

#### 4.2.4.5 Summary

The Hurricane (West) alignment has the highest number of crossings compared to the other alternatives and the highest number of crossings over anadromous waters (see Table 4-14). However, proposed crossings over the four major anadromous streams would be designed with full span bridges.

The Seattle Creek (North) alignment has the fewest number of stream crossings and does not cross anadromous streams. However, the Seattle Creek (North) alignment would span between two watersheds: the Susitna and the Tanana. Impacting fewer watersheds is preferable because potential impacts (such as introduction of an invasive species) would affect a smaller geographic area if they were to occur. Additional research would be needed to identify potential impacts. The Butte Creek (East) alignment has a total of 29 stream crossings.

Table 4-14. Summary of fish crossings				
	South Road	Hurricane (West)	Seattle Creek (North)	Butte Creek (East)
Salmon stream crossings	8	4	0	0
Stream crossings requiring passage for resident fish	23	32	15	29

Red = Not preferable      Green = Favorable

#### 4.2.5 Terrestrial Resources

There are 142 species of birds (mostly migratory), 38 species of mammals, and one amphibian (the wood frog, *Rana sylvatica*) known or suspected to occur in the Susitna River basin (see Appendix I). In the upper and middle Susitna basins, where all the access corridors are located, 135 bird species have been documented (Kessel et al. 1982). The Susitna River basin, divided into five subbasins, extends west and south of the corridor study area, but excludes the northern part of the Seattle Creek corridor (ABR 2011).

There are no Federally or State-threatened, endangered, or candidate species of plants or animals known to occur in the study area (ABR 2011, HDR 2011a). Fifty-five bird species (including Trumpeter swans), one mammal (Alaska tiny shrew), and the wood frog are species of concern designated by various agencies and organizations in the Susitna basin (HDR 2011a). There are 17 plant species considered rare or sensitive in the Upper and Lower Susitna sub-basins (see Appendix I).

All migratory bird species are protected by the Federal Migratory Bird Treaty Act, which makes it unlawful to “pursue...take, capture, kill...any migratory bird...nest, or egg...unless authorized under a permit.” Take is defined in regulations as: “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” Both bald and golden eagles occur in the study area. They have additional protection under the Federal Bald and Golden Eagle Protection Act (Eagle Protection Act). Both acts are regulated by the U.S. Fish and Wildlife Service (USFWS), which sets project-specific timing windows for construction, establishes areas of impact, and stipulates buffers surrounding known nests.

The Eagle Protection Act provides for the protection of bald and golden eagles by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The management guidelines (USFWS 2007) include definition of zones around nest trees to avoid disturbance. The primary zone extends 330 feet from the nest tree, and land clearing or construction may be discouraged year-round. Human disturbance is discouraged, particularly during the spring-summer nesting season. A secondary zone ranges to a distance of 660 feet from the nest, and human disturbance must be minimized during the breeding season, but construction may be possible outside the nesting season (USFWS 2007).

The USFWS and FERC have recently developed a Memorandum of Understanding (MOU) regarding protection of migratory birds (FERC and USFWS 2011). While the MOU covers all species of migratory birds, it emphasizes “Species of Concern” that are identified by various names by agencies and multi-organization working groups. The MOU does not have regulatory authority that would affect alternative selection; consultation with USFWS and working groups will occur according to the terms of the MOU during the NEPA process.

Because of emphasis on certain species during previous studies for the Susitna Hydroelectric Project (SHP), caribou, moose, black and brown bears, Dall sheep, bald and golden eagles, ducks, and trumpeter swans were the focus of this Watana Transportation Access study. Available and pertinent summary information on wildlife species, status, distribution, habitat use, and past environmental reviews and recommendations for access routes were reviewed (APA 1981; Acres 1982; Kessel et al. 1982; ADF&G 1984, 2009 a–f; BLM 2002; ABR 2011; HDR 2011a).

Terrestrial resource data for the project area are largely from studies conducted in the early 1980s, with limited updates available (ABR 2011). Many of the earlier studies were focused on the Watana impoundment and/or downstream areas, and did not explicitly or completely cover the three alternative corridor routes proposed in this report. More current wildlife data may reflect changes in species distribution and habitat use, but this information is not readily available from ADF&G (ABR 2011). Recent eagle nest survey data for the project area is unavailable. Since nest occupation can vary from one year to the next, current data is essential to accurately determine areas subject to the USFWS primary or secondary zones. While this analysis assumes that the alternatives’ corridor widths are sufficient to avoid impacting primary or secondary eagle nest zones, a take permit may be required if disturbance is unavoidable.

There is no complete and current wildlife habitat mapping for the selected species that covers the entire access corridor study area. GIS data is not available for brown or black bears from the Alaska Habitat Mapping Guide (ADF&G 2009 a–f). The Susitna Area Planning habitat maps (ADF&G 1984), some of which include more detail than the Habitat Guide maps, are not available digitally, so the information gathered from them is only referred to in the text.

Environmental reviews and recommendations of access alternatives chosen in the 1980s are not completely applicable to the proposed alternatives in this analysis due to differences in configurations and locations (APA 1981). In addition, there was no environmental analysis for an access corridor in the Butte Creek (East) route area (APA 1981).

Due to these data limitations, most of the following analysis was based on the available maps and reports, and is presented as a qualitative comparison between the alternatives.

#### 4.2.5.1 South Road

The South Road corridor is anticipated to have fewer adverse impacts to caribou compared to the other three alignments. It intersects the least mapped winter habitat (449.6 acres), summer habitat (942.2 acres), and migration area (0 acres) than Hurricane (West), Seattle Creek (North), or Butte Creek (East). “The upper Prairie Creek, Stephan Lake and Fog Lakes areas support one of the largest year-round moose concentrations in the region” (APA 1981 2-29 and 2-30). The South Road corridor intersects the fewest acres of moose general habitat and calving habitat. The South Road corridor intersects slightly more rutting and winter moose habitat than the Seattle Creek (North) corridor but less than Hurricane (West) and Butte Creek (East). “The upper Prairie Creek, Stephan Lake and Fog Lakes areas support one of the largest year-round moose concentrations in the region” (APA 1981 2-29 and 2-30).

The South Road corridor does not intersect mapped sheep habitat (Figure 4-10 and Table 4-15). This alignment impacts fewer acres of general habitat for migratory ducks than the Hurricane (West) alignment but more than the other two alignments. This alignment impacts slightly more acreage of general swan habitat than the Hurricane (West) alignment and more than Seattle Creek (North) and Butte Creek (East).

Bears, especially brown bears, have been known to inhabit the area near upper Prairie Creek, Stephan Lake, and Fog Lake. This area is near a “midsummer migratory route for bears moving from the Susitna River to Prairie Creek.” (APA 1981 2-30).

#### 4.2.5.2 Hurricane (West)

With a few exceptions, the Hurricane (West) corridor has fewer adverse impacts to caribou and moose compared to the Seattle Creek (North) route, because this corridor traverses or approaches fewer areas of productive habitat and zones of species concentration or movement (APA 1981, Acres 1982). This corridor includes both summer and winter caribou habitat range (ADF&G 1984; see Figure 4-8 and Table 4-15), but earlier studies suggested that this area has little use by caribou (APA 1981, ABR 2011). Most or all of the entire corridor is mapped for general, summer, or rutting, or winter habitat for moose (ADF&G 1984; Figure 4-9 and Table 4-15), but moose were not considered abundant in this area during the early 1980s except for the mouth of Tsusena Creek (APA 1981).

