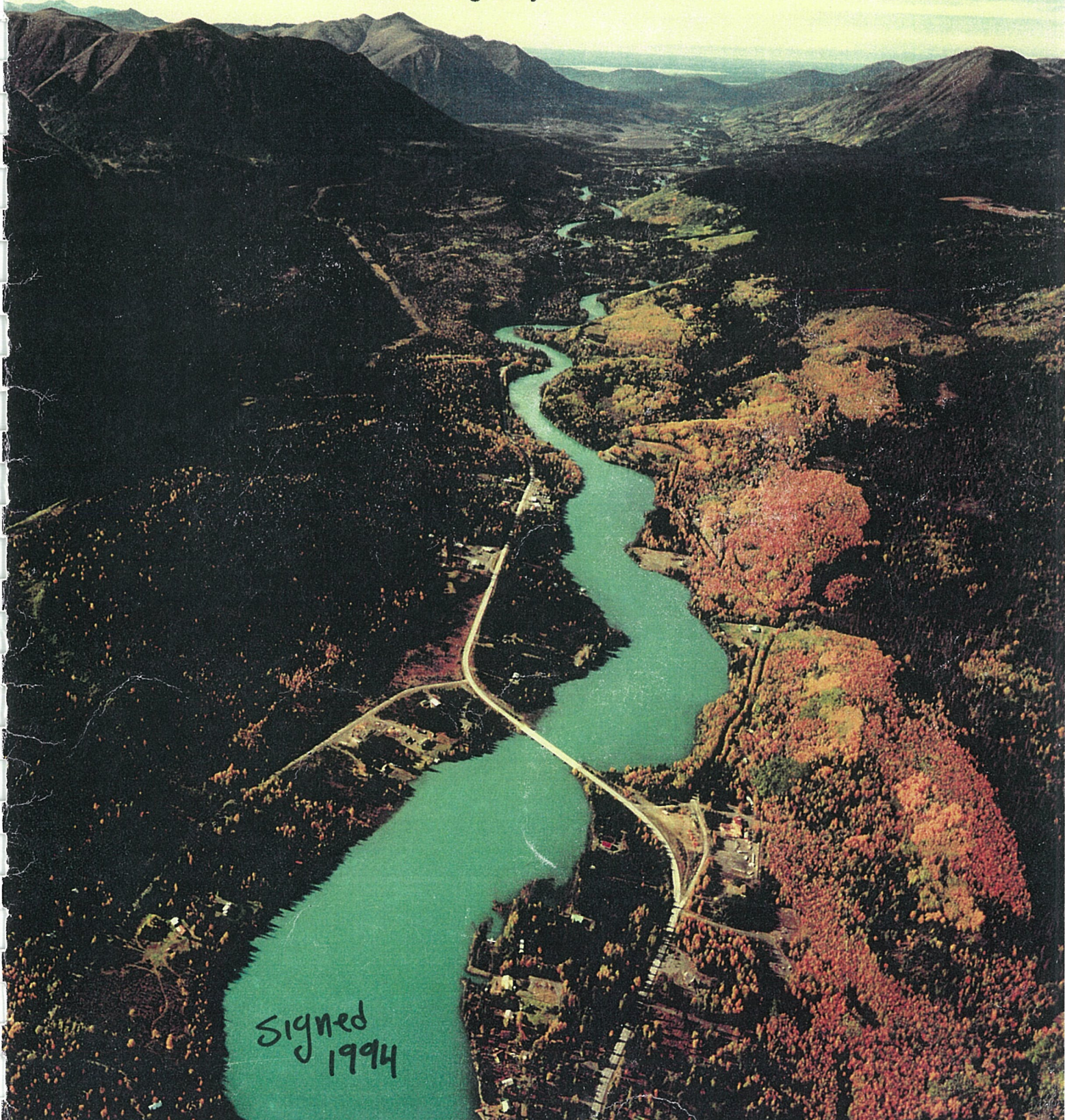


STERLING HIGHWAY MP 37-60

Project No. F-021-2(15)/53014

Draft Environmental Impact Statement and Section 4(f) Evaluation

State of Alaska Department of Transportation and Public Facilities
and
Federal Highway Administration



Signed
1994



PROJECT UPDATE

STERLING HIGHWAY, MP 37-60 **Project No. F-021-2(15)/53014**

Central Region

JULY 1995

Segment between Sterling Highway MP 37-45 to be Expedited

The Alaska Department of Transportation and Public Facilities (ADOT&PF) recently received approval from the Federal Highway Administration to split the Sterling Highway, MP 37 to MP 60 project into two separate projects. The projects are being identified as Sterling Highway, MP 37 (Seward Wye) to MP 45 (Quartz Creek Road) and Sterling Highway, MP 45 to MP 60 (Skilak Lake Road). The approval is viewed as a very positive step towards expediting the reconstruction of the portion of the Sterling Highway between MP 37 and MP 45. The reason for the split is that each segment has logical endpoints, and would be a valuable improvement regardless of whether the other is constructed. In addition, no significant impacts

or substantial controversy have been identified in the MP 37 to MP 45 segment as there is only one build alternative in this section of the highway. Reconstruction of the MP 37 to MP 45 segment will not affect what is done in the MP 45 to MP 60 project.

The ADOT&PF will now be able to pursue environmental approvals and permits on the MP 37 to MP 45 segment of road without waiting for the more complex environmental and social issues to be resolved on the MP 45 to MP 60 segment of highway. This should allow the MP 37 to MP 45 project to proceed into its detailed design phase by the fall of 1995.

Transportation Officials Select Preferred Alternative

After considerable planning, engineering, and environmental study, the ADOT&PF has selected an alternative for reconstruction of the Sterling Highway between Mileposts 45 and 60. The Juneau Creek Alternative, an 11.2 mile major realignment around the community of Cooper Landing was chosen by transportation officials because it best serves existing and future transportation needs, while minimizing impacts to the sensitive Kenai River system. The decision comes after an evaluation of comments received on the project's draft environmental impact statement (DEIS), and a recent visit to the project area by Transportation Commissioner Joe Perkins and area legislators.

Commissioner Perkins had the opportunity to review each alternative in the field, and to speak with people representing a wide range of views on the project while in Cooper Landing. These included public proponents of each

alternative, Kenai Peninsula Borough planning officials, representatives of affected Native organizations, several board members of the Kenai River Special Management Area, and the U.S. Forest Service.

The Juneau Creek Alternative offers several advantages over reconstruction of the existing highway through the Cooper Landing community. Most importantly, it moves the main travel route for through traffic away from the Kenai River. State resource agencies overwhelmingly support the Juneau Creek Alternative because it decreases the potential for catastrophic fuel spills into the Kenai River. In addition, it would avoid disturbance to valuable fish and wildlife habitat adjacent to the River. Native organizations favor the Juneau Creek Alternative because it would have far fewer impacts on the significant cultural resources located along the River valley.

(Continued on page 2)

Preferred Alternative (Continued from Page 1)

From a transportation perspective, the Juneau Creek Alternative has many benefits. It provides more traffic capacity and better traffic flow on an improved alignment. Through traffic would not be mixed with local residential and recreational traffic in the Cooper Landing community. Traffic induced noise would be reduced in the more densely developed areas along the highway. In addition, the character of the existing highway through the Cooper Landing community would be preserved. This would help maintain the recreational and small town atmosphere that the community's economy is based upon. The Juneau Creek Alternative also provides opportunities for creating new recreational experiences. Scenic overlooks, trails and trailheads, new campground access points, and other amenities can be incorporated into the project.

While the Juneau Creek Alternative is preferred, some concerns with it have been raised by agencies and the public. This alternative would result in some loss of wildlife habitat. In addition, some local road dependent business owners are fearful of a loss of revenue due to decreased traffic. The new alignment would introduce traffic noise and related impacts to low density residential

areas and undeveloped areas located off the existing highway, and costs more to construct and maintain.

The new highway would cross National Forest and National Wildlife Refuge lands, requiring changes to their current management plans. The road would cross the Resurrection Pass Trail approximately 2.5 miles up from its existing trailhead at the Sterling Highway. This would alter the current use patterns of the Trail and its associated facilities. A small segment of the highway will cross Refuge lands designated Wilderness by the Alaska National Interests Land Conservation Act (ANILCA). The Department expects some controversy with respect to the conversion of wilderness lands to transportation uses.

There is still much work to be done before the project can move into the detailed design phase. The ADOT&PF is working to finalize the EIS. Project engineers and environmental analysts are developing mitigation strategies for lost fish and wildlife habitat, wetlands, and cultural resources. They will also be coordinating with agency representatives, interested organizations, and the public regarding the Juneau Creek Alternative. It is anticipated that a final EIS will be ready for submittal to the FHWA in the spring of 1996.

ANILCA TITLE XI

What is it?

In 1980, Congress passed the Alaska National Interest Lands Conservation Act (ANILCA). The intent of the Act was to preserve nationally significant lands and waters in Alaska. Significant lands included those exhibiting extraordinary natural, scenic, historic, archaeological, geologic, wilderness, and recreational values to name a few. The Act greatly expanded the national park and wildlife refuge system in Alaska. As a part of the legislation, the Department of Interior was required to identify areas within the new refuges that were suitable for wilderness designation. These areas were to be designated and managed for wilderness use. A Wilderness designation generally excludes any development from that parcel of land. Recognizing that Alaska's transportation and utility system was undeveloped, a process for obtaining approvals for these types of facilities in the various conservation units created by the Act was provided. This process is designated in Title XI of ANILCA.

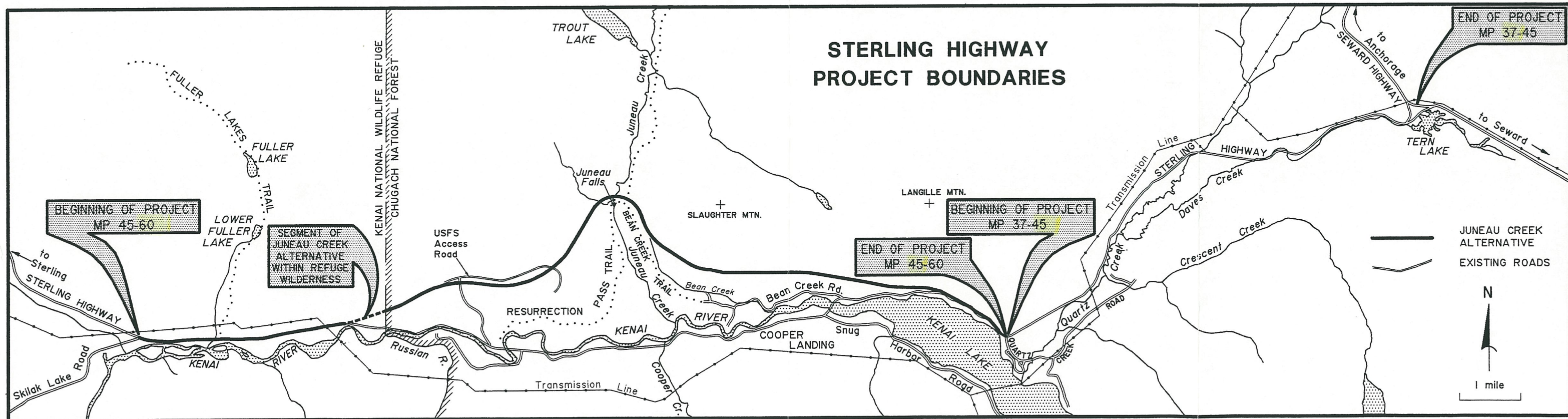
How does it apply to the Sterling Highway, MP 45 to 60 Project?

ANILCA expanded the boundaries of the Kenai National Moose Range by 240,000 acres and redesignated it the Kenai National Wildlife Refuge. As required by the Act, some of the Refuge lands were designated Wilderness. A small section of the Juneau Creek Alternative would cross lands designated for Wilderness protection.

Are there any major problems to overcome?

Yes. The Department of Interior, as well as several local and national environmental organizations do not favor the conversion of Wilderness lands to any other uses. There is a fear that if the conversion is allowed to take place, a precedent would be set for conversions elsewhere in the State.

(Continued on Page 4)



ANILCA (Continued from Page 3)

How long does it take?

The process is anticipated to add a minimum of one year to project development from the time the Federal Highway Administration approves the final EIS and files an application with the Department of Interior.

Why bother?

The ADOT&PF truly believes that the Juneau Creek Alternative is the best option for this section of the highway. The benefits to the community of Cooper Landing, the Kenai Peninsula Borough, highway travelers, and the Kenai River outweigh the project's limited negative effects, particularly on Wilderness designated lands. The area of Wilderness to be affected already contains a cleared transmission line corridor and a gravel road, and is immediately adjacent the Sterling Highway and recently logged areas. All of these uses are inconsistent with the Refuge's management strategies for Wilderness. In addition, some of the Wilderness lands in this area are on property that have been selected pursuant to the Alaska

Native Claims Settlement Act (ANCSA) by Cook Inlet Regon, Inc. If conveyed, the Wilderness designation would no longer apply to these lands.

Protecting wilderness values is very important to the State of Alaska. The desire to convert a small segment of Wilderness lands to transportation uses for this project should not be viewed as an attempt to undermine the Wilderness system. Relocating heavy traffic and road development further away from the sensitive banks of the Kenai River to protect valuable fish and wildlife habitat simply makes more sense than avoiding lands which are already impacted by uses that are incompatible with the Wilderness designation.

What's next?

The ADOT&PF will be coordinating with State, Federal, and local agencies, environmental organizations, and the public to gain support for the Juneau Creek Alternative. The environmental impact statement will be submitted with the Title XI application to the Department of Interior sometime in the summer of 1996.

For more detailed information, contact Hank Wilson, PE, Project Manager, (907) 266-1700, or Laurie Mulcahy, Environmental Analyst, (907) 266-1760. Comments can be mailed to the return address on this project update.



**State of Alaska
Department of Transportation & Public Facilities
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Preliminary Design and Environmental
P.O. Box 196900
Anchorage, Alaska 99519-6900**

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**Sterling Highway, MP 45-60
Kenai National Wildlife Refuge
Preliminary Design Involvement**

Subsequent to the March 1994 draft EIS, the Department adjusted the preliminary design of the proposed MP 55 intersection to reduce Wilderness involvement. This change of design is summarized below and illustrated on the following appended Figures 5-1 and 5-2. Also included in this summary are direct impacts to the Refuge and additional proposed mitigation. This information has not been incorporated into the text of the 1994 draft EIS.

MP 55 Intersection: Shifted approximately 2,800 feet to the east, from that which was shown in the DEIS. Intersection is approximately 1,500 feet from access to the Russian River Ferry Crossing/Sportsmans Lodge site. The access would be improved.

Proposed ROW: Contained entirely within the CIRI 14(h)(1) Selection. We understand the selection will be transferred from Refuge and taken out of "Wilderness" management (regardless of highway project). 19.55 acres are required for highway ROW.

Realignment through CIRI 14(h)(1) Selection: Estimated between points where centerline leaves existing ROW boundary to the west and where centerline intersects shared Refuge/Forest boundary to the east. This represents approximately 2,176 linear feet.

Abandoned "Old Sterling Highway" segment west of the proposed intersection that would not be incorporated into new embankment is estimated at 850 linear feet. This segment is on the banks of the Kenai River near RM 73.

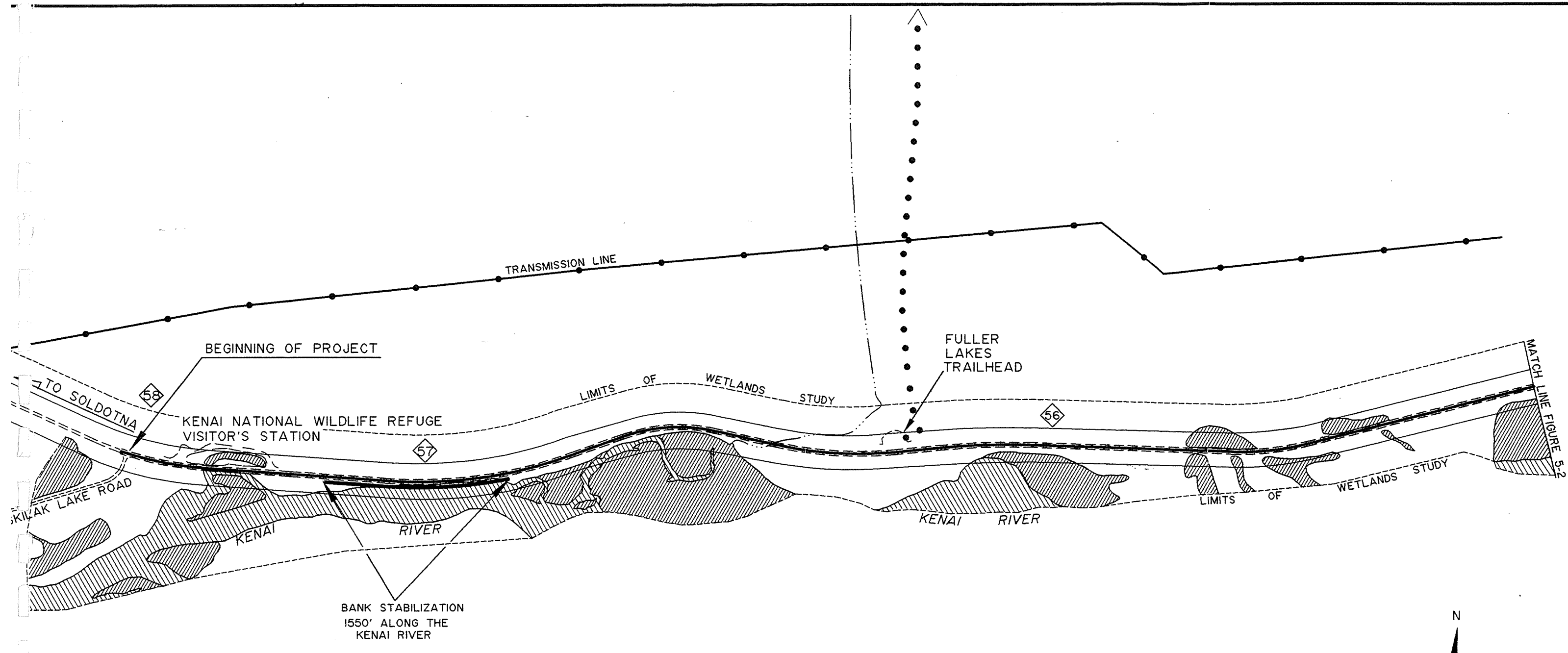
Sqilantnu Archaeological District Sties: Will develop a MOA to mitigate adversely effected sites and construction conditions for no adverse effects. The following is a list of Refuge sites to be included in the MOA.

No Adverse Effect: KEN-092, KEN-215, KEN-094, KEN-228

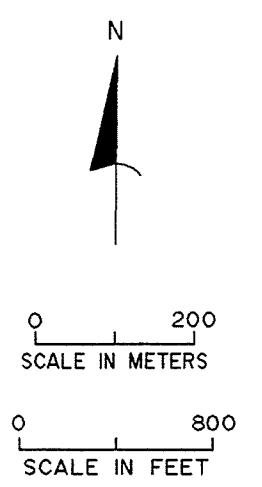
Adverse Effect: KEN-133, KEN-068, KEN-249, KEN-250, KEN-081

Wetlands: approximately one acre of palustrine wetlands would be involved for sliver fills along the existing alignment between MP 58 and MP 55 (estimated at 12,600 cy).

Kenai Rivermile 50 (MP 57): Will consider bioengineering bank stabilization along an approximate 1,500-foot long reach of the Kenai River. Restoration and rehabilitation considered as an enhancement opportunity. Location has severe physical constraints and extreme velocities (estimated at 13 fps). The ADF&G, USF&WS, and DNR will have to work with Department to develop successful bioengineering solutions.



- LEGEND**
- == STERLING HIGHWAY/3R ALTERNATIVE
 - JUNEAU CREEK ALTERNATIVE
 - EXISTING R/W
 - ==== EXISTING ROADS
 - EXISTING TRAIL
 - ◇ MILEPOST
 - ▨ RIVERINE
 - DRAINAGE
 - ▨ PALUSTRINE



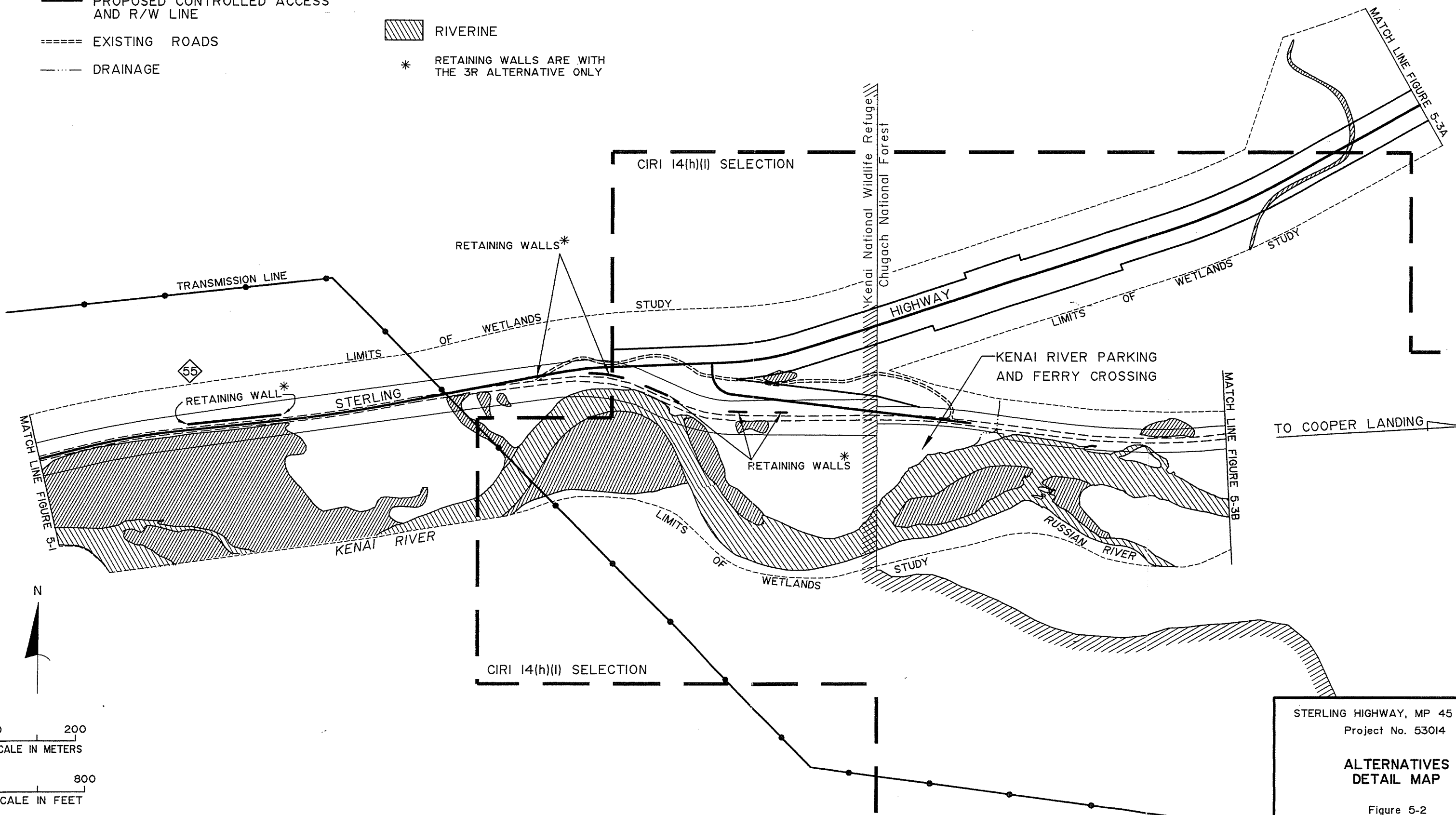
STERLING HIGHWAY, MP 45 - 60
 Project No. 53014

**ALTERNATIVES
 DETAIL MAP**

Figure 5-1

LEGEND

- === STERLING HIGHWAY/3R ALTERNATIVE
- JUNEAU CREEK ALTERNATIVE
- EXISTING R/W
- PROPOSED CONTROLLED ACCESS AND R/W LINE
- ===== EXISTING ROADS
- DRAINAGE
- ◇ 58 MILEPOST
- ▨ PALUSTRINE
- ▧ RIVERINE
- * RETAINING WALLS ARE WITH THE 3R ALTERNATIVE ONLY



STERLING HIGHWAY, MP 45 - 60
 Project No. 53014
**ALTERNATIVES
 DETAIL MAP**
 Figure 5-2

Sterling Highway
Milepost 37 to Milepost 60

DRAFT ENVIRONMENTAL IMPACT STATEMENT/SECTION 4(f) EVALUATION

Submitted Pursuant to 42 U.S.C. 4332 (2) (c),
49 U.S.C. 1653 (f),
and
16 U.S.C. 3164 by the

U.S. Department of Transportation
Federal Highway Administration
and
State of Alaska
Department of Transportation and Public Facilities

Cooperating Agencies

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. National Park Service

This action complies with Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.

March 24, 1994
Date of Recommendation

Robert Redick Director D&C
For ADOT&PF Title

APRIL 8, 1994
Date of Approval

Robert E. Ruby DIVISION ADMINISTRATOR
For FHWA Title

The following persons may be contacted for additional information concerning this document:

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This project involves reconstruction of the Sterling Highway between Skilak Lake Road (East) and the Seward Wye.

Agency comments on this Draft EIS are due by June 20, 1994. General public comments on this Draft EIS are due by July 15, 1994. All comments should be sent to Hank Wilson at the address shown above.

COVER PHOTOGRAPH: This September 1982 aerial photograph of the Kenai River Valley provides a view towards the west. The Cooper Landing Bridge is in the foreground.

SUMMARY

The Alaska Department of Transportation and Public Facilities (ADOT&PF) in conjunction with the Federal Highway Administration (FHWA) proposes to reconstruct the Sterling Highway from the Skilak Lake Road intersection (MP 58) to its junction with the Seward Highway (Seward Wye) MP 37.

Terrain and poor soil conditions are limiting constraints for roadway development along the existing Sterling Highway. The pavement width of the two-lane highway is 24 feet and shoulder widths vary between 1 or 2 feet. The road follows along the north side of the Kenai River Valley through the Kenai Mountain Range, and is constricted by the Kenai River and tributary creeks against steep valley walls.

A Draft Environmental Impact Statement (DEIS)/4(f) Evaluation for this project was approved by FHWA on June 29, 1982. At that time, the preferred alternative involved reconstruction of the existing highway with three major realignments: MP 52-50, MP 49.5-49, and MP 43.5-42.5. This alternative involved multiple bridge crossings of the Kenai River.

In 1984, the State Legislature created the Kenai River Special Management Area (KRSMA) which included the Kenai River. The KRSMA was put under the authority of the Department of Natural Resources, Division of Parks and Outdoor Recreation (DPOR) and the Kenai River was designated as part of the State Park System. Easements for the proposed Sterling Highway improvements were not included within the KRSMA legislation nor was the special management unit considered within the approved draft EIS as part of the State park system. Additional fieldwork located significant prehistoric sites within the construction limits of the preferred alternative and throughout the area. In 1986, the Sqiilantnu Archaeological District received a

formal National Park System (NPS) Determination of Eligibility for the National Register of Historic Places (NRHP).

The changes in the affected environment and public and agency opposition to the preferred alternative brought the project to a standstill in the late 1980's. It became evident that modernizing the road within the existing corridor through the Cooper Landing area would be difficult and that extensive involvement in the Kenai River would not be acceptable.

As a result, a decision to investigate a new alternative which avoided and/or minimized impacts to the park and river system, and cultural resources was made. A revision of the DEIS and the Section 4(f) Evaluation was also determined appropriate. The Juneau Creek Alternative along the north wall of the Kenai River Valley was developed. However, the Juneau Creek Alternative, impacts the Kenai National Wildlife Refuge (KNWR) and the Resurrection Pass Trail. Another alternative was considered through the Quartz Creek Valley, but was later rejected when a 1991 Department soil survey located high water tables and inferior soils. To meet the requirements of Section 4(f), the Resurfacing, Restoration, Rehabilitation (3R) Alternative was developed as an avoidance alternative for the KNWR and the Resurrection Pass Trail.

The proposed project would provide a modern highway meeting current design standards. There are two build alternatives currently under consideration, the 3R and the Juneau Creek. The No-Build Alternative is also being considered and would have no improvements beyond normal maintenance.

The **3R Alternative** is essentially the minimum development alternative, which improves the road primarily on the existing alignment. The two-lane highway would have a total 36-foot surface width: two 12-foot lanes and two 6-foot shoulders (Figure 2A).

Twelve-foot passing lanes with a 4-foot shoulder would be provided between approximately MP 56 and 55, MP 52.5 and MP 51.5, MP 45 and MP 44, and MP 41 and MP 40. Left-turn lanes

would be considered at high use intersections. A separated pedestrian pathway would be provided between MP 55 and MP 45.

3R projects generally are constructed to preserve and extend the service life of roadways, while enhancing safety conditions (ADOT&PF, PCM 11-12.01.02). Elements of a 3R design are determined by the safety performance of the existing facility. The actual accident rate for each vertical and horizontal curve is compared to the statistically expected accident rate. When the actual exceeds the predicted rate, improvements are made.

Using this criteria, only one low-speed curve at MP 47.5 would require improvements under the 3R Alternative. None of the other curves with design speeds less than 55 mph have exhibited high accident rates. Consequently, improvements to their alignments are not required.

Additional improvements may be required within 10 to 15 years after construction of this alternative. It is expected that the pavement will serve for approximately 10 years, and improvements could range from another 3R project to full reconstruction.

Project costs in 1993 dollars, not including mitigation, were estimated at \$29.8 million.

Adverse environmental impacts resulting from the 3R Alternative would include: 1) loss of approximately 5 acres of wetlands, 2) loss of fish and wildlife habitat, 3) 2.4 acres of right-of-way (ROW) from Cooper Landing, 4) one Cooper Landing residential relocation, 5) all highway traffic would continue to be routed through the Cooper Landing community, 6) disturbance of archaeological resources, and 7) disturbance of historic properties. In addition, 8) the functional life of this alternative is 5 to 10 years shorter than the Juneau Creek Alternative.

Beneficial environmental impacts of the 3R Alternative would include: 1) increased safety for roadway users and pedestrians, 2) improved traffic flow, and 3) reduced construction and operational costs.

Mitigation for the **3R Alternative**:

1) **Archaeological and Historic Properties:** Data recovery is proposed to mitigate adverse effects of the 3R Alternative on 12 archaeological sites of the Sqilantnu Archaeological District, a Section 4(f) property, and one archaeological site outside of the District. Both build alternatives would impact archaeological sites and conceptual mitigation costs are expected to be similar for either alternative.

The 3R Alternative would involve the Cooper Landing Historic District, another Section 4(f) property. Mitigation for the Leo Douglas Cabin and the Riddiford School would be photo documentation to Historic American Buildings Survey standards. The proposed mitigation is estimated at approximately \$3,000. For the Harry Brown Cabin, there would be limited subsurface testing and a revegetation plan developed for the hillside.

2) **Wetlands/Fisheries Habitat:** To mitigate potential impacts to area wetlands and fisheries habitat for either **build alternative**, a new clear span bridge with spur dikes is proposed at (MP 41) Quartz Creek. Also, previously isolated wetlands adjacent to the abandoned road near active channels of Daves Creek (MP 37.5) and at Tern Lake (MP 37) will be reconnected to provide rearing habitat. Abandoned sections of roadway in these area wetlands not required for access would be removed to original grade and revegetated. Should the Quartz Creek Materials Site (M.S.) 21-2-051-1 be excavated for this project, fish rearing ponds for riverine habitat enhancement project are also being considered.

Where practicable, avoidance of wetlands along the Quartz and Daves Creeks (areas identified by the agencies as being sensitive) would be accomplished through shifts in alignment on the uphill side and steepening of embankment slopes. Embankment widening along the existing road at Tern Lake will be conducted so that fill would not be placed within the main lake. Special design efforts have avoided placing any bank protection along a 1,500 foot section of the Kenai River near MP 57.5 (River mile 70) where river erosion could potentially undermine the highway

embankment. Rip rap would be placed within the roadway embankment to avoid involvement of the river.

The **Juneau Creek Alternative** is a full reconstruction alternative. It would provide an improved two-lane highway with a total 40-foot surface width: two 12-foot lanes and two 8-foot shoulders (Figure 2B). Twelve-foot passing/climbing lanes with a 4-foot shoulder would also be provided between approximately MP 56 and 55, along much of the realignment, and between approximately MP 45 and MP 44. Left-turn lanes would be considered at high use intersections.

Design elements would provide an improved highway which meets current desirable geometric standards throughout its alignment. It would upgrade the existing alignment with some straightening of curves except between MP 55 and MP 46 where the highway would be realigned to the north wall of the Kenai River Valley. The realignment would reroute through highway traffic from the Cooper Landing community and the recreation facilities along the Kenai River. The existing highway between MP 55 and MP 46 would remain on the State highway system, having continued maintenance, but would not be improved with this project. The highway would probably require repaving after approximately 10 years.

Project costs in 1993 dollars, not including mitigation, were estimated at \$64.4 million.

Adverse environmental impacts resulting from the Juneau Creek Alternative would include: 1) loss of approximately 43 acres of wetlands, 2) loss of fish and wildlife habitat, 3) 24 acres of ROW from Kenai National Wildlife Refuge wilderness and 183 acres of ROW from the Chugach National Forest, 4) introduced traffic noise in undeveloped areas, 5) crossing the Resurrection Pass Trail, 6) disturbance of archaeological resources, and 7) increased construction and maintenance costs.

The Kenai National Moose Range was established in 1941, but renamed the Kenai National Wildlife Refuge (KNWR) under the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. The Resurrection Pass Trail is a National Recreation Trail and also subject to ANILCA. Although the Final KNWR Management Plan does not allow for construction of transportation or utility systems except in areas of the refuge under intensive or moderate management, Title XI of ANILCA includes provisions for allowing transportation and utility corridors through designated wilderness with Congressional approval. This process will have to be completed prior to approval of the Juneau Creek Alternative.

Beneficial environmental impacts of the Juneau Creek Alternative would include: 1) increased safety for roadway users, 2) improved traffic flow, 3) reduced traffic noise levels within the community of Cooper Landing and along the Kenai River Special Management Area, 4) increased opportunities for developed recreation, and 5) the functional life of the alternative would meet the needs of the travelling public 5 to 10 years longer than the 3R Alternative.

Mitigation for the **Juneau Creek Alternative**:

1) **Resurrection Pass Trail:** To mitigate potential Juneau Creek Alternative impacts to the Resurrection Pass Trail Section 4(f) property and to recreation users of the trail and adjacent forest land, two recreation options are being considered by the USFS. Both options would relocate a portion of the Resurrection Pass Trail and construct two scenic pullouts along either end of the Juneau Creek realignment. The first option would not provide additional access to the trail. With the second option, the Department would construct one primary trailhead near Juneau Falls, maintained for both summer and winter use.

2) **Archaeological and Historic Properties:** Data recovery is proposed to mitigate adverse effects of the Juneau Creek Alternative on 5 archaeological sites of the Squalantnu Archaeological District and one archaeological site outside of the District.

3) **Wildlife Habitat:** To mitigate wildlife habitat impacts of the Juneau Creek Alternative, the Department would participate in funding two U.S.D.A. Forest Service (USFS) moose habitat improvement projects. Each project site encompasses approximately 100 acres. This project would be conducted and monitored by the USFS. Conceptual total cost would be approximately \$60,000.

