneau Falls Recreation Area Ability to mitigate is moderate. Mitigation: New trailhead and trail connections for walkers and horses; formalized falls overlook; pedestrian amenities on bridge with connections to Bean Creek and Resurrection Pass trails and to parking. However a change in character of the area would remain.</p> <p>Sqilantnu Archaeological District, and Confluence Site Ability to mitigate is moderate. Mitigation for the districts and Confluence Site has been documented in a Section 106 agreement process that includes data recovery from a portion of affected contributing features; interpretation; preparation of a Sqilantnu National Register nomination, and publication of research. However, some loss of data is expected.</p>	<p>Resurrection Pass Trail Ability to mitigate is moderate. Mitigation: Route highway over trail on bridge; provide summer and winter trailheads; fund construction pedestrian access to support the Iditarod Trail at Snow River bridge; maintain access during construction. However, long-distance character would be reduced/trail effectively shortened by 3.4 mi. Character of use would change.</p> <p>Bean Creek Trail Ability to mitigate is moderate Mitigation: provide pullout parking; reroute trail to cross under Juneau Creek bridge; interpretive sign for trail history. However, highway visual/noise/recreation intrusion at a point 1.75 miles into trail, and the severing and likely disuse of the historic alignment, remain.</p> <p>Juneau Falls Recreation Area Ability to mitigate is moderate. Mitigation: New trailhead and trail connections for walkers and horses; formalized falls overlook; pedestrian amenities on bridge with connections to Bean Creek and Resurrection Pass trails and to parking. However a change in character of the area would remain.</p> <p>Sqilantnu Archaeological District, and Confluence Site Ability to mitigate is moderate for the district and low for the Confluence Site. Mitigation for districts and Confluence Site has been documented in a Section 106 agreement process that includes data recovery from a portion of affected contributing features; interpretation; preparation of a Sqilantnu NRHP nomination, and publication of research. However, loss of data is expected. Consulting parties indicate Tract A losses within the Confluence Site cannot be mitigated.</p>

This page intentionally left blank.

Table 4.8-15. Least Overall Harm Factor ii, severity of impacts to Section 4(f) properties after mitigation

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Impact Detail	<p>KRSMA Two replacement bridges would be wider than existing bridges but would be improved to allow wildlife passage on both sides of river.</p> <p>Stetson Creek Trail</p> <ul style="list-style-type: none"> Trail length reduced by 0.32 mile (of 5.2 miles). Trail would parallel road (noise, visual change) over approximately 1,600 feet. Trail would no longer connect to campground, but dual-access management issue would be resolved. Historic alignment compromised. <p>Cooper Landing Boat Launch and Day Use Area</p> <ul style="list-style-type: none"> Popular area closed and/or restricted during construction. Short duration closures during summer (longer closures possible at less popular times). <p>Forest Service Kenai River Recreation Area</p> <ul style="list-style-type: none"> 14.7% of land used. Reduced buffer not mitigated but appearance similar to existing. Location of roadside parking altered (parking is located outside the recreation area but used for access). <p>Sqilantnu Archaeological District</p> <ul style="list-style-type: none"> 28 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. <p>Confluence Site</p> <ul style="list-style-type: none"> Minor change in setting, feeling, and association of culturally important lands. Same as Sqilantnu. <p>Hubbard Claims Historic District</p> <ul style="list-style-type: none"> 6 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. <p>Kenai Mining Historic District</p> <ul style="list-style-type: none"> 3 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. 	<p>KRSMA</p> <ul style="list-style-type: none"> 2–3 new piers in water. 1 new bridge (3 total), and visual/noise/recreation changes at new bridge. Replacement bridges would be improved to allow for wildlife passage on both sides of river. <p>Bean Creek Trail</p> <ul style="list-style-type: none"> The highway crossing of the trail remains as an impact despite mitigation to retain continuity. No snow in undercrossing for winter users. Minor routing off historic alignment. <p>Forest Service Kenai River Recreation Area</p> <ul style="list-style-type: none"> 11.3% of land used. Reduced buffer not mitigated but appearance similar to existing. Location of roadside parking altered (parking is located outside the recreation area but used for access). <p>Sqilantnu Archaeological District</p> <ul style="list-style-type: none"> 26 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. <p>Confluence Site</p> <ul style="list-style-type: none"> Minor change in setting, feeling, and association of culturally important lands. Same as Sqilantnu. <p>Hubbard Claims Historic District</p> <ul style="list-style-type: none"> 4 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. 	<p>Kenai National Wildlife Refuge</p> <ul style="list-style-type: none"> 14.3 ac. loss of land to highway right-of-way within KNWR Habitat fragmented/wildlife movement inhibited inside and outside KNWR. <p>Resurrection Pass Trail</p> <ul style="list-style-type: none"> Trail effectively shortened 3.4 mi/9%. Changes occur to up-valley trail use. See also Juneau Falls Recreation Area. <p>Bean Creek Trail</p> <ul style="list-style-type: none"> Trail rerouted off historic alignment. Changes occur to up-valley trail use. See also Juneau Falls Recreation. <p>Juneau Falls Recreation Area</p> <ul style="list-style-type: none"> Noise/visual/activity change in character from backcountry to front-country. <p>Sqilantnu Archaeological District</p> <ul style="list-style-type: none"> 9 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. <p>Confluence Site</p> <ul style="list-style-type: none"> Moderate change in setting, feeling, and association of culturally important lands; affects lands outside existing highway corridor but affects fewer archaeological sites than G South & Cooper Creek alternatives. Same as Sqilantnu. 	<p>Resurrection Pass Trail</p> <ul style="list-style-type: none"> Trail effectively shortened 3.4 mi./ 9%. Changes occur to up-valley trail use. See also Juneau Falls Recreation Area. <p>Bean Creek Trail</p> <ul style="list-style-type: none"> Trail rerouted off historic alignment. Changes occur to up-valley trail use. See also Juneau Falls Recreation Area. <p>Juneau Falls Recreation Area</p> <ul style="list-style-type: none"> Noise/visual/activity change in character from backcountry to front-country. <p>Sqilantnu Archaeological District</p> <ul style="list-style-type: none"> 20 contributing properties impacted. Some information gained instead of remaining in the ground. Some data lost. <p>Confluence Site</p> <ul style="list-style-type: none"> High²⁵ change in setting, feeling, & association of culturally important lands; affects lands outside existing highway corridor and near important sites but affects fewer archaeological sites than G South & Cooper Creek alternatives. Same as Sqilantnu.

²⁵ Changed from moderate to high because agencies and tribal entities indicated impacts could not be mitigated in their comments on the Draft SEIS.

This page intentionally left blank.

Table 4.8-16. Least Overall Harm Factors iii and iv, relative significance of Section 4(f) properties, and views of officials with jurisdiction regarding Section 4(f) properties

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Properties Affected (See also Table 4.8-6 in Section 4.8.3)	<p>KRSMA: Highest significance compared to other properties.</p> <p>Stetson Creek Trail: Lower significance compared to other properties.</p> <p>Forest Service Kenai River Rec. Area: Moderate significance compared to other properties.</p> <p>Cooper Landing Boat Launch and Day Use Area: Moderate significance compared to other properties (and impact not permanent).</p> <p>Sqilantnu District: Higher significance compared to other properties.</p> <p>Confluence Site: Higher significance compared to other properties.</p> <p>Hubbard Claims District: Lower significance compared to other properties.</p> <p>Kenai Mining District: Lower significance compared to other properties.</p>	<p>KRSMA: Highest significance compared to other properties.</p> <p>Bean Creek Trail: Moderate significance compared to other properties.</p> <p>Forest Service Kenai River Rec. Area: Moderate significance compared to other properties.</p> <p>Sqilantnu District: Higher significance compared to other properties.</p> <p>Confluence Site: Higher significance compared to other properties.</p> <p>Hubbard Claims District: Lower significance compared to other properties.</p>	<p>KNWR: Higher significance compared to other properties.</p> <p>Resurrection Pass Trail: Higher significance compared to other properties.</p> <p>Bean Creek Trail: Moderate significance compared to other properties.</p> <p>Juneau Falls Rec Area: Moderate significance compared to other properties</p> <p>Sqilantnu District: Higher significance compared to other properties.</p> <p>Confluence Site: Higher significance compared to other properties.</p>	<p>Resurrection Pass Trail: Higher significance compared to other properties.</p> <p>Bean Creek Trail: Moderate significance compared to other properties.</p> <p>Forest Service Kenai River Rec. Area: Moderate significance compared to other properties (impact <i>de minimis</i>).</p> <p>Juneau Falls Rec Area: Moderate significance compared to other properties.</p> <p>Sqilantnu District: Higher significance compared to other properties.</p> <p>Confluence Site: Higher significance compared to other properties.</p>
iv. Views of officials with jurisdiction regarding 4(f) properties				
Views of Officials for Each Property	<p>KRSMA: Kenai River highly valued by State, Forest Service, USFWS, Borough, and other agencies. Comments from DNR, ADF&G, Forest Service, EPA, and tribal entities suggest that the Kenai River is the most used and important resource. Serious concerns by DNR, ADF&G, EPA, KP.B.</p> <p>Stetson Creek Trail: Valued by Forest Service but not as important as Resurrection Pass or Bean Creek trails.</p> <p>Cooper Landing Boat Launch and Day Use Area: Valued by ADFG/DPOR because highly used.</p> <p>Forest Service Kenai River Rec. Area: Valued by Forest Service. Recognized as linked to highway.</p> <p>Sqilantnu District: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p> <p>Confluence Site: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p> <p>Hubbard Claims District: SHPO views as generally important because eligible for NRHP.</p> <p>Kenai Mining District: SHPO views as generally important because eligible for NRHP.</p>	<p>KRSMA: Kenai River highly valued by State, Forest Service, USFWS, Borough, and other agencies. Comments from DNR, ADF&G, Forest Service, EPA, and Tribal entities suggest that the Kenai River is the most used and important resource. Serious concerns by DNR, ADF&G, EPA, KP.B. Mitigation concerns from ADF&G, USFWS, USFS.</p> <p>Bean Creek Trail: Valued by Forest Service, State, and Borough but not as highly as Resurrection Pass Trail. Valued by SHPO as generally important because eligible for NRHP.</p> <p>Forest Service Kenai River Rec. Area: Valued by Forest Service. Recognized as linked to highway.</p> <p>Sqilantnu District: Highly valued by SHPO, Tribes, Forest Service, and USFWS. Serious concerns by CIRI, the Kenaizte Indian Tribe (Cultural concerns for the river).</p> <p>Confluence Site: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p> <p>Hubbard Claims District: SHPO views as generally important because eligible for NRHP.</p>	<p>KNWR: Highly valued by USFWS. Visual and noise impacts to Wilderness considered moderate by USFWS.</p> <p>Res. Pass Trail: Highly valued by Forest Service.</p> <p>Bean Creek Trail: Valued by Forest Service, State, and Borough but not as highly as Resurrection Pass Trail. Valued by SHPO as generally important because eligible for NRHP.</p> <p>Juneau Falls Rec Area: Highly valued by Forest Service.</p> <p>Sqilantnu District: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p> <p>Confluence Site: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p>	<p>Res. Pass Trail: Highly valued by Forest Service.</p> <p>Bean Creek Trail: Valued by Forest Service, State, and Borough but not as highly as Resurrection Pass Trail. Valued by SHPO as generally important because eligible for NRHP.</p> <p>Juneau Falls Rec Area: Highly valued by Forest Service.</p> <p>Sqilantnu District: Highly valued by SHPO, Tribes, Forest Service, and USFWS. The Kenaizte Indian Tribe, CIRI, Forest Service, and USFWS (RRLA MOU Group) indicate it cannot be mitigated.</p> <p>Confluence Site: Highly valued by SHPO, Tribes, Forest Service, and USFWS.</p>