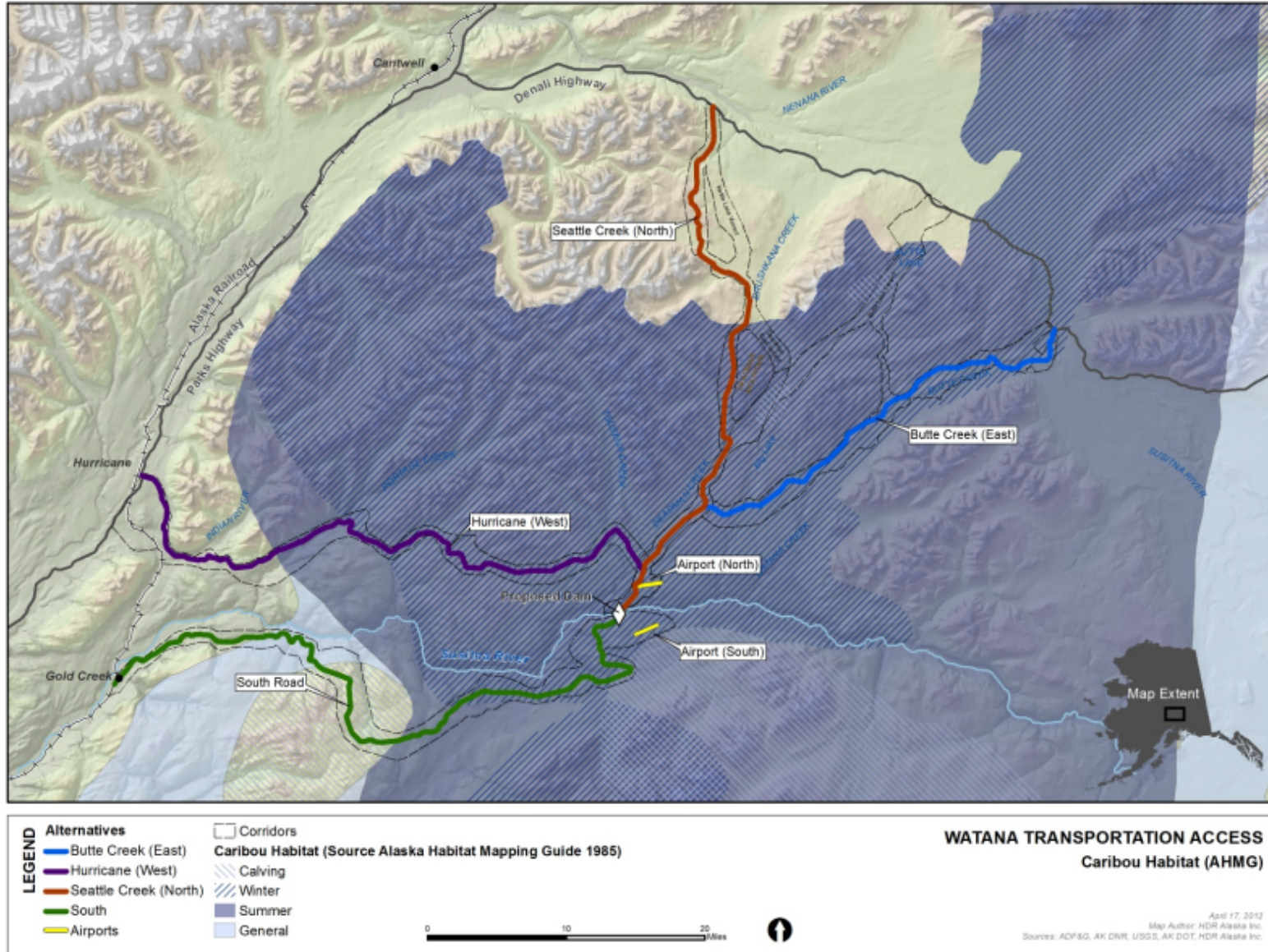


Figure 4-8. Caribou habitat

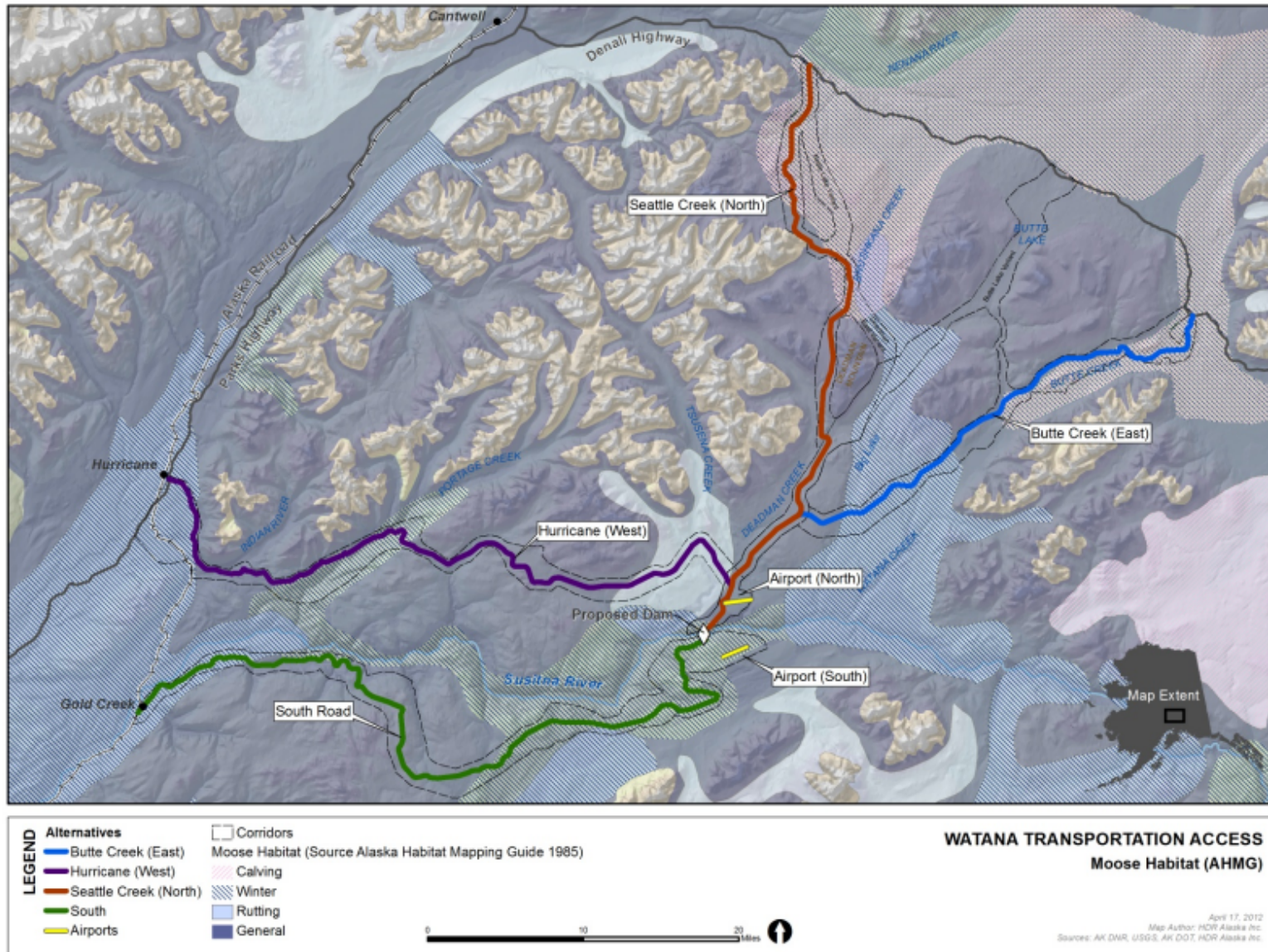
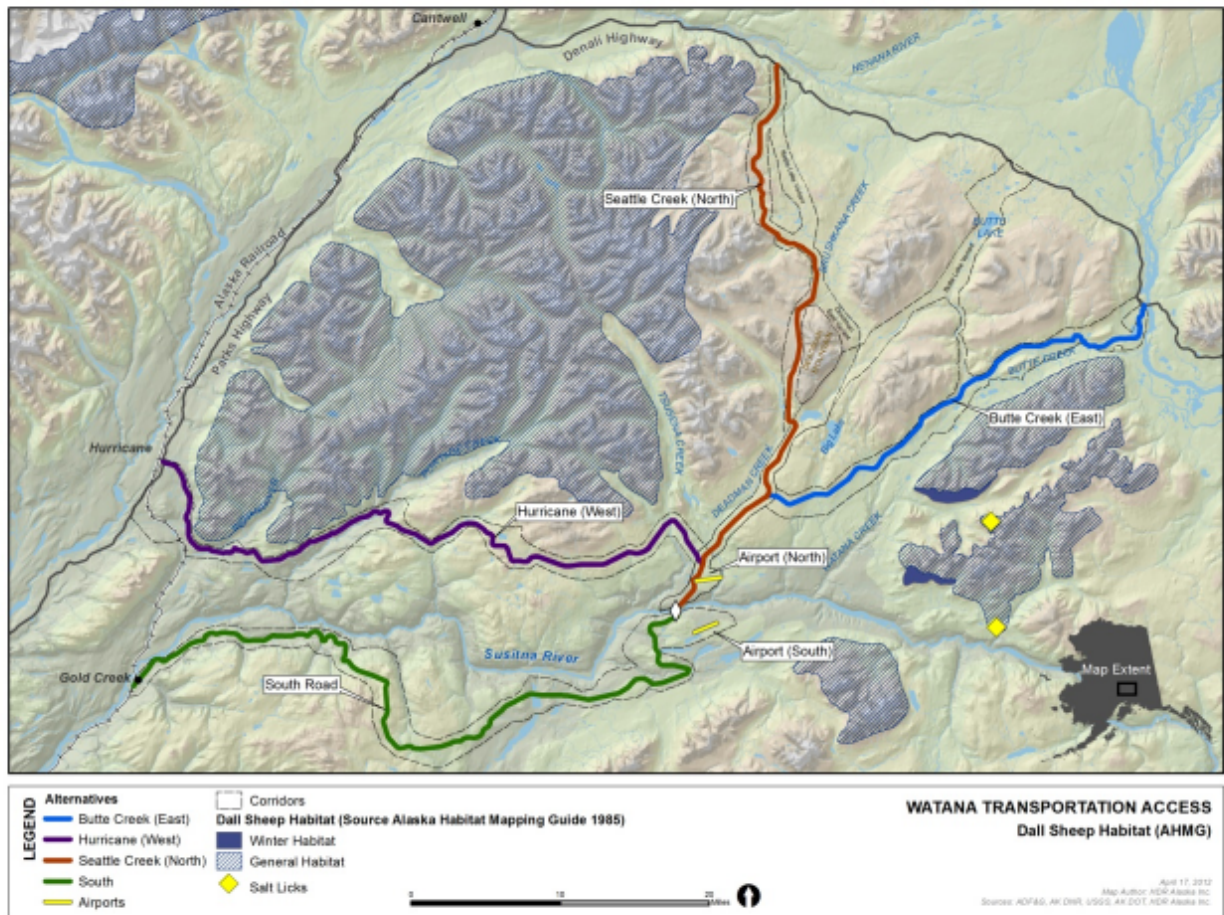


Figure 4-9. Moose habitat

Along the eastern half of the corridor, brown bears were more common than black bears (APA 1981). An area just north of the corridor and south of the headwaters of Devil and Clark Creeks was mapped as a brown bear denning area, and Portage Creek was identified as a brown bear concentration area during seasonal salmon abundance (ADF&G 1984). The extreme western end of the corridor was mapped as “intensive use” by black bears during the spring (ADF&G 1984), and the mouth of Tsusena Creek was also considered important habitat for black bears (APA 1981). The rest of the corridor is mapped as “general distribution” of black bears.

The Hurricane (West) corridor comes the closest to mapped Dall sheep habitat of the four alternatives, but does not intersect sheep habitat (Figure 4-10 and Table 4-15).



**Figure 4-10. Dall sheep habitat**

The Hurricane (West) corridor intersects the most migratory duck habitat (387 acres) of the four corridors, and intersects the same amount of trumpeter swan habitat as the Butte Creek (East) route (65 acres; see Figure 4-11; Table 4-15).

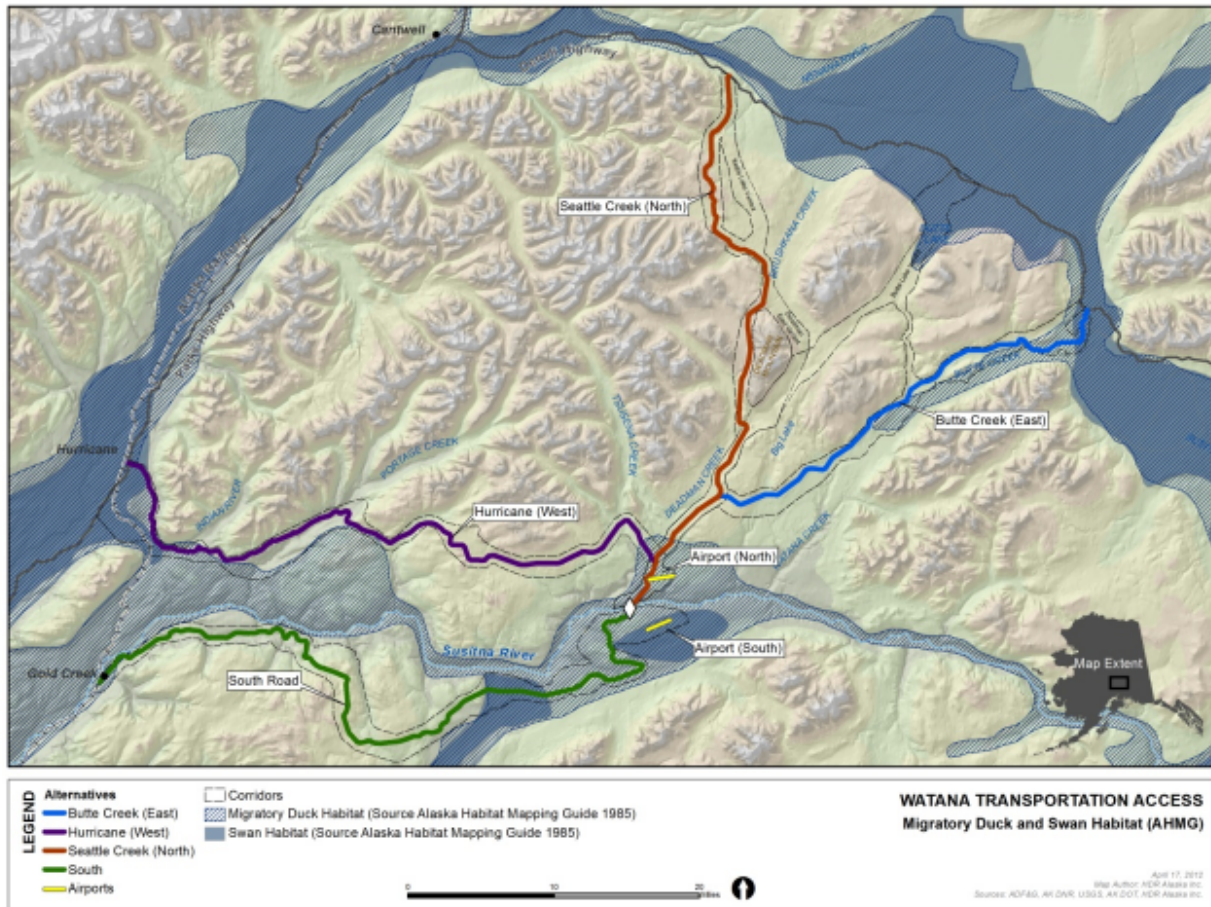


Figure 4-11. Duck and swan habitat

#### 4.2.5.3 Seattle Creek (North)

The Seattle Creek (North) route has more potential for wildlife disturbance and increased public access to caribou and brown bear habitat and movement zones than much of the Hurricane (West) route (Acres 1982). Moose and caribou were considered the most numerous big game species along this route, compared to estimates along variations of the West route (APA 1981). More than half of the corridor has been mapped as general habitat for moose (ADF&G 1984, ADF&G 2009 a–f), although upper Deadman and Brushkana Creeks have been mapped as a fall concentration area (ADF&G 1984), and the northern part of the corridor has been mapped as both calving and winter habitat (Figure 4-9; Table 4-15). The corridor intersects year-round habitat (see Figure 4-8) for a subherd of the Nelchina caribou herd (up to 1,500 animals), and seasonal habitat for some of the migratory Nelchina and Delta herds (APA 1981, ABR 2011).

This corridor bisects an area of about 32 square miles west of Deadman Mountain that was mapped as a brown bear denning area (ADF&G 1984). No brown bear concentration areas are intersected or nearby (ADF&G 1984). The entire corridor is mapped as “general distribution” for black bears.

This corridor is well outside Dall sheep habitat (Figure 4-10; Table 4-15), and intersects the least amount of migratory duck habitat (322.1 acres) and trumpeter swan habitat (0 acres) of the four alternatives (Figure 4-11; Table 4-15).

#### 4.2.5.4 Butte Creek (East)

The Butte Creek (East) route was not included in previous environmental reviews of access alternatives (APA 1981, Acres 1982). This entire corridor has been mapped as year-round range for caribou (ADF&G 1984; Figure 4-8), and the entire corridor crosses general, winter, rutting, and calving habitat areas for moose (ADF&G 2009 a-f; Figure 4-9). This corridor does not intersect or closely pass brown bear denning or concentration areas or Dall sheep habitat (ADF&G 1984; Figure 4-10). The entire corridor is mapped as “general distribution” for black bears (ADF&G 1984).

