West Susitna Access Reconnaissance Study
West Susitna Access to Resource Development

Transportation Analysis Report

4 ALTERNATIVES DEVELOPMENT
Part 1 of 2

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Acronyms

AAC	Alaska Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ADF&G	Alaska Department of Fish and Game
ADL	Alaska Division of Land
AEA	Alaska Energy Authority
AIDEA	Alaska Industrial Development and Export Authority
AMHT	Alaska Mental Health Trust
ANCSA	Alaska Native Claims Settlement Act
ARDF	Alaska Resource Data File
ARTEC	Alaska Railbelt Transmission and Electric Company
AS	Alaska Statute
ASCMCRA	Alaska Surface Coal Mining Control and Reclamation Act
ATV	all-terrain vehicle
bbl	barrels
BIF	best interest finding
BLM	U.S. Bureau of Land Management
bpd	barrels per day
CEA	Chugach Electric Association
CBM	Coalbed Methane
CIE	Cook Inlet Energy, LLC
CIRI	Cook Inlet Region, Inc.
CWA	Clean Water Act
DEM	digital elevation model
DGGS	Division of Geologic and Geophysical Surveys
DNR	Alaska Department of Natural Resources
DOF	Division of Forestry
DOG	Division of Oil and Gas
DOT&PF	Alaska Department of Transportation and Public Facilities
DPOR	Department of Parks and Outdoor Recreation
EIS	environmental impact statement
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FMU	Forest Management Unit
GIS	Geographic Information System
GMU	Game Management Unit
KPB	Kenai Peninsula Borough

KPEDD	Kenai Peninsula Economic Development District
LNG	liquid natural gas
mcf	million cubic feet
MEA	Matanuska Electric Association
Mgal	million gallons
ML&P	Municipal Light and Power
MLW	Mining, Land and Water
MOA	Municipality of Anchorage
MSB	Matanuska-Susitna Borough
MW	megawatt
NHCC	National Highway Construction Cost Index
NPR-A	National Petroleum Reserve – Alaska
NWI	National Wetlands Inventory
OPMP	Office of Project Management and Permitting
PGDHS	A Policy on Geometric Design of Highways and Streets
PGE	platinum group elements
ROD	Record of Decision
RM	river mile
SRR	State Recreation River
SRS	State Recreational Site
syngas	synthetic gas
UCG	underground coal gasification
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

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4 ALTERNATIVES DEVELOPMENT

The objective of this study is to identify possible routes to connect to areas of resources (mineral, timber, oil, gas, etc.) identified in the Alaska Range and its southeast foothills, as presented earlier in this document. This section discusses the methodology used to develop the corridor segments, alignments, and proposed access routes.

The scope of this study addressed only a hard surface road access option. Rail access could be another option but was not considered or evaluated as part of this study at this time.

4.1 Corridor Development Methodology

Alternatives development for this study occurred in a six-step process:

1. Inventory resource opportunities for access in the Study Area
2. Consider previously identified alignments or corridors
3. Identify Susitna River crossing location(s)
4. Identify environmental constraints and opportunities
5. Identify broad preliminary corridor opportunities and refine alignment centerlines
6. Evaluate proposed access routes for strengths and weaknesses

- Step 1. Inventory resource opportunities in the Study Area

The project team reviewed existing literature and conducted interviews to determine the location of resource opportunities (and constraints) for a potential access road into the Susitna Basin. The result of this process is the identification of possible logical termini – the origin and destination for the proposed corridors. At the outset of the study, the beginning point was the Parks Highway system; however, as the study progressed, other possible origin locations were identified, which included the Beluga/Tyonek region, the Alaska railroad, or Port MacKenzie. The other possible termini for surface transportation access were the identified resource opportunities, most specifically the mineral deposits generally located either southeast of Rainy Pass or in the Beluga/Tyonek region. The subsequent corridors between these termini provide access to additional resource opportunities (e.g., timber, agriculture, recreation, etc.). The objective of providing access is not to connect to any one particular resource deposit, but to provide access to an area where multiple resources could be accessed by a transportation system. Resource opportunities are described in the resource inventory, Section 2.

- Step 2. Consider previously identified alignments or corridors

Several access corridors into or through the Susitna Basin have been previously identified by a number of agencies over the past 50 years. Information was gleaned from these reports, and the previously identified routes were considered in determining the location for access corridors as part of this current study.

- Step 3. Identify Susitna River crossing location(s)

There are very few locations where the Susitna River can be reasonably crossed, based on a number of factors including river stability, required crossing length, and approach topography. Once the crossing location(s) of the Susitna River were identified, the corridors were routed to connect to these crossing locations.

- Step 4. Identify environmental constraints and opportunities

The team identified environmental opportunities and constraints for the location of an access road. Whereas opportunity identification helps to determine where the road could feasibly and reasonably be located, constraints identification helped to determine where placement of the road should be avoided from an engineering or permitting perspective. Constraints included natural barriers or factors such as topography, rivers, wetlands, and other features such as non-State lands (e.g., private lands).

- Step 5. Identify broad preliminary corridors and refine alignment centerlines

Broad preliminary corridors were identified based on the location of natural resources, constraints, and opportunities. Based on these broad corridors, alignment centerlines were refined and combined to create potential access routes for evaluation.

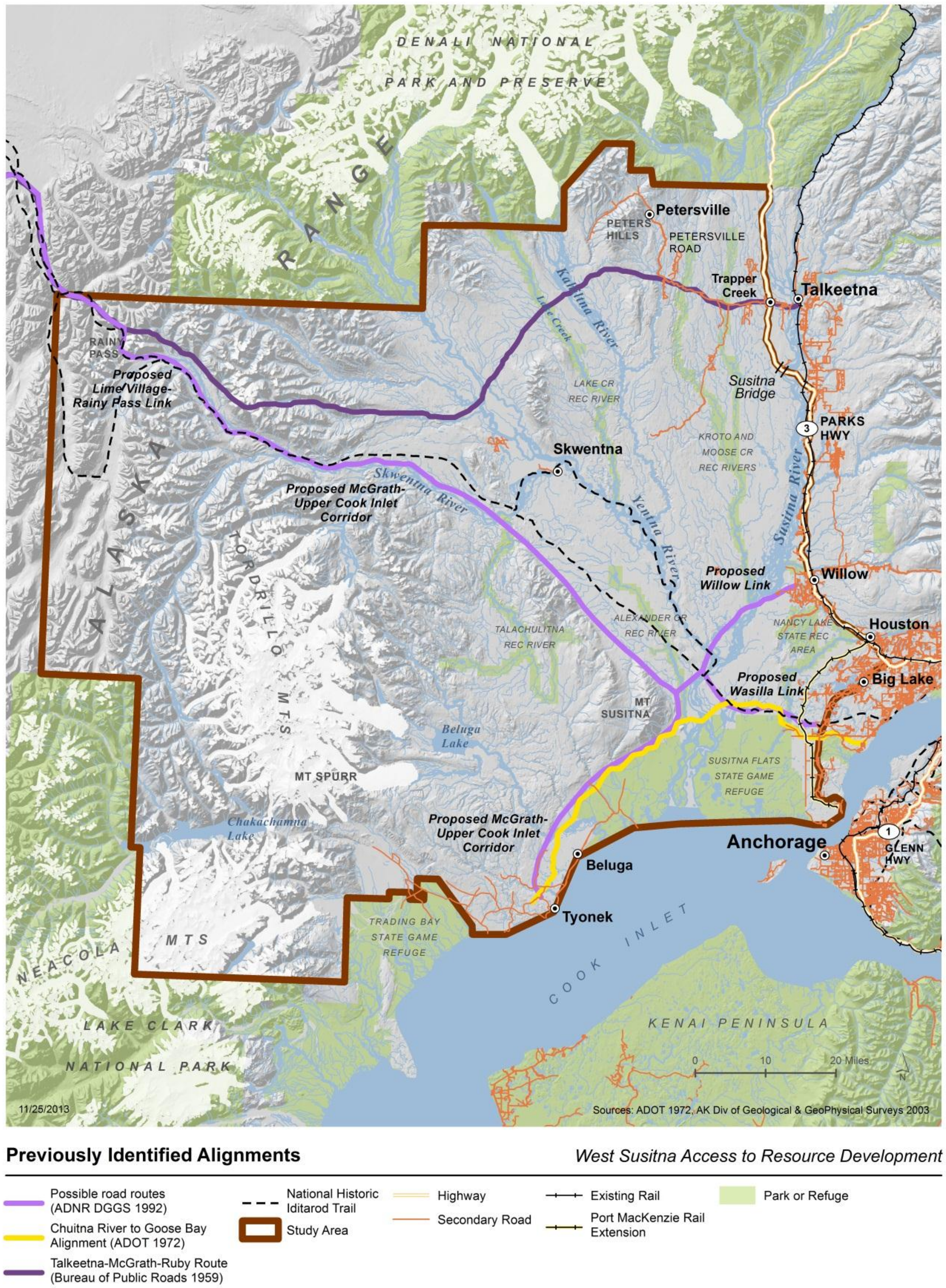
- Step 6. Evaluate proposed access routes for strengths and weaknesses

The project team evaluated the strengths (opportunities) and weaknesses (constraints) of the identified alignments.