This page intentionally left blank.

Table 4.8-17. Least Overall Harm Factor v. degree to which alternative meets purpose and need

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Need 1: Reduce Congestion				
Level of Service (LOS) in 2043 <i>Eastbound (EB) and westbound (WB) LOS at the 100th highest traffic hour of the year. Percentage calculated on both directions of travel.</i>	EB: 4 segments at LOS D; 2 segments at LOS C. WB: 6 segments at LOS C. 61% at LOS C or better	EB: 3 segments at LOS D; 3 segments at LOS C. WB: 3 segments at LOS C; 3 segments at LOS B. 69% at LOS C or better	EB: 2 segments at LOS D; 4 segments at LOS C. WB: 4 segments at LOS C; 2 segments at LOS B. 83% at LOS C or better.	EB: 2 segments at LOS D; 4 segments at LOS C. WB: 4 segments at LOS C; 2 segments at LOS B. 82% at LOS C or better
Congestion relief: Passing lanes <i>Percent (%) of length with passing lanes</i>	28	25	43	40
Congestion avoidance: Intersections and driveways^a (fewer is better)	47	23	12	13
Need 2: Meet Standards for a Rural Principal Arterial (Note: all build alternatives would meet the current highway design standards)				
Horizontal Curves				
<i>Minimum design speed selected for this project = 60mph Desirable design speed for 'rural principal arterial' class nationwide = 65mph</i>				
Total number of horizontal curves <i>(existing highway = 43)</i>	27	25	21	22
Number of curves at or better than the "desirable" standard	23	24	20	21
Number below "desirable"	4	1	1	1
Grades				
Percent (%) of length above maximum grade (>6% grade)	0	0	0	0
Percent (%) of length at 5.9%-6% grade (steep)	9	8	2	0
Percent (%) of length at >5% grade (hilly)	9	14	16	26
Need 3: Improve Safety (Note: curve information and congestion information above are also indicators of relative safety)				
Total Crashes/Year on new highway (2043)	12.4	11.4	9.8	10.0
Fatal and Injury Crashes/Year on new highway (2043)	4.1	3.7	3.2	3.3
Property Damage Only Crashes/Year on new highway (2043)	8.3	7.6	6.6	6.8

^a For comparison, the No Build Alternative currently has 123 intersections of driveways and side roads. Numbers changed from the Draft SEIS to account for previously uncounted pullouts/parking areas/informal driveways, and to account for parking lots, trailheads, and pullouts added for mitigation.

^b Meeting design standards is known to reduce crashes. This is based on statistics related to lane and shoulder width and other standards.

This page intentionally left blank.

Table 4.8-18. Least Overall Harm Factor vi, magnitude of impacts to non-4(f) resources

Much of the project area is encompassed by the Sqilantnu Archaeological District, a Section 4(f) resource. Therefore, technically some of the resources discussed below are within the bounds of a Section 4(f) resource. For the purposes evaluating Factor vi, they are included, as they are not typically identified as Section 4(f) resources.

Impact Category		Impacts by Alternative							
		Cooper Creek Alternative		G South Alternative		Juneau Creek Alternative		Juneau Creek Variant Alternative	
Land Ownership (see Section 3.1)									
Land Ownership <i>(acres, % in project area)</i>	Federal (9,046)	54	<1%	88	1%	165	2%	125	1%
	Forest Service	54	<1%	88	1%	132	1%	125	1%
	USFWS	-	-	-	-	14	<1%	-	-
	State (1,722)	7	<1%	42	3%	89	5%	91	5%
	Borough (2,010)	95	5%	127	6%	130	6%	130	6%
	Native/CIRI (60)	-	-	-	-	-	-	12	19%
Private (698)	53	8%	1	<1%	1	<1%	1	<1%	
Total (13,537)	209	2%	259	2%	385	3%	360	3%	
Land Use (see Section 3.2)									
National Forest Inventoried Roadless Area (IRA) Lands <i>(Acres of right-of-way)</i>		3.8 acres		48.4 acres		127.5 acres		96 acres	
Social Environment (see Section 3.3)									
Community Impacts		Change in local traffic patterns and community character through rerouting of traffic, less for the Cooper Creek Alternative, more for the G South, Juneau Creek, and Juneau Creek Variant alternatives. Reduction in traffic in the community expected overall to be a benefit to community character.							
Housing and Relocation (see Section 3.4)									
Private Property Acquisition and Relocations <i>(number of affected parcels)</i>	Private	38		4		4		4	
	Full Parcel	16 <i>(8 residential properties and approximately 14 people relocated)</i>		0 <i>(0 relocations)</i>		0 <i>(0 relocations)</i>		0 <i>(0 relocations)</i>	
	Part of Parcel	22		4		4		4	
	Native Corporation	0		0		0		1	
	Full Parcel	0		0		0		0	
Part of Parcel	0		0		0		1		
Economic Environment (see Section 3.5)									
Tax Base/Business Impacts		Similar impact types to other build alternatives, but adverse impacts to individual businesses lower because all traffic would remain routed through a portion of the central commercial area of Cooper Landing.		Would not result in any business relocations. These alternatives would remove 70 percent of the traffic from all of the central commercial area of Cooper Landing. Thirty percent of the traffic would continue traveling through Cooper Landing on the "old" highway. Adverse impacts would result from reduced spontaneous stops for services; businesses impacted would need to adapt to the altered traffic pattern or risk failure.					

Impact Category	Impacts by Alternative			
	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Transportation (see Section 3.6)				
Roadway System: Travel Patterns	This alternative would remove 70% of traffic from a portion of the central commercial area of Cooper Landing (MP 48-50) but would retain all traffic in the MP 47-48 portion. No change in overall traffic volumes.	This alternative would remove 70% of all traffic from all of the central commercial area of Cooper Landing (approximately MP 47 to 50). No change in overall traffic volumes.	These alternatives would remove 70% of all traffic from all of the central commercial area of Cooper Landing (approximately MP 47 to 50) and from the primary recreation corridor (approximately MP 50 to 55). No change in overall traffic volumes.	
Roadway System: Accessibility	Under this alternative, getting on and off the highway would remain difficult at some times because all traffic would remain in town in the MP 47-48 area.	Under these alternatives, accessibility for Cooper Landing businesses and residents along the “old” Sterling Highway is expected to improve because traffic would be lighter in this area.		
Aviation, Pedestrians, and Bicyclists	No impacts			
Existing pullouts not retained	15	11	4	4
River Navigation (see Section 3.7)				
Impacts to navigation by boat on the Kenai River (non-motorized downstream of Cooper Landing)	Construction impacts to river navigation would occur for two replacement bridges. No permanent change to navigation would occur at bridges. Minor changes at the river's edge where the highway is adjacent.	Construction impacts to river navigation would occur for a replacement bridge and a new bridge. New bridge would be a permanent change but would have ample navigation clearances. Minor changes at the river's edge where the highway is adjacent.	No crossings of the Kenai River and no bridge impacts to river navigation. Minor changes at the river's edge where the highway is adjacent.	
Non Section 4(f) Recreation Resources (see also Section 3.8)				
Non Section 4(f) Recreation Resources Affected	Cooper Lake Dam Road/Powerline Trail crossed (underpass provided)	Birch Ridge Trail shortened Art Anderson/ Slaughter Gulch trail crossed (underpass provided)	Birch Ridge Trail shortened Art Anderson/ Slaughter Gulch trail crossed (underpass provided) West Juneau Rd.(used as snowmobile and horse access) crossed with culvert or bridge	Birch Ridge Trail shortened Art Anderson/ Slaughter Gulch trail crossed (underpass provided) West Juneau Rd.(used as snowmobile and horse access) crossed with culvert or bridge
Subsistence (see Section 3.10)				
Changes in Resources, Resource Habitat, or Competition for Resources	Changes in both fish and wildlife resources may occur as a result of construction and operation of the build alternatives. Impacts to subsistence uses in the project area may include game species avoiding or reducing their use of habitat near the highway, actual loss of habitat within the new alignment, decreased habitat quality, fragmentation of habitat, and injury or mortality of wildlife from collisions or hazardous materials spills.			
Changes in Resource Availability due to Alteration in Wildlife Movement Patterns or Distribution	Changes to the landscape caused by project construction can influence wildlife population movement patterns and distribution through habitat loss, changes in habitat suitability, changes in habitat use, or reduced survival. In addition, the highway itself can become a barrier to animal movement patterns through design, such as steep embankments or retaining walls, or through injuries or mortality due to collisions.			
Physical or Legal Barriers to Accessing Resources	No impact			