The Butte Creek (East) intersects a similar amount of duck habitat (763.5 acres) than the South Road corridor, less duck habitat (744.7 acres) than the Hurricane Creek (West) corridor (965.3 acres), but more than the Seattle Creek (North) corridor (322.1 acres; Figure 4-11). This corridor intersects an less of trumpeter swan habitat than the South Road (166.4 acres) and the Hurricane Creek (West) corridor (163.6 acres), but more than the Seattle Creek (North) corridor (0 acres).

#### 4.2.5.5 Summary

There are no Federally or State-threatened, endangered, or candidate species of plants or animals known to occur in any of the three corridors. The South Road corridor appears to pose the least impact to caribou. The South Road corridor impacts the least amount of general moose habitat but the highest amount of winter habitat. The Hurricane (West) corridor appears to be less impactful to moose and caribou compared to the Seattle Creek and Butte Creek corridors because it has fewer areas of productive habitat and zones of species concentration or movement.

The South Road corridor intersects a similar amount of migratory duck habitat (763.5 acres) to the Butte Creek (East) corridor. This is less than the amount of migratory duck habitat impacted by Hurricane (West) but more than double that of Seattle Creek (North). This corridor also impacts a similar amount of trumpeter swan habitat (166.4 acres) as the Hurricane (West) corridor.

The Hurricane (West) corridor intersects the most migratory duck habitat (965.3 acres) of the four corridors, and intersects more trumpeter swan habitat than Seattle Creek (North) alternative (0 acres) or the Butte Creek (East) route (71.3 acres).

The Seattle Creek (North) corridor is well outside Dall sheep habitat, and intersects the least amount of migratory duck habitat (322.1 acres) and trumpeter swan habitat (0 acres) of the three alternatives.

The Butte Creek (East) intersects less duck habitat (744.7 acres) than the Hurricane (West) corridor (965.3 acres), but more than the Seattle Creek (North) corridor (322.1 acres). This corridor intersects more trumpeter swan habitat than Hurricane (West) corridor (163.6 acres) or the Seattle Creek (North) corridor (0 acres).

As the GIS mapping for terrestrial resources did not cover the entire area being studied and may not reflect current conditions, each corridor was also ranked using professional judgment of available information for the selected species as a whole. The corridors were ranked on a 1 to 5 scale with 1 representing no impact to terrestrial resources and 5 representing a significant impact to threatened and endangered species (see Table 4-15).



**Table 4-15. Summary of impacts to terrestrial resources**

	Corridor			
	South Road	Hurricane (West)	Seattle Creek (North)	Butte Creek (East)
<b>Caribou</b>				
Winter habitat (acres)	449.6	1,797.8	1,489.0	2,552.0
Summer habitat (acres)	942.2	2,226.0	1,489.0	2,552.0
Migration (acres)	0.0	162.7	1,46.3	146.3
Habitat qualitative score	2	2	3	3
<b>Moose</b>				
General habitat (acres)	738.8	1,703.4	1,677.1	1,404.0
Calving habitat (acres)	0.0	0.0	922.2	584.3
Rutting habitat (acres)	320.5	838.2	50.5	534.7
Winter habitat (acres)	1,255.0	874.3	951.0	1,147.8
Habitat qualitative score	2.5	2	3	3
<b>Dall sheep</b>				
Habitat (acres)	0.0	0.0	0.0	0.0
Habitat qualitative score	1	2	1	1
<b>Migratory duck</b>				
General habitat (acres)	763.5	965.3	322.1	744.7
<b>Swan</b>				
General habitat (acres)	166.4	163.6	0.0	71.3
Nesting habitat (acres)	0.0	0.0	0.0	93.0
<b>Bear</b>				
Habitat qualitative score	3.5	3	2.5	2

Red = Not preferable    Green = Favorable

## 4.2.6 Wetlands and Vegetation

### 4.2.6.1 Wetlands

Wetlands are regulated by the Corps, whose permitting authority requires identification of measures to minimize harm to wetlands. This is typically demonstrated in alternative development that demonstrates alignment placement attempting to avoid identified wetlands. Acreage quantification of wetland type will identify the relative impacts of the three project alternatives to jurisdictional wetlands.

The USFWS National Wetland Inventory (NWI) mapped wetlands in the general project area in 1984 (see Figure 4-12 and Appendix J). NWI mapping is an effective tool for large-scale planning and wetland analysis but is generally not suitable for a Section 404 permit application. NWI mapping is based primarily on aerial photographic interpretation with limited ground verification, and therefore wetland boundaries tend to be overly simplistic, with many smaller wetlands not included in the mapping.

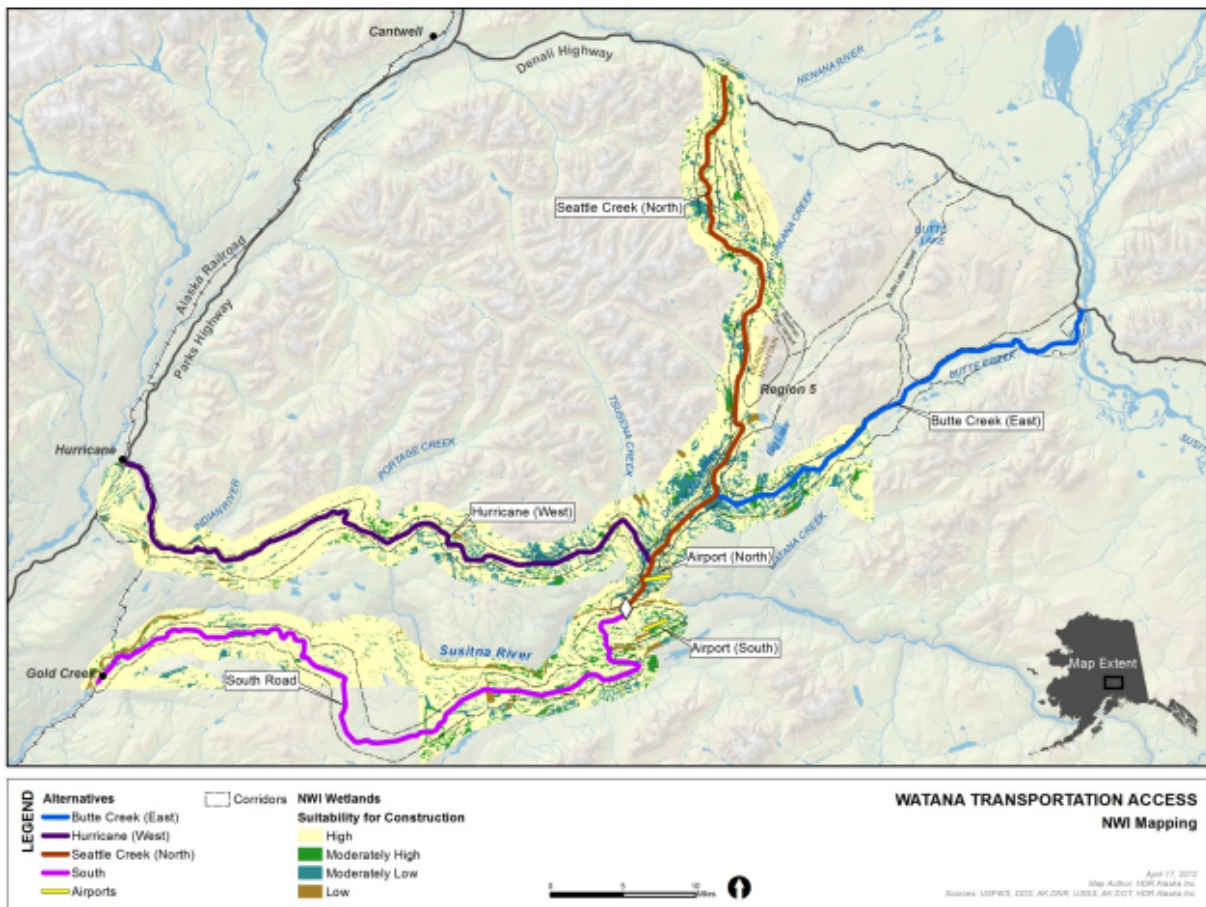


Figure 4-12. Wetlands

Current NWI mapping does not include, approximately half of the Butte Creek (East) alternative and a portion of the South Road alternative, and the inventory therefore does not include the extent of the current project alternatives. Digital Data Services, Inc. digitized hardcopy NWI maps into a GIS layer in 2011 to support an evaluation of mapped wetlands within each proposed

project alternative corridor. A small portion of the westernmost portion of the Hurricane (West) alternative was not included in the digitized effort; however, the existing NWI mapping was digitized by HDR to complete digital coverage for that alternative. Mapping boundaries in the project area are shown in Appendix J. No other wetland mapping datasets exist that would provide a more detailed inventory or accurately describe functional analysis of wetlands within each alternative corridor.

In general, wetlands may serve environmentally beneficial functions including water quality regulation, animal habitat provision, and flood protection, which are provided relative value by the Corps. While functional assessment methodology is often applied to field investigations, and field indicators are recorded to determine potential functional performance of a wetland, these activities are outside the scope of the Watana Transportation Access Study, which is to identify potential landscape-level impacts that would deter further study and selection of a project corridor. This study has used typical wetland functions based on wetland types to determine construction suitability, and has not verified the existence of these functions in the field.

#### **4.2.6.2 Construction Suitability Categories**

For this evaluation, wetlands and uplands identified through NWI mapping were classified into four construction suitability categories (Table 4-16). Areas with a high suitability rating (Category 1) are expected to allow for the easiest construction and have the fewest regulatory and design permitting challenges. Areas with a low suitability rating (Category 4) are expected to pose the greatest challenges to construction, including the most permitting and design challenges. Category 4 areas would likely require water crossings, addressing strong regulatory concern and stringent environmental considerations, and result in a longer, more complicated permit acquisition process. These suitability categories are based on the wetland type associated with the NWI mapping data and the general wetland functions that these wetland types typically perform.

Uplands were ranked as Category 1 because a Section 404 permit would be unnecessary for construction in these areas.

The wetland types listed in Category 2 represent forested and scrub/shrub wetlands. These wetlands may perform functions including groundwater discharge, wildlife habitat provision, and sediment and pollutant retention. This category was associated with a “moderately high” suitability ranking. These wetlands were assigned a slightly lower suitability because forested and scrub/shrub wetlands are generally widespread and are least likely of all the wetlands to perform functions that are unique to wetlands.

Emergent wetlands are dominated by grass-like plants, are represented in Category 3, and have a “moderately low” suitability ranking. The functions of emergent wetlands can be highly variable depending on their topographic position and level of inundation or saturation. In general, emergent wetlands provide functions for groundwater discharge, stormwater runoff attenuation, and habitat for water-dependent wildlife. In addition, many emergent wetlands perform water quality improvement functions and do so at a greater rate than other wetland types because they have more water movement within and through them. The water input and movement typically causes emergent wetlands to provide more productive habitat and allows them to export organic material to support downstream ecosystems. Emergent wetlands near human development (including roads) may protect water quality by retaining sediments and other pollutants.

The wetland types included in Category 4 represent open water habitats. In general, these wetlands represent the most unique wetland types within the project area, and have been assigned a "low" suitability ranking. Permanently flooded wetlands, streams, and lakes were assigned to this category because they typically provide important wildlife movement corridors, improve stream water quality, provide habitat cover for fish, and stabilize stream banks against erosion. These wetlands and waterbodies are also likely to export organics to aquatic systems, and perform flood flow attenuation that protects downstream habitats and water quality.

Any fill placed in the wetlands included in Categories 2, 3, and 4 would likely require a Corps Section 404 Permit.

Table 4-16. NWI wetland classification association with general categories		
Category (Suitability for Construction)	Wetland Type and NWI Code	
1 (High)	Uplands (U)	
2 (Moderately High)	<u>Forested Wetlands</u> PFO4/SS1B	<u>Scrub/Shrub Wetlands</u> PSS1A PSS1B PSS1/4B PSS/F04B
3 (Moderately Low)	<u>Emergent Wetlands</u> PEM1C PEM1F	PSS1/EM1B PSS1/EM1C
4 (Low)	<u>Lake or Reservoir Basins</u> L1OWH <u>Rivers or Stream Channels</u> R3OWH	<u>Additional Open Water Codes</u> PEM1H POWH

The acreage of wetland category, as grouped by association in Table 4-16, was determined for each project alternative corridor for a 300-foot buffer (150 feet either side of centerline) and represents a potential right-of-way corridor-level assessment of wetlands associated with each corridor. Table 4-17 presents wetland category impacts, by alternative, for this area.

