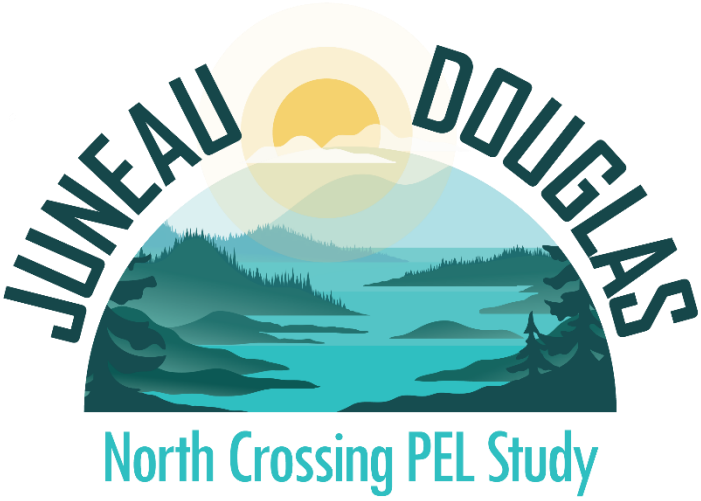
APPENDIX 6:

Basic Description of Environmental Setting



ENVIRONMENTAL SETTING

December 2022

This planning document may be adopted in a subsequent environmental review process in accordance with 23 U.S.C. 168 Integration of Planning and Environmental Review. The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

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ACRONYMS & ABBREVIATIONS

ADEC ..... Alaska Department of Environmental Conservation
ADFG ..... Alaska Department of Fish and Game
ADNR ..... Alaska Department of Natural Resources
AHRS ..... Alaska Heritage Resources Survey
AKEPIC ..... Alaska Exotic Plant Information Clearinghouse
AMSA ..... Area Meriting Special Addition
BIA ..... Bureau of Indian Affairs
CAA ..... Clean Air Act
CBJ ..... City and Borough of Juneau
CFR ..... Code of Federal Regulations
CO_2 ..... Carbon Dioxide
DOT&PF ..... The State of Alaska Department of Transportation & Public Facilities
DOWLD ..... Alaska Department of Workforce and Labor Development
DPS ..... distinct population segments
Eagle Act ..... Bald and Golden Eagle Protection Act
EFH ..... Essential Fish Habitat
EJ ..... Environmental Justice
EPA ..... Environmental Protection Agency
ESA ..... Endangered Species Act
FHWA ..... Federal Highway Administration
ID ..... Identification
IHA ..... Incidental Harassment Authorization
LMP ..... Limited Maintenance Plan
LOS ..... Level-of-Service
LRTP ..... Long Range Transportation Plan
LWCF ..... Land and Water Conservation Fund
MBTA ..... Migratory Bird Treaty Act
MWSGR ..... Mendenhall Wetlands State Game Refuge
NAAQS ..... National Ambient Air Quality Standards
NEPA ..... National Environmental Policy Act
NMFS ..... National Marine Fisheries Service
NRHP ..... National Register of Historic Places
PEL ..... Planning and Environmental Linkages
PDSR ..... Project Development Summary Report
SATP ..... Southeast Alaska Transportation Plan
SGCN ..... species of greatest conservation need
TMDL ..... total maximum daily loads
USACE ..... U.S. Army Corps of Engineers
USCG ..... United States Coast Guard
USDOT ..... U.S. Department of Transportation
USFWS ..... United State Fish and Wildlife Service

1.0 INTRODUCTION

The purpose of this report, consistent with 23 United States Code (U.S.C.) 168, *Integration of planning and environmental review,* and 23 Code of Federal Regulations (CFR) 450.212 and 450.318, *Transportation planning studies and project development*, is to document a basic description of the natural and human environment of the study area of the Juneau Douglas North Crossing Planning and Environmental Linkages (PEL) Study. Consistent with the above code and regulations, which may be adopted or incorporated by reference during a later environmental review process. The resources considered in this Environmental Setting Report are consistent with the Federal Highway Administration (FHWA) and the State of Alaska Department of Transportation & Public Facilities (DOT&PF) environmental review guidelines and include issues raised during the public involvement process.

Statewide transportation planning requirements are described in 23 U.S.C. Section 135. The DOT&PF does this through its Long Range Transportation Plan (LRTP), which considers all modes of transportation that function as an intermodal transportation system. The intent of this process is to inform transportation investments and decision-making. A PEL[1] study is a planning product that needs to consider the key Federally required planning factors, which include:

1. Support the economic vitality of the United States, the States, nonmetropolitan areas and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users.
4. Increase the accessibility and mobility of people and freight.
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system across and between modes throughout the State, for people and freight.
7. Promote efficient system management and operation.

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[1] The FHWA defines PEL studies as "a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process." (FHWA 2021e).

The National Highway System (NHS) includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the USDOT in cooperation with the states, local officials, and metropolitan planning organizations (MPOs).

8. Emphasize the preservation of the existing transportation system.
9. Improve transportation system resiliency and reliability and reduce (or mitigate) the stormwater impacts of surface transportation.
10. Enhance travel and tourism.

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

1.1 PEL Study Description

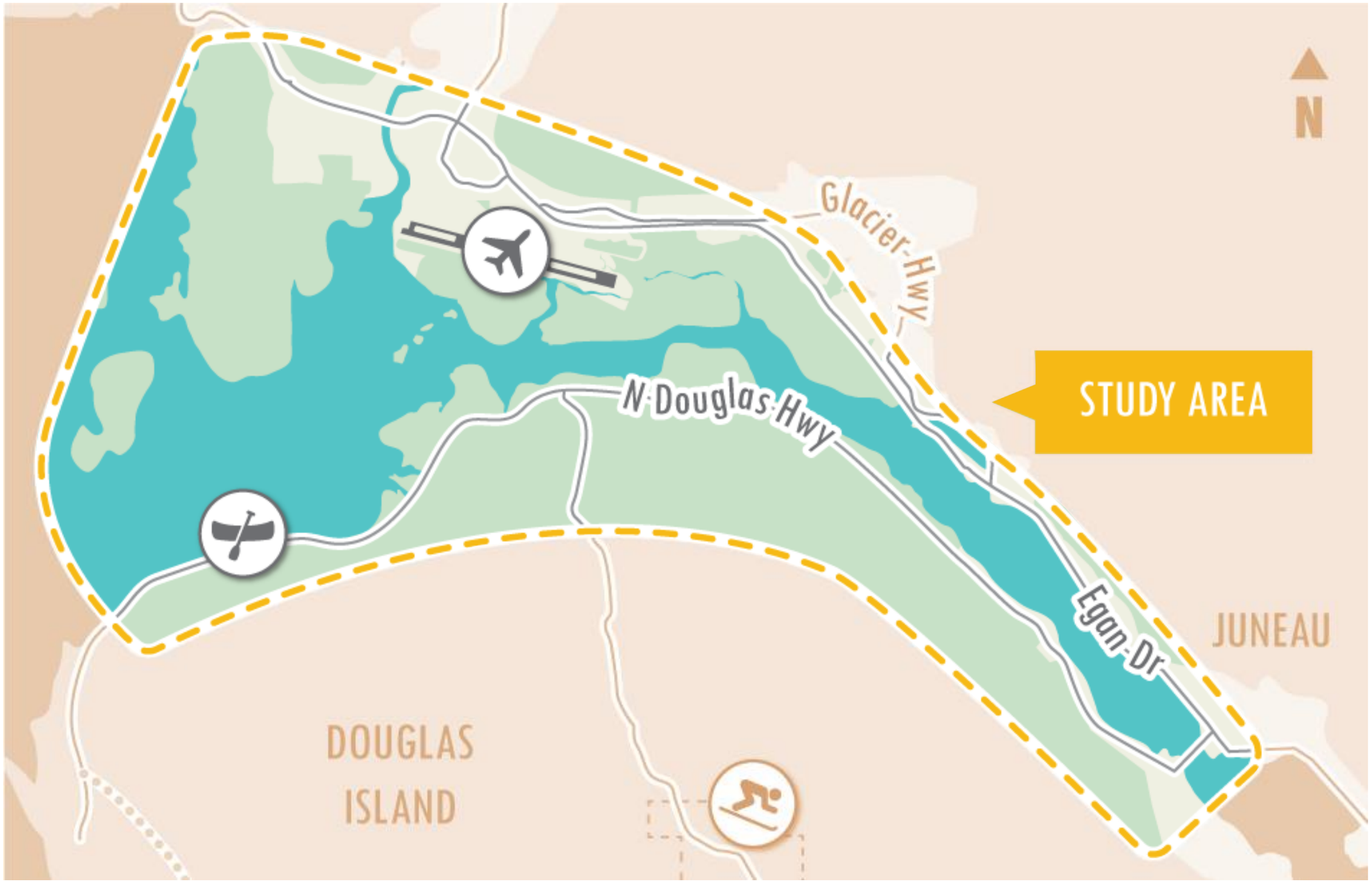
The Alaska Department of Transportation and Public Facilities (DOT&PF) in cooperation with City and Borough of Juneau (CBJ) is studying a possible transportation corridor to connect Juneau with the north end of Douglas Island. A connection has been studied since the 1980s but has not progressed beyond identification and recommendation of preliminary alternative alignments. The previous studies highlighted several reasons for a north crossing:

- Congestion during peak periods on the existing Douglas Island bridge
- Concerns about safety and emergency response in the event of a bridge closure
- The potential for residential, commercial, industrial and port development at west Douglas Island

DOT&PF has chosen to use the PEL process to identify and evaluate a purpose and need (P&N) and recommend alternatives for connecting Juneau with the northern end of Douglas Island. The PEL process will provide opportunities for public input and involvement. The analyses conducted may be incorporated into a future National Environmental Policy Act (NEPA) process.

The study area boundary, where the proposed crossing may be located, is shown in Figure 1. The study area encompasses the area where prior studies and community outreach identified potential alternative crossing locations.

Figure 1: PEL Study Area



2.0 EXISTING CONDITIONS

The following resources are not present within the study area and are therefore not analyzed: coastal barriers and coastal zone management, farmlands, and wild and scenic rivers. Methods used to describe each resource below are detailed in stand-alone memorandums.

2.1 Human Environment

2.1.1 Socioeconomics

2.1.1.1 Regulatory Framework

Transportation improvement projects have the potential to affect local communities indirectly through changing economic development patterns and land use or directly through impacts such as real estate acquisition for right-of-way.

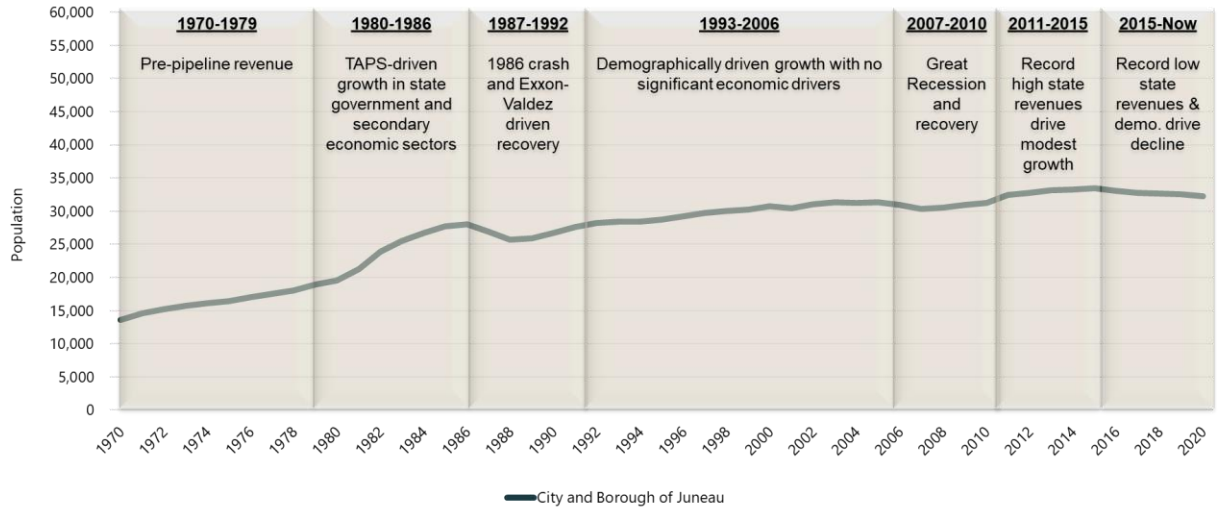
Understanding community, social, and economic conditions is critical to determine if proposed transportation improvements affect local populations who live and work in the study area (per Section 109[h] of the Federal Aid Highway Act). Guiding this analysis is the FHWA's Technical Advisory T 6640.8A, Title VI of the Civil Rights Act of 1964, and Executive Order 12898, Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations. The EJ Executive Order, in particular, directs federal agencies to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

2.1.1.2 Existing Conditions

2.1.1.2.1 Population and Economic Projections

CBJ is home to approximately 32,300 people (Alaska Department of Workforce and Labor Development [DOWLD], 2022b). Between 1970 and 2020, the city's population more than doubled but nearly all this growth took place in the first half of that fifty-year period. In 2005 the city's population was 31,340. In short, growth between 2005 and 2020 was less than 1,000 persons or approximately 2.9 percent of the total population. The CBJ's peak population was an estimated 33,445 in 2015 after a period of strong state revenues and a post-Great Recession rebound in tourism. Since 2015, the state's recession and associated cuts to government employment contributed to a slow drift downward in population (see Figure 2).

Figure 2: City and Borough of Juneau Population 1970-2020



(Alaska Department of Labor and Workforce Development 2022b)

As growth slowed after the turn of this century, the CBJ's population aged and continues to age. The senior population (age 60+) more than doubled while the city lost approximately 18 percent of its citizens under the age of 19, three percent of its reproductive age population, and more than eight percent of its middle age population. In twenty years, the median age in Juneau increased from 35.3 to 38.8 (see Table 1). This shift could be described as "many more seniors and fewer people of reproductive age having substantially fewer children". Global demographic analyses show that once the average age of a population exceeds roughly 37.5 years of age the population is highly unlikely to be able to sustain itself.[2] The CBJ's median age is well beyond that required for natural growth and moving beyond the level required to sustain a population. The DOLWD estimates that median age by the 2040s will reach 43-44 years of age (Ritchie, 2019) (DOWLD, 2022b).

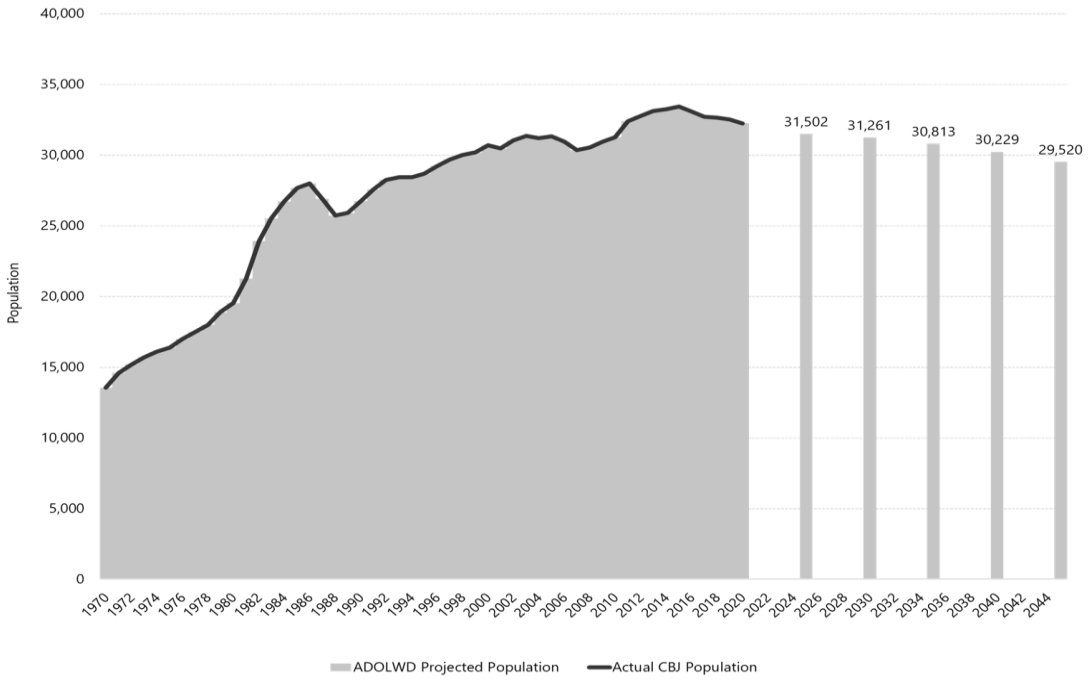
[2] *The median age required to support a one percent natural growth rate appears to be around 31-33 years of age (Ritchie, 2019).*

Table 1: Juneau Population Changes 2000-2020

Age Group	2000	2020	Change
Children (Under 19 Years)	9,204	7,619	-1,585
Reproductive Age (20-44)	11,753	11,085	-668
Middle Age (45-59)	6,970	6,402	-568
Seniors (60+)	2,784	6,777	3,993
Total Population	**30,711**	**31,833**	**1,172**
Median Age	**35.3**	**38.8**	**+3.5**

Alaska state demographer currently projects that annual deaths in the CBJ will soon exceed annual births and that the population of the CBJ will start falling later this decade and drop below 30,000 in the 2040s (Howell, 2022)(see Figure 3).

Figure 3: Historical and Projected Population, 1970-2045



(Alaska Department of Labor and Workforce Development 2022b)

While the CBJ's population is declining or stagnant, the average size of a household in the borough has fallen by more than nine percent in the last 14 years. In 2008, American Community Survey (ACS) data showed that the average CBJ household contained 2.7 persons (Juneau Economic Development Corporation, 2010). The most recent ACS data estimates an average household size of 2.45 persons (U.S. Census Bureau, 2022). Given the same population, smaller household sizes mean a need for more housing units.

In 2008, Juneau had a population of roughly 30,500 persons. Housing these individuals at an average household size of 2.7 persons per household requires just over 11,300 housing units. Housing that same number of people at 2.45 persons per household requires nearly 12,500 units. Therefore, even if the CBJ's population had remained stable and all other things being equal, the borough would have needed 1,200 more units between 2008 and 2022 to accommodate the change in average household size. With a population change from 30,500 to 32,255 in 2020 (U.S. Census Bureau, 2022) the borough would need 13,165 units, nearly 2,000 more units than in 2008, to accommodate for the population change and the change in average household size (2.7 to 2.45 persons). Through this simplistic lens we estimate that population growth alone added a need for approximately 650 more units between 2008 and 2022, while the change in household size added a need for an additional 1,350 units.

In November 2010, the Juneau Economic Development Council published the *Juneau Housing Needs Assessment* (Juneau Economic Development Corporation, 2010). This report documented that the CBJ contained 12,911 housing units in 2008. DOLWD data indicate that between 2009 and 2022, developers completed 1,335 new units (DOWLD, 2022a). Without accounting for retired or destroyed untits and short-term rentals, that brings the total number of units to about 14,246 in 2022.

2.1.1.2.2 Social Groups and Community Cohesion

The top block groups by demographic index[3] are in downtown Juneau north and south of the Juneau-Douglas Bridge, in the Lemon Creek community south of Lemon Creek, and south of Egan Drive between Old Dairy Road and Mendenhall Loop Road. The lowest demographic indices are present on Douglas Island, in Auke Bay, and south of Glacier Highway west of the Mendenhall River.

Table 2 shows the percentage of people over the age of 64, people of color, people with low income, and people with disabilities, along with corresponding statewide percentages. The percentage of people with low income in the study area is about half that of the national percentage. For the other characteristics, the study area has similar percentages to Alaska statewide and nationally.

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[3] Demographic Index is based on the average of demographic indicators; high indices demonstrate large variability, low indices demonstrate low variability

Table 2: Demographic Characteristics in the Study Area, 2019

Demographic Characteristic	Percentage of Population, Study Area	Percentage of Population, Alaska
People over the age of 64	14%	11%
People of color	37%	39%
People with low income	18%	25%
People with disabilities	14%	15%

Change in Demographics Over Time

From 2014 to 2019, the percentage of people over the age of 64 and people of color grew, while the other characteristics stayed approximately the same (Table 3). While it is uncertain if these trends will continue, percentages of people over the age of 64 and people of color continuing to grow is a possibility.

Table 3: Demographic Changes between 2014 and 2019 in the Study Area

Demographic Characteristic	Percentage of Population, 2014	Percentage of Population, 2019
People over the age of 64	11%	14%
People of color	33%	37%
People with low income	17%	18%
People with disabilities	12%	14%

In analyzing each demographic characteristic separately, downtown Juneau south of the bridge has a percentage of people over 64 that is 2.5 times (35 percent) higher than the study area percentage. Additionally, downtown Juneau south of the bridge has the highest percentage per block group of individuals identifying as disabled. North and south of Egan Drive between Vanderbilt Road and Mendenhall Loop Road has a high percentage of people of color (70 percent), doubling the study area percentage. Half of the population near Egan Drive between Switzer Creek and Old Dairy Road are low income.

To visualize demographics by block group, the four demographic characteristics described in Tables 3 and 4 were combined into a single index, similar to the Environmental Protection Agency's EJSCREEN Index. The index is calculated by taking the average of the percentages of the four characteristics. Figure 4 shows the demographic indices by block group in the study area.