4.2 Previously Identified Alignments in the Study Area

As data was collected and literature was reviewed during the resource inventory task, three previously identified alignments into the Study Area were discovered. These previously identified alignments are described briefly in this section and shown on Figure 4-1.

Figure 4-1. Previously Identified Alignments



4.2.1 McGrath-Upper Cook Inlet Corridor, DNR-DGGS 1992

In 1992, the DNR-DGGS compiled a series of digital maps for the State depicting transportation corridors to areas with high resource potential and areas that required land links between critical locations. The corridors were identified by the State Pipeline Coordinators Office via a Corridor Selection Steering Committee. Many of the centerlines had been a part of their long-range planning documents for many years while some routes were identified at the time of the State's Land Selection project. These DGGS maps were compiled based on previously published and unpublished reports, and interpretations of aerial photographs and satellite imagery. Nearly 200 sources of technical information were used and nearly 400 geologic maps were produced through this corridor evaluation project. These maps were published and made available in 2003.[144]

> "Access to Alaska's mineral lands is a strategic issue for the mineral industry and the state and federal governments. During previous campaigns undertaken by the state of Alaska to choose stateland entitlement lands, many potential access corridors were identified and linked in a conceptual long-range transportation grid. This grid is the basis for much of the state's current transportation planning and is consulted when considering access to new mineral discoveries."
>
> - Survey of Geology, Geologic Materials, and Geologic Hazards in Proposed Access Corridors, Alaska. (DNR-DGGS 2003)
>
> http://137.229.113.112/webpubs/dggs/mp/text/mp129.pdf

The DGGS maps depict 10-mile-wide corridors that straddle the centerlines of the proposed access routes. These routes were identified to connect strategically important centers of population, ports, pinch points, and resource-rich lands. The routes were identified based on favorable terrain and avoiding natural hazards so that available geologic-materials resources could also be selected.

Two geologic maps (in the Tyonek and Talkeetna quadrangles) depict DNR-DGGS corridors in the Study Area. These two corridors are:

- A proposed McGrath-Upper Cook Inlet Corridor that begins in the Beluga/Tyonek region and travels east of Mount Susitna before turning northwest and traveling through Rainy Pass to McGrath.
- A proposed Willow or Wasilla Link that connects to the McGrath-Upper Cook Inlet Corridor as an alternative to the Beluga/Tyonek termini.

4.2.2 Chuitna River to Goose Bay Corridor, Department of Highways 1972

The State of Alaska Department of Highways (the precursor to the Alaska DOT&PF) prepared a series of ROW maps dated May 1972 showing an alignment that goes west from Goose Bay across the Susitna River to the Beluga area. The DNR Alaska Division of Land (ADL) 575888 record indicates the Department of Highways had submitted an application in 1972 requesting a ROW corridor of 400 feet and 65 miles in length for the Chuitna River to Goose Bay project. The ADL record indicates that a number of land disposal activities have been recorded over the years for the subject lands, including land conveyances to Native corporations and several sections deleted from this ROW corridor as land was transferred. The case file was closed in 2008 and then reopened shortly thereafter. The application for the ROW corridor was never formally acted upon.

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[144] DNR-DGGS. May 17, 2013. Personal communication with De Anne Stevens, DNR-DGGS Engineering Geology Section Chief.

As drawn on the 1972 maps, the alignment crosses approximately 61 sections. As of March 2013, 9 of those sections contain Mental Health Trust land, 16 contain Municipal Entitlement land, and one section had been conveyed per Alaska Native Claims Settlement Act (ANCSA). Based on communications with DNR in March 2013, approximately 43 percent of the corridor is not on state-patented or state-selected land.

4.2.3 Talkeetna-McGrath-Ruby Proposed Road Route, Bureau of Public Roads 1959

The Bureau of Public Roads prepared a report in 1959 depicting a proposed road route from Talkeetna to McGrath and Ruby. The alignment starts near Talkeetna and Petersville and travels through the Study Area and on through Rainy Pass. The document describes the existing conditions in 1959, the proposed transportation routes, and how construction of the proposed routes may aid in the development of the area's natural resources. At the time of the report, only the Alaska Railroad tracks were in place (as the Parks Highway had not yet been constructed).

4.3 Susitna River Crossing Location

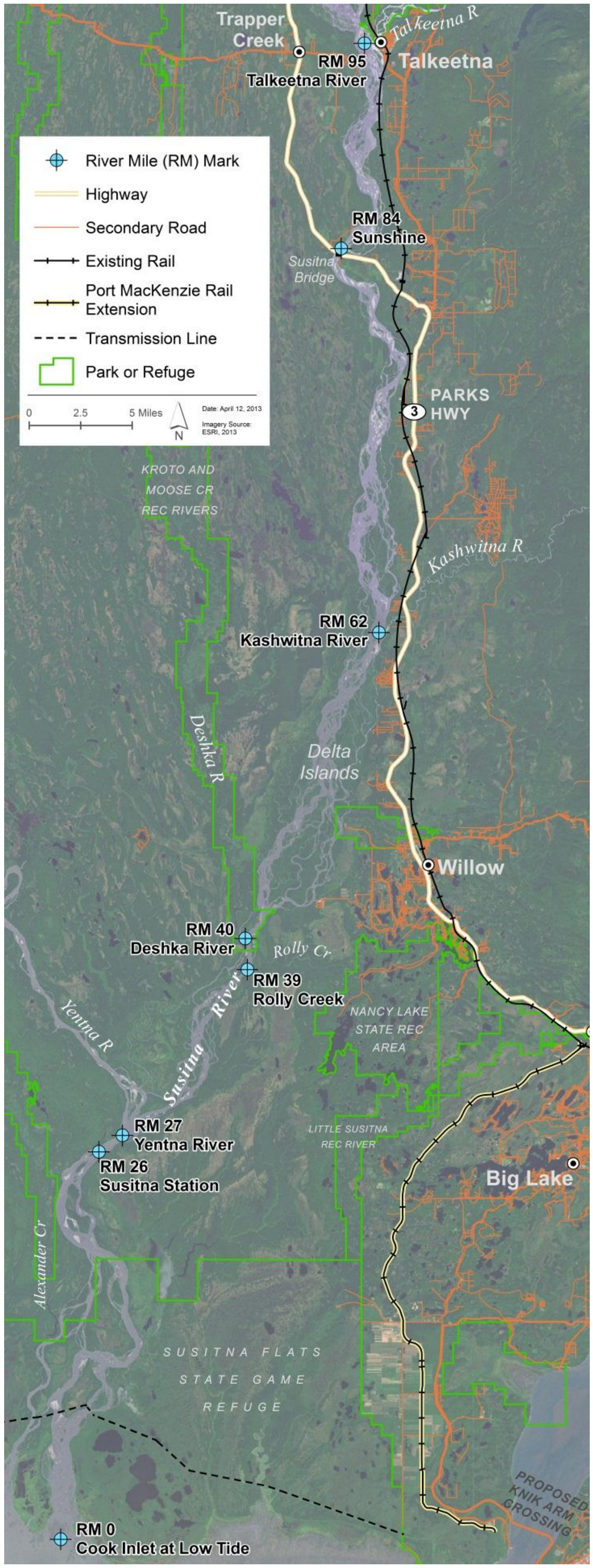
4.3.1 Introduction

The Susitna River originates in glaciers of the Alaska and Talkeetna Mountain ranges and flows about 320 miles in a southerly direction before entering northern Cook Inlet. The river is generally differentiated into the lower river and the upper river at the confluence of the Susitna River, Talkeetna River, and Chulitna River at Talkeetna. The only existing road crossing of the Lower Susitna River is the Parks Highway crossing at Sunshine, approximately 12 river miles downstream of Talkeetna.