Impact Category	Impacts by Alternative			
	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Water Bodies and Water Quality (see Section 3.13)				
New Bridges <i>(new bridges that are not otherwise addressed in Chapter 4)</i>	Cooper Creek New Cooper Creek Bridge: • No piers or fill in creek.	Juneau Creek New Juneau Creek Bridge: • No piers or fill in creek	None (Juneau Creek Bridge is addressed in Ch. 4 along with discussion of Juneau Falls Recreation Area)	
Drainages	58 small drainage crossings: • 48 replacement culverts • 10 new culverts	73 small drainage crossings: • 39 replacement culverts • 32 new culverts <i>(drainages were combined into one culvert where possible)</i>	63 small drainage crossings: • 20 replacement culverts • 41 new culverts <i>(drainages were combined into one culvert where possible)</i>	
Water Quality ²⁶	Increase in storm water runoff because the project area would have more paved surfaces; least new surface area of all alternatives.	Increase in storm water runoff: slightly greater new surface area than CC Alternative, less than JC alternatives.	Increase in storm water runoff because the project area would have more new paved surfaces than other alternatives.	Increase in storm water runoff because the project area would have more paved surfaces: Somewhat less new paved surface than JC Alternative but more than CC and GS alternatives.
Approximate area of stream replaced by culvert or bank stabilization (acres)	0.6	0.7	0.8	1.3
Percent length within 500 feet of Kenai River and major tributaries ^d	56	45	25	26
Percent length within 300 feet of Kenai River and major tributaries ^d	43	33	15	16
Noise (see Section 3.15)				
Noise <i>Number of Non-4(f) resources impacted</i>	4 residential 1 commercial	0	0	0
Visual Environment (see Section 3.16)				
Visual Impacts ²⁷	Visual analysis for the build alternatives indicates that all build alternatives have at least moderate impacts as a result of new or updated roadway elements. The analysis shows that none of the build alternatives would result in impacts that are orders of magnitude different than the others.		Visual analysis for the build alternatives indicates that all build alternatives have at least moderate impacts as a result of new or updated roadway elements. The analysis shows that none of the build alternatives would result in impacts that are orders of magnitude different than the others. More visual intrusion in views from high elevations than other alternatives, particularly important to USFWS for views from designated Wilderness.	
Wetlands and Vegetation (see Section 3.20)				
Wetlands (acres filled)	10.1 acres	27.4 acres	39.2 acres	38.6 acres
Vegetation (acres removed)	190 acres	211 acres	262 acres	257 acres

²⁶ Changed from the Draft SEIS to better distinguish among alternatives based on comments (Draft SEIS showed a single column).

²⁷ Changed from the Draft SEIS to better distinguish among alternatives based on comments (Draft SEIS showed a single column).

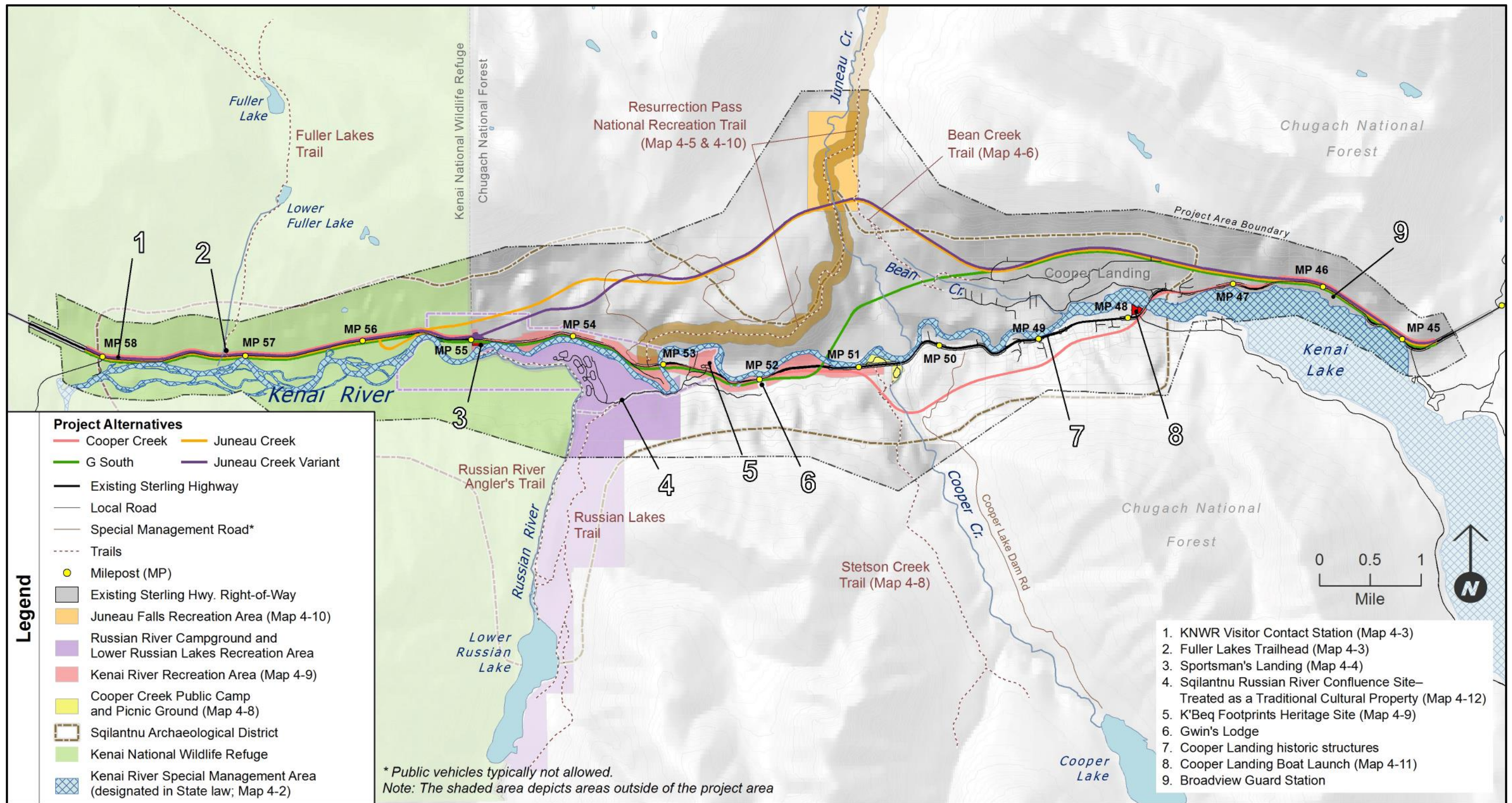
Impact Category	Impacts by Alternative				
	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative	
Fish and Essential Fish Habitat (see Section 3.21)					
Essential Fish Habitat Impacts <i>Note: For each alternative, one of the bridges listed is a creek crossed but without any piers in the water or riparian area.</i>	0.8 acres altered Crossings: <ul style="list-style-type: none"> • 3 bridges • 5 culverts • 1 creek rerouted 	0.6 acre altered Crossings: <ul style="list-style-type: none"> • 3 bridges • 5 culverts 	0.2 acre altered Crossing: <ul style="list-style-type: none"> • 1 bridge • 1 culvert 	0.8 acre altered Crossing: <ul style="list-style-type: none"> • 1 bridge • 1 culvert 	
Wildlife (see Section 3.22)					
Brown Bear Habitat <i>Additional habitat avoidance area created by highway segment built on new alignment</i>	605 acres	1,468 acres	2,834 acres	2,640 acres	
Moose Habitat (total)	210 acres	229 acres	275 acres	273 acres	
Bald Eagles <i>(active & inactive nests)</i>	Number of nests within a 330-foot primary zone	3 nests	3 nests	0 nests	1 nest (may require removal)
	Number of nests within a 330- to 660-foot secondary zone	4 nests	2 nests	0 nests	0 nests

Table 4.8-19. Least Overall Harm Factor vii, substantial cost difference analysis in 2014 dollars

	Cooper Creek Alternative	G South Alternative	Juneau Creek Alternative	Juneau Creek Variant Alternative
Construction Subtotal (includes design and other project development costs)	\$308.6 million	\$312.0 million	\$280.1 million	\$288.2 million
<i>Operations & Maintenance (annual)</i>	<i>\$593,400/year</i>	<i>\$585,400/year</i>	<i>\$608,600/year</i>	<i>\$611,700/year</i>
O&M and Periodic Major Activities <i>Over 20 years</i>	\$23.7 million	\$23.8 million	\$24.2 million	\$24.3 million
Total Expenditures <i>Construction + O&M/Periodic over 20 years, in 2014 dollars</i>	\$332.3 million	\$335.8 million	\$304.3 million	\$312.6 million