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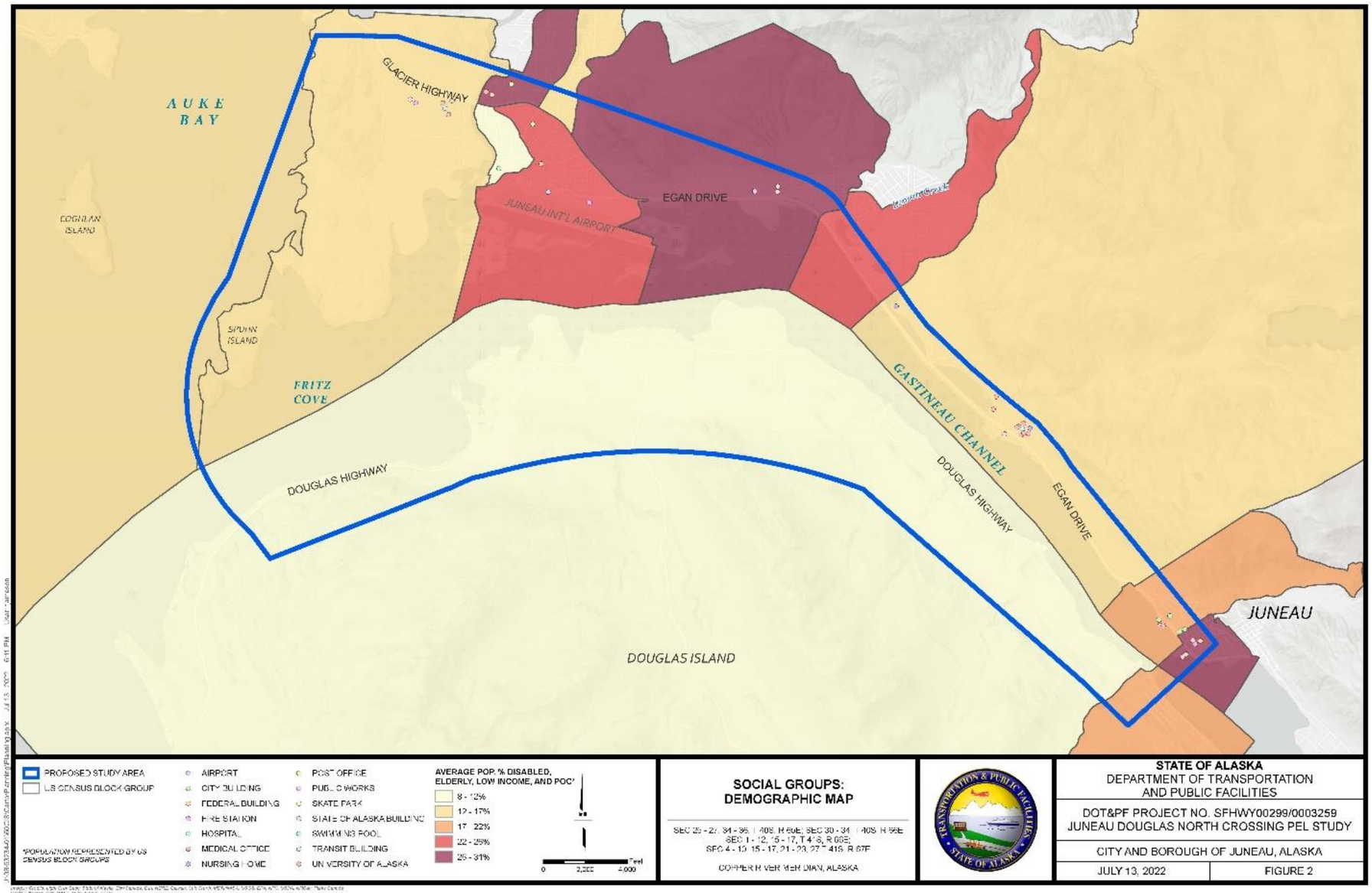
Figure 4: Social Groups: Demographic Map



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Environmental Justice

Environmental justice populations are based on low income or minority populations in comparison with state and national percentages. There is no EJ population as the percentage of people in each block group with low income or a minority is less than the state or national percentage, as shown in Table 4.

Table 4: Environmental Justice Characteristics of the Study Area, 2019

Demographic Characteristic	Percentage of Population, Study Area	Percentage of Population, Alaska	Percentage of Population, USA
People of color	37%	39%	40%
People with low income	18%	25%	31%

Transit

Table 5 shows the percentage of workers who did not work from home and did not take a car, truck, or van to work. While the percentage in the study area is equal to the statewide percentage, both are 1.5 times the national percentage. The percentage in the study area is less than other Alaska coastal communities such as Sitka (25 percent) and Kodiak (18 percent), but nearly double the percentage of larger cities in Alaska such as in the Municipality of Anchorage (eight percent) and Fairbanks (seven percent). Compared to larger cities, commuting patterns in the study area appear to be driven by a higher percentage of people using public transportation and walking. The percentage did not change significantly from 2014 (15 percent).

Table 5: Workers Who Did Not Take a Car, Truck, or Van to Work

Characteristic	Percentage of Population, Study Area	Percentage of Population, Alaska	Percentage of Population, USA
Workers who did not take a car, truck, or van to work	14%	15%	10%

Travel to work by walking, biking, motorcycle, or taxicab was not limited to those with short commute times. Most trips by walking were greater than 10 minutes, with three-quarters greater than 10 minutes for people bicycling or using a motorcycle or taxicab. The percentage of travel times greater than 20 minutes remains sizeable for active transportation modes at greater than 20 percent, as shown in Table 6.

Table 6: Travel Times to Work by Mode in the Study Area

Travel Mode	% Travel Times Greater Than 10 Minutes	% Travel Times Greater Than 20 Minutes
Car, truck, or van	73%	24%
Public transportation (excluding taxicab)	94%	78%
Taxicab, motorcycle, bicycle, or other means	73%	29%
Walked	61%	21%
All Modes	**73%**	**26%**

The highest percentages are in downtown Juneau, and along Radcliffe Road and Berners Avenue just east of the Mendenhall River, and in Lemon Creek west of Alaway Avenue. An average of 50 percent of workers did not take a car, truck, or van to work in downtown Juneau. These generally correspond with where the density of transit routes and stops are highest. The lowest percentages occurred on Douglas Island, near the airport, and east of Mendenhall Loop Road north of Egan Drive. In these areas, an average of six percent of workers did not take a car, truck, or van to work.

Schools

Table 7 shows the percentages of people under the age of 18 for the study area, state, and nation. The study area has a lower percentage of school-aged children compared to the state and nation. This, in tandem with the higher percentage of people over the age of 64, demonstrates the older population in the study area. The percentage in 2019 did not vary significantly from the percentage in 2014 (22 percent).

Table 7: People Under the Age of 18

Demographic Characteristic	Percentage of Population, Study Area	Percentage of Population, Alaska	Percentage of Population, USA
People under the age of 18	20%	25%	23%

The highest percentages of school-aged children (average of 27 percent) are along Egan Drive between Switzer Creek and Mendenhall Loop Road and along Glacier Highway between the Mendenhall River and Auke Lake. The lowest percentages are in downtown Juneau, Auke Bay, and west of Mendenhall Loop Road north of Egan Drive, with an average of 12 percent. Even though downtown Juneau has a lower percentage of school-aged children, five of the six schools in the study area are located there.

2.1.2 Land Use Designations

2.1.2.1 Regulatory Framework

The list below describes the regulatory framework related to land use.

- **Existing Land Use Plans and Documents.** Section 2.1.2.2.2 below summarizes relevant plans and policies related to land use within the study area. This review is intended to facilitate consistency and alignment with adopted/applicable land use plans, existing land uses, zoning, and land ownership data within the study area.
- **Native Allotments.** The Alaska Native Allotment Act of 1906 (34 Stat. 197) authorized land transfers to individual Alaska Natives. Amended, the act authorized the Secretary of the Interior to convey up to 160 acres of land to individual Alaska Natives. The Bureau of Indian Affairs (BIA) provides land management services to Alaska Native landowners and any rights-of-way request of an allotment would require a lengthy BIA approval, including a NEPA review.
- **Section 4(f) and 6(f)**
    - Section 4(f) of the U.S. Department of Transportation Act of 1966 was enacted to protect publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public and private historic sites of local, state, and national significance. Federally funded transportation projects cannot impact Section 4(f)-protected properties unless there are no feasible and prudent avoidance alternatives and all possible planning to minimize harm has occurred. Prior to approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent or feasible alternative that completely avoids the 4(f) resource.
    - Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies). The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States. Section 6(f)(3) of the LWCF Act requires that no property acquired or developed with these funds be converted to a non-recreational purpose without the approval of the National Park Service. Importantly, Section 6(f) applies to all transportation projects (and others) involving possible conversions of the property, whether or not federal funding is being used for the project.

2.1.2.2 Existing Conditions

2.1.2.2.1 Existing Land Use, Zoning, and Ownership

Land Use

Land use and transportation directly affect one another for several reasons. Community development locations and density directly affects travel demand, while the number and location of transportation access points influences land development patterns and growth. Additionally, changing land use patterns can alter travel demand and, therefore, transportation infrastructure needs.

The study area is approximately 16,127 acres. The portion of Douglas Island within the study area, which forms the southern boundary of the study area, is predominantly undeveloped with additional uses including recreational resource, natural, conservation, and rural, low and medium density residential. The northern part of the study area borders Fritz Cove, Mendenhall Wetlands State Game Refuge (MWSGR), Gastineau Channel, and the Juneau International Airport and is predominantly rural, medium, and low density residential, with some commercial and industrial uses.

Land development within the study area is primarily linear along existing roadway corridors due to steep mountainous terrain, except for development centers in the Mendenhall Valley and the Lemon Creek area along the northern boundary. The areas with primary residential and shopping centers in the borough are Lemon Creek and Mendenhall Valley.

MWSGR and the airport are two major unique land use features in the study area. The MWSGR is a large game refuge, of approximately 3,800 acres and extending approximately nine miles along the shores of the Gastineau Channel, from Salmon Creek to the eastern side of the Mendenhall Peninsula. The Alaska Legislature established the MWSGR in 1976 (Alaska Statute 16.20.034) to protect natural habitat and game populations, especially waterfowl, and to provide recreational opportunities. The State of Alaska Department of Fish and Game (ADFG) manages the refuge habitat, wildlife, and human uses, while the Alaska Department of Natural Resources (ADNR) manages the surface and subsurface estate. MWSGR is closed to hunting, except for waterfowl, snipe, and cranes. No person may use any off-road or all-terrain vehicle, motorcycle, or other motorized vehicle (except a boat) within the refuge. All waterfowl hunters are required to complete Basic Hunter Education and all hunters must register with the ADFG and carry proof of registration in the field. Hunting season is between September 1 and December 16 in odd-numbered years and between September 16 and December 31 in even-numbered years (2021-2022 Migratory Game Bird Hunting Regulations, ADFG). The airport covers approximately 660 acres and is bounded by the MWSGR on three sides and by private property and public highways to the north. It is located approximately 10 miles north of the center of downtown Juneau.

The Southeast Alaska Land Trust owns land within the MWSGR that is set aside to be conserved. Some of these properties, including properties on Sunny Point and Hendrickson Point, are mitigation sites.

The following are the CBJ Comprehensive Plan land use designations in the study area. Figure 5 illustrates the location of these land uses in the study area. The locations of the designated land uses are as shown on the CBJ Comprehensive Plan Land Use map. A detailed description of each designation and the approximate acreage of each designation in the PEL Study Area is shown in Table 8.

Table 8: Land Use Designation Descriptions and Approximate Acreage in the Study Area

Land Use Designation	Designation Description	Acres
Commercial (C)	Lands devoted to retail, office, food service or personal service uses, including neighborhood retail and community commercial centers, such as shopping centers and malls, office complexes or other large employment centers.	270.25
Conservation Area (CA)	CBJ-owned Parks and Recreation Department-managed lands with recognized high value environmental qualities that are set aside for the protection and management of the natural environment with recreation, such as fishing, hiking, and non-motorized boating, as a secondary objective. These may be non-anadromous fish watercourses or areas adjacent to anadromous fish streams that have been designated Stream Protection Corridors (SC), greenbelts, or high value wetlands.	217.60
Heavy Industrial (HI)	Land for heavy industrial uses such as large-scale food production and/or processing, large-scale or industrial-related repair activities, metal fabrication, wholesale trade, manufacturing processes, warehousing, outdoor storage, trucking, animal kennels, crematoria, repair and maintenance uses, resource extraction and processing (such as gravel pits, rock crushing facilities, cement batch plants, asphalt plants, fuel tanks, stump, salvage yards, landfill sites), aircraft facilities; and other similar large-scale or noisy and/or noxious industrial activities.	290.53
Institutional and Public Use (IPU)	Lands in public ownership and dedicated for a variety of public uses, such as the University of Alaska Southeast; local, state and federal government uses; and for such public facilities as community gardens, schools, libraries, fire stations, treatment plants, and public sanitary landfills. Included are potential sites for future boat harbors, schools, parks, farmers markets, publicly supported arts events, permitted arts or food-service kiosks or sales activities, parking facilities, and road and public transit system easements. Also included are public aircraft facilities.	947.79
Light Industrial (LI)	Land developed for heavy commercial or light industrial uses such as small- to medium- scale food processing, printing and other business services, wholesale trade, research and development laboratories, light manufacturing processes, metal fabrication, warehousing, trucking, animal kennels, crematoria, indoor and outdoor storage, sales such as car, boat, and heavy equipment, and repair and maintenance activities.	72.93
Marine Commercial (MC)	Land for water-dependent commercial uses such as marinas/boat harbors, marine vessel and equipment sales and repair services,	119.88

	convenience goods and services for commercial and sport fishing, marine recreation and marine tourism activities such as food and beverage services, toilet and bathing facilities, bait and ice shops, small scale fish processing facilities, hotels and motels, and goods/services to support mariners and guests.	
Medium Density Residential (MDR)	Lands characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).	**1,048.74**
Medium Density Residential – Single Family Detached (MDR-SF)	Lands characterized by single-family detached homes at densities ranging from 10 to 20 units per acre. Only single-family detached homes, single-family detached homes with an accessory apartment, cottage houses, and bungalow houses are permitted within this zone. Any commercial development should be of a scale consistent with a single-family residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).	**8.97**
Natural Park Area (NP)	Natural Area Parks are CBJ-owned lands characterized by areas of natural quality designed to serve the entire community by providing fish and wildlife habitat, open space/natural areas, access to water, and opportunities for passive and dispersed recreation activities.	**432.78**
Recreational Resource (REC)	Land primarily under federal or state management for a range of resources, such as timber, minerals, fish and wildlife and recreation uses, including recreation cabins. Uses may include small-scale, visitor-oriented, and/or seasonal recreational facilities.	**2,066.29**
Resource Development (RD)	Land managed primarily to identify and conserve natural resources until specific land uses are identified and developed.	**444.77**
Rural Dispersed Residential (RDR)	Lands characterized by dispersed, very low density development not provided with municipal sewer or water. Densities permit one dwelling unit per acre or larger lot sizes, based on existing platting or the capability of the land to accommodate on-site septic systems and wells. Uses may also include small-scale, visitor-oriented, seasonal recreational facilities.	**601.34**
Rural/Low Density Residential (RLDR)	Rural residential land at densities of one to three dwelling units per acre, based on existing platting and capability of the land to accommodate on-site septic systems and wells or whether the land is served by municipal water and sewer service.	**600.49**
Recreational Service Park (RS)	On CBJ-owned lands with parks developed for active recreation, programmed use, and/or community gardens. Recreation, parking, playgrounds and fields, ski lifts, All-Terrain Vehicle (ATV) riding parks, rifle ranges, operations and maintenance-related structures are possible uses or components of RS designated lands.	**94.34**
Stream Protection Corridor (SC)	On CBJ-owned lands, a Stream Protection Corridor designation serves to protect anadromous fish streams and their tributaries from development that could cause pollution, erosion, depletion of groundwater infiltration or to otherwise could degrade the stream corridor and its biological functions.	**367.14**
Traditional Town Center (TTC)	Lands characterized by high density residential and non-residential land uses in downtown areas and around shopping centers, the University, major employment centers and public transit corridors, as	**98.92**

	well as other areas suitable for a mixture of retail, office, general commercial, and high density residential uses at densities at 18 or more residential units per acre. Residential and non-residential uses combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above.	
Urban/Low Density Residential (ULDR)	Lands characterized by urban or suburban residential lands with detached single-family units, duplex, cottage or bungalow housing, zero-lot-line dwelling units and manufactured homes on permanent foundations at densities of one to six units per acre. Any commercial development should be of a scale consistent with a single family residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).	**1,456.01**
Waterfront Commercial and Industrial (WCI)	Land for water-dependent heavy commercial and industrial uses such as marine transportation terminals, large or small boat marinas, boat repair, shipyards, marine freight handling areas, fish buying and processing plants, ice plants, marine hatcheries, and marine parks.	**216.92**
Area Without Land Use Designation	Lands not mapped for under a land use designation.	**6,988.23**
Total Study Area	N/A	**16,127.00**

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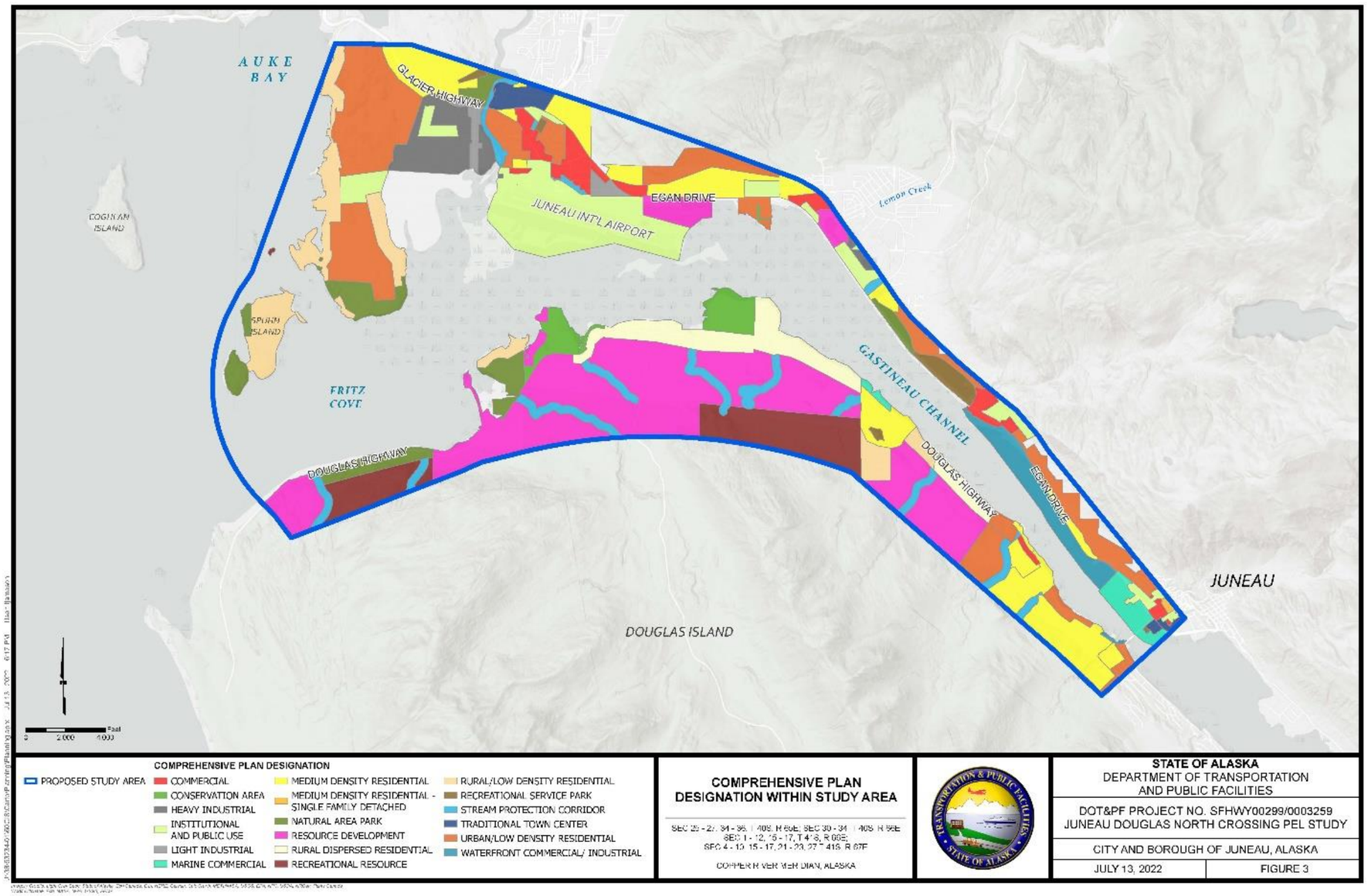
Figure 5: Comprehensive Plan Designation within Study Area



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Zoning

Zoning indicates where elected officials, planning professionals, and the community believe various types of land use should be located. It is a type of land use regulation adopted by the CBJ that divides the community into zones and imposes land development requirements within each zone. Zoning typically regulates allowable land uses, site and building requirements, and the allowable density of each use. Zoning designations adopted by the CBJ within the study area consist of residential (various densities), commercial (general, light and waterfront), industrial, waterfront industrial, mixed use, and rural reserve. Regulatory requirements for each specific zoning designation are addressed in the Juneau, Alaska Code of Ordinances, Title 49 Land Use.

Within the study area, the zoning with the most acreage is rural reserve, accounting for a large portion of Douglas Island, Mendenhall Peninsula, and Spuhn Island. The northern portion of the study area on Juneau mainland has a wide mixture of zoning designations. Figure 6 illustrates the CBJ zoning designations within the study area. Table 9 provides the approximate acres of each zoning designation within the study area.

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Figure 6: Zoning Designation within Study Area

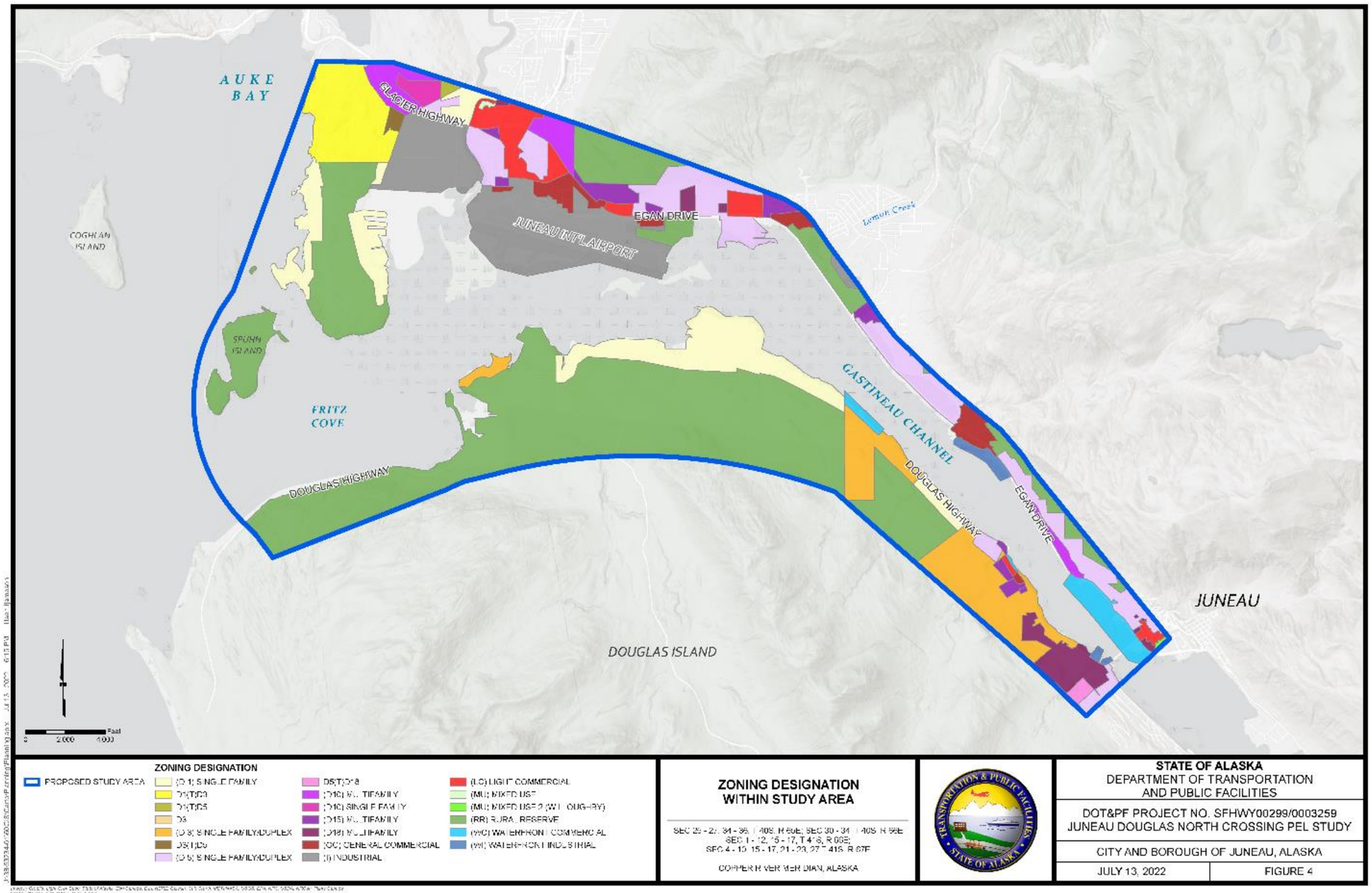

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Table 9: Summary of Study Area Zoning

Zoning Designation	Acres
(D1) Single Family	914.86
(D3) Single Family/Duplex	642.57
(D5) Single Family/Duplex	909.73
(D10) Single Family	47.77
(D15) Multifamily	168.38
(D18) Multifamily	204.53
(GC) General Commercial	194.81
(I) Industrial	1,100.70
(LC) Light Commercial	269.11
(MU) Mixed Use	4.72
(MU) Mixed Use 2 (Willoughby)	5.90
(RR) Rural Reserve	4,243.48
(WC) Waterfront Commercial	170.47
(WI) Waterfront Industrial	52.04
D1(T)D3	421.72
D1(T)D5	14.81
D3	1.35
D3(T)D5	18.87
D5(T)D18	20.98
Area Without Zoning Designation	6,720.20
Total Study Area	16,127.00

Ownership

Approximately 4,995 acres of the land in the study area is publicly owned by either a municipality, the state or the federal government, while approximately 2,999 acres is owned by private individuals, of which 54 acres are under multiple ownership and 10 acres are three Native Allotments.