4) **Wetlands/Fisheries Habitat:** The proposed Quartz Creek clear span bridge with spur dikes, discussed above, would mitigate impacts to area wetlands and fisheries habitat.

Due to potential involvement within wetlands, a Section 404 permit from the Department of the Army would be required. The U.S. Army Corps of Engineers (COE) is a cooperating agency pursuant to the National Environmental Policy Act (NEPA) of 1969. The NEPA and Section 404 processes are being merged for the Sterling Highway MP 37 to MP 60 project. Consequently, the analysis and coordination documented in this EIS will be the basis for NEPA and Section 404 process decisions.

In consultation with COE, the Department determined conceptual wetlands involvement, calculating potential acreage and fill amounts for both alternatives. The COE reviewed the draft EIS and agrees that it satisfies their preliminary Section 404 requirements (Appendix F). They have prepared a Draft Public Notice for the Department of the Army Section 404 Permit (Appendix F), which will be issued concurrently with the Draft EIS public notice of availability.

Identification of a preferred alternative and mitigation options would be made in the Final EIS after the results of the EIS and input received from the public and agencies have been evaluated.

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LIST OF ABBREVIATIONS OF ABBREVIATIONS

AAC	Alaska Administrative Code
AASHTO	American Association of State Highway Transportation Officials
ACHP	Advisory Council of Historic Preservation
ACMP	Alaska Coastal Management Program
ADF&G	Alaska Department of Fish and Game
ADOT&PF	Alaska Department of Transportation and Public Facilities
AHRS	Alaska Heritage Resource Survey
AMSA	Area Meriting Special Attention
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
AS	Alaska Statute
BMP	Best Management Practices
CFR	Code of Federal Regulation
CIRI	Cook Inlet Region, Inc.
CNF	Chugach National Forest
COE	U.S. Army Corps of Engineers
dBA	A-weighted decibels
DCRA	Department of Community and Regional Affairs
DEC	Department of Environmental Conservation
DNR	Department of Natural Resources
DOE	Determination of Eligibility
DPOR	Division of Parks and Outdoor Recreation
EIS	Environmental Impact Statement
FAI	Federal-Aid Interstate System
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Maps
GMU	Game Management Unit
GP	General Permit
KNWR	Kenai National Wildlife Refuge
KPB	Kenai Peninsula Borough
KRSMA	Kenai River Special Management Area
Leq	Equivalent Sound Level
LOS	Level of Service
MOA	Memo of Agreement
MP	Milepost
MS	Materials Site
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program

NPDES	National Pollutant Discharge Elimination System
NPS	National Park System
NRHP	National Register of Historic Places
OHW	Ordinary High Water
P	Primitive
PL	Public Law
3R	Resurfacing, Restoration, Rehabilitation Project
4R	Reconstruction Project
RM	River Mile
RN	Roaded Natural
ROS	Recreation Opportunity Spectrum
ROW	Right Of Way
RV	Recreational Vehicle
SPM	Semi-primitive Motorized
SPNM	Semi-primitive Non-motorized
SHPO	State Historic Preservation Officer
USCG	U.S. Coast Guard
USFS	U.S.D.A. Forest Service
USF&WS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
VQO	Visual Quality Objective

I. PURPOSE AND NEED FOR PROJECT. PURPOSE AND NEED FOR PROJECT

The purpose of this project is to provide a safe modern highway from the Skilak Lake Road intersection (MP 58) to the Seward Wye (MP 37). This Federal-Aid Interstate System (FAI) highway provides the only road linking western Kenai Peninsula communities (Kenai, Soldotna, Homer, and Seldovia) with the remainder of the state.

The Sterling Highway project area is in the vicinity of the community of Cooper Landing and partially within the Kenai National Wildlife Refuge and the Chugach National Forest (Figure 1). Several popular State and federal campgrounds, recreation sites, and trails, including the Resurrection Pass Trail, the Russian River Campground, and the Kenai River Special Management Area are in the vicinity (Figures 9 and 10).

At the turn of the century, this transportation corridor was a mining trail. The trail later evolved into a one lane road to support homesteading activities. Automobile travel west to Cooper Landing was possible by 1937. Rapid development and growth of western Kenai Peninsula spurred road improvements in the 1950's. Since then, upgrading has been limited in the project area. Adjacent unstable slopes contain slide areas. At MP 50.3, 49.5, and 43, precipitation and runoff erode silty glacial soils filling roadside ditches and silting adjacent wetlands and streams.

According to the U.S. Census Bureau, the Kenai Peninsula Borough experienced a growth greater than 300 percent between 1960 and 1980. It experienced an increase of 61 percent from the population of 25,282 in 1980, to 40,802 in 1990. The majority of the population (62.7 percent) is centered in the cities of Kenai and Soldotna, west of the project area. The population of Cooper Landing varies greatly from winter to summer but has been growing fairly rapidly. The 1990 census shows 243 residents compared to 116 in 1980. There were 220 registered voters in 1991. In the summer the population nearly doubles.

The Kenai River System is the most heavily used freshwater sport fishery within the state. Approximately 10.6 percent of the total fishing effort occurred between Skilak and Kenai Lakes from 1977 and 1984, and 6 percent for the Russian River (Alaska Department of Natural Resources (DNR), 1986). On an average, use of vicinity campgrounds and recreation facilities is increasing at an annual rate of 10 percent and are at or near 100 percent capacity during the summer.

Sport fishing activities accounted for 70 percent of the Anchorage visitor travel causing a well defined summer traffic peak. The Kenai Peninsula Borough estimated that approximately 180,000 Anchorage area residents visited the Kenai Peninsula more than four times during the year 1990 (Fox Marketing and Management, 1991). Ninety-seven percent drove, 20 percent in an RV or camper. Roughly 160,400 nonresident visitors traveled to the Kenai Peninsula during 1989.

The Sterling Highway is narrow, having only one or two-foot wide shoulders through the project corridor. It has a low speed alignment and follows valley walls, often situated at the toe of steep slopes, virtually on top of river banks. The current minimum design speed is 50 mph for new construction of an interstate highway in rolling terrain. Some curves on the Sterling Highway are consistent for design speeds of 35 and 40 mph. The curving alignment limits traffic capacity by reducing opportunities for safe vehicular passing. This is a major problem as slow moving vehicles, especially in the busy summer months, result in long lines of traffic. Motorists, who generally have been traveling for long distances, become frustrated and take chances in passing.

Summer traffic congestion is typical. Through much of the area, the road parallels the Kenai River. Visitors park vehicles along the roadway, especially near the confluence of the Russian River, reducing the effective width of the travelway. Vehicles often merge with higher speed through traffic in areas where sight distance is limited, reducing highway speeds. Narrow

shoulders pose serious concerns for vehicular emergency pull-offs and pedestrian safety in Cooper Landing and near the Russian River where recreation users are concentrated.

Accident analysis for years 1988 through 1992 shows that the curve at the Bean Creek Road intersection (approximately MP 47.5) had nine accidents, which is higher than expected (see Appendix A). There were 40 moose road kills between years 1988 and 1992. Three roadway segments between MP 59 and 57, MP 56 and 55, and MP 50 and 48 (representing a total of 3.74 miles) are within the State's top 25 percentile moose accident rate per million vehicle miles.

Annual Average Daily Traffic (AADT) is shown in Table 1. A Level of Service (LOS) capacity study was completed to determine the existing and predicted LOS for the project corridor (Appendix A). LOS is a qualitative measure which denotes operating capacity conditions designated A (excellent) through F (gridlock) on a given roadway while accommodating different traffic volumes.

The LOS analysis indicates that a current acceptable LOS "C" exists in the project corridor. This represents a capacity condition having stable traffic flows operating at speeds of 40 mph or more.

**Table 1
Area Traffic Analysis**

	Year (1987)	Future Year (2010)
MP 58 to MP 50		
AADT	1,932	4,250
Recreation Vehicles	2.70%	2.70%
Commercial Trucks	16.00%	16.00%
MP 50 to MP 46		
AADT	2,055	5,300
Recreation Vehicles	2.70%	2.70%
Commercial Trucks	16.00%	16.00%
MP 46 to MP 37		

AADT	1,932	4,300
Recreation Vehicles	2.70%	2.70%
Commercial Trucks	16.00%	16.00%

For purposes of comparison, the LOS capacity analysis evaluated both build alternatives using the projected 20-year design traffic volumes. Generally, 20-year projections are applied only to full-reconstruction projects, while 10-year design traffic volumes are applied to 3R projects.

Both build alternatives provide passing and/or climbing lanes. The LOS analysis does not account for these auxiliary lanes. These lanes reduce highway traffic congestion and improve capacity as they afford an opportunity for passing slow moving vehicles. It is also important to realize that this highway experiences high seasonal fluctuations of recreational traffic, and that the AADT and the LOS conditions are not typical during the off-season, lower traffic periods.

Anticipated future (2010) traffic volumes from the Skilak Lake Road intersection to Tern Lake indicate that a LOS "E" could occur under the **No-Build Alternative**. This condition is at design capacity, having congested, unstable traffic flows and low vehicle operating speeds of approximately 35 mph.

Under the **3R Alternative** for the design year, the LOS was determined at "D and E." The "D" condition is anticipated west and east of Cooper Landing while the "E" condition is projected for the community. LOS "D" is approaching design capacity volumes and delays may occur, operating speeds are approximately 35 mph.

LOS conditions for the **Juneau Creek Alternative** were determined at "D" for the new highway alignment and the reconstructed roadway sections. LOS "B and C" were determined for the

existing highway segments between MP 56 and MP 46. LOS "B" represents a condition with stable traffic flows and operating speeds of 50 mph or greater. The "B" condition is anticipated west and east of Cooper Landing while the "C" condition is projected for the community.

Both build alternatives provide passing and/or climbing lanes. However, the LOS analysis does not account for these auxiliary lanes. These highway design features reduce highway traffic congestion and thus would lower the predicted capacity conditions.

There are several other on-going and planned federal State actions in the project area. Several recreation facilities along this roadway segment will be upgraded during 1994. The U.S. Fish and Wildlife Service (USF&WS) intends to upgrade the boat launch and provide additional parking at Jim's Landing. The USF&WS also plans to expand the parking lot and provide additional restrooms at the Kenai National Wildlife Refuge Station. The Alaska Department of Fish and Game (ADF&G) and USF&WS provided a public use boat launch at the Russian River Ferry Crossing in 1993, and propose to develop 5 acres for parking at the site. The USFS plans to construct a wildlife viewing platform at the Tern Lake pullout.

The DPOR is proposing a boat launch, parking, restrooms, and day-use area in Cooper Landing near MP 48. This project is scheduled for construction in 1996.

The USFS is salvaging dead trees and has proposed to construct 12.1 miles of temporary access roads to timber salvage units and fuelbreaks. Roads presently exist at MP 53 near the Resurrection Pass Trailhead and off Bean Creek Road. An existing mining road through the Quartz Creek Valley is being upgraded for timber harvest access. A rehabilitation project for the Seward Highway from MP 0 (Seward) to MP 36 (Seward Wye) is under development by the Department.

II. ALTERNATIVES. ALTERNATIVES

Several location alternatives were identified during the development of this project (Figure 5 and the subsequent Section C, Alternatives Considered but Rejected). Most involved the reconstruction of the existing highway. Three build alternatives, the Juneau Creek, the Kenai River, and the Resurfacing, Restoration, Rehabilitation (3R), received detailed engineering evaluation. Only the Juneau Creek and the 3R Alternatives were considered viable and carried through the environmental evaluation. The remaining build alternatives were dismissed because of poor soils, impacts on the Cooper Landing community, Section 4(f) properties, and wetlands. The No-Build Alternative was also evaluated.

A. No-Build Alternative. No-Build Alternative

The No-Build Alternative does not provide highway improvements beyond normal maintenance. Existing problems would remain. Traffic congestion would worsen with increases in traffic, especially during the summer tourism season. Slower moving vehicles and parked vehicles along the narrow shoulders would continue to hinder traffic flow; there are few opportunities for vehicular passing or emergency pulloffs. Safety concerns which include limited sight distances on the winding roadway would not be remedied.

Deterioration of the driving surface would accelerate with increased traffic. Maintenance and Operations would continue to reinforce roadway embankments with riprap to counter river erosion, conduct ditch and slope maintenance in areas of erosion prone cutslopes, and perform instream work to clear the channels of the Quartz Creek beneath the bridge crossing. Siltation runoff from slope failure areas would continue to impact adjacent wetlands and streams.

The No-Build Alternative does not satisfy the purpose of this project.

B. Transportation Systems Management (TSM) Alternative. Transportation Systems Management (TSM) Alternative

The TSM Alternative could potentially increase existing highway efficiency through one or more options which include ride sharing and fringe parking, bus and/or high occupancy vehicle (HOV) lanes, rail services, traffic signal timing optimization, and resurfacing and rehabilitation. Constructing fringe parking areas along the highway could remove some vehicles from the highway shoulders, which constrict the travel lanes. This would increase safety conditions by reducing the number of vehicles that pull over to park and then exit, merging with the highway traffic. This is primarily a problem in the area surrounding the Russian River (near MP 54.5).

However, the Department of Parks and Outdoor Recreation (DPOR) has concerns that additional parking areas would disperse bank fishermen along the Kenai River, which is a Section 4(f) property. The DPOR would rather concentrate recreation users in certain areas and reduce the number of parking areas to discourage use in other areas and thus reduce cumulative impacts to the river. They want to provide quality recreation experience and facilities rather than spreading limited funds to manage a large number of recreation use sites, while at the same time trying to preserve and rehabilitate riverine habitat.

In addition, the project area is rural with high volumes of trucks and Recreational Vehicles (RV's). The TSM Alternative would not be cost effective as a result. There would be minimal potential for reducing congestion and improving roadway conditions with this alternative. For these reasons, this action was not considered viable.

C. Alternatives Considered but Rejected. Alternatives Considered but Rejected

Over the development of this project, many alternative alignments were investigated (Figure 5). The original DEIS approved by FHWA considered 9 alternatives. Most of these alternatives were variants of what is subsequently described as the Kenai River Alternative. Due to the significantly adverse impacts of these alternatives and because of overwhelming agency and public opposition to them, they have been eliminated from further consideration. A brief description of these alternatives is provided below.

1. Kenai River Alternative (A). Kenai River Alternative (A)

The Kenai River Alternative between MP 55 and MP 46 is full reconstruction to current geometric standards for a 55 mph design speed. It would upgrade the existing highway, flattening curves to increase sight distances. Alignment shifts and bridge construction would be necessary to avoid substantial cuts into unstable river bluffs where erosion conditions are severe. A north side frontage road would be provided within Cooper Landing to separate local and through traffic.

The Cooper Landing Bridge (MP 47.8) would be replaced, the alignment shifting to the east. The existing bridge would serve as a detour during construction and later be removed. The deck of the existing Schooner Bend Bridge (MP 53) would also be replaced. This alternative in combination with the subsequently described Kenai River Variants 2 and 3 could construct four additional new bridges over the Kenai River between MP 52 and MP 49.

Two crib walls and/or bank protection along the Kenai River would counter river erosion of the highway embankment between MP 55.2 and 54.5. A large cut would be made into the uphill slope at MP 54.5, approximately 1,700 feet in length and 100 feet high. A 250-foot long retaining wall would support the slope.

The Kenai River Alternative would involve four Section 4(f) properties, the Kenai River Special Management Area (KRSMA); the Kenai National Wildlife Refuge (KNWR), the Cooper

Landing Historic District, and the Sqilantnu Archaeological District. An eagle nest is identified along the west side of Juneau Creek, north of the proposed realignment centerline by approximately 220 feet. The river encroachments and additional bridge crossings are not viewed favorably by the resource agencies and the general public because of the potential impacts to fish and wildlife habitat and public lands.

Based on conceptual design, 14 residences and 9 businesses would be relocated. This number of relocations would represent a significant portion of the community.

The Kenai River Alternative would continue to mix local and through highway traffic on the existing highway. Traffic noise levels within the community would increase with future traffic volumes. Cuts into Cooper Landing area slopes would be difficult to stabilize through revegetation and erosion control matting. Large quantities of waste material would be generated. Construction activities along the existing highway would require extensive traffic control maintenance. The cost range for the Kenai River Alternatives in 1989 dollars was 61.3 million to 97.5 million dollars.

2. Kenai River Alternative Variants. Kenai River Alternative Variants

Kenai River VariantRiver Variant

This alternative is essentially identical to the Kenai River Alternative (A) except for a realignment between MP 49.5 and MP 49. This 0.5 mile realignment would construct two new bridges over the Kenai River below the Princess Tours Lodge. It avoids an actively eroding cutslope (MP 49.5) where mud slumpage and tree debris regularly fill the ditches. There is a sharp low speed curve at this site.

The Kenai River Variant would involve three Section 4(f) properties, the KRSMA, the Sqilantnu Archaeological District, and the Cooper Landing Historic District. Several business/residential

properties within the community would be relocated. For the remainder of the highway segment between MP 55 and MP 46, erosion and maintenance concerns would remain.

Kenai River Variant with Juneau Creek Crossing
Kenai River Variant with Juneau Creek Crossing

This alternative is the same as the Kenai River Alternative (A) except for a realignment between MP 52 and MP 50. This 1.72-mile realignment avoids the constrictions of the existing highway between the bluff and the river by crossing undeveloped land on the north side of the Kenai River across from the Cooper Creek Campground. Three bridges would be required, two across the Kenai River and one across Juneau Creek.

The alternative would involve three Section 4(f) properties, the KRSMA, the Squalantnu Archaeological District, and the Cooper Landing Historic District. An eagle nest is identified along the west side of Juneau Creek, north of the proposed realignment centerline by approximately 220 feet.

Erosion and maintenance concerns between MP 55 and MP 46 would not be remedied. However, the quality of outdoor camping at the Cooper Creek Campground (MP 51) may be enhanced because through traffic would be moved farther from the recreation facility.

Bean Creek Alternative (C)

This alternative is identical to the Kenai River Alternative (A) except for a realignment between MP 49.5 and MP 47.7. This 2.2-mile realignment through Cooper Landing avoids the unstable slope near MP 49.5. A portion of Bean Creek Road would be realigned. Three bridges would be constructed across the Kenai River below the Princess Tours Lodge. The lodge was not in existence when this alternative was developed. Bean Creek would be crossed with a culverted fill embankment.

The Bean Creek Alternative would involve two Section 4(f) properties, the KRSMA and the Sqilantnu Archaeological District. Economic and social impacts could be extensive within Cooper Landing. Highway traffic would continue through the community and adversely affect other residential areas previously separated from the highway. The traffic would be rerouted past the elementary school. ROW acquisition would relocate several residential and business properties. The community did not support this alternative because of potential disruption to residential neighborhoods and the business district.

Bean Creek Variant (D)Creek Variant (D)

This alternative is a slight variation of the Bean Creek Alternative (C). This 2.45-mile realignment between MP 50 and MP 47.7 through Cooper Landing avoids the unstable slope near MP 49.5. The primary difference between this alternative and the Bean Creek Alternative (C) is the number of Kenai River crossings. One bridge would be constructed. After crossing the river, the realignment would climb onto the bluff near the site of the Princess Tours Lodge before merging with the Bean Creek Road. The lodge was not in existence when this alternative was developed. There are engineering design constraints to ascend the bluff.

Two Section 4(f) properties would be involved with this action, the KRSMA and the Sqilantnu Archaeological District. As previously described, residential and business properties would be relocated, including the Princess Tours Lodge. Additional community impacts would also be similar. This alternative did not receive community support.

Cooper Landing Alternative (E)Landing Alternative (E)

This alternative is the same as the Kenai River Alternative (A) except for a realignment between MP 49 and MP 47. This 2.0-mile realignment avoids the multiple driveways within the community and improves sight distances at the Cooper Landing Bridge. The road would follow the hillside on the south side of Cooper Landing. An alignment shift would also occur east of the

bridge at the site of the Cooper Landing elementary school. The existing bridge would be widened. This alternative would not avoid the actively eroding cutslope at MP 49.5. Erosion and maintenance concerns along the existing highway would not be remedied.

The Cooper Landing Alternative would have significant impacts on the Cooper Landing community. It would require ROW from the community and adjacent Section 4(f) KRSMA property. There would be relocations of residential and business properties. The realignment would also impact the school. Highway traffic would continue through the community.

3. Reconstruction (4R) Alternatives (B and B-1). Reconstruction (4R) Alternatives (B and B-1)

These are full reconstruction (4R) alternatives. The existing highway alignment would be improved to current desirable standards for 50 mph or 60 mph design speeds without major realignment. However, highly erodible slopes and inferior soils at MP 50.3 and MP 49.5 limit road improvement options. The higher design speed alternative requires greater cuts into the unstable slopes, aggravating the serious erosion conditions.

Three Section 4(f) properties would be involved with this action, the KRSMA, the Sqilantnu Archaeological District, and the Cooper Landing Historic District. There would be no relocations.

Anticipated problems include: 1) slope failures of exposed backslopes, 2) large quantities of waste materials from road cuts, and 3) runoff from large excavation cuts flowing into the river. Potential maintenance problems and associated operation costs would not be minimized. Construction and long term impacts to the traveling public, community, and recreation users, as previously described within the Kenai River Alternative (A), can be expected.

4. Juneau Creek Variant (F). Juneau Creek Variant (F)

This realignment is a variation of the Juneau Creek Alternative which follows benchlands above the Kenai River. The alternative crosses the Juneau Creek Canyon about 0.5 mile below Juneau Falls, approximately 2 miles north of the Kenai River.

The Juneau Creek Variant would involve five Section 4(f) properties, the KRSMA, the Kenai National Wildlife Refuge, the Resurrection Pass Trail, the Sqilantnu Archaeological District, and the historic Bean Creek Trail.

This Juneau Creek crossing was rejected because 1) of the need to reinforce the rock canyon walls to provide a stable bridge foundation, 2) inferior soils in the vicinity, and 3) a 450-foot long suspension bridge 275 feet above the canyon floor would be required to span the canyon.

5. Crescent Creek Alternative. Crescent Creek Alternative

This alternative could be used in combination with any of the build alternatives except the Quartz Creek Variant, which is subsequently discussed. This 1 mile realignment between MP 43.5 and MP 42.5 would avoid the constrictions between Quartz Creek and the rock face of the uphill slopes by shifting to the south side of Quartz Creek with two bridge crossings.

Most of the Crescent Creek Alternative would place fill through extensive contiguous wetlands of Quartz Creek. Archaeological resources would also be impacted. It would move through highway traffic to within 200 feet of the USFS Crescent Creek Campground. ROW would be needed from the Chugach National Forest.

6. Quartz Creek Alternative. Quartz Creek Alternative

This alternative could be used in combination with any of the build alternatives except the Crescent Creek Alternative discussed above. This 4.2-mile realignment departs from the Sterling Highway near MP 40.9 and merges with the Seward Highway at MP 38, north of Jerome Lake.

The realignment follows relatively level hillside terraces through the Quartz Creek Valley. It would parallel an existing mining access and USFS timber harvest road. This Quartz Creek Alternative would avoid the Daves Creek wetlands, but involve other palustrine and riverine wetlands. Jerome Creek would be crossed.

Soil surveys determined that the Quartz Creek Valley contains inferior soils and highly erodible slopes. Anticipated problems include: 1) backslope failures, 2) extensive erosion of inferior soils from water seeps along cut slopes, 3) large quantities of waste materials generated from road cuts, and 4) runoff from large excavation cuts impacting adjacent wetlands.

The alignment would follow along a north facing slope where potential glaciation problems could be severe. Long term expenses for slope and ditch maintenance would be required. Expected mud slides could affect the long term stability of the roadway. This alternative would add an additional 2.5 miles to the State Highway maintenance operations.

7. Quartz Creek Variant. Quartz Creek Variant

This 8.5-mile realignment includes a segment of the Quartz Creek Alternative discussed above to avoid unstable slopes between MP 43.5 through MP 42.5 and extensive Daves and Quartz Creeks wetlands. It would leave the Sterling Highway at MP 46 and follow through undeveloped areas of the Quartz Creek Valley. The Quartz Creek Variant would require a bridge over Quartz Creek and would cross Jerome Creek. Additional palustrine wetlands would be involved.

Near Kenai Lake, the realignment would cross proposed residential subdivisions and a potential site for the future Cooper Landing high school. It would add an additional 8.5 miles to the State Highway maintenance operations. As previously discussed with the Quartz Creek Alternative, inferior soils and highly erodible slopes and associated maintenance are major concerns.

D. Viable Build Alternatives. Viable Build Alternatives

The proposed project would provide a modern highway meeting current design standards. Two build alternatives are being considered as reasonable: the **Resurfacing, Restoration, Rehabilitation (3R) Alternative** and the **Juneau Creek Alternative**. A detailed description of each alternative by highway segment follows. Currently the Department does not have a preferred alternative. Both alternatives are being considered equally. Identification of a preferred alternative would be made in the Final EIS after the results of the EIS and input received from the public and agencies have been evaluated.

This project would involve several Section 4(f) properties depending on the build alternative: the Kenai National Wildlife Refuge (KNWR) and the Resurrection Pass Trail, both subject to the Alaska National Interest Lands Conservation Act (ANILCA) Title XI; the Cooper Landing Historic District, which qualified for the National Register of Historic Places (NRHP); and the Sqilantnu Archaeological District, which has received a formal Determination of Eligibility from the National Park Service for the NRHP. (Refer to the Draft Section 4(f) Evaluation, and Figure 16).

A Level of Service (LOS) capacity study was completed to determine the existing and predicted LOS for the project corridor (Appendix A). LOS is a qualitative measure which denotes operating capacity conditions designated A (excellent) through F (gridlock) on a given roadway while accommodating different traffic volumes.

The LOS analysis indicates that a current acceptable LOS "C" exists in the project corridor. This represents a capacity condition having stable traffic flows operating at speeds of 40 mph or more.

For purposes of comparison, the LOS capacity analysis evaluated both alternatives using the projected 20-year design traffic volumes. Generally, 20-year projections are applied only to full-reconstruction projects, while 10-year design traffic volumes are applied to 3R projects. The

capacity study shows that, for the most part, either build alternative would provide an acceptable LOS "D" for future (year 2010) traffic volumes. LOS "D" is approaching design capacity volumes and delays may occur, operating speeds are approximately 35 mph.

Both build alternatives provide passing and/or climbing lanes. The LOS analysis does not account for these auxiliary lanes. These lanes reduce highway traffic congestion and improve capacity as they afford an opportunity for passing slow moving vehicles. It is also important to realize that this highway experiences high seasonal fluctuations of recreational traffic, and that the AADT and the LOS conditions are not typical during the off-season (October through May), lower traffic periods.

The **3R Alternative** is essentially the minimum development alternative, which improves the road primarily on the existing alignment. The two-lane highway would have a total 36-foot surface width: two 12-foot lanes and two 6-foot shoulders (Figure 2A). Where needed, a 12-foot passing lane with a 4-foot shoulder would be provided.

Widening the roadway embankment would require cuts and/or additional fill along the entire length of the project. Eleven retaining binwalls are proposed to support the erosion prone slopes. Ten of the binwalls would be constructed along the Kenai River. These would vary in lengths from 100 feet to 0.3 mile, and be up to 10 feet tall.

A separated pedestrian pathway would be provided between MP 55 and MP 45. Vehicle pulloffs would be provided as appropriate. The site locations would be coordinated with the resource agencies.

3R projects generally are constructed to preserve and extend the service life of roadways, while enhancing safety conditions (ADOT&PF, PCM 11-12.01.02). This type of project was established in 1976, when it became evident that the deterioration rate of the nation's highways exceeded the funding levels available for full reconstruction projects.

Elements of a 3R design are determined by the safety performance of the existing facility. The actual accident rate for each vertical and horizontal curve is compared to the statistically expected accident rate. When the actual exceeds the predicted rate, improvements are made. Only one low-speed curve at MP 47.5 would require alignment improvements under the 3R Alternative. Accident rates at the remaining low speed curves were not high and consequently no alignment improvements are required.

A Level of Service (LOS) analysis for this alternative determined the future (year 2010) LOS at "D and E" (Appendix A). The "D" condition is anticipated west and east of Cooper Landing while the "E" condition is projected for the community. LOS "E" is at design capacity, having congested, unstable traffic flows and low vehicle operating speeds of approximately 35 mph.

It is important to realize that this highway experiences high seasonal fluctuations of recreational traffic, and that the LOS conditions are not typical during the off-season (October through May), lower traffic periods. While the capacity provided by this alternative's design may be sufficient to handle the 20-year traffic projections, it is likely that some additional improvements may be required within 10 to 15 years after construction of this alternative. It is expected that the pavement will serve for approximately 10 years. Additional improvements could range from another 3R project to full reconstruction.

Highway improvements would enhance safety conditions and alleviate traffic congestion. The widened shoulders would provide for vehicular emergency pulloffs. Widened slopes would provide a greater vehicle recovery zone. Rumble strips for alerting drivers would be added to the shoulders. Traffic congestion would be reduced by the addition of passing and left-turn lanes. Expenses for slope and ditch maintenance would continue but be substantially reduced because the project would stabilize back slopes. This would minimize long term siltation into the adjacent wetlands and river.

Project costs in 1993 dollars, not including mitigation, were estimated at \$29.8 million.

The **Juneau Creek Alternative** is a full reconstruction alternative. It would provide an improved two-lane highway with a total 40-foot surface width: two 12-foot lanes and two 8-foot shoulders (Figure 2B). Twelve-foot passing/climbing lanes with a 4-foot shoulder would also be provided. Vehicle pulloffs would also be provided and located in cooperation with resource agencies.

Design elements would provide an improved highway which meets current desirable geometric standards throughout its alignment. This alternative would have a 60 mph design speed throughout the project area. Although it is considered as having a 20-year design, repaving would likely be required after approximately 10 years. This would upgrade the existing alignment with some straightening of curves except between MP 55 and MP 46 where the highway would be realigned to the north wall of the Kenai River Valley.

The Juneau Creek Alternative would also require cuts and/or additional fill along the entire segment length to widen the roadway embankment. Conceptual design presently does not include retaining binwalls to support the erosion prone slopes. Alignment shifts have removed the highway from these slumpage zones and/or increased embankment heights to contain the erodible slopes. However, greater wetlands involvement was required to accomplish this and two retaining walls (100 and 200 feet long) contain the highway embankment out of Quartz and Dave's Creeks.

Future (year 2010) LOS conditions for this alternative were determined at "D" for the new highway alignment and the reconstructed roadway sections (Appendix A). LOS "B and C" are projected for the existing highway segments between MP 56 and MP 46. The "B" condition is anticipated west and east of Cooper Landing while the "C" condition is projected for the community. These conditions represent stable traffic flows and operating speeds of 40 and 50 mph, respectively.

It is expected that the Juneau Creek Alternative would enhance safety conditions, reduce slope and ditch maintenance, and minimize long term siltation into the adjacent wetlands and river.

Project costs in 1993 dollars, not including mitigation, were estimated at \$64.4 million.

1. Skilak Lake Road (East) intersection (MP 58) to MP 55. Skilak Lake Road (East) intersection (MP 58) to MP 55

The highway is on the Kenai River floodplain through this segment. The narrow highway has 2-foot shoulders and is confined to the toe of the valley wall, paralleled by the river to the south. At MP 57.5, the embankments are reinforced with riprap. Road cuts have exposed an eroding backslope. Slope failures are filling ditches at MP 57 and MP 55.5 and require continued maintenance.

The Skilak Lake Road (East) intersects the highway at the beginning of the project, and provides access to several USF&WS campground and recreation facilities in the Skilak Loop Special Management Area. Other USF&WS recreation facilities along this highway segment include: Jim's Landing (MP 58), the Kenai National Wildlife Refuge Contact Station (MP 58), Fuller Lakes Trailhead (MP 57).

With either **build alternative**, reconstruction in this segment would improve the roadway within the current ROW along the existing alignment. Passing lanes would be provided between MP 56 and 55. A left-turn lane would be provided for access to Skilak Lake Road to improve safety and alleviate summer traffic congestion at the intersection. Traffic would need to be maintained on the existing highway during construction.

In addition, the **3R Alternative** would require cuts into erodible slopes and inferior soils to widen the embankment. Retaining binwalls up to ten feet in height would support these slopes. An approximate 750-foot long binwall would be constructed near MP 55.5, Kenai River Mile

(RM) 73, and at MP 55 there would be a series of 5 binwalls (three 100-foot, one 200-foot, and one 300-foot) west of the Russian River Ferry Crossing.

2. MP 55 to Broadview Guard Station (MP 46). MP 55 to Broadview Guard Station (MP 46)

The highway follows the Kenai River and the toe of valley slopes through this segment until Kenai Lake where it is cut into the mountainside. There are existing development constraints in several areas because of the terrain. Roadway embankments are reinforced with riprap to deter river erosion. Cuts have been made into unstable slopes where erosion conditions are severe. Mud slumpage and tree debris regularly fill ditches. Travel speeds are reduced along the curving alignment which limits passing opportunities.

Cooper Landing community development is adjacent to the highway along much of this segment. Roadside development has created multiple driveway accesses. A pedestrian safety pathway was constructed during 1993 along the highway between MP 51 and MP 45.5. An undeveloped boat launch is at the west approach of the Cooper Landing Bridge (MP 47.7).

There are several State and federal recreation facilities along this highway segment which include: the Kenai-Russian River Campground (MP 54.5), the Russian River Ferry Crossing/Sportsman's Lodge Site (MP 54.5), the Resurrection Pass Trailhead (MP 53.2), the Russian River Campground and Trail (MP 52.5), the Cooper Creek Campground (MP 51). During the summer, especially in the vicinity of the Russian River, vehicles are parked along road shoulders, congesting traffic.

The **3R Alternative** would require approximately 2.4 acres of additional ROW from the community of Cooper Landing. Passing lanes would be provided between approximately MP 52.5 and 51.5. The bridges at Schooner Bend, Cooper Creek, and Cooper Landing would be resurfaced.

Four retaining binwalls are proposed to support the erosion prone slopes. A 400-foot long binwall would be constructed at MP 52.3 (RM 77.5) east of the Russian River Campground entrance. A 0.25 mile long binwall is proposed at MP 50 (RM 79.5) immediately east of Cooper Creek and the Cooper Creek Campground. A 0.21 mile long binwall is proposed at MP 49.5 (RM 80.5) across from the Princess Tours Lodge. The fourth wall is 750 feet long and is proposed in Cooper Landing at MP 49 (RM 81).

Left-turn lanes would be considered at high use intersections to alleviate traffic congestion. Areas considered include the Russian River Ferry Crossing and, should it be constructed when this project is designed, a proposed DPOR Cooper Landing recreational site at MP 48. An approach to the park land would be provided and/or improved.

This action would improve the existing pedestrian path between MP 50 and MP 45.5 to provide a 5-foot wide surface. New pathway construction is proposed between MP MP 50 to the Russian River Ferry Crossing and from 45.5 to MP 45. There would be a pedestrian undercrossing within the highway embankment at the east side of the Schooner Bend Bridge (MP 43) where the pathway would shift from the south to the north side of the highway. Between MP 46 and the Quartz Creek Road intersection (MP 45), only the portion of pathway within the ROW would be improved.

Accident analysis shows that the curve at the Bean Creek Road intersection area had nine accidents during the period between 1986 and 1991 which is higher than expected. The curve would be improved to increase sight distance and safety.