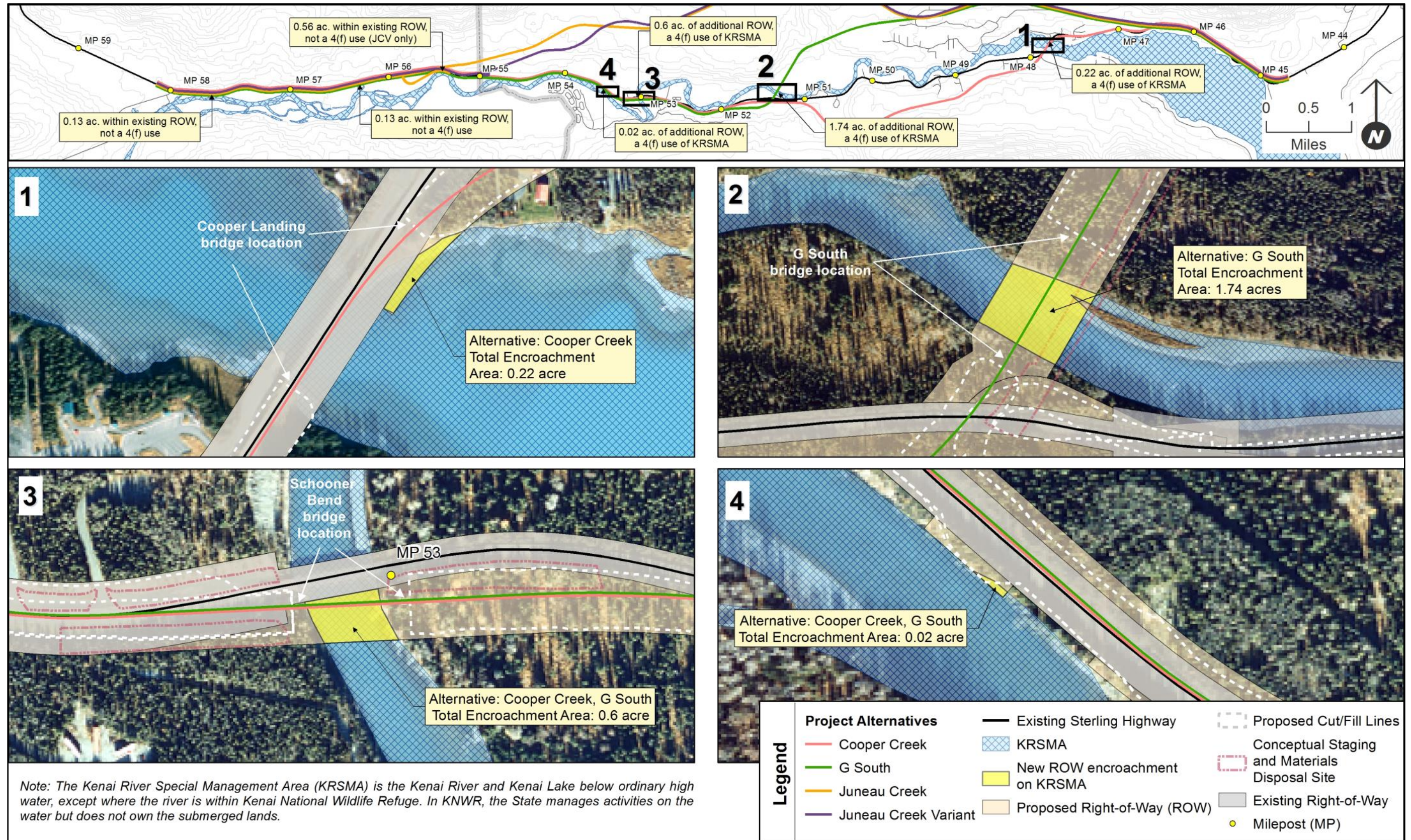
Note: Acreage, count, and cost changes since the Draft SEIS reflect minor updates to the project design, proposed mitigation measures, and, in the case of costs, inflation.

This page intentionally left blank.



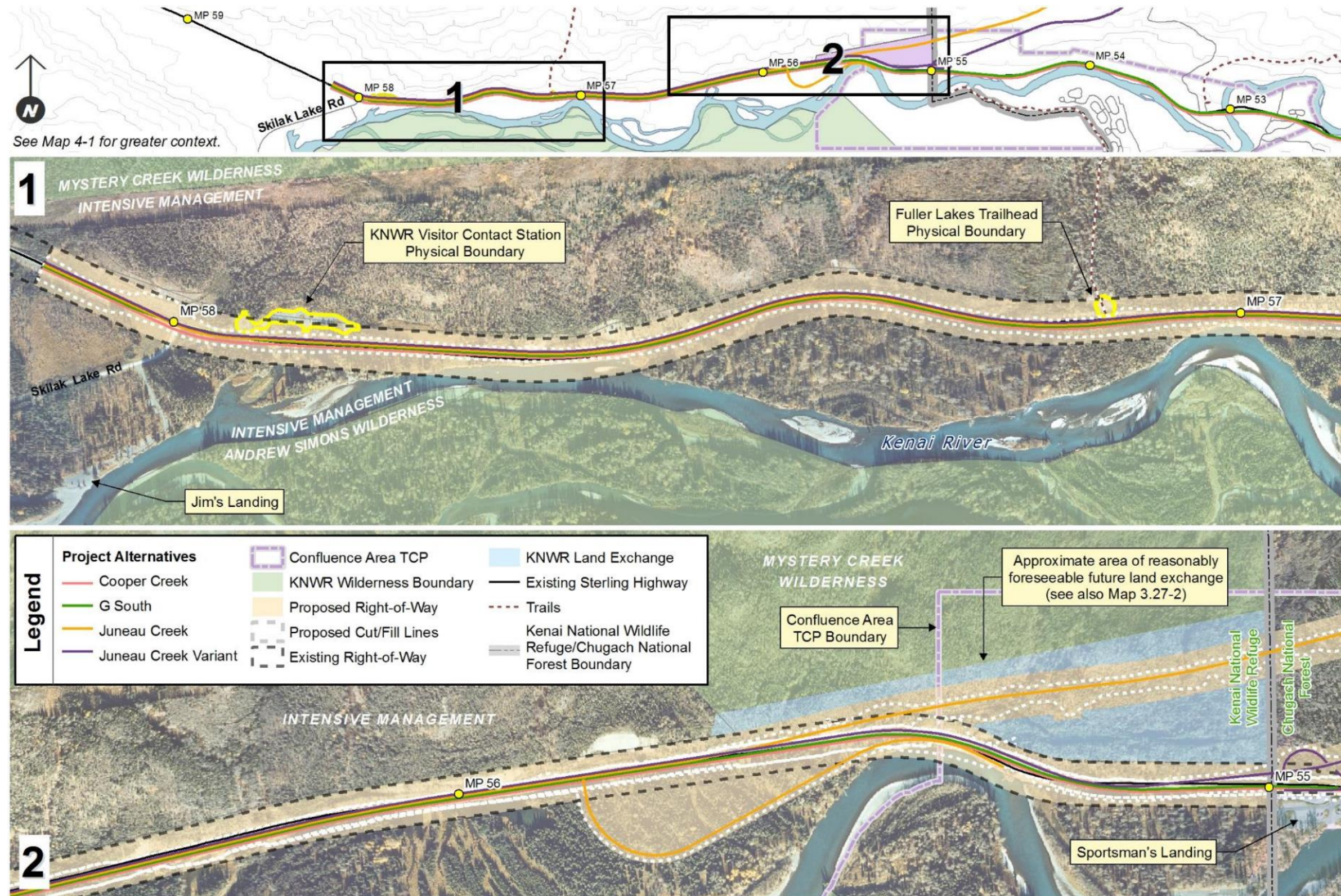
Map 4-1. Project vicinity and Section 4(f) properties

This page intentionally left blank.



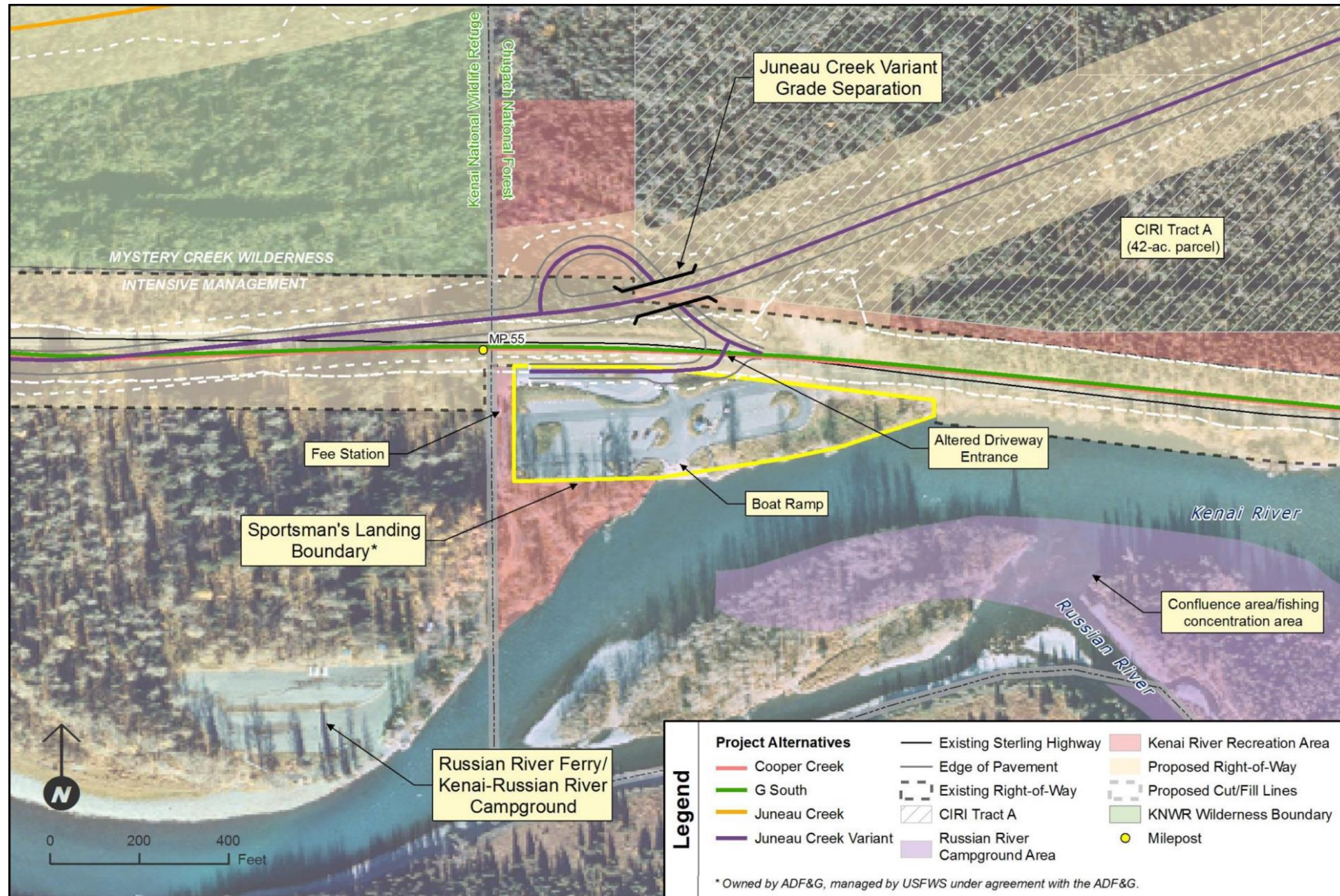
Map 4-2. Kenai River Special Management Area [Updated]

This page intentionally left blank.