As noted above, NWI mapping is not available in either hand-drawn or digital formats for the eastern approximately half of the Butte Creek (East) alternative and approximately 316.5 acres of the South Road alternative. Because of this lack of data, total acreage calculations for the Hurricane (West) and Seattle Creek (North) alternatives should not be directly compared to those for the South Road and Butte Creek (East) alternatives. It is likely, given the landscape location of the alternative in the Susitna River valley, that wetlands are present throughout the unmapped area. Additionally, riverine wetlands are included in Category 4 and have the greatest relative value; it is expected that the Butte Creek (East) alternative would be within close proximity of riverine wetlands along the unmapped portions of the route. It is likely that the total acreage of wetland impacts is underrepresented by the available data presented in Table 4-17.

**Table 4-17. Acres of wetland impacts, by alternative and category**

Alternative <sup>a</sup>	Total acres of wetland impact (Categories 2–4 combined)	Acres of impact, by category			
		1	2	3	4
South Road <sup>b</sup>	226.8	1,449.6	150.4	69.9	6.5
Hurricane (West)	553.9	2,589.6	59.0	485.3	9.6
Seattle Creek (North)	699.2	1,928.9	199.9	490.1	9.2
Butte Creek (East) <sup>c</sup>	544.1	817.2	95.5	442.6	6.0

<sup>a</sup> Each alternative assumed a 300-foot buffer

<sup>b</sup> NWI mapping is not available for approximately 316.5 acres of the South Road alternative; therefore, the acreage of impacts shown for this alternative are not for the entire corridor.

<sup>c</sup> NWI mapping is not available for approximately half of the Butte Creek (East) alternative; therefore, the acreage of impacts shown for this alternative are not for the entire length of the route.

Using existing data, the Seattle Creek (North) alternative impacts the greatest total acres of wetlands, but impacts similar acreage of Category 3 and 4 wetlands as the Hurricane (West) alternative. While the Corps will require preparation of a permit for impacts to all wetlands regardless of the wetland's relative value, wetland impacts to Category 3 and 4 wetlands are expected to receive the greatest scrutiny for efforts made during preliminary design to avoid or minimize impacts. Consultation with the Corps will be necessary to further evaluate permit stipulations and conditions, including potential mitigation options. For more information about wetlands, please see Appendix J.

#### 4.2.6.3 Vegetation

Earth cover habitat types for the Gulkana region, which includes the project area, was mapped by the Bureau of Land Management (BLM) and Ducks Unlimited in 1997, and contains highly diverse landscapes used by a variety of animals (BLM 2002). While this mapping effort was initially focused on wetland and upland boundaries, the project scope was expanded to quantify nine habitat types: forest, shrub, herbaceous, aquatic, barren, urban, agriculture, cloud/shadow, and other. Each habitat type is further delineated into subtypes. This dataset is incomplete for the project area, so acreage of impact to vegetation types was not calculated. Vegetation cover alone is not subject to regulatory authority, and so would not be a considerable factor in alternatives screening.

The BLM includes 17 plant species considered rare or sensitive in the Upper and Lower Susitna sub-basins; these are listed below in Table 4-18 (HDR 2011a). None of the listed species are subject to management restrictions, permit limitations, or law; however, consultation with BLM regarding distribution and potential impact to listed species will be required during the NEPA process.

**Table 4-18. BLM-listed rare and sensitive plants in the project area**

Species <sup>a</sup>	Sensitive (S) or Watch List (W) Plant <sup>c</sup>
<i>Aphragmus eschscholtzianus</i>	W
<i>Arnica mollis</i>	—
<i>Artemisia laciniata</i> <sup>d</sup>	W
<i>Botrychium ascendens</i>	S
<i>Ceratophyllum demersum</i>	—
<i>Douglasia alaskana</i>	S
<i>Douglasia gormanii</i>	W
<i>Draba ruaxes</i>	—
<i>Erysimum asperum</i> var. <i>angustatum</i>	S
<i>Papaver alboroseum</i>	S
<i>Potamogeton robbinsii</i>	W
<i>Ranunculus kamchaticus</i>	W <sup>e</sup>
<i>Smelowskia pyriformis</i>	S
<i>Stellaria alaskana</i>	W
<i>Taraxacum carneocoloratum</i>	W
<i>Thlaspi arcticum</i>	W
<i>Viola selkirkii</i>	—

<sup>a</sup> Query of BIOTICS Database (Santosh 2011) unless otherwise noted

<sup>b</sup> AKNHP 2008

<sup>c</sup> BLM 2010

<sup>d</sup> MON 2011

<sup>e</sup> Listed by BLM as *Oxygraphis glacialis*

#### 4.2.7 Land Status

There are several land ownerships<sup>24</sup> in the project area, including the Federal and State governments, Alaska Native corporations, and other private land owners (see Figure 4-13). Federal lands in the project area are controlled by the BLM. State lands include properties owned by the State of Alaska (State), properties selected by the State of Alaska (State Selected), and

<sup>24</sup> Due to the conceptual level of this study, minimal efforts have been made to avoid specific parcels and to ensure that impacts to certain parcels may be minimized through future design refinements.

properties selected by the State of Alaska for which the state has been granted tentative approval by the Secretary of the Interior for transfer of these properties to state ownership (State TA), but title to these properties has not yet transferred. Native corporations (Native) lands may include Selected Regional Native Corporation Lands (Native Selected). Other private lands may include ownership by private citizens or corporations (Private), and Boroughs (Borough). Native allotments have been identified in the South Road corridor but not the other three corridors.

In general, the time it takes to acquire ROW/construction rights varies by ownership. Based on previous experience, BLM lands generally take the longest to acquire, with an estimated time of 24 to 36 months from the time the application is filed and accepted by the BLM as complete. In general, it can take up to 3 months to prepare an application. It is recommended that consultation with the BLM be initiated early in the project development process (pre-application). The pre-application can and usually pulls in other Federal/State agencies to participate. This pre-application meeting is very important for this project as there are several BLM field offices that manage the various lands. When an application such as this one involves lands under more than one jurisdiction of more than one office, the BLM Field Manager having jurisdiction over the application process will be determined. Only one permit needs then to be filed. After successful negotiations, BLM would issue a ROW Grant for the right of way. Land issues for BLM may be managed out of the Fairbanks, Anchorage, or Glennallen BLM office. If the ROW does not require any federal land (i.e. the ROW is all state land), there would be no BLM involvement in the ROW acquisition process.

Lands owned by Native corporations typically take between 18 and 24 months to negotiate acquisition. Should negotiation for Native lands not be achievable, the State does have condemnation authority for the property. However, condemnation of Native land would be precedence-setting, as the State has not condemned Native lands to date.

A Native allotment refers to a piece of unappropriated, and unreserved public land granted to an eligible applicant under the Alaska Native Allotment Act of May 17, 1906, as amended. The acquisition process from a Native allotment can be complex because out of the roughly 15,000 proposed or existing allotments, only a little more than half have been certified. The process for acquiring land from an allottee or an allottee's heirs can be a lengthy process. Most allotments are restricted which means the process must work through the Bureau of Indian Affairs (BIA). If an allotment has had its restriction classification removed, then the process would be the same as acquiring land from any other private property owner. Only a very small number of allotments have had their restriction classification removed.

The restricted allotments are managed by the BIA for the allottee and/or their heirs. Each allotment can contain up to 160 acres and may be divided into as many as four parcels at different locations. The location of an allotment frequently changes during the adjudication process. Reasons for these changes include a lack of an adequate legal description, overlapping land boundaries, land that has been already conveyed to another party prior to filing, filing on top of other land uses such as 17(b)<sup>25</sup> easements or a lake or river or within a State park. Many allotments are still being surveyed. Until the survey is complete the exact location of the allotment is not guaranteed. The BLM is working on surveying as time allows. Acquiring

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<sup>25</sup> A 17(b) easement is an easement "on lands which will be conveyed to Alaska Native Village and Regional Corporations in order to allow public access to public land and water" (DNR 2012).

property from any restricted native allotment is coordinated through the BIA. This process typically takes between anywhere from 6 month up to a year to complete. There are some cases where this process has taken over 2 years to complete. On some projects, the acquisition process has stalled due to the inability to locate allottees or to reach agreement on the terms of the acquisition. Private lands, including those owned by private individuals, private corporations, or Boroughs, generally takes up to 18 months for ROW acquisition. State lands generally take a similar amount of time to acquire for State-supported projects. State-, Private-, and Borough-owned land acquisition usually is not on the critical path for projects of this type.

For a road access corridor, a 300-foot ROW is typically acquired. The quantity of land from each landowner type for a preliminary ROW is summarized in Table 4-19. The acreage of land by land owner type for the corridor is also shown in Table 4-19 to indicate how future changes to the alignment could influence ROW acquisition.

None of the four corridors cross designated Wilderness lands or wild and scenic rivers, or would require the acquisition of land from Denali State Park. Near Gold Creek, the ARRC tracks are located at the boundary of Denali State Park. Any activity west of the tracks would require the acquisition of land from the park. The South Road alignment would require the acquisition of land from the Nelchina Public Use Area. The Nelchina Public Use Area was created by the legislature in 1985 to:

- Protect fish and wildlife habitat, particularly caribou calving areas, trumpeter swan nesting areas, and other important habitats for moose, Dall sheep and brown bear so that traditional public uses of fish and wildlife populations may continue;
- Perpetuate and enhance public enjoyment of fish and wildlife and their habitat, including fishing, hunting, trapping, viewing, and photography;
- Perpetuate and enhance general public recreation in a quality environment;
- Perpetuate and enhance additional public uses described in the Susitna Area Plan;
- Allow additional public uses of the area in a manner compatible with the purpose specified above. (AS 41.23.010)

The Hurricane (West) corridor contains 19,443 acres of State-owned land, which is the lowest of the four corridors. The Butte Creek corridor contains the most State land (27,939 acres). The Hurricane corridor also contains the most Federal land (14, 817 acres). This is almost double the amount of Federal land in the Seattle Creek (North) and Butte Creek (East) corridors. The South Road corridor does not contain any Federal land. The South Road corridor contains substantially more Native corporation land (40,828 acres) than the other three corridors. The Hurricane (West) corridor contains much less Native corporation land (300 acres). The other two corridors contain the fewest acres of Native corporation land (45 acres each). In each corridor, land is owned by Cook Inlet Regional Corporation, Knikatu, and Tyonek Native Corporation<sup>26</sup>. It also contains the most private/Borough land. Within the MSB<sup>27</sup>, GIS records indicate there are approximately 10 private landowners<sup>28</sup> in the South Road corridor, 118 private landowners in the Hurricane

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<sup>26</sup> Specific landowner information was not available for lands within the Denali Borough.

<sup>27</sup> Specific landowner information was not available for lands within the Denali Borough.

<sup>28</sup> A landowner may own one or more parcels.