A literature and aerial photograph review was completed to evaluate potential crossing locations of the lower Susitna River. The results of the review are described in this section. The river miles (RMs) referenced are based on river mapping, with RM 0 approximately at the confluence of the Susitna River and Cook Inlet at low tide and RM 95 in Talkeetna. For reference only, other notable RMs include the Kashwitna River (RM 62); Deshka River (RM 40); Rolly Creek (RM 39); Yentna River (RM 27); and Susitna Landing (RM 26) (also known as Susitna Station). Figure 4-2 depicts these locations. The project team assessed the entire lower Susitna River (RM 0 to RM 95) for potential crossings, as described in the following sections.

Numerous clear water tributaries enter the east side of the Lower Susitna River, and generally enter perpendicular to the river. In contrast, tributaries on the west side flow roughly parallel to the river and enter the main stem below Willow Creek. West side tributaries include the Deshka River, Lake and Alexander Creeks, and the Yentna River and its tributaries. Much of this west side drainage north of the Yentna River flows north to south.

Figure 4-2. Lower Susitna River Vicinity



4.3.2 Crossing Location Options and Analysis

Identifying where to cross the Susitna River is a key element in establishing the location and practicality of potential access corridors in the Study Area. Crossing width, approach topography, geotechnical aspects, stream hydrology, and bank stability are considerations to factor into determination of a crossing location.

The study team identified potential crossing locations and rated them as suitable, marginal, or unsuitable. A suitable location is defined as a location where the river is stable, the banks are high enough for abutments, and the crossing length is relatively short. Alternatively, an unsuitable location is anticipated to be unstable with low banks and a relatively long crossing length. A marginal location is rated somewhere in between. Only "suitable" locations were recommended for crossing locations at this preliminary level of evaluation.

Three possible locations were identified for crossing the Susitna River between Talkeetna and tidewater. Of the three locations, only two locations were determined to be suitable: (1) Sunshine at RM 84 and (2) Susitna Landing at RM 26. There is also a marginally suitable third location at the Deshka River (RM 40). These three locations are summarized in Table 4-1 and further described in the following section.

Table 4-1. Potential Susitna River Crossing Locations

Susitna River Mile (RM)	Crossing Name	Crossing Width (feet)	Comments
84	Sunshine	1,000	High stable banks, single channel. Good crossing location with the existing bridge.
40	Deshka River	3,000 to 5,000	Low unstable banks, primarily single channel, ongoing channel migration. Will require extensive bank stabilization. Marginal crossing location.
26	Susitna Landing*	2,000	Stable banks, bedrock control, single channel. Good crossing location.

*Also called Susitna Station.

RM 95 (Talkeetna) to RM 62 (Kashwitna River). Downstream of the Three River Confluence at Talkeetna, the Susitna River is braided with multiple channels interlaced through a sparsely vegetated floodplain. The floodplain consists of river-deposited alluvial sediments that are easily moved by the river. The area is subject to major channel and floodplain changes during flood events. The main channel is intermittently controlled laterally where it flows against terraces. Since the active floodplain is very wide, the presence of terraces has little significance except for determining the general orientation of the river system. An exception is where the terraces constrict the river to a single channel at the Parks Highway Bridge at Sunshine at RM 84. See Figure 4-3.

The existing crossing at Sunshine is the only suitable crossing location in this reach.

Figure 4-3. Susitna River: Talkeetna (RM 95) to Kashwitna River (RM 62)

RM 62 (Kashwitna River) to RM 40 (Deshka River). Downstream of the Kashwitna River confluence the Susitna River branches out into multiple channels separated by islands with established vegetation. This reach of the river has been named Delta Islands because it resembles the distributary channel network common with large river deltas. The Delta Islands section has a very broad floodplain, approximately 1 mile wide, with little lateral control. The floodplain consists of river-deposited alluvial sediments that are easily moved by the river. The area is subject to major changes during flood events. See Figure 4-4.

There are no suitable crossing locations in this reach.

Figure 4-4. Susitna River: Kashwitna River (RM 62) to Deshka River (RM 40)

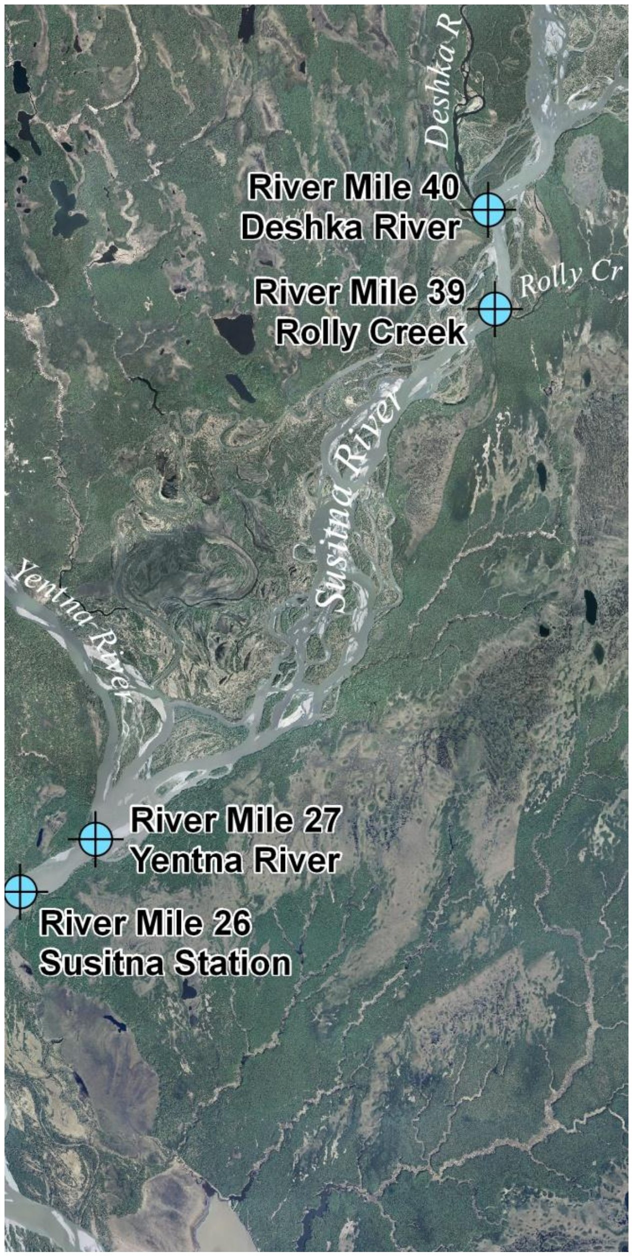
RM 40 (Deshka River). Terraces constrict the Susitna River for a short distance between the downstream end of the Deshka River and the upstream end of Kroto Slough. Despite the constriction, there is significant channel movement in this reach. A crossing would be possible at this location but significant bank stabilization will be required.

This is a marginal site for a road crossing.

RM 39 (Rolly Creek) to RM 27 (Yentna River). This reach of the Susitna River is composed of multiple split channels. This reach is actively migrating within a broad floodplain. For much of this reach, the river is paralleled by Kroto Slough on the west side, and the Yentna River enters at RM 27. See Figure 4-5.

There are no suitable crossing locations in this reach.

Figure 4-5. Susitna River: Rolly Creek (RM 39) to Yentna River (RM 27)