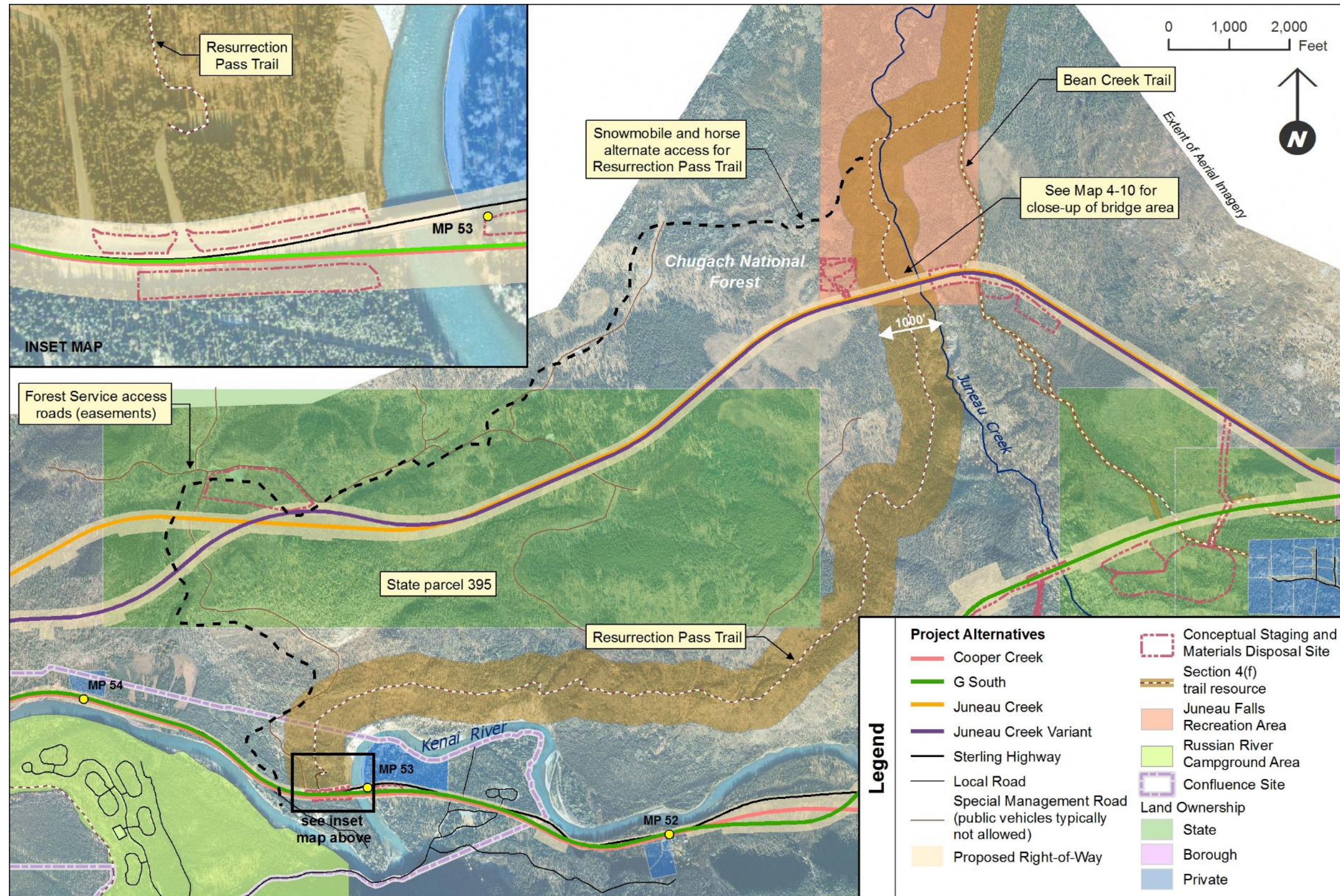
Map 4-3. Kenai National Wildlife Refuge in the MP 55 to MP 58 area [Updated]

This page intentionally left blank.



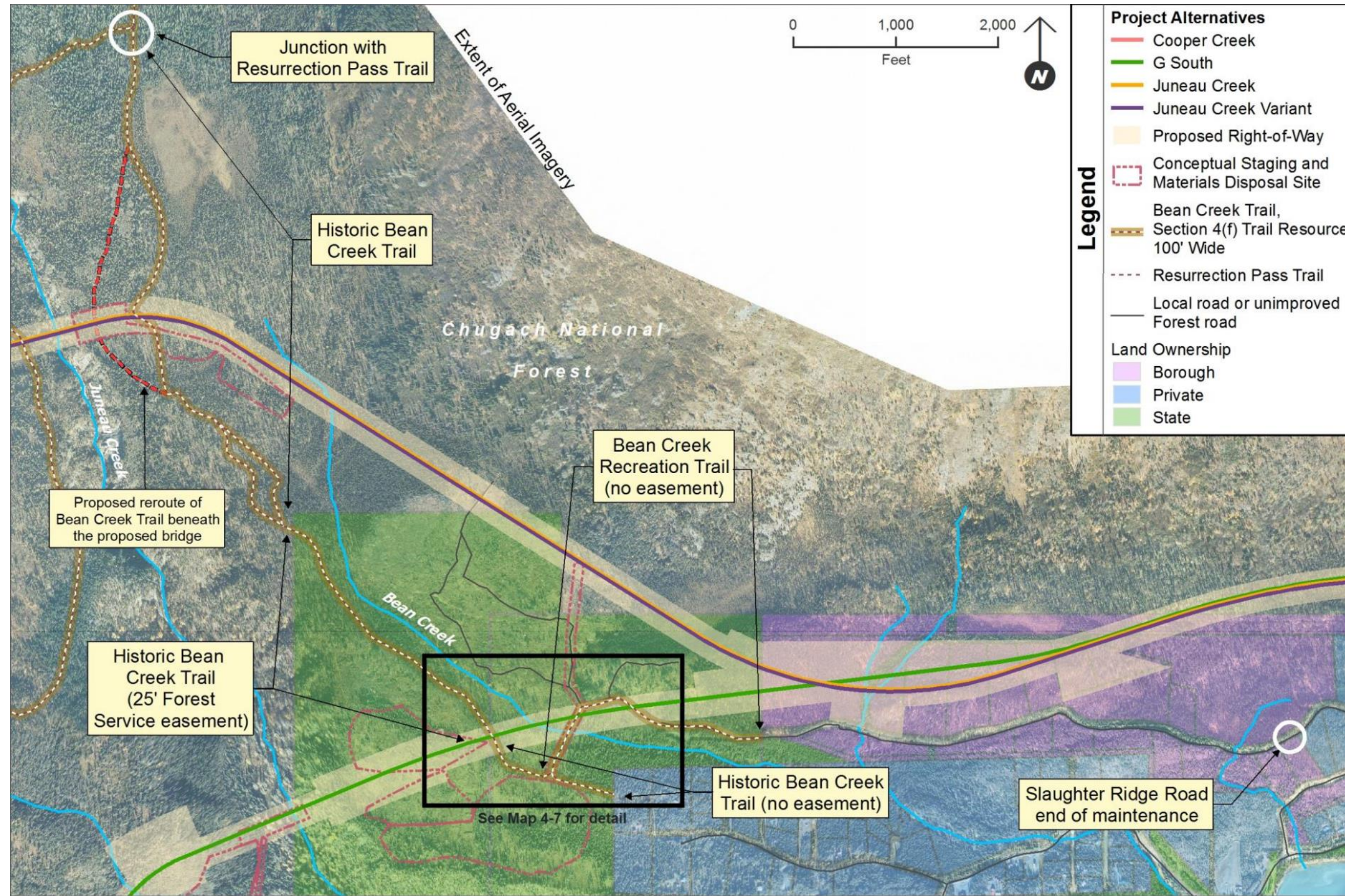
Map 4-4. Sportsman's Landing and Russian River Ferry

This page intentionally left blank.