This action would improve traffic safety conditions but would continue to route all highway traffic through Cooper Landing, merging with local and recreational traffic. The improved pedestrian path would reduce pedestrian safety concerns. Existing traffic noise levels would

increase along the highway as the traffic levels increase. During construction, traffic would need to be maintained on the existing highway. Road closures would be expected.

The **Juneau Creek Alternative** realigns an approximate 11.2-mile highway segment to the north valley wall (Figure 5). At MP 55, the highway would leave the existing alignment and climb out of the valley onto benchlands until reconnecting with the existing Sterling Highway alignment near USFS Broadview Guard Station (MP 46). A tee intersection design is proposed for both west and east termini. Traffic on the existing highway segment will have the stop condition at the intersection. The existing highway would be maintained to serve local and recreational traffic.

Climbing and passing lanes are proposed through most of the segment. Gradients would range between 2.75 and 5.25 percent. Access would be controlled to accommodate through highway traffic. Preferred American Association of State Highway and Transportation Officials (AASHTO) intersection spacing for rural controlled access facilities is two miles. Should the Juneau Creek Road exist when this project is designed and constructed, the Department would improve the intersection if desired by the owner of the adjacent land.

For the most part, the realignment would cross undeveloped areas within the Kenai National Wildlife Refuge and the Chugach National Forest (CNF). Approximately 24 acres of ROW would be required from designated Wilderness of the Refuge (refer to the Draft Section 4(f) Evaluation and Figure 16-1). Approximately 183 acres would be required from CNF.

The length of the new roadway segment within the Refuge would be about 0.68 mile (3,600 linear feet). The Juneau Creek Alternative would leave the existing highway and enter the Refuge on the east side of the Chugach Power Electric transmission line crossing of the highway

at MP 55. Where it leaves the Refuge and enters the CNF, the proposed centerline would be approximately 770 feet north of the existing highway.

The Resurrection Pass Trail would be crossed with a road cut about 2.5 miles north of Cooper Landing, approximately 500 feet north of the confluence of the Resurrection Pass and Bean Creek Trails (refer to the Draft Section 4(f) Evaluation and Figure 16-2).

Juneau Creek would be crossed about 1,000 feet above the falls. The highway bridge would be about 135 feet long and 15 feet above the creek (Figure 4).

A technical report on the Resurrection Pass Trail and Juneau Creek Area recreation development options was prepared by USFS for this project (Appendix I). Two recreation development options are being considered for purposes of Section 4(f) mitigation. Both options would relocate a portion of the Resurrection Pass Trail and construct two scenic pullouts along either end of the Juneau Creek realignment to be field located with the assistance of USFS prior to final design. The first option would not provide additional access to the trail. The second option would construct one primary trailhead and associated facilities near Juneau Falls, maintained for both summer and winter use.

Trail Relocation: Approximately 550 feet of the Resurrection Pass Trail would be abandoned between the intersection of the Bean Creek Trail and the new highway alignment, replaced by a 0.6 mile length gravel trail segment constructed by the Department. The new trail segment would be relocated beneath the proposed highway bridge. It would merge with the existing Resurrection Pass Trail about 1,400 feet north of the proposed highway. The relocated trail is shown in Figure 16-2. Relocating the trail would require placing approximately 200 linear feet of embankment within palustrine wetlands.

Option One - No New Trailhead: The existing Resurrection Pass Trailhead at MP 53.2 would continue to be maintained as the primary access point for the trail. Winter access would be provided from a new trailhead in the Bean Creek area. No parking would be provided along the

highway realignment near Juneau Creek. The trail underpass would be located where access from the highway would be difficult, thereby discouraging users from entering or exiting the trail in the area. This option would limit the number of users directly accessing the area from the new highway.

Option Two - Juneau Falls Trailhead: The Department would construct a new trailhead on the west side of Juneau Falls, south of the highway. Access to the trailhead would be provided via a gravel surfaced road approximately 1,800 feet (0.34 mile) in length. The facility would include parking for 15 standard sized and 10 oversized vehicles, toilets, interpretive signs, and a picnic site. Between the parking area and the Juneau Falls viewing area, a 300-foot length trail would be constructed. This trail would intersect the Resurrection Pass Trail. A barrier fence would be installed along the bluff overlooking the falls. The USFS would maintain this facility for summer and winter use with the Department plowing the road and parking area in the winter. Signing to direct winter use under the Juneau Creek bridge would be maintained by the USFS.

Additional winter parking needs would be evaluated by the USFS in the future if the facility did not meet user needs. This would not be included as part of this highway project. Two options were considered: 1) connect a winter trail with the proposed Slaughter Ridge Road trailhead and maintain parking at the end of the road; and 2) locate a trailhead along the existing trail alignment to provide access to the 1,400 feet of existing trail above the highway realignment.

Construction impacts would be minimized with this alternative because traffic could be maintained on the existing highway during construction. The realignment would provide time savings for through highway travelers, but would also add 11.2 miles of highway to the State Maintenance System. This alternative would avoid additional bridge crossings over the Kenai River.

Rerouting around Cooper Landing would separate through highway traffic from local and recreational traffic, and reduce the pedestrian safety concerns. There would not be any relocations with this alternative. Existing traffic noise levels would be lowered along the existing highway, but higher levels would be introduced to undeveloped areas. According to a 1987 Cooper Landing Community survey, 68 percent were in favor of rerouting the highway section. The community has included the proposed realignment within its 1993 Community Land Use Plan.

3. Broadview Guard Station (MP 46) to Quartz Creek Bridge (MP 41). Broadview Guard Station (MP 46) to Quartz Creek Bridge (MP 41)

Road conditions through this segment include low speed roadway geometrics and 1-foot wide shoulders.

Along the north shore of Kenai Lake the existing alignment is cut into rocky outcroppings of the mountainside. In some areas, slopes drop more than 100 feet to the lake. Guardrail has been installed to prevent vehicles from running off the roadway. Quartz Creek Road (MP 45) intersects the highway on a sharp curve near the lake and provides access to the USFS Quartz Creek and Crescent Creek Campgrounds; residential and cabin properties; and a State owned general aviation strip.

East of Kenai Lake, the highway is constricted between the toe of steep sidehills and Quartz Creek. This area contains unstable slopes particularly near MP 44 after heavy periods of precipitation. Severe mud slides frequently flow into the adjacent ditches and onto the road.

With either **build alternative**, the existing highway segment would be improved. A left-turn lane would be provided for the Quartz Creek Road intersection. Passing lanes would be provided between MP 45 and 44. With either alternative, traffic would need to be maintained on the existing highway during construction.

At Quartz Creek (MP 41) there is a 138-foot long bridge which has a long history of hydraulic problems. The bridge is located on a flat depositional benchland and is constricting the stream. Considerable amounts of silt and bedload have been deposited under the structure. Mining activities upriver of the bridge contribute to the bedload. Debris collects behind the two instream piers, restricting and damming channel flows, and creating high backwater conditions. State maintenance forces must conduct instream work to clear the stream on a continued basis.

In the mid-1980's, an approximately 750-foot long berm was constructed upstream along the west bank to encourage water flow beneath the bridge. This berm was later breached and during 1992, a channelization project reconstructed the berm to force the stream velocity away from the west side highway embankment and bridge abutment.

The Quartz Creek bridge would be replaced with a 150-foot long clear span bridge, constructed approximately 50 feet south of the existing structure (Figure 3). The proposed bridge grade is approximately ten feet higher than the existing to provide for more adequate water flow passage. The older structure would be removed and the east side approach obliterated and revegetated. The abandoned west side approach would remain to protect the new highway embankment. During construction, vehicles would use the existing bridge to minimize impacts on the traveling public.

The existing berm would be removed. Two 150-foot long spur dikes would be placed upstream to encourage water flow beneath the bridge and move bedload. Bioengineering would be considered during final design to insure that suitable fish habitat parameters are maintained. Maintenance costs would be reduced because the design would eliminate dredging operations. Bedload deposition at the bridge would eventually be distributed downstream.

Three other design alternatives were evaluated at Quartz Creek to remedy the hydraulic problems at the bridge, but were rejected.

a. Longer Bridge: The existing site is located on a bench where the river tends to meander. Although a 1992 channelization project diverted the channel flows from the west bridge approach, velocities are now deflecting off the east side of the facility. Lengthening the existing bridge would be only be a temporary fix. Deposition would continue to occur at the bridge and require periodic instream dredging. Maintenance costs would not be reduced.

b. Dikes: In addition to the newly constructed bridge proposed as part of this highway project, the existing berm would be armored and another dike constructed along the east side of the main channel. This design would increase the velocities to keep the bedload from depositing at the bridge site. Armoring the riverbanks would adversely affect fish by eliminating adjacent fish habitat. The river would tend to meander behind the termini of the dikes. These new channels might eventually threaten the highway embankment and bridge abutments.

3. Drop Structures: Concrete structures would be staggered along either side of the main channel to encourage water flow and suspended bedload beneath the bridge. There would be minimum impacts on fish habitat. However, the channel bottom shifts up to 3 feet each year and shifting bedload would immediately fill behind the structures and deposit at the bridge. Dredging of the stream would continue. Hydraulic problems would not be resolved with drop structures, which are best used in stable streams.

The **3R Alternative** would require a 0.3 mile long retaining binwall at MP 44 to support the erodible slopes.

With the **Juneau Creek Alternative**, highway reconstruction would straighten curves and require additional ROW. Flattened curves would increase driving sight distances. Cuts into the rock hillside along Kenai Lake are required to straighten the alignment and flatten the curve at MP 45.

4. Quartz Creek Bridge (MP 41) to Seward Wye (MP 37). Quartz Creek Bridge (MP 41) to Seward Wye (MP 37)

The highway is situated between the hill slopes and Daves Creek. As a result, it contains numerous curves which limit sight distance and reduce traveling speeds. Summer traffic congestion is typical. The USFS Tern Lake Campground (MP 37.5) and two interpretive pullouts, at MP 40.8 and at Tern Lake (MP 37), are along this highway segment. A USFS materials site is at MP 38.

With either **build alternative**, reconstruction would improve the existing roadway. Passing lanes would be provided between MP 41 and 40. An improved Seward Highway intersection (Seward Wye) is proposed. Two culverts would be replaced with longer pipes at the culverted embankment crossings of Daves Creek near MP 39.5. The culvert gradients would be developed in cooperation with ADF&G during final design to insure that suitable fish habitat parameters are maintained.

The USFS interpretive MP 40.8 pullout would be relocated immediately adjacent to the new road.

The **Juneau Creek Alternative**: Some road shifts ranging from 0 to 150 feet are required to improve the alignment and increase sight distances. Two curves west of Tern Lake (MP 37.5) would be straightened and require an alignment shift for about 0.5 mile. Access to the USFS materials site (MP 38) would be maintained.

III. AFFECTED ENVIRONMENT. AFFECTED ENVIRONMENT

A. Social. Social

1. Population. Population

The population of the Kenai Peninsula Borough has increased 278 percent during the past two and a half decades (Table 2). There are 40,802 Borough residents according to the 1990 census. The population of the Kenai Borough experienced a growth greater than 300 percent between 1960 and 1980, and an increase of 61 percent between 1980 and 1990. Four of the five first class cities, Kenai, Soldotna, Homer, and Seldovia, and nine unincorporated communities are in the west Kenai Peninsula area. The majority of the Peninsula population (62.7 percent) is centered in the cities of Kenai and Soldotna.

The unincorporated community of Cooper Landing is within the project corridor. In 1990, there were 243 community residents compared to 116 in 1980, representing a 109 percent increase.

Table 2
Kenai Peninsula Borough Population

Year	Population	Increase /Decrease
1965	10,659	
1970	16,586	+55%
1975	18,770	+13%
1980	25,842	+38%
1985	39,180	+52%

1990	40,312	+03%
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(U.S. Bureau of the Census, State Dept of Labor, and DCRA)

2. Local Development. Local Development

The Sterling Highway is a major travel corridor for the Kenai Peninsula, along which all highway traffic to and from the west Peninsula is routed. This includes residential traffic as well as commercial, freight hauling semi-trailers. According to traffic analysis conducted by the Department, trucks comprise approximately 16 percent of the vehicles traveling the Sterling Highway.

Clusters of low density rural and strip development are typical in the project area. Cooper Landing is situated on the western end of Kenai Lake along the Kenai River. The center of the community is along the highway near the Cooper Landing bridge (MP 48). Various commercial and residential development as well as local community services and the elementary school are located in this area. Other development exists along the Snug Harbor and Bean Creek Roads which intersect the Sterling Highway near the bridge.

The Quartz Creek Road intersects the highway on the northeast shore of Kenai Lake (MP 45). This road provides access to two USFS recreation campgrounds (Quartz Creek and Crescent Creek), numerous cabins and residential properties, an airstrip, and a floatplane landing area. Tourist related businesses exist along the intersection.

Many homes and cabins and tourism businesses front the lake and line the river because of the desire to maintain an outdoor setting close to area resources and activities. Since the highway is parallel to the river and lake system, this strip development results in multiple driveway accesses.

Related effects on the highway system are especially noticed in the Cooper Landing area where local traffic must merge with through traffic.

A Chugach Electric Association powerline contained within a 200-foot wide clearing parallels the Sterling Highway through much of the project corridor. From BOP to approximately MP 55, in areas designated as Refuge Wilderness, the powerline is north of the highway at distances varying up to 1,800 feet (0.34 mile). At MP 55 the powerline crosses the highway to benchlands on the south side of the Kenai River. The powerline again crosses to the north side of the highway at MP 43.5 to the Chugach Electric Association power substation on Quartz Creek (MP 41). From the substation it continues north through the Quartz Creek Valley. The U.S.D.A. Forest Service (USFS) has a developed materials site on the north side of the highway at MP 38.

3. Local Recreation Development. Local Recreation Development

There are several campgrounds and recreation sites within or adjacent to the project corridor (Figure 10). There are also several locally used trails around Cooper Landing which include the Slaughter Gulch and Slaughter Ridge Trails. The USF&WS manages the Skilak Loop Special Management Area, which contains the Jim's Landing boat ramp (near MP 58) and several campgrounds with boat launch facilities; the Fuller Lakes Trail and Trailhead, the Kenai-Russian River Campground (MP 54.5), and the Kenai River Ferry Crossing/Sportsman's Lodge Site (MP 54.5).

Estimated use of Jim's Landing in 1992 was between 22,000 and 23,000. The USF&WS intends to upgrade the boat launch and provide additional parking at the site in 1994. The Kenai National Wildlife Refuge Contact Station at MP 58 received 4,765 visitors between June and August 1993. They will be expanding the Refuge contact station facilities in 1994 to include a larger parking lot and restrooms, and expect to see a 10 to 20 percent increase in site use during

the first year. Recreation use of the Fuller Lakes Trail was estimated to be 3,600 in 1992. This figure includes hikers, horse users, and snowmobilers.

The Resurrection Pass Trail and Trailhead (MP 53.2), Russian River Campground and Trail (MP 52.5), Cooper Creek Campground (MP 51), Quartz Creek and Crescent Creek Campgrounds (MP 45), and Tern Lake Campground (MP 37.5) are managed by USFS. The USFS is proposing to construct boardwalks and wildlife viewing platforms at the Tern Lake interpretive site (MP 37) during 1994.

Total recreation use on the Resurrection Pass Trail is approximately 7,000 during 1993. The south trailhead is used by 6,000 of those users for either entry, exit, or both. Presently USFS manages the trail and Juneau and Trout Lakes for dispersed recreation: predominantly for overnight, semi-primitive non-motorized and motorized recreation opportunities. Areas adjacent to the trail are managed for primitive outdoor experiences.

Of trail users, 4,000 rented one or more of the three recreational cabins which are used at capacity and must be reserved months in advance. In 1992, it was estimated that approximately 690 people stayed at the Trout Lake cabin, 7.8 miles from the South Resurrection Pass Trailhead. At the Romig and Juneau Lake cabins, 9.6 miles from the trailhead, there were approximately 670 and 610 people respectively.

On an average, use of USFS campgrounds and recreation facilities in the area are increasing at an annual rate of 10 percent. Russian River Campground was at 100 percent capacity for the entire 3.5-month summer fishing period during 1993 with an estimated 72,300 recreation users, which includes 48,500 day users.

The following figures are 1993 estimates and do not include day users or those using boat launches: Quartz Creek Campground - 10,750 campers; Crescent Creek Campground - 1,600 campers; and Tern Lake Campground - 4,600 campers.

Cooper Creek Campground was nearly filled to 100 percent capacity during the red salmon run from mid-June 1993 until the first week of August. It is estimated that there were 7,200 campers.

The Division of Parks and Outdoor Recreation (DPOR) is proposing a boat launch, parking, restrooms, and day-use area on undeveloped State park land in Cooper Landing (MP 48) to replace an undeveloped, unmanaged boat launch at MP 47.7. The existing gravel boat launch is at the west Cooper Landing bridge approach within the highway ROW and accessed on the highway curve. Current use of the existing boat launch by the general public and by river guiding operations is increasing, while creating highway safety concerns because of its road access location. This proposed park development is scheduled for construction in 1996. The DPOR also manages a Langille Mountain sheep viewing pullout (MP 46) and is considering an additional pullout overlooking Kenai Lake (MP 45).

The Alaska Department of Fish and Game (ADF&G) has recently acquired the Sportsman's Lodge Site at MP 54.5. The ADF&G has removed the lodge buildings and opened a boat launch in 1993. Along with the USF&WS, they propose to develop five acres for Russian River Ferry Crossing parking in 1994. There were counts of 15,858 vehicles parked at the site between June to mid-August 1992. During the summer, especially in the vicinity of the Russian River, vehicles are parked along road shoulders, congesting traffic.

There are a number of local trails that have been developed by Cooper Landing area residents for hiking, skiing, and snowmobiling. The Cooper Landing Community and the Kenai Peninsula Borough are in the process of developing a new trailhead for the Bean Creek Trail along the Bean Creek Road. The Forest Service is assisting and cooperating with this effort. The lower portion of the trail traverses the Bean Creek Parcel which is being considered as a potential land selection by DPOR (Figure 7). An easement for the trail will need to be considered with the acquisition.

4. Land Use. Land Use

The Kenai Peninsula Borough comprises 16,384,000 acres (25,600 square miles) and includes portions of Cook Inlet, the Alaska Peninsula, and the Kenai Peninsula.

Federal Land: Approximately 60 percent of the Borough is owned by the federal government and contained within the Kenai National Wildlife Refuge and the Chugach National Forest. Land ownership within the project area is shown in Figure 7.

Totaling 2.0 million acres, the Kenai National Wildlife Refuge (KNWR) extends the length of the Kenai Peninsula (Figure 8). The Refuge was originally established in 1941 as the Kenai National Moose Range, but was renamed under the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. It is managed by the U.S. Fish and Wildlife Service (USF&WS). Land use varies within the Refuge (see Figure 7 and Appendix J). Approximately 1.4 million acres are designated for Wilderness preservation. The remaining acreage has been set aside for mineral, oil, and gas extraction; timber harvest; and transportation and recreation.

The Chugach National Forest (CNF) was created in 1907, and is under USFS management. It contains 5.9 million acres, of which 1.2 million acres are in the Kenai Peninsula Borough. The CNF adjoins the Refuge to the west at MP 55. Management of the portion of the Kenai Peninsula in the area of the highway project is at Level II (Analysis Area 2) for timbered sideslopes and the road corridor. The primary management goals are to increase and improve dispersed recreation opportunities, maintain landscape character, and maintain and enhance wildlife and fish habitat.

According to USFS, spruce bark beetle infestation had affected 22,697 acres of CNF in the Cooper Landing area by 1990, increasing wildfire potential (refer to Figure 5). The USFS is harvesting the infected timber to provide immediate protection to the community and eventual restoration of area forests (Cooper Landing Cooperative Project). Reforestation and tree salvage

activities should be completed in 1996. Altogether, the USFS has proposed to construct 12.1 miles of temporary access roads to timber salvage units and fuelbreaks. The Juneau Creek Road exists at MP 53.5 near the Resurrection Pass Trailhead and other roads have been built off Bean Creek Road. An existing mining road through the Quartz Creek Valley is being upgraded for timber harvest access.

For purposes of recreation, the USFS manages forest lands according to the Recreation Opportunity Spectrum (ROS) classifications. The classifications are included in the 1984 Chugach National Forest Land and Resources Management Plan as guidelines for recreation management. Based on these guidelines, the USFS manages the Resurrection Pass Trail and surrounding area for semi-primitive non-motorized (SPNM) recreation opportunities (Figure 14 and Appendix I). During December 1 through February 15, the areas are managed for semi-primitive motorized (SPM) recreation.

State Land: When land conveyance is complete, the State will have title to roughly 25 percent of the Borough. State legislation designated 580,000 acres for state parks, game refuges, and sanctuaries, and, in 1984, established the Kenai River Special Management Area (KRSMA) (Figure 9). The KRSMA is classified as a park unit and includes the Kenai River system through Kenai Lake and other adjacent land that is not in private ownership. Management responsibility was given to the DPOR, having goals to protect the natural resources while providing for recreation use.

The Kenai River flows westerly out of Kenai Lake near Cooper Landing for approximately 83 miles and drains into Cook Inlet. The upper Kenai River flows for approximately 18 miles from Kenai Lake to Skilak Lake. The middle river flows from Skilak Lake to the Kenai River Bridge at Soldotna. The lower river flows from Skilak Lake to Cook Inlet. The highway project area lies within the upper segment between River Mile (RM) 82 to RM 65. The Kenai River is considered a world class salmon stream and receives more fishing days of effort than any other river system in Alaska.

A 150-acre parcel which has been transferred from the CNF to the Division of Land and Water Management is the Bean Creek Parcel (Figure 7). This parcel is being considered by the Division of Parks and Outdoor Recreation (DPOR) as a potential land selection and is identified within the Kenai River Comprehensive Management Plan. Once acquired, it would be included as part of the KRSMA. Long term management intent of the parcel is not identified within the Kenai River Comprehensive Plan. The Bean Creek Parcel is accessed north of the Cooper Landing by the Bean Creek Road, which was upgraded by the Borough during 1991.

Private and Local Government Land: The Municipal Land Entitlement Act of 1978 entitles the Borough to 156,000 acres and the unincorporated community of Cooper Landing to 10,000 acres. Some of this acreage has been selected from CNF. Outside of the first class cities, there are no local regulations or building permits regulating land use or development. There are a number of vacant lots within existing residential and commercial development areas along the existing highway corridor and Cooper Landing, and several others are proposed.

Cooper Landing has drafted a community land use plan, which was approved by the Kenai Peninsula Borough Planning commission in July 1992, and was recommended to the Borough Assembly for adoption. Land use recommendations include establishing a centralized site for public and local government facilities along the Sterling Highway and Snug Harbor Road (MP 48). Other development areas being considered include: a commercial development zone and residential and high school development near MP 45, by the intersection of the Quartz Creek Road; and residential development along Snug Harbor, Quartz Creek, and Bean Creek Roads.

Although the parcel is not addressed within the Cooper Landing Land Use Plan, the Cooper Landing Advisory Council Cooper Landing is considering the selection of 916 acres of land along Juneau Creek under the Municipal Land Entitlement Act (Figure 7) (per. comm., Larry Wright, Cooper Landing Advisory Council, May 19, 1992). Utilities do not extend to the parcel. The Juneau Creek Parcel has been transferred from the Chugach National Forest (CNF) to the

Alaska Department of Natural Resources, Division of Land and Water Management. An earlier selection request submitted by the Borough was rejected in 1989.

Remaining land within the Borough is privately owned and represents approximately 1.32 million acres. Native village corporations and Chugachmiut (formally Chugach Alaska) and Cook Inlet Region, Inc. (CIRI) regional corporations are the major private landowners. Created under the Alaska Native Claims Settlement Act (ANCSA) in 1971, these corporations will eventually have title to approximately 1,073,000 surface acres and 230,000 subsurface acres. (There are no Native Alaskan communities within the project area, the nearest village corporation is in the City of Kenai.)

Under ANCSA, regional corporations are entitled to the conveyance of land containing cemetery sites and historic places. Approximately 2,024 acres between MP 55 and MP 53 have been selected by CIRI under ANCSA. In 1988, the Bureau of Indian Affairs (BIA) determined that the CIRI selection met the criteria for qualification as a Native historical place and cemetery site and issued a Certificate of Eligibility. The Bureau of Land Management (BLM) is adjudicating the conveyance and has not issued a decision. This decision is not expected soon; the selected lands are already appropriated and developed by federal and State agencies.

5. Cultural Resources. Cultural Resources

There are more than 700 cultural sites included on the Alaska Heritage Resource Survey (AHRS) within the Kenai Peninsula Borough. Many are listed or considered eligible for nomination to the National Register of Historic Places (NRHP). Sites within the project area are the Sqilantnu Archaeological District, the Resurrection Pass Trail, the Cooper Landing Historic District, the Jalmar Anderson Cabin, and the Broadview Guard Station.

This project would involve Section 4(f) properties depending on the build alternative: the Kenai National Wildlife Refuge and the Resurrection Pass Trail, both subject to the ANILCA Title XI;

the Cooper Landing Historic District, and the Sqilantnu Archaeological District. (Refer to Section S, Historic and Archaeological Preservation, the Draft Section 4(f) Evaluation, and Figure 16).

The Sqilantnu Archaeological District (KEN-156/SEW-282) contains late prehistoric to early historic Tanaina Athapaskan village winter settlements and smaller seasonal camps. This District received a formal National Park System (NPS) Determination Of Eligibility (DOE) for the National Register of Historic Places in 1981. It encompasses approximately 3,240 acres within the Refuge; the Chugach National Forest; and CIRI and private land holdings.

Fifteen sites were originally included within the nomination. There has not been a comprehensive survey of the District or subsequent site nominations. For the most part, archaeological investigations have been limited to cultural reconnaissance surveys and mitigation projects designed for the Department on this project and for other federal and CIRI land management preconstruction and inventory projects. Archaeological data is not included in this public document because of the resource sensitivity.

The CIRI and the Kenaitze Tribe are working with the USFS and USF&WS on a cultural heritage and awareness project, "Footprints." The Kenaitze Tribe has developed and is staffing an interpretive cultural program at the "Beginnings Site" (MP 53.5) during the summer. Boardwalks have been constructed and interpretive signs are also installed. Lack of parking at the site has been a problem and owing to limited available land along the riverbank there is little opportunity to develop parking facilities. Locations to construct a cultural heritage center as part of the "Footprints" project in the Sqilantnu Archaeological District are being evaluated. The preferred site is across from the entrance to the Russian River Campground near MP 53.

The Resurrection Pass Trail (SEW-364) originated as a mining trail in the late 1800's and is presently the most heavily used recreational trail in Alaska. This historic trail, excluding a

segment which was constructed in 1971, is considered eligible for NRHP. It is also a National Recreation Trail and a Conservation Value Unit, subject to ANILCA.

The Cooper Landing Historic District (SEW-338), located at MP 48.7, qualified for the NRHP in 1986 with five contributing buildings: the Charles and Beryl Lean House, the Riddiford Schoolhouse (SEW-179), the Dunc Little Cabin, the Cooper Landing Post Office (SEW-146), the Leo Douglas Cabin (SEW-180), and the Harry Brown Cabin (SEW-174). This District represents the 1905-1929 homesteading period. The Harry Brown Cabin (SEW-174) at MP 49.2 is considered by the Department as contributing to the District. The Jalmar Anderson Cabin at MP 48.9 is also considered as eligible for NRHP by the Department, having contributed to the Cooper Landing settlement during World War II and post war periods.

The Broadview Guard Station (SEW-218) at MP 46 is considered by the Department and the USFS as being eligible for NRHP. The building was originally constructed by the USFS as a fire lookout during 1936/1937. Presently the facility is maintained by USFS for research purposes.

B. Economic. Economic

State oil revenue spending stimulated rapid economic growth in Alaska. Between 1980 and 1986, the Kenai Peninsula Borough (KPB) was the fastest growing region in the State. Since early 1989, the KPB has experienced growth in all economic sectors. Strong year-round employment in oil and gas related industries, retail, service, and government was supplemented seasonally by fisheries and tourism. In 1985, total economic earnings were \$343 million (KPB, 1988).

Due to the abundance of fish and wildlife resources, proximity to Anchorage, and availability of recreational facilities, the Kenai Peninsula receives the heaviest recreation and tourism visitation in the State. Tourism generates approximately \$96.5 million annually or 7.2 percent of the

KPB's gross revenues (Fox Marketing and Management, 1991). About 2,019 Peninsula jobs (12.3 percent of the work force) are tourism related.

Sport fishing on the Kenai River is the most important activity. Trends show increased resource pressure from the growing number of participating fishermen. In 1986, southcentral Alaska sport fishing expenditures were \$127.1 million and business earnings \$65.3 million (Jones & Stokes Associates, Inc., 1987), directly supporting 886 Peninsula jobs. The Kenai Peninsula accounted for 39.4 percent of all sport fishing trips in Alaska. The Kenai River between Skilak and Kenai Lakes received 10.6 percent of all fishing effort from 1977 and 1984, while the Russian River received 6.0 percent.

The importance of the Kenai River to the local economy is significant. The towns of Cooper Landing, Sterling, Soldotna, and Kenai, which are situated along the river, change face from the middle of May until the middle of September, when the salmon are in the river. The upper river segment is known for the return of the sockeye (red) salmon to the Russian River, a tributary of the Kenai River (RM 74). Hundreds of anglers line up shoulder-to-shoulder for "combat fishing" at the confluence of these rivers.

The Borough estimated that approximately 180,000 Anchorage area residents visited the Kenai Peninsula more than four times during the year 1990 (Fox Marketing and Management, 1991). Ninety-seven percent drove, 20 percent in an RV or camper, staying an average of two nights per trip. Residents frequently used vicinity campgrounds. Roughly 160,400 nonresident visitors traveled to the Kenai Peninsula during 1989, staying an average of three nights. The cities of Kenai and Soldotna accounted for 33 percent of the destinations.

Long term community goals focus on transforming Cooper Landing into a tourism destination point. Approximately 90 percent of the Cooper Landing businesses are oriented to tourists and visitors who are drawn to the area for the resources and associated recreation activities, especially sport fishing (pers. comm., Larry Smith, Cooper Landing Advisory Planning Commission,

September 19, 1990). There are six guiding services, six lodge/restaurants, two grocery stores, fishing tackle and gift shops, two air charter services, and one horse trail ride business. Guiding operators indicate that for the most part clientele are nonresidents and booked in advance.

Princess Tours has developed a new economic enterprise in the community. The company operates a lodge overlooking the Kenai River and is working closely with the community in an effort to attract visitors, estimated at 30,000 annually. These lodge facilities provide the base for company package tours in combination with cruise ship dockings in Seward and other Kenai Peninsula activities. The community views Princess Tours' actions within Cooper Landing as having tremendous beneficial impacts. Princess Tours is conducting a feasibility study to determine future resort expansion needs.

According to statistics from the Kenai Peninsula Borough Planning Department, sales in the community are highest during July through September (Table 3). Third quarter gross sales accounted for 49 and 55 percent of the total respective 1988 and 1989 sales. Many businesses close after the summer season and several owners/operators reside outside of the community during the winter months. Area residents mostly travel elsewhere for retail sales and general services.

Table 3
Cooper Landing Gross and Taxable Sales

Year	Quarter	Gross	Taxable
1988	1st	141,650	92,880
	2nd	608,275	473,431
	3rd	1,010,203	796,613
	4th	301,490	179,740
1989	1st	277,307	140,381
	2nd	873,320	603,770
	3rd	1,939,167	1,133,133
	4th	444,771	218,974
1990	1st	529,071	163,103
	2nd	1,274,065	920,750
	3rd	2,661,090	1,650,172

	4th	not available	not available
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C. Natural. Natural

1. Topography. Topography

In the project area, the highway follows glacial U-shaped valleys of the Kenai River, and the Quartz and Daves Creeks, which are cut west to east through the Kenai Mountains of the Chugach Range. The terrain varies from steep mountainous terrain to river bottom areas.

Most of the Kenai Peninsula Borough is susceptible to earthquakes of Richter magnitude 6.0 to 8.8. There is a predicted 75-year recurrence interval for magnitude 7.3 earthquakes. Numerous small, inactive faults exist and include the Border Ranges Faults west of Cooper Landing. Avalanche chutes bisect uplands in numerous locations around the east project terminus. During the 1964 earthquake, extensive landslides in the Kenai Lake delta caused waves 30 feet in height.

2. Climate. Climate

Climate of the Kenai Peninsula is maritime in nature and influenced by waters of the Cook Inlet and Kenai Mountain glaciers. Temperatures average a moderate 54 degrees Fahrenheit in August and 6 degrees Fahrenheit in January. Annual precipitation ranges from 101 to 127 inches, the greatest accumulation occurring during summer. Snowfall averages 65 inches.

3. Vegetation. Vegetation

There is a mix of vegetation ecosystems due to changes in terrain and elevation. On the well-drained terraces are mixtures of white spruce, paper birch, and aspen forests. Poorly drained areas contain black spruce, willow, and balsam poplar. In wetlands, sphagnum moss is

predominant with small woody plants such as black spruce, dwarf willow, and lowbush cranberry.

Fires are a major occurrence in the forests of the Kenai Lowlands. Much of the area between the community of Sterling (MP 81) and Skilak Lake (southwest of the project) was burned in 1947; fires also burned 3,278 acres around Kenai Lake in 1959 and 2,570 acres along the Russian River in 1969. During May 1991, wildfires burned approximately 7,900 acres south of the Sterling Highway in the vicinity of the Russian and Kenai Rivers and Skilak Lake.

The USFS determined that 22,697 acres of National Forest in the Cooper Landing area were affected by spruce bark beetle infestation by 1990 (Figure 7). Associated forest mortality is high, creating large amounts of fuel and increasing wildfire potential. Ninety to 95 percent of all spruce trees, 5 inches and larger in diameter as measured at a point 4.5 feet above the ground, have been killed. Timber harvests and salvaging activities are being conducted through the Cooper Landing Cooperative Project (USFS, 1990) to provide immediate protection to the community, for the wood by-products from the infected timber, and to eventually restore area forests. Project completion is anticipated in 1996.

4. Floodplains. Floodplains

Kenai River is a major glacially fed river system flowing 83 river miles west into Cook Inlet, from Kenai Lake. The 100-year floodplain for the Kenai River extends from its mouth at the Cook Inlet to the upper end of Kenai Lake. Within the project area, the existing Sterling Highway encroaches or is immediately adjacent to this floodplain westward of MP 48, making floodplain encroachments unavoidable.

The Kenai River characteristically has high summer flows resulting from the Skilak and Trail Glaciers meltwater (of the Harding Icefield) and precipitation runoff. It carries heavy glacial silt loads. Although the overall mean annual discharge is 5,340 cubic feet per second, the river bed

is capable of supporting a greater flow. Sections of the river bottom are armored and protected with coarse materials, thus producing a stable and fairly durable stream bed.

On the Kenai River three types of flooding hazards have occurred during the past 30 years (KPB, 1988): riverbank overflow from excessive amounts of precipitation during summer and fall (1977 and 1980), springtime thaw ice-jams which backed-up river water when outflowing ice became restricted (1967 and 1981), and outbursts of glacially dammed lakes (jokulhlaup) in the river's headwaters which contained excessive meltwater and rain runoff (1977, 1982, and 1994).

5. Wetlands. Wetlands

The project follows the Kenai River, Kenai and Tern Lakes, and crosses the Juneau, Quartz, and Daves Creeks. All of the rivers, streams, lakes, and some of the contiguous wetlands within the project area contain anadromous and resident fish species. High values are placed on the habitat, biological, hydrological, and social components of these systems.