Figure 7 illustrates the location of municipal, state, federal, multiple, and private land ownership within the study area. Table 10 summarizes the categories of municipal, state, federal, multiple, and private ownership and acreage of each within the study area.

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Figure 7: Land Ownership

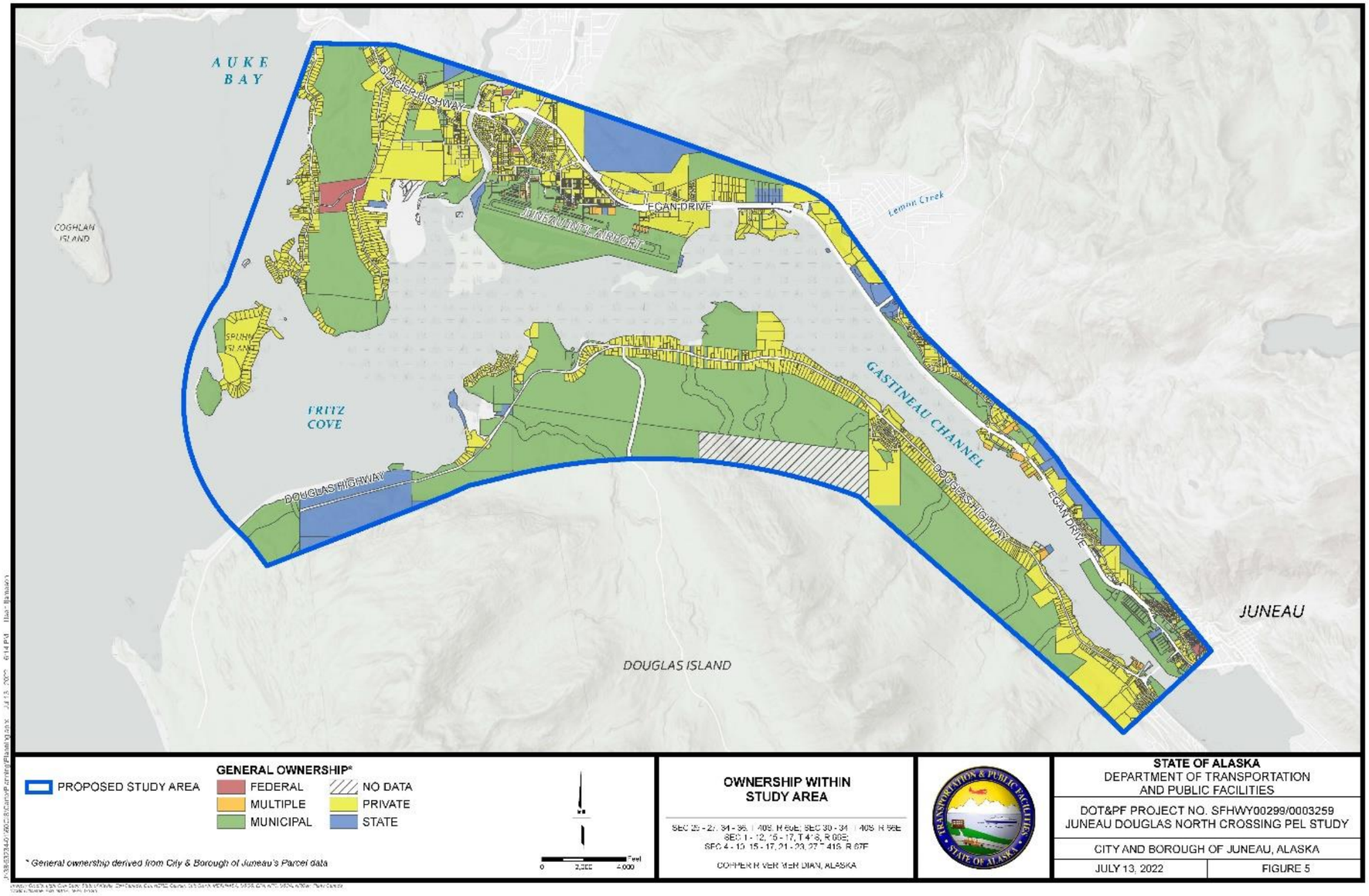

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Table 10: Summary Land Ownership in the Study Area

General Ownership	Acres
Municipal	4,777.88
State	118.79
Federal	98.48
Multiple	54.44
Private*	3,009.17
No Data	8,068.24
Total Study Area	16,127.00

* Includes three native allotments totaling 10 acres

2.1.2.2.2 Community Planning

This section provides a brief summary of adopted land use plans and regulatory compliance documents within the study area. These plans provide insight and guidance into how a north crossing may impact existing and future land uses, as well as identifying areas that should be avoided due to extensive land development and sensitive land uses. The study area is a mixture of land uses located along the north and south boundaries with water features and wetlands throughout the central area. Policies and regulations relevant to the PEL study process are identified within the land use documents.

Land Use Plans

Comprehensive Plan of the City and Borough of Juneau (2013)

The Comprehensive Plan of the City and Borough of Juneau is a long-range plan that guides the growth, development, and conservation of public and private land within the CBJ to the year 2033. It is a collaborative document, prepared by CBJ planning staff incorporating input from diverse sectors of the community. The plan provides both a long-term vision of where the community is going, as well as policies and actions to accomplish the vision. Land use policies identified in the plan implement decisions relating to community forms, housing, economic and community development, natural resource protection, and hazard prevention. The plan is used by CBJ staff, elected officials, and their appointed Boards and Commissions as a guide in shaping the community through allocation of resources that reflects the community needs. The plan provides a logical and consistent approach to managing community growth and development. The comprehensive planning area includes Juneau and Douglas, as well as the communities of West Juneau, North Douglas, Salmon Creek, Switzer Creek, Lemon Creek, the Mendenhall Valley, Auke Bay, Thane, and the “Out the Road” communities of Lena Point and Tee Harbor.

A concern stated in the Land Use chapter of the Comprehensive Plan is the need to protect the character of existing neighborhoods by minimizing the intrusion of heavy traffic and avoiding conflicts related to parking congestion, noise, glare, loss of privacy, and other factors associated with higher intensity uses and increased traffic. The Comprehensive Plan's Transportation chapter discusses policies and development guidelines for the coordination of future transportation development and the provision of adequate access and roadway systems scaled to the development.

The Transportation Chapter of the Comprehensive Plan (Chapter 8) notes that the western side of Douglas Island has been identified as a possible location for new marine freight facilities, but this is feasible only if a North Douglas channel crossing and roadways capable of carrying greater volumes of traffic, including heavy industrial-related trucks, are provided from West Douglas to the mainland. The chapter also notes that over the years, North Douglas has experienced increased traffic from recreational users of North Douglas, and the increased traffic is dangerous for pedestrians, joggers, bicyclists and students awaiting school bus service.

For over twenty years, a North Douglas crossing has been identified as CBJ's top transportation priority, due to the role this additional access would play in facilitating development of west Douglas Island as well as in providing emergency access in the event the Juneau-Douglas Bridge or another single-route travel corridor in the area (North Douglas Highway or Egan Drive) is inaccessible or out-of-service. The chapter highlights the extensive work previously completed and notes that if the project moves forward, the North Douglas neighborhood, the West Douglas Development Working Group, relevant CBJ staff, other interested stakeholder groups and representatives of the community-at-large should participate in a study of the associated transportation elements needed to accommodate the crossing at its landing on Douglas Island, including the location, design and capacity of the crossing landing structure, the road(s) or reserved fixed guideway right-of-way accommodating new traffic to and from West Douglas to the mainland via both the new crossing and the existing bridge, and separated pedestrian/bicycle pathways. It further notes the study should be accompanied by a neighborhood plan as described in Subarea 9 Guidelines and Considerations in Chapter 11 of the Comprehensive Plan.

The Transportation Chapter includes the following Implementing Actions[4]:

- **8.8-IA21:** Encourage DOT&PF to upgrade North Douglas Highway, with or without a North Douglas bridge and associated arterial roadways, to reduce safety hazards related to the increased traffic on North Douglas Highway due to continuing residential development and increasing residential infrastructure on North Douglas. These improvements may include reduced and consistent speed limits throughout the roadway; installation of better warning signage at curves, bus stops at points with large numbers of residents and/or major destinations; separated bicycle and

[4] *https://juneau.org/index.php?gf-download=2021%2F04%2FChapter-8.pdf&form-id=22&field-id=11&hash=97692fed1f314fa026f8a364ea493ec8692fc190e494cf4ade02150cfd791305* Accessed September 12, 2022.

pedestrian pathways; and pull-off areas for school and public transit buses, if suitable for minor arterial roadway with over 500 driveway access points.

- **8.8-IA22:** Work with DOT&PF to make improvements to roads, intersections and bridges on Douglas Island to accommodate new affordable housing development. Transportation infrastructure deficiencies that should be addressed in the near future include the capacity of the Tenth Street and Egan Drive intersection, particular turning movements at Cordova Street and Douglas Highway intersection, and the reliance on a single road connection between Douglas Island and the mainland.

- **8.8-IA23:** Maintain strong municipal support for construction of a North Douglas crossing of Gastineau Channel to accommodate new, compact development of North Douglas and the New Growth Area on west Douglas Island. On the North Douglas landing, the bridge should connect to a roadway that provides sufficient right-of-way to accommodate a future fixed guideway transportation system to West Douglas.

In the near term, the Comprehensive Plan recommends that CBJ Community Development Department should conduct a neighborhood planning effort with the North Douglas neighborhood, which would include:

A. Analysis of potential impacts and improvements needed to maintain and enhance the existing character of the North Douglas community. All improvements should be designed to provide adequate capacity to take residents, workers and visitors of Douglas Island to their destinations on the mainland. This may require improvements to the intersection of Tenth Street and Egan Drive as well as providing a new northern Gastineau Channel crossing route.

B. Evaluation of the engineering design and costs and the environmental impacts of a North Douglas crossing landing intersection, including the options of the landing intersecting with the North Douglas Highway or upland of the Highway at a bench road alignment; and

C. Analysis of the location and configuration of separated pedestrian/bicycle pathways, bus pull-offs and any access road(s) carrying traffic from Douglas Island to the mainland.

- **8.8-IA24:** Designate potential road and non-motorized trail linkages between residential neighborhoods throughout the Island, where terrain permits and avoiding high-value wetlands wherever possible.

- **8.8-IA25:** Require sidewalks and bicycle paths or lanes along newly constructed arterial and collector streets where appropriate and provide or work with DOT&PF to provide such amenities along the existing roads to provide safe and efficient access and recreation and to reduce pedestrian/automobile conflicts.

- **8.8-IA26:** Implement the subarea improvements for Douglas Island called for in the Area Wide Transportation Plan as funding becomes available. Where there is a public need for those improvements in the immediate future, actively pursue the funding needed to complete these improvements.

- **8.8-IA27:** Investigate providing improved transit service to North Douglas.

Chapter 11 of the Comprehensive Plan sets out Land Use Maps and identifies Subarea 9: Douglas & West Juneau. The guidelines and considerations for Subarea 9 reiterate many of the details set out in the Transportation Chapter, but note that future developments in North Douglas, West Juneau or downtown Douglas will require improvements to Tenth Street and Egan Drive intersection and may require additional traffic capacity on the Juneau-Douglas bridge. The Comprehensive Plan states these two congestion points limit additional residential development on Douglas Island and impede the CBJ's progress in promoting and facilitating the construction of affordable housing.

The CBJ is planning an update to the Comprehensive Plan; as of September 2022 the proposed update was fully funded just awaiting staffing.

City and Borough of Juneau Lands Management Plan (2016)

The City and Borough of Juneau Lands Management Plan provides for use and disposal of land owned by the CBJ. The plan acknowledges the need for transportation improvements in the CBJ, and that publicly-owned land must be considered for such improvements when identifying lands for future disposal. The plan provides guidance and reference information including maps of all CBJ owned properties, technical information about size, legal descriptions, general comments, and managing departments, as well as future retention or disposal status of parcels.

City and Borough of Juneau Buildable Lands Sites: Criteria and Results (2006)

The City and Borough of Juneau Buildable Sites: Criteria and Results identifies land for heavy industry, export industry, resource processing and manufacturing uses, as well as land for affordable housing. The document describes buildable sites selection criteria, lists buildable site candidates and related analysis, findings, and supporting maps, which may provide relevant information on sites to avoid when determining future roadway alignments.

Juneau Economic Development Plan (2015)

The Juneau Economic Development Plan outlines economic development for the City and Borough of Juneau until 2025. It is an economic development tool that identifies strategic initiatives, including transportation infrastructure, to position the community for economic resiliency and growth. The plan identifies Juneau's economic challenges and builds on the community's strengths and opportunities to provide for continuing economic stability and growth. The document includes an overview of economic development planning concepts and practices, a discussion of the role of local government, an economic baseline report,

and a summary of survey research conducted with households and businesses. An Action Plan provides guidance for Juneau's economy, including the following eight economic development initiatives:

- Enhance Essential Infrastructure
- Build the Senior Economy
- Attract and Prepare the Next Generation Workforce
- Recognize and Expand Juneau's Position as a Research Center
- Build on Our Strengths
- Protect and Enhance Juneau's Role as Capital City
- Revitalize Downtown
- Promote Housing Affordability and Availability

The initiative *Enhance Essential Infrastructure* addresses future transportation infrastructure:

- Goal: Support transportation infrastructure-related policies and developments that will provide access to developable land and control or lower the cost of freight shipment into and out of Juneau.
- Objective 1: Proceed with extension of North Douglas Highway, and North Douglas/Gastineau Channel Bridge construction to realize the residential, commercial, transshipment and maritime, industrial, and recreational potential of West Douglas.

Fish Creek Master Plan (2003)

The Fish Creek Master Plan is a development plan for the Fish Creek Natural Area Park located along the southern boundary of the study area. The plan includes a summary of existing conditions, issues, concerns, and legal constraints related to future development of the park, proposed improvements including required essential needs, recreational upgrades and habitat restoration, and supporting maps and illustrations.

Fish Creek Estuary Area Plan (2022)

The Fish Creek Estuary Area Plan identifies opportunities for improving habitat and recreation infrastructure in the Fish Creek Estuary Area. The plan recommends a "light-handed" approach to recreational amenities and habitat restoration and includes a site plan. During public outreach efforts for the plan, transportation was identified as one of the barriers that keep people from participating in recreation activities in the Fish Creek area. Public comments also specifically sought the construction of a second bridge to Douglas.

Lemon Creek Area Plan (2018)

The Lemon Creek Area Plan forms CBJ's strategy for developing projects in a mixed-use area located between downtown Juneau and the Valley. The Lemon Creek area was identified through a public planning process as Juneau's "mid-town," with a mix of housing choices, natural settings, and business opportunities. The Lemon Creek study area encompasses more than 1,500 acres, from the Mendenhall Game Refuge north to the Hidden Valley area, and from Vanderbilt Hill to the Fred Meyer area.

The following Goal addresses future transportation projects:

- GOAL 1: "Improve the Lemon Creek area's identity as an area of attractive neighborhoods and distinctive work places…Juneau's Midtown."
- Action: Ensure that land use decisions and transportation projects promote neighborhoods and create or enhance buffers between different land uses and/or zoning districts.

The Juneau Trails Plan (1993)

The Juneau Trails Plan was developed to provide guidance for the development of an integrated and comprehensive trails system in the road-accessible Juneau area. It does not consider sidewalks, bike trails, or other trails adjacent to roads. The purpose was to identify the highest priority trail actions to improve Juneau's trail system and to discuss responsibilities and funding options.

Long Range Waterfront Plan (2003)

The Long-Range Waterfront Plan is a guidebook to manage and focus changes along the Juneau waterfront. The plan lists four goals to guide future development:

- Enhance community quality of life
- Strengthen tourism product offerings as well as downtown retail, entertainment, residential, and service activities
- Improve Juneau's image and attractiveness for investment
- Recognize all current waterfront uses

The plan's study area extends from the Juneau Douglas Bridge, south along Gastineau Channel, to the Little Rock Dump. It includes portions of Downtown and the South Franklin Street Corridor as well as the AJ Mine Tailings areas commonly referred to the AJ Rock Dump and Little Rock Dump.

West Douglas Conceptual Plan (1997) =

CBJ and Goldbelt, In., jointly began conceptual planning of their adjoining properties along approximately 8 miles of west Douglas Island. The area includes 1,740 acres of Goldbelt, Inc. property along the coastal margin and 3,434 acres of CBJ land located immediately

interior of the Goldbelt Inc. property. The West Douglas Conceptual Plan acknowledged the two parties had different development goals that would require balancing, and that any future development options would require participation from both parties.

The Conceptual Plan identified five development area (Areas 1A, 1B, 2, 3 and 4) providing land uses including commercial and institutional development, residential housing at a range of densities (approximately 2,500 units), a golf course, marine industrial area, and marine and water access with camping and RV accommodations. At its full build the conceptual development provided for a residential population of approximately 7,500 people. The Plan was characterized as a generalized concpt plan that did not try to address specific New Growth Area requirements in the CBJ Comprehensive Plan, but characterized the nature of each development area, including appropriate developable areas, densities, and mix us uses, which was intended to be useful for future detailed planning for each area.

Douglas/West Juneau Area Plan (ongoing development)

The CBJ is currently developing the Douglas/West Juneau Area Plan to create a long-term vision for the area from Sandy Beach to the Douglas Bridge. The CBJ intends to have the plan guide growth and development for the next 20 years, reflecting current public desires and incorporating past work from relevant existing plans. This planning process, initiated in January 2020, is ongoing.

Juneau, Alaska Code of Ordinances, Title 49 Land Use

The Juneau, Alaska, Code of Ordinances, Title 49 Land Use provides the regulatory framework for land development in the CBJ. Specifically, the ordinance strives to:

- Achieve the goals and objectives, and implement the policies, of the Juneau comprehensive plan, and coastal management program[5]
- Ensure that future growth in the CBJ and development in the City and Borough is in accord with the values of its residents
- Identify and secure, for present and future residents, the beneficial impacts of growth while minimizing the negative impacts
- Ensure that future growth is of the appropriate type, design and location, and is served by a proper range of public services and facilities such as water, sewage, and electrical distribution systems, transportation, schools, parks, and other public requirements, and in general to promote public health, safety and general welfare
- Provide adequate open space for light and air
- To recognize the economic value of land and encourage its proper and beneficial use

[5] *In July of 2011 the State of Alaska choose to no longer take part in the coastal management program.*

This ordinance applies to all private, state, and municipally owned land in the CBJ, and to the extent allowed by law or administrative regulation, it also applies to federal lands in the CBJ Land Use. Relevant for the PEL study are Title 49, Chapter 49.35 – Public and Private Improvements and Chapter 49.40 – Parking and Traffic.

Mendenhall Wetlands State Game Refuge Management Plan (1990)

The **Mendenhall Wetlands State Game Refuge Management Plan** provides guidance to the ADFG, ADNR, and other agencies. The MWSGR is popular for waterfowl hunting, sport fishing, personal use crabbing, boating, wildlife viewing and photography, wetland studies, and hiking.

The management plan states regarding a transportation corridor, that "*the City and Borough of Juneau may acquire land for a public transportation corridor, including a water corridor, only after the following have been demonstrated: 1) that there is a significant public need for the corridor which cannot reasonably be met off-refuge; 2) that the use of refuge lands are avoided or minimized to the maximum extent feasible including use of subsurface or elevated, no-fill corridor options where feasible; 3) that public access to the refuge is maintained; and 4) that all unavoidable impacts to the refuge and to refuge resources are fully mitigated through restoration, replacement and/or other compensation. It is not the intent of this policy to prevent the maintenance of the Gastineau navigational channel. New private, exclusive use transportation corridor will not be authorized within the refuge*."

The ADFG implemented the plan and any habitat altering activity will require a Special Areas Permit obtained from the Habitat Division Regional Office in Douglas (and applicable permits from other agencies).

Activities within the MWSGR must be in accordance with the following goals:

I. Fish and Wildlife Populations and Their Habitat - Manage the refuge to maintain and enhance fish and wildlife populations and their habitat. Minimize the degradation and loss of habitat values due to habitat fragmentation. Recognize cumulative impacts when considering effects of small incremental developments and actions affecting refuge resources.

A. Wildlife

1. Protect important wildlife habitat including water quality.

2. Minimize harmful disturbance to wildlife, especially to nesting, rearing, staging, and wintering waterfowl.

3. Maintain, protect, and, where appropriate, enhance the quality and quantity of nesting, rearing, staging, and wintering habitat for resident and migrant waterfowl.

4. Protect bald eagle nesting, perching, and roosting habitat including the maintenance of windfirm boundaries around large old trees.