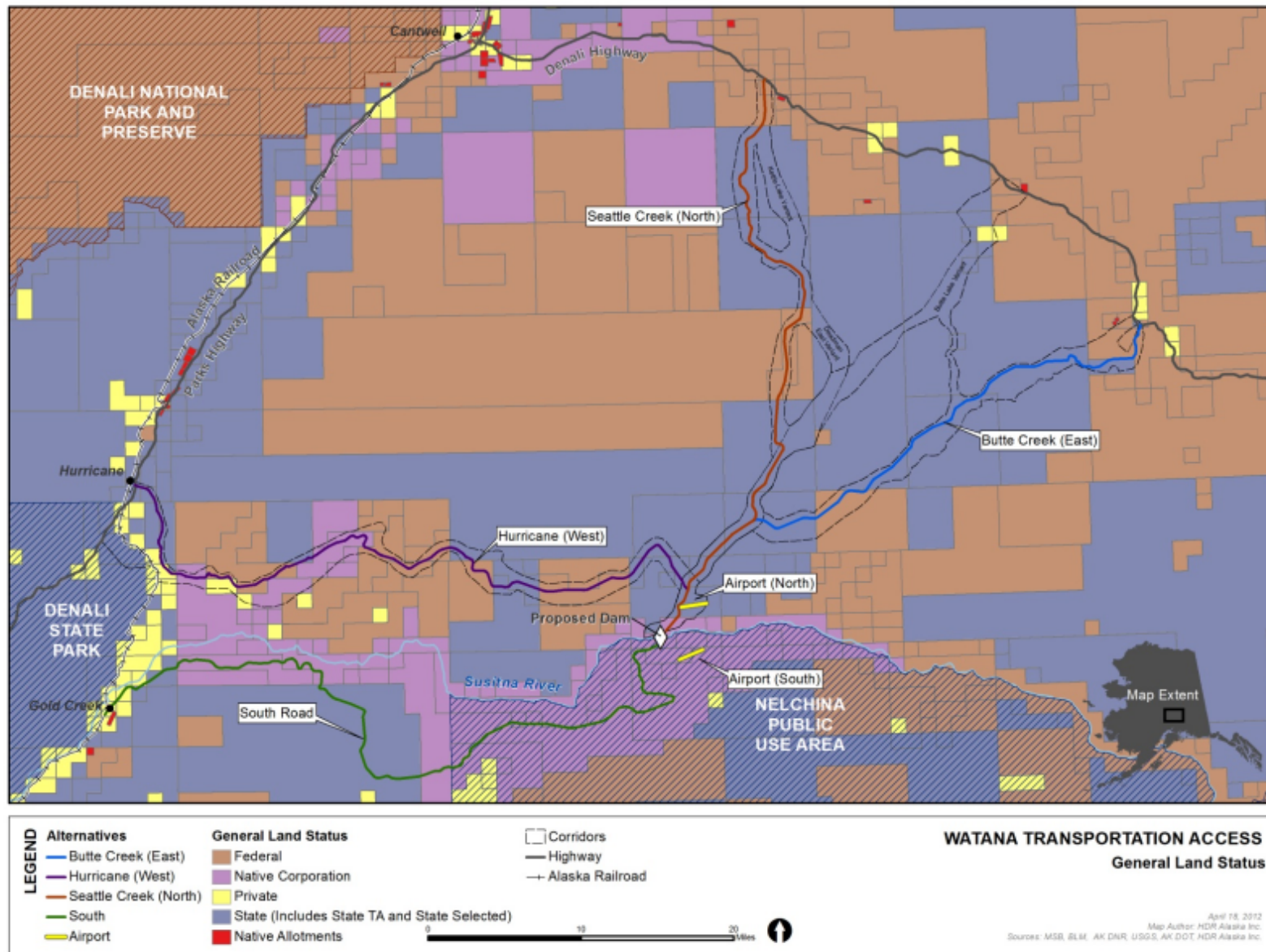


Figure 4-13. Generalized land status

(West) corridor, and two private landowners in the Butte Creek (East) corridor. There are no identified privately owned lands within the Seattle Creek (North) corridor<sup>30</sup>

The potential Hurricane (West) ROW uses the most federal land (771 acres) compared to South Road (0 acres), Seattle Creek (North; 357 acres) and Butte Creek (East; 255 acres). The potential Butte Creek (East) ROW uses the most state owned land (1,230) which is only slightly more than Seattle Creek (East; 1,174 acres). The South Road ROW contains the least amount of State owned land (417 acres). The South Road ROW contains substantially more Native corporation land (1,466 acres) than the other three alternatives. The Hurricane (West) ROW contains a substantial amount more private land (300 acres) than the other 2 alternatives (45 acres each). The South Road and Hurricane (West) ROW are the only two that would use private/Borough-owned land.

The proposed location of the railroad laydown yard at Gold Creek associated with the South Road alignment is on land owned by the State of Alaska, CIRI, and seven private owners. The proposed location of the railroad laydown yard at Cantwell associated with the Seattle Creek (North) and Butte Creek (East) alternatives is owned by Native corporations while the proposed location of the railroad laydown yard at Hurricane is on State owned land.

Overall, the Seattle Creek (North) and Butte Creek (East) alternatives would be about the same from a land status perspective. The ROW need for the Hurricane (West) corridor has the potential to require the acquisition of more Federal and Native lands than the other corridors. The South Road ROW is the only one of the four that would not require the acquisition of Federal land. The actual length of time to acquire the ROW necessary for the project will depend on a number of factors including the number of landowners to negotiate with and their willingness to sell.

**Table 4-19. Land status summary**

<b>Land type</b>	<b>South Road</b>	<b>Hurricane (West)</b>	<b>Seattle Creek (North)</b>	<b>Butte Creek (East)</b>
Wilderness designated lands	0	0	0	0
Wild and scenic rivers	0	0	0	0
Denali State Park (acres)	0	0	0	0
Nelchina Public Use Area	27,584	0	0	0
<b>Corridors (acres)</b>				
Federal lands	0	14,817	6,613	10,238
State lands	13,719	19,443	36,042	50,634
Native	40,828	9,521	896	896
Private or Borough	1,692	5,160	0	818

<sup>30</sup> The parcel information does not include the northern third of the Seattle Creek (North) corridor. Based on BLM data, this land appears to be all state or federally owned.

**Table 4-19. Land status summary**

Land type	South Road	Hurricane (West)	Seattle Creek (North)	Butte Creek (East)
ROW (acres) <sup>a</sup>				
Federal lands	0	771	357	255
State lands	417	749	1,174	1,230
Native	1,466	300	45	45
Private or Borough	112	66	0	0

Red = Not preferable    Green = Favorable

<sup>a</sup> ROW acres impacted is based on a 300-foot wide ROW.

## 4.2.8 Fish and Wildlife Uses

The fish and wildlife resources in the potential access corridors are important to a variety of user groups that participate in managed hunts and recreational/subsistence fisheries. Development of an access route to the Watana dam site may provide users new and expanded access to these resources, potentially resulting in increased harvest pressure on some fish and wildlife populations. Analyses of proposed access routes from the 1980s Susitna Hydro Project (Terrestrial 1981, Acres 1982) were reviewed and compared to the current alternatives. In addition, current data gap reports for subsistence resources (Simeone et al. 2011), terrestrial resources (ABR 2011) and aquatic resources (HDR 2011) were included in the review along with current management area reports and databases available on the ADF&G Web site. Detailed geographic information on resource uses was not available at a high enough resolution to perform a spatial analysis of access alternatives. As a result, this category was scored on an objective ranking system (1 [best] to 5 [worst]) using professional judgment of the resource specialists conducting the review.

### 4.2.8.1 Subsistence Uses of Fish and Wildlife Resources

Subsistence hunting and fishing are economically and culturally important to Alaskans. Both State and Federal management authorities have a mechanism for establishing preferences among subsistence users when a fish or wildlife population is not large enough to support harvests by all those who are eligible for subsistence. This process is called a “Section 804” process under Federal and a “Tier II” process under State management. The subsistence preference is granted through a customary and traditional use determination made by the Alaska Boards of Fisheries and Game.

For the purpose of wildlife population management and harvest reporting, the state of Alaska is divided into 26 game management units. The Watana dam site, reservoir and potential access corridors are located in Game Management Unit (Unit) 13 and more specifically within sub unit 13 E (Figure 4-14, GMU 13 and project features). The State has made customary and traditional use determinations for all major resources within Unit 13: salmon, non-salmon fish, Dall sheep, black bear, grizzly bear, caribou, and moose. This means that all of these resources are classified as subsistence resources. Of these, caribou and moose are most popular (Simeone et al. 2011). All Alaskan residents as defined by the State are eligible to participate in subsistence hunts.

The Nelchina caribou herd occupies Unit 13 and is important to a large number of hunters due to its accessibility and proximity to Fairbanks and Anchorage (Harper 2009). All of the caribou hunts in Unit 13 are subsistence hunts. In 1990 more than 6,000 people obtained subsistence permits to hunt caribou and achieved the allowable harvest in 3 days (Simeone et al. 2010). Consequently in 1991, the State instituted a Tier II hunt to limit the number of hunters and prevent over-harvest. From 2003 to 2008, the state Tier II subsistence hunt in Unit 13 accounted for 60 to 90 percent of the Nelchina herd's total annual harvest. The majority of the balance of the harvest is taken by the Federal registration hunt, which takes place on BLM lands.

#### **4.2.8.2 Sport Hunting and Fishing**

A new access road to the Watana dam site will also provide new opportunities for hunters and fishers. Expanded access opportunities to fish and wildlife resource areas may result in indirect impacts due to increased harvest pressure or user conflicts. Sport fishing use areas in the upper Susitna fall under the Northern Cook Inlet management area. Unit 3, a sub area of this management area, incorporates the upper Susitna basin above Talkeetna to the Oshetna River. Sport fishing activity ranged from 1,900 to 8,440 angler days in the 10-year period from 1995 to 2006 (Ivey et al. 2009).

Unlike some hunts which are limited by registration or drawing systems, sport fishing is unrestricted as to the number of users that can participate. In the 1980s, a statewide sport fishing organization supported the alignment alternatives that would provided the most access for its members to new fishing areas (Acres 1982). Local groups may not share that position, leading to user conflicts. Modifications to fishing methods, means, seasons, and harvest allocations through the Board of Fisheries is one manner in which these changes may have to be mitigated in the future.

Where access alignments cross tundra, as opposed to forested areas, there is a greater opportunity for off-road all-terrain vehicles (ATVs) to exit the roadway. To minimize secondary impacts to caribou and other resources special land use policies governing road use and off-road ATV use may need to be adopted.

#### **4.2.8.3 South Road**

The South Road alignment has a similar elevation to the Hurricane (West) and is lower than the other two corridors. This alignment is not accessible from the existing roadway network which means it has less potential for access than the other three alignments. This may reduce the potential for secondary effects.

This route will cross or is in proximity to fish bearing streams which may increase sport fishing activity in the area. However, the lack of connection to the existing road network may limit this.



Figure 4-14. Game management units

#### **4.2.8.4 Hurricane (West)**

The Hurricane (West) alignment has a similar elevation to the South Road alignment but is lower in elevation than the other two corridors and passes through forest land between MP 0 and MP 22. This habitat type limits the opportunities for ATV access to adjacent resource areas, and as a result may pose a reduced potential for secondary effects discussed for the other alternatives. Because this route is lower in elevation, it crosses less of the Nelchina caribou range than the other alternatives.

The route will cross Indian Creek and Portage Creek, both salmon-producing streams. These new access points may result in increased sport fishing pressure on these systems.

#### **4.2.8.5 Seattle Creek (North)**

This alignment passes through range habitat for the Nelchina caribou herd and has the potential to have secondary impacts due to the increased hunter access. Previous studies cautioned that increased hunting pressure may result from the new access (Acres 1982). Because much of this alignment crosses tundra, there is a greater opportunity for ATVs to exit the roadway than with the Hurricane (West) alignment.

Much of the alignment crosses, or is in proximity to, seasonal Arctic grayling habitat where recruitment and growth are thought to be low (Acres 1982). Opening new sport fishing access to the area may put pressure on the stability of the population.

#### **4.2.8.6 Butte Creek (East)**

This alignment passes through important range habitat for the Nelchina caribou herd and has the potential to have secondary impacts due to the increased hunter access. Because much of this routing crosses tundra, there is a greater opportunity for ATVs to exit the roadway.

Much of the route crosses or is in proximity to Butte Creek, which likely provides seasonal Arctic grayling habitat. Providing access to more angling opportunities in the area could put pressure on grayling populations.

#### **4.2.8.7 Summary**

All four corridors involve the construction of a road into areas that currently do not have access except by off-road vehicle.

The South Road and Hurricane (West) alignments cross less of the Nelchina caribou range than the Seattle Creek (North) or Butte Creek (East) alignment because the former are at a lower elevation. Because the Hurricane (West) alignment passes through forested land instead of tundra like Seattle Creek (North) and Butte Creek (East), there is less potential for people to use off-road vehicles to access adjacent areas.

All four alignments will also provide new access points to fishing opportunities, which may put pressure on local fish populations. The South Road alignment will provide less access for the general public than the other three alignments because it is not connected to the existing road network. Table 4-20 summarizes the qualitative assessment of impacts to sport fishing and recreational and subsistence hunting for each alternative.

**Table 4-20. Summary of fish and wildlife uses (qualitative assessment)**

Factor	South Road	Hurricane (West)	Seattle Creek (North)	Butte Creek (East)
Sport fishing	2	3	2	2.5
Recreational and subsistence hunting	2	2	3	3

Red = Not preferable    Green = Favorable

#### 4.2.9 Cultural Resources

Cultural resources are subject to consideration under Section 106 of the National Historic Preservation Act (NHPA). Under the Act, Federal agencies must consider the effects of Federal undertakings on historic properties. Historic properties are cultural resources such as prehistoric archaeological sites, historic buildings, or traditional cultural properties that have been evaluated and found eligible for listing in the National Register of Historic Places (NRHP). Cultural resources are also subject to consideration under Section 4(f) (49 USC 303), AS 41.35.070 (Alaska Historic Preservation Act), and NEPA. Coordination of the NHPA with NEPA is outlined in 36 CFR 800.8, which states that “Agency officials should ensure that preparation of an...EIS and record of decision includes...identification of historic properties, assessment of effects upon them, and consultation leading to resolution of adverse effects.”