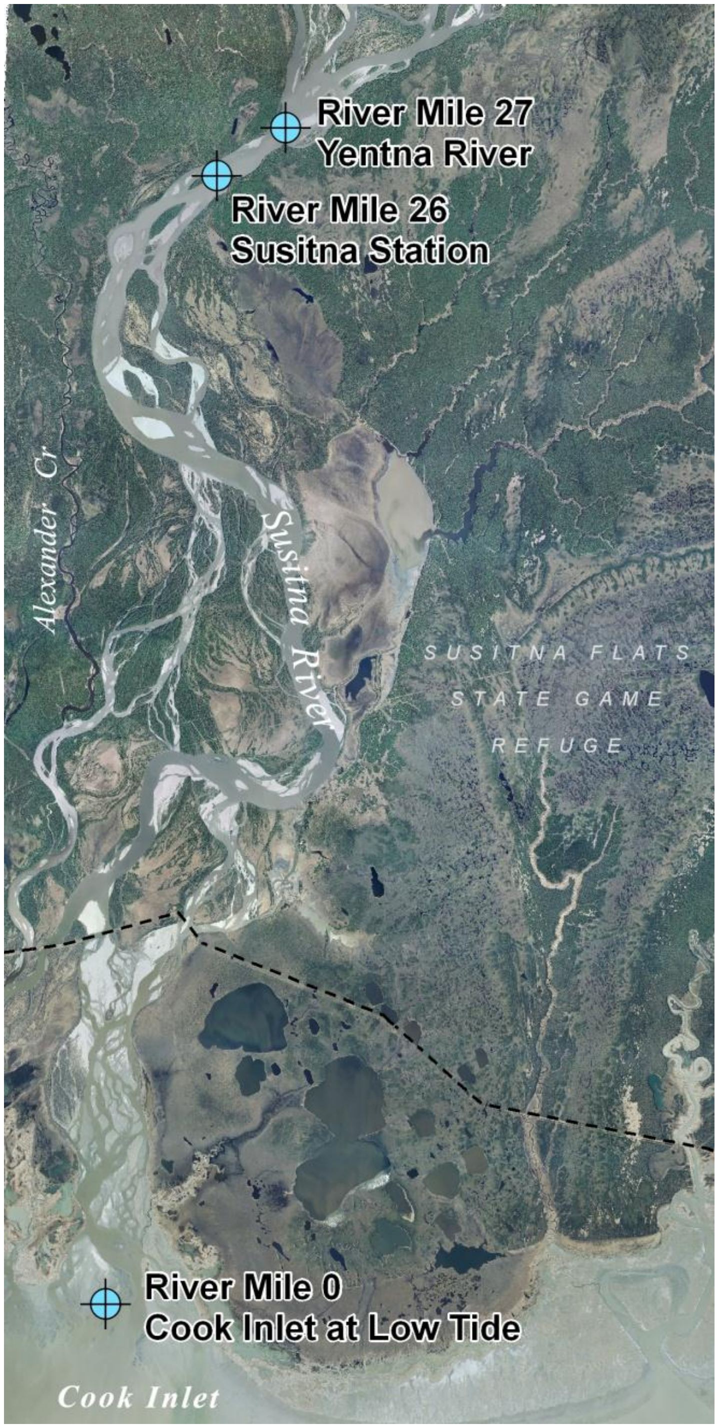
RM 26 (Susitna Landing). Susitna Landing is the historic landing area on the river and has been in use since the early 1900s. It is located at a straight reach of river with one of the few bedrock controls on the entire lower river. The river banks are stable. Water velocity is low due to the low gradient of the river. The location is just downstream of the Yentna River (RM 27).

This is a suitable site for a road crossing.

RM 26 (Susitna Landing) to RM 0 (Cook Inlet). This reach of the river is composed of multiple split channels. Downstream of RM 20 the river is tidally influenced and branches out into delta distributary channels. See Figure 4-6.

There are no suitable crossing locations in this reach.

Figure 4-6. Susitna River: Susitna Landing (RM 26) to Cook Inlet (RM 0)



4.4 Environmental Constraints

4.4.1 Constraints Analysis

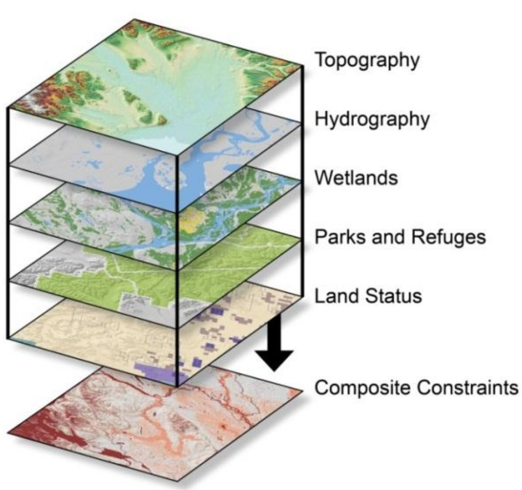
To identify and evaluate corridor opportunities for an access road into the Susitna basin to reach resources, the project team developed a composite environmental constraints map. The purpose of this mapping process is to identify potential corridors based on constraints considered to be less suitable for locating an access road (and conversely identifying areas more conducive to an access road). This method allows the identification of broad preliminary corridors and then more specific alignments that avoid or minimize the potential environmental impacts or engineering constraints of a proposed access road. The constraints analysis process is depicted in Figure 4-7. Baseline environmental features are displayed on Figure 4-8 through Figure 4-11.

Using available data, each environmental constraint was considered separately and then all were considered collectively to determine if there were opportunities to avoid or minimize the potential impacts of the project. The composite constraints map revealed areas more conducive to potential corridors.

To develop this overall understanding of the Study Area's constraints, the project team used a modern version of an overlay process introduced in the 1960s by landscape architect Ian McHarg. McHarg developed this process so that a project's environmental impacts could be considered in the early stages of project development. The process entails mapping environmental resources separately and then combining them in a layering process to develop a map that reveals the overall environmental constraints of an area.

The evaluation process starts with the identification of the factors or resources to be considered. For each factor, a GIS layer was created, with dark gradations representing areas with the most constraints (least suitable for roadway access) and the lightest gradations representing the areas with the fewest constraints (more suitable for roadway access). The layers were digitally superimposed on each other to form a composite constraints map. The darkest areas were those with the most overall constraints, and the lightest were those with the fewest constraints. The layering process enabled the project team to identify broad preliminary corridors while attempting to avoid environmental constraints.

Figure 4-7. Composite Constraints Development Process



4.4.2 Constraints

The project team identified the following environmental factors that had readily available information for environmental evaluation in a GIS format. The factors used to develop the composite constraints map are: topography, hydrography (waterbodies, anadromous fish streams, wetlands), parks and refuges, and land status.

Individual constraints are displayed on Figure 4-12 through Figure 4-16. Steep slopes and major waterbodies and streams were carried forward in all the constraints figures as these areas were deemed as extremely prohibitive for an access road.

Composite constraints are depicted on Figure 4-17. The previously identified alignments were overlaid on the composite constraints map, as depicted on Figure 4-18. The previously studied alignments did a pretty good job of missing major constraints.

Topography/slope. The elevation in the Study Area greatly varies from sea level at Cook Inlet, to several hundred feet near the Parks Highway to the slopes and mountains of the Alaska Range, as shown on Figure 4-12. Slopes were derived in GIS using a 30-meter digital elevation model (DEM) of the Study Area. The slope function calculates the rate of change of elevation for each DEM cell. Slopes for the Study Area are classified by slope value and graphically depicted in a light gray (flat terrain) to dark red (steep terrain) color scheme.

Hydrography/waterbodies and anadromous fish streams. A large number of the streams in the Study Area originate from glaciers. Large glaciers, such as the Kahiltna, flow down into the Susitna Basin. The Study Area is characterized by major river valleys and countless smaller streams. See Figure 4-13.

Waterbodies such as lakes and rivers are generally environmentally sensitive areas. Within the Study Area, they can be considered an opportunity for access as well as a constraint for the development of an access road. Water crossings were considered important to avoid when possible due to permitting requirements and the expense of culverts or bridges. The information on waterbodies in the Study Area came from the USGS National Hydrography Dataset. The resulting map is depicted in Figure 4-13.

Fish, particularly salmon, are an important resource in Alaska for economic, subsistence, and recreational purposes as part of the ecosystem. As a result, the State has developed regulations designed to protect fish habitat, particularly those streams that support anadromous fish. Activities that can impact anadromous fish streams, such as culvert and bridge construction or stream bank disturbances, require an ADF&G Title 16 Permit. The project team mapped anadromous fish streams as identified by the ADF&G Anadromous Fish Stream Catalog[145].

Wetlands. Under most circumstances, wetlands and other "waters of the U.S." are regulated by the USACE under authority of Section 404 of the Clean Water Act (CWA) or under authority of Section 10 of the Rivers and Harbors Act of 1899. By federal law (CWA) and associated policy, it is necessary to avoid project impacts to wetlands wherever practicable, minimize impact where impact is not avoidable, and in some cases compensate for the impact. Construction in Waters of the U.S., including wetlands, requires a permit process whereby any work proposed in wetlands must comply with the CWA. Before a permit to work in a wetland is granted by the USACE, the project

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[145] Alaska Department of Fish and Game. 2013. *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes—Southcentral Region.* http://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=main.home

proponent must demonstrate that no practicable alternatives exist that would avoid impacts to wetlands altogether and still meet the overall project purpose. Alternatives are typically evaluated to determine whether wetlands have been avoided where possible.

The USFWS National Wetlands Inventory (NWI) mapped wetlands in the general project area in 1984 (see Figure 4-14). 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. A significant area of the Study Area does not have NWI mapping, as indicated on Figure 4-14. As a result, due to coarse data resolution and missing data, the wetlands in the Study Area are likely greatly underestimated.