River and stream channels are classified as riverine wetlands. Permanently flooded lakes are classified as lacustrine. Habitats associated with these wetlands provide spawning, rearing, nesting, feeding, and resting areas for fish, furbearers, birds, migratory waterfowl, and mammals. Riparian (streamside) vegetation provides moose browse during the winter. Contiguous wetlands adjacent to the Kenai River below Russian River provide important calving habitat for resident moose and migratory moose summering in the Kenai Mountains.

Palustrine category wetlands are shallow and nontidal. They are adjacent to rivers and lakes, on floodplains, or self-contained in isolated basins on uplands and slopes. Typical vegetation includes spruce, cottonwoods, shrubs, emergents, mosses and lichens. Water regimes vary between saturated and flooded.

The riverine wetlands within the project area are part of the Kenai River system, which is considered by resource agencies as having extraordinary high value because of the fisheries habitat diversity and overall productivity of the river system. Because of this, it also has an extraordinary high recreational value.

The project area contains four distinct palustrine wetland habitats: 1) seasonally flooded creek floodplains, 2) saturated black spruce bogs bordering the upland edge of muskegs, or as islands within a bog complex, 3) saturated shrub bog with 30 percent canopy coverage consisting of broad-leaved deciduous shrubs, and 4) saturated black spruce bog with shrubs exceeding 50 percent areal coverage. Refer to Appendix E for the corridor wetlands classifications.

Of the four wetlands types described above, those wetlands near the Kenai River, Bean, Juneau, Quartz, and Daves Creeks provide the basis for aquatic food chains for juvenile salmon by producing enriched detritus. The nearshore vegetation also serves as a source of organic debris, the primary food of aquatic invertebrates, and habitat for terrestrial insects and other invertebrates. In turn, these insects are an important component of the diet of juvenile salmon and trout.

The wetlands also regulate water flow and quality by acting as a discharge area for groundwater and as a natural retention area for runoff and floodwaters. These wetlands also establish drainage characteristics, sedimentation and patterns of upland and lowland water flows. They further provide filtration for water purification by acting as sediment accretion sites that reduce nutrient and sediment loads and increase oxygen content of waters that pass through them.

6. Water Quality. Water Quality

The Kenai River system comprises the primary source of surface water in the region. The lake is sustained by snow and glacial melt water and contains a high silt and glacial flour sediment load. The source of Daves Creek, Tern Lake (at the east project terminus) is shallow with clear water.

Its sources are local streams and groundwater. The headwaters for Juneau Creek and Quartz Creek are in the Kenai Mountains. These creeks are clear. A series of lakes (Trout, Juneau, Swan, and Devils Pass Lakes) are hydrologically connected to Juneau Creek.

There are three principal uses of waters within the highway corridor: domestic and commercial water supply, recreation, and fish and wildlife habitat. Groundwater from private wells is the only source of potable water in the Cooper Landing area. Other water uses include placer mining on Quartz Creek and the Cooper Lake hydroelectric power project. Groundwater is noted to have a high iron content. There are no designated sole source aquifers or wellhead protection areas within the State (pers. comm., Jean Bodeau, Department of Environmental Conservation (DEC), May 20, 1992).

There are seasonal fluctuations, with higher flows and higher water tables in the summer and early autumn during the rainy season. Quartz Creek and other streams which drain from higher elevations have their highest flow from snow melt in June or July or from high intensity precipitation during late summer or fall. Minor lowland, non-glacial drainages such as Daves Creek thaw and experience their highest rates of runoff in May.

7. Fish and Wildlife. Fish and Wildlife

Important year-round, fish and wildlife habitat exists within the Kenai Peninsula Borough, especially the Kenai River Valley which contains one of the most intense fisheries in the state (Figures 9, 12, and 13). In National Forest lands around the Cooper Landing area, wildlife carrying capacity could decline during the next 10 to 40-year period because of spruce bark beetle infestation (USFS, 1990). Although studies are not available, infestation is also occurring on the adjacent Refuge lands.

The USFS estimates that most beetle killed spruce will topple within 10 years. Beetle infested spruce borders about 65 percent of the local anadromous habitat fishery. Loss of trees and root

structures are increasing streambank erosion and eliminating the large woody debris source which is vital for fish habitat.

The Kenai River supports five species of salmon (chinook, coho, sockeye, pink, and chum), rainbow trout, Dolly Varden, whitefish, and Arctic grayling. Other spawning and/or rearing tributaries within the project area include Juneau Creek below the falls, and Quartz and Daves Creeks. Nearshore areas provide critical summer spawning and rearing habitat for juvenile fish. The main stream of the Kenai River between the BOP and the outlet of Kenai Lake is considered primary for coho spawning. Separate runs of salmon occur between mid-May through September.

According to USFS (1984), the early-run Kenai River chinook use Daves Creek to spawn from early to mid-August. Runs of sockeye and coho spawn through August and September predominantly at the upper end of Tern Lake. Nearly all sockeye production from the Quartz Creek system occurs in Tern Lake. The Daves Creek/Tern Lake tributary system provides better rearing habitat for both chinook and coho salmon than the main stream of Quartz Creek (Flagg, et al, 1986).

Adult sockeye salmon escapements at an ADF&G weir on the lower Quartz Creek accounted for 12 to 13 percent of the total Kenai River sockeye salmon between 1983 and 1985 (Flagg, et al, 1986). In 1984 and 1985, 34 percent and 55 percent respectively of the migrating coho salmon smolts trapped by ADF&G at Tern Lake were of hatchery origin, indicating that an earlier salmon fingerling stocking program increased coho salmon production in the Daves Creek/Tern Lake tributary system. The USFS also conducted a chinook spawning enhancement project in Daves Creek at the outlet of Tern Lake during 1984. (The site now functions as a salmon viewing area.)

The ADF&G has just completed a Habitat Evaluation Procedures analysis on the Kenai River (1993). The USFS is proposing a baseline level habitat inventory of Quartz Creek during 1994, which will be coordinated with the ADF&G.

Waterfowl (dabbling and diving ducks, geese, and swans) inhabit area ponds, marshes and shallow water along lake shorelines having emergent vegetation. Generally, lowland ponds are preferred for nesting. The molt and brood-rearing period occurs during June through August. Wintering habitat includes areas between Skilak Lake and Kenai Lake because of the frequent ice-free conditions.

Eagle feeding and nesting occurs within an approximate 500-foot band of forested habitat along the Kenai and Russian Rivers, Cooper and Quartz Creeks, Juneau Creek below the falls, and along the shores of Kenai, Trout, Juneau, and Swan Lakes (USFS, 1990). Nests and perches are located in mature cottonwoods and in 60 to 80-year growth spruce. The Kenai River system supports the second largest concentration of overwintering bald eagles in Alaska. Annual winter surveys, both ground and air, have been conducted annually by USF&WS. A May 1992 USFS survey identified 7 bald eagle nests in the project area (Figure 13). The closest nests to the highway are approximately 0.2 mile and 0.7 mile south along Quartz Creek near the airport and those nests at the mouth of Juneau Creek.

Eagles are dependent on large, flat topped trees near rivers, lakes or coastal area to provide nesting habitat and hunting perches. In the Cooper Landing area these sites appear to be the factor limiting breeding pairs. The bark beetle infestation should have no negative impact, and may improve the quality of the habitat along the Kenai River by providing additional nest and perch trees. The overall effect of the bark beetle to date is positive to the extent that it has created additional snags for roosting and nesting.

Moose inhabit spruce/mixed hardwood forests, alluvial floodplains, and river bottoms (Figure 12). Wetlands adjacent to rivers provide important calving habitat. Wintering habitat for moose

is associated with riparian vegetation along rivers and willow browse (early seral forest) especially on the west shore of Kenai Lake within the 1969 Russian River Burn area and along Snug Harbor Road. Because the Cooper Landing winter ranges are narrow and timbered, an accurate aerial winter census of the moose population is not possible. The moose population is monitored during the fall by ADF&G aerial surveys.

The ADF&G feels that the Kenai Peninsula moose population is in a slow but steady decline because of the changes in the forest succession. The moose population in Game Management Unit (GMU) 7 is estimated between 1,000 to 1,500 animals. (Refer to Figure 17 for GMUs.) In the USFS Cooper Landing Cooperative Project area, the current carrying capacity is estimated to be approximately 123 moose, approximately 2 moose per square mile. The low carrying capacity reflects the declining moose habitat as regrowth matures. Adjacent areas of the Refuge (GMU 15), which support 5 to 7 moose per square mile, are in early stages of forest succession that provide excellent moose habitat.

The Cooper Landing moose population is delineated into three sub-groups based on the winter range they occupy: Juneau Creek; Quartz and Crescent Creeks and Tern Lake; and Cooper Creek. Moose from the Dike Creek drainage east of Round Mountain through Devil's Pass and north of Juneau Lake (representing the Juneau Creek subherd), winter on the north side benchlands of the Kenai River valley.

Total winter range for all sub-groups in the assessment area is 32,315 acres. Of this, 30,637 acres are primary winter range and 1,678 acres are secondary winter range (based on the amount of use it receives from mid to late winter). Unless the amount of available browse is maintained or increased, the moose population will continue to decline.

The Chugach National Forest has an active, on-going habitat enhancement program designed to stimulate and maintain browse production on winter ranges. The goal of this program is to stabilize the loss of winter range by enhancing a total of approximately 20,000 acres of mixed

Apparently, the range grazing habitat was enhanced by a 1974 wildfire. The Cooper Landing area is closed to sheep hunting.

The overall sheep herd size peaked in the 1970's and then declined rapidly following a series of severe winters before building back up in the 1980's to the present level (Nichols, 1992). Apparently a number of ewes and lambs moved across the Juneau Creek Valley from Broadview to Round Mountain after the 1974 wildfire. The Broadview population has not regained its previous level, while the Round Mountain population accounts for the major part of the overall herd. The USFS and the USF&WS do not consider the sheep travel corridor across the Juneau Creek Valley as an annual migration route. For the most part, sheep will come down to the timberline but not the benchlands (pers. comm., Ted Bailey, USF&WS, Oct. 25, 1993). During 1992, a USF&WS and ADF&G survey counted 126 sheep in the Round Mountain herd.

Brown bears are found throughout the Kenai Peninsula area and require large tracts of undisturbed habitat. Heavy concentrations of brown bear coincide with the late summer and early fall salmon migration up the Kenai River and its tributaries, especially along the Russian Lake and River areas and the benchlands between Skilak and Tustemena Lakes (outside of the project corridor). Most of the Upper Kenai River is not heavily used by brown bears because of the amount of human activity (Jacobs, 1989). During 1984 through 1987, an Interagency Brown Bear Study Team, consisting of USF&WS, USFS, and ADF&G, estimated that the brown bear population of the Peninsula was between 150 to 250. The Interagency Team is continuing research within the proposed project area and is developing a predictive bear habitat model.

The brown bear is an indicator of human disturbance and habitat change in the alpine, mature forest, and along salmon streams. Limiting factors are prey density and human disturbance. Bears are highly mobile and require a large home range for adequate food sources, hiding cover, and den sites. Increases in human activity, overall loss of hiding cover, and reductions in salmon production all can result in negative impacts to brown bear populations. Any human activity or

disturbance which takes place outside of the denning period may also have negative impacts in the form of habitat displacement or increased defense of life and property mortality.

Black bear frequent the open avalanche chutes around Kenai Lake during the spring through fall. Spring foods (equisetum, bluejoint reed grass, and clover) are widely available (Schwartz and Franzmann, 1991). Summer and fall foods consist primarily of berries typically located in old growth tree stands. According to USFS, black bear are very common in the Juneau drainage which provides moderate to high quality black bear habitat.

There is one known pack of wolves, the Mountain Pack, which regularly uses and crosses through the Juneau Creek Valley upstream from the falls (pers. comm., Ted Bailey, USF&WS, December 10, 1992). The pack has been seen along the benchlands above Kenai Lake and around the Snow River inlet of the lake. Radio-collared lynx have also been monitored in the area and appear to travel parallel to the Kenai River on the north side of the river. According to USF&WS, several radio-collared lynx have been struck and killed on the Sterling Highway.

Aquatic furbearers (beaver, otter, mink, and muskrat) are distributed throughout the river drainage. Ideal habitat is located in the numerous side channels between the confluences of Jean Creek (MP 59) and the Russian River. Other local wildlife includes: mountain goat, wolverine, coyote, short-tailed weasel, red fox, marten, red squirrel, muskrat, snowshoe hare, voles and shrews, grouse, glaucous-winged and herring gulls, double-crested cormorant, and ptarmigan.

IV. ENVIRONMENTAL CONSEQUENCES. ENVIRONMENTAL CONSEQUENCES

A. Land Use Impacts. Land Use Impacts

Under the **No-Build Alternative** existing land use patterns are expected to change as discussed below:

1. Private and Local Government Land

Cooper Landing development would continue to increase along the existing highway. Commercial development along the highway at the intersection of the Quartz Creek Road (MP 45) would create multiple points of access unless a frontage road is constructed. Traffic noise levels at properties adjacent to the highway corridor would also increase.

The Cooper Landing Community, the Kenai Peninsula Borough, and USFS are developing a new trailhead for the Bean Creek Trail along the Bean Creek Road. The lower portion of the trail traverses the Bean Creek Parcel which is being considered as a potential land selection by DPOR (Figure 7). An easement for the trail will need to be considered with the acquisition.

Road access already exists to the Juneau Creek Parcel by the USFS Juneau Creek Road from the existing Sterling Highway (MP 53.5) (Figure 7). The Juneau Creek Parcel is being considered for future community expansion. The draft Cooper Landing Land Use Plan discusses the future potential to use some of the existing USFS forest roads. The Juneau Creek Road is narrow and was constructed with a gravel embankment. Should the Juneau Creek Road be considered for long term use, funding may be needed to widen the 3-mile long road.

Secondary: To minimize impacts of unplanned growth within the Juneau Creek Parcel, the Borough and the community should consider zoning and other local ordinances.

2. Federal Land

Recreation would continue for the most part to be restricted to the existing river corridor. It is anticipated that there will continue to be an increased demand for recreation opportunities and use of existing facilities.

The west boundary of the Juneau Creek Parcel coincides with the eastern boundary of USF&WS Refuge Wilderness lands. Refuge policies would restrict development from the Wilderness.

Secondary: The lower segment of the Resurrection Pass Trail is situated below the Juneau Creek Parcel. As the parcels are developed the remote setting of the trail will change and may not be consistent with the existing ROS (see Section III.A, Land Use). Remote areas along the Resurrection Pass Trail above the falls should see a change in user types from overnight backcountry use to dispersed day use. Remote cabins at Trout and Juneau Lakes would be more easily accessed. Therefore, the quality and type of recreational use of these cabins would change.

According to the CNF Land and Resource Management Plan, potential demand for developed recreation is projected to increase almost twice as rapidly as for dispersed recreation. While there is no shortage of dispersed recreation opportunities in the CNF (fishing and hunting comprise about one-fifth of the total), the lack of transportation facilities is concentrating developed recreation users into some areas.

3. State Land

As described for federal land, recreation activities would continue to focus around the Kenai River (KRSMA). Recreation campgrounds which operate at capacity during the summer will receive increasing demand for recreation opportunities and use of existing facilities.

The proposed DPOR day-use and boat launch facilities near MP 48 would help alleviate some of the recreation use pressure and replace an undeveloped, unmanaged boat launch at the Cooper Landing Bridge. Development of the DPOR Cooper Landing park land could benefit local economy as it would increase the number of recreationists stopping within the community. Relocating the boat launch would enhance highway safety because the road access would be in an area having greater sight distances.

Secondary: Should the Bean Creek Parcel be transferred to the Division of Parks and Outdoor Recreation (DPOR), it would be included as part of the KRSMA. Long term management intent of the parcel is not identified within the Kenai River Comprehensive Plan. The new Bean Creek trailhead and trail segment crosses this parcel.

With the **3R Alternative** existing land use patterns would change and develop as described for the No-Build. The 3R Alternative appears to be consistent with the long term goals of the community as described in the Cooper Landing Community Land Use Plan.

The **Juneau Creek Alternative** would change land use patterns as follows:

1. Private and Local Government Land

The Juneau Creek Alternative would enhance existing and proposed future Cooper Landing development. Through traffic would be rerouted away from the heart of the community where centralized public facilities, residential, and commercial developments are being considered. Existing traffic noise levels would be lowered along the existing highway, but higher levels would be introduced to undeveloped areas. The Quartz Creek Road intersection would be

upgraded and a left-turn lane provided to improve traffic flow. Other residential and school zone developments would occur beyond the highway and the Department would work with community planners to provide recommendations for highway access.

The proposed realignment would intersect the Slaughter Gulch and Slaughter Ridge Trails. The Bean Creek Trail would not be crossed. During the design phase, the Department would evaluate feasible means to accommodate any of these trail crossings.

The Juneau Creek Alternative appears to be consistent with the long term goals of the community as described in the Cooper Landing Community Land Use Plan.

Secondary: The alternative traverses the Juneau Creek Parcel and intersects the USFS Juneau Creek Road. Access would be controlled to accommodate through highway traffic. Preferred AASHTO intersection spacing for rural controlled access facilities is two miles. All private driveway approaches would be restricted from the highway. The Juneau Creek Road is being considered by the Cooper Landing community as a permanent road to the parcel. Should the Juneau Creek Road exist when this project is designed and constructed, the Department would improve the intersection if desired by the owner of the adjacent land. The intersection would provide direct access to the New Sterling Highway for highway orientated commercial development.

This alternative would not improve the existing Sterling Highway between MP 55 and MP 46. An additional highway improvement project would be required to maintain the driving surface of the highway segment beyond normal maintenance.

2. Federal Land

The Juneau Creek Alternative would reroute through traffic from area recreation facilities and enhance existing and proposed future development. Existing traffic noise levels and congestion would be lowered.

The Juneau Creek Alternative would cross KNWR Wilderness and land within CNF which includes the Resurrection Pass Trail, a National Recreation Trail. Both KNWR and the Resurrection Pass Trail are subject to ANILCA Title XI. Although the final KNWR Plan does not allow for construction of transportation or utility systems except in areas of the Refuge under intensive or moderate management, Title XI includes provisions for allowing transportation and utility corridors through designated Wilderness with Congressional approval.

The Refuge Wilderness that would be involved contains a Chugach Electric high voltage transmission line which has been brushed to provide a 200-foot wide clearing (refer to Figure 16-1 and the Section 4(f) Evaluation). At MP 55 the transmission crosses the highway and the Kenai River. A gravel access road that is cut into the Wilderness hillside intersects the highway at MP 55 and at MP 54.5.

The Juneau Creek Alternative would leave the existing highway and enter the Refuge on the east side of the transmission line crossing and parallel the gravel road. Where it leaves the Refuge, the proposed centerline is approximately 770 feet upslope of the existing highway centerline and 400 feet upslope of the gravel road. The length of the new roadway segment within the Refuge would be about 0.68 mile. Approximately 24 acres of Refuge Wilderness would be required as right-of-way (ROW).

Since the Refuge in this area is along an existing transportation corridor subjected to significant volumes of traffic, the Refuge is already under the influence of the highway. Significant impacts on the Refuge are not expected.

The Resurrection Pass Trail would be bisected approximately 2.5 miles north of the current highway trailhead, and 0.5 mile north of Juneau Falls. The proposed highway crossing of the trail would provide easier access and alter much of the surroundings into day use areas. Although recreation use of the trail is expected to increase with or without the project, it is anticipated that there would be a dramatic increase in the number and in the type of recreation user year-round as a result of the proposed project. The new highway alignment would be closer to the primary attractions and use of the lower trail segment between the Old Sterling Highway and Juneau Falls is expected to decrease. Remote cabins at Trout and Juneau Lakes would be more easily accessed, and the quality and type of recreational use of these cabins would change.

The USFS evaluated the proposed crossing and prepared conceptual development options for the trail (refer to the Section 4(f) Evaluation and Appendix I). Two recreation development options are being considered for purposes of Section 4(f) mitigation. Both options would realign a portion of the Resurrection Pass Trail and construct two scenic pullouts along either end of the Juneau Creek realignment to be field located with the assistance of USFS prior to final design. The first option would not provide additional access to the trail. The second option would construct one primary trailhead near Juneau Falls, maintained for both summer and winter use. The Juneau Creek Alternative crosses eight of the fuel treatment units of the USFS Cooper Landing Cooperative Project and some associated timber harvest roads. In areas where the alignment intersects temporary USFS roads, excavation of the existing USFS road embankment would be required.

Although the proposed realignment would change access within CNF, it remains consistent with primary management goals which addresses developed and dispersed recreation, cultural resources, and visual resources. In November 1986 correspondence, the USFS expressed support for a Juneau Creek Alternative to meet growing transportation needs on the Kenai Peninsula.

Secondary: The current ROS classifications for the Resurrection Pass Trail and new highway route would need to be changed. The realignment of the road would permanently change the recreation management in this area. The road corridor for approximately 0.5 mile on either side would be managed for a Roded Natural (RN) opportunity. The trail corridor to the north would continue to be managed as Semi-primitive Non-motorized (SPNM) in the summer and as Semi-primitive Motorized (SPM) in the winter. The Primitive (P) II classification for Trout and Juneau Lakes would be changed to SPNM (see Figure 14 and Appendix I). Conceptual future ROS management boundaries would need to be refined to reflect the terrain.

The Visual Quality Objective (VQO) for this area would need to be changed to reflect the new highway alignment. While the VQOs are not currently being met due to fuel reduction efforts and timber harvest, the long-term management VQO objective for the road corridor realignment is Retention. Management activities within this category should not be visible to the general public when viewed from one-quarter to one-half mile distance. All structures and roads would be carefully located to take advantage of natural screening.

As the number of recreational users in the area increase and warrant more development, the USFS would consider constructing a new campground and day use area on the east side of Juneau Falls. Additional winter parking needs would also be evaluated by the USFS as funding became available.

3. State Land

Overuse problems and resource damage along the Kenai River (KRSMA) are still expected because of the existing demand and anticipated increase of recreation users. Overall, recreational and tourism opportunities and use of the project area would benefit from the Juneau Creek Alternative. Although recreation would continue to be focused on the river corridor, opportunities for dispersed recreation would be available along both roadway segments. Wildlife

and scenic viewing from the roadway would be enhanced with the vantage of the Kenai River Valley.

Removing through traffic from the river area would reduce potential conflicts with slower moving local recreational traffic. Through traffic would be rerouted from area recreation facilities and the KRSMA, enhancing existing and proposed future development. Existing traffic noise levels and congestion would be lowered.

Regardless of the project, the DPOR is considering to develop the KRSMA State land within Cooper Landing (MP 48) and along the Quartz Creek Road (MP 45) overlooking Kenai Lake. The proposed Juneau Creek Alternative should not induce substantial development on State lands or the Kenai River Special Management Area.

Secondary: Should DPOR acquire the Bean Creek Parcel, it would be included as part of the KRSMA. The Juneau Creek realignment would cross the northern portion of the parcel. Long term management intent of the parcel is not identified within the Kenai River Comprehensive Plan.

B. Farmland Impacts. Farmland Impacts

There are no prime or unique agricultural lands, as defined in the Farmland Protection Policy Act, PL 97-88, located within the state of Alaska (pers. comm., Dan Laplant, Soils Conservation Service, October 30, 1990). Commercial agricultural activities are not conducted within in the project corridor.

C. Social Impacts. Social Impacts

The **No-Build Alternative** would continue to mix local and through traffic within Cooper Landing. The community is situated along a major travel corridor for the Kenai Peninsula. All highway traffic to and from the west Peninsula is routed through Cooper Landing year-round, which includes residential and recreational traffic as well as commercial, freight hauling semi-trailers. According to traffic analysis conducted by the Department, trucks comprise approximately 16 percent of the vehicles traveling the Sterling Highway. Traffic congestion would continue and worsen as future traffic levels increase, especially during the summer months. Vehicles accessing and exiting adjacent properties would continue to interfere with highway traffic flow, reducing highway speeds. Noise levels from highway traffic would remain high at adjacent properties.

Pedestrians would continue to use the safety pathway which was constructed along the highway through the community between MP 50 and MP 45.5.

If development occurs as identified within the community land use plan, there would be changes in neighborhoods and the business district. Public services would be centralized. Travel patterns and accessibility would change.

Recreation facilities along the Kenai River Special Management Area are also adjacent to the highway. Recreation would continue for the most part to be restricted to the existing river corridor. Nearly all recreation campgrounds are filled to capacity during the peak summer months. It is anticipated that there will continue to be an increased demand for recreation opportunities and use of existing facilities. Overuse problems, resource damage, and lower experience levels are expected.

The **3R Alternative** would continue to mix local and through traffic within Cooper Landing as discussed for the No-Build Alternative. Traffic congestion would increase over time. However, this would be alleviated by adding the passing lanes between approximate MP 56 and 55, MP 52 and 51, and MP 45 and 44; the widened highway shoulders; and left-turn lanes at high use

intersections. Overall public safety would also be enhanced. Noise levels from highway traffic would remain high at adjacent properties. There would be one relocation with this alternative.

The 3R Alternative would also improve the existing pathway to a 5-foot surface, extend it to the Russian River Ferry Crossing (MP 54.5), and to the Quartz Creek Road intersection (MP 45).

According to the Kenai River Carrying Capacity Study (1993), driftboater and riverbank anglers of the upper river segment report that natural scenery and wildlife viewing are an important part of their trips to the upper Kenai River segment. Ten of the eleven retaining binwalls would be constructed along the Kenai River. These would vary in lengths from 100 feet to 0.3 mile, and be up to 10 feet tall. The binwalls could be considered as a visual detraction from the natural setting, but they would contain the mud slumpage and tree debris of the eroding slopes. The surrounding terrain and vegetation would be considered with the wall design and color selection.

The **Juneau Creek Alternative** would cross primarily undeveloped lands away from the community. This action received the greatest support during a 1987 Cooper Landing community survey, and is included within the 1992 Cooper Landing Land Use Plan.

Higher speed through traffic would be removed from Cooper Landing and the recreation facilities along the river road system. Community cohesion would be enhanced by this project. Services and residences would not be disrupted and neighborhoods would experience lower levels of traffic induced noise. There would be no relocations. The community setting would also be enhanced to benefit local tourism. Community properties adjacent to the existing highway may increase in value as they become more desirable. The realignment would not impact the proposed subdivisions and access would be provided. The existing road between MP 55 and MP 46 would remain on the State highway system, having continued maintenance, but would not be improved with this project.

This would provide a modern highway with increased traffic capacity and enhanced safety conditions. Since sight distance is limited in some of the areas along the existing alignment, providing a greater sight distance would increase passing opportunities. Wider shoulders would provide areas for emergency stops. This alternative would replace the existing bridge at Quartz Creek, but the existing structure would be used for traffic maintenance during construction. Construction activities would be removed from MP 55 through MP 46 and not disrupt traffic flow.

Users of the Resurrection Pass Trail would be affected with the proposed realignment. In the long term should a new trailhead be developed, the action would provide opportunities for outdoor experiences previously unavailable to some social groups because of age, handicap, or ability. Dispersed recreation opportunities would increase due to convenient highway accessibility. The new alignment would provide pulloffs for vantage opportunities and developed facilities at the trail crossing (refer to the Section 4(f) Evaluation).

Secondary: As proposed, there would be control of access along the entire realignment, restricting access to intersections at two-mile intervals. However, the alternative traverses the Juneau Creek Parcel and intersects the USFS Juneau Creek Road. Should the Juneau Creek Road exist when this project is designed and constructed, and the parcel owner concur, the Department would improve the intersection. Refer to Section A, Land Use Impacts for further discussion.

D. Relocation Impacts. Relocation Impacts

A Conceptual Stage Relocation Study and field inspection was conducted by the Department to determine affected residences and businesses based on the preliminary ROW. Any affected properties listed as relocations would include structures within the designated ROW and those with the potential loss of access rights.

According to the study, there would not be any relocations with the **Juneau Creek Alternative**. The **No-Build Alternative** would similarly have no relocations. A number of alternatives that were rejected would have involved a large number of relocations.

Under the **3R Alternative**, there is one unoccupied cabin within Cooper Landing (MP 48.7) which may be relocated according to conceptual design.

There is currently an adequate supply of replacement housing for the one displaced homeowner available on the market. The Kenai Peninsula Borough's 1991 Land Use map confirms that there will be ample residential lots for new construction.

The final disposition of all relocations will be done in full conformance with applicable State and federal laws (A.S. 34.60, Uniform Relocation Assistance and Real Properties Acquisition Practices Act of 1971, and Public Law 91-646). Special relocation advisory services will not be required for this alternative because there were not any unusual conditions identified. Based on this Conceptual Stage Study and previous studies, surveys and investigations, the Department does hereby assure that there will be adequate replacement housing.

E. Economic Impacts. Economic Impacts

The **No-Build Alternative** and the **3R Alternative** would continue to route all highway traffic through Cooper Landing and the recreational facilities along the existing highway. Some existing roadside businesses such as service stations, restaurants, and convenience stores benefit from their location on major thoroughfares.

There may be substantial changes on local development, tax revenues, public expenditures, employment opportunities, accessibility, and retail sales regardless of the project. The community has identified other areas for commercial and residential development which could beneficially alter local economy (refer to Section III.A(3) Land Use). Resource agencies are

proposing to upgrade and develop vicinity recreation facilities which would also benefit area economy.

Traffic congestion would continue and worsen as future traffic levels increase, especially during the summer months. All highway traffic to and from the west Peninsula would continue to be routed through Cooper Landing. There would be potential for future highway expansion on the existing highway alignment or on a realignment to support the increasing levels of Peninsula traffic.

Secondary: The Cooper Landing economy is primarily based on tourist highway business. Through highway traffic detracts from the business setting of the community, having potential to adversely affect long-term tourism development goals of maintaining the scenic qualities, unique character, and rural setting of Cooper Landing.

The **Juneau Creek Alternative** would establish a new traffic pattern by realigning the highway north of Cooper Landing for higher speed through traffic. Recreation and local traffic could use the existing highway through the community. The community and the business district, and the proposed DPOR recreation facility, should benefit from the removal of the through traffic volumes. It would enhance safety for pedestrians and reduce traffic congestion. Surroundings should become more pleasant for residents and visitors by eliminating through traffic noise.

As previously discussed, there may be substantial changes on local development, tax revenues, public expenditures, employment opportunities, accessibility, and retail sales regardless of the project.

Some business owners have expressed anxiety pertaining to the potential economic effects. For the most part, local businesses should not be substantially affected by the proposed Juneau Creek Alternative. The traffic using the existing highway would be local or consist largely of tourists and visitors who have come to stop. Impacts to economic vitality would be minimized because

there would be no relocations. There may be some loss of economic vitality to existing highway related businesses (such as gasoline stations, grocery stores, and shops), but this would be minimized by good access connections to the community coupled with information signing to direct service seeking travelers to the business district.

For the most part, the Juneau Creek Alternative would cross Refuge Wilderness and undeveloped lands of CNF. It is not the intent of USF&WS or USFS to open these areas for development.

The proposed realignment would provide energy and time savings for through traffic. For the existing MP 55.5 to MP 46 highway section, it would moderate deterioration of the facility, but not provide additional or improve existing pulloffs for travelers and recreation users. Additional State money would be required to maintain and operate both highways. Road maintenance costs would increase by an estimated \$208,320 per year in 1993 dollars.

Secondary: The Juneau Creek Alternative was included in and compliments the planned economic development areas of the Cooper Landing Comprehensive Land Use Plan (July 1992). Those areas identified for future commercial and residential development would not be affected. All highway traffic would continue to pass through the future commercial development zone near MP 45.

A portion of the alternative does cross land in the Juneau Creek Parcel which is being considered for development by Cooper Landing (Figure 7). Since control of access is proposed along the new segment of highway, highway strip orientated commercial development should not occur in the Juneau Creek Parcel.

F. Pedestrian and Bicycle Facilities Impacts. Pedestrian and Bicycle Facilities Impacts

Area residents have long been concerned about the lack of safe pedestrian/bicycle access during the school year and summer tourist season, especially with the increasing volumes of Kenai

Peninsula traffic passing through the community, including tandem trucks and recreational vehicles. The Cooper Landing Advisory Planning Commission has been a strong advocate for increased pedestrian safety (1987 Cooper Landing Survey, 1992 Cooper Landing Community Recommendations on a Land Use Plan for Borough Lands, and the 1992 Kenai Peninsula Borough Comprehensive Trail Plan). Analysis conducted by the Department did not show any reported pedestrian/vehicular accidents in Cooper Landing within the past five years.

In 1993, a safety pedestrian pathway was constructed along the highway through Cooper Landing between MP 50 and to MP 45.5 which overlooks Kenai Lake. The existing west and east termini of the pathway are in areas where terrain constraints prevent extension without major construction. Funds for this project were provided by the State Legislature. Ultimately the community and USFS wants the pedestrian safety pathway to extend between the Kenai River Ferry Crossing (MP 54.5) to the Quartz Creek Road (MP 45) because of the concerns on bicyclist and pedestrian safety with the narrow highway shoulders.

The **No-Build Alternative** would not extend the pedestrian safety pathway nor provide wider shoulders for residential and recreational pedestrian and bicyclist use adjacent to the travel lanes. The USFS and Cooper Landing community concerns would remain unsolved and increases in traffic are expected. Construction of proposed community and agency developments would compound these concerns. Heavy volumes of truck and vehicle traffic would continue to hamper pedestrian highway crossings, especially in Cooper Landing.

The **3R Alternative** would provide six-foot shoulders, and upgrade the safety pedestrian pathway to a five-foot width surface, extending it west to MP 55 and east to MP 45. The extended safety pathway would provide additional access and safety along the highway for residents and visitors and connect the community with heavily used recreation areas.

The **Juneau Creek Alternative** would have 8-foot shoulders to safely accommodate recreational and transportation-related bicyclists and pedestrian use. A pathway paralleling the highway is not proposed as a part of this project. At the Resurrection Trail crossing, a bridge separated

crossing would be provided for users of the trail as part of the Section 4(f) mitigation. If determined desirable by the general populous, trailhead(s) with parking would also be included as mitigation. Refer to Section II, Alternatives, and Section V, Draft Section 4(f) Evaluation, for detailed discussion.

The highway between MP 55 and MP 46 would not be improved nor would the existing Cooper Landing pedestrian safety pathway be extended with this action. Much of the commercial and through highway traffic would be removed, creating safer conditions by reducing potential vehicular and pedestrian conflicts. This highway segment would be available as an alternative recreation route for pedestrians and bicyclists. Tourists would be encouraged to park and walk, thus reducing congestion in the high-use recreation areas.

G. Air Quality Impacts. Air Quality Impacts

Borough air quality is generally good and land within the project area is classified as Class II airshed, which is generally pollution free, allowing some industrial development (KPB, 1988).

The proposed project is located within an attainment area for air quality. The State Implementation Plan (SIP) is presently under revision, but does not contain any transportation control measures for the project corridor (pers. comm., Bill McClarence, DEC, May 19, 1992), therefore, the project is not subject to conformity review as outlined in 40 CFR Part 51. Some temporary impacts on air quality are expected to occur during construction activities and are discussed in Section V, Construction.

H. Noise Impacts. Noise Impacts

A traffic noise analysis was completed for the proposed project using the FHWA Highway Traffic Noise Prediction Nomograph (Hard Site) Model. This analysis was based on existing

(1990) and design year (2010) peak hour highway traffic and average traffic speed, estimated number of vehicles according to vehicle type, and receiver distance from the highway centerline. Traffic data used for this analysis are found in Appendix A. The nomograph does not account for reflections from buildings or surface terrain variations. Analyses results are shown in Tables 5 and 6, and Appendix C.