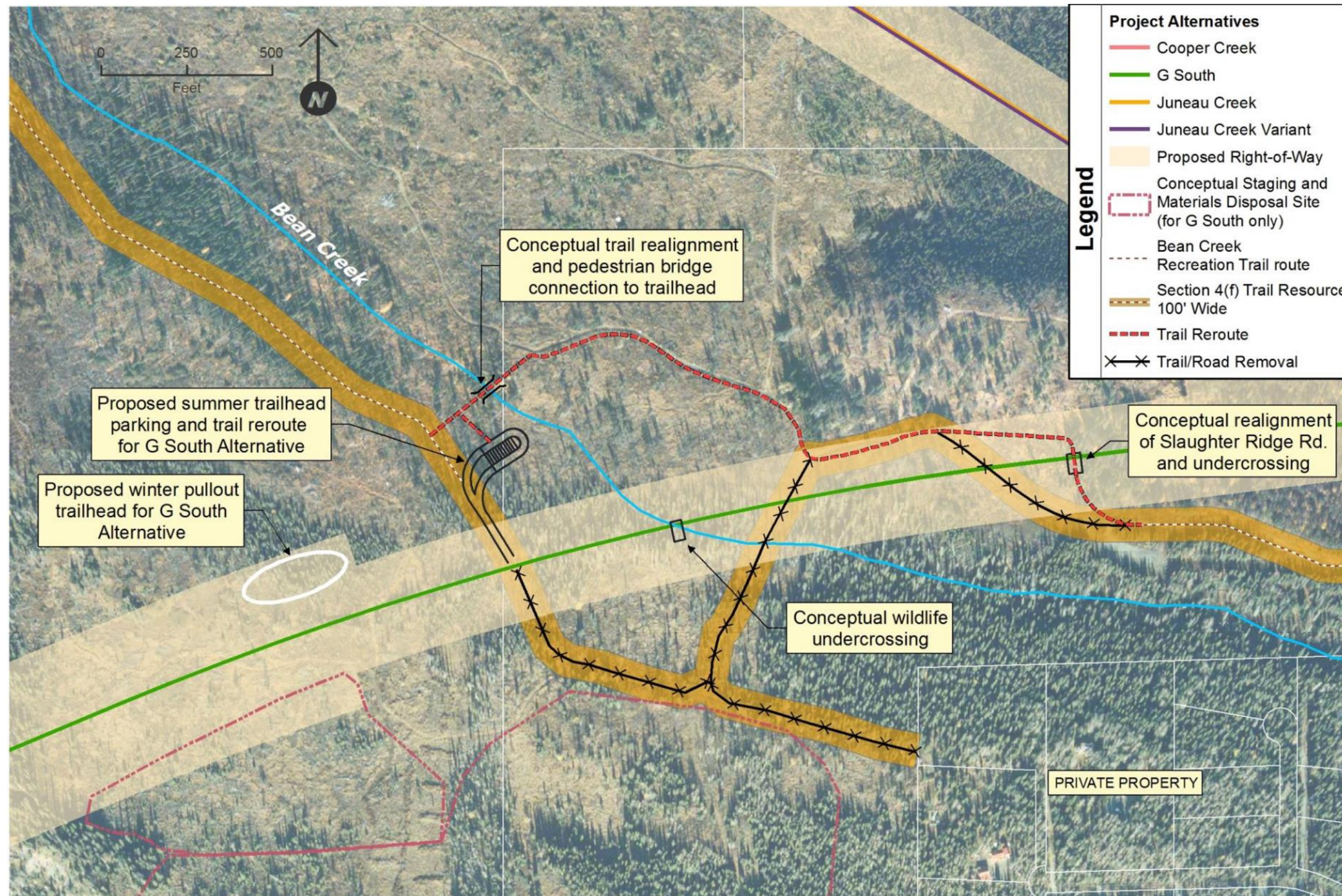
Map 4-5. Resurrection Pass Trail

This page intentionally left blank.



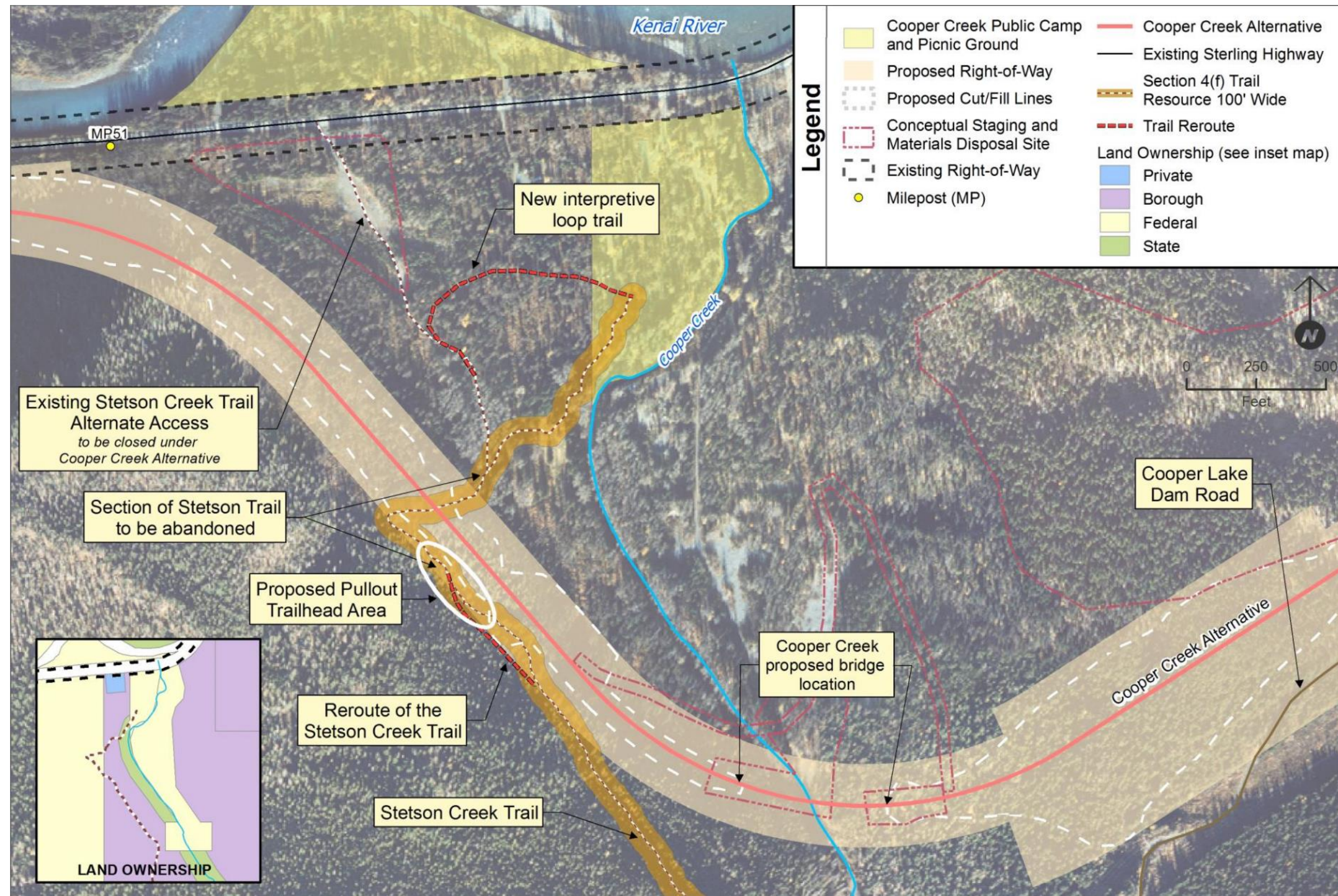
Map 4-6. Bean Creek Trail

This page intentionally left blank.



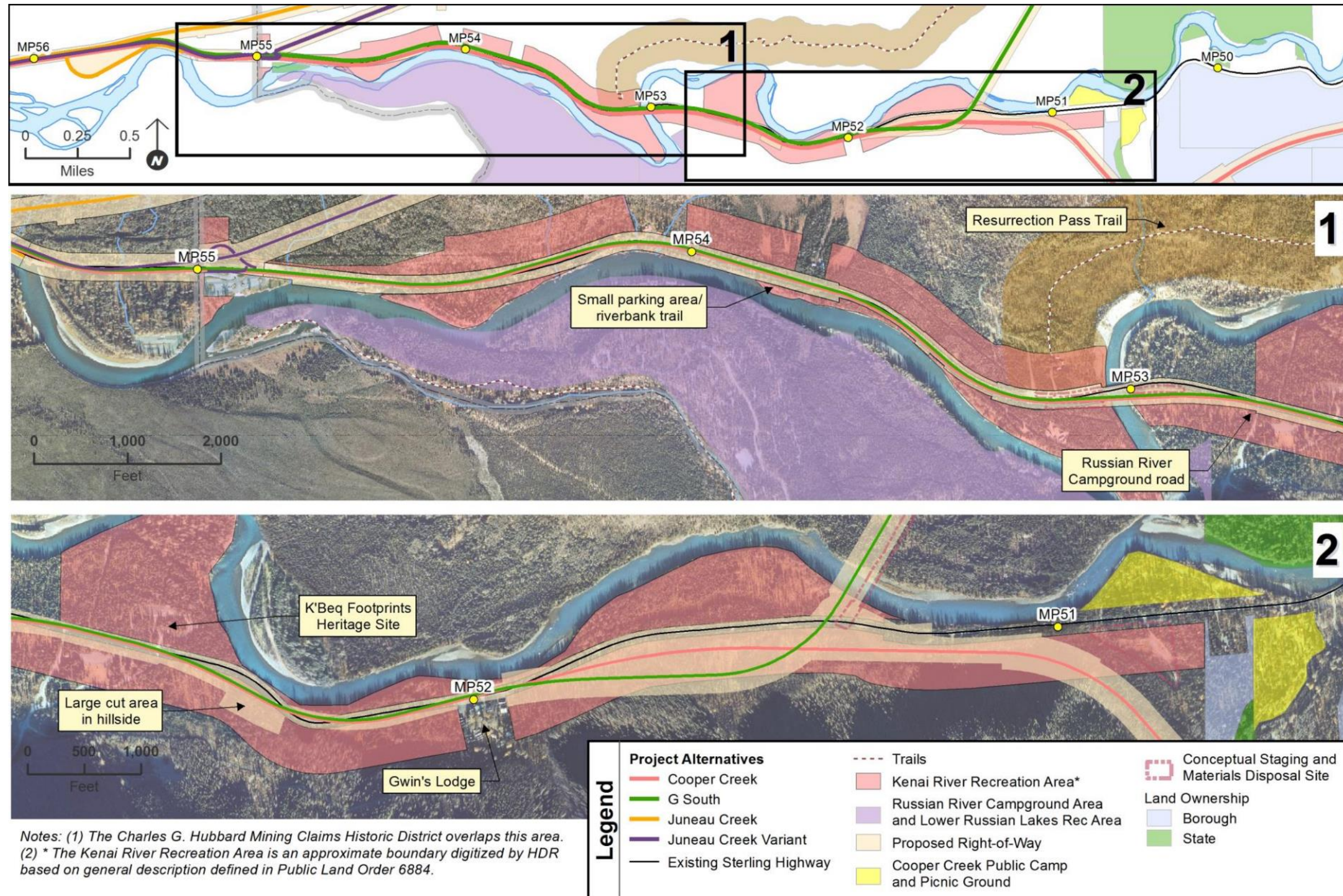
Map 4-7. Bean Creek Trail reroute—detail for G South Alternative

This page intentionally left blank.