Parks, refuges, and recreation areas. State parks and wildlife refuges represent important public recreation and wildlife resources. These public lands were designated for primary purposes ranging from protecting fish and wildlife habitat to providing public recreation opportunities. Recreational resources are discussed further in Section 2.7. The project team used information from the DNR Administrative Large Parcel dataset to identify State parks and refuges in the Study Area. Parks and refuges are shown in Figure 4-15.

The Iditarod National Historic Trail traverses the Study Area and might also be considered a constraint. In addition to this trail, due to historic uses in the Susitna basin, there are likely a number of historic and archaeological resources that may also be considered constraints. A historic and archaeological survey of the Study Area was conducted at this reconnaissance-level analysis.

Land status. Land status can be viewed as both an opportunity and a constraint because the motivation for owning land can vary. Some entities own land with the intent to make a profit from the development or sale of that land. For example, the State's Mental Health Trust Land Office, which manages trust lands, manages their lands to derive income to support mental health organizations. In addition, government-owned land tends to consist of large parcels. Buying land from a few owners is preferable to buying small amounts of land from multiple land owners because it simplifies the ROW acquisition process. Institutions that have lands for the primary purpose of generating income tend to be more willing sellers than private owners. Fore these reasons, land owned the Trust or a government agency (excluding land designated as a State park, recreation area, or game refuge) was considered an opportunity.

Spatial data depicting general land status for the State of Alaska, available from the DNR Information Resource Management Division, Alaska General Land Status database, January 2013, was used to assess land status within the Study Area. The dataset combines land ownership and status records from both the U.S. Bureau of Land Management (BLM) and DNR to produce a section level indicator of general land ownership. Land status classification is summarized at the section level; therefore limitations exist with using this information. The general land ownership categories as defined within the dataset are summarized in Table 4-2 for the Study Area. The study team recognizes that additional land status analysis is important as access routes are further refined.

Table 4-2. General Land Ownership Status within the Study Area

Owner Category	Data Code	Size (acres)	% of Study Area	Viewed as Constraint or Opportunity
BLM	1500	441,509	7.2	Opportunity
Native Patented	2101	27,603	0.5	Constraint
Native Interim Conveyed (IC)	2102	11,440	0.2	Constraint
CIRI Patented	2111	1,909	0.0	Constraint
CIRI Interim Conveyed (IC)	2112	323,384	5.3	Constraint
State Patented	3101	4,333,123	70.8	Opportunity
State Tentatively Approved (TA)	3102	180,690	3.0	Opportunity
State and Native Owned	4100	8,829	0.1	Constraint
Privately Owned - BLM	5101	53,620	0.9	Constraint
State Land Disposals - Other than Municipal	5102	436,642	7.1	Constraint
State Land Disposals - Municipal Entitlements, Municipal Land Exchanges, Public & Charitable Use	5103	302,173	4.9	Opportunity
Total		6,120,922	100	

Source: GIS data from DNR 2013.

When possible, additional information and interpretation of each owner type is provided below in an attempt to better define the individual categories. Due to limitations of the data, actual ownership of any land should be verified using legal documents such as contracts, leases, etc., and/or Master Title Plats (federal land), Status Plats (state land), or municipal/borough plats in subsequent project development.

- **BLM:** This ownership type represents federally-owned land under management of BLM for various purposes such as national conservation areas, wilderness areas, national scenic and historic trails, grazing, and abandoned mines. Within the Study Area, there is only one National Historic Trail: the Iditarod. There are no National Conservation Areas, BLM Wilderness Areas, or National Scenic Trails.[146] There are various levels of interest possible (e.g., subsurface mineral estate underlying federal, State or private lands, or surface estate, etc.).
- **Native patented:** This ownership type generally consists of land for which a Native corporation or village received a patent. Additionally, interpretation may include land patented as a Native allotment to an individual or group of individuals by means of a "Certificate of Native Allotment."
- **Native Interim Conveyance:** Land designated as an entitlement to a Native corporation or village under ANCSA. Interests in the land are binding but subject to pending plat of survey and issuance of final patent.

[146] DNR-Office of Project Management and Permitting (OPMP). October 8, 2013. Comments provided during a review of a draft of this report. In subsequent project development, DNR-OPMP requested additional information be considered in terms of whether the BLM land has been designated for a particular purpose or if it is managed for multiple uses.

- **CIRI patented**: Cook Inlet Region, Inc. land for which the Native corporation CIRI holds a patent. Interests are typically subsurface but occasionally include surface rights as well.
- **CIRI Interim Conveyance**: Land designated as an entitlement to the corporation under ANCSA. Interests in the land are binding but subject to pending plat of survey and issuance of final patent.
- **State tentatively approved**: Lands that have been approved for conveyance to the State but for which the State has not yet received final patent. These lands could have been offered and even conditionally sold via quitclaim deed to private individuals (the sale cancelled/refunded if the State is not granted patent). The State of Alaska DNR typically manages these lands.
- **State patented**: Lands that have been conveyed to the State of Alaska for various purposes (e.g., Mental Health Grants, Community Grants, School Land Settlements, University Grant, General Grant, Mineral Estate, Railroad Transfer, etc.) and at varying levels of interest (e.g., surface, subsurface, or both). Interpretation may also include land patented by the State to an individual or group of individuals.
- **State- and Native-owned**: Interpreted as land owned by both the State of Alaska and a native corporation or village; individually defined above. More research is required.
- **Privately owned - BLM**: More research is required to determine specifics on this ownership type. It is assumed these lands are under private ownership.
- **State Land Disposals - other than municipal**: There are several types of land sales programs whereby State land is disposed of by DNR to private individuals under programs such as the sealed-bid auction program for the sale of subdivision and other surveyed parcels, over-the-counter sales, and remote recreational cabin site sales. Alaska Mental Health Trust Land office (by lease) and the University of Alaska Land Management office (by sale and/or lease) are also involved in disposal of State land.
- **State Land Disposals - Municipal Entitlements, Municipal Land Exchanges, Public and Charitable Use**: Under the General Grant Land law (AS29.65) local government acquires, at no cost, large undeveloped tracts of land from the state. Restrictions apply to disposal of this land by the municipality (i.e., it cannot be transferred except for a public purpose).

The above ownership types were aggregated to provide a more concise description of land ownership. Within the Study Area, the State of Alaska owns or has selected approximately 74 percent of the land (Codes 3101 and 3102). Of the remaining land, 7 percent is federally owned (Code 1500), 5 percent is Borough-owned land (MSB and KPB, Code 5103), 6 percent is owned by Native village and regional corporations (Codes 2101, 2102, 2111, and 2112), and 8 percent is in private ownership (Codes 5101 and 5102). Land status constraints are depicted on Figure 4-16**.**