In addition, noise measurements were taken at the receiver locations on August 17, 1990, using the FHWA Sound Procedures for Measuring Highway Noise (1981), with a "Precision" Sound-Level Meter. Actual noise levels were recorded at 10 second intervals, with 100 sample measurements per site. Measurement results are shown in Table 5. These measurements were not all taken at peak hour which explains the difference between measure levels and predicted levels. Predicted levels were based on peak hour traffic projections.

Altogether, four noise receiver locations were evaluated in the Cooper Landing area using the nomograph method and taking actual measurements: three along the Sterling Highway and one along Bean Creek Road (Figure 15 and Appendix C). Noise analysis for the Juneau Creek realignment was based on the nomograph method (Table 6).

Table 5 lists each receiver site, actual recorded measurements, existing predicted peak hour traffic, and the predicted design year (2010) affects under the **3R Alternative**, the **Juneau Creek Alternative**, and the **No-Build Alternative**.

Predicted noise levels at the **Cooper Creek Campground (Receiver 1)** and the **Cooper Landing Historic District (Receiver 2)** currently exceed the FHWA Noise Abatement Criterion of 67 dBA for Land Use Category B (which includes picnic areas, recreation areas, playgrounds, parks, residences, motels, schools, churches, libraries, and hospitals).

Receiver 3, the Cooper Landing School Playground, approaches the FHWA noise criterion for Category B. The **Cooper Landing Library and Community Park (Receiver 4)** site is below

FHWA Noise Abatement Criterion of 57 dBA for Land Use Category A (which includes lands on which serenity and quiet are of extraordinary significance).

**Table 5
Cooper Landing Noise Measurements and Analysis**

Receiver	Actual Measurements dBA (L_{eq})	Existing Predicted Peak Hour dBA (L_{eq})	Build 3R dBA (L_{eq})	Build Juneau Creek dBA (L_{eq})	No-Build dBA (L_{eq})
1	58	69	71	62	71
2	69	74	77	65	77
3	57	66	69	58	69
4	52	55	58	49	58

When FHWA noise abatement criteria are approached or exceeded and/or when there is a substantial increase in noise (ADOT&PF considers a 10-15 dBA increase as substantial), a noise impact is said to exist. During summer, especially the peak fishing season in July, noise levels increase at all of the Cooper Landing area sites because of the higher traffic levels. Tour buses destined for the Princess Tours Lodge use the Bean Creek Road throughout the Summer. This condition would occur under all considered alternatives.

Noise measurements in undeveloped forested land were not taken for this project. However, measurements were taken along the Seward Highway (MP 63) at the Granite Creek Campground for the Seward Highway MP 50 to MP 65.5 project in the Design Phase. Existing noise levels ranged between 30 to 40 dBA. It is felt that these noise levels are representative of the undeveloped areas to be effected by the Juneau Creek Alternative.

Under the **No-Build Alternative**, noise levels in Cooper Landing are expected to increase because of anticipated increases in future traffic. The predicted noise levels at the three selected sites along the Sterling Highway would exceed the FHWA Noise Abatement Criterion of 67 dBA for Land Use Category B by 2 to 10 dBA.

Under the **3R Alternative**, all noise levels in Cooper Landing are expected to increase, but not significantly. Design year noise levels predicted for the 3R Alternative would be similar to the No-Build Alternative.

Effects of the **Juneau Creek Alternative**, which removes the through highway traffic from the Cooper Landing area, are reductions of the overall traffic noise levels at the four sites and throughout the existing highway corridor between MP 55.5 and MP 46. This alternative would introduce traffic noise into undeveloped areas of the Kenai National Wildlife Refuge and the Chugach National Forest, and to users of the Resurrection Pass Trail (Table 6). These areas are considered as being in Land Use Category A. Lands within this category are those "which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose."

According to the nomograph, predicted noise levels at a distance of approximately 100 feet from the proposed centerline would reach the FHWA Noise Abatement Criterion of 72 dBA for Land Use Category C. (This category includes other activities such as commercial development not described within Category B.) This is an approximately 30 to 40 dBA increase over existing levels and would be considered a substantial increase in noise.

At about 400 feet, predicted levels would reach the Criterion of 67 dBA for Category B. Around 2,600 feet (0.49 mile), predicted levels would reach the Criterion of 57 dBA for Land Use Category A. Consequently, noise impacts would be considered to occur within one-half mile of either side of the realignment corridor.

Presently, USFS is conducting reforestation activities because of the extensive areas of dead and dying spruce trees from spruce bark beetle infestation. As reforestation occurs within the area, traffic noise levels should be reduced. A 200-foot width of dense vegetation can reduce noise by 10 decibels, which cuts the loudness of traffic noise in half.

**Table 6
Juneau Creek Realignment Noise Analysis**

Receiver Distance (feet) from highway	dBA (L_{eq})
100 feet	72.5
400 feet	66.5
800 feet	64.0
1,200 feet (0.22 mile)	62.0
1,900 feet (0.35 mile)	60.0
2,600 feet (0.49 mile)	57.0

No noise abatement measures are likely to be implemented for either **build alternative**. This recommendation is based on studies conducted to date and existing area conditions: there are no land use controls along the project corridor and noise barriers would not be cost effective because of the low density residential development. If during final design, conditions substantially change, the need for noise abatement measures would be reevaluated.

During construction, temporary increases in noise are expected. Impacts would be mitigated by scheduling construction activities for noncritical wildlife seasons, especially near Slaughter and Langille Mountains where lambing areas are known to exist. Further discussion of temporary noise is within Section U, Construction Impacts.

I. Water Quality Impacts. Water Quality Impacts

Under the **No-Build Alternative**, there would be continued significant impacts to water quality of Quartz Creek. The Quartz Creek Bridge (MP 41) has a long history of hydraulic problems (refer to Section L, Water Body Modification). Periodic instream maintenance concerns the resource agencies because of the siltation and disruption to fish habitat. The creek is a predominantly clear water system, but its quality is sometimes affected by mining activities upstream.

Both **build alternatives** would cause temporary construction impacts to water quality on Quartz and Daves Creeks (see Section L, Water Body Modification, and Section V., Construction). A clear span bridge with spur dikes is proposed at Quartz Creek. Two culverts would be replaced or lengthened at the embankment crossing of Daves Creek (MP 39.5). In addition, the **Juneau Creek Alternative** would cross an unnamed Daves Creek tributary near MP 38 with a culverted fill embankment. A clear span bridge is also proposed at Juneau Creek.

The Contractor will be required to conduct all work according to the National Pollutant Discharge Elimination System General Permit for construction activities in Alaska. The Contractor will develop and implement a Storm Water Pollution Prevention Plan during construction. The timing of all instream construction would be coordinated with ADF&G. Best management practices as detailed in ADOT&PF Storm Water Manual would be implemented during construction activities to minimize erosion and sedimentation.

Use of Best Management Practices (BMPs) throughout construction will minimize harm. The Department will continue to coordinate with the resource agencies during final design and consider suitable bioengineering into the bank protection and to formalize the design of the spur dikes and fisheries enhancement project.

A Water Quality Monitoring plan would be utilized during project construction. Prior to initiating work at streams, water samples would be obtained at locations determined as optimal by the Department in consultation with the resource agencies. These samples would be tested for turbidity and suspended solids in accordance with EPA standards. During construction, samples would be taken and tested both up and downstream of construction activities at intervals agreed upon with the agencies. After completion of the work, final samples shall be obtained and tested. It will also include a feedback mechanism which uses monitoring results to adjust BMPs, standard operating procedures and intensity of monitoring when adverse effects are first detected.

Temporary degradation of water quality and increases in turbidity may result from construction. There would be some alteration of drainage patterns with ditch construction and culvert installation, but the roadway would allow ground and surface water to pass with minimum disturbance to streams and wetlands. Stabilization of existing cut slopes and roadway embankments would reduce erosion and resultant sedimentation. No significant or long-term impacts to water quality or potable water sources are expected to result from the proposed project.

Other discussion on water quality impacts can be found in the Environmental Consequences Section of this document under Wetlands Impacts, Floodplains, Water Body Modification, Fish and Wildlife, and Construction impacts.

J. Permits. Permits

The proposed project would require the following federal and State permits and certification:

- 1) Department of the Army, Corps of Engineers, Section 404/10 Permit
- 2) Alaska Department of Environmental Conservation, Section 401 Permit

- 3) Alaska Department of Fish and Game, Title 16 Permit
- 4) Alaska Division of Governmental Coordination, Coastal Consistency Certification
- 5) Kenai Peninsula Borough, Floodplain Development Permit
- 6) Environmental Protection Agency, National Pollutant Discharge Elimination System General Permit for construction activities in Alaska.
- 7) Alaska Department of Natural Resources Water Extraction Permit

The **Juneau Creek Alternative** would additionally require:

- 8) U.S. Fish and Wildlife, Special Use Right-of-Way Permit
- 9) U.S.D.A. Forest Service Right-of-Way Permit
- 10) Cook Inlet Regional, Inc., Land Use Permit

While several bridges are proposed for construction with this project, they are not over navigable waters. Consequently, a Section 9 Bridge Permit from the U.S. Coast Guard would not be required for the alternative.

K. Wetlands Impacts. Wetlands Impacts

Wetlands as defined by Executive Order 11990 are involved in the project area (Figures 6-1 through 6-8, and Table 7). Due to potential involvement within wetlands, a Section 404 permit from the Department of the Army would be required for either build alternative. The U.S. Army Corps of Engineers (COE) is a cooperating agency pursuant to the National Environmental Policy Act (NEPA) of 1969. The NEPA and Section 404 processes are being merged for the Sterling Highway MP 37 to MP 60 project. Consequently, the analysis and coordination documented in this EIS will be the basis for NEPA and Section 404 process decisions.

In consultation with COE, the Department determined conceptual wetlands involvement, calculating potential acreage and fill amounts for both alternatives. The COE reviewed the draft

EIS and agrees that it satisfies their preliminary Section 404 requirements (Appendix F). They have prepared a Draft Public Notice for the Department of the Army Section 404 Permit (Appendix F), which will be issued concurrently with the Draft EIS public notice of availability.

The COE provided blue-line copies, field checked in 1986, to identify wetlands in the vicinity of the Kenai River and Lake and adjacent highway areas through MP 43. For the existing highway between MP 43 and MP 37 not covered by the blue-lines and for the Juneau Creek Alternative, wetlands were determined by the U.S. Fish and Wildlife Service (USF&WS) using aerial photography.

The existing highway and proposed highway corridor can be subdivided according to dominant wetland classification. Water regimes vary between saturated and flooded (seasonally, semipermanent or permanently). A photographic inventory of wetlands along the existing highway corridor was completed by Department staff during October 1990 to assist in ascertaining wetland types. Refer to Appendix E for the corridor wetlands classifications.

The riverine wetlands within the project area are part of the Kenai River system, which is considered by resource agencies as having extraordinary high value because of the fisheries habitat diversity and overall productivity of the river system. Because of this, it also has an extraordinary high recreational value.

The project area contains four distinct palustrine wetland habitats: 1) seasonally flooded creek floodplains, 2) saturated black spruce bogs bordering the upland edge of muskegs, or as islands within a bog complex, 3) saturated shrub bog with 30 percent canopy coverage consisting of broad-leaved deciduous shrubs, and 4) saturated black spruce bog with shrubs exceeding 50 percent areal coverage.

Table 7
Wetlands Involvement

Area	Alternative	Acres	Fill (cy)	Wetlands Type
Skilak Lake Road (MP 58) to MP 55	Juneau Creek	1.0	12,600	Palustrine
	3R	0.5	3,800	Palustrine
MP 55 to the Broadview Guard Station (MP 46)	Juneau Creek	20.5	444,000	Palustrine
	3R	0.3	1,500	Palustrine
MP 46 to the Quartz Creek Bridge (MP 41)	Juneau Creek	10.0	84,500	Palustrine
		0.5	2,700	Riverine
3R		1.9	19,300	Palustrine
		0.5	2,700	Riverine
MP 41 to the Seward Wye (MP 37)	Juneau Creek	10.8	82,300	Palustrine
		0.2	6,200	Riverine
3R		1.4	6,600	Palustrine
		0.1	1,600	Riverine
Subtotals according to wetlands type	Juneau Creek	46.40	1,927,475,100.00	Palustrine
				Riverine
3R		0.00	0.00	Palustrine
				Riverine

Of the four wetlands types described above, those wetlands near the Kenai River, Bean, Juneau, Quartz, and Daves Creeks provide the basis for aquatic food chains for juvenile salmon by producing enriched detritus. The nearshore vegetation also serves as a source of organic debris, the primary food of aquatic invertebrates, and habitat for terrestrial insects and other invertebrates. In turn, these insects are an important component of the diet of juvenile salmon and trout.

All alternatives including the No-Build would impact wetlands. For the most part, the existing highway traverses river terraces through extensive contiguous wetlands. These areas are considered as having high value for fish and wildlife habitat. Resource agencies consider that the Kenai River system is of extraordinary high value. Under the **No-Build Alternative**, maintenance of the existing highway would require periodic dredging below the Quartz Creek Bridge when deposition and debris threaten the structure. Mud flows and slumpage from erodible slopes would continue to flow into ditches, the highway, and adjacent wetlands.

Neither of the viable build alternatives, the 3R or the Juneau Creek Alternatives, would involve the Kenai River.

The **3R Alternative** would involve approximately 4.7 acres of wetlands. Of this total, approximately 0.6 acre is high value riverine wetlands (Daves and Quartz Creek).

Riverine wetlands: A new 150-foot clear span long bridge at Quartz Creek would be constructed 50 feet south of the existing bridge to accommodate an alignment shift (Figure 3). The existing bridge which has two sets of instream piers would be removed. Spur dikes about 12 feet wide would extend 150 feet upstream of each abutment (each with a 1,800 sq ft or 0.04 acre footprint) to channel water flow beneath the structure and curtail bank erosion (refer to Section II, Alternatives, and Section L, Water Body Modification). The existing 12-foot wide, 750-foot long berm (9,000 sq ft or 0.2 acre) along the west bank would be removed and the area restored where not needed for the spur dikes. Approximately 2,700 cy would be placed within 0.5 acre at Quartz Creek.

Roadway widening is proposed at MP 39.5 which contains two culverted embankment crossings of Daves Creek. The embankment would be widened by approximately 25 feet on the north side. The culverts would be replaced at both crossings. Approximately 1,600 cy would be placed within 0.1 acre at Daves Creek.

Palustrine wetlands: Along the existing highway alignment, most palustrine wetland impacts would result from sliver fill encroachment to widen roadway embankments. Whenever possible, embankment widening would occur on the uphill side in areas of wetlands.

Development of the materials site (M.S.) 21-2-051-1/fisheries enhancement site near MP 41 could ultimately affect eight bogs and four small drainages (Figure 6-8). These wetlands represent approximately 4 acres of the total 100-acre site. Initial excavations would likely occur in the southwest portion of the site, near the power substation. Gravel extraction at this site would be made available for other projects. It would be designed for long term maximum use. As a result, permit applications for this site would be separate from the proposed highway project. The area would be mined incrementally back from the highway.

Should materials site M.S. 21-2-051-1 be used for this alternative, six acres are needed and excavation could involve a 0.3 acre palustrine wetland.

The **Juneau Creek Alternative** would involve approximately 43 acres of wetlands. Of this total, approximately 0.7 acre is high value riverine wetlands (Daves and Quartz Creek).

Riverine wetlands: Two new bridges are proposed. A 135-foot long clear span bridge over Juneau Creek would not require instream piers or abutments within the stream bed (Figure 4). There would be no involvement of Juneau Creek.

A 150-foot clear span bridge would be constructed over Quartz Creek. Refer to the previous 3R Alternative description. Altogether, 0.5 acre would be involved at the Quartz Creek bridge crossing.

Alignment shifts and roadway widening are proposed to improve winding stretches of roadway along the Daves Creek system in two localities. Altogether, 6,200 cy of fill would be placed in 0.2 riverine acre.

Roadway widening is proposed at MP 39.5 which contains two culverted embankment crossings at Daves Creek. At the first culvert, the embankment would be widened by 30 feet on either side. At the second culvert, the alignment would shift about 70 feet south. The culverts would be replaced at both crossings. The Department will coordinate with ADF&G to insure suitable gradients for juvenile fish passage. A small unnamed Daves Creek tributary near MP 38 would also be crossed by a culverted fill embankment.

Palustrine wetlands: The Juneau Creek Alternative traverses benchlands above Cooper Landing which contain clusters of isolated scrub/shrub and forested wetlands. Approximately 195 acres of palustrine wetland within 14 separate wetlands are identified along the proposed ROW corridor. Roadway fill embankment would be placed in ten wetlands and involve 20.5 acres.

Along the existing highway alignment, most palustrine wetland impacts would result from sliver fill encroachment to widen roadway embankments. Whenever possible, embankment widening would occur on the uphill side in areas of wetlands.

There are several winding stretches of roadway along the Quartz and Daves Creek terraces where wetlands contiguous to the creeks exist. Highway improvements require some minor alignment shifts which encroach in these wetland areas. In these areas, the old roadbed would be obliterated (when not needed to provide access) and graded to approximate original elevation, contoured, and revegetated. A 0.6 mile long shift is proposed west of Tern Lake near MP 38.

Should materials site M.S. 21-2-051-1 be used for this alternative, twenty acres are needed and excavation could involve a 0.3 acre palustrine wetland.

There is wetlands involvement with the Section 4(f) mitigation for the Resurrection Pass Trail. Relocating the trail would place approximately 200 linear feet of embankment within wetlands.

Secondary Impacts: Altered erosion and deposition patterns downstream of the Quartz Creek bridge crossing could result with the spur dikes. Refer to Section L, Water Body Modification, for a discussion. The advantage of this plan is that it eliminates the need for recurring dredging operations in Quartz Creek which disrupt fish habitat. In the long-term the proposed action would restore the substrates to spawning fish. There would be an increase in fish habitat. The west side pond would remain but not be in the main channel. Ponding would occur on the east side of the river (an estimated 1.3 acres) in an area which currently contains multiple side channels.

The hydrology at the Juneau Creek and Daves Creek crossings should not change from the existing conditions. These sites are located in stable river areas where there is no active river erosion.

Should materials site M.S. 21-2-051-1 be used for this project, up to twenty acres would be excavated.

Mitigation

The Department in coordination with USFS, USF&WS, DPOR, and ADF&G has developed a draft mitigation plan to compensate for the loss of wetlands habitat and fish and wildlife habitat. Mitigation alternatives, to minimize loss of wetland functional values, will be evaluated according to FHWA Publication No. FHWA-RE-88-028, "Applying the Section 404 Process to Federal Aid Highway Projects", which is consistent with 40 CFR 1508.20 (NEPA) stated below:

- a) Avoiding the impact altogether by not taking a certain action or parts of an action.

- b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- e) Compensating for the impact by replacing or providing substitute resources or environments.

Avoidance: The **3R and the Juneau Creek Alternatives** avoid the extensive riverine wetlands involvement and bridge crossings of the Kenai River and its high value contiguous wetlands that were associated with the other previously considered alternatives. The alternatives avoid placing 1,500 linear feet of bank protection along the Kenai River near MP 57.5 (RM 70) where river erosion could potentially undermine the highway embankment. At this site, riprap would be placed within the existing roadway embankment and not require any involvement of the river. The 3R Alternative avoids the Kenai River between MP 55 and MP 49 by constructing ten retaining binwalls to contain unstable hillside slopes. These would vary in lengths of 100 feet to 0.25 mile.

The Juneau Creek Alternative does cross palustrine wetlands which are avoided by the 3R Alternative. Involvement in Juneau Creek is avoided by the proposed bridge crossing.

The only alternatives which avoid Daves Creek and Tern Lake and their contiguous wetlands are the rejected **Quartz Creek Alternative** and the **Quartz Creek Variant**, and the **No-Build Alternative**. However, both build alternatives would cross Jerome Creek with a culverted fill embankment and also cross Quartz Creek. Additional palustrine wetlands would be involved. Neither action was considered feasible because of the presence of inferior soils and highly erodible slopes. There are no build alternatives that completely avoid Quartz Creek.

The **3R Alternative** avoids Quartz Creek riverine habitat at MP 44, identified as by USF&WS as containing sensitive fisheries habitat. Widening activities would shift the road centerline to the north, cutting into the hillside. This avoidance requires a 0.3 mile long bin retaining wall to contain the unstable hillside slopes.

Where practicable with the **3R Alternative** and the **Juneau Creek Alternative**, avoiding contiguous wetlands along the Quartz and Daves Creeks and above Bean Creek (areas identified by the agencies as being sensitive), would be accomplished through shifts in alignment and steepening of embankment slopes. The alignment will be adjusted during the final design process to provide for the minimum impact practical on the high value wetlands. As recommended by USF&WS, shifts would be made whenever possible on the uphill side in the areas of wetlands between MP 44 and MP 37. Embankment widening along the existing alignment at Tern Lake would be conducted so that fill would not be placed within the main lake.

Minimization: Impacts to wetlands will be minimized by keeping all construction activities within the design toe of slope. All erodible slope cuts, fill embankments, and other exposed earth work would be stabilized and revegetated during the first growing season following construction to prevent erosion. Best Management Practices as detailed in ADOT&PF's Storm Water Manual will be utilized during construction to minimize siltation and erosion. Roadway embankments would consist of clean uncontaminated material.

A mining plan with requirements for rehabilitation and/or a fisheries enhancement project would be implemented during and upon completion of all gravel extraction activities. The materials sites would be rehabilitated. Slopes would be terraced to prevent erosion and facilitate revegetation, and, except for bedrock slopes, would be revegetated immediately after all usable material is removed.

All culverts would be placed in and aligned with the natural stream or drainage channels and hydraulic gradient. Any realignment or channelization of streams and drainages would be done in accordance with the Alaska Department of Fish and Game's "Fishstream Protection and Enhancement Strategies" and would conform to Title 16 permit conditions. Proposed roadway facilities and bridge structures would be designed and constructed to accommodate fish passage while meeting floodwater flow requirements. Cross-culverts would be placed at appropriate intervals to maintain surface and subsurface wetland drainage. Care would be taken to assure that water flow between Tern Lake and adjacent open water areas is maintained through adequate culverting.

To reduce potential disturbance of side slopes along the stream corridors, use of heavy equipment and tree/vegetative clearing would be minimized. Should embankment protection be identified as needed along streams, the Department would also consider incorporating bioengineering into the design. No disposal sites for excess or unusable material would be approved within 300 feet of an anadromous stream without ADF&G concurrence.

Rectification: A new clear span bridge and spur dikes are proposed at Quartz Creek with either build alternative. The Quartz Creek bridge has a long history of hydraulic problems. Considerable amounts of silt and bedload are deposited under the structure. Debris collects behind the two instream piers, restricting and damming channel flows, and creating high backwater conditions. State maintenance forces must conduct instream work to clear the stream on a continued basis.

The older bridge would be removed and the east side approach obliterated and revegetated. The abandoned west side approach would remain to protect the new highway embankment. Bioengineering would be considered to insure that suitable fish habitat parameters are maintained.

The advantage of this plan is that it eliminates the need for recurring dredging operations in the stream, which disrupt fish habitat. In the long-term the proposed action would restore the substrates to spawning fish. There would be an increase in fish habitat. The west side pond would remain but not be in the main channel. Ponding would occur on the east side of the river (an estimated 1.3 acres) in an area which currently contains multiple side channels.

In addition, abandoned sections of roadway in wetlands not required for access to private properties or other facilities would be removed to original grade and revegetated. The USF&WS identified previously isolated wetlands adjacent to the active channels of Daves Creek (MP 37.5) and at Tern Lake, which are separated by the highway. These would be reconnected through improved culverting to provide rearing habitat. Coordination will continue with USF&WS, USFS, ADF&G, and other resource agencies to incorporate and develop the sites as part of the final design.

Enhancement: Materials Site (M.S.) 21-2-051-1 at Quartz Creek (MP 41) has been identified as a potential fisheries enhancement site (Figure 6-8). The materials site is owned by the Alaska Department of Natural Resources. During July 1992, the Department conducted a preliminary site survey with USFS, USF&WS, ADF&G, NMFS, and DPOR. At M.S. 21-2-051-1, the Department would consider developing a gravel extraction and revegetation plan that would provide irregular ponds for fish rearing purposes on acres excavated for this highway project should the following conditions be met.

- a. The Department would construct ponds only as part of material extraction activities.
- b. The Department would fund a monitoring program for the mitigation project during an establishment period following its construction.

c. The landowners and/or resource agencies with jurisdiction become owners of the ponds and be responsible for maintenance and management of them over the life of the project.

Gravel extraction at this site would be made available for other projects and therefore be designed for long term maximum use. The full potential for this floodplain deposit has not been ascertained, but preliminary assessments indicate an area possibly encompassing 100 acres. The area would be mined incrementally back from the highway. Initial excavations would likely occur in the southwest portion of the site, near the Chugach Electric Association power substation.

It is estimated that approximately 200,000 cy of material would be required for the **3R Alternative**, representing about six acres of excavation. Roughly 500,000 cy of material would be needed for the **Juneau Creek Alternative**, excavating about twenty acres.

The fisheries enhancement project would result in creating higher value riverine wetlands. After removing gravel materials, locales would be reclaimed for mitigation. It is expected that ground water is shallow, approximately 6 to 8 feet. The design of the fisheries enhancement project would be developed after detailed site surveys have been conducted. The fisheries enhancement project would be designed in cooperation with the resource agencies as a no/low maintenance facility. Final design would be completed prior to the Local Review Phase of the highway project.

Ponds would be interconnected by channels to Quartz Creek for fish spawning and rearing purposes. Conceptually, the ponds would be approximately 3 acres in size. The design would provide for a wide, shallow littoral zone around the peripheries and deep overwintering refuges, having depths of 12 to 20 feet. Organics/overburden would be placed on the sides and bottoms. Some rootwads removed during initial clearing activities would be stockpiled and put into the ponds at 6 to 10 foot levels to provide cover for the fish.

A vegetated buffer zone would be provided between the ponds and the highway. A buffer and berm would also be provided between the enhancement site and the electric substation.

The ADF&G has concerns over potential long-term effects of the fisheries enhancement project and will reevaluate it prior to the Final EIS. If the project is determined to be feasible, a Memorandum of Agreement (MOA) would be formalized between the Department and the landowner and/or appropriate resource agency to document the responsibilities for the construction, maintenance, and monitoring of the fisheries enhancement project. The MOA will be included within the FEIS.

The design of the fisheries enhancement project would be developed with the agencies after detailed site surveys of the site have been conducted. Final design would be completed prior to the Local Review Phase of the highway project's plans and specifications.

Compensatory Mitigation: No compensatory mitigation is proposed for either build alternative. The proposed Quartz Creek bridge replacement discussed above should mitigate impacts to high value wetlands. If necessary, other mitigation alternatives to offset the loss of wetlands functional values would be explored.

All practicable and appropriate measures to minimize wetlands impacts would be incorporated into the project design and construction. Best Management Practices as defined by ADOT&PF's Storm Water Manual for erosion and sediment control and stream crossings would be employed. However, temporary degradation of water may occur during construction activities.

L. Water Body Modification. Water Body Modification

At MP 41 there is a 138-foot long bridge crossing of Quartz Creek which has a long history of hydraulic problems (refer to the Hydrology Report, Appendix D). The bridge is located on a flat

depositional bench and is constricting the stream. Debris, gravel, silt, and other sediments collect behind the two instream piers, restricting and damming channel flows, and creating high backwater conditions. State maintenance must conduct instream work to clear the stream on a regular basis.

A 750-foot long upstream berm was constructed along the west bank during the mid-1980's to encourage water flow beneath the bridge. This berm was later breached and during 1992, a channelization project repaired the berm to force the stream velocity away from the west side highway embankment and bridge abutment. The project also excavated material from beneath the bridge.

Intermittent maintenance concerns the resource agencies because of the disruption to fish habitat. The agencies would prefer a permanent solution which eliminates the need for recurring operations in the stream.

The **No-Build Alternative** would not resolve the hydraulic problems at the bridge nor reduce the instream maintenance. Conditions previously described would continue.

With either **build alternative**, the Quartz Creek bridge would be replaced with a 150-foot long clear span bridge, constructed approximately 50 feet south of the existing structure (Figure 3). The proposed bridge grade is approximately ten feet higher than the existing to provide for more adequate water flow passage and accommodate 100-year flood events. The abutments would not be placed in the stream bed.

The existing bridge which has two sets of instream piers would be removed and the east side approach obliterated and revegetated. The abandoned west side approach would remain to protect the new highway embankment. During construction, vehicles would use the existing bridge to minimize impacts on the traveling public.

The existing berm (9,000 sq ft or 0.2 acre) would be removed. Two 150-foot long, 12-foot wide spur dikes (each with a 1,800 sq ft or 0.04 acre footprint) would be placed upstream. Spur dikes

encourage water flow beneath the bridge to move bedload, reduce constriction of the river, and establish a more natural gradient. Several design alternatives were considered to remedy the hydraulic problems at the Quartz Creek bridge (refer to Section II, Alternatives).

Secondary: As the creek stabilizes, the meanders would lengthen and straighten for several hundred feet upstream of the bridge. The gravel bars just upriver of the bridge would eventually be distributed downstream. The west side pond would remain but would not be in the main channel. Ponding would also occur on the east side of the river (an estimated 1.3 acres at high water) in an area which currently contains multiple side channels.

The spur dike design would not require continued dredging below the bridge. Maintenance costs would be reduced and overall impacts to the sensitive fish habitat minimized (refer to Section M, Fish and Wildlife). There would be an increase in fish habitat. The increased velocity would not restrict fish passage.

3R Alternative: Daves Creek would also be involved. There are two existing culverted crossings of the creek at MP 39.5 along a winding stretch of roadway. The embankment would be widened by approximately 25 feet on the north side. The culverts would be replaced or lengthened at both crossings. Approximately 1,600 cy would be placed within 0.1 acre at Daves Creek.

Juneau Creek Alternative: Involvement of Daves Creek would place a total of 6,200 cy of fill in 0.2 acre in two separate localities. At the first (MP 39.5) crossing, the embankment widened by 30 feet on either side. The road would shift about 70 feet south at the second crossing and require a fill embankment approximately 40 feet in height. A realignment shift west of the Seward Wye (MP 38) would cross an unnamed tributary to Daves Creek with a culverted embankment.

The Juneau Creek Alternative would also cross Juneau Creek with a 135-foot long clear span bridge would not require instream piers or abutments within the stream bed. There would be no involvement of Juneau Creek.

For either build alternative, the total extent of water body modifications along the Sterling Highway would not be determined until the design phase. Care would be taken during construction to assure that culverts are not perched to create barriers to fish passage. All impacts to streams would be minimized through coordination with appropriate resource agencies and, during construction, employment of best Management Practices (Refer to Section K, Wetlands, and Section VI, Comments and Coordination). None of the proposed actions would create significant changes in backwater elevation during 100-year flood conditions. Bioengineering would be considered during final design to insure that suitable fish habitat parameters are maintained.

M. Fish and Wildlife Impacts. Fish and Wildlife Impacts

The **No-Build Alternative** would impact fish and wildlife and their habitat. The existing roadside brush limits sight distances which contributes to road kills of moose. Moose road kills will continue to be high, and will increase with the expected growth in future traffic levels, especially on three local roadway segments between MP 59 and 57, MP 56 and 55, and MP 50 and 48.

Due to the popularity of recreation fishing on the Kenai River, impacts to streambank vegetation and fish habitat will continue to occur and is expected to increase. Salmon spawning habitat exists near the Quartz Creek Bridge. Debris would continue to collect beneath the bridge, damming channel flows, which requires periodic instream maintenance.

Recreational use of the Resurrection Pass Trail will continue to increase but have limited impacts on local wildlife populations. Should Cooper Landing receive title to the Juneau Creek Parcel

for community expansion, development is expected that would impact wildlife habitat. The Resurrection Pass Trail skirts the south and east boundaries of the parcel.

The Juneau Creek Parcel is within moose primary winter habitat below the sheep range of the Round Mountain subherd. Wolves, identified as the Mountain Pack, have been seen along the benchlands. Radio-collared lynx have been monitored in the area. Increases in human use of the area would probably displace some wildlife. Sheep may not be affected because their habitat is located in the higher mountain elevations.

With either **build alternative**, a new clear span bridge and spur dikes are proposed at Quartz Creek (MP 41). This is considered as wetlands mitigation and is detailed in the Rectification discussion of Section K, Wetlands Impacts. The creek contains spawning habitat for sockeye salmon. Spur dikes would eliminate the need for recurring dredging operations in the stream, which disrupt fish habitat. Construction activities will temporarily disturb the substrates and affect salmon habitat.

Should the Department use materials site M.S. 21-2-051-1 at Quartz Creek (MP 41), then the Department would consider a mining plan to ultimately construct ponds for a fisheries enhancement project. This is detailed in the Enhancement discussion of Section K, Wetlands Impacts. Ponds would be constructed in up to 6 acres excavated for the 3R Alternative and in up to 20 acres excavated for the Juneau Creek Alternative.

The ADF&G has concerns over potential long-term effects of the fisheries enhancement project and will reevaluate it prior to the Final EIS. If the project is determined to be feasible, the design of the fisheries enhancement project would be developed with the agencies after detailed site surveys of the site have been conducted. Final design would be completed prior to the Local Review Phase of the highway project's plans and specifications.

Proposed roadway facilities and bridge structures would be designed and constructed to not impede or interfere with anadromous fish spawning and rearing, and to minimize loss of other wildlife habitat. There would be no involvement of the Kenai River.

Roadway embankment widening at approximately MP 38.5 would require fill placement and the replacement of two culverts in Daves Creek. The Department will coordinate with ADF&G to insure suitable gradients for juvenile fish passage. Instream construction would occur during non-critical fish periods. Previously isolated wetlands adjacent to the active channels of Daves Creek (MP 37.5) and at Tern Lake which are separated by the highway would be reconnected through improved culverting to provide rearing and spawning habitat.

Improvements would widen existing roadway embankments and clear zones would facilitate crossing of wildlife by making them more visible to traffic. The USFS recommends providing a cleared area 50 feet wide along the existing highway corridor. Signing cautioning motorists of moose would be incorporated into the project to alert drivers of potential conflicts.

Abandoned sections of roadway in wetlands not required for access to private properties or other facilities would be removed to original grade and revegetated. Coordination will continue with USF&WS, ADF&G, and other resource agencies to incorporate and develop the sites with final design.

Slope cuts, fill embankments, and bank protection adjacent to streams and wetlands would be stabilized to prevent erosion and sedimentation during and after construction. Stream/riverbank protection would include irregular bank contours and insure that near shore water velocities do not increase. Erosion control measures would be employed to minimize any suspended and bed load sediment downstream of road crossings. Tree clearing along stream banks would be minimized to protect fish habitat and slopes from erosion. Proposed activities would be conducted to maintain adequate water flow and natural circulation patterns. Where habitat loss cannot be avoided, the loss would be minimized through design and/or maintenance efforts.

It does not appear that there would be any direct impact to eagles with either build alternative. An eagle nest survey conducted by the USFS in 1992 did not identify any nests in the realignment corridor. The closest nest within the project corridor is 0.2 mile from the highway (MP 44) along Quartz Creek.

Secondary: With the Quartz Creek Bridge design there would be an increase in fish habitat. The west side pond would remain but not be in the main channel. Ponding would occur on the east side of the river (an estimated 1.3 acres at high water) in an area which currently contains multiple side channels. In the long-term the proposed action would restore the midchannel substrate to rearing fish.