5. Protect endangered species habitat (e.g., peregrine falcon and humpback whale).

6. Minimize harmful disturbance to endangered species (peregrine falcon and humpback whale).

B. Fish

1. Protect water quality and circulation patterns to maintain fish habitats.

2. Maintain refuge water quality sufficient for the growth and propagation of fish, shellfish, and other aquatic life in fresh, estuarine, and marine waters.

3. Maintain refuge water quality sufficient for harvesting for human consumption of raw mollusks or other raw aquatic life.

4. Maintain and, where necessary, improve the hydrologic integrity of the refuge.

II. Public Use - Manage the refuge to maintain and enhance public use of fish, wildlife, and refuge lands.

A. Maintain public access to and within the refuge consistent with the goals of this management plan.

B. Maintain opportunities for hunting waterfowl and fishing within the refuge

C. Maintain opportunities to recreate in the refuge consistent with the goals of this management plan.

D. Maintain opportunities for viewing, photography, education, and study of fish and wildlife.

E. Provide information about the refuge to the public.

Juneau State Land Plan (1993)

The Juneau State Land Plan is an ADNR Division of Mining Land and Water plan for state-owned lands and has two main sections; one outlining land management policies that apply throughout the planning area which is organized by types of land uses or resources; and the second describing the management intent for the regions in the planning area, actions that will implement the plan, and how it can be changed.

The PEL study area is covered by regions 3, 4, 5, 6, 8, 9, and 10a. The Fritz Cove area, part of region 10, was recommended as an Area Meriting Special Addition (AMSA) by the coastal management program for the CBJ. The area is used extensively for water-related recreational activities, has high scenic values, and aquatic and terrestrial habitat. The intent of the AMSA would be to assist in coordinating state, federal, and CBJ involvement in developing new growth areas and the proposed channel crossing (The most likely locations

for channel crossings that were studied by DOT&PF are in the MWSGR and were not addressed by this plan.) The purpose of the proposed AMSA as described in the CBJ Coastal Management Plan is to minimize the impacts of development on the public's use of the shoreline and the scenic values of the area between Fish Creek and Outer Point.

Region 4 contains the MWSGR and the management intent refers to Alaska Statutes AS 16.20.020 and AS 16.20.034. This region will be managed consistent with Title 16 of Alaska Statute, Chapter 20, for the Conservation and Protection of Alaska Fish and Game, the purpose of which is to protect and preserve the natural habitat and game population. AS 16.20.034(g) states that management of the surface and subsurface estate in the refuge is the responsibility of the ADNR. In accordance with this statute, any actions by the ADNR which affect the habitat in the refuge will be in conformity with the ADFG plan completed in 1990. As required by AS 16.20.034(1), management of the refuge will include provisions for expanding the Juneau International Airport, establishing additional transportation corridors, and establishing publicly owned and operated docking facilities. The ADFG Mendenhall Wetlands State Game Refuge Management Plan (1990) contains the policies which guide how CBJ may acquire land for these purposes.

A summary of CBJ land use plans and other documents used as sources of information and data presented in this section is illustrated in Table 11.

Table 11: Summary of Applicable Land Use Plans

Plan Name (Year)	Agency	Link
Comprehensive Plan of the City and Borough of Juneau Update (2013)	CBJ	https://juneau.org/community-development/comp-plan-2013
City and Borough of Juneau Lands Management Plan 2016 Update (2016)	CBJ	https://juneau.org/index.php?gf-download=2019%2F12%2FCBJ-Lands-Management-Plan-2016.pdf&form-id=22&field-id=11&hash=a1d2d9d55742b52f8632f694c6be3984ea14e1e2268b51a770a2d1770c0cc58a
City and Borough of Juneau Buildable Lands Sites: Criteria and Results (2006)	CBJ	https://juneau.org/index.php?gf-download=2019%2F12%2FCBJ-Lands-Buildable-Sites-Criteria-and-Findings.pdf&form-id=22&field-id=11&hash=ba2a8a4bc393dd75928a2eea0dd36d0d46a551c1dc55773933b4dd6b7d804e15
Juneau Economic Development Plan (2015)	CBJ	https://juneau.org/index.php?gf-download=2017%2F04%2F20150226040900.pdf&form-id=22&field-id=11&hash=31de1f216e74ac6949171748d44eb9657f2d2811197144ef3157fb54f64c4342
Fish Creek Master Plan (2003)	CBJ	https://juneau.org/wp-content/uploads/2019/12/Fish-Creek-Master-Plan-2003.pdf
Fish Creek Estuary Area Plan (2022)	CBJ	https://juneau.org/wp-content/uploads/2022/04/Fish-Creek-Area-Planning-Final-report_Full.pdf
Lemon Creek Area Plan (2018)	CBJ	https://juneau.org/index.php?gf-download=2021%2F04%2FLC-Area-Plan-Final-05232018-update-Reduced.pdf&form-id=22&field-id=11&hash=5481973cdf6880f90d5aa5be1a531edd33e37ef873efd670abc683fcb33d924a
The Juneau Trails Plan (1993)	CBJ; Alaska Department of Natural Resources; US Forest Service	https://juneau.org/index.php?gf-download=2019%2F12%2FThe-Juneau-Trails-Final-Plan-1993.pdf&form-id=22&field-id=11&hash=771ae04de3539ca2c17d340c1d038cb79aa9846afdfeed193d8ef9f477a3ea03
Long Range Waterfront Plan (2004)	CBJ	https://juneau.org/index.php?gf-download=2018%2F01%2F2004-11-22-2003-Long-Range-Waterfront-Plan-CBJ.pdf&form-id=22&field-id=11&hash=8efb3f420b5c10b0a926edb0513dcd09316973838dd05b639b76e3d6d9a239c9
West Douglas Conceptual Plan (1997)	CBJ	https://juneau.org/index.php?gf-download=2019%2F12%2FWest-Douglas-Conceptual-Plan-1997.pdf&form-id=22&field-id=11&hash=2f8cf6af9312d49dee597d80c7a3623c71cbc4a6992fde8f1c9afa74dfa93519
Douglas/West Juneau Area Plan (ongoing development)	CBJ	https://juneau.org/community-development/douglas-west-juneau
Juneau, Alaska Code of Ordinances, Title 49 Land Use	CBJ	https://library.municode.com/ak/juneau/codes/code_of_ordinances?nodeId=PTIICOOR_TIT49LAUS
Mendenhall Wetlands State Game Refuge Management Plan (1990)	Alaska Dept. of Fish and Game	https://www.adfg.alaska.gov/static/lands/protectedareas/_management_plans/mendenhall.pdf
Juneau State Land Plan (1993)	Alaska Dept. of Natural Resources	https://dnr.alaska.gov/mlw/planning/areaplans/juneau/

Transportation Plans

Long-Range Transportation Plan Update: Let's Keep Moving 2036

The Alaska Statewide LRTP, Let's Keep Moving 2036: Policy Plan sets out a 20-year vision to provide a network that enables a robust and growing economy to meet the mobility needs of the nation and the State's residents, consistent with DOT&PF's mission to keep Alaska moving through service and infrastructure. The LRTP sets overall policy and investment priorities, but it does not list specific projects or identify local transportation priorities. The LRTP is augmented by corridor and area plans, which include specific details on project recommendations within a geographic location. The relevant area plan for Juneau is the Southeast Alaska Transportation Plan.

Draft Alaska Statewide Long-Range Transportation Plan and Freight Plan: Alaska Moves 2050

The Alaska Long-Range Transportation plan and Freight Plan (LRTP/FP) updates Let's Keep Moving 2036 and includes a long-range vision, policies, and implementation actions to guide the transportation system through 2050. The LRTP/FP set out ten overarching goals that aim to make the best use of existing infrastructure, services, and resources. The LRTP/FP will guide investment decisions in transportation infrastructure, and will be updated in five years. The draft plan is currently available for public comment, from September 16 – October 31, 2022.

Southeast Alaska Transportation Plan (2014, unadopted draft)

The unadopted draft of the Southeast Alaska Transportation Plan (SATP) is a component of the LRTP. It describes the changes expected in the region's transportation needs over 20 years and proposes methods to meet them, including recommended projects. It serves as a guide to capital development of the transportation assets in the area for the 20-year period. The SATP recommends some large projects in the mid- to long-term, including projects that may not be constructed in the 20-year horizon of the plan. However, most of the plan proposes actions to maintain and improve the existing transportation system. The plans recommendations include:

- Maintenance of the existing Alaska Marine Highway System routes
- Retirement of up the three mainline ferries, depending on available funding and travel demand
- Replacement of other ferries as they reach the end of their useful life
- Completion of the highway to Katzehin and initiation of a shuttle ferry service in upper Lynn Canal
- Construction of a road from Kake to Petersburg
- Construction of a road from Sitka to Warm Spring Bay and a ferry terminal
- Construction of an airport in Angoon

The plan does not refer to or provide any recommendations on a Second Channel Crossing between mainland Juneau and Douglas Island. DOT&PF is planning to update the SATP in 2023.

North Douglas Crossing Public Involvement Project to Identify Juneau's Preferred Route for a Crossing of Gastineau Channel (City & Borough of Juneau, April 2007)

This report documented the results of a public involvement process initiated by CBJ to determine the community preferred crossing location. It affirmed that a North Douglas Crossing of Gastineau Channel was one of CBJ's top transportation priorities, and project objectives were to improve transportation access and efficiency between the Juneau mainland and Douglas Island, provide a second access route for emergency response, and enhance access to the designated New Growth Area on west Douglas Island. The report built on previous analyses summarized above and a CBJ Assembly Resolution 2330(b) in October 2005, which focused the city's consideration on three general crossing locations that would best meet project objectives: Vanderbilt Hill Road area, Sunny Point area, and Yandukin Drive area. In addition, the CBJ Resolution supported a "Bench Road on North Douglas as a necessary transportation improvement in the future to reduce traffic on North Douglas Highway and enhance access to West Douglas." However, the Resolution specifically did not link progress on a future Bench Road with progress on the North Douglas Crossing project. It recommended that a crossing area at Vanderbilt Hill Road be identified as the community's preferred location for the North Douglas Crossing. The public involvement process presented five conceptual alignments for public response, one at Vanderbilt Hill Road, two at Sunny Point, and three at Yandukin Drive.

2.1.2.2.3 Native Allotments

Three patented native allotments and one native allotment application in process were found within the preliminary study area (Figure 8):

- Patent number NA0019551004 within C041S066E Section 2 containing 1.7 acres, Case number: AKA 017456 – Appears to no longer be restricted. See multiple records in the Juneau Recording District in 2017 conveying 'UNRESTRICTED FEE TITLE' by BIA to two individuals. Unknown if individuals own 100% of the interests in the property.
- Patent number NA0019630621 within C041S066E Section 2 containing 5.81 acres, Case number: AKJ 011249 – Restricted nature still in question – Subsequent conveyances have occurred – unknown if the BIA officially released restricted status – See recorded records in the Juneau Recording District 1971-00379-0 and 1971-000380-0 – Resulting in current ownership to individual with Native Allotment applicability status unknown.
- Patent number NA0019200428 within C041S067E Section 22 containing 2.61 acres, Case number: AKA 001683 & AKJ 001683 – Remains Restricted Native Land as of 3/21/2022 – See recorded records in the Juneau Recording District under 2014-001795-0 and 2017-00474-0.

Other Native Allotment related cases found that are in process include:

Reinstated case November of 2018 in C041S067E Section 15 containing 0.05 acres, Case number: AKJ 002907 – Apparent contested ownership case as the Master Title Plat shows 1.9 acres was conveyed by Patent number 1051162. The Native Allotment application is for a portion of this previously patented land.

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Figure 8: Native Allotments within Study Area

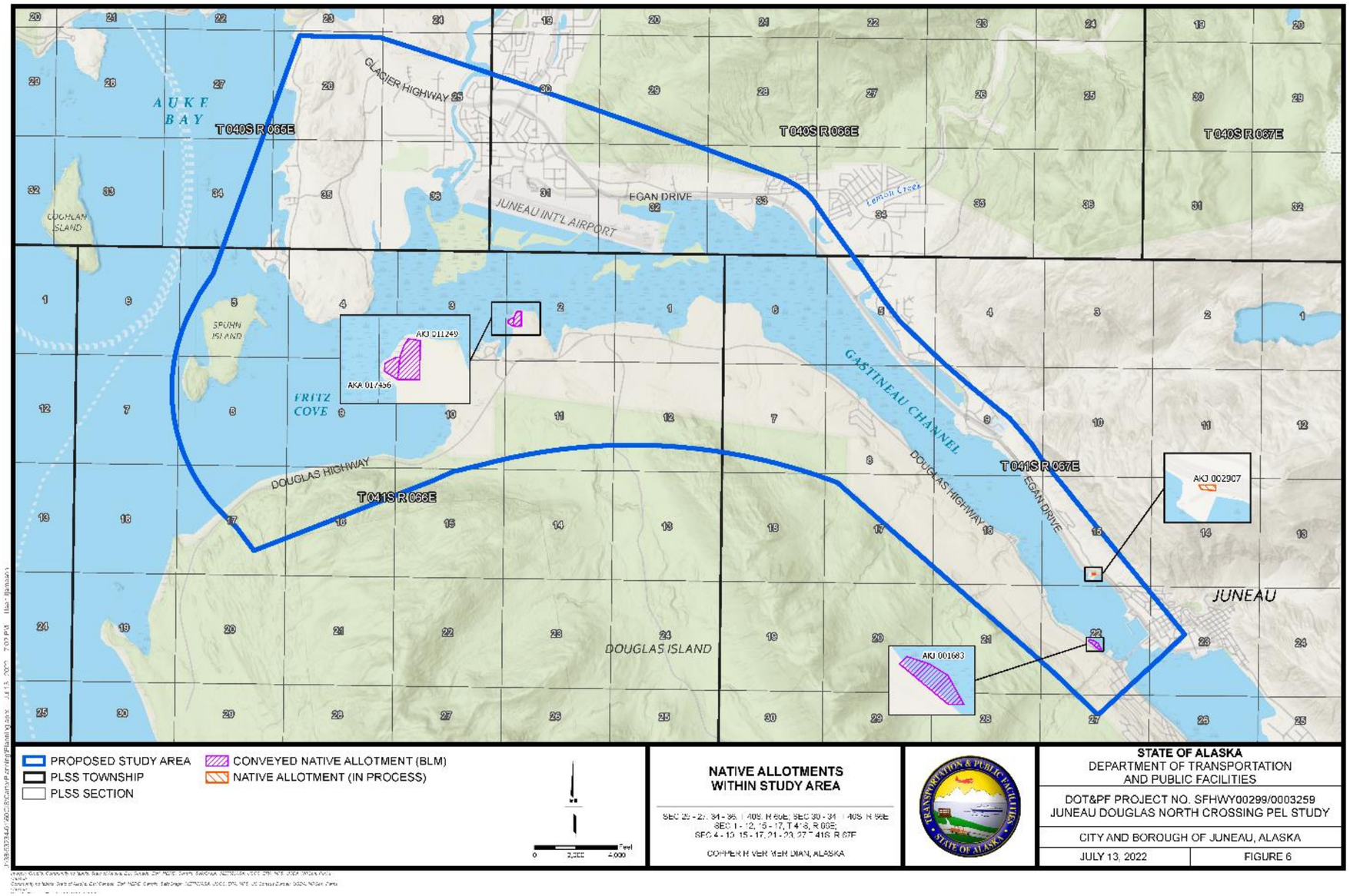

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Table 12 provides a summary of the allotments including township, type, case number, acres, document date, owner, and status.

Table 12: Native Allotments within Study Area

Township	Case Type	Case Number	Acres	Document Number	Document Date	Owner	Status
C041S066E							
Section 2	256100	AKA 017456	1.7	NA0019551004	8/31/1955	Gamble, Jack (Deceased)	Patented
Section 2	256100	AKJ 011249	5.81	NA0019630621	6/21/1963	Kunz, Edward N. SR.	Patented
C041S067E							
Section 22	256100	AKA 001683 & AKJ 001683	2.61	NA0019200428	4/28/1920	Nakatak, Jim (Deceased)	Patented
Sections 16, 21, 21	256100	AKA 002902	160	Denied	N/A	Joseph, Daniel	Denied
Section 15	256100	AKJ 002907	0.5	In Process	N/A	Shown as: LANDOWNER PRIVATE	In Process – Appears to be contested as MTP shows conveyed via Patent 1051162

2.1.2.2.4 Section 4(f) and Section 6(f)

The study area contains 37 potential 4(f) properties, six of which are also 6(f) resources. Twenty 4(f) properties function as recreational resources including trails, a swimming pool, a state recreation area, and a pond. The study area also contains eight parks, eight known historic properties, and one wildlife refuge with 4(f) protections, as illustrated in Figure 9 and Table 13.

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Figure 9: Section 4(f) and 6(f) Properties within Study Area

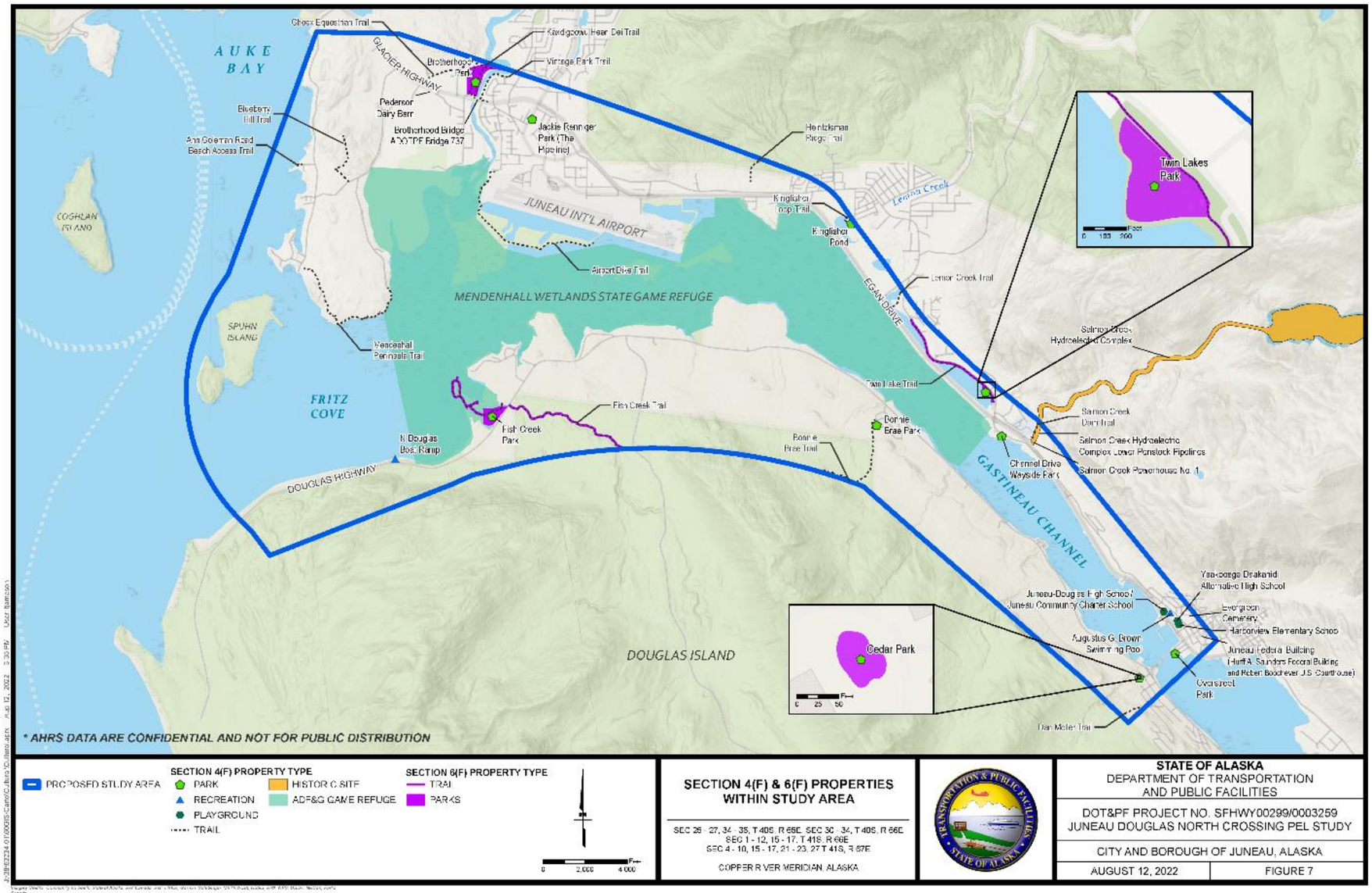

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Table 13: Section 4(f) and 6(f) Resources in the Study Area

Property Name	Management Agency	Property Type	Section 6(f)	Function
Airport Dike Trail	City and Borough of Juneau Airport	Trail	No	Recreation
Anne Coleman Beach Access Trail	City and Borough of Juneau	Trail	No	Recreation
Augustus G Brown Swimming Pool	City and Borough of Juneau	Recreation	No	Recreation
Blueberry Hill Trail	City and Borough of Juneau	Trail	No	Recreation
Bonnie Brae Park	City and Borough of Juneau	Mini Park	No	Park
Bonnie Brae Trail	City and Borough of Juneau	Trail	No	Recreation
Brotherhood Bridge ADOTPF Bridge 737	SHPO and landowners	Structure	No	Historic Site
Brotherhood Park	City and Borough of Juneau	Semi-Primitive Areas	Yes	Park
Cedar Park	Alaska Housing Finance Corporation	Mini Park	Yes	Park
Channel Wayside Park	City and Borough of Juneau	Special Use Areas	No	Park
Cheex Equestrian Trail	City and Borough of Juneau	Trail	No	Recreation
Dan Moller Trail	U.S. Forest Service	Trail	No	Recreation
Evergreen Cemetery	SHPO and landowners	Site	No	Historic Site
Fish Creek Park	City and Borough of Juneau	Semi-Primitive Areas	Yes	Park

Property Name	Management Agency	Property Type	Section 6(f)	Function
Fish Creek Trail	City and Borough of Juneau	Trail	Yes	Recreation
Heintzelman Ridge Trail	City and Borough of Juneau	Trail	No	Recreation
Jackie Renniger Park (The Pipeline)	City and Borough of Juneau	Special Use Areas	No	Park
Johnson Creek State Recreation Site	Department of Natural Resources	Recreation Site	No	Recreation
Juneau Federal Building (Hurff A. Saunders Federal Building and Robert Boochever U.S. Courthouse)	SHPO and landowners	Building	No	Historic Site
Kaxdigoowu Heen Dei Trail[10]	City and Borough of Juneau	Trail	No	Recreation
Kingfisher Loop Trail	City and Borough of Juneau	Trail	No	Recreation
Kingfisher Pond	City and Borough of Juneau	Semi-Primitive Areas	No	Recreation
Lemon Creek Trail	City and Borough of Juneau	Trail	No	Recreation
Mendenhall Peninsula Trail	City and Borough of Juneau	Trail	No	Recreation
Mendenhall Wetlands State Game Refuge and access points	Department of Fish and Game	State Game Refuge	No	Refuge
North Douglas Boat Launch Ramp	City and Borough of Juneau	Recreation	No	Recreation
Overstreet Park	City and Borough of Juneau	Special Use Areas	No	Park

[10] *Consists of hiking, paved, and equestrian trails near Mendenhall River*

Property Name	Management Agency	Property Type	Section 6(f)	Function
Pederson Dairy Barn	SHPO and landowners	Building	No	Historic Site
Salmon Creek Dam Trail	City and Borough of Juneau	Neighborhood Park	No	Recreation
Salmon Creek Hydroelectric Complex	SHPO and landowners	District	No	Historic Site
Salmon Creek Hydroelectric Complex Lower Penstock Pipelines	SHPO and landowners	Structure	No	Historic Site
Salmon Creek Powerhouse No. 1	SHPO and landowners	Site	No	Historic Site
Treadwell Ditch and Maintenance Trail, Main Branch	SHPO and landowners	Structure	No	Historic Site
Treadwell Ditch Trail	City and Borough of Juneau, U.S. Forest Service	Trail	No	Recreation
Twin Lakes Park	City and Borough of Juneau	Neighborhood Park	Yes	Park
Twin Lakes Trail	City and Borough of Juneau	Trail	Yes	Recreation
Vintage Park Trail	City and Borough of Juneau	Trail	No	Recreation

2.1.3 Historic and Cultural Resources

2.1.3.1 Regulatory Framework

Historic Properties are cultural resources that are listed or may be eligible for inclusion on the National Register of Historic Places (NRHP). Cultural resources may include buildings, structures, sites, objects, or districts more than 45 years old.