Figure 4-8. Anadromous Streams

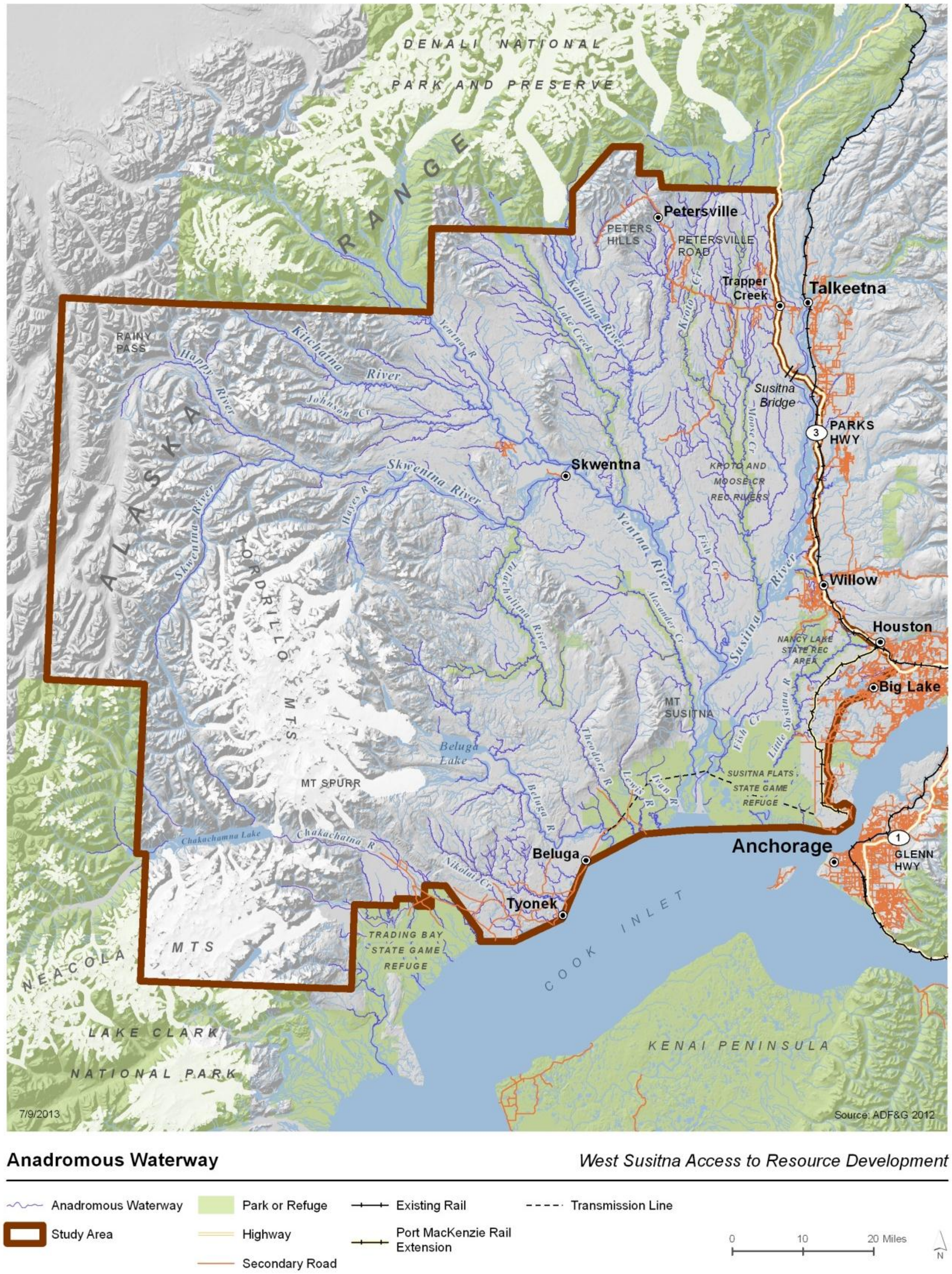


Figure 4-9. Wetlands

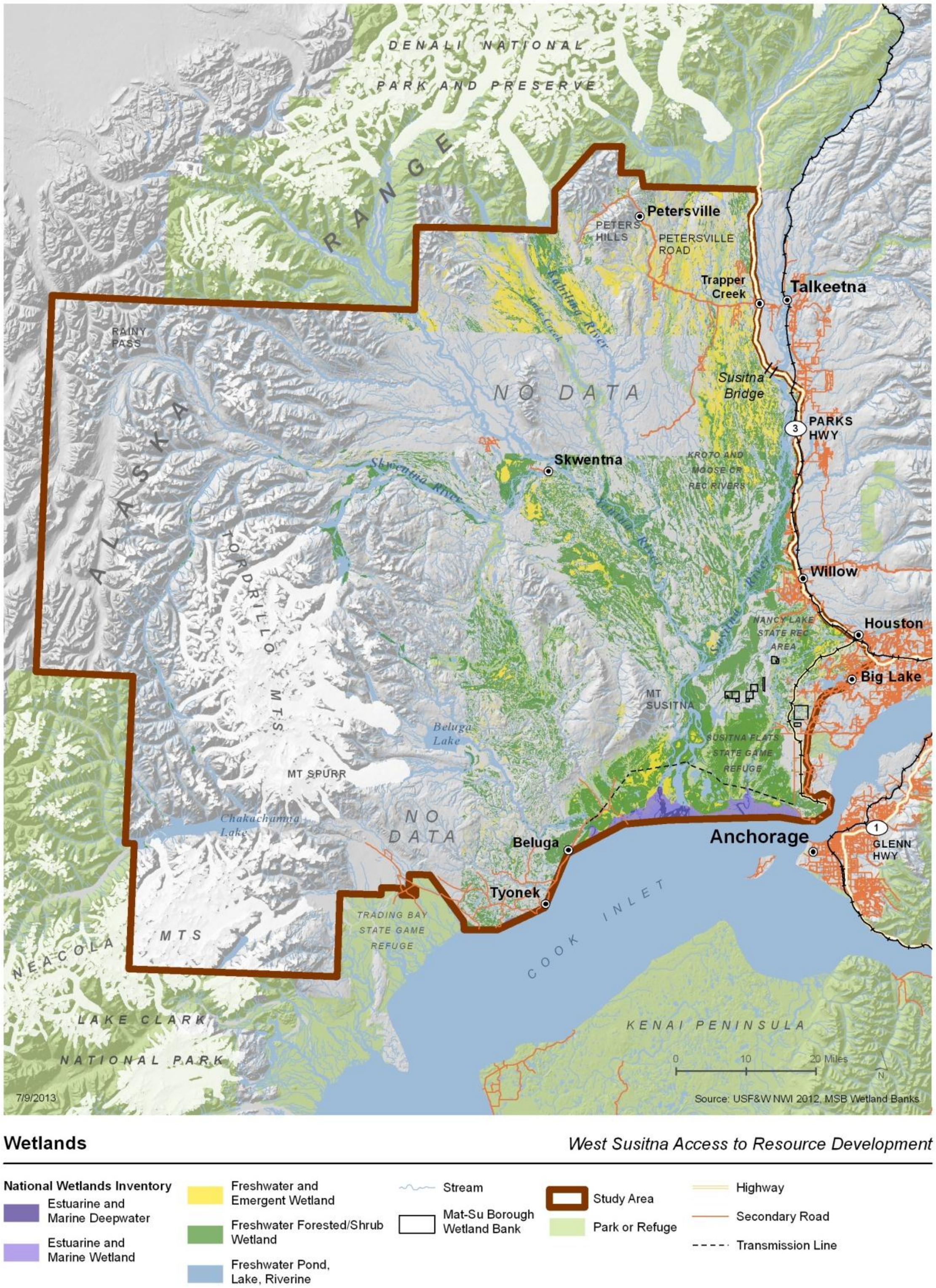


Figure 4-10. Parks and Refuges

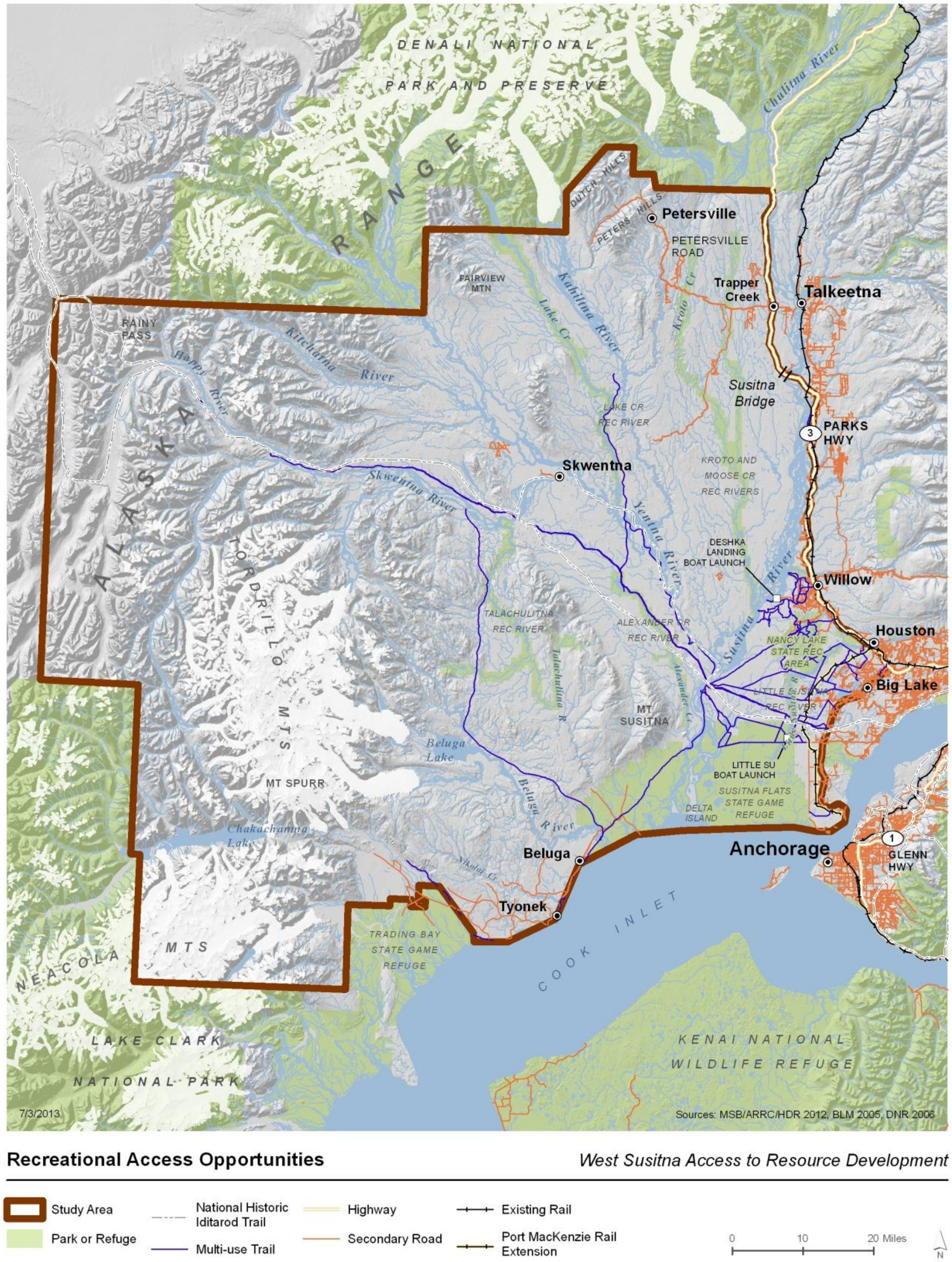