Cultural resource site location information is restricted and withheld from public records disclosure under state law (AS 40.25.110) and the Federal Freedom of Information Act (PL 89-554); consequently, site locations are not identified in this document but are discussed in general geographic terms for each corridor analysis. The restriction of site location information is allowed by AS 40.25.120(a)(4), Alaska State Parks Policy and Procedure No. 50200, the National Historic Preservation Act, and the Archaeological Resources Protection Act.

For this analysis, cultural resources were identified through a review of the Alaska Heritage Resources Survey (AHRS) database and Office of History and Archaeology records, including studies associated with the 1980s Watana licensing effort. Based on the AHRS review, previously recorded cultural resources in the Watana Access area consist primarily of prehistoric surface lithic scatters on south-trending and/or south-facing ridge systems, terraces, and knolls. Lithic scatters are prehistoric distributions of cultural items that consist primarily of lithic (i.e., stone) material. Often they include not only chipping debris from stone tool manufacture activities, but also formed tools such as projectile points, bifaces, or knives. Because AHRS site locations can vary up to 60 meters in some instances, AHRS sites reported in this study are located within or up to 60 meters outside the access corridors.

Most AHRS sites were identified during cultural resource surveys for the 1980s Watana licensing effort or the 1980s intertie project; however, some sites were recorded during identification of important traditional and historical sites ([14][h]1 sites) under the Alaska Native Claims Settlement Act (ANCSA). Only one previously recorded site within the Access Study area has been evaluated for eligibility for inclusion in the NRHP. The site, HEA-0353: Seattle Creek Bridge, was determined to be not eligible for listing in the NRHP and therefore does not require consideration as a historic property under the NHPA. However, the Denali Highway was

listed on 11/30/2010 by DOT&PF and the SHPO as an “Alaska road to be treated as NRHP Eligible.” Consequently, maintenance or improvement plans to the Denali Highway for the Watana Access project should consider this designation.

It is important to note that absence of sites within the AHRS is not necessarily indicative of absence of sites on the landscape, as much of Alaska has never been archaeologically surveyed. It can be assumed that site concentrations identified in the AHRS likely represent areas that were archaeologically surveyed, while areas with no sites likely represent areas that have not been archaeologically surveyed. Because of the disparity in archaeological survey coverage, this analysis is based upon not only upon information in the AHRS, but also the professional judgment of HDR’s cultural resource specialists.

#### 4.2.9.1 South Road

The South Road corridor runs along the south side of the Susitna River, skirts the base of north facing slopes, then works through the Stephan Lake and Fog Creek areas until its intersection with the Susitna River. Only one previously recorded site (the historic Susitna River Railroad Station at Gold Creek) is located within the South Road corridor (see Table 4-21); however lithic scatters are present at other locations 1 to 2 miles from the currently defined corridor. As previously discussed, this lack of recorded sites within the corridor reflects a lack of previous cultural resource survey in the corridor area and should not be interpreted to mean that there is little potential for disturbance to cultural resources should this alignment be constructed. The north-facing slopes present relatively low potential for containing prehistoric sites. However, the Stephan Lake and Fog Creek areas are characterized by low-elevation bluff and ridge systems in close proximity to fresh water. The presence of archaeological sites within 1 to 2 miles of the defined alignment corridor combined with this topography indicate a high potential for containing prehistoric archaeological sites, particularly those associated with hunting and tool manufacture, in some areas.

Table 4-21. AHRS sites within or adjacent to the South Road corridor		
AHRS Number	Site Name/Description	NRHP Status
TLM-0005	Gold Creek/Susitna River Railroad Station	NE <sup>a</sup>

<sup>a</sup> Not evaluated

#### 4.2.9.2 Hurricane (West)

The Hurricane (West) alignment follows the Susitna River from the Parks Highway and skirts the bases of numerous south-facing slope, terrace, and ridge systems. Given their proximity to freshwater creeks and the Susitna River, as well as south-facing aspect, these landforms present a high potential for containing prehistoric archaeological sites, specifically those associated with hunting and tool manufacture.

A total of 28 previously recorded sites are located within the Hurricane corridor (see Table 4-22). Many of the sites are large lithic scatters spread out along ridge and terrace tops, consisting of both surface and subsurface components. Artifacts identified at these sites include tool manufacture flakes, bifacial tools, and other lithic deposits. Other sites have been identified outside the proposed road corridor. Construction of the Hurricane corridor could open up access to Tsusena Butte, potentially causing disturbance to these sites.



**Table 4-22. AHRs sites within or adjacent to the Hurricane access corridor**

<b>AHRs Number</b>	<b>Site Name/Description</b>	<b>NRHP Status</b>
TLM-0272	ARRC Timber Bridge MP 276.1	NE <sup>a</sup>
TLM-0112	Irregular Stone Ring	NE
TLM-0110	Lithic Scatter	NE
TLM-0111	Rectangular Depression	NE
TLM-0109	Lithic Scatter	NE
TLM-0108	Lithic Scatter	NE
TLM-0107	Lithic Scatter	NE
TLM-0106	Chert Biface Tool	NE
TLM-0275	Lithic Scatter	NE
TLM-0113	Lithic Scatter	NE
TLM-0114	Lithic Scatter	NE
TLM-0101	Two Flakes	NE
TLM-0103	Lithic Scatter	NE
TLM-0202	Single Flake	NE
TLM-0209	Lithic Scatter	NE
TLM-0203	Lithic Scatter	NE
TLM-0176	Two Flakes	NE
TLM-0214	Lithic Scatter	NE
TLM-0002	Chulitna RR Station	NE
TLM-0160	Three Waste Flakes (Subsurface)	NE
TLM-0015	Two Flakes	NE
TLM-0016	North Arrow Site (hearth and flaking station)	NE
TLM-0192	Cobble Stone	NE
TLM-0018	Corps Trailer Site (subsurface lithic deposit)	NE
TLM-0165	Lithic Scatter	NE
TLM-0167	Single Flake	NE
TLM-0017	Lithic Scatter	NE
TLM-0137	Two Flakes	NE

<sup>a</sup> Not evaluated

**4.2.9.3 Seattle Creek (North)**

The Seattle Creek (North) access route runs north-south along Seattle Creek from the Denali Highway to Deadman Creek. A total of 20 previously recorded sites were identified within or adjacent to the Seattle Creek corridor (with an additional 5 along the Denali Highway; see Table 4-23). Most sites consist primarily of small, discrete surface lithic scatters containing only a few flakes. Based on landforms, slope, and aspect, the Seattle Creek corridor overall has a medium potential for containing additional unrecorded cultural resources, though potential is higher in the area around Deadman Lake and Deadman Creek.

**Table 4-23. AHRS sites within or adjacent to the Seattle Creek access corridor**

<b>AHRS Number</b>	<b>Site Name/Description</b>	<b>NRHP Status</b>
TLM-0160	Three Waste Flakes (Subsurface)	NE <sup>a</sup>
TLM-0015	Two Flakes	NE
TLM-0016	North Arrow Site (hearth and flaking station)	NE
TLM-0192	Cobble Stone	NE
TLM-0018	Corps Trailer Site (subsurface lithic deposit)	NE
TLM-0165	Lithic Scatter	NE
TLM-0167	Single Flake	NE
TLM-0017	Lithic Scatter	NE
TLM-0137	Two Flakes	NE
HEA-0248	Lithic Scatter	NE
HEA-0182	Lithic Scatter	NE
HEA-0181	Lithic Scatter	NE
HEA-0184	Two Articulated Flake Fragments	NE
HEA-0180	Lithic Scatters	NE
TLM-0098	Two Waste Flakes	NE
TLM-0117	Four Waste Flakes	NE
TLM-0250	Lithic Scatter (Rita)	NE
TLM-0251	Lithic Scatter (Rebecca Site)	NE
TLM-0183	Single Chert Flake	NE
TLM-0099	Lithic Scatter	NE
<b>Denali Hwy between Parks Hwy and Seattle Creek Access</b>		
HEA-0450	Denali Highway	NE; considered eligible
HEA-0097	Edmonds Creek Site (late	NE

**Table 4-23. AHRs sites within or adjacent to the Seattle Creek access corridor**

AHRs Number	Site Name/Description	NRHP Status
	prehistoric site)	
HEA-0115	20-Mile Shelter Cabin	NE
HEA-0274	No Information	NE
HEA-0353	Seattle Creek Bridge	NE

<sup>a</sup> Not evaluated

#### 4.2.9.4 Butte Creek (East)

Like the Hurricane (West) corridor, the Butte Creek (East) corridor runs east-west and is in close proximity to freshwater creeks and south facing slope, ridge and terrace systems. However, the corridor is separated from the Susitna River by large landforms. A total of 19 previously recorded sites were identified within or adjacent to the Butte Creek (East) corridor (with an additional 12 located along the Denali Highway; see Table 4-24). Several sites along the Butte Creek (East) alignment were recorded within the last year by the BLM and the Office of History and Archaeology and descriptive information regarding the sites' features and artifacts is not yet available. The remaining cultural resources within the Butte Creek (East) alternative were recorded during Ahtna, Inc., Section 14(h)(1) selections, and include the grave of Chief Nicholai and prehistoric lithic scatters associated with Caribou hunting in the area of Snodgrass Lake. There is one paleontology site (HEA-0212) within the corridor. Paleontology sites do not fall under the purview of NHPA; however, they are subject to consideration under 41.35.070, the Alaska State Historic Preservation Act.

**Table 4-24. AHRs sites within or adjacent to the Butte Creek access corridor**

AHRs Number	Site Name/Description	NRHP Status
TLM-0160	Three Waste Flakes (Subsurface)	NE <sup>a</sup>
TLM-0015	Two Flakes	NE
TLM-0016	North Arrow Site (hearth and flaking station)	NE
TLM-0192	Cobble Stone	NE
TLM-0018	Corps Trailer Site (subsurface lithic deposit)	NE
TLM-0165	Lithic Scatter	NE
TLM-0167	Single Flake	NE
TLM-0017	Lithic Scatter	NE
TLM-0137	Two Flakes	NE
HEA-0463	No Information (BLM using)	NE
HEA-0441	No Information (BLM using)	NE
HEA-0440	No Information (BLM using)	NE
HEA-0439	No Information (BLM using)	NE

**Table 4-24. AHRS sites within or adjacent to the Butte Creek access corridor**

AHRS Number	Site Name/Description	NRHP Status
HEA-0424	Denali Block Site (no information)	NE
HEA-0425	Denali Block Site (no information)	NE
HEA-0309	Lithic Scatter	NE
HEA-0212 (Paleo)	Paleontology Site	NE
HEA-0307	Chief Nicholai Grave	NE
HEA-0308	Lithic Scatter	NE
Denali Hwy between Parks Hwy and Butte Creek Access		
HEA-0450	Denali Hwy	NE; considered eligible
HEA-0097	Edmonds Creek Site (late prehistoric site)	NE
HEA-0115	20-Mile Shelter Cabin	NE
HEA-0274	No Information	NE
HEA-0353	Seattle Creek Bridge	NE
HEA-0098	Sand Dune Site (lithic scatter)	NE
HEA-0100	No Information	NE
HEA-0432	Large Square Depression	NE
HEA-0122	Grimes Site (biface tool)	NE
HEA-0272	No Information	NE
HEA-0352	Brushkana Creek Bridge	NE
HEA-0268	No Information	NE

<sup>a</sup> Not evaluated

#### 4.2.9.5 Summary

The Hurricane (West) Corridor contains the greatest number of identified sites (28), while the Seattle Creek (North) and Butte Creek (East) corridors (excluding the sites along the Denali Highway) each contain only two-thirds of that number (see Table 4-25) and the South Road corridor contains only one identified site. The South Road, Hurricane (West) and Butte Creek (East) corridors hold the highest potential for containing additional unrecorded sites, while the potential for additional sites in the Seattle Creek corridor is lower. While sites are located along the Denali Highway between the Butte Creek (East) and Seattle Creek (North) corridors and the Parks Highway (including the Denali Highway itself), these sites can likely be more easily avoided or mitigated, as improvements to the Denali Highway associated with the Watana Access will typically not involve re-routing or movement of the existing Denali Highway alignment.