Historic Properties are afforded special consideration by Section 106 of the National Historic Preservation Act of 1966, as amended. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

Executive Order 11593, Protection and Enhancement of the Cultural Environment, directs Federal agencies to treat properties that have been determined eligible as though they were already included in the NRHP.

Executive Order 13007, Indian Sacred Sites Act, calls on Federal agencies to avoid physical damage to and prevent loss of access to sacred sites on both Federal and Indian Lands. Sacred sites do not need to be a historic site per Section 106 of the NHPA.

In addition to the NHPA, the National Maritime Heritage Act specifically calls on Federal agencies to preserve and protect irreplaceable maritime heritage historic properties. The Abandoned Shipwreck Act of 1987 transfers title of abandoned shipwrecks on submerged state lands to state ownership and state agencies are directed to afford them special consideration as an archaeological resource under the Alaska Historic Preservation Act (AHPA; AS 41.35.070).

Alaska Statute 41.35.200 classifies the disturbance of historic, prehistoric, and archaeological resources as a class A misdemeanor on state lands.

Existing Conditions

The Alaska Heritage Resources Survey (AHRS) is a restricted online database of cultural resources within the State of Alaska. The AHRS database is limited to known and documented cultural resources and is not a conclusive inventory. In total, 147 AHRS properties are recorded within or intersecting the extent of the study area. Of these 147 properties:

- Eight have been determined ELIGIBLE or are LISTED in the NRHP (Table 14)
- 32 have been determined NOT ELIGIBLE for the NRHP

- 107 have not been evaluated for their eligibility for listing in the NRHP

The locational reliability of these properties varies, and is influenced by factors such as:

- Year when the property was identified and entered into the AHRS database
- The subsequent re-investigations or relocations of resources as part of cultural resource compliance activities or scholarly research collection and mapping methods used to record the location of the property (e.g., GPS unit vs. hard copy field map)

Table 14: AHRS Property Types and NRHP Eligibility Status in the Study Area

National Register Eligibility Status					
Property Type	**Number of Properties**	**Listed or Determined Eligible**	**Not Eligible or Needs Re-Evaluation**	**Not Evaluated**	**Status Pending / Closed**
Building	115	2	19	94	0
District	2	1	0	1	0
Site	16	2	8	5	1
Structure	14	3	5	5	1
Totals:	**147**	**8**	**32**	**105**	**2**

2.2 Natural Environment

2.2.1 Geologic and Geotechnical Considerations

2.2.1.1 Regulatory Framework

The use and extraction of soil and groundwater is regulated through ADNR. The provisions for general land use are contained in 11 AAC 96 and apply to any state-owned land along existing and proposed corridors. The use of large amounts of water (more than 30,000 gallons per day) is regulated by 11 AAC 93 and temporary groundwater use for large construction dewatering projects is governed by 18 AAC 72.

2.2.1.2 Existing Conditions

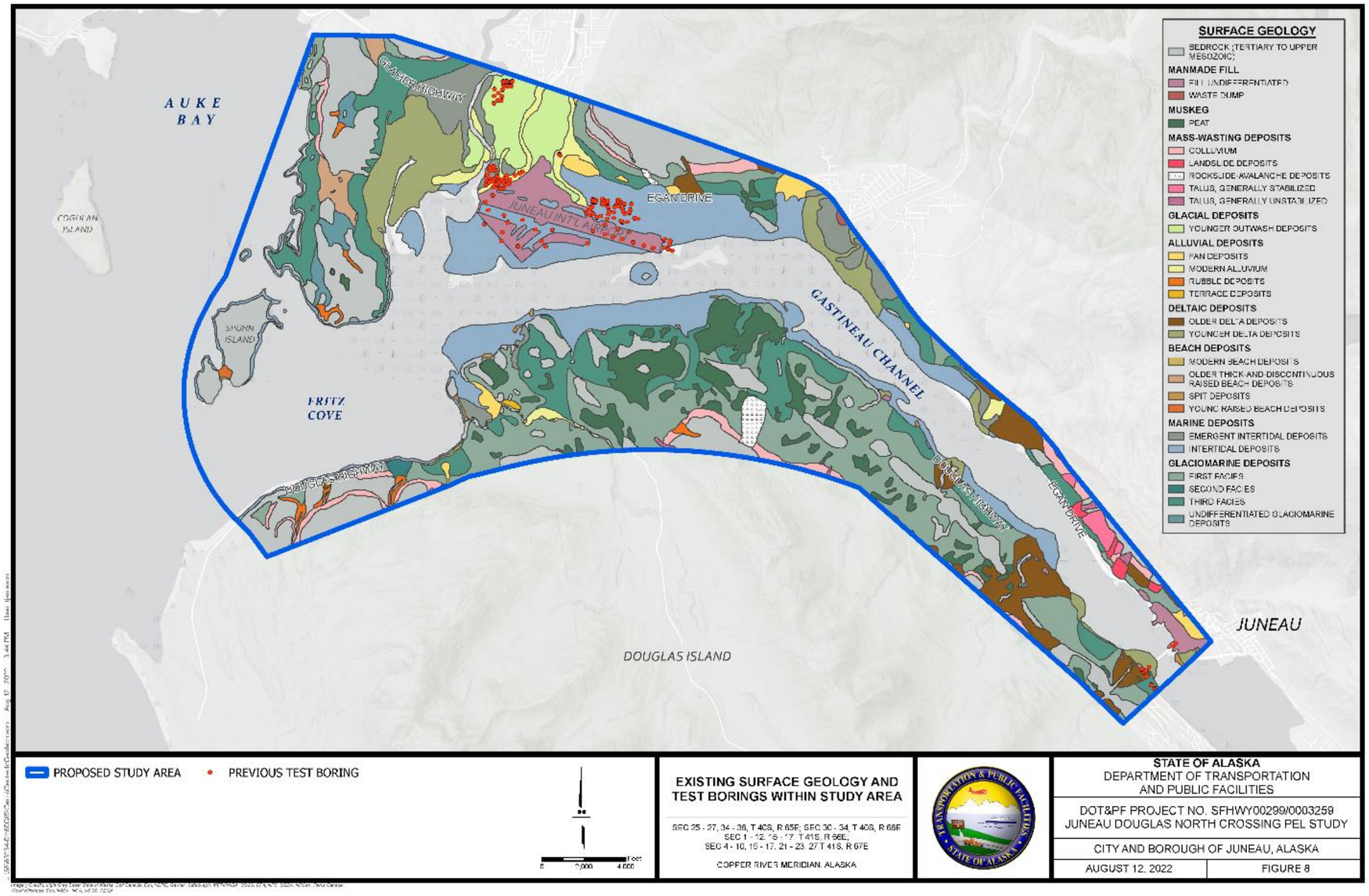
The bedrock of the Juneau area consists of layered greenstone, graywacke, slate, greenschist, and metavolcanic flow breccia that were formed mainly during the Mesozoic age. Unconsolidated material deposits were placed over the bedrock during the Quaternary age as a result of glacial advances and retreats. The unconsolidated material consists of mass-wasting deposits, glacial deposits, alluvial deposits, marine deposits, and glaciomarine deposits. Due to the proximity of the active tectonic boundary between the Pacific Ocean and North American plates, the study area has experienced effects from strong earthquakes. Historically, earthquake epicenters have been west of the study area along active plate boundaries, however the Juneau area has been repeatedly shaken by earthquakes. Within this study area the Gastineau Channel Fault, an inactive splay of the plate boundary, is mapped along Gastineau Channel then trends onshore north of the airport.

Developed areas of Juneau are covered with a surficial layer of man-made fill consisting of poorly graded gravel with sand and silt to sand with gravel and silt. The thickness of fill varies, but is expected to be deeper near shorelines, drainages, and areas of peat/muskeg. Underlying the fill material, and occasionally exposed at the surface, native material ranges

from colluvium and talus near the base of steep slopes, dense glacial till, soft glaciomarine deposits, deltaic sands and silts, or exposed bedrock. Materials within Gastineau Channel and Mendenhall Wetlands are mapped as marine intertidal deposits of sandy silt, silty gravel with sand and sandy gravel. Surface material onshore Douglas Island ranges from areas of peat to glaciomarine deposits silty sand over bedrock and areas of exposed surface bedrock. Groundwater is anticipated to be variable with location. Within Gastineau Channel and Mendenhall Wetlands surface and groundwater is anticipated to be tidally influenced. Existing surface geology is shown on Figure 10.

The most considerable geological hazard within the study area is earthquake induced liquefaction, specifically within Gastineau Channel and Mendenhall Wetlands areas. Marine intertidal deposits within these low laying areas are anticipated to be saturated with low densities, having the potential for liquefaction. Glacial outburst flooding has occurred in the Mendenhall Valley almost every year since 2011 (Kienholz, et al. 2020). Outburst floods occur when water dammed by the glacier suddenly releases and floods downstream areas causing inundations, erosion, and scour that must be considered in the bridge design for routes crossing the Mendenhall River. Isostatic rebound resulting from the Mendenhall Glacier retreating produces a risk of differential displacement along roadways and bridges. According to a 2007 climate change report, rates of uplift in the Juneau area average about 0.5 inches per year (Kelly et. al., 2007). Additionally, avalanches, landslides, and rock fall present hazards along the base of steep slopes. The northeastern portion of the study area along mainland Juneau contains steep slopes with the potential to release snow, surficial material, and/or rock that could impact selected routes that are below these slopes.

Figure 10: Existing Surface Geology and Test Borings within Study Area



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2.2.2 Hydrology, Water Quality, and Floodplains

2.2.2.1 Regulatory Framework

Section 303, subsection (d) of the Clean Water Act requires the State of Alaska to develop a list, subject to Environmental Protection Agency (EPA) approval, of waterbodies that do not meet water quality standards. When water quality fails to meet state water quality standards, the Alaska Department of Environmental Conservation (ADEC) determines the causes and sources of pollutants in a sub-basin assessment and sets maximum pollutant levels, called total maximum daily loads (TMDL). The TMDLs set by ADEC become the basis for implementation plans to restore water quality to a level that supports state designated beneficial water uses. The implementation plans identify and describe pollutant controls and management measures to be undertaken (such as best management practices), the mechanisms by which the selected measures would be put into action, and the individuals and entities responsible for implementation projects.

2.2.2.2 Existing Conditions

2.2.2.2.1 Hydrology and Water Quality

This section describes the hydrologic characteristics of the study area, including waterbody types, watershed boundaries, floodplains and impaired waterbodies. There are 25 named creeks in the study area and eight drainage Basins that intersect with the study area at the hydrologic unit codes 14 watershed level (see Figure 11). Five waterbodies identified as 'impaired' within, or 1,000 feet from the study area include Vanderbilt Creek, Lemon Creek, Duck Creek, Jordan Creek, and Peterson Hill Creek (Figure 11 and Table 15). All have approved TMDLs.

Table 15: Impaired Waterbodies in the Study Area

Waterbody	Pollutants
Vanderbilt Creek	Sediment, turbidity and debris
Lemon Creek	Sediment and turbidity
Duck Creek	Debris, fecal coliform bacteria, turbidity, dissolved oxygen, and iron
Jordan Creek	Debris, low dissolved oxygen, and sediment
Peterson Hill Creek / Casa Del Sol	Fecal coliform bacteria

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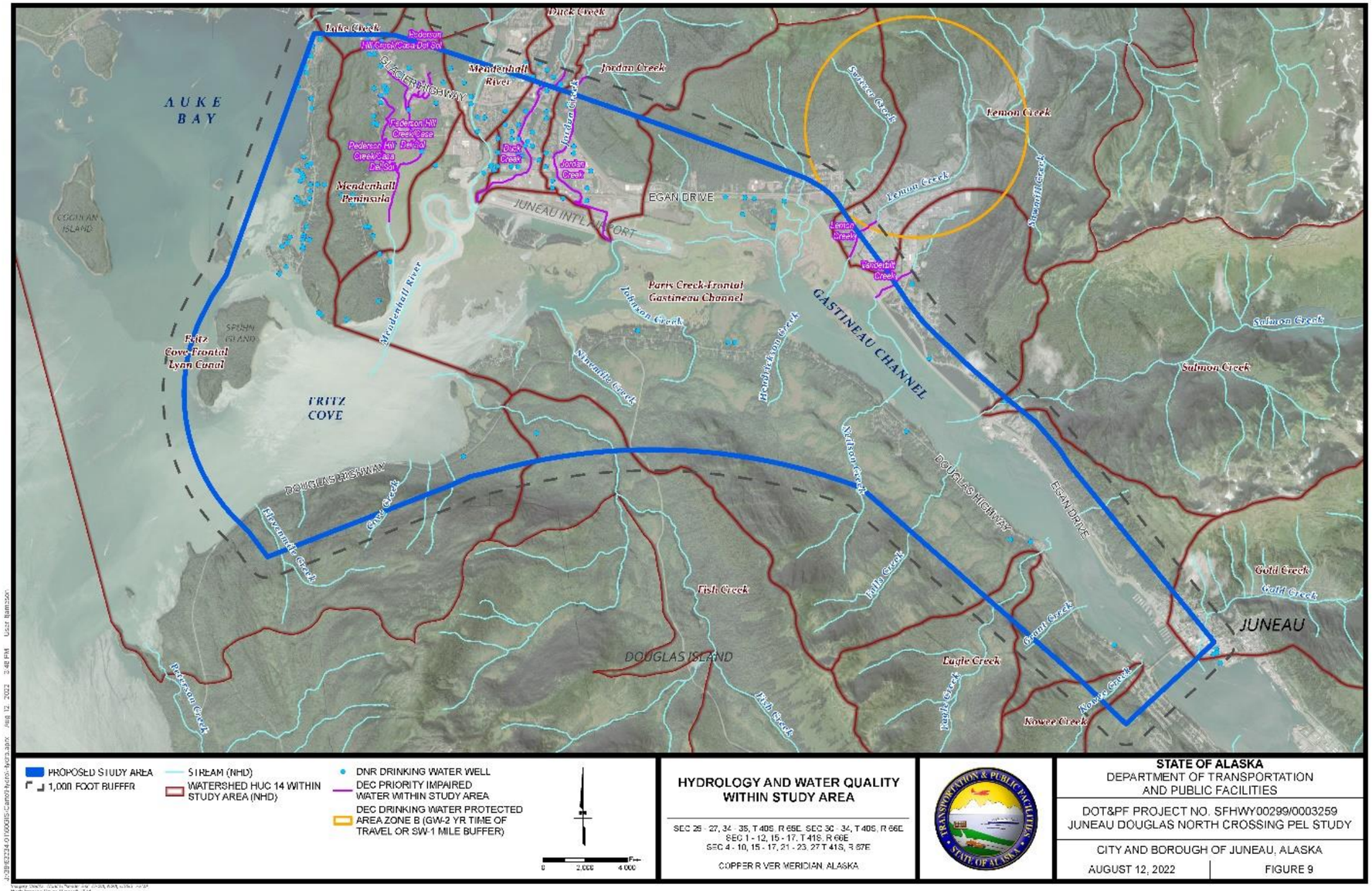
Figure 11: Hydrology and Water Quality within the Study Area



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2.2.2.2.2 Floodplains

The majority of the study area adjacent to Gastineau Channel, Fritz Cove, and waterbodies has been determined to be within flood hazard zone (A, V, AE, VE, or AH), which are areas subject to inundation by a 100-year flood event. The “A” designations indicate Special Flood Hazard Areas of high risk, and the “V” designations indicate Coastal High Hazard Areas. Flood hazard zones are shown on Figure 12.

Areas within flood hazard Zone A do not have detailed hydraulic analyses and subsequently no base flood elevation. These include:

- Creeks on Douglas Island (Hendrickson Creek, Eagle Creek, Grant Creek, and Gold Creek)

Areas within flood hazard Zone V do not have detailed hydraulic analyses and subsequently no base flood elevation. These include:

- Gastineau Channel and Fritz Cove

Areas within flood hazard Zone AE have detailed hydraulic analyses and a base flood elevation is known. These include:

- Tidal Flats and Lemon Creek with Base Flood Elevations ranging from 20 to 23 feet

Areas located within flood hazard Zone VE have detailed hydraulic analyses and a base flood elevation is known. These include:

- Gastineau Channel and Fritz Cove with Base Depth Elevations of 24 to 27 feet

Areas located within flood hazard AH have detailed hydraulic analyses and a base flood elevation is known. These include:

- Duck Creek and wetlands associated with Duck Creek with Base Flood Elevations ranging from 28 to 30 feet

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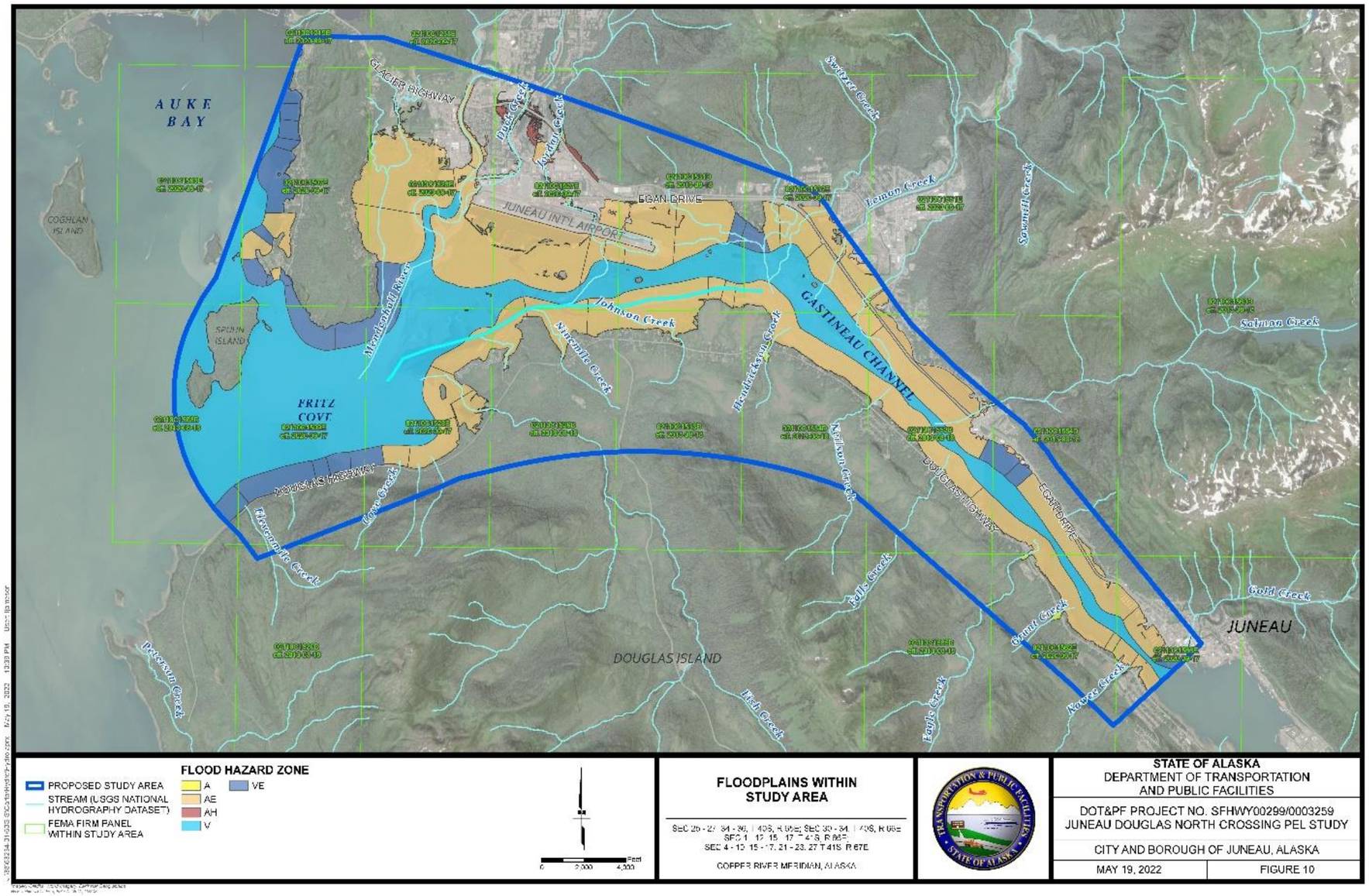
Figure 12: Floodplains within the Study Area



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2.2.2.2.3 Navigable Waters

Federal and state definitions of navigable waters differ:

- Federal jurisdiction applies to waters subject to the ebb and flow of the tide, and/or are used or have been used for interstate or foreign commerce
- State jurisdiction applies to tidally influenced areas and rivers/streams used for commerce or travel

The United States Army Corps of Engineers (USACE) has jurisdiction for structures constructed in or over navigable waters of the United States (US). Navigable waters of the US are areas below the mean high water (tidal areas). The following waterbodies are navigable below the mean high water (see Figure 13):

- Gastineau Channel (limitations on vessel size north of the Juneau Douglas Bridge)
- Fritz Cove
- Mendenhall Bar (small vessels are cautioned to only attempt passage during high water and with local knowledge)
  - Gastineau Channel and Fritz Cove are separated by Mendenhall Bar
- Mendenhall River is considered navigable by
  - The United States Coast Guard (USCG) from the mouth to Montana Creek
  - The ADNR from the mouth to river mile 5.71
- Lemon Creek has undetermined navigability by the ADNR from the mouth to river mile 1.32

Navigable waters require the following permits based on the following conditions:

- Bridges spanning navigable waters per 33 CFR 329.4 would require a bridge permit from the USCG
- Section 10 permit from the USACE for work in, over or under mean high water

USACE Tidal Data (Juneau):

- Mean tidal range for Juneau is 13.74 feet
- Mean High Water is 15.3 feet

Obstructions to navigable waters include bridges spanning Gastineau Channel, Mendenhall River, and Lemon Creek. Physical limitations to vessel size due to vertical clearance (i.e., mean high water to bottom of bridge), horizontal navigable channel width (i.e., distance between piers), and water depths (varies tidally and seasonally).