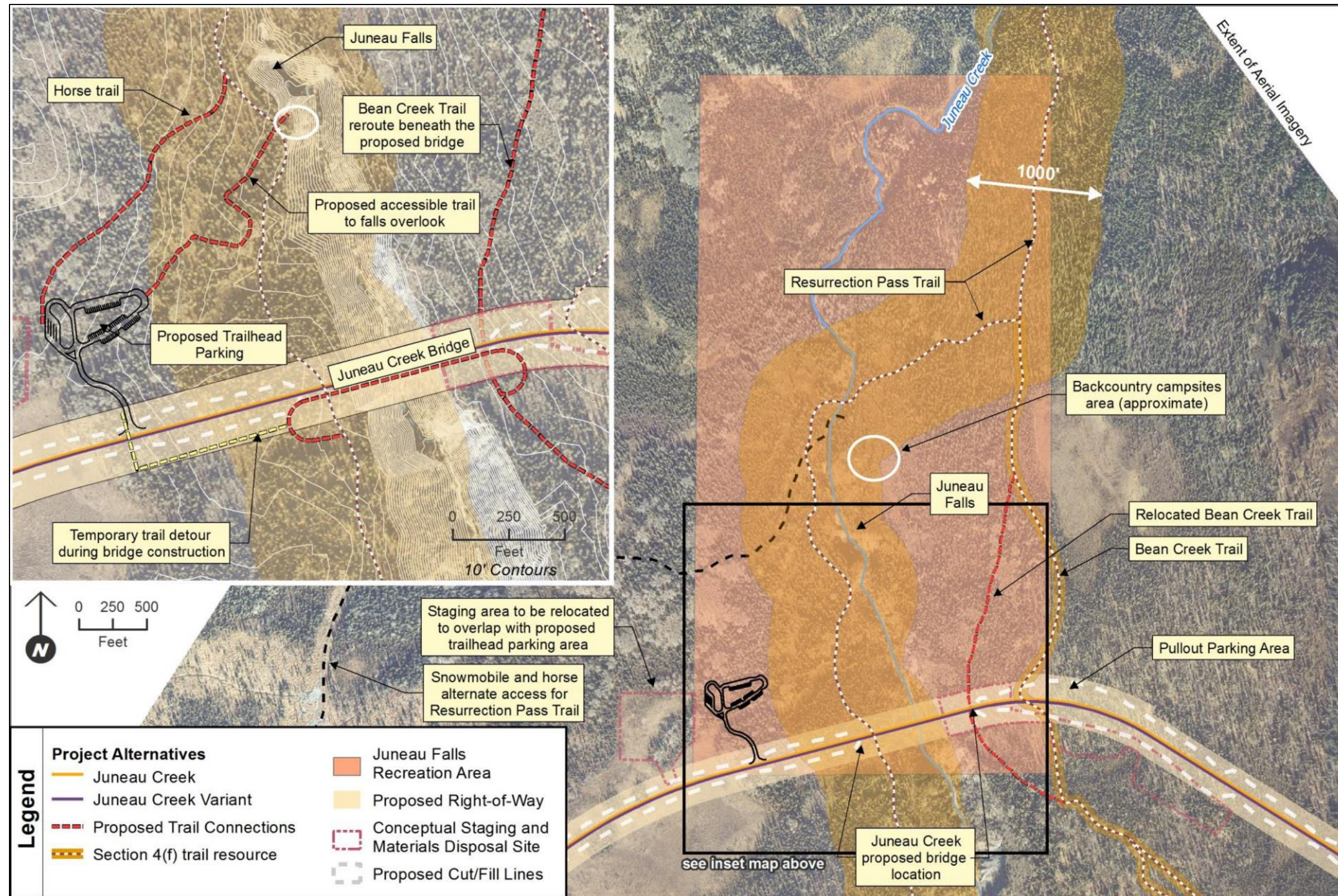
Map 4-8. Stetson Creek Trail and Cooper Creek Campground

This page intentionally left blank.



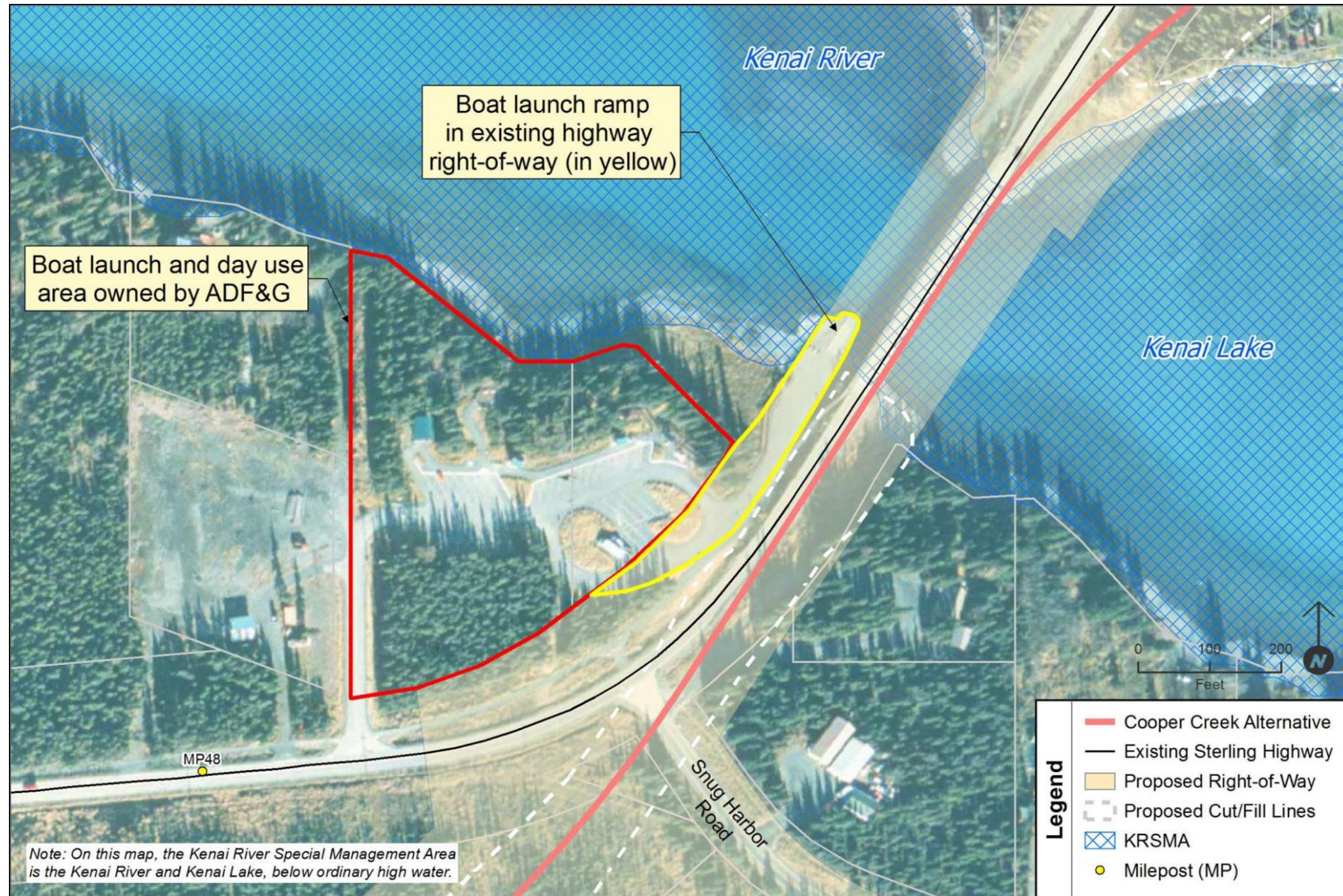
Map 4-9. Forest Service Kenai River Recreation Area

This page intentionally left blank.