The **Juneau Creek Alternative** would cross undeveloped land, much recently disturbed by USFS reforestation activities. Dead tree clearing limits are recommended at 100 feet beyond slope limits in areas of spruce forest that USFS has not treated for the bark beetle killed spruce. Traffic noise would be introduced, but as reforestation occurs, dense tree growth would absorb and buffer noise, reducing its affect on local wildlife (see Section H, Noise Impacts, and Appendix C).

A permanent road through the area would improve access and increase the level and intensity of human use, including the amount of hunting pressure as well as the number of animals harvested. These increases in access may also cause habitat displacement.

As with the existing highway, the 11.2-mile realignment also traverses moose primary winter habitat. Moose from the Dike Creek drainage east of Round Mountain through Devil's Pass and north of Juneau Lake (representing the Juneau Creek moose subherd), winter on the benchlands of the realignment corridor. Increased moose and vehicle collisions may result in addition to an increase in harvest attributed to improved access.

To mitigate the loss of moose winter habitat, the Department would participate in two USFS moose habitat improvement projects. Identified areas are in T5N, R4W, Sections 13, 22, and 27. Each project site encompasses approximately 100 acres. The objective would be to attract wintering moose away from the highway. Over time, the USFS habitat improvement projects should slow the decline of local sub-populations.

This is an established program within the USFS Chugach National Forest. The project would focus on the quality of the enhanced area rather than the quantity, and the treatment methods would be tailored to specific vegetation types. Forage production on these acres of winter range could be significantly increased with the treatments, and over time will have a major impact on slowing the decline of local sub-populations.

A monitoring plan will be developed with the USFS to measure effectiveness of the mitigation measures, and agreed upon with the agencies during final design. The plan would include types of surveys, location and frequency of sampling, parameters to be monitored, and procedures for using data or results in project implementation.

For the realignment, wide shoulders and clear zones should allow drivers more opportunity to avoid animals encountered. During the winter as equipment is available, plowed pulloffs would be provided to provide an escape route for moose caught on the highway.

For the most part, the proposed action will barely get into the lower edge of sheep winter range of the Broadview and Round Mountain subherds and would not impact the spring and summer ranges which are farther north. Although the Juneau Creek crossing is in the vicinity of a sheep travel corridor, it is not used as an annual migration route. For the most part, sheep will come down to the timberline but not the benchlands (pers. comm., Ted Bailey, USF&WS, Oct. 25, 1993). There should not be a problem with sheep coming down to the road (Nichols, 1992; USFS, 1992). Blasting operations would occur during non-critical wildlife periods.

The USF&WS believes that roadway sections, including the Juneau Creek Alternative, located away from the Kenai River should have less impact on overwintering eagles than roads within the river corridor.

An approximate 0.6 mile realignment would occur just west of Tern Lake and cross an unnamed tributary of Daves Creek with a culverted fill embankment. Instream construction would occur during non-critical fish periods.

Lynx have been monitored along the benchlands, and up and down the entire Kenai River valley (pers. comm., Ted Bailey, USF&WS, Oct. 25, 1993). There may be potential for vehicle conflicts, as previously described for moose.

Secondary Impacts: The proposed Juneau Creek Alternative does not encroach brown bear concentration areas. According to USFS, the greatest affects on the brown bear population from this project are secondary impacts from the increase in back country hunting and other recreation activities such as hiking rather than the loss of habitat to road construction.

Black bear densities are high and USFS does not feel that the project would have a significant impact on the population. However, any garbage dumpsters at highway pullouts and/or the Resurrection Pass Trailhead should be a bear proof design and emptied frequently to reduce the potential for increased bear/human contact.

The territory of the Mountain Wolf Pack which includes areas of the Snow River would be crossed by the realignment (pers. comm., Bill Schuster, USFS, December 28, 1992). As a result of the proposed action and increased human use of the area, the pack may gravitate towards Snow River and avoid Juneau Creek.

N. Floodplain Impacts. Floodplain Impacts

Floodplains, as defined by Executive Order 11988, would be involved in the proposed project. Project areas west of approximately MP 47 are covered under the National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM), while areas to the east are excluded. The Kenai Peninsula Borough Assembly has voted to enter NFIP, making insurance available to property owners in flood prone areas. A time table for FIRM amendments has not been determined.

Since the existing roadway follows the Kenai River and Quartz and Daves Creeks, there are no practicable build alternatives which avoid floodplains. The **No-Build Alternative** would be the only action that would avoid additional involvement.

The **3R Alternative** and the **Juneau Creek Alternative** would place clean granular fill at the Quartz Creek crossing and at MP 39.5 where two culverts would be replaced.

Additionally, the **Juneau Creek Alternative** would place clean granular fill at the Juneau Creek crossing and along Daves Creek near MP 37.5. Fill quantities are included within Section K, Wetlands Impacts. Disturbed stream banks would be revegetated with appropriate species.

Construction would not promote any incompatible development with floodplains and area facilities would accommodate 100-year flooding events. All bridges and culverts would be designed to allow fish passage.

The proposed project would include all practicable measures to minimize unnecessary encroachments into floodplains. Construction of the proposed project would not promote any incompatible development within the floodplain area, nor would it increase the estimated water surface elevations associated with the base flood. Best Management Practices, as defined in the ADOT&PF Storm Water Manual, would be implemented to minimize erosion and sedimentation during construction. A Draft Hydraulics Report pursuant to 23 CFR 650.111 is in Appendix D.

O. Wild and Scenic Rivers. Wild and Scenic Rivers

As defined in the Wild and Scenic Rivers Act, PL 50-542 as amended, there are no system rivers located within the project area (National Park Service, November 1, 1990).

P. Coastal Barriers. Coastal Barriers

As defined in the Coastal Barrier Resources Act of 1982, PL 97-348, there are no barrier resources along Alaska coasts (U.S. Fish and Wildlife Services, October 30,, 1990).

Q. Coastal Zone Impacts. Coastal Zone Impacts

Portions of the project are within the coastal management boundary; described in the Kenai Peninsula Borough Coastal Resource Management Area effective July 3, 1990. This includes all land below the 1,000-foot elevation contour in the Borough, which includes the upper Kenai River and Kenai Lake. The USFS National Forest System land is excluded from the State's coastal zone. The Kenai River has been nominated as a potential candidate for future Area Meriting Special Attention (AMSA) planning. Adoption of a Kenai River AMSA into the Kenai Peninsula Borough Coastal Management Program has not occurred. Proposed boundaries include the Kenai River and all tributaries to the 1,000-foot elevation, and a 350-foot corridor measured perpendicular from the mean high water mark.

The Kenai River below the Ordinary High Water (OHW) elevation and State park land contained within the nominated AMSA are managed by DPOR according to the Kenai River Special Management Area Plan. Remaining areas in the project corridor are regulated by the Kenai Peninsula Borough, which has issued no land use regulations or building permit requirements. Within the Refuge and the Chugach National Forest, the Kenai River is subject to federal management.

Proposed activities and improvements appear to be consistent with the policies and provisions of the Kenai Peninsula Borough Coastal Management Program which were developed under the standards and guidelines (6 AAC 80 and 6 AAC 85) of the Alaska Coastal Management Program (ACMP) (KPB, 1988). A formal consistency determination will be made during the permitting phase of this project.

R. Threatened or Endangered Species. Threatened or Endangered Species

Based on current records at the U.S. Fish and Wildlife Service (USF&WS), there are no listed or proposed threatened or endangered species in the project vicinity (pers. comm., Brian Anderson, USF&WS, October 30, 1991).

S. Historic and Archeological Preservation. Historic and Archeological Preservation

Historic and archaeological cultural resources within the project vicinity were identified and evaluated in accordance with the requirements of 36 CFR 800.4. According to 36 CFR 800, Protection of Historic Properties, federally assisted projects must take into account the effects on properties included in or eligible for the National Register of Historic Places (NRHP). Potential impacts and mitigation of the project alternatives are discussed in the Section 4(f) Evaluation and Appendix H).

All alternatives, including highway maintenance under the **No-Build Alternative** because of the proximity of some archaeological sites, could impact cultural resources. The Cooper Landing Historic District is adjacent to the highway and is subject to high levels of traffic noise (refer to Section H, Noise Impacts). As traffic volumes increase, these noise levels will intensify.

For the **3R Alternative**, Section 106 Coordination with the State Historic Preservation Office (SHPO) and archaeologists from USF&WS and USFS determined that the action as proposed

would have an Adverse Effect on twelve archaeological sites within the Sqilantnu Archaeological District: KEN-249, KEN-250, SEW-619, SEW-633, SEW-620, SEW-297, SEW-615, SEW-217, SEW-634, SEW-635, SEW-165, SEW-168, and one archaeological site which is outside of the District, SEW-187b. A No Adverse Effect for District site KEN-092 was determined because data recovery to mitigate project effects had already taken place.

Section 106 Coordination also determined that the **3R Alternative** would have an Adverse Effect on the Cooper Landing Historic District: the Leo Douglas Cabin, the Riddiford Schoolhouse, and the Harry Brown Cabin. A determination of No Effect was found for the Jalmar Anderson Cabin, the USFS Broadview Guard Station, and the Resurrection Pass Trail.

For the **Juneau Creek Alternative**, Section 106 Coordination with SHPO and archaeologists from USF&WS and USFS determined that the action as proposed would have an Adverse Effect on five archaeological sites within the Sqilantnu Archaeological District: KEN-068, KEN-081, KEN-093, KEN-215, and SEW-215, and one archaeological site which is outside of the District, SEW-187b. A No Adverse Effect for District site KEN-092 was determined because data recovery to mitigate project effects had already taken place.

Section 106 Coordination with SHPO determined that the **Juneau Creek Alternative** would not effect historic properties within Cooper Landing or the Broadview Guard Station. However, SHPO has determined that there would be an Adverse Effect on the historic segment of the USFS Resurrection Pass Trail.

Roadway excavation and fill placement would directly impact some archaeological resources. Secondary impacts include increased public accessibility and unforeseen erosion problems. Identified archaeological site features outside the proposed cut and fill areas that are close to the zone limits would be flagged or brought to the attention of the Project Engineer prior to construction. All disturbed areas with the exception of rock faces would be stabilized and seeded after construction. Hand clearing would be conducted in areas determined as potentially

sensitive within the Sqilantnu Archaeological District, as directed by SHPO. Refer to Section VI, Comments and Coordination, and Appendix H for additional discussion.

A Memorandum of Agreement (MOA) will be developed with the Cook Inlet Region, Inc. (CIRI), and the Kenaitze Tribe under the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) due to the proximity of known and/or suspected mortuary remains to the proposed project area.

A comprehensive mitigation plan will be developed and agreed to by SHPO, USF&WS, USFS, the Kenaitze Tribe, CIRI, and the property owners and formalized within an MOA. Data recovery is proposed to mitigate project effects on archaeological resources adversely impacted by the proposed project. Adverse impacts to the Cooper Landing Historic District would be mitigated through photo documentation to Historic American Buildings Survey Standards, subsurface testing, and revegetation of disturbed areas.

Specific excavation strategy recovery/mitigation for the sites will be fully developed and coordinated with all parties during the Design Phase of the highway project. It will be implemented prior to and in coordination with those project activities that could disturb archaeological resources. Preliminary estimates indicate the costs of data recovery for both the Juneau Creek and the 3R Alternatives are similar.

Concurrence on the project effects and proposed mitigation is required from ACHP. This concurrence along with the MOAs will be incorporated within the project's Final EIS. Coordination with the resource agencies and involved parties will continue throughout the project to minimize potential impacts. If additional cultural resources are discovered during construction, all work which would affect these resources would be stopped and SHPO would be contacted.

T. Hazardous Waste Sites. Hazardous Waste Sites

On February 22, 1991, and on January 3, 1994, the Department of Environmental Conservation (DEC) provided lists of registered underground storage tanks (USTs) within the project area (Table 8). According to DEC, the Sportsman's Lodge site at MP 55 (Sta. 1433 RT) is closed; the two USTs were removed during October of 1990. Age of USTs at the remaining three sites range between 15 to 22 years. A preliminary reconnaissance survey conducted by Department staff identified two other USTs along the project corridor. No other potential hazardous waste sites were noted.

Altogether, 9 underground tanks are known to exist within the project area. However, it is probable that heating oil tanks may be associated with structures in the Cooper Landing area.

With either the **No-Build Alternative** or the **Juneau Creek Alternative**, there would not be any acquisition of additional ROW within the Cooper Landing area where contamination could be encountered. Proposed ROW for the action would be acquired primarily from undeveloped areas. The **3R Alternative** would acquire 2.41 acres of ROW from within the Cooper Landing area. None of the proposed ROW is from the sites listed in Table 8. For either build alternative, should contamination be discovered within the ROW, a clean-up and disposal plan acceptable to the DEC and EPA as appropriate would be developed.

Table 8
Underground Storage Tank Locations

Site	Number Tanks
MP 52: Gwins Lodge (Sta. 1588 RT)	1
MP 48.5: Hamiltons Chevron (Sta. 1771 LT)	3
MP 47.5: Tesoro (Sta. 1834 RT)	2
MP 47.5: Unoccupied Service Station (Sta. 1832 LT)	2

The Construction Contractor will be required to develop and implement a Hazardous Material Control Plan which addresses containment, cleanup, and disposal of all construction-related discharges of petroleum fuels, oil, and/or other hazardous substances. The plan shall comply with the requirements of 18 AAC 75 and Title 46 of the Alaska Statutes. A specification requiring the use of material "free from contamination" will also be incorporated into the contract.

U. Visual Impacts. Visual Impacts

Recommendations were made by the Department in April of 1990 to include a portion of the Sterling Highway (MP 37 to MP 79) in the Scenic Byways Inventory of the Federal Highway Administration (FHWA). The basis for the nomination, which will be included within the next federal inventory request, is due to the abundant local resources: scenic public lands, diverse wildlife, the river system and salmon fishery, historic sites, and the varied recreational opportunities.

Extensive areas of dead and dying spruce trees from spruce bark beetle infestation are within the project area. This forest mortality is visually impacting the travel routes and public recreation/use areas. Campgrounds have lost the screening between campsites and the highway. Additional impacts due to beetle killed trees include loss of wildlife habitat and reduced wildlife viewing opportunities.

The **3R Alternative** would construct a total of 11 bin retaining walls along the highway to support erodible slopes. Ten of the binwalls would be constructed along the Kenai River (KRSMA). These would vary in lengths from 100 feet to 0.3 mile, and be up to 10 feet tall.

According to the Kenai River Carrying Capacity Study (1993), driftboater and riverbank anglers of the upper river segment report that natural scenery and wildlife viewing are an important part

of their trips to the upper Kenai River segment. The binwalls could be considered as a visual detraction from the natural setting, but they would contain the mud slumpage and tree debris of the eroding slopes. The surrounding terrain and vegetation would be considered with the wall design and color selection.

A geotechnical reconnaissance investigation conducted by the Department during 1990, indicates the need for wider clearing standards along the proposed **Juneau Creek Alternative**. Spruce forest mortality has created potentially hazardous conditions along the project corridor. Dead trees are susceptible to breakage and toppling during periods of high winds. Recommendations establish dead tree clearing limits 100 feet beyond the toe of proposed cut and fill sections.

Resource management activities are being conducted by USFS through the Cooper Landing Cooperative Project to eventually restore area forests. The USFS project treatment began in 1991 and will continue through 1996. Several USFS reforestation units are crossed by or are adjacent to the Juneau Creek Alternative. In these areas wider clearing buffers would not be required.

Secondary: The Visual Quality Objective (VQO) for this area would need to be changed to reflect the new highway alignment. While the VQOs are not currently being met due to fuel reduction efforts and timber harvest, the long-term management VQO objective for the road corridor realignment is Retention. Management activities within this category should not be visible to the general public when viewed from one-quarter to one-half mile distance. All structures and roads would be carefully located to take advantage of natural screening.

The proposed action would not jeopardize any future Scenic Byway designation. In addition, wider clearing limits sometimes open up more scenic vistas. Visual resources of the region are already impacted by bark beetle killed trees. Most affected Chugach National Forest land should be treated prior to this highway project and spot clearing may only be needed. However, affected

spruce forests in the proposed right-of-way within the Kenai National Wildlife Refuge may require clearing.

The Juneau Creek realignment would be located on benchlands above the Kenai River and not along exposed mountain slopes. After reforestation has occurred, tree cover and topographical features should prevent the proposed route from being exposed. The new segment of roadway should not be highly visible from the existing Sterling Highway except where it climbs out of the Kenai River Valley.

From the new highway, southern views of the Kenai River Valley would be available when ascending or descending the benchlands. Views of the Kenai Mountains and Chugach Mountains should be available along the proposed realignment. The Juneau Falls would not be visible from the highway. Since most of the alignment is within forested areas, the highway should not be visible to Resurrection Pass Trail users except at the Juneau Creek crossing and along nonforested areas of the northwest portion.

Where feasible and desirable for either **build alternative**, scenic turnouts, sheep viewing areas, and pullouts would be provided. Locations for these sites would be coordinated with USFS, USF&WS, and DPOR, during the design phase of the highway project. The DPOR has identified and submitted a design plan for a potential rest area and scenic pullout site on State owned property along the Quartz Creek Road (MP 45) overlooking Kenai Lake.

The USFS has requested and the Department proposes to construct two turnouts along the Juneau Creek Alternative realignment and will field locate the sites prior to final design. The USFS is actively participating in the design of the new trailhead facilities at the Juneau Creek crossing of the Resurrection Pass Trail (refer to the Section 4(f) Evaluation).

All disturbed erodible areas would be seeded after construction. A revegetation plan would be developed to insure adequate plant succession and hinder moose browse along the highway. The

proposed highway clearings would accommodate snow removal activities, distances from vegetation would be sufficient to prevent damage from snow blowers and provide for adequate snow storage. Visual resources would be an important consideration in the design of the facility.

V. Construction Impacts. Construction Impacts

Ditch maintenance operations in erosion prone areas would continue to hinder traffic with the **No-Build Alternative**. Asphalt patching would be required on a more frequent basis as the driving surface deteriorates and there would be a need for resurfacing. Dredging operations below the Quartz Creek Bridge to remove the debris and sedimentation would continue to impact fish habitat.

With either **build alternative**, phased construction would occur over several years because of the 22-mile length of the project. Segments would be prioritized according to funding availability, roadway deficiencies, and public need.

Construction requires blasting operations, short-term road closures, temporary delays, and traffic detours. Scheduling would be coordinated with agencies and local governments to occur at a time with the least amount of impact. Public notices would be placed in local and Anchorage newspapers and radio stations. Public transportation and safety would be considered as well as fish and wildlife populations, especially during sensitive calving, lambing, and spawning seasons. Along the Sterling Highway there is heavy summer traffic with the tourism and recreation activities in the area. A construction traffic control plan would be developed to minimize any congestion from the proposed activities.

An overall advantage of the **Juneau Creek Alternative** is that construction activities are removed from MP 55.5 through MP 46 and would not disrupt traffic flow or the community of Cooper Landing. Adverse economic effects on roadside businesses due to delays and construction detours would be minimized.

This realignment would encounter USFS logging roads. Most of these temporary roads embankments are composed in part of large woody debris to naturally degrade in place. Highway construction standards require total excavation and removal of such materials because of the potential long-term stability effects on the roadway.

Air quality within the immediate project area would temporarily degenerate slightly as a result of dust and exhaust from construction activities. Regular watering would control dust. Adjacent areas would be exposed to higher noise levels emitted from project equipment. Short term increases in suspended and bed load sediment downstream of road crossings are anticipated. A stormwater pollution prevention plan (SWPPP) detailing protective measures would be developed prior to and implemented during construction. Best Management Practices as detailed in ADOT&PF's Storm Water Manual would also be implemented during construction. Storage and staging areas would be located in uplands where practicable. The project would be constructed under the National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for construction activities in Alaska.

To reduce potential disturbance of side slopes in the riparian zone along stream corridors, the use of heavy equipment and tree/vegetative clearing would be minimized. Vegetative cover would be reestablished on disturbed areas within the riparian zone.

Unless otherwise permitted, overburden and unusable material would be disposed in uplands locations. No disposal sites for waste excess material would be allowed within 300 feet of an anadromous fish stream unless a non-objection from ADF&G is received. There are, however, pockets of lower value wetlands isolated by the existing roadway embankment between MP 58 and MP 55.5. Some of these areas are being considered for parking facility development, especially needed to absorb overflow parking along the highway shoulders during the fishing season. Potential site locations will be coordinated with DPOR, ADF&G, and USF&WS, and incorporated into project plans and permits.

In upland areas, overburden would be saved whenever practicable for reclamation of disturbed areas. A mining plan with requirements for landscaping and revegetation would be implemented during and upon completion of all material extraction activities. A Storm Water Prevention Pollution Plan, complying with the requirements of the NPDES GP for construction activities, will also be developed for the proposed borrow sites. Upon completion of gravel extraction, slopes of exhausted areas would be graded to blend with the natural topography (except in those areas designated to provide irregular ponds for fish rearing) and erosion control measures implemented to stabilize the site. Areas designated for revegetation would be covered with topsoil to encourage reestablishment of native plant species.

W. Materials Sites. Materials Sites

Available materials sites (M.S.) in the vicinity of this project are limited because of the predominance of glacial till and bedrock. Although materials site identification was not included within the scope of a reconnaissance geotechnical investigation by the Department in 1991, the report recommended the following:

The Forest Service has constructed a 3-mile long logging access road in the Schooner Bend vicinity. Based on the exposed backslope materials of the road, there may be potential for additional materials sites in this area. Additional material may also be generated from the wide rock cuts for the Juneau Creek Alternative. Suitable aggregate rock would be stockpiled for future river erosion-control needs or be crushed and used as roadway fill embankment.

M.S. 21-2-050-1: MP 53.1. The Department has clearances to use this existing materials site near Schooner Bend, bounded on the east by the Resurrection Trailhead (MP 53.2). Remaining material is limited to approximately 150,000 cy, however, there is potential for expansion. A cultural clearance would be required for any additional mining within the existing site boundaries.

M.S. 21-2-051-1: This presently undeveloped site is near MP 40.6 in the vicinity of Daves Creek and Quartz Creek near the Chugach Electric Association power substation (Figure 3-8). The full potential for this floodplain deposit has not been ascertained, but preliminary assessments indicate an area possibly encompassing 100 acres. During July 1992, the Department conducted a preliminary site survey with USFS, USF&WS, ADF&G, NMFS, and DPOR. Further evaluation and appropriate agency clearances are required although it has received a cultural clearance.

Gravel extraction at this site would be made available for other projects. It would be designed for long term maximum use. As a result, permit applications for this site would be separate from the proposed highway project (see Section J, Permits). Initial excavations would likely occur in the southwest portion of the site, near the power substation. The area would be mined incrementally back from the highway.

It is estimated that approximately 200,000 cy of material would be required for the **3R Alternative**, representing about six acres of excavation. Roughly 500,000 cy of material would be needed for the **Juneau Creek Alternative**, excavating about twenty acres.

With either build alternative, access would be maintained to the USFS materials site at MP 38.

M.S. 21-2-051-1 is being considered for a potential fisheries enhancement project. After removing gravel materials for this highway project, locales would be reclaimed. The Department would develop a gravel extraction and revegetation plan with the resource agencies that would ultimately provide irregular ponds for fish rearing purposes should the enhancement project be determined feasible and an acceptable agreement for long-term management and maintenance be reached with the resource agencies and landowners (refer to Section K, Wetlands, for additional discussion).

The ADF&G has concerns over potential long-term effects of the fisheries enhancement project and will reevaluate it prior to the Final EIS. If the project is determined to be feasible, the design

of the fisheries enhancement project would be developed with the agencies after detailed site surveys of the site have been conducted. Final design would be completed prior to the Local Review Phase of the highway project's plans and specifications.

Existing trees and landscape would be used as visual screening for materials sites adjacent to recreation or open areas wherever possible. These vegetative screens would act as additional buffers to filter airborne dust and abate noise levels generated by gravel extraction equipment. Protective fuel transfers measures will be implemented.

A mining plan with requirements for landscaping and revegetation would be implemented during and upon completion of all activities. Slopes would be terraced to conform to the existing natural contours, except in those areas designated to provide irregular ponds for fish rearing sites.

Disturbed slopes would be revegetated with indigenous grasses and non moose browse shrubs immediately after all usable material is removed, ensuring compatibility with future uses. A Storm Water Pollution Prevention Plan will also be developed for the proposed borrow sites.

A mining plan with requirements for rehabilitation and/or a fisheries enhancement project would be implemented during and upon completion of all gravel extraction activities. The materials sites would be rehabilitated. Slopes would be terraced to prevent erosion and facilitate revegetation, and, except for bedrock slopes, would be revegetated immediately after all usable material is removed.

X. The Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity. The Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

The proposed transportation improvements are based on State and local comprehensive planning which considers the need for present and future traffic requirements and land use development. Local short-term impacts and use of resources by the proposed action are consistent with the long-term maintenance of the facilities and the enhancement of the local area and State.

Y. Any Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action. Any Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action

The proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used for the construction of the proposed facility is considered to be an irreversible commitment during the time period that the land is used for a highway facility. Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be required. Although these materials are generally not retrievable, they are not in short supply and their use would not have an adverse effect upon continued availability. Construction also requires a substantial expenditure of both State and federal funds.

Residents and recreation users in the locality and State would benefit by the overall improvement to the transportation system, including improved accessibility and safety, savings in time, and greater availability of quality services. These benefits are anticipated to outweigh the commitment of these resources.

Z. Subsistence Impacts. Subsistence Impacts

Subsistence uses and needs within the project vicinity were identified and evaluated in accordance with the requirements of Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), Public Law 96-487. Subsistence means the customary and traditional uses by rural Alaska residents of wild, renewable resources. According to Section 810, no U.S. Department of Interior (DOI) approval may be granted for a project using federal lands in Alaska unless there is an evaluation and determination of the potential effects of

proposed land-use activities on subsistence uses and needs (See Draft Section 810 Subsistence Evaluation). The **Juneau Creek Alternative** would acquire ROW from the USF&WS Kenai National Wildlife Refuge and from the USFS Chugach National Forest.

The proposed highway project lies within State of Alaska Game Management Units (GMUs) 7 and 15, which cover altogether 8,400 square miles of the Kenai Peninsula (Figure 17). Subsistence species identified for GMUs 7 and 15 are black bear, brown bear, caribou, sheep, moose, goat, beaver, coyote, red fox, hare, marten, mink and weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan.

For GMU 7, a single customary and traditional use determination was made for goat in the Brown Mountain area. Customary and traditional use means a long-established, consistent pattern of use, incorporating beliefs and customs. Residents of Port Graham and English Bay were given subsistence priority of this species. The Brown Mountain area is in the south Kenai Peninsula and well outside the highway project corridor.

For GMU 15, customary and traditional use determinations were made for moose, grouse, and ptarmigan. Subsistence priority for moose occurs in select areas of Unit 15(C) for residents of Port Dick, English Bay, and Port Graham. Unit 15(C) covers the south Kenai Peninsula, beyond the highway project corridor. Customary and traditional use of grouse and ptarmigan is allowed throughout GMU 15. Subsistence priority is established for the rural residents of a large portion of Alaska, GMUs 11, 13, 15, 16, 20(D), 22, and 23. In order of listing, these GMUs are Wrangel Mountains-Chitina River, Nelchina-Upper Susitna, Kenai Peninsula, Lower Susitna, Nome, and Kotzebue Sound.

Generally, subsistence activities for GMUs 7 and 15 are limited to only a few specific areas in the extreme south portions of the Kenai Peninsula. Although Cooper Landing and Hope are rural communities within GMU 7, they are not eligible for the subsistence priority on goats in GMU 7, nor are they eligible for the subsistence priority on moose, ptarmigan, or grouse of GMU 15.

In terms of the rural communities in other GMUs that are eligible for the subsistence priority in GMU 15 on ptarmigan and grouse, the majority are remote and not within the Kenai Peninsula region. Subsistence activities are thought to generally occur more locally within the region surrounding each rural community. Harvesting ptarmigan and grouse in the GMU 15 appears to be done almost exclusively by nonsubsistence users.

The proposed project should not affect subsistence uses and needs or cause limitations on access into the area for rural residents of these other GMUs. The improved roadway should increase area accessibility. Construction is not likely to impact hunting activities. Although there could be a direct loss of habitat, these species have a widespread general distribution. Changes in the availability of these birds are not expected to result. Long-term cumulative impacts are not anticipated.

V. DRAFT SECTION 4(f)/(U.S.C. 303) EVALUATION. DRAFT SECTION 4(f)/(U.S.C. 303) EVALUATION

Section 4(f) of the U.S. Department of Transportation Act recodified as U.S.C. 303 requires that no Administration approval may be granted for a project using land from a publicly owned park, recreation area, wildlife and waterfowl refuge, or any significant historic site unless there are no prudent and feasible alternatives. This project would involve four Section 4(f) properties: the Kenai National Wildlife Refuge (KNWR), the Resurrection Pass Trail, the Sqilantnu Archaeological District and archaeological site SEW-187b, and the Cooper Landing Historic District (Figure 11). As shown in the table below, the Resurfacing, Restoration, Rehabilitation (3R) Alternative involves 2 properties, while the Juneau Creek Alternative involves 3 properties.

**Table 9
Section 4(f) Involvement**

Section 4(f) Property	3R Alternative	Juneau Creek Alternative
Kenai National Wildlife Refuge	None	24 acres
Resurrection Pass Trail	None	crosses trail
Sqilantnu Archaeological District and SEW-187b	13 sites	6 sites
Cooper Landing Historic District	2 buildings	None

Kenai National Wildlife RefugeNational Wildlife Refuge

Site Description: The Kenai National Wildlife Refuge is composed of 1,970,000 acres, of which 1,350,000 are designated as Wilderness (Figure 8). The eastern boundary of the Refuge

coincides with MP 54.5 of the Sterling Highway. The U.S. Fish & Wildlife Service (USF&W) administers these lands for the Department of the Interior.

The Kenai National Wildlife Refuge was originally created in 1941 as the Kenai National Moose Range. In 1980, it was renamed under the Alaska National Interest Lands Conservation Act (ANILCA). The Refuge serves as wildlife habitat as well as a recreational destination for visitors.

The Refuge was established to conserve fish and wildlife populations and habitats; while providing opportunities for scientific research, environmental education, and land management training; and to provide opportunities for fish and wildlife-orientated recreation. The USF&W estimates that overall Refuge use in 1993 will top 800,000 recreational visitors.

Strategies for Refuge management are classified into five categories (Appendix J). From the least to most protective management they are: Intensive, Moderate, Traditional, Minimal, and Wilderness. Although the Final Refuge Management Plan does not allow for construction of transportation or utility systems except in areas of the refuge under intensive or moderate management, Title XI of ANILCA includes provisions for allowing transportation and utility corridors through designated Wilderness with Congressional approval. Refuge lands adjacent to the project area are Wilderness.

Within the immediate project corridor, there are developments within the Kenai National Wildlife Refuge (refer to Figures 10 and 16-1). The Refuge visitor contact station is located at MP 58 within the highway right-of-way (ROW). There were 4,765 visitors at the station between June 1 and Labor Day (September 6), 1993. The USF&WS proposes to expand the station's parking area and provide restroom facilities in 1994. As a result, they expect to see a 10 to 20 percent increase in station visitors in the first year.

Skilak Lake Road (MP 58) provides road access into the Refuge, along which are several developed USF&WS recreation facilities. The Jim's Landing boat launch is near the highway intersection. There were an estimated 22,000 to 23,000 recreation users at Jim's Landing in 1992. The USF&WS intends to upgrade the boat launch and provide additional parking at the site in 1994.

Recreation use of the Fuller Lakes Trail (MP 56) in 1992 was estimated to be 3,600. This figure includes hikers, horse users, and snowmobilers.

The USF&WS does not keep counts of the users of the Kenai-Russian River Campground (MP 54.5) which is generally full during the sockeye salmon season. At the adjacent Russian River Ferry Crossing/Sportsman's Lodge site there were counts of 15,858 vehicles parked between June 1 to August 20, 1992 (although use of the area operated beyond that date). Parking space is limited, so many vehicles park along the highway shoulders. A gravel boat ramp was opened in 1993 and a total of 393 boats were launched between June 25 and August 10.

Sportsman's Lodge site rehabilitation is proposed for construction in 1994. The USF&WS and the ADF&G will be upgrading the site to provide for overflow parking in an effort to get the cars off the highway shoulders. With the upgrading and increased parking, USF&WS expects to see a 10 to 20 percent increase in use the first year.

As discussed in the subsequent Sqilantnu Archaeological District 4(f) evaluation, some District sites that are in the Refuge were identified as being within or adjacent to the proposed right-of-way. Archaeological data is not included in this public document because of the resource sensitivity. These archaeological resources are eligible for the NRHP under Criterion "D"; these

sites "may be likely to yield information important to prehistory or history" (36 CFR 60.4)." The consultation required by Section 106 of the National Historic Preservation Act is on-going.

The Cook Inlet Region, Inc. (CIRI) has selected acreage under Section 14(h)(l) of ANCSA. Section 14(h)(l) authorizes the Secretary of Interior to withdraw and convey public lands outside of those selected by the village corporations to the regional corporations for existing cemetery sites and historical places. Some of this acreage includes adjacent parcels to the highway ROW between MP 55 and the Refuge boundary. The Bureau of Land Management (BLM) is adjudicating the conveyance and has not issued a decision.

A Chugach Electric high voltage transmission line has been brushed to provide a 200-foot wide clearing. The line crosses designated Wilderness land of the Refuge. It parallels the highway for about 18 miles, between MP 73 and MP 55. At MP 55, the transmission line crosses the highway and the Kenai River. A gravel access road that is cut into the hillside intersects the highway at MP 55 and at MP 54.5.

There are Dall sheep in the project area. The Round Mountain herd occupies all of Round Mountain year-round. The sheep also range farther north in the spring and summer. During 1992, a USF&WS and ADF&G survey counted 126 in the Round Mountain herd.

The ADF&G feels that the Kenai Peninsula moose population is in a slow but steady decline because of the changes in the forest succession. The moose population in Game Management Unit (GMU) 7 is estimated between 1,000 to 1,500 animals. In the USFS Cooper Landing Cooperative Project area, the current carrying capacity is estimated to be approximately 123 moose, approximately 2 moose per square mile. The Refuge, Game Management Unit (GMU) 15, supports 5 to 7 moose per square mile because of the early stages of forest succession that provide excellent moose habitat. The Juneau Creek moose herd, from the Dike Creek drainage

east of Round Mountain through Devil's Pass and north of Juneau Lake, winter on the benchlands of the realignment corridor.

According to the FHWA Highway Traffic Noise Prediction Nomograph (Hard Site) Model, existing predicted peak hour noise levels along the existing highway approach or exceed the FHWA Noise Abatement Criterion of 67 dBA for Land Use Category B (which includes picnic areas, recreation areas, playgrounds, parks, residences, motels, schools, churches, libraries, and hospitals). Refer to Section H, Noise and the Noise Impact Analysis contained in Appendix C. During summer, noise levels in Refuge lands along the existing highway corridor are high because of the heavy volume of traffic.

Section 4(f) Impacts: Only the **3R Alternative** and the **Juneau Creek Alternative** were determined to be viable. The **3R Alternative** avoids the Refuge and is included in the subsequent Section 4(f) Avoidance discussion. Nine other build alternatives used Section 4(f) property to varying degrees but were deemed not practical for the reasons evaluated in the Section II, Alternatives and in the subsequent Section 4(f) Avoidance Alternatives discussion (see Figure 5). The **No-Build Alternative** was also evaluated and does not satisfy the purpose of this project.