The Juneau Douglas Bridge limits access to the upper reaches of Gastineau Channel with the following dimensions:

- Horizontal clearance of 490 feet
- Vertical clearance
  - Minimum clearance of 49.9 feet (outer 240 feet of horizontal clearance)
  - Maximum clearance of 51 feet (middle 250 feet of horizontal clearance)

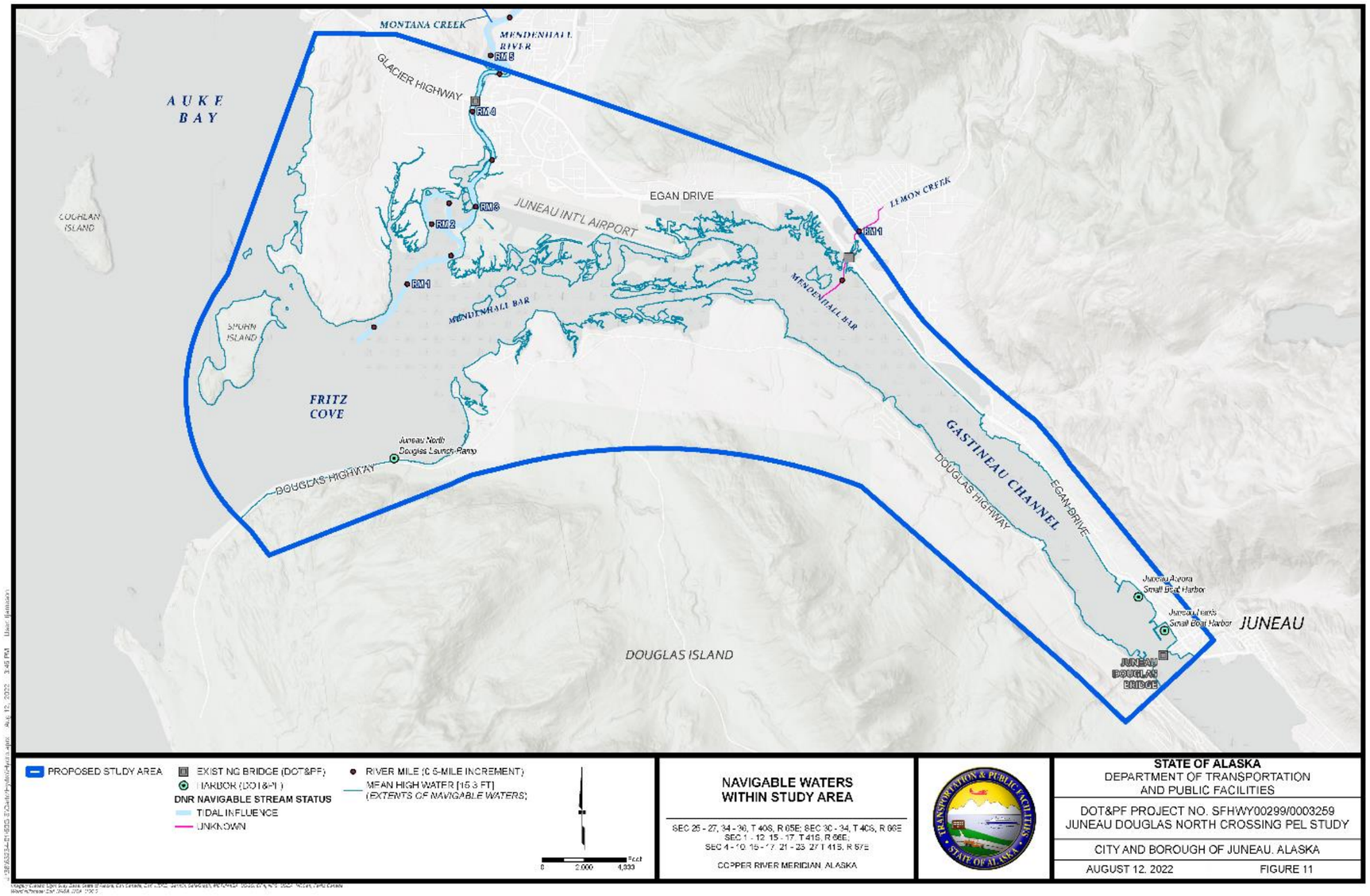
Egan Drive/Glacier Highway Bridge elevation over the Mendenhall River and the river flow regime limits the size of vessel which can access the navigable portions of the Mendenhall River. The bridge has the following dimensions:

- Horizontal clearance is 122 feet
- Vertical clearance of 18.5 feet

Egan Drive/Glacier Highway Bridge elevation over Lemon Creek and the stream flow regime limits the size of vessel which can access the navigable portions of Lemon Creek. The bridge has the following dimensions:

- Horizontal clearance is 181 feet
- Vertical clearance of 17.9 feet

Figure 13: Navigable Waters within Study Area



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2.2.3 Wetlands

2.2.3.1 Regulatory Framework

Projects that could affect wetlands or other waterbodies require investigation to identify areas that may fall under the USACE jurisdiction per Section 404 of the Clean Water Act. The USACE defines wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Unavoidable impacts to wetlands must be compensated through mitigation in accordance with the USACE regulatory requirements and/or requirements of Executive Order 11990.

2.2.3.2 Existing Conditions

Wetlands occur consistently throughout the study area. Areas with relatively less wetland coverage include Mendenhall Peninsula, west Douglas Island, Spuhn Island, and areas with built environment. Figure 14 shows the location of wetlands, waterbodies, and waterways identified within the study area. Wetlands are summarized by type in Table 16.

Table 16: Uplands and Wetlands in Study Area, by Type

Type	Acres	% of Study Area
Uplands	**6,089**	**41**
Wetlands	**1,829**	**12**
Palustrine Forested	*714*	*5*
Palustrine Scrub-Shrub	*89*	*>1*
Palustrine Emergent	*1,026*	*7*
Palustrine Waterbodies	*17*	*>1*
Waters of the U.S.	**7,053**	**47**
Estuarine Intertidal	*3,789*	*25*
Estuarine Subtidal	*3,025*	*20*
Lacustrine	*142*	*1*
*Streams**	*61*	*>1*

* *Streams consist of 283,222 linear feet (54 miles)*

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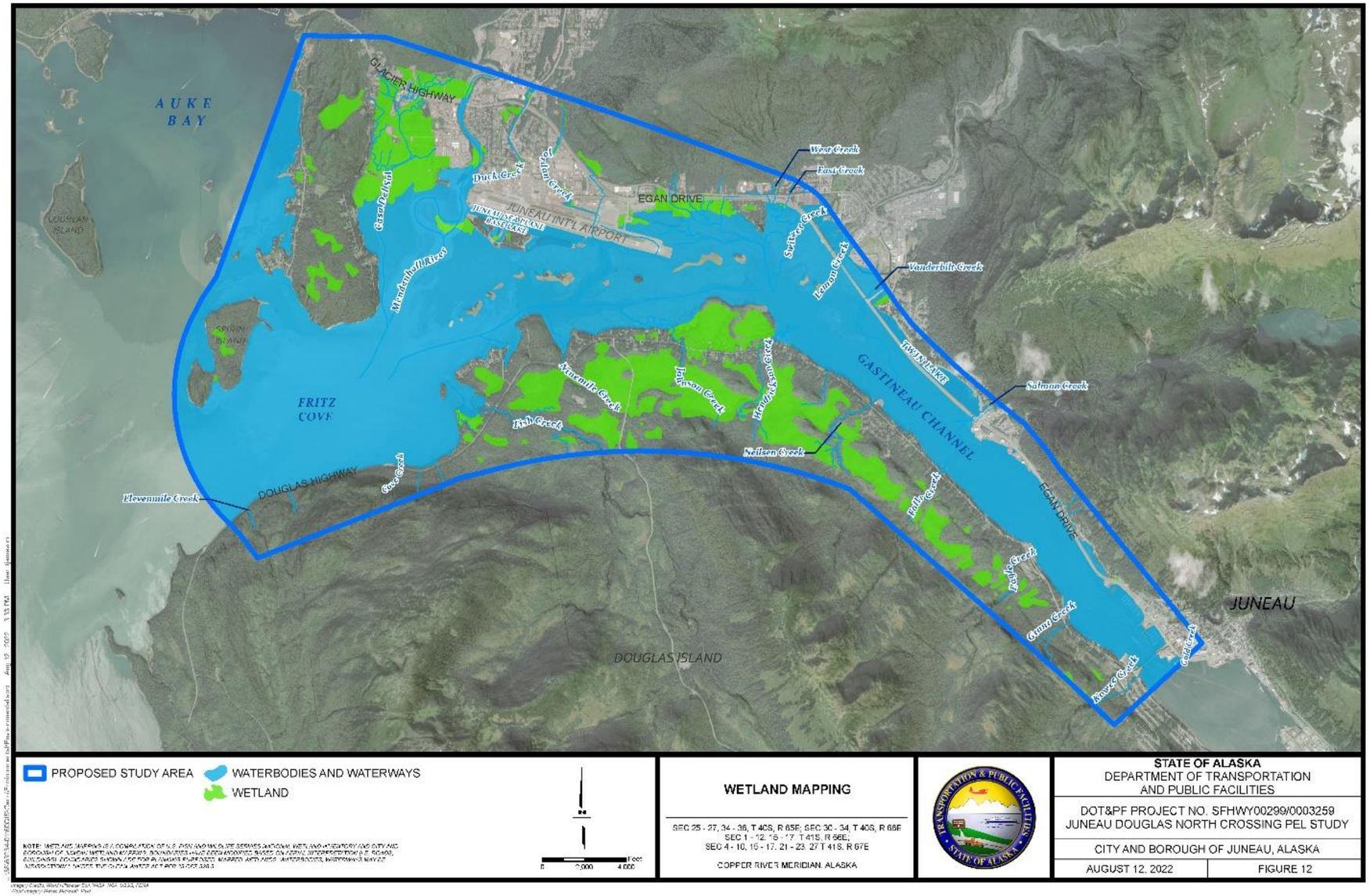
Figure 14: Wetlands in the Study Area



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2.2.4 Threatened or Endangered Species

2.2.4.1 Regulatory Framework

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure their activities are not likely to jeopardize the continued existence of federally listed species or destroy or adversely modify designated critical habitat. The lead agencies for implementing the ESA are the U.S. Fish and Wildlife Service (USFWS) and the U.S. National Oceanic and Atmospheric Administration Fisheries Service.

2.2.4.2 Existing Conditions

The USFWS Information for Planning and Consultation website indicates that one ESA-listed wildlife species under the jurisdiction of USFWS may use habitats in the study area. That species is the short-tailed albatross, which is listed as endangered. Although the USFWS website indicates that the short-tailed albatrosses may use the study area as habitat, short-tailed albatrosses are generally associated with shelfbreak and slope regions of the northwestern Pacific Ocean and the Bering Sea which are not qualities of the study area, as such they are not expected to use the inland waters of the study area.

Two ESA-listed species under the jurisdiction of National Marine Fisheries Service (NMFS) may use habitats in the study area. These are humpback whales and Steller sea lions. Two distinct population segments (DPSs) of humpback whales occur in southeast Alaska—Mexico and Hawaii. The Hawaii DPS is not listed under the ESA, however the Mexico DPS is threatened. Two percent of all humpback whales in southeast Alaska are members of the Mexico DPS and all others are from the Hawaii DPS. Humpback whales are regularly observed foraging in Fritz Cove. They are also occasionally sighted in the southern portion of Gastineau Channel but are unlikely to venture into the shallow waters north of the existing Douglas Island Bridge.

Populations of Steller sea lions are divided into two DPSs—eastern and western. Most Steller sea lions that enter the study area are from the eastern DPS. In 2013, citing population recovery and other factors, NMFS removed the eastern DPS from the list of endangered and threatened species (78 FR 66139, November 4, 2013).

The western DPS, which is ESA-listed as endangered, includes all Steller sea lions originating from rookeries west of Cape Suckling (144° west longitude). Cape Suckling is more than 300 miles from the study area. However, Steller sea lions are a wide-ranging species, and animals from this DPS may wander into the waters of the study area. The proportion of western DPS Stellar sea lion in the Lynn Canal region (the larger geographical region in which the study area is located) is approximately 18 percent. Steller sea lions from the western DPS have occasionally been observed near Statter Harbor (83 FR 52394, October 17, 2018). It is possible, therefore, that some ESA-listed Steller sea lions may use habitats in the study area.

No areas that have been designated as critical habitat for any ESA-listed species are present in the study area.

In addition to being ESA-listed, short-tailed albatrosses, humpback whales, and Steller sea lions are also on the State of Alaska's list of endangered species.

As of August 15, 2011, ADFG no longer maintains a list of Species of Special Concern. The list has not been reviewed and revised since 1998 and is no longer considered valid. Since that time, the ADFG has completed Alaska's Wildlife Action Plan. That plan evaluates the status of wildlife populations and recommends actions to conserve wildlife and vital habitat before they become more rare and more costly to protect.

The action plan identifies species of greatest conservation need (SGCN), which include species whose population is small, declining, or under significant threat ("at-risk" species); species that are culturally, ecologically, or economically important; species that function as sentinel species (indicators of environmental change); and stewardship species (species with a high percentage of their North American or global populations in Alaska). Examples of SGCN that may be present in the study area include salmon and trout, trumpeter swan, bald eagle, golden eagle, marbled murrelet, olive-sided flycatcher, northern flying squirrel, and various species of bats.

The action plan also includes examples of priority species. Such species have small populations, declining populations, and/or populations under threat, or they are species for which Alaska has high stewardship responsibility. The plan identifies 15 species or subspecies as examples of high-priority SGCN that meet these criteria. High-priority SGCN that may be present in the study area include western DPS Steller sea lion, king eider, marbled godwit, rock sandpiper, and Kittlitz's murrelet.

2.2.5 Fish and Wildlife

2.2.5.1 Regulatory Framework

NEPA requires that all major actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as effects related to fish and wildlife are given due weight in decision making. This section addresses several distinctly managed natural resources, therefore each subsection's regulatory framework is listed below in the order described in this section.

- Aquatic species described below includes fish and microinvertebrates present in either freshwater or marine environments and protected by the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (Magnuson-Stevens Act). Under this act, the NMFS has authority to regulate the fisheries of the U.S. In 1996, this Act was amended to emphasize the sustainability of the nation's fisheries and create a new habitat conservation approach called Essential Fish Habitat (EFH). Agencies must consult with the NMFS on all activities which may have an adverse effect to EFH. All

anadromous fish habitat is considered EFH. In Alaska, NMFS oversees EFH in marine waters and the State of Alaska oversees EFH in streams.

- Marine mammals are protected by the Marine Mammal Protection Act, which aims to prevent marine mammal species and population stocks from decline by prohibiting 'take' of marine mammals.
- Land mammals, unless otherwise listed as a protected species under the Endangered Species Act, are generally regulated through ADFG as game species.
- Amphibians, unless otherwise listed as a protected species under the Endangered Species Act, are not protected or regulated by any existing state or federal laws and would be managed specifically under management plans.
- Birds are protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (Eagle Act), which prohibits actions resulting in a "take" of migratory birds and eagles, their parts, nests, and eggs. Destruction of active bird nests, eggs, or nestlings that can result from spring and summer vegetation clearing, grubbing and other site preparation and construction activities would violate the MBTA and the Eagle Act.

2.2.5.2 Existing Conditions

2.2.5.2.1 Aquatic Species

Collectively, Figure 15 through 17 identify areas that provide habitat for fish and other aquatic species. First, the maps of EFH (Figure 15) and streams used by anadromous fish (Figure 16) show areas explicitly designated or identified as fish habitat. These resources are discussed in the following subsections. Figure 15 also depicts streams where anadromous fish have not been documented; these streams may provide habitat for resident fish, such as threespine stickleback or rainbow trout. Finally, the map of habitat types for upland species (Figure 15) shows the locations of fresh and marine waterbodies where fish and other aquatic species may be present. A May 2005 Project Development Summary Report (PDSR) (HDR Alaska, Inc., 2005) developed to document baseline conditions for a Juneau Second Channel Crossing includes descriptions of species and life history stages that use aquatic habitats in the study area. The report states that anadromous species spawn, rear, and overwinter in the Mendenhall Flats, Mendenhall River, Fritz Cove, Gastineau Channel, and associated streams, especially the lower reaches of moderate to large streams; that information is still valid. Marine habitats at the eastern end of Fritz Cove and in Gastineau Channel extending from Entrance Point to Salmon Creek lie within the Mendenhall Wetlands State Game Refuge. The refuge has been identified as an important nursery rearing area for juvenile salmon and other marine fishes.

In the mid-1980s, ADFG developed maps identifying areas of important habitat for species valued for commercial and/or subsistence uses. These maps continue to be the primary source of information about the locations of the following species in the study area:

- Pacific herring—Winter concentration areas are mapped in Fritz Cove and along the western shore of Mendenhall Peninsula.
- Eulachon—Spawning concentration areas are mapped in the Mendenhall River estuary.

The study area includes designated EFH for several species. NMFS has not designated any Habitat Areas of Particular Concern or other areas protected from fishing in the study area. As shown in Figure 15, the study area includes three generalized areas of designated EFH.

Area 1 extends along the eastern shore of Auke Bay and into the southern portion of Fritz Cove. Marine habitats in Area 1 include EFH for the following groundfish species from the Gulf of Alaska fishery:

- Alaska plaice
- Arrowtooth flounder
- Dover sole
- Flathead sole
- Northern rock sole
- Pacific cod
- Pacific Ocean perch
- Rex sole
- Sablefish
- Southern rock sole
- Walleye pollock
- Yellowfin sole

Area 1 includes marine waters designated as EFH for larvae of all these species except yellowfin sole. It also includes areas designated as EFH for eggs of Alaska plaice, Dover sole, flathead sole, rex sole, walleye pollock, and yellowfin sole.

Area 2 encompasses Area 1 as well as the entirety of Fritz Cove and Gastineau Channel. Marine habitats in Area 2 have been designated as EFH for mature adults of all five Pacific salmon species in Alaska (Chinook salmon, chum salmon, coho salmon, pink salmon, and sockeye salmon). These habitats are also designated as EFH for juveniles of all these species except Chinook salmon, as well as EFH for immature adults of Chinook, chum, and sockeye salmon.

Area 3 consists of a small area along the northeastern shore of Gastineau Channel immediately north of the existing crossing. Marine habitats in Area 3 have been designated as EFH for eggs of yellowfin sole.

Vegetation classification was used to identify habitats for upland species (i.e., wildlife species that are not restricted to aquatic habitats—in other words, amphibians, birds, and mammals other than marine mammals). Table 17 summarizes how data from these sources were classified into land cover types for this analysis and Figure 17 shows the distribution of this habitat.

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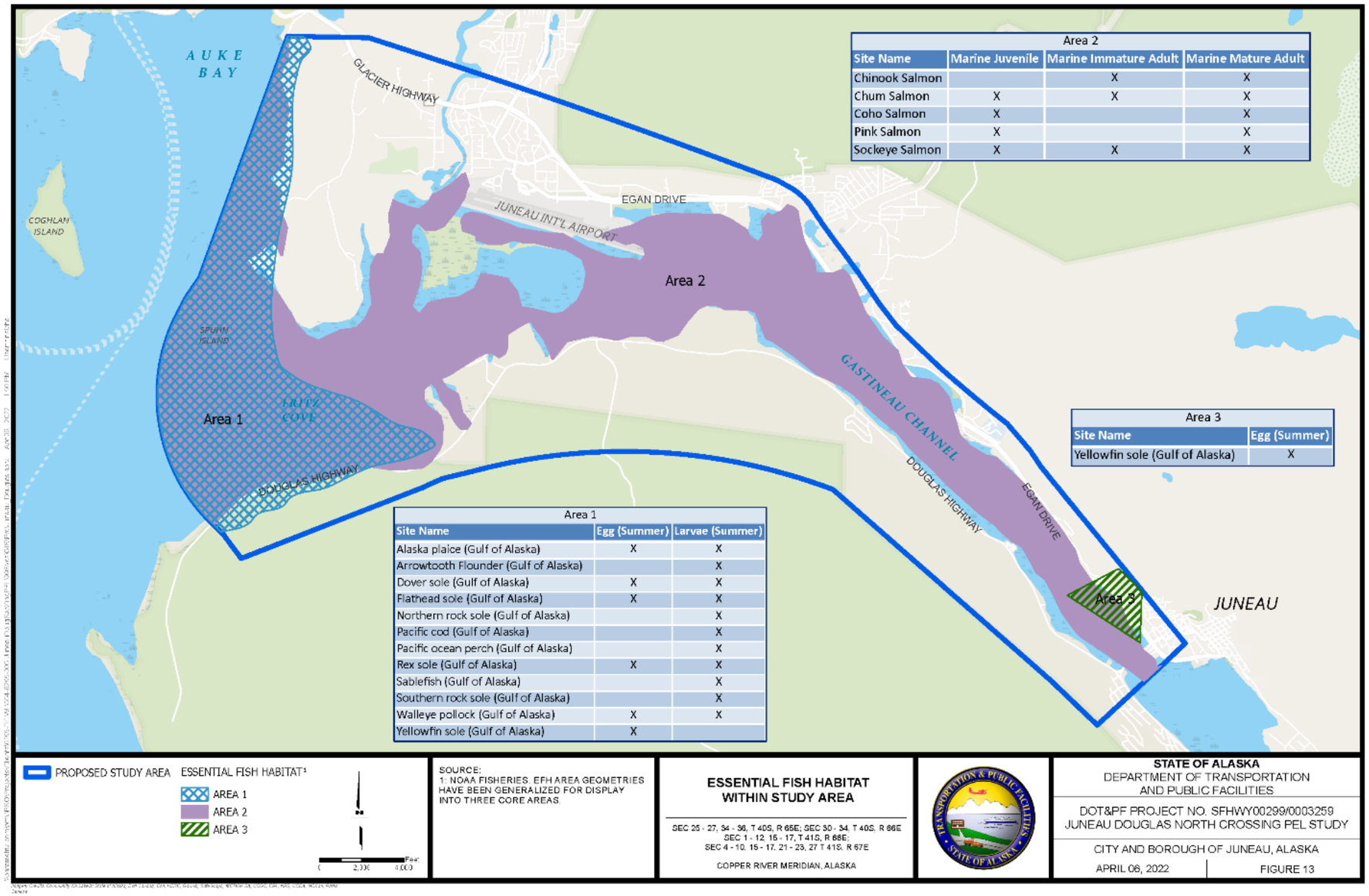
Figure 15: Essential Fish Habitat Within Study Area