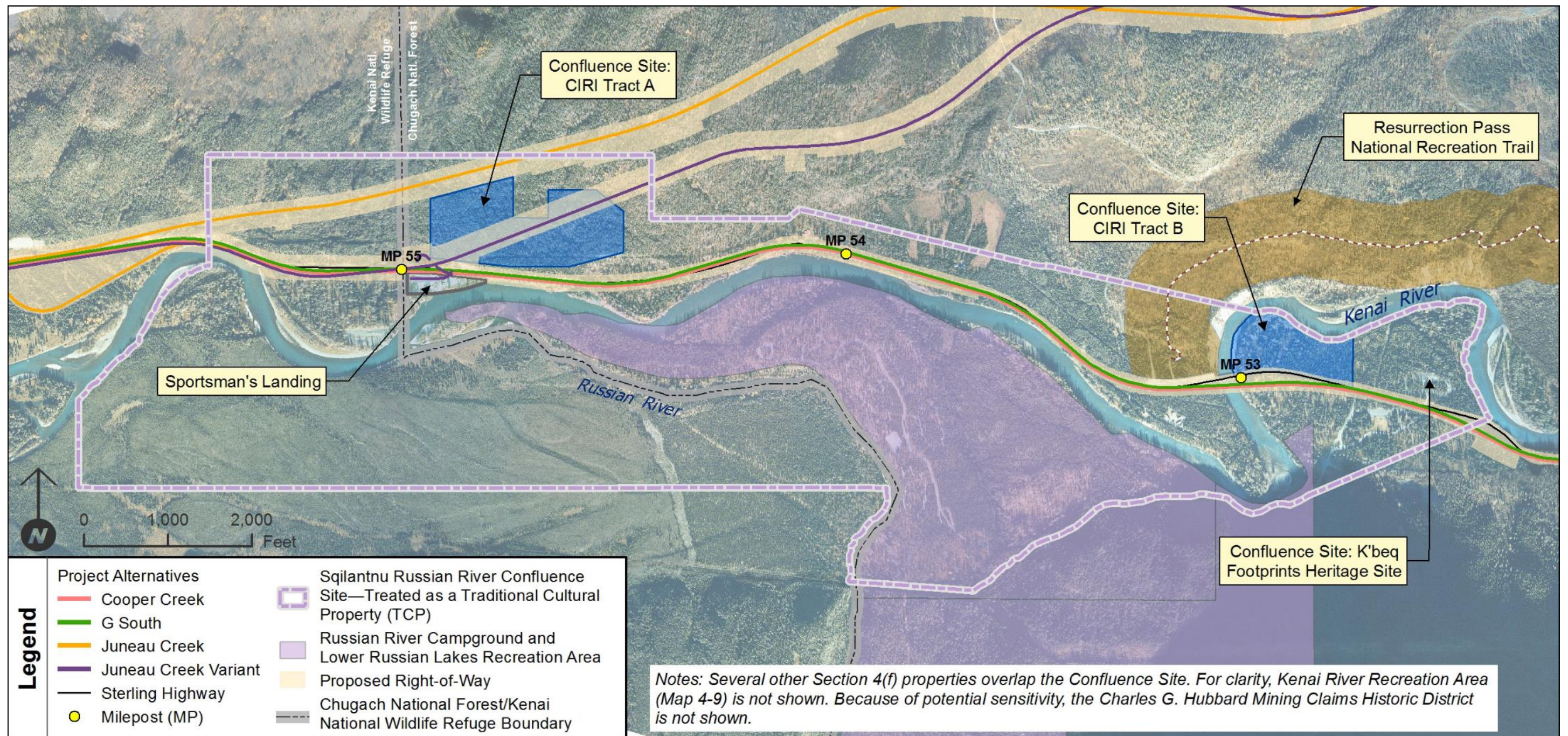
Map 4-10. Juneau Falls Recreation Area

This page intentionally left blank.



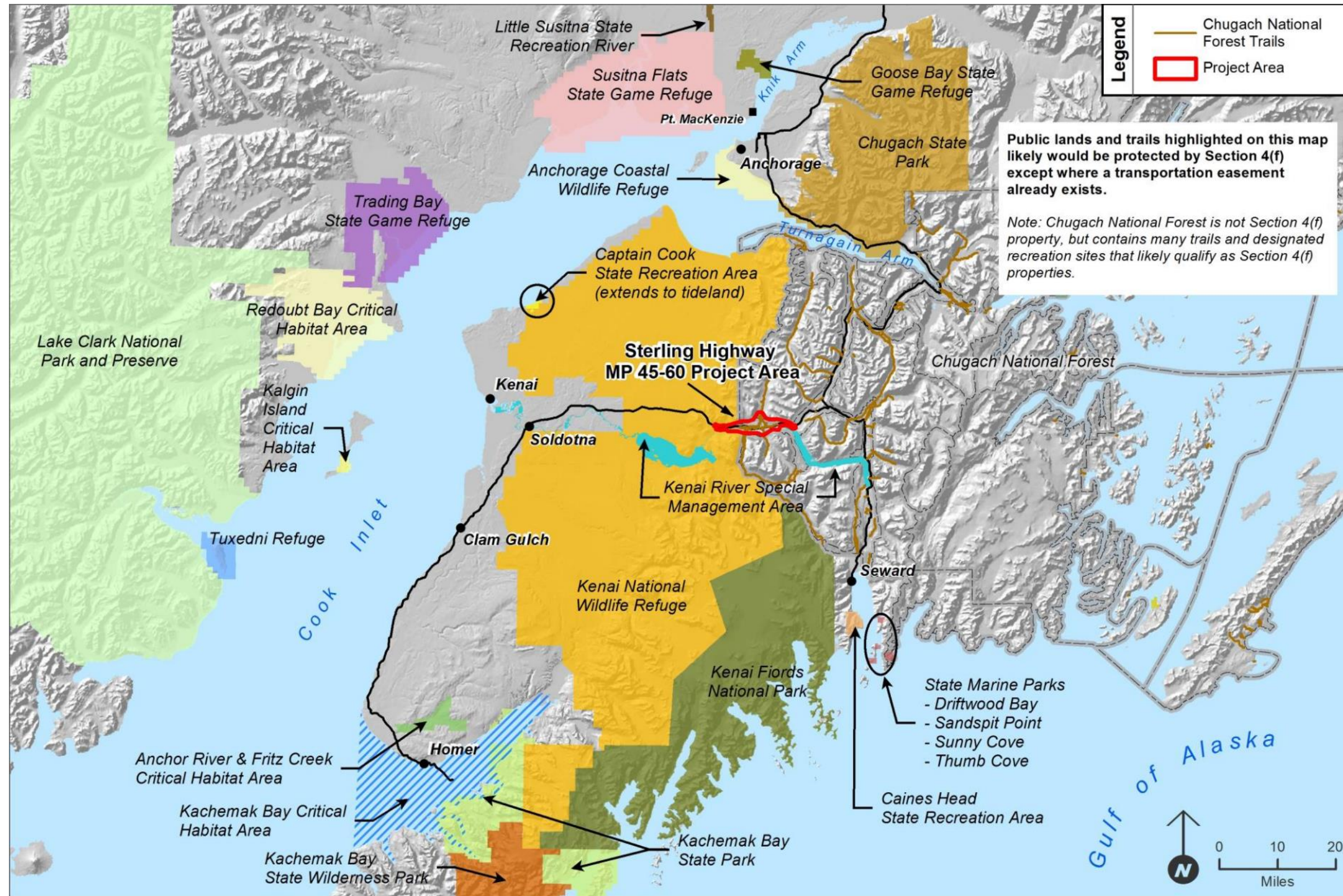
Map 4-11. Cooper Landing Boat Launch and Day Use Area

This page intentionally left blank.



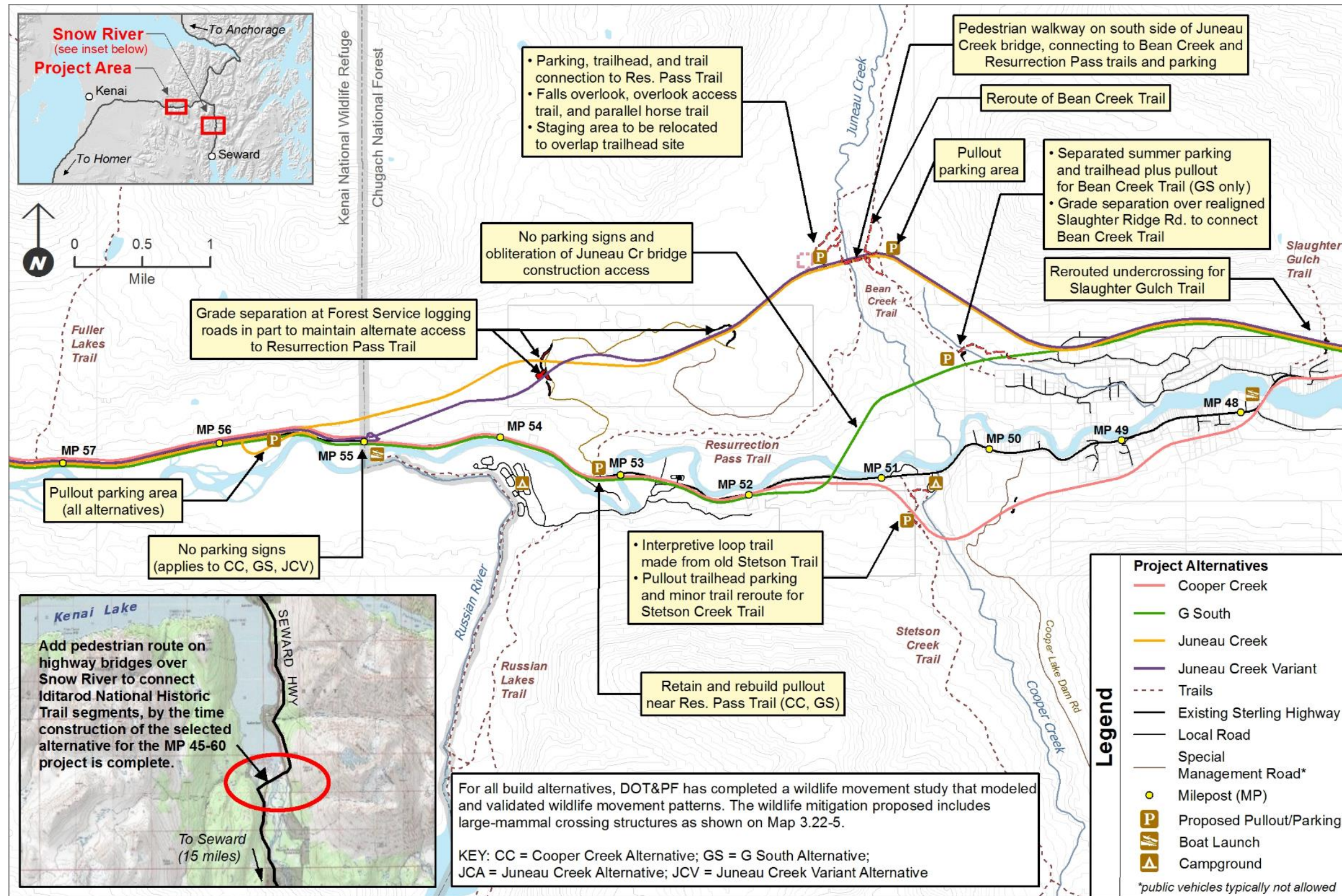
Map 4-12. Sqliantnu Russian River Confluence Site—treated as a Traditional Cultural Property [Updated]

This page intentionally left blank.



Map 4-13. Likely Section 4(f) properties in the Cook Inlet area

This page intentionally left blank.



Map 4-14. Measures to minimize harm [Updated]

This page intentionally left blank.