Figure 4-11. Land Status

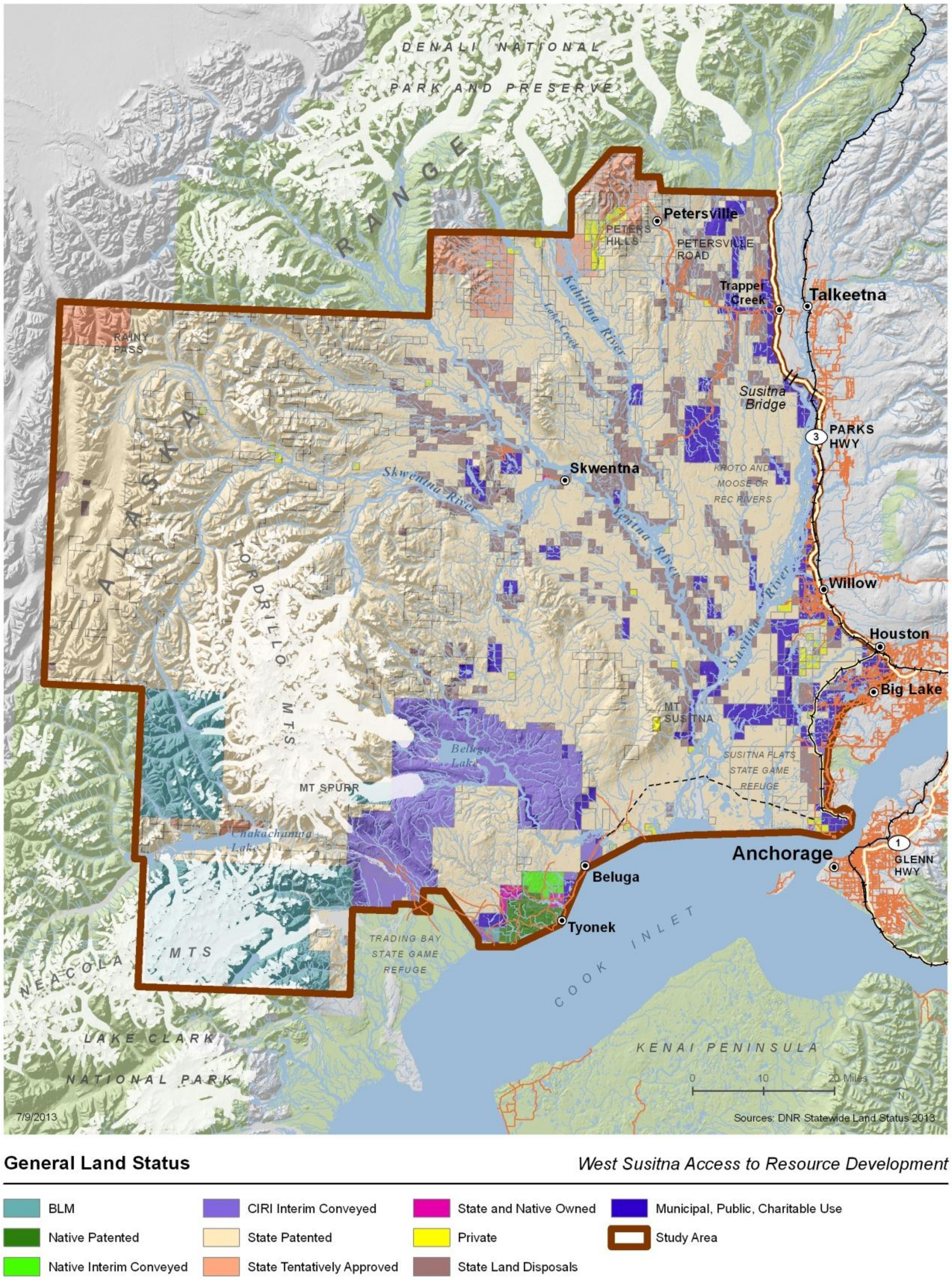


Figure 4-12. Constraints: Slope

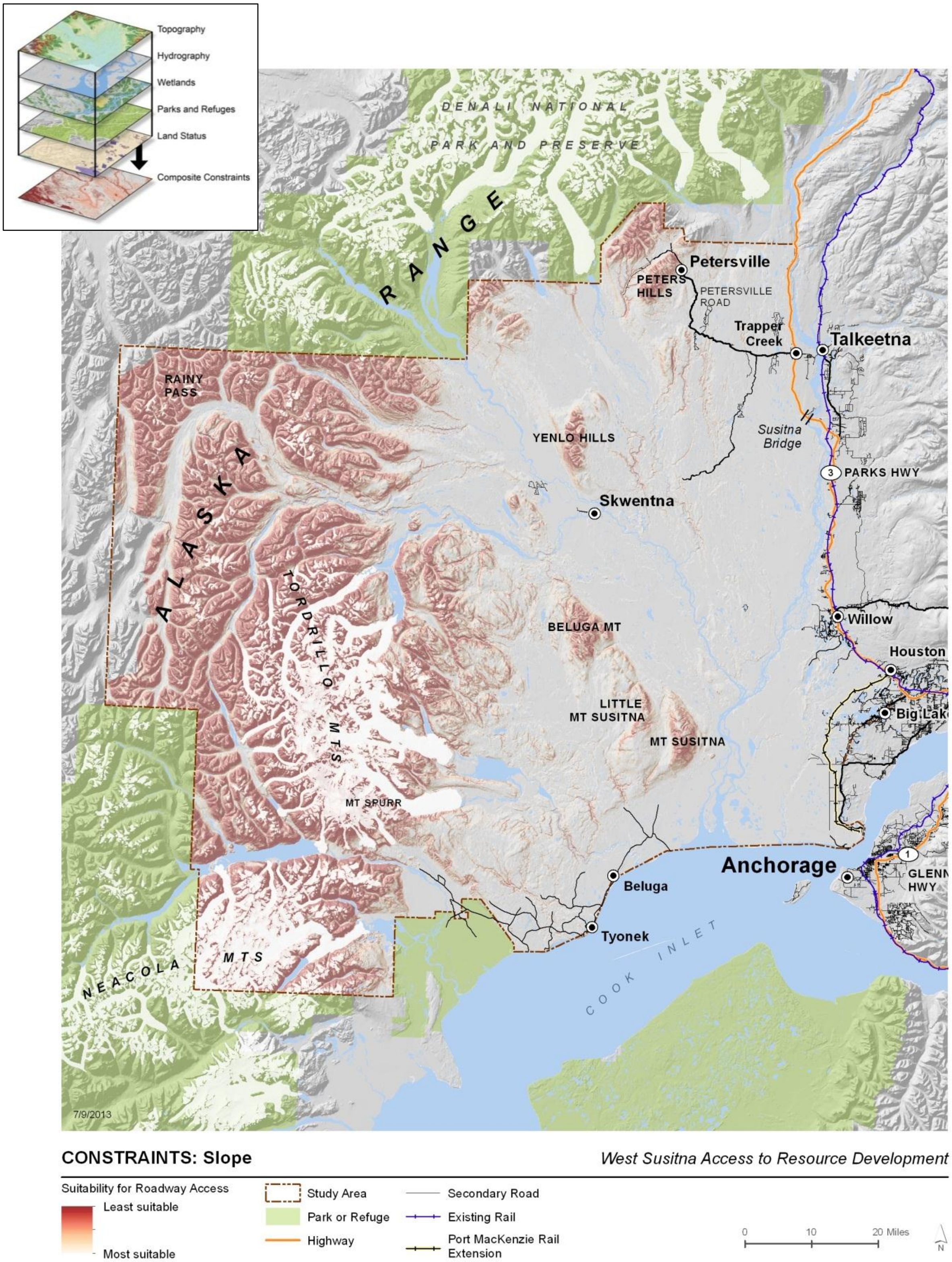


Figure 4-13. Constraints: Slope + Waterbodies and Streams