There are a total of nine cultural resource sites located within three of the four access corridors, as the corridor(s) approach the Susitna River. These sites are all lithic scatters or subsurface tool manufacturing sites and are concentrated between Deadman and Tsusena Creeks and the Susitna River. It can be assumed that all three of the access corridors would impact these sites in the same way; consequently they were not factored into the discussion and scoring analysis of the four corridors presented below.

Based on the presence of and disturbance to known sites, the potential for additional unrecorded sites, and the potential to increase access to previously inaccessible areas of high site concentration outside the access corridor, the Hurricane (West) corridor would likely have the greatest impact on cultural resources. The Seattle Creek (North) corridor, with fewer reported AHRS sites and lower potential for containing additional sites, would likely cause the least disturbance to cultural resources.

**Table 4-25. Summary of cultural resource sites by corridor**

<b>Factor</b>	<b>South Road</b>	<b>Hurricane (West)</b>	<b>Seattle Creek (North)</b>	<b>Butte Creek (East)</b>
Cultural Resources on new roadway	1 <sup>a</sup>	28	20	19
Cultural Resources on Denali Highway	0	0	5	12
<b>Total</b>	<b>1</b>	<b>28</b>	<b>25</b>	<b>31</b>

**Red = Not preferable    Green = Favorable**

<sup>a</sup> Although only one known cultural resource is identified within the South Road corridor, the potential for portions of the corridor to contain additional sites is high.

#### **4.2.10 Socioeconomics**

The development of an access route to the Watana dam site will affect the socioeconomic characteristics of the surrounding region. Socioeconomic impacts may be both positive and negative. The potential for socioeconomic impacts was evaluated based on analyses of proposed access routes from the 1980s Susitna Hydro Project (APA 1981) and the current Socioeconomic data gap report (HDR 2011b). The socioeconomic impacts will vary greatly depending on construction activities. A construction camp-based project will have substantially fewer impacts on the socioeconomics of the surrounding area than one where construction workers are expected to reside in nearby communities. For the purpose of this study, we have assumed that a construction camp near the Watana dam site will be used. For the purposes of this report, the project team assumed that only employees will be housed at the dam site and will be transported to the dam site on a two-week on/two-week off (or similar) schedule. The majority of the socioeconomic impacts of the access corridor will be associated with changes in traffic levels. The magnitude and location of potential impacts varies depending on the route and location of the Watana dam access route tie-in with existing transportation facilities. In addition, all of the proposed alternatives would provide road access to a large area that has no existing roads. This may cause changes to recreation, subsistence activities, and business use that currently occurs in the area.



Figure 4-15. Communities of interest

Communities likely to be impacted by the Watana access project include those within the Denali and Matanuska-Susitna Boroughs and specifically those along the Parks and Denali Highway Road Corridors. Communities in the immediate vicinity of the project area include Cantwell

(population 219), Trapper Creek (population 481), Chase (population 34), and Talkeetna<sup>31</sup> (population 876; Figure 4-15; USCB 2010). In addition to these communities, other settlements also exist along the existing ARRC corridor near the Curry, Sherman, Gold Creek, Canyon, and Chulitna railroad stations. The extent to which each of these communities experiences socioeconomic impacts depends largely on where the junction between the proposed access corridor and existing transportation facilities occurs.

Other communities located along existing transportation corridors (such as Wasilla [population 7,831], Anchorage [population 291,826], and Whittier [population 220]), also have the potential for socioeconomic impacts related to the transportation of construction materials. Socioeconomic impacts on these communities are likely to be similar for all Susitna-Watana dam access alternatives.

#### **4.2.10.1 South Road**

The junction between the South Road alignment and the existing transportation network occurs at ARRC MP 263 of the Alaska Railroad. Socioeconomic impacts to communities located on the ARRC tracks are likely to be the result of increased train traffic. The specific communities that will be impacted depends on if trains are coming from the south, the north, or both.

The construction of the South Road alignment would likely result in substantial project-related traffic and activity within the Gold Creek area. Gold Creek is expected to have additional impacts because it is the point of modal shift from rail to road for goods, material, and people. The increased distance from larger cities such as Wasilla and Anchorage may result in an increased demand for housing, community services, and utilities in the community; additional employment opportunities; increased income; and changes to community culture and way of life.

The construction and operation of the South Road alignment could have impacts on residents and owners of cabins in the area. While access to the area would still be limited to ARRC and ATV access from the Parks Highway, it would be easier for people to travel between Gold Creek and the proposed dam site.

The increased activity in the area is also anticipated to impact one remote lodge (Stephens Lake Lodge) in the project area.

#### **4.2.10.2 Hurricane (West)**

The junction between the proposed Hurricane (West) alignment and existing transportation routes occurs at MP 171 of the Parks Highway, across from the ARRC station near Hurricane (ARRC MP 282). Socioeconomic impacts would likely impact communities in the immediate area including Talkeetna and Trapper Creek (86 and 56 miles, respectively, from the proposed junction; see Table 4-26). Project impacts related to increased traffic on the Parks Highway may be minimal in Talkeetna, as the community is located on a 14-mile spur road off the highway itself.

While it is anticipated that the many of the construction goods and materials will be moved by rail to an improved siding at Hurricane, construction supplies will also be transported by truck. The movement of construction goods and materials along the Parks Highway is likely to result in

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<sup>31</sup> In an advisory ballot vote on October 5, 2011, the community of Talkeetna communicated their opposition to the construction of the Susitna-Watana Dam to the Talkeetna Community Council by a vote of 109 to 19 (KTNA 2011).

increased traffic that may impact communities farther south along the Parks Highway, including Montana, Willow, Houston, and Wasilla (75, 101, 114, and 129 miles, respectively, from the proposed junction). An increase in traffic from construction activities and post-construction users (recreationalists, hunters, fishermen, etc.) may change the quality of life for some area residents, but may also provide increased opportunities and traffic for local businesses. Impacts from increased road traffic depend on the degree to which materials and supplies are moved by road or via rail.

The Hurricane (West) alignment would likely have the fewest impacts (positive or negative) to communities on the Parks and Denali Highways north of MP 171 such as Cantwell (39 miles from the proposed junction; see Table 4-26) because construction traffic would not need to pass through the community (HDR 2011b). As the community closest to the proposed site, Cantwell may still experience an increased demand for housing and services during construction, but potentially to a lesser extent than if access is provided via the Seattle and Butte Creek alternatives.

The construction and operation of the Hurricane (West) alignment could have impacts on residents and owners of cabins along the ARRC corridor. The Hurricane (West) alignment could provide direct road access to people who live in or own cabins near the ARRC station of Chulitna. Access to this area is currently limited to ARRC and ATV access from the Parks Highway. The Hurricane route would not provide direct road access to cabins and communities farther south along the ARRC corridor, but it may provide an alternative point of access for trails leading to those locations.

The proposed Hurricane access route may also alter land use and businesses activities that currently occur east of the Parks Highway. The Hurricane access route is likely to provide ground access to the area near the High Lake Lodge, a commercial lodge that is currently accessed by airplane. Road access near the lodge would likely alter the remote characteristics of the lodge, but may also provide different business opportunities. Guiding companies that provide services in the area may experience similar changes in the type of recreational experience and use of the area, but may benefit from increased ease of access. In summary, the Hurricane access route is likely to have greater impacts on communities along the Parks Highway corridor and the ARRC corridor, including Trapper Creek, and may be better positioned to rely on services from larger population centers farther south in Anchorage and Wasilla. The Hurricane (West) alignment has the only remote lodge identified in the area. The construction of this alignment may have an impact on the character of the lodge. There are other lodges located near the Parks Highway that may be affected by an increase in traffic during construction. No residential or business relocations are anticipated with this alternative.

#### **4.2.10.3 Seattle Creek (North)**

The junction between the proposed Seattle Creek access route and existing transportation routes occurs at MP 113.7 of the Denali Highway. The development of the Seattle Creek access route would likely shift many of the socioeconomic impacts farther north along the Parks Highway to the community of Cantwell (20 miles from the proposed junction). However, project equipment and construction materials would still likely be transported up the Parks Highway corridor, either on the Highway itself or by rail to an improved siding at Cantwell. Project-related traffic is still likely to have some impact on communities along the Parks Highway from Wasilla to Cantwell.



The construction of the Seattle Creek (North) alignment would likely result in substantial project-related traffic and activity within the community of Cantwell. The upgrade of the western 20 miles of the Denali Highway would require construction work directly adjacent to the community. The increased distance from larger cities such as Wasilla and Anchorage may result in increased reliance on and demand for housing, community services, and utilities in the community; additional employment opportunities; increased income; and changes to community culture and way of life. There would also be impacts (including noise and traffic) related to the railroad laydown yard at Cantwell.

The development of access to the Watana dam site via the Denali Highway would provide ground access to a region that is relatively remote and currently used primarily for recreation and subsistence purposes. The Seattle Creek access route would directly impact cabins at Big Lake, near the access route corridor.

The upgrade of the Denali Highway also has the potential to change access to the Denali Highway area. Currently, the Denali Highway is open only seasonally to vehicle traffic, and is used by snow machine users, dog mushers, skiers, and hunters in winter. The upgrade of the western 20 miles of the Denali Highway has the potential to change seasonal land use in the area and may provide different opportunities for businesses operating in the area. No residential or business relocations are anticipated with this alternative.

In summary, the Seattle Creek (East) alignment is likely to have an impact on the community of Cantwell, with fewer impacts to Talkeetna and Trapper Creek, similar to that of the Butte Creek (East) alignment. It is not anticipated to impact remote lodges in the project area. Construction-related traffic may impact lodges located along the Parks Highway. The August 1982 *Access Plan Recommendation Report* indicated that an access route in this vicinity would not conflict with the interested of Native organizations and local communities.

#### **4.2.10.4 Butte Creek (East)**

The junction between the proposed Butte Creek (East) alignment and existing transportation routes occurs at MP 81 of the Denali Highway, approximately 53 miles east of Cantwell and 81 miles west of the community of Paxson, located at the junction of the Denali and Richardson Highways. As part of the Butte Creek (East) alignment, 53 miles of the Denali Highway east from Cantwell would be upgraded and would become available for year-round use.

The socioeconomic impacts of the Butte Creek (East) alignment are expected to be virtually the same as those described for the Seattle Creek (North) alignment, with the community of Cantwell likely to experience the largest number of socioeconomic impacts. The community of Paxson may also experience some spillover effects, but, as most construction traffic and activity would occur via Cantwell and the Parks Highway, they are likely to be more minor impacts.

Businesses located along the Denali Highway, including the Alpine Creek Lodge at MP 68 and the Gracious House Lodge at MP 82, are likely to experience substantial impacts, both as a result of construction-related traffic and activity and as a result of increased use and seasonal access to the area. No residential or business relocations are anticipated with this alternative.

In summary, the Butte Creek (East) alignment is likely to have a moderate impact on the community of Cantwell and the fewest impacts to Talkeetna and Trapper Creek. It is anticipated to impact one remote lodge in the project area and one lodge located adjacent to the proposed

junction with the Denali Highway. Construction-related traffic may also impact lodges located along the Parks Highway.

#### 4.2.10.5 Summary

The socioeconomic impacts are expected to be greater during the construction of the proposed project than during its operation. The socioeconomic impacts may vary greatly depending on construction logistics (how workers are housed, hours of operation, traffic generated, etc.). The South Road alignment would have the greatest impact to communities located along the ARRC tracks. The Seattle Creek (North) and Butte Creek (East) alignments both use the Denali Highway and would result in increased impacts to Cantwell. The Hurricane (West) alignment would have fewer impacts to Cantwell. Hurricane (West), Seattle Creek (North) and Butte Creek (East) alignments are likely to have similar impacts to Talkeetna.

**Table 4-26. Distance between Parks Highway Junction and selected communities**

	<b>South Road</b>	<b>Hurricane (West)</b>	<b>Seattle Creek (North)</b>	<b>Butte Creek (East)</b>
Distance between Parks Highway junction and Cantwell (miles)	N/A	39	0	0
Distance between Parks Highway junction and Talkeetna (miles)	N/A	86	125	125

**Red = Not preferable    Green = Favorable**

#### 4.2.11 Costs

Costs for each corridor were estimated based on conceptual engineering and using DOT&PF bid tabs (see Table 4-27). For a detailed breakdown of costs per corridor and assumptions used for estimating purposes, see Appendix C.