Area 2

Site Name	Marine Juvenile	Marine Immature Adult	Marine Mature Adult
Chinook Salmon		X	X
Chum Salmon	X	X	X
Coho Salmon	X		X
Pink Salmon	X		X
Sockeye Salmon	X	X	X

Area 3

Site Name	Egg (Summer)
Yellowfin sole (Gulf of Alaska)	X

Area 1

Site Name	Egg (Summer)	Larvae (Summer)
Alaska plaice (Gulf of Alaska)	X	X
Arrowtooth Flounder (Gulf of Alaska)		X
Dover sole (Gulf of Alaska)	X	X
Flathead sole (Gulf of Alaska)	X	X
Northern rock sole (Gulf of Alaska)		X
Pacific cod (Gulf of Alaska)		X
Pacific ocean perch (Gulf of Alaska)		X
Rex sole (Gulf of Alaska)	X	X
Sablefish (Gulf of Alaska)		X
Southern rock sole (Gulf of Alaska)		X
Walleye pollock (Gulf of Alaska)	X	X
Yellowfin sole (Gulf of Alaska)	X	

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Figure 16: Anadromous Fish Habitat Within Study Area

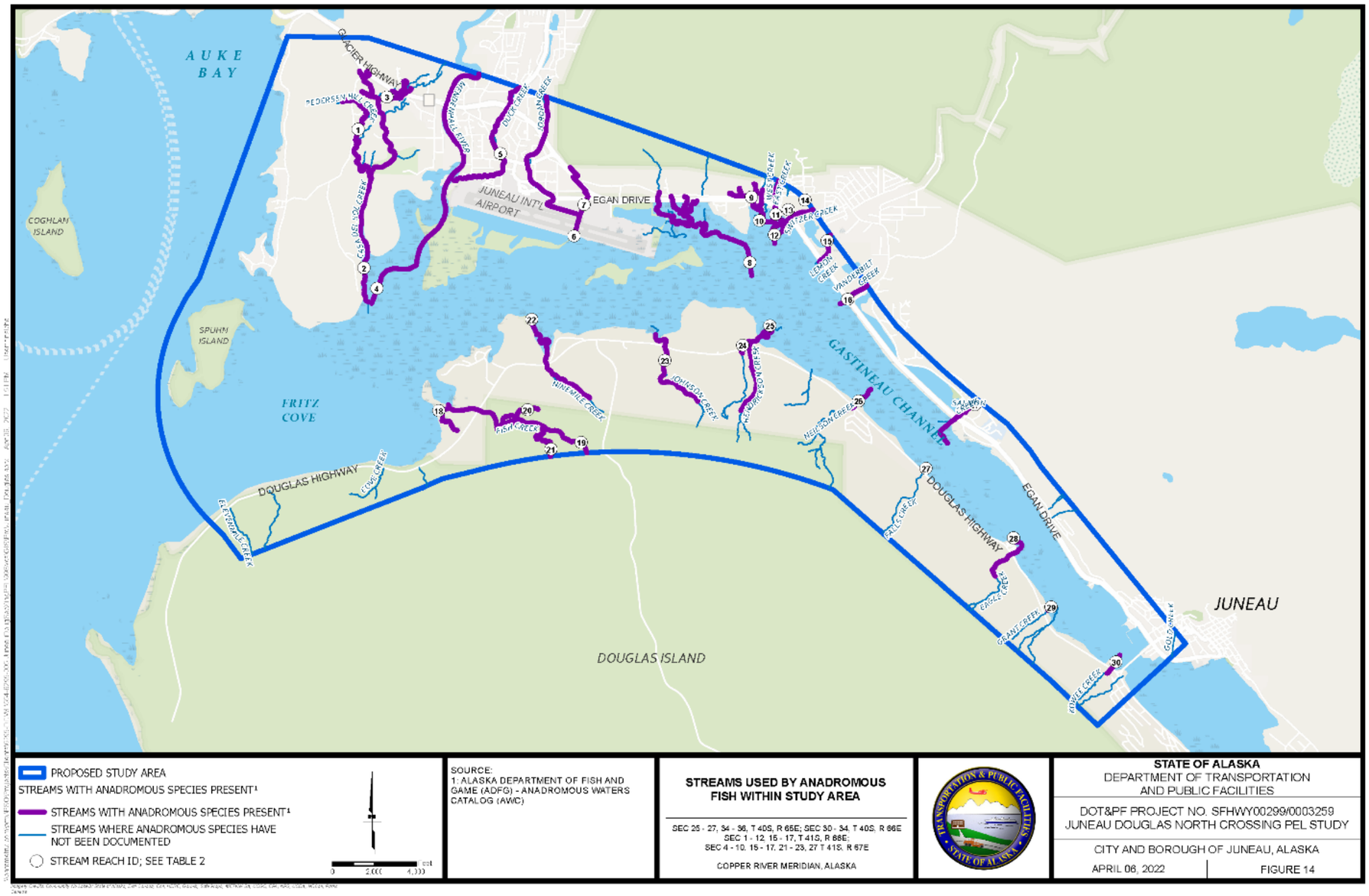

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Figure 17: Habitat Area for Upland Species within Study Area

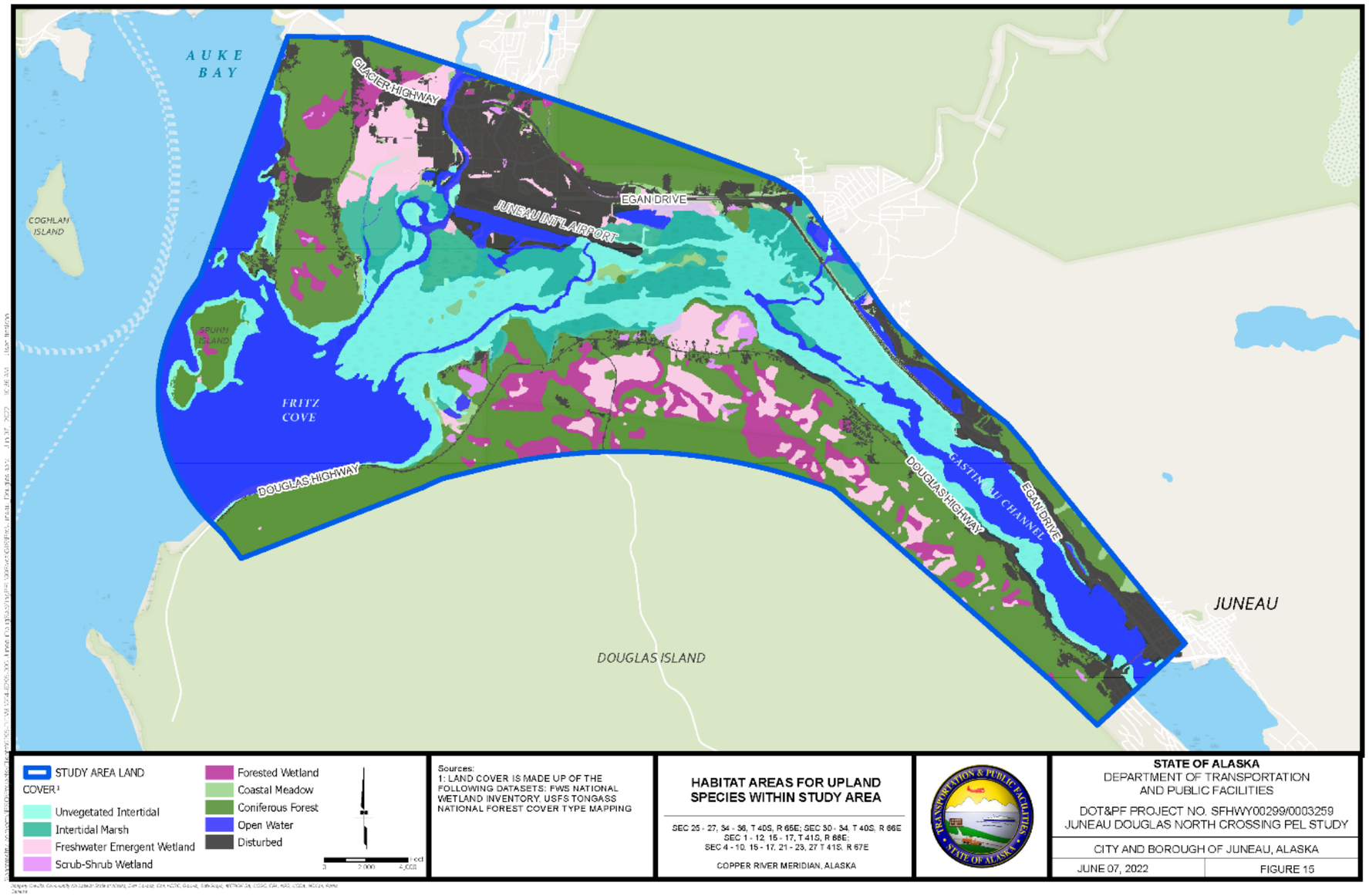

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Table 17: Land Cover Type Classification

Land Cover Type	NWI Classifications	Tongass National Forest Cover Types[1]	Example Wildlife Species
Open Water	Estuarine Subtidal; Lacustrine Limnetic; Riverine Tidal or Lower Perennial; Palustrine Aquatic Bed or Unconsolidated Bottom	Non-forest—Freshwater	Fish, marine mammals, seabirds
Unvegetated Intertidal	Estuarine Unconsolidated Shore or Rocky Shore	N/A	Crabs, benthic invertebrates, northwestern crow
Intertidal Marsh	Estuarine Emergent	N/A	Canada goose, great blue heron, American pipit, savannah sparrow
Forested Wetland	Palustrine Forested	N/A	Woodpeckers, great horned owl, olive-sided flycatcher
Scrub-Shrub Wetland	Palustrine Scrub-Shrub	N/A	Fox sparrow, yellow warbler, beaver
Freshwater Emergent Wetland	Palustrine Emergent	N/A	Western toad, western snipe, belted kingfisher
Coastal Meadow	N/A	Non-forest—Natural Grassland	Long-tailed vole, northern harrier, American kestrel
Coniferous Forest	N/A	Forested	Steller's jay, varied thrush, Sitka black-tailed deer, black bear
Disturbed[2]	N/A	N/A	Rock pigeon, European starling, glaucous-winged gull

[1] Tongass National Forest cover types were used to identify vegetation cover where NWI data are not available.
[2] Disturbed areas, as identified through evaluation of aerial imagery, supersede all underlying cover types.

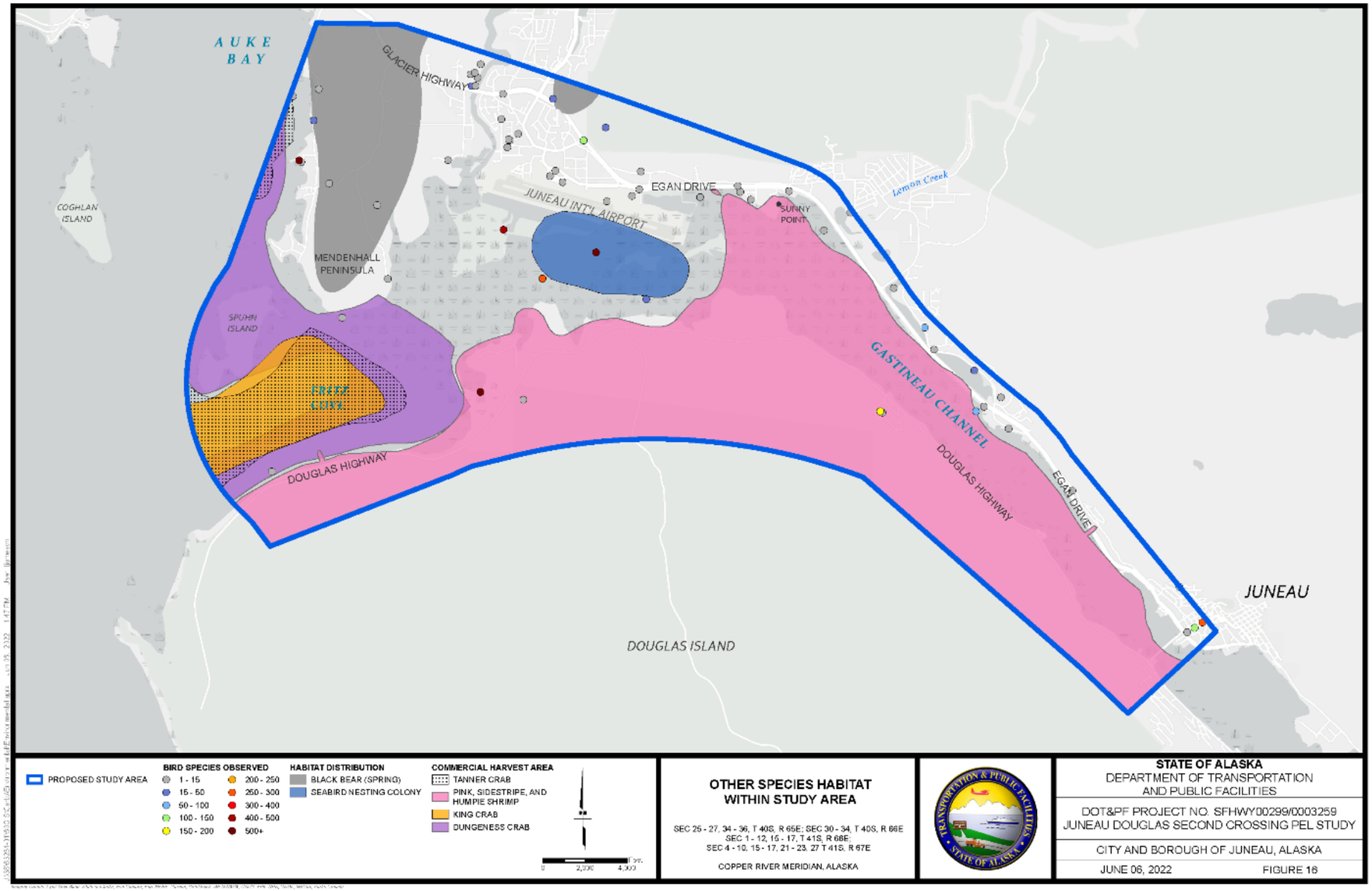
In the mid-1980s, ADFG developed maps identifying areas of important habitat for species valued for commercial and/or subsistence uses (Figure 18). These maps continue to be the primary source of information about the locations of the following species in the study area:

- Tanner crab—Commercial harvest areas near the mouth of Fritz Cove (south of Mendenhall Peninsula and Spuhn Island) and in Auke Bay off the western shore of Mendenhall Peninsula.
- Shrimp—Harvest areas for pink, sidestripe, and humpie shrimp are mapped in Gastineau Channel southeast of Sunny Point and along the northern shore of Douglas Island.
- King crab—Marine habitats throughout Fritz Cove and Gastineau Channel are identified as harvest areas for red king crab and blue king crab. Fritz Cove and portions of

Gastineau Channel west of Sunny Point are also identified as harvest areas for golden (brown) king crab.

- Dungeness crab—Most of Fritz Cove (except for deeper, mid-cove waters) is identified as commercial harvest area for Dungeness crab. The May 2005 PDSR includes a detailed description of habitat use by Dungeness crabs in Fritz Cove.

Figure 18: Other Species Habitat Within Study Area



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Several stream networks in the study area provide spawning and/or rearing habitat for the following species of anadromous fish (Table 18):

- Chinook salmon
- Chum salmon
- Coho salmon
- Cutthroat trout
- Dolly Varden
- Pink salmon
- Sockeye salmon
- Steelhead

Table 18: Use of Streams in the Juneau Douglas North Crossing Study Area by Anadromous Fish

Map Reach Label[2]	Stream Name	Salmon					Cutthroat Trout	Dolly Varden	Steelhead
		Chinook	Chum	Coho	Pink	Sockeye			
1	Pederson Hill Creek		S	R				R	
2	Casa del Sol Creek		P	R				R	
3	Unnamed Tributaries to Casa del Sol Creek		P	R				R	
5	Duck Creek		P	R	P		R	P	
6	Jordan Creek		P	P	S	P	P	P	
7	Tributary No. 2002 to Jordan Creek			R					
8	Stream 111-50-10625 and tributaries			R					
9	Tributary No. 2003 to West Creek			R					
10	West Creek		S	S, R				R	
11	East Creek		P	R	S			R	
12	Switzer Creek		P	P	P	P	R	P	
13	Tributary No. 2001 to Switzer Creek			R					
14	Tributary No. 2003 to Switzer Creek			P				P	
15	Lemon Creek		S	P	P			P	
16	Vanderbilt Creek		S	S, R	S			R	
17	Salmon Creek		S	S, R	P			P	
18	Tributary No. 2000 to Fish Creek			R					
19	Fish Creek	P	P	R	P		P	P	S, R
20	Tributary No. 2003 to Fish Creek			R					
21	Tributary No. 2006 to Fish Creek			R					
22	Ninemile Creek		S	R	S			P	
23	Johnson Creek			P	S		R	P	

Map Reach Label[2]	Stream Name	Salmon					Cutthroat Trout	Dolly Varden	Steelhead
		Chinook	Chum	Coho	Pink	Sockeye			
24	Tributary No. 2002 to Hendrickson Creek			R					
25	Hendrickson Creek			R	S		R	P	
26	Neilson Creek			R				P	
27	Falls Creek							P	
28	Eagle Creek		P	P	P			P	
29	Grant Creek		P	R					
30	Kowee Creek		S		S				

These streams are depicted in Figure 13 which is accompanied by a tabular summary of the species that have been documented in each stream reach, as well as the nature of each species' use of that reach (spawning, rearing, or presence [i.e., no life stage or behavior specified]). The streams identified as habitat for fish are afforded protection under Alaska Statute 16.05.871 and 16.05.841, and federal protections under the Magnuson-Stevens Act.

Fish Passage

ADFG maintains a database of stream crossings that have been assessed for fish passage. The Fish Passage Inventory Database includes assessments of 51 culverts at road-stream crossings in the study area. Based on evaluations of gradient, outfall height, and constriction ratio (calculated as culvert width divided by stream channel width), each culvert was assigned to one of the following categories:

- Red: Assumed to be a barrier to passage for juvenile salmonids or weak-swimming fish
- Gray: Likely to be a barrier to passage for juvenile salmonids or weak-swimming fish
- Green: Assumed to be adequate for passage for juvenile salmonids or weak-swimming fish
- Black: Status unknown

Twelve of the 51 culverts are rated as red, indicating a high likelihood that they impede fish passage for one or more species. Seven of these are along North Douglas Highway on Douglas Island. Three are near the intersection of Glacier Highway and Engineer's Cutoff Road in the northwestern portion of the study area. One is in a residential area

north of Glacier Highway near Sunny Point, and one is on a private driveway north of North Douglas Highway.

Eleven culverts are rated as gray (barrier status likely). Five of these are on Glacier Highway or Egan Drive east of the airport. The others are evenly divided between Douglas Island and mainland Juneau. Of the remaining culverts, 22 are rated green (no barrier) and six are rated black (status unknown).

Eisenman and O'Doherty (2020) evaluated fish passage at road crossings in and around Juneau, assigning prioritization scores based on the potential ecological benefits of reconfiguring or replacing the existing culvert with a structure that does not impede fish passage. Prioritization scores are based on the amount of habitat available upstream of the crossing, the number of fish species present in the stream, and the severity of the barrier. Higher scores indicate a higher degree of impact on fisheries resources.

Of 59 Juneau-area culverts evaluated by Eisenman and O'Doherty (2020), 24 are in the study area. Seven of the ten culverts with the highest prioritization scores in the study area are along North Douglas Highway (at the crossings of Neilson, Johnson, Hendrickson, Falls, Grant, Eagle, and Ninemile Creeks, in descending order of prioritization score). The crossing with the highest prioritization score is Jordan Creek at the airport.

2.2.5.2.2 Marine Mammals

NMFS recently issued an Incidental Harassment Authorization (IHA) to the City of Juneau for construction activities associated with a harbor improvement project in Statter Harbor. Statter Harbor is in Auke Bay immediately north of the study area; marine mammals present at that site are also likely to use habitats in the study area.

According to the IHA, seven species of marine mammals under the jurisdiction of NMFS have been documented in the waters of Southeast Alaska near the study area. These species are harbor seal, harbor porpoise, Dall's porpoise, killer whale, humpback whale, minke whale, and Steller sea lion. Only three of these (harbor seal, Steller sea lion, and humpback whale) are known to be present in Statter Harbor and are expected to use marine habitats in the study area. Two of the other four species (Dall's porpoise and minke whale) have been observed only in open-ocean waters west of the study area and are not expected to enter the study area. Killer whales have been sighted infrequently and irregularly in the outer portions of Auke Bay and in the Gastineau Channel south of the Douglas Bridge; killer whales may enter the study area from the south. Harbor porpoises might use waters in or near the study area, but they are an inconspicuous species and difficult to detect (83 FR 52394, October 17, 2018). A protected species final report documenting monitoring observations for the Statter Harbor improvements confirmed the presence of the species in Auke Bay.

The other marine mammal species that may be present in the study area is the northern sea otter, which is under the jurisdiction of USFWS. Sea otters are not commonly seen

in inland waters such as Fritz Cove and Gastineau Channel, but they may enter the study area on occasion.

Humpback whales and Steller sea lions are discussed further above in Section 2.2.4, Threatened and Endangered Species.

2.2.5.2.3 Land Mammals

Land mammals in the Juneau region include brown bear, black bear, Sitka black-tailed deer, moose, wolf, and mountain goat (Kautz, et al 2004). The Sitka black-tailed deer and black bear the two largest users of the MWSGR, with common small fur-bearers including muskrat, otter, mink, and short-tailed weasel (ADFG 1990). Other terrestrial mammals known to occur in the area include the snowshoe hare, red squirrel, deer mouse, porcupine, hoary marmot, little brown bat, long-tailed vole, and masked shrew.

The ADFG habitat management guide for black bears identifies spring concentration areas on Mendenhall Peninsula and along lower reaches of Jordan Creek in the study area.

2.2.5.2.4 Amphibians

Six species of amphibians are native to Southeast Alaska, including the wood frog (Rana sylvatica), western toad (Bufo boreas), Columbia spotted frog (Rana luteiventris), rough-skinned newt (Taricha granulosa), long-toed salamander (Ambystoma macrodactylum), and northwestern salamander (Ambystoma gracile) (Carstensen et al. 2003).

All species require ponds or other still-water for breeding. Data documenting local abundance of amphibians within the study area is sparse and not comprehensive. However, freshwater ponds in the larger Juneau area support breeding populations of western toads, wood frogs, and rough-skinned newts. ADF&G confirmed the east pond adjacent the mouth of Fish Creek is one documented breeding area for western toads (personal communication, 10/28/22).