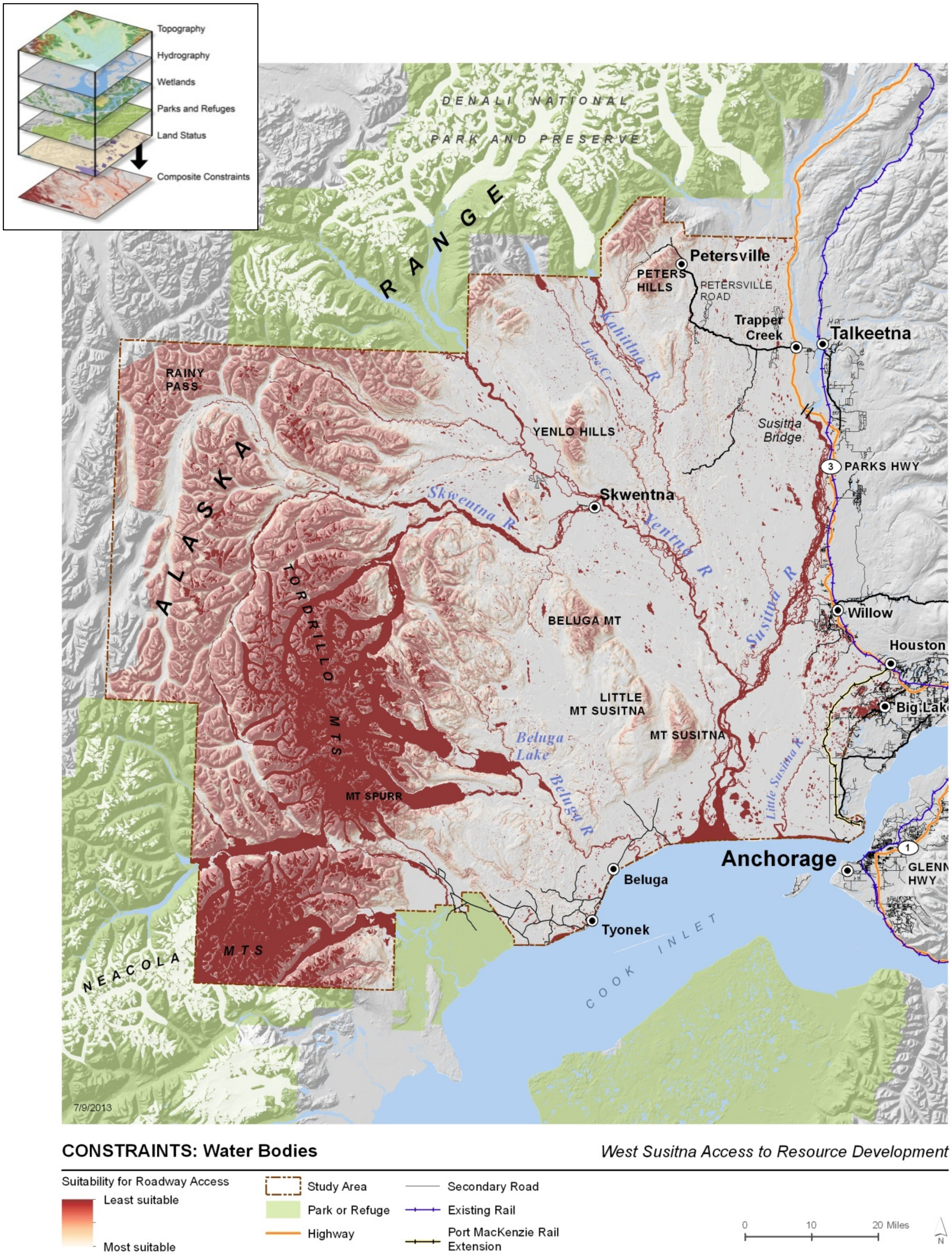
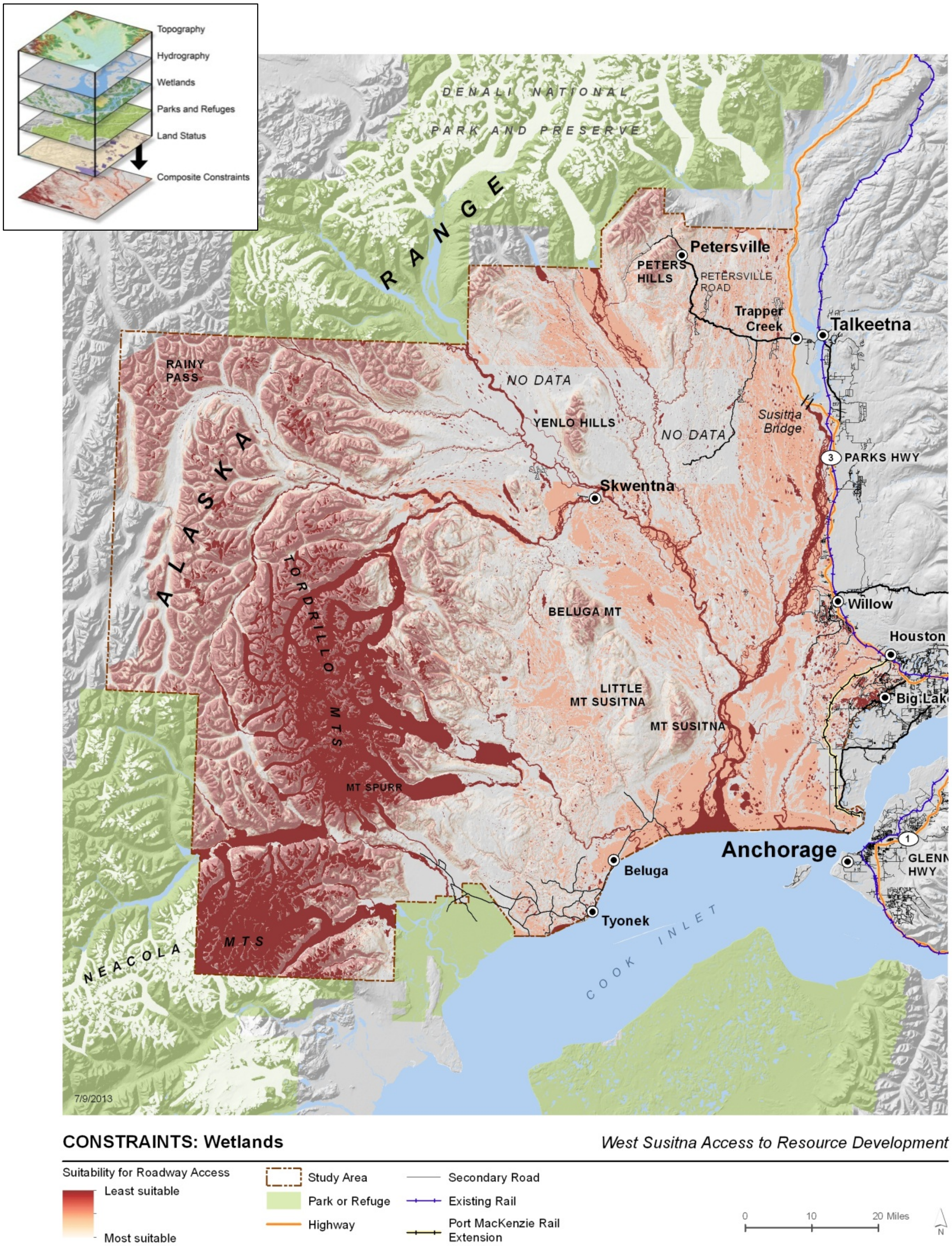


Figure 4-14. Constraints: Slope, Waterbodies, and Streams + Wetlands



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