The **Juneau Creek Alternative** would provide a safe highway meeting current design standards. The improved two-lane highway would have a total 40-foot surface width: two 12-foot lanes and two 8-foot shoulders (Figure 2B). Where needed for either alternative, a 12-foot passing or climbing lane with a 4-foot shoulder would be provided. A turning lane would also be considered at the Skilak Lake Road intersection.

This action would upgrade the existing alignment with some straightening of curves except between MP 55 and MP 46 where the highway would be realigned to the north wall of the Kenai River Valley. It would reroute Peninsula bound commercial and residential traffic away from the heavily used recreation area around the confluence of the Kenai and Russian Rivers. The

highway segment along the river between MP 55 and 46 would become an alternate recreation route.

The Refuge Wilderness that would be involved contains a transmission line and a gravel road (Figure 16-1). This is not consistent with USF&WS Management Strategies for Wilderness areas (Appendix I). The Juneau Creek Alternative would leave the existing highway and enter the Refuge on the east side of the Chugach Power Electric transmission line crossing of the highway. The length of the new roadway segment within the Refuge would be about 3,600 feet or 0.7 mile. Where it leaves the Refuge, the proposed centerline would be approximately 770 feet north of the existing highway and 400 feet from the gravel road.

Twenty four acres of Refuge Wilderness would be acquired as ROW. This acreage is within CIRI Section 14(h)(l) selected lands. Of the total, approximately 2.6 acres are required for a tee intersection to the existing Sterling Highway. The proposed intersection is in lowlands adjacent to the Kenai River and would involve approximately 0.6 acre of palustrine wetlands.

The remaining, 21.4 acres would be needed to climb out of the Kenai River Valley onto benchlands. The immediate area is rugged and requires large slope cuts. There would be an approximate 500-foot long cut, about 200 feet in height, where the realignment departs from the existing highway. This alternative would require a 250-foot width of ROW north of the proposed centerline at the site. Beyond this, remaining cuts and fill could be contained within a ROW corridor width of 300 feet.

The proposed action will barely get into the lower edge of sheep winter range of the Broadview and Round Mountain subherds and would not impact the spring and summer ranges which are farther north. For the most part, sheep will come down to the timberline but not the benchlands (pers. comm., Ted Bailey, USF&WS, Oct. 25, 1993). The USFS and the USF&WS do not consider the sheep travel corridor across the Juneau Creek Valley as an annual migration route.

There should not be a problem with sheep coming down to the road (Nichols, 1992; USFS, 1992).

The new highway corridor also traverses moose primary winter habitat and a portion of territory the Mountain Wolf Pack (pers. comm., Bill Schuster, USFS, December 28, 1992). Lynx have also been monitored along the benchlands. There is potential for vehicle and wildlife conflicts, however, the rate of conflicts should be less than existing Sterling Highway levels. The proposed alignment and wider shoulders should allow drivers more opportunity to avoid animals encountered along the realignment. As a result of the proposed action and increased human use of the Juneau Creek area, the wolf pack may shift to other areas within its current territory such as Snow River.

Section 106 Coordination with the State Historic Preservation Office (SHPO) and archaeologists from USF&WS and USFS determined that the Juneau Creek Alternative as proposed would have an Adverse Effect on five archaeological sites within the Sqilantnu Archaeological District and SEW-187b. Four of these sites are within the Refuge: KEN-068, KEN-081, KEN-093, and KEN-215 (Appendix H).

Existing and projected peak hour noise levels along the existing highway approach or exceed the FHWA Noise Abatement Criterion of 67 dBA for Land Use Category B (refer to Appendix C, Noise and the Noise Impact Analysis). Since the proposed route in the Wilderness lands is along an existing transportation corridor already subjected to significant volumes of traffic and traffic related noise, significant impacts on the Refuge are not expected.

Views of the Kenai River Valley and Chugach Mountains would be available from the new highway. Visual resources of the region are already impacted by extensive areas of dead and dying spruce trees from spruce bark beetle infestation are within the project area. Natural plant

succession is occurring in bark beetle-killed areas. These areas will become naturally reforested in time.

Spruce forest mortality has created potentially hazardous conditions along the project corridor. Dead trees are susceptible to breakage and toppling during periods of high winds. A geotechnical reconnaissance investigation conducted by the Department during 1990, indicates the need for wider clearing standards along the proposed Juneau Creek Alternative. Recommendations establish dead tree clearing limits 100 feet beyond the toe of proposed cut and fill sections.

Avoidance Alternatives: The Kenai River and the abrupt mountainous terrain of the river valley are the limiting constraints for development within the vicinity. The Sterling Highway follows the valley walls, often along the toe of steep slopes, virtually on top of river banks. Along the corridor there are unstable slopes containing slide areas.

As discussed in the Alternatives Section of the Draft Environmental Impact Statement (EIS), the eleven build alternatives considered would impact one or more of the following Section 4(f) properties: the Kenai River Special Management Area, the Kenai National Wildlife Refuge, the Resurrection Pass Trail, the Sqilantnu Archaeological District, and the Cooper Landing Historical District. The Kenai River system is considered by the resource agencies as being of extraordinary high value.

The **Kenai River Alternatives** would involve acquiring five parcels of Refuge land totalling about 3.8 acres to accommodate cut slopes. These cuts would vary from 100 to 140 feet above the elevation of the road. Armoring and reinforcing embankment between MP 55.2 and 54.5 would require two retaining walls and bank protection along the Kenai River, a Section 4(f) property. There would be additional involvement of the river with road widening activities and bridge crossings throughout this roadway segment to avoid the erosion prone areas, especially

near Cooper Landing. Large quantities of waste materials would be generated from these road cuts and potential runoff from large excavation cuts could impact the adjacent river.

Only the previously discussed **Juneau Creek Alternative** and the **3R Alternative**, which is described below, were determined to be viable. The **3R Alternative** is the only build alternative that would avoid the Refuge. For the reasons discussed in Section II, Alternatives, the remaining alternatives were eliminated from further consideration. The **No-Build Alternative** is the only action which would avoid impacts to these properties, but does not satisfy the purpose of this project.

Shifting the **Juneau Creek Alternative** realignment farther to the east to avoid the Refuge would involve a greater number of archaeological resources of the Sqilantnu Archaeological District, which is a Section 4(f) property. Some of these sites are significant for preservation in place. This would also place the intersection near the Russian River Ferry Crossing and Parking area. This is a high use recreation vicinity along the Kenai River Special Management Area, a Section 4(f) property. The high volumes of traffic and the numbers of recreation users along the highway shoulders could create safety concerns.

Shifting farther east would require substantial grades to climb onto the benchlands to intersect the realignment. The first acceptable location where terrain would allow for a tee intersection connecting the two highway is approximately 0.3 mile east of the Russian River Ferry Crossing and Parking area. Large cuts up to 60 feet in height would be required into the hillside. Preliminary engineering indicates that grades approaching 10 percent would be required for approximately 0.85 mile. The minimal acceptable standard for mountainous conditions is 6 percent.

Within the Refuge, the **3R Alternative** would make all improvements within the existing ROW on the existing highway alignment. It would provide two 12-foot wide travel lanes, passing lanes

where needed, and widened 4 to 6-foot shoulders. Turning lanes would be considered in high use areas to alleviate traffic congestion.

Retaining binwalls, up to ten feet in height, would be constructed to support the erodible slopes. An approximate 750-foot long binwall would be constructed near MP 55, Kenai River Mile (RM) 73, and there would be a series of 5 binwalls (three 100-foot, one 200-foot, and one 300-foot) west of the Russian River Ferry Crossing and Parking area. According to the Kenai River Carrying Capacity Study (1993), driftboater and riverbank anglers of the upper river segment that is within the Refuge report that natural scenery and wildlife viewing are an important part of their trips to the upper Kenai River segment. The binwalls could be considered as a visual detraction from the natural setting, but they would contain the mud slumpage and tree debris of the eroding slopes.

Existing and projected peak hour noise levels along the existing highway approach or exceed the FHWA Noise Abatement Criterion of 67 dBA for Land Use Category B. Since the existing highway is within the Refuge, the corridor is already subjected to significant volumes of traffic and traffic related noise. There would be no change as a result of this action.

This action would continue to route Peninsula commercial, residential, and recreation traffic on the existing Sterling Highway. It would improve safety conditions for highway travelers and pedestrians along the highway. There would be potential for future highway expansion on the existing highway alignment or on a realignment should the increasing levels of Peninsula traffic exceed the capacity of the rehabilitated highway.

Minimization: To reduce proposed impacts to the Kenai National Wildlife Refuge, the facility would be designed to minimize ROW requirements. Impacts to wetlands will be minimized by keeping construction activities within the design toe of slope as much as practicable. Upon completion, all slope cuts, fill embankments, and other exposed earth work would be stabilized and revegetated during the first growing season to prevent erosion. Best Management Practices as detailed in ADOT&PF's Storm Water Manual will be utilized during construction to minimize siltation and erosion. Roadway embankments would consist of clean uncontaminated material.

Spruce forest resources of the region are already impacted by bark beetle killed spruce trees, and are being treated in the Chugach National Forest under USFS reforestation plans. Affected spruce forests within the Refuge are not presently being restored. The Juneau Creek Alternative will clear dead spruce trees in affected areas 100 feet beyond the toe of proposed cut and fill sections. These cleared buffers along the highway corridor and all disturbed areas with the exception of rock faces would be seeded after construction.

For the **3R Alternative**, the design and color of the binwalls would be coordinated with the USF&WS and DPOR to minimize visual impacts. The color would be chosen to blend with the natural surroundings. A turning pocket would be considered at the Russian River Ferry Crossing/Sportsman's Lodge Site parking area (MP 54.5).

For the **Juneau Creek Alternative**, to mitigate the loss of moose winter habitat (along the entire realignment), the Department would participate in two USFS moose habitat improvement projects. Identified areas are in T5N, R4W, Sections 13, 22, and 27. Each project site encompasses approximately 100 acres. The objective would be to attract wintering moose away from the highway. The project would focus on the quality of the enhanced area rather than the quantity, and the treatment methods would be tailored to specific vegetation types. Forage production on these acres of winter range could be significantly increased with the treatments, and over time will have a major impact on slowing the decline of local sub-populations.

Signing cautioning motorists of moose would be incorporated into the project to alert drivers of potential conflicts.

Coordination: The proposed action and associated Section 4(f) involvement was coordinated with USF&WS, SHPO, National Park Service (NPS), USFS, ADF&G, CIRI, and the Kenaitze Tribal Council. Agencies provided a large quantity of research documentation and

recommendations to assist with the environmental analysis and participated in several project meetings.

Additional Section 106 Consultation is still required. A plan for cultural resource mitigation will be developed and agreed to by all parties and formalized within an MOA. Excavation strategy/data recovery for the sites will be fully developed and coordinated with all parties at the highway project Design Phase. It will be implemented prior to and in coordination with those project activities that could disturb archaeological resources. An MOA will also be developed and formalized with CIRI and Kenaitze Tribe under the provisions of the Native American Graves Protection and Repatriation Act prior to any data recovery/mitigation.

Concurrence on the project effects and proposed cultural resource mitigation is required from ACHP. This concurrence along with the MOAs will be incorporated within the project's Final EIS. If additional cultural resources are discovered during construction, all work which would affect these resources would be stopped and SHPO would be contacted.

Coordination with the resource agencies and involved parties will continue throughout the project to minimize potential impacts.

Resurrection Pass TrailPass Trail (SEW-364)

Site Description: The 38-mile Resurrection Pass Trail (SEW-364) is the most heavily used trail in Alaska (refer to Appendix I for a detailed description). It is a National Recreation Trail and a Conservation Value Unit, also subject to ANILCA.

The Resurrection Pass Trail is part of a trail system that extends 72 miles between the community of Seward, located on the east coast of the Kenai Peninsula along Resurrection Bay, continuing northward through the Chugach National Forest to its terminus at the community of Hope on the south side of the Turnagain Arm. Recreational activities include hiking, hunting, fishing, camping, mountain biking, cross-country skiing, snowmobiling, scenic and wildlife viewing. The Juneau Falls is a popular attraction. Presently, 3 hunting guides, 1 horse tour company, and 2 ecotourism companies are permitted to use the trail and area.

The Resurrection Pass Trail originated as a mining trail in the late 1800's and played a historic part in the area's early mining days. The original portions of the trail are considered as being eligible for the NRHP under Criterion A "associated with events that have made a significant contribution to the broad patterns of our history" and Criterion B "associated with the lives of persons significant in our past".

In 1971, USFS relinquished an easement on the Bean Creek section of the Resurrection Pass Trail when conflict developed over the use of the trail through a homestead at the end of the Bean Creek Road. The USFS rerouted about 3.5 miles of the trail to the west side of Juneau Creek. (The original trail section replaced by the reroute is called the Bean Creek Trail.) The new trail section joins with the original trail a few hundred feet northeast of the Juneau Falls. The South Resurrection Pass Trailhead was established at Schooner's Bend (MP 53.2). Trailhead facilities provide vehicle parking, a toilet, information board, and registration station. During the

winter months, icing conditions exist on some of the steeper slopes of the new trail section making passage difficult.

The trail lies within Management Area 3 of the Chugach National Forest (CNF) Land and Resource Management Plan. Recreation management guidelines for the trail are based on the Recreation Opportunity Spectrum (ROS) (Figure 14). The ROS objectives focus on recreation settings based on area qualities and conditions. The Resurrection Pass Trail is presently being managed for "semi-primitive non-motorized" (SPNM) recreation opportunities from February 16 to November 30 and for "semi-primitive motorized" (SPM) recreation from December 1 to February 15. Surrounding lands are considered more remote and zoned for "primitive" (PI and PII) Wilderness experience.

Recreational use of the trail has increased steadily. Total recreation use on the trail is approximately 7,000 per year. The south trailhead is used by 6,000 of those users for either entry, exit or both. Three recreational cabins along the trail are used at capacity and must be reserved months in advance. In 1992, it was estimated that approximately 690 people stayed at the Trout Lake cabin, 7.8 miles from the South Resurrection Pass Trailhead. At the Romig and Juneau Lake cabins, 9.6 miles from the trailhead, there were approximately 670 and 610 people respectively.

According to the CNF Land and Resource Management Plan, potential demand for developed recreation is projected to increase almost twice as rapidly as for dispersed recreation. While there is no shortage of dispersed recreation opportunities on the Forest (fishing and hunting comprise about one-fifth of the total), the lack of transportation facilities is concentrating users into some areas. Overuse problems and lower experience levels are created as a result.

Cooper Landing is considering 916 acres of land along Juneau Creek under the Municipal Land Entitlement Act (Figure 7) (per. comm., Larry Wright, Cooper Landing Advisory Council, May 19, 1992). The Juneau Creek Parcel has been transferred from the Chugach National Forest

(CNF) to the Alaska Department of Natural Resources, Division of Land and Water Management.

Road access already exists to the Juneau Creek Parcel by the USFS Juneau Creek Road from the existing Sterling Highway (MP 53.5). The draft Cooper Landing Land Use Plan discusses the future potential to use some of the existing USFS forest roads. The Juneau Creek Road is narrow and was constructed with a gravel embankment. Should the Juneau Creek Road be considered for long term use, funding may be needed to widen the 3-mile long road.

The lower segment of the Resurrection Pass Trail is situated below the Juneau Creek Parcel. As the parcels are developed the remote setting of the trail will change and may not be consistent with the existing ROS. Convenient access to remote areas along the Resurrection Pass Trail above the falls will result. There would be a change in user types from overnight backcountry use to dispersed day use. Trail impacts would be similar to those described with the increased use of the Juneau Creek Alternative (described below).

Section 4(f) Impacts: As previously discussed in the Alternatives Section of the DEIS, and the Section 4(f) Impacts and Avoidance Sections for the Kenai National Wildlife Refuge, eleven build alternatives were evaluated (see Figure 5). Only the **3R Alternative**, which is described in the subsequent Section 4(f) Avoidance discussion, and the **Juneau Creek Alternative** described below were determined to be viable. The remaining build alternatives used Section 4(f) property to varying degrees but were deemed not practical. The **No-Build Alternative** does not satisfy the purpose of this project.

With the **Juneau Creek Alternative**, the Resurrection Pass Trail would be crossed about 2.5 miles north of Cooper Landing, approximately 550 feet north of the intersection of the Resurrection Pass and Bean Creek Trails (Figures 16 and 16-2). Roadway cuts are proposed at the trail crossing. Juneau Creek would be crossed about 1,000 feet above the falls. A bridge would be constructed which would be about 135 feet long and 15 feet high. (Refer to the Section

4(f) Impacts Section for the Kenai National Wildlife Refuge for an overall general description of the proposed facilities.)

The original portion of the Resurrection Pass Trail is considered as being eligible for the NRHP. Section 106 Coordination with SHPO has concluded that there would be an Adverse Effect on the Resurrection Pass Trail with the highway crossing (Appendix H).

Without the proposed Section 4(f) mitigation which is subsequently described in the Minimization Section, the Juneau Creek Alternative would separate lower and upper portions of the trail. To continue along the trail, recreation users would need to cross the highway. Vehicles may park along the highway shoulders and traffic congestion could result. Safety concerns would be created for both pedestrians and vehicles.

The new highway alignment would be closer to the primary attractions. The distance to Juneau Falls would decrease from about 2.5 miles to less than 0.2 mile. Access to the remote cabins at Trout and Juneau Lakes would also be shortened. Trout Lake would be about 1.5 miles from the proposed crossing. According to USFS, more convenient and easier access would alter much of the surroundings into day use areas. It is anticipated that there would be a dramatic increase in the number of recreation users during the summer and winter. Juneau Falls, Trout Lake, and Juneau Lake would be so accessible that use in those areas could increase more than 10 times over current levels. Use of the South Resurrection Trailhead and lower trail segment between the Old Sterling Highway and Juneau Falls is expected to decrease.

Existing trail users may be less satisfied with their recreation experience because of increased use and conflicts between user groups. Increased use would result in more encounters with other groups than at present, and the total number of people seen would increase.

Constructing a road in an unroaded area would decrease the feeling of remoteness for a distance of about 3 miles from the road (USFS correspondence, May 4, 1993). The new road may

displace some existing trail users who are looking for solitude as a part of their recreation experience. Displacement might be to other areas on the Kenai National Wildlife Refuge or the Chugach National Forest. Juneau Falls would not be visible from the highway. Because most of the alignment is within forested areas, the highway should not be visible to Resurrection Pass Trail users except at the Juneau Creek crossing and along nonforested areas of the northwest portion.

The Juneau Creek Alternative would introduce traffic noise levels into undeveloped areas of Chugach National Forest and to users of the Resurrection Pass Trail. Land Use within the Resurrection Pass Trail area is included within FHWA Activity Category A, which has a Noise Abatement Criterion of 57 dBA (Lands on which serenity and quiet are of extraordinary significance.) Refer to Section H, Noise and the Noise Impact Analysis contained in Appendix C.

A traffic noise analysis was completed for the proposed project using the FHWA Highway Traffic Noise Prediction Nomograph (Hard Site) Model. The analysis was based on existing (1990) and design year (2010) peak hour highway traffic. According to the nomograph, predicted noise levels at a distance of approximately 100 feet from the proposed centerline would reach the FHWA Noise Abatement Criterion of 72 dBA for Land Use Category C. (This category includes activities such as commercial development.)

At about 400 feet, predicted levels would reach the Criterion of 67 dBA for Category B. Around 2,600 feet (0.49 mile), predicted levels would reach the Criterion of 57 dBA for Land Use Category A. Consequently, noise impacts would be considered to occur within one-half mile of either side of the realignment corridor. Presently, USFS is conducting reforestation activities because of the extensive areas of dead and dying spruce trees from spruce bark beetle infestation. As reforestation occurs within the area, traffic noise levels should be reduced. A 200-foot width of dense vegetation can reduce noise by 10 decibels, which cuts the loudness of traffic noise in half.

A technical report on the Resurrection Pass Trail and Juneau Creek Area recreation development options was prepared by USFS for this project (Appendix I). Two recreation development options are being considered for purposes of Section 4(f) mitigation. Both options would relocate a portion of the Resurrection Pass Trail and construct two scenic pullouts along either end of the Juneau Creek realignment to be field located with the assistance of USFS prior to final design. Relocating the trail would require placing approximately 200 linear feet of embankment within palustrine wetlands. The first option would not provide additional access to the trail. The second option would construct one primary trailhead and associated facilities near Juneau Falls, maintained for both summer and winter use.

Although the realignment would change access within CNF, it remains consistent with primary management goals which addresses developed and dispersed recreation, cultural resources, and visual resources. In November 1986 correspondence, the USFS expressed support for a Juneau Creek Alternative to meet growing transportation needs on the Kenai Peninsula.

Secondary: USFS operation, maintenance, and management costs would increase due to increased use, resulting in more litter pick-up, increased trail and cabin maintenance, increased backcountry ranger and law enforcement patrols, and revegetation of some concentrated use areas. It may be necessary to harden the trail and limit dispersed camping only to designated sites. There may be a demand for the USFS to construct more recreation cabins in the south Resurrection Pass Trail area.

Current ROS classifications for the Resurrection Pass Trail and new highway route would need to be changed. The realignment of the road would permanently change the recreation management in this area and alter the natural appearance of the environment (see Figure 14). Approximately 0.5 mile on either side of the road corridor for would be managed for a Roaded Natural (RN) opportunity. The trail corridor to the north would continue to be managed as Semi-

primitive Non-motorized (SPNM) in the summer and as Semi-primitive Motorized (SPM) in the winter. The Primitive (P) II classification for Trout and Juneau Lakes would be changed to SPNM. Conceptual future ROS management boundaries would need to be refined to reflect the terrain.

Should the number of future recreational users in the area warrant development, pending available funding, USFS would consider building a new campground and trailhead on the east side of the Juneau Falls. Access to these facilities would be provided via a gravel road approximately 2,000 feet (0.38 mile) in length. Development would be designed to provide for 20 RV spaces and 20 tent campsites. The facilities would be large enough to accommodate 200 people at any given time, but not be visible from the summer Juneau Falls viewing area. A 1,300-foot long trail segment to the Resurrection Pass Trail, also providing views of the falls, would be constructed. It may be necessary for the USFS to develop an established snowmobile route for a portion of the area or restrict motorized/non-motorized use to certain days.

Future development of the USFS campground access road would effect the historic Bean Creek Trail and require a formal determination of NRHP eligibility and a Finding of Effect.

The Visual Quality Objective (VQO) for this area would need to be changed to reflect the new highway alignment. While the VQOs are not currently being met due to fuel reduction efforts and timber harvest, the long-term management VQO objective for the road corridor realignment is Retention. Management activities within this category should not be visible to the general public when viewed from one-quarter to one-half mile distance. All structures and roads would be carefully located to take advantage of natural screening.

Direct impacts to wildlife resulting from construction of the proposed project would include a minor loss of habitat at the Resurrection Pass Trail. (Refer to Section M, Wildlife Impacts for

anticipated affects on wildlife for the overall realignment.) Any garbage dumpsters at highway pullouts and/or the Resurrection Pass Trailhead should be a bear proof design and emptied frequently to reduce the potential for increased bear/human contact. According to USFS, the greatest affects on wildlife at the trail crossing site would be the result of secondary impacts from the increase in back country hunting and other recreation activities such as hiking rather than the loss of habitat to road construction.

Avoidance Alternatives: All build alternatives that were considered along the Kenai River between MP 55 and MP 46 would impact one or more of the following Section 4(f) properties: the Kenai River Special Management Area, the Kenai National Wildlife Refuge, the Resurrection Pass Trail, the Sqilantnu Archaeological District, and the Cooper Landing Historical District. The Kenai River system is considered by the resource agencies as being of extraordinary high value. The **No-Build Alternative** is the only action which would avoid impacts to all of these properties, but it does not satisfy the purpose of this project.

Only the previously discussed **Juneau Creek Alternative** and the **3R Alternative**, which is described below, were determined to be viable. The **3R Alternative** would avoid the Resurrection Pass Trail. For the reasons discussed in Section II, Alternatives, the remaining alternatives were eliminated from further consideration.

The **3R Alternative** reconstruction would occur along the existing alignment. It would provide two 12-foot wide travel lanes, passing lanes where needed, and widened 4 to 6-foot shoulders. Turning lanes would be considered in high use areas to alleviate traffic congestion. The bridges at Schooner Bend, Cooper Creek, and Cooper Landing would be resurfaced. Altogether, a total of 11 bin retaining walls would be constructed along the highway and river corridor to support erodible slopes.

This action would continue to route Peninsula bound commercial, residential, and recreation traffic on the existing Sterling Highway. It would improve safety conditions for highway travelers and pedestrians along the highway. The existing pedestrian path between MP 50 and

MP 46 would be improved to provide a 5-foot wide surface and new pathway would be constructed to the Russian River Ferry Crossing (MP 54.5). There would be potential for future highway expansion on the existing highway alignment or on a realignment should the increasing levels of Peninsula traffic exceed the capacity of the rehabilitated highway.

With the 3R Alternative, recreation users would continue to access the trail via the existing Resurrection Pass Trailhead at MP 53.2. Recreation Management would not change and would continue to be semi-primitive non-motorized and semi-primitive motorized ROS classes (Figure 14). Surrounding lands in the Juneau Lake and Trout Lake areas would remain remote and not easily accessed.

The **Juneau Creek Alternative** and **Juneau Creek Variant** are the only alternatives which would involve the Resurrection Pass Trail. These were proposed to avoid and/or minimize the cumulative Section 4(f) property involvement on the KRSMA and the Cooper Landing Historic District, and the Sqilantnu Archaeological District.

a) Juneau Creek Variant (F): Two build alternatives were considered for the Juneau Creek crossing. The Juneau Creek Variant (F) is a variation of the Juneau Creek Alternative, crossing about 0.5 mile below Juneau Falls, approximately 2 miles north of the Kenai River. This alternative would avoid the historic portion of the trail, crossing the recently developed segment. However, any portion of the trail is Section 4(f) property. In addition, this action would involve the historic Bean Creek Trail which would need a formal determination of NRHP eligibility. As with the Juneau Creek Alternative, the Refuge is involved at the west terminus.

Primarily, this alternative was rejected because 1) inferior soils were determined to exist in the vicinity and site inspection indicated the need to reinforce the rock canyon walls to provide a stable bridge foundation; and 2) spanning the canyon below the falls would require a 450-foot long suspension bridge 275 feet above the canyon floor, which would be extremely expensive to build.

b) Juneau Creek Alternative: Cuts are proposed where the highway realignment would cross the Resurrection Pass Trail. Without the proposed Section 4(f) mitigation which is subsequently described in the Minimization Section, the Juneau Creek Alternative would separate lower and upper portions of the trail and require recreation users to make highway crossings. Two alternate designs were considered to maintain the existing trail alignment while providing for pedestrian safety. These design alternates had less involvement of the trail and did not require any trail segment relocation. Neither option was favored by USFS.

An **arch pedestrian tube** would be incorporated into the roadway embankment. Conceptual design indicates that this action may require a minimum 15-foot high fill. This action would be more intrusive to the surroundings and increase potential visual impacts. Traffic noise may be audible for greater distances because of the higher embankment. The high embankment fill could possibly act as a barrier to animal crossings.

A **pedestrian bridge** would be constructed over the highway. Ramps would be incorporated into the design to accommodate all user groups and permitted recreation activities. This structure would be visible for great distances because of the clearance required over the highway.

Minimization Alternatives: To reduce proposed impacts to the Resurrection Pass Trail and to recreation users of the trail, two recreation development options are being considered by the USFS. Both options would relocate a portion of the Resurrection Pass Trail. The first option would not provide additional access to the trail. The second option would construct one primary trailhead near Juneau Falls, maintained for both summer and winter use (Figure 16-2). Clearings would be kept to a minimum and all erodible slopes revegetated.

Trail Relocation: Approximately 550 feet of the Resurrection Pass Trail would be abandoned between the intersection of the Bean Creek Trail and the new highway alignment. A 0.6 mile length gravel trail segment would be constructed by the Department. The new trail segment would be relocated beneath the proposed highway bridge overpass. It would merge with the existing Resurrection Pass Trail about 1,400 feet north of the proposed highway. Relocating the trail would require placing approximately 200 linear feet of embankment within palustrine wetlands.

Option One - No New Trailhead: The existing Resurrection Pass Trailhead at MP 53.2 would continue to be maintained as the primary access point for the trail. Winter access would be provided from a new trailhead in the Bean Creek area. No parking would be provided along the highway realignment near Juneau Creek. The trail underpass would be located where access from the highway would be difficult, thereby discouraging users from entering or exiting the trail in this area. This option would limit the number of users directly accessing the area from the new highway.

Option Two - Juneau Falls Trailhead: The Department would construct a new trailhead on the west side of Juneau Falls, south of the highway. Access to the trailhead would be provided via a gravel surfaced road approximately 1,800 feet (0.34 mile) in length. The facility would include parking for 15 standard sized and 10 oversized vehicles, toilets, interpretive signs, and a picnic site. Between the parking area and the Juneau Falls viewing area, a 300-foot length trail would be constructed. This trail would intersect the Resurrection Pass Trail. A barrier fence would be installed along the bluff overlooking the falls. The USFS would maintain this facility for summer and winter use with the Department plowing the road and parking area in the winter. Signing to direct winter use under the Juneau Creek bridge would be maintained by the USFS. Interpretive signs would also be installed at the trailhead informing people of the low impact backcountry ethics

To further mitigate the Section 4(f) recreation impacts of the project, two scenic pullouts would be constructed along either end of the Juneau Creek realignment. Locations for these sites will be field located by USFS and the Department prior to the design phase. To mitigate the Section 4(f) impacts involving the historic component (Section 106) of the trail, interpretive signs pertaining to the history of the trail would be developed and installed at the trailhead.

Secondary: Additional winter parking needs would be evaluated by the USFS in the future if the facility did not meet user needs. This would not be included as part of this highway project. Two options are being considered: 1) connect a winter trail with the proposed Slaughter Ridge Road trailhead and maintain parking at the end of the road; and 2) locate a trailhead along the existing trail alignment to provide access to the 1,400 feet of existing trail above the highway realignment.

Coordination: The proposed action and associated Section 4(f) properties involvement was coordinated with DPOR, USF&WS, NPS, SHPO, USFS, and ADF&G. Agencies provided a large quantity of research documentation and recommendations to assist with the environmental analysis and participated on a number of project meetings and fieldtrips.

The USFS prepared a technical report on the Resurrection Pass Trail, which included recreation management guidelines and assessment of the effects of the proposed highway project on recreation and future recreation opportunities. Recreation development options were also developed. The USFS will be field locating the two proposed scenic pullout sites. An eagle nest survey was also conducted by USFS along Juneau Creek and the highway project corridor.

A joint meeting with the USFS and USF&WS recreation staff, DPOR, NPS, and the Department will be conducted to discuss the development and management of the recreational and scenic aspects of this highway development for both the old and new highway segments. After the proposed mitigation is agreed to by all parties, a Memorandum of Agreement (MOA) will be developed to formalize the commitments.

Concurrence on the project effects and proposed mitigation is required from the Advisory Council for Historic Preservation (ACHP). This concurrence along with the MOA will be incorporated within the project's Final EIS. Coordination with the resource agencies will continue throughout the project to minimize potential impacts.

Sqilantnu Archaeological District
Archaeological District (KEN-156/SEW-282)
and
SEW-187b

Site Descriptions: The **Sqilantnu Archaeological District, KEN-156/SEW-282**, received a formal National Park System (NPS) Determination Of Eligibility (DOE) for the National Register of Historic Places (NRHP) in 1981. Fifteen sites were originally included with the Multiple Property (District) Nomination, listed eligible under Criterion "D" (for properties that "have yielded, or may be likely to yield, information important in prehistory or history").

Sqilantnu is a Tanaina Athapaskan placename that refers to the Kenai River between Skilak and Kenai Lakes. The District is characterized by late prehistoric to early historic Tanaina Athapaskan village winter settlements and smaller seasonal camps. Most features within the District are intact and virtually undisturbed despite easy access and heavy use of this area.

The formal District boundaries are between approximately MP 57 and MP 53 of the Sterling Highway. It encompasses approximately 3,240 acres within the U.S. Fish and Wildlife Service (USF&WS) Kenai National Wildlife Refuge; the U.S.D.A. Forest Service (USFS) Chugach National Forest; the Cook Inlet Region, Inc. (CIRI) and private land holdings. Since the nomination, there have been a number of additional contributing sites discovered in and outside the District boundaries. The Department, in consultation with the State Historic Preservation Office (SHPO) and archaeologists from the USF&WS and USFS consider it appropriate to extend the District boundaries east to Kenai Lake, approximately MP 48.

For the most part, archaeological investigations have been limited to cultural reconnaissance surveys and mitigation designed for the Department on this project and for other federal and CIRI land management preconstruction and inventory projects. There has not been a comprehensive survey of the District or subsequent site nominations, nor has there been a compilation of the

District sites. Archaeological data is not included in this public document because of the resource sensitivity.

The length of the District is crossed by a major transportation corridor. The Sterling Highway supports year-round commercial truck and residential traffic, as well as seasonal recreation traffic to the Peninsula region, which includes the cities of Kenai, Soldotna, and Homer.

Summer traffic congestion is typical. The winding road parallels the Kenai River through much of the area and visitors park vehicles along the 2-foot shoulders, congesting traffic. Vehicles merge with higher speed through traffic in the community of Cooper Landing and in areas where sight distance is limited. Narrow shoulders pose serious concerns for vehicular emergency pulloffs. There is a pedestrian safety pathway on the north side of the highway between MP 50 through Cooper Landing to MP 45.

Local area development in the District includes Cooper Landing and numerous private developments as well as several recreation sites: USF&WS Jim's Landing, Kenai National Wildlife Refuge Station, Fuller Lakes Trailhead and the Kenai-Russian River Campground and Ferry Crossing; ADF&G Russian River Parking; USFS Russian River Campground, the Cooper Creek Campground, the Resurrection Pass Trailhead; and several other locally used trails and boat launches. The USF&WS, USFS, and ADF&G are upgrading some of the sites and expanding parking facilities during 1994.

The USF&WS, USFS, and ADF&G are planning to construct additional parking at the recreation facilities in the vicinity during 1994. This would help concentrate Kenai River recreation access to certain areas and reduce the potential for trampling and disturbance of the area's cultural resources. It would also increase safety considerations because it would reduce the number of vehicles parking along the highway shoulders and reduce the number of people walking along the highways to access the river.

The CIRI and the Kenaitze Tribe are working with the USFS and USF&WS on a cultural heritage and awareness project, "Footprints." The Kenaitze Tribe has developed and is staffing an interpretive cultural program at the "Beginnings Site" (MP 53.5) during the summer. Boardwalks have been constructed and interpretive signs are also installed. Lack of parking at the site has been a problem and owing to limited available land along the riverbank there is little opportunity to develop parking facilities. Locations to construct a cultural heritage center as part of the "Footprints" project in the Sqilantnu Archaeological District are being evaluated. The preferred site is across from the entrance to the Russian River Campground near MP 53.

The CIRI, USF&WS, USFS, and ADF&G are considering a comprehensive management plan for the area to allow for recreation use while protecting cultural and natural resources. Approximately 2,024 acres between MP 55 and MP 53 were selected by CIRI under the Alaska Native Claims Settlement Act (ANCSA). The ANCSA provides settlement of aboriginal claims to Alaskan Eskimos, Aleuts, and Indians. Section 14(h)(l) authorizes the Secretary of Interior to withdraw and convey public lands outside of those selected by the village corporations to the regional corporations for existing cemetery sites and historical places.