**New alignments:** Alignments in each corridor were established that met the design criteria for the project through a conceptual engineering process. The terrain in each corridor was evaluated and classified as level, rolling, or mountainous. Due to the length of the corridors and the coarseness of the contour data (20m and 30m intervals), only representative sections of profiles were developed in each terrain type. These representative sections (approximately 5 miles) were modeled using Civil 3D to generate earthwork quantities. Following aerial reconnaissance of the corridors, there was a concern about the slope stability in mountainous terrain with excavations on the uphill sides when sidehilling. To address this concern, retaining walls were assumed and included in the corridor estimates to minimize excavation on the uphill sides. Once quantities were developed for the three representative sections, the quantities were normalized on a per mile basis. Miscellaneous construction items were also estimated on a per mile basis.

**Denali Highway:** Following a field reconnaissance effort on the Denali Highway to document existing conditions and evaluate the necessary improvements to support the Seattle Creek (North) and Butte Creek (East) alternatives, quantities were developed by estimating the existing embankment fill or cut heights, number and size of culverts, and bridge deck area for replacement bridges. Miscellaneous construction items were estimated on a per mile basis.

**Other items:** Costs for intersection improvements, rail sidings, staging areas, and the airport were also estimated. These costs were not used in the analysis for comparing the three access routes as they are deemed to be essentially the same for all corridors. Table 4-27 presents the estimated costs in 2011 dollars for the corridors; totals are exclusive of ROW costs.

	South Road	Hurricane (West)	Seattle Creek (North)	Butte Creek (East)
Road (new alignment)	251.2	211.5	149.1	144.0
Road (Denali Highway)	—	—	14.6	31.7
Roadway subtotal <sup>a</sup>	251.2	211.5	163.7	175.7
Rail sidings and intersection improvements <sup>b</sup>	28.3	9.1	9.1	9.1
Airport	36.7	36.7	36.7	36.7
<b>Total access cost</b>	<b>316.2</b>	<b>257.3</b>	<b>209.5</b>	<b>221.5</b>

**Red = Not preferable    Green = Favorable**

<sup>a</sup>Used for comparison of access alternatives

<sup>b</sup>This total does not include costs to upgrades to the ARRC mainline that may be needed.

The South Road alignment is estimated to cost approximately \$316.27 million, which is the highest cost of the four alternatives. The Hurricane (West) alignment is estimated to cost approximately \$257.3million. The Seattle Creek (North) alignment is expected to cost approximately \$209.5 million, which includes \$14.6 million to upgrade the Denali Highway and \$149.1 million to connect the Denali Highway to the Watana dam site. The Butte Creek (East) alignment has a similar cost. It is expected to cost \$221.5million, which includes \$31.7 million to improve the Denali Highway and \$144.0 million to connect the Denali Highway to the Watana dam site. The South Road alignment presents greater technical/engineering challenges than the other three alignments. This translates to a higher potential of construction cost escalations.

The South Road alignment is expected to have rail improvements costing approximately \$28.3 million. The other three alternatives are expected to have railroad and roadway intersection improvements costing approximately \$9.1 million, regardless of the alternative selected.

The airport is expected to cost approximately \$36.7 million, regardless of the alternative selected, and will not affect the overall evaluation.

#### 4.2.12 Permits

All proposed corridors will require the construction of new roadways, with the Seattle Creek and Butte Creek alignments also needing to upgrade portions of the Denali Highway to be used as year-round access. Because much of the project will include similar impacts to resources, permits required for the construction of all access road alternatives are anticipated to require

similar permits and permitting strategies. The following permits are anticipated<sup>32</sup> for all proposed alternatives.

#### **4.2.12.1 Section 404 Permit (Corps)**

The Corps reviews, coordinates, and issues permits for the removal or placement of fill into wetlands and other waters of the United States under Section 404 of the Clean Water Act. A Section 404 permit would be required for all build alternatives that would affect wetlands and other waters under Section 404 jurisdiction. The Section 404 permit application and approval also requires the following:

- Endangered Species Act Section 7 consultation with the National Marine Fisheries Service (NMFS) and USFWS
- NHPA Section 106 consultation with the State Historic Preservation Office (SHPO)
- Coordination and conference with ADF&G
- Section 401 Water Quality Certification from ADEC

The Corps would also require authorization under Section 10 of the Rivers and Harbors Act for any build alternative that includes construction of a structure that would cross navigable waters or result in the modification of navigable waters. It is not anticipated that the proposed project corridors would involved the placing a structure over Federally navigable waterways.

The Section 404 application process for large projects may take as little as 9 months, and up to 2 years, depending on the amount of field data collected, progress of engineering plans, and preliminary agency consultation conducted prior to permit submittal. The Corps will not issue a Section 404 permit without an approved environmental document and requires that the chosen alternative be the least environmentally damaging while still meeting the purpose of and need for the project. In general, the Section 404 permit has the most potential to cause delays to the construction schedule.

#### **4.2.12.2 Eagle Take Permit (USFWS)**

Bald and golden eagles may nest in the project vicinity and are protected under the Bald and Golden Eagle Protection Act (Eagle Protection Act; 16 USC 668). Some activities are eligible for Federal permits under 50 CFR 22.26; USFWS 2011. The Eagle Protection Act prohibits anyone without a permit from “taking” bald and golden eagles except as permitted under USFWS regulations. Due to the location of the proposed corridors and the anticipated proximity to active and inactive bald eagle nests, an eagle take permit may be necessary. Prior to submitting the eagle take permit, a preconstruction survey of the project corridor will be conducted to identify current nest locations and status of nests. Compensatory mitigation measures and post-construction monitoring may be necessary to offset impacts.

Obtaining an eagle take permit generally takes 30 to 90 days following submittal and requires a \$500 application fee<sup>33</sup> at the time of submittal. The amount of time required to obtain this permit is directly related to preliminary agency coordination and completion of the preconstruction survey prior to submittal.

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<sup>32</sup> Other permits may be needed if new regulations are enacted, project funding changes, etc.

<sup>33</sup> The permit application fees are November 2011 rates and are subject to change in the future.

#### 4.2.12.3 Title 16 Fish Habitat Permit (ADF&G)

The Fishway and the Anadromous Fish Acts are Alaska Statutes (AS) that require projects to obtain a Fish Habitat Permit from the ADF&G for certain activities in fish-bearing streams. Activities that may affect fish passage and all activities within or across anadromous fish streams require a Title 16 Fish Habitat Permit. All project alternatives will require Title 16 Fish Habitat permits; see Table 4-28 for the number of fish-bearing waters crossed for each alternative. Where no data exist for a waterway, for the purposes of this report, it was assumed fish are present and an application will be required.

Title 16 permits are generally obtained within 30 to 90 days of submittal, given sufficient field data has been collected, crossing design information is provided, and appropriate preliminary agency coordination has occurred. It is not uncommon for ADF&G to issue conditional permits that require additional design information to be provided and approved by ADF&G prior to construction.

#### 4.2.12.4 Land Use Permit (DNR, Application for Easement AS 38.05.850)

For crossing State navigable waterways, an easement application will be necessary from the DNR, Division of Mining, Land and Water (DMLW). The DNR retains ownership of navigable stream beds from ordinary high water (OHW) to OHW and will require a permit for construction over or work in waters identified as navigable. A navigational analysis will be required under 11 Alaska Administrative Code (AAC) 51.035<sup>34</sup> by the DMLW to determine if any of the waterways crossed are considered navigable by the State of Alaska.

Generally, land use permits are obtained 60 to 90 days following submittal, as long as the navigational determinations have been completed and sufficient agency coordination has occurred prior to submittal. There is a \$ 100 fee per land use permit application, due at the time of submittal. DNR has the option to issue a Public Notice, which requires a 30-day review period, or not. If DNR determines that sufficient public scoping has been conducted, it may determine that the notice is not needed.

#### 4.2.12.5 APDES Construction General Permit (ADEC)

Beginning in 2008, the ADEC assumed the role from EPA to administer the Alaska Pollutant Discharge Elimination System (APDES). This program was formerly called the National Pollutant Discharge Elimination System. An APDES construction permit, issued by the ADEC, is required for all construction activities that result in ground disturbance of 1 acre or greater. A Storm Water Pollution Prevention Plan (SWPPP), which is related to the APDES permit, must also be approved by the ADEC before construction can begin.

This permit and the associated plans are the responsibility of the contractor and will be obtained prior to the start of construction.

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<sup>34</sup> A river, stream, lake pond, slough, creek, bay, sound, estuary, inlet, strait, passage, canal, sea, ocean, or any other body of water or waterway within the territorial limits of the State of Alaska or subject to its jurisdiction, that is navigable in fact for *any* useful purpose such as commerce, hunting, trapping, log floating, landing or take off of aircraft, public boating or *any* other recreational purpose.

#### **4.2.12.6 Floodplain Development Permit**

A Floodplain Development Permit would be required for a construction activity that includes development in the mapped floodplain or floodway. A review was conducted of mapped floodplains/floodways in the vicinity of the proposed project corridors. All corridors lie outside of the mapped flood hazard areas so a MSB floodplain development permit will not be required (MSB 2011). A review of the Federal Emergency Management Agency (FEMA) Map Service Center Web site indicates that there are no FEMA mapped flood hazard areas located in the Denali Borough (FEMA n.d.).

#### **4.2.12.7 Borough Land Use Permit**

If any borough-owned material sources/sites would be used, a conditional land use permit from the borough would be required. A land use permit would also be required for any grubbing/clearing to take place prior to ROW acquisition on MSB- or Denali Borough-owned lands.

Borough land use permits take 60 to 90 days to obtain, assuming that the lands (material sources/sites) have been surveyed and appropriate coordination has occurred with each respective Borough prior to submittal.

#### **4.2.12.8 Contractor-specific Permits**

Additional contractor-specific permits may be required for the construction of an access route. These permits may include the APDES construction permit noted above and also may include Temporary Water Use Permits from the DNR, DMLW, Water Section; and a material sale permit<sup>35</sup> from DMLW if materials are going to be used from state sources. If materials are extracted or used from a state source, a site reclamation plan may be necessary.

Other permits may include additional Title 16 Habitat permits for temporary water usage from fish-bearing waters, an ADEC dewatering permit, and various local land use permits, which will be acquired following route selection and the right-of-way acquisition process begins.

A listing of all applicable permits and regulatory requirements and their statutory authority is located in Appendix K. Anticipated permits by alternative are described in Table 4-28. The same permits are required; however, the number and complexity of the permits will vary based upon potential project impacts to areas resources.

#### **4.2.12.9 Summary**

Based on the available information, all four alignments need the same permits (see Table 4-28), with one exception; the Seattle Creek (North) and Butte Creek (East) alignments are not anticipated to need a Title 16 Habitat permit for anadromous stream crossings. While all resident fish stream crossings can be addressed in one Title 16 Habitat permit, the Hurricane (West) alignment would have to address 32 crossings, compared to 23 for South Road, 14 for Seattle Creek (North) and 29 for Butte Creek (East). Permits that address more stream crossings are likely to take longer to prepare. Separate Title 16 Habitat permits have to be prepared for anadromous stream crossings. The South Road alignment would require eight permits and Hurricane (West) alignment would require four permits. Butte Creek (East) would only require one permit application and none would be required for the Seattle Creek (North) crossing.

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<sup>35</sup> A material sales permit may also be provided to the contractor from DOT&PF.

Without additional information about impacts of each corridor, it would be difficult to assess the ease of obtaining these permits. However, it would take more effort to prepare permits for the Hurricane (West) and South Road alignments than Seattle Creek (North) or Butte Creek (East).

**Table 4-28. Summary of permits**

<b>Permit</b>	<b>South Road</b>	<b>Hurricane (West)</b>	<b>Seattle Creek (North)</b>	<b>Butte Creek (East)</b>
ADF&G— Title 16 Habitat <sup>a</sup> (Resident, number of crossings)	23	32	15	29
ADF&G—Title 16 Habitat <sup>a</sup> (Anadromous, number of crossings)	8	4	0	0
Corps 404/401	1	1	1	1
USFWS Bald Eagle <sup>b</sup>	1	1	1	1
DNR Land Use AS 38.05.850	TBD	TBD	TBD	TBD
NMFS—EFH Assessment	1	1	1	1
ADEC APDES (Contractor)	1	1	1	1
DNR Temp Water Use Permits (Contractor) <sup>c</sup>	TBD	TBD	TBD	TBD
MSB Flood Hazard Permit	N/A	N/A	N/A	N/A

**Red = Not preferable    Green = Favorable**

<sup>a</sup>It is assumed that Title 16 applications will be required for all stream crossings; however, some resident crossings may be able to be combined onto one application. All anadromous crossings will result in separate applications.

<sup>b</sup>An eagle survey will be conducted prior to construction.

<sup>c</sup>Additional Title 16 applications may be necessary is water is withdrawn from fish-bearing waters.