In 1988, the Bureau of Indian Affairs (BIA) determined that the CIRI selection met the criteria for qualification as a Native historical place and cemetery site and issued a Certificate of Eligibility. The Bureau of Land Management (BLM) is adjudicating the conveyance and has not issued a decision. This decision is not expected soon; the selected lands are already appropriated and developed by federal agencies.

SEW-187b is within the Chugach National Forest, and is considered eligible for the NRHP under Criterion "D". The Sterling Highway cuts across an edge of the site. Although the site appears to be a Tanaina Athapaskan winter settlement, it is not included within the Sqilantnu Archaeological District because it is several miles east of the District.

Section 4(f) Impacts: The **3R Alternative** and the **Juneau Creek Alternative** were determined to be the only viable alternatives. Archaeological sites within the District and SEW-187b would

be impacted with either alternative as described below. The remaining alternatives were deemed not practical for the reasons evaluated in Section II, Alternatives, and in the subsequent Section 4(f) Avoidance discussion (see Figure 5).

The **3R Alternative** would improve the existing highway, providing two 12-foot wide travel lanes, passing lanes where needed, and widened 4 to 6-foot shoulders. Turning lanes would be considered in areas of high usage to alleviate traffic congestion. Approximately 9 miles of highway would be upgraded within the boundaries of the District. Bin retaining walls would be constructed to contain unstable hillside slopes. Two acres of ROW would be acquired from within the District.

An improved 5-foot wide pedestrian pathway would also be provided for approximately 7 miles within the District, including 5 miles of new pathway between the USF&WS Russian River Ferry Crossing at MP 55 and its present terminus in Cooper Landing at MP 50.

This action would continue to route all Peninsula commercial, residential, and recreational traffic on the existing Sterling Highway. It would improve safety conditions for highway travelers and pedestrians along the highway. Completing the pathway between the Russian River Ferry Crossing and Cooper Landing would reduce the number of pedestrians on the highway shoulders. There would be potential for future highway expansion on the existing highway alignment or on a realignment should the increasing levels of Peninsula traffic exceed the capacity of the rehabilitated highway.

Section 106 Coordination with SHPO and archaeologists from USF&WS and USFS determined that the 3R Alternative as proposed would have an Adverse Effect on twelve archaeological sites within the Sqilantnu Archaeological District: KEN-249, KEN-250, SEW-619, SEW-633, SEW-620, SEW-297, SEW-615, SEW-217, SEW-634, SEW-635, SEW-165, SEW-168, and one archaeological site which is outside of the District, SEW-187b (Appendix H).

Based on conceptual plans, it appears that the 3R Alternative would effect 5 house pits, 12 cache pits, one lithic scatter, and one midden. Of this total, construction of new pathway would effect 6 cache pits and the midden. Roadway excavation and fill placement would comprise the primary impacts, while secondary impacts with the pathway include increased public accessibility.

The **Juneau Creek Alternative** would provide two 12-foot wide travel lanes, passing or climbing lanes where needed, and widened 4 to 8-foot shoulders. It would improve the existing highway between MP 58 and MP 55, and between MP 46 and MP 37. At MP 55, the highway would leave the existing alignment and climb out of the valley onto benchlands along the north Kenai River valley wall until reconnecting with the existing Sterling Highway alignment near USFS Broadview Guard Station (MP 46). A tee intersection design is proposed for both the west and east termini of the realignment. There would be no improvements to the existing highway between MP 55 and MP 46.

Approximately 2 miles of existing highway would be upgraded within the boundaries of the District. The proposed new highway encroachment in the Sqilantnu Archaeological District is an approximate 1.52-mile long segment. Thirty four acres of land from within the District would be acquired as ROW.

This action would reroute much of the through traffic bound for other Peninsula destinations. Safety would increase on the existing highway segment as slower moving local traffic would not merge with the current levels of higher speed through traffic. It would reduce potential vehicular and pedestrian conflicts. The existing highway segment would be available as an alternative recreation route for pedestrians and bicyclists. Over time, deterioration of the driving surface on the existing highway will occur and require a rehabilitation project.

Section 106 Coordination with SHPO and archaeologists from USF&WS and USFS determined that the Juneau Creek Alternative as proposed would have an Adverse Effect on five archaeological sites within the Sqilantnu Archaeological District: KEN-068, KEN-081, KEN-

093, KEN-215, SEW-093, SEW-215, and one archaeological site outside of the District, SEW-187b (Appendix H).

Based on conceptual plans, it appears that the Juneau Creek Alternative would effect 4 house pits, 19 cache pits, and one lithic scatter. Roadway excavation and fill placement would comprise the primary impacts.

Avoidance Alternatives: The Kenai River and the abrupt mountainous terrain of the river valley are the limiting constraints for development within the vicinity. The Sterling Highway follows the valley walls, often along the toe of steep slopes, virtually on top of river banks. Along the corridor there are unstable slopes containing slide areas. At MP 50.3 and 49.5, precipitation and runoff erode silty glacial soils filling roadside ditches and silting adjacent wetlands and streams.

Only the **No-Build Alternative** avoids using Section 4(f) property. However, this does not satisfy the purpose of this project. The existing highway transects the District and the road cannot be rerouted around it cost effectively. The issue of safety is the major consideration for abandoning the No-Build Alternative. Limited sight distances on the winding roadway would not be remedied. For the most part, traffic congestion would worsen with increases in traffic, especially during the summer tourism season. Deterioration of the driving surface would accelerate with the increased traffic. Narrow shoulders pose serious concerns for vehicular emergency pulloffs and for pedestrians and recreation users.

As discussed in the draft EIS Section II, Alternatives, all eleven build alternatives that were considered between MP 58 and MP 46 would impact one or more of the following Section 4(f) properties (see Figure 5): the Kenai River Special Management Area (KRSMA), the Kenai National Wildlife Refuge (KNWR), the Resurrection Pass Trail, the historic Bean Creek Trail, the Cooper Landing Historic District, and the Sqilantnu Archaeological District. Only the **3R Alternative** and the **Juneau Creek Alternative** were determined to be viable. The remaining alternatives were deemed not practical.

In the area of SEW-187b, of the seven build alternatives that were considered, only the **Quartz Creek Variant** avoided the site. This 8.5-mile realignment was rejected because soil surveys determined the presence of inferior soils and highly erodible slopes with associated maintenance concerns. The remaining alternatives were deemed not practical for the reasons evaluated in Section II, Alternatives.

Archaeological sites within the Sqilantnu Archaeological District and SEW-187b would be impacted with either build alternative as previously described. Avoiding all properties through alignment shifts was not possible because of the highway's location, terrain restraints, density of the cultural resources, and other Section 4(f) properties.

The **Juneau Creek Alternative** avoids cultural resources of the District between MP 55 and MP 48.

Not extending the **3R Alternative** pedestrian safety pathway to MP 55 would avoid impacting 6 cache pits and a midden. This was rejected because of the concern for pedestrian safety. The vicinity of Cooper Landing and the confluence of the Russian and Kenai Rivers with the several USF&WS and USFS recreation facilities, are heavily used during the summer by growing numbers of recreationists and local residents.

The new pedestrian pathway would for the most part be placed along the existing south side highway shoulder, following the north bank of the Kenai River, and road widening activities would shift to the north. Should the pathway be placed along the north side, visitors would cross the highway randomly to access the Kenai River, causing safety concerns with the increased potential for vehicle and pedestrian collisions.

Minimization: To reduce proposed impacts to the Sqilantnu Archaeological District, the facility would be designed to minimize the limits of cut and fill. During final design, the Department would further evaluate hillsides in erosion prone areas, which are near archaeological sites to

assure slope stability. The limits of adjacent sites and/or features would be flagged. Construction activities and equipment would not be allowed within the delineated site. Best Management Practices as detailed in ADOT&PF's Storm Water Manual will be utilized during construction. At designated sites, an archaeologist would be on site during construction to insure that the sites will not be disturbed. Upon completion, all slope cuts, fill embankments, and other exposed earth work would be stabilized and revegetated during the first growing season to prevent erosion.

A comprehensive mitigation plan will be developed and agreed to by SHPO, NPS, USF&WS, USFS, the Kenaitze Tribe, CIRI, and the property owners and formalized within a MOA. Data recovery is proposed to mitigate project effects on archaeological resources adversely impacted by the proposed project.

Specific excavation strategy recovery/mitigation for the sites will be fully developed and coordinated with all parties during the Design Phase of the highway project. It will be implemented prior to and in coordination with those project activities that could disturb archaeological resources.

An MOA will also be developed and formalized with CIRI and Kenaitze Tribe under the provisions of the Native American Graves Protection and Repatriation Act prior to any data recovery/mitigation.

Coordination: The proposed action and associated Section 4(f) properties involvement was coordinated with SHPO, NPS, USF&WS, USFS, Kenaitze Tribe, and CIRI. Agencies and local residents provided a large quantity of research documentation and recommendations to assist with the environmental analysis and participated on a number of project meetings and interviews.

Concurrence on the project effects and proposed mitigation is required from ACHP. This concurrence along with the MOA's will be incorporated within the project's Final EIS. Coordination with the resource agencies and involved parties will continue throughout the project to minimize potential impacts. If additional cultural resources are discovered during construction, all work which would affect these resources would be stopped and SHPO would be contacted.

Cooper Landing Historic DistrictLanding Historic District (SEW-338)

Site Description: The **Cooper Landing Historic District (SEW-338)** qualified for the National Register of Historic Places (NRHP) on April 24, 1986. The District contains remnants of a frontier mountain community, originating from homesteading during the period of 1905-1929.

Five buildings were originally included with the Multiple Property (District) Nomination, listed as eligible under Criterion "A" (properties "that are associated with events that have made a significant contribution to the broad patterns of our history"); and Criterion "B" (properties "that are associated with the lives of persons significant in our past"): the Charles and Beryl Lean House, the Riddiford Schoolhouse (SEW-179), the Dunc Little Cabin, the Cooper Landing Post Office (SEW-146), and the Leo Douglas Cabin (SEW-180).

The core of the Cooper Landing Historic District is located north of the Sterling Highway at MP 48.7. Two of the historic structures are close to the highway. The Leo Douglas Cabin is within the ROW, 20 feet from the toe of the highway/pedestrian pathway embankment. There are no trees between the building and the highway. The Riddiford Schoolhouse is 40 feet from the embankment toe and partially shielded by trees. The elevation of the highway is about level with the roof eaves.

The remaining three historic structures are approximately 180, 215, and 225 feet from the toe of the highway/pedestrian path embankment. They are partially buffered from the highway by several buildings, including the historic Riddiford School (SEW-179) and the Leo Douglas Cabin, and many large trees.

The **Harry Brown Cabin (SEW-174)** is also considered as contributing to the District under Criterion "A." This cabin is located on a hill on the south side of the highway at MP 49.2. The cabin is approximately 10 feet above the highway and about 30 feet from the edge of the cutslope. There are trees on the hillside which shield the building from the highway.

Through this entire area, the highway follows the toe of the south side hill and is often situated on the banks of the Kenai River. The highway is winding and has narrow two-foot wide shoulders. Traffic congestion is typical during the summer with the higher levels of recreation traffic, and is compounded because roadside development has created multiple driveway accesses. Because of local concerns, a pedestrian safety path was constructed in 1993 along the north side of the highway between MP 51 and MP 45.

Section 4(f) Impacts: Only the **3R Alternative** and the **Juneau Creek Alternative** were determined viable alternatives. The **Juneau Creek Alternative** avoids the District and is included in the subsequent Section 4(f) Avoidance discussion. The Cooper Landing Historic District would be impacted with the **3R Alternative** as described below. The remaining alternatives were deemed not viable for the reasons evaluated in Section II, Alternatives, and in the Section 4(f) Avoidance discussion (see Figure 5).

In the vicinity of the District, the **3R Alternative** would improve the existing highway, resurface the two 12-foot travel lanes, and provide widened 6-foot shoulders. For the most part the highway centerline would not change. This action would also improve an existing pedestrian safety pathway to a 5-foot wide surface.

The conceptual limits of the highway/pathway embankment fill would be approximately 10 feet closer to the core District buildings. The **Leo Douglas Cabin** would be 10 feet from the toe of the embankment. The **Riddiford Schoolhouse** would be 20 feet from the embankment toe. Some trees would be cleared along the highway, eliminating the vegetative screen at the schoolhouse. The three other buildings in the District core would be 170, 205, and 215 feet from the toe of the embankment. Tree buffers would remain between these buildings and the highway.

Road widening would require cuts into the hillside below the **Harry Brown Cabin**. The edge of the cutslope would be 10 feet closer or 20 feet from the cabin. Trees on the cutslope would be cleared. Some of the large trees near the cabin would remain.

Section 106 Coordination with the State Historic Preservation Office (SHPO) has determined that the 3R Alternative would have an Adverse Effect on the Cooper Landing Historic District: the Leo Douglas Cabin, the Riddiford Schoolhouse, and the Harry Brown Cabin (Figure 11 and Appendix H).

Avoidance Alternatives: The Kenai River and the abrupt mountainous terrain of the river valley are the limiting constraints for development within the vicinity. The Sterling Highway follows the valley walls, often along the toe of steep slopes, virtually on top of river banks. Along the corridor there are unstable slopes containing slide areas.

The **No-Build Alternative** avoids using Section 4(f) property, but does not satisfy the purpose of this project. The issue of safety is the major consideration for abandoning the No-Build Alternative. Limited sight distances on the winding roadway would not be remedied. For the most part, traffic congestion would worsen with increases in traffic, especially during the summer tourism season. Deterioration of the driving surface would accelerate with the increased traffic. Narrow shoulders pose serious concerns for vehicular emergency pulloffs and for pedestrians.

As discussed in the draft EIS Section II, Alternatives, all eleven build alternatives that were considered between MP 58 and MP 46 would impact one or more of the following Section 4(f) properties: the Kenai River Special Management Area (KRSMA), the Kenai National Wildlife Refuge (KNWR), the Resurrection Pass Trail, the historic Bean Creek Trail, the Cooper Landing Historic District, and the Sqilantnu Archaeological District. The Bean Creek Variant, the Juneau Creek Variant, and the Juneau Creek Alternative were the only build alternatives which avoided the Cooper Landing Historic District.

Only the previously discussed **3R Alternative** and the **Juneau Creek Alternative**, which is described below, were determined to be viable. The Bean Creek Variant was dismissed because of the number of residential and business properties that would be relocated and the involvement of other Section 4(f) properties. The Juneau Creek Variant was rejected because of the need for a major bridge crossing of the Juneau Creek Canyon and the involvement of several Section 4(f) properties. The remaining alternatives were deemed not viable for the reasons evaluated in Section II, Alternatives.

The **Juneau Creek Alternative** would avoid the Cooper Landing Historic District by constructing a new highway alignment away from the community and the river corridor. It would provide two 12-foot wide travel lanes, passing or climbing lanes where needed, and widened 4 to 8-foot shoulders. The existing highway between MP 58 and MP 55, and between MP 46 and MP 37 would be improved. At MP 55, the highway would leave the existing alignment and climb out of the valley onto benchlands along the north Kenai River valley wall until reconnecting with the existing Sterling Highway alignment near USFS Broadview Guard Station (MP 46). A tee intersection design is proposed for both the west and east termini of the realignment. There would be no improvements to the existing highway between MP 55 and MP 46.

With the **3R Alternative**, avoiding impacts to historic properties was not possible because of the highway's location, terrain restraints, density of the cultural resources, and other Section 4(f) properties.

In the area along the core of the Cooper Landing Historic District, road widening will require cuts up to 50 feet into the south side slopes. Additional right-of-way is needed to accommodate the cuts. Shifting the centerline to the south would require extensive cuts, the need for additional ROW, and a possible relocation. This action was determined to not be practical.

To avoid making cuts into the hillside below the Harry Brown Cabin, the highway centerline would have to shift to the north. This would involve placing fill within the Kenai River to accommodate the highway embankment. The Kenai River below Ordinary High Water, is part of the KRSMA, a Section 4(f) property. The KRSMA is considered by the agencies as having extraordinary high value. This action was not considered further.

Minimization: Prior to construction, the setting and exterior of the Leo Douglas Cabin and the Riddiford Schoolhouse would be photographed to Historic American Buildings Survey standards. At the Harry Brown Cabin, subsurface testing would be conducted in the area of a proposed cut and a revegetation plan developed.

Project mitigation will be developed and agreed to by SHPO and the property owners and formalized within a Memorandum of Agreement (MOA). It will be implemented prior to and in coordination with those project activities that could disturb archaeological resources.

To reduce proposed impacts to the Cooper Landing Historic District, the facility would be designed to minimize the limits of cut and fill. Best Management Practices as detailed in ADOT&PF's Storm Water Manual will be utilized during construction. Upon completion, all slope cuts, fill embankments, and other exposed earth work would be stabilized and revegetated during the first growing season to prevent erosion.

Coordination: The proposed action and associated Section 4(f) properties involvement was coordinated with SHPO, NPS, USF&WS, USFS, Kenaitze Tribe, and CIRI. The SHPO participated on a number of project meetings and made recommendations to assist with the environmental analysis. One of the property owners and several local residents were interviewed, providing a large quantity of documentation.

Concurrence on the project effects and proposed mitigation is required from ACHP. This concurrence and the MOA will be incorporated within the project's Final EIS. Coordination with the resource agencies and involved parties will continue throughout the project to minimize

potential impacts. If additional cultural resources are discovered during construction, all work which would affect these resources would be stopped and SHPO would be contacted.

VI. DRAFT SECTION 810 SUBSISTENCE EVALUATION. DRAFT SECTION 810 SUBSISTENCE EVALUATION

Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), Public Law 96-487, requires that no U.S. Department of Interior (DOI) approval may be granted for a project using federal lands in Alaska unless there is an evaluation and determination of the potential effects of proposed land-use activities on subsistence uses and needs. This project would involve two Section 810 properties, the Chugach National Forest (CNF) and the Kenai National Wildlife Refuge (KNWR) (Figure 10).

As defined in the Subsistence Management Regulations for Federal Public Lands in Alaska, (DOI 1993:4-9):

Subsistence uses means the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing of personal or family consumption; and for customary trade.

No subsistence means that the Board has determined that there is no priority for subsistence use of wildlife and fish resources. In these cases, there are no federal subsistence seasons. Hunting may be permitted under State regulations, and there is no federal priority for subsistence use.

Customary and traditional use means a long-established, consistent pattern of use, incorporating beliefs and customs which have been transmitted from generation to generation. This use plays an important role in the economy of the community.

If there is no customary and traditional use determination for a wildlife or fish species, then all rural Alaska residents are eligible for use of those species.

Rural means any community or area of Alaska determined by the Federal Subsistence Board to qualify as such. Only residents of communities or areas that the Board has determined to be rural are eligible for the subsistence priority.

Rural Alaska residents may take fish and wildlife on most federal public lands, except national parks and monuments, under federal subsistence management regulations.

SITE DESCRIPTION

The proposed highway project lies within State of Alaska Game Management Units (GMUs) 7 and 15, which cover altogether 8,400 square miles of the Kenai Peninsula (Figure 17). Customary and traditional use for wildlife and fish resources have been determined by the Federal Subsistence Board (Subsistence Management Regulations for Federal Public Lands in Alaska, [DOI 1993]). Subsistence species identified for GMUs 7 and 15 are black bear, brown bear, caribou, sheep, moose, goat, beaver, coyote, red fox, hare, marten, mink and weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan.

For GMU 7, a single customary and traditional use determination was made for goat in the Brown Mountain area. Residents of Port Graham and English Bay were given subsistence priority of this species. The Brown Mountain area is in the south Kenai Peninsula and well outside the highway project corridor.

For GMU 15, customary and traditional use determinations were made for moose, grouse, and ptarmigan. Subsistence priority for moose occurs in select areas of Unit 15(C) for residents of Port Dick, English Bay, and Port Graham. Unit 15(C) covers the south Kenai Peninsula, beyond

the highway project corridor. Customary and traditional use of grouse and ptarmigan is allowed throughout GMU 15. Subsistence priority is established for the rural residents of a large portion of Alaska, GMUs 11, 13, 15, 16, 20(D), 22, and 23. In order of listing, these GMUs are Wrangel Mountains-Chitina River, Nelchina-Upper Susitna, Kenai Peninsula, Lower Susitna, Nome, and Kotzebue Sound.

Ptarmigan and spruce grouse are upland birds and generally have a wide distribution within Alaska. Ptarmigan prefer alpine elevations. Grouse are found within coniferous forests.

The Alaska Department of Fish and Game (ADF&G), Division of Subsistence, has prepared "The Use of Fish and Wildlife in the Upper Kenai Peninsula Communities of Hope, Whittier, and Cooper Landing" (1992). These communities are considered as being rural. Cooper Landing is the only community within the project area. (Hope is north of Cooper Landing, about 46 miles by road. Whittier is about 43 miles northeast by road and then an additional 12 miles east by railroad.)

The ADF&G study indicates that harvest and use patterns for Cooper Landing and Hope are controlled by regulatory seasons and restrictions; access to game populations; the ability to fish or hunt in other areas; and the availability of permits. For purposes of this evaluation, Whittier is not discussed because of its more distant location and harvest use area. In Cooper Landing, 93 households (94 percent) hunted, fished, or gathered wild foods. The 1990/91 population was 258. In Hope, 60 households (94 percent) used harvested resources, and the population was 152.

Birds were a minor component of the resource harvest in both communities during 1990/91. The most common were ptarmigan and grouse. At Cooper Landing, 22 percent of the households used ptarmigan and 33 percent used grouse. The number of birds harvested were 442 and 288 respectively. At Hope, 30 percent used ptarmigan and 21 percent used grouse, or 349 and 88 birds respectively.

EVALUATION

Generally, subsistence activities for GMUs 7 and 15 are limited to only a few specific areas in the extreme south portions of the Kenai Peninsula. Although Cooper Landing and Hope are rural communities within GMU 7, they are not eligible for the subsistence priority on goats in GMU 7, nor are they eligible for the subsistence priority on moose, ptarmigan, or grouse of GMU 15. Even so, both communities would like to see regulations developed for local preference in hunting (and fishing) because of the competition from others who also live along the road system.

In terms of the rural communities in other GMUs that are eligible for the subsistence priority in GMU 15 on ptarmigan and grouse, the majority are remote and not within the Kenai Peninsula region. Subsistence activities are thought to generally occur more locally within the region surrounding each rural community. Harvesting ptarmigan and grouse in the GMU 15 appears to be done almost exclusively by nonsubsistence users.

The proposed project should not affect subsistence uses and needs or cause limitations on access into the area for rural residents of these other GMUs. With either alternative, the improved roadway should increase area accessibility. Construction is not likely to impact hunting activities. Although there could be a direct loss of habitat, these species have a widespread general distribution. Changes in the availability of these birds are not expected to result. Long-term cumulative impacts are not anticipated.

Several location alternatives were identified during the development of this project (See Figure 3 and Section II Alternatives). Most involved the reconstruction of the existing highway. Two involved a realignment along benchlands above the Kenai River through National System Land. However, all build alternatives that were considered between MP 55 and MP 46 would impact one or more of the following Section 4(f) properties (See Section V, Draft Section 4(F)

Evaluation): the Kenai River Special Management Area, the Kenai National Wildlife Refuge, the Resurrection Pass Trail, the Cooper Landing Historic District, and the Sqilantnu Archaeological District. The Kenai River system is considered by the resource agencies as being of extraordinary high value. For the reasons discussed previously in Section II, Alternatives, all but two build alternatives were eliminated from further consideration.

Only two build alternatives were considered viable and were carried through the environmental evaluation. A No-Build Alternative was also evaluated.

The **3R Alternative** would primarily upgrade the existing Sterling Highway alignment to provide two 12-foot wide travel lanes and widened shoulders. Passing and turning lanes would also be constructed. A pedestrian pathway would be constructed between MP 55 and MP 50, and the existing pathway between MP 50 and MP 45 would be upgraded. With this alternative, there would be little or no direct impact to habitat of either subsistence bird species of GMU 15.

The **Juneau Creek Alternative** would involve constructing a new 11.2-mile long highway corridor through National System Land and the Kenai National Wildlife Refuge. The proposed right-of-way (ROW) width is 300 feet. The action would provide a total 40-foot surface width: two 12-foot wide lanes and 8-foot shoulders. Where needed, a passing or climbing lane with a 4-foot outer shoulder would be provided. Construction would require clearings within the ROW. This alternative could directly impact bird habitat of GMU 15 and would create new access on National System Land.

RESOURCE FINDING

This evaluation concludes that the build alternatives of the proposed Sterling Highway MP 37-60 project will not result in a significant restriction of subsistence uses in the project area. No further evaluation is required.

VII. COMMENTS AND COORDINATION. COMMENTS AND COORDINATION

This project has been in development for many years with much agency and public involvement. Correspondence is on file at the Department's Anchorage Office. Transcripts of public scoping meetings in Cooper Landing (September 4, 1986) and in Anchorage, (October 21, 1986) are also on file.

The latest coordination was initiated with a Notice of Intent, which was published in the Federal Register on June 20, 1991. Agencies were notified through correspondence on December 5, 1991, and several agency scoping meetings and fieldtrips were held during 1992. Concerns of various agencies and the general public have been identified through correspondence, telephone contacts, and meetings.

A Preliminary Draft Environmental Impact Statement (EIS) was prepared and made available to the agencies on February 26, 1993. A Public Meeting was held in Cooper Landing on May 28, 1993. Several project and mitigation development, and Section 106 meetings with the agencies were held during 1993.

U.S.D.A. Forest Service (USFS) is a Cooperating Agency for this project. Most of the project is within and much of the proposed right-of-way for the Juneau Creek Alternative would be acquired from the USFS Chugach National Forest. They have reviewed and provided comments on the preliminary DEIS.

Their concerns include: 1) access to the Resurrection Pass Trail with a highway realignment; 2) changes in the recreation experience for Resurrection Pass Trail user; 3) impacts from increased use on Recreation Pass Trail on physical resources and recreation facilities; 4) replacement of

any relocated pullouts, and constructing two additional pullouts, one on each end of the Juneau Creek Alternative; 5) maintaining access to the Broadview Guard Station; 6) identification of archaeological resources; 7) protection of fish and wildlife and their habitat, especially brown bear and moose; 8) the need for separated pathways along the existing realignment; 9) the proposed Quartz Creek materials site; 10) crossing forest harvest areas; 11) construction methods and scheduling; and 12) minimizing impacts to visual resources.

The USFS prepared a technical report on the Resurrection Pass Trail, which included recreation management guidelines and affects of the proposed highway project on recreation and future recreation opportunities. Recreation development options were also developed. The USFS will be field locating the two proposed scenic pullout sites.

The USFS have worked closely with the Department to develop preliminary plans for new trailhead facilities. They have participated on several fieldtrips to survey the potential materials site and to view the proposed Resurrection Pass Trail crossing site. Staff biologists have provided studies and recommendations, and have continued to assist and develop draft mitigation plans for impacts to wetlands and fish and wildlife habitat. An eagle nest survey was also conducted by USFS along Juneau Creek and the highway project corridor. Section 106 Consultation is continuing with USFS for the archaeological sites to develop data recovery plans.

U.S. Fish and Wildlife Service (USF&WS) is a Cooperating Agency for this project. A portion of the project is within the Kenai National Wildlife Refuge and proposed right-of-way would be required from Refuge Wilderness. They have reviewed and provided comments on the preliminary DEIS.

Their concerns include: 1) wetlands involvement, including the Quartz and Daves Creeks; 2) protection of fish and wildlife and their habitat, especially eagles, Dall sheep, brown bear, and

anadromous fish; 3) identifying archaeological sites; 4) the proposed road within the Refuge Wilderness; and 5) project mitigation, including enhancement and restoration.

The USF&WS provided preliminary wetlands delineations for the Juneau Creek Alternative and areas west of Kenai Lake. Section 106 Consultation is continuing with USF&WS for archaeological sites to develop data recovery plans. Staff biologists have provided numerous studies and recommendations, and conducted a sheep survey including the Round Mountain herd near the project area. Staff biologists participated in a fieldtrip to assist in developing mitigation plans for impacts to wetlands and fish and wildlife habitat. The USF&WS is working with the Department, USFS, and ADF&G to develop preliminary mitigation plans.

U.S. Army Corps of Engineers (COE) is a Cooperating Agency for this project. Due to potential involvement within wetlands, a Section 404 permit from the Department of the Army would be required. The National Environmental Policy Act (NEPA) and Section 404 processes are being merged for the Sterling Highway MP 37 to MP 60 project. Consequently, the analysis and coordination documented in this EIS will be the basis for NEPA and Section 404 process decisions.

The COE provided blue-line copies, field checked in 1986, to identify wetlands in the vicinity of the Kenai River and Lake and adjacent highway areas through MP 43. They have reviewed and concurred with the Department's preliminary wetlands designations for the road corridor. In consultation with COE, the Department determined conceptual wetlands involvement, calculating potential acreage and fill amounts for both alternatives. The COE reviewed the draft EIS and agrees that it satisfies their preliminary Section 404 requirements (Appendix F). They have prepared a Draft Public Notice for the Department of the Army Section 404 Permit (Appendix F), which will be issued concurrently with the Draft EIS public notice of availability.

U.S. National Park Service (NPS) is a Cooperating Agency for this project. They have reviewed and provided comments on the preliminary DEIS. Their concerns focus on the

Resurrection Pass Trail and impacts to users, recreation issues and proposed mitigation, and historical and archaeological properties.

U.S. Environmental Protection Agency (EPA) declined to be a Cooperating Agency for this project. They reviewed and provided comments on the preliminary DEIS. Their concerns include: 1) the need to fully develop and evaluate an alternative for the EIS that would use the existing highway alignment, 2) the need for a water quality monitoring plan, 3) more detailed information on wetlands along the Juneau Creek Alternative, 4) a discussion of secondary impacts of fish and wildlife resources, and 5) developing mitigation and monitoring plans.

National Marine Fisheries Service (NMFS) have reviewed and provided comments on the preliminary DEIS. Their main concerns involve any riverine and fisheries impacts of the Daves and Quartz Creeks and the Kenai River, project mitigation, and any plans that would access the Kenai River.

Alaska Department of Natural Resources, Division of Parks & Outdoor Recreation (DPOR) supports the proposed realignment and prefer that the existing highway along the Kenai River corridor be used for local access and recreation purposes. They also support plans to develop scenic pullouts and trailhead facilities on the proposed realignment. They have reviewed and provided comments on the preliminary DEIS.

They have concerns on any involvement of the Kenai River, stream crossings at Quartz Creek and Juneau Creek, the proposed material site at Quartz Creek, and the fill placement along Daves Creek.

The DPOR is concerned that there is a lack of public rest stop facilities within the project corridor. They have provided conceptual plans for a pulloff overlooking Kenai Lake near the

Quartz Creek Road. Staff personnel have participated in fieldtrips for this project. They have requested a joint meeting with USFS recreation staff and the Department to discuss the development and management of the recreational and scenic aspect of this highway development, for both the old and new highway segments.

Alaska Department of Fish and Game (ADF&G) is concerned about fish and wildlife and their habitat, especially with an identified sheep transportation corridor above Juneau Falls. They have reviewed the preliminary DEIS. Staff biologists have participated in fieldtrips and meetings to assist in developing mitigation plans for impacts to wetlands and fish and wildlife habitat. They have also provided documentation, especially on anadromous fish habitat and harvest data, for this project. A draft mitigation plan for impacts to wetlands and fish and wildlife habitat is being coordinated with ADF&G. The ADF&G has concerns over potential long-term effects of the fisheries enhancement project and will reevaluate it prior to the Final EIS.

State Historical Preservation Office (SHPO) and the Office of History and Archaeology (OHA) have been involved with reconnaissance level surveys for the proposed realignments and Section 106 coordination. They have reviewed the preliminary DEIS. Areas identified as crucial are the Sqilantnu Archaeological District, the Cooper Landing Historic District, and the historic Resurrection Pass Trail. Determinations of Eligibility and Effect on historic properties and archaeological sites within the project area have been made in consultation with SHPO pursuant to Section 106 of the National Historic Preservation Act.

Alaska Department of Environmental Conservation (DEC) has reviewed and provided comments on the preliminary DEIS. DEC has concluded that provisions for storm water treatment will not be needed for this project because it is a rural facility. They want to review the proposed materials sites, plans for erosion and sediment control at those sites and the Quartz Creek bridge crossing, and proposals for any abandoned roadway segments. They believe there is potential to encounter contaminated underground storage tank sites along the Kenai River

Alternative and existing alignment. They advise that the Department survey any proposed fill and excavation sites and access routes prior to construction for contaminated soils. Other concerns included project permits and clearances, use of clean fill material, and private septic systems.

Cook Inlet Region, Inc. (CIRI) primary concerns are the Section 14(h)(1) lands of the Alaska Native Claims Settlement Act which are within the project corridor and treatment of cultural and historical resources. Proposed right-of-way acquisition would involve CIRI land. They have reviewed and provided comments on the preliminary DEIS, and request future opportunities for review and comment. Section 106 Consultation is continuing with CIRI on archaeological sites within or adjacent to the project corridor.

Kenaitze Tribal Council (KTC) is concerned with avoidance and preservation of burials and other cultural sites. They were provided a copy of the preliminary DEIS. Section 106 Consultation is continuing with KTC for archaeological sites within or adjacent to the project corridor.

Kenai Peninsula Borough, Planning Department has been working with Cooper Landing to develop a Community Comprehensive Plan. Their concerns include: the public should have opportunity to review the document when it is available; there is need for wider shoulders to provide passage for walking or for bikes; potential for slides east of Slaughter Gulch (approximately MP 46.5), and the need to protect the quality of the stream at the Juneau Creek crossing. The planning office has provided numerous documents, economic data for Cooper Landing, and land use maps for this project. They have reviewed and provided comments on the preliminary DEIS.

Cooper Landing Advisory Planning Commission and Cooper Landing Community Club drafted a community land use plan (1992) which is being reviewed for acceptance by the Borough. According to the Commission, the majority of the community prefers the Juneau Creek Alignment. Concerns would be generated if reasonable highway access was not provided

or if proposed access caused community relocations. The community is working with the Princess Tours to develop a new economic enterprise in Cooper Landing, and believe their actions would have tremendous beneficial impacts for the economy of the community to transform it into a tourist destination point.

The Cooper Landing Community Club requested a public meeting on May 27, 1993, in Cooper Landing for an update on the project status. They were provided copies of the preliminary DEIS. Several members of the community reviewed the document and provided comments. Their main concerns included: 1) existing concerns on highway safety concerns within Cooper Landing, 2) increased traffic and trucks/semi pulling tandems through Cooper Landing, 3) increased truck and traffic noise within the community, and 4) potential impacts on Cooper Landing residents with an upgrading of the existing highway. Those who wrote supported the Juneau Creek Alternative because it would remove through traffic away from the community and increase safety conditions. They were not in favor of rebuilding the existing highway through Cooper Landing.

VIII. LIST OF PREPARERS. LIST OF PREPARERS

Name/Education	Expertise Applied to the EIS	Professional Discipline Experience
COORDINATION AND SUPERVISION		
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Steven R. Horn, P.E.	Environmental Supervisor and Document Review project development	<u>Preliminary Design & Environmental Supervisor</u> 17 years ADOT&PF Design; management, supervision
Hank Wilson, P.E.	Preliminary Design and Document Review consulting	<u>Preliminary Design Project Manager</u> 16 years ADOT&PF; 13 years Alaska engineer
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