Documented wood frog distribution in Southeast Alaska is restricted to the Stikine, Taku, and Chilkat drainages, Glacier Bay and near Yakutat. A localized population found on Douglas Island were likely transplants (MacDonald 2007). Western toads are widely distributed but may be rapidly declining (MacDonald 2007); they are the only amphibian documented within the boundaries of the MWSGR (ADFG 1990). The Columbia spotted frog (Rana luteiventris) has been documented in southeast, but not near Juneau. Roughskinned newts (Taricha granulosa) are the most common tailed amphibian in Southeast Alaska and populations may be highest in mature and old-growth forests (MacDonald 2007). Long-toed salamanders have an unknown population status in Alaska, but it is considered small; the closest reported sighting to Juneau is the Taku River (ACCS 2018). The northwestern salamander has only been collected at two locations in Southeast Alaska; neither near Juneau (MacDonald 2007).

An emerging concern is the spread of chytridiomycosis, an infectious disease of amphibians caused by the fungus Batrachochytrium dendrobatidis. The disease has caused the decline or complete extinction of more than 200 species of frogs and other amphibians worldwide. Reports of chytridiomycosis have been recorded from the Kenai Peninsula to Prince of Wales Island. The disease has not yet been reported in the study area, however.

2.2.5.2.5 Birds

The study area supports large and diverse assemblages of birds. Examples include the following:

- Airport Dike Trail, Mendenhall Wetlands State Game Refuge—233 different species, including shorebirds and waterfowl numbering in the thousands
- East of River Mouth, Mendenhall Wetlands State Game Refuge—199 different species, including waterfowl, shorebirds, and gulls numbering in the thousands
- Fish Creek Delta, Mendenhall Wetlands State Game Refuge—180 different species, including waterfowl, gulls, and occasionally migratory songbirds (pine siskins) numbering in the thousands
- West of River, Mendenhall Wetlands State Game Refuge—177 different species, including waterfowl, shorebirds, and gulls numbering in the thousands

The ADFG habitat management guides indicate the presence of a comparatively small (fewer than 1,000 birds) nesting colony of seabirds in the marshlands immediately south of the airport. That source also identifies Gastineau Channel between Entrance Point and Salmon Creek as a spring and fall concentration area for waterfowl and shorebirds.

The May 2005 PDSR indicated bald eagles congregate in the Mendenhall wetlands and the Mendenhall River area in the spring, the mouth of the Mendenhall River throughout the year, and the confluence of the Chilkat and Tsirku rivers (north of Haines) in the fall. Habitat for bald eagle nesting and perching in southeast Alaska is identified as large spruce trees along the coast and rivers. The May 2005 PDSR included a figure showing the locations of known eagle nests. An unknown number of those nests are likely to have been abandoned since then, and other nests have likely been established at new locations. Congregation areas and patterns of habitat use in the study area are expected to be similar to what was described in the May 2005 PDSR.

2.2.6 Invasive Species

2.2.6.1 Regulatory Framework

Invasive species are subject Federal Executive Order 13112 *Safeguarding the Nation from the Impacts of Invasive Species.* As amended on December 5, 2016, federal agencies are required to prevent and control the introduction of invasive species to minimize the economic, ecological, and human health effects that invasive species may

cause. Per this EO, Federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the U.S., unless all reasonable measures to minimize risk of harm have been analyzed and considered. FHWA's Guidance on Invasive Species (FHWA, 1999) was used to determine the likelihood the proposed project would introduce or spread invasive species.

2.2.6.2 Existing Conditions

The Alaska Exotic Plant Information Clearinghouse (AKEPIC) database was searched to identify any invasive terrestrial or aquatic plant species in the study area. The clearinghouse has ranked non-native species in terms of invasiveness.

More than 300 instances of species classified by AKEPIC as extremely or highly invasive have been mapped in the study area representing 12 species (Figure 19). This includes plants considered to be extremely invasive (purple loosetrife, white sweetclover, reed canarygrass, bohemian knotweed) and highly invasive (bigleaf lupine, Canada thistle, creeping buttercup, field and moist sowhistle, orange hawkweed, rugosa rose).

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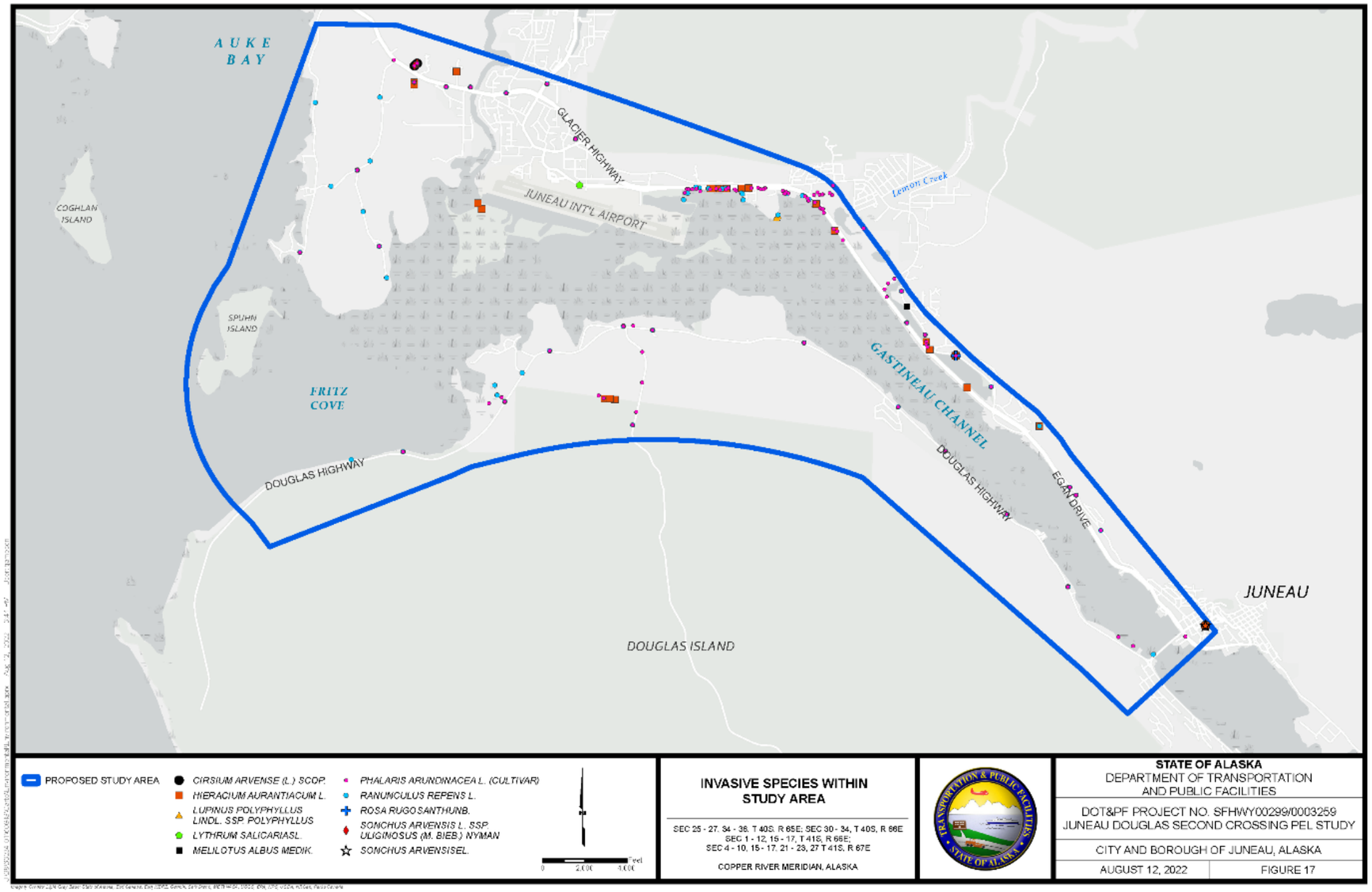
Figure 19: Invasive Species within Study Area



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2.3 Built Environment

2.3.1 Transportation Infrastructure

2.3.1.1 Regulatory Framework

Roadway classifications and designations assist with decisions governing design, maintenance, operations, and management decisions. A functional classification is a hierarchical system used to classify each road based on its relative emphasis on mobility versus land access.

2.3.1.2 Existing Conditions

2.3.1.2.1 Transportation Network

Arterials, collectors, and local roads each comprise one-third of the total 94 miles within the study area. Arterials include Egan Drive, Mendenhall Loop Road, and the Glacier Highway. Collectors are dispersed through Mendenhall Valley to the Mendenhall Peninsula, as well as along Douglas Island and include North Douglas Highway. Local Roads are also interspersed throughout the study area, the with most being located in the Mendenhall Valley and along the Mendenhall Peninsula (see Figure 20). Table 19 shows summary statistics for roads by functional class and ownership, bridges, sidewalks, transit stops, and transit routes within the study area.

DOT&PF owns two-thirds of the roadways within the study area, while City and Borough of Juneau owns the remaining third. Sidewalks are present near downtown Juneau south of Ross Way, and between the Brotherhood Bridge and Old Dairy Road north and south of Egan Drive. Nearly 90 percent of the 13 miles of sidewalks are regularly or periodically maintained. Separated paths and shoulders are present, however along Egan Drive through Lemon Creek, bicycles are prohibited. No bicycle or shoulder lanes are present in downtown Juneau. Capital Transit services 64 transit stops with 14 routes, of which five are running every weekday between 7:00 in the morning and 7:00 in the evening. One of these routes has 30-minute stop intervals and four have one-hour intervals.

Traffic movements from Juneau to Douglas, and vice-versa, rely on the Douglas Island bridge. An operational analysis for the Douglas Island bridge, conducted to support this PEL Study (Appendix A), indicates the signalized intersection at Egan Drive with 10th Street operates at Level of Service[6] (LOS) D[7] during peak hours under existing conditions. Operational analysis indicates the roundabout at Douglas Highway with the

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[6] *The Florida Department of Transportation 2020 Quality/Level of Service (Q/LOS) Handbook provides guidance for developing and reviewing roadway capacity and Q/LOS at a generalized planning level. Volume tables in the handbook provide generalized annual average daily volumes for roadways by facility type.*

[7] *Level of Service is graded on a descending quality scale from A to F.*

Douglas Island bridge operates well (LOS D or better) during the evening peak under existing conditions. Under existing conditions during the morning peak, significant delay (LOS F with queues over 500 feet) is experienced by vehicles entering the roundabout from West Juneau/Douglas and continuing onto North Douglas Highway or turning right onto the bridge (towards downtown). The through and right lane is shared and there is a high volume of vehicles wishing to turn right to cross the bridge (more than double the volume of any other movement entering the roundabout), causing congestion. Additionally, vehicles entering the roundabout from North Douglas Highway and continuing onto the Douglas Island bridge have right-of-way in the roundabout over the vehicles entering from West Juneau/Douglas, exacerbating the congestion.

Figure 20: Roadways by Functional Classification within Study Area

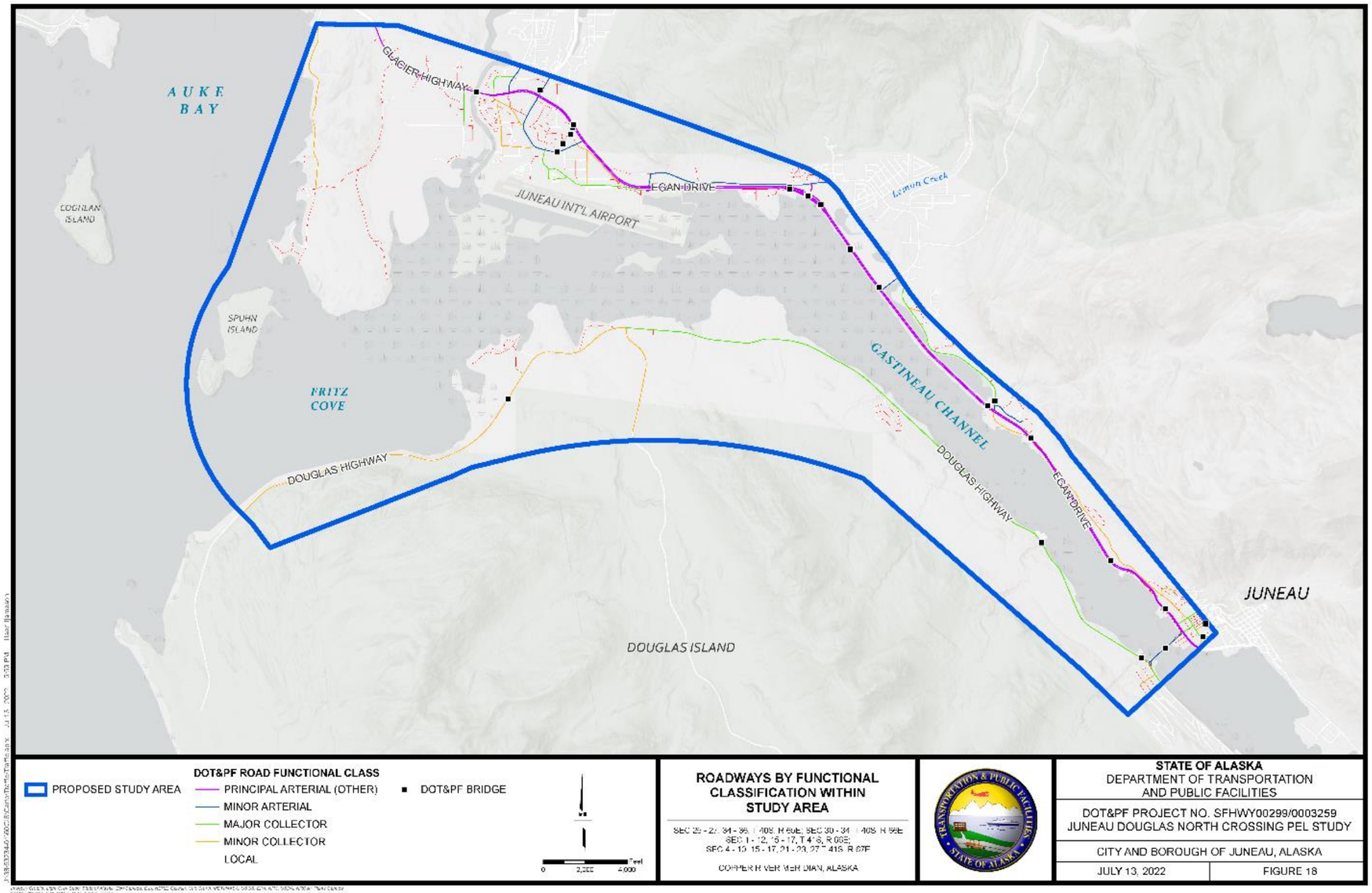

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Table 19: Summary Statistics for Study Area Transportation Network

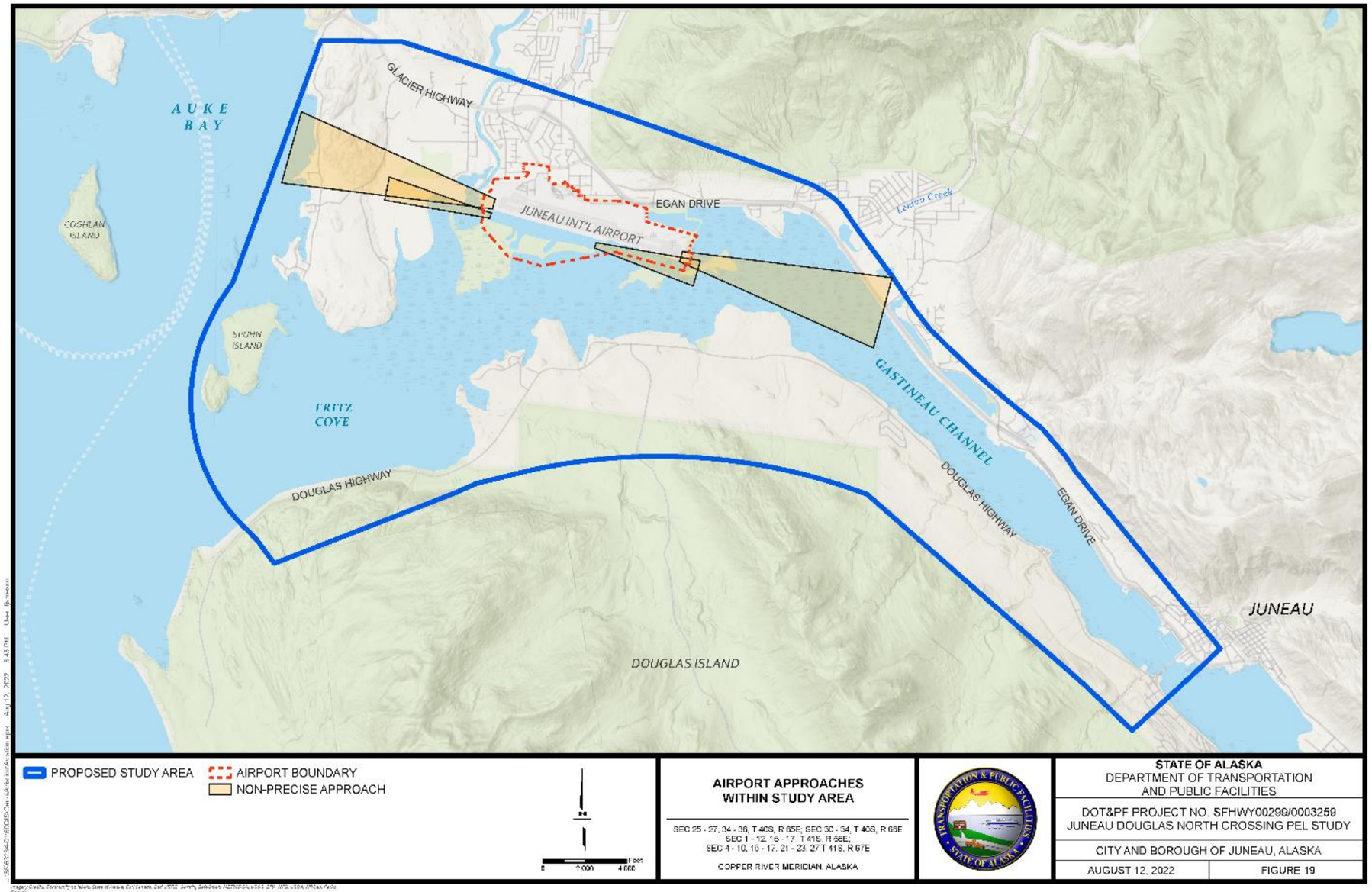
Data Category	Category	Category Summation	% of Total
Roadway Functional Classification (miles)	Interstate	0.00	0%
	Principal Arterial – Other	23.65	25%
	Minor Arterial	9.23	10%
	Major Collector	12.92	14%
	Minor Collector	18.04	19%
	Local	30.08	32%
	Total	**93.91**	**100%**
Bridges (count)	**All Bridges**	**41**	**100%**
Transit Stops (count)	**All Stops**	**64**	**100%**
Transit Routes (count)	All day – 7 days a week	3	20%
	All day – weekdays only	2	14%
	Weekday only (only 2 runs per day)	1	8%
	Weekday mornings only	7	50%
	Weekday afternoons only	1	8%
	Total	**14**	**100%**
Sidewalks (miles)	Regularly Maintained	4.95	53%
	Periodically Maintained	2.70	29%
	Not Maintained	1.70	18%
	Total	**9.35**	**100%**
Separated Paths	**Total**	**5.26**	**100%**
Shoulder Lanes	**Total**	**20.05**	**100%**

2.3.1.2.3 Aviation

The runway at Juneau International Airport is located entirely within the airport property, but surrounding areas of airspace extend beyond the runway area protected (Figure 21). These areas exist for the protection of airspace used by aircraft approaching the airport. Aircraft landing or taking off from a runway require an area free of obstructions to operate safely. Part 77 is a series of illustrative surfaces defined as: primary surface, conical surface, approach surface and transitional surface. The surfaces are used to determine whether natural terrain or man-made structures would be obstructions to the safe navigation of aircraft operating on approach to the runway. The dimension of each surface is defined within Part 77.

- The primary surface exists at ground level, centered on the runway, at the same elevation as the runway and extends 200 feet beyond each runway end.
- The approach surface is one of the most critical surfaces because it is the one the aircraft uses on approach to landing. To the greatest extent possible the approach surface should be clear of all objects so that nothing can impede the landing of an aircraft on final approach. The slope for approach surface is 34:1 degree so for each 34 feet outward one (1) foot of elevation is gained.
- The transitional surface extends outward and upward from the sides of the airport and its runways. The transitional surface starts at the edge of the primary surface and rises at a slope of 7:1.
- The horizontal surface is 150 feet above the airport elevation and the perimeter is a set of swinging arcs from the center of the end of the primary surface for each runway end. The radius used is 10,000 feet.
- The conical surface starts at the edge of the horizonal surface and extends outward and upward at a 20:1 slope for a horizontal distance of 4,000 feet and a vertical rise of 200 feet, putting the outer edge of the conical surface at 350 feet above the airport elevation.

Figure 21: Airport Approaches within Study Area



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2.3.2 Contaminated Sites

2.3.2.1 Regulatory Framework

Prior to any construction project, a due diligence effort is needed to identify the risk of encountering hazardous materials to avoid soil excavation within prohibited areas and to avoid unknowingly subjecting a contractor to hazardous materials. To estimate these risks, established databases that track spills, contaminated soils and groundwater and other pollutants are used to understand and characterize the types of hazardous materials within the study area. Contaminated sites can threaten public health or the environment and can cause economic hardship to people and communities (ADEC 2011). The regulatory framework for the management of hazardous materials, hazardous wastes, and contamination is complex, with both federal and state components.

ADEC regulatory definitions:

- Hazardous material is any material that, because of its quantity, concentration, or physical and chemical characteristics, poses a significant presence or potential hazard to human health and safety, or to the environment, if released into the workplace or the environment.
- Hazardous waste is a hazardous material that can pose a substantial or potential hazard to human health or the environment when improperly managed.
- Contaminated sites (ADEC database) consist of a location where hazardous substances, including petroleum products, have been improperly disposed of, spilled, or leaked from their containers. Solid waste includes solids, liquids, and gases and must be discarded to be considered waste.
- A regulated hazardous waste site is a location where a known hazard material has been generated, transported, treated, stored, or disposed of and is tracked in an Environmental Protection Agency (EPA) or an ADEC database.
- A non-regulated waste site is a location where the disposal of solids, liquids, and gases occur. These sites are not tracked through an EPA or ADEC database but may receive low quantities or unknown quantities of hazardous materials.

2.3.2.2 Existing Conditions

The database searches described above identified the following sites which may pose a risk to human health or the environment:

- EPA EnviroMapper identified 50 Resource Conservation and Recovery Act (RCRA) sites, no brownfield sites, and no superfund sites within the study area.
- ADEC databases identified 38 regulated contaminated sites (25 active, 13 institutional controls) containing petroleum, waste oil, and/or chemical waste, and one permitted solid waste holder (disposal facility).

- Other database searches for non-regulated waste sites identified 16 businesses associated with automobile salvage and recovery operations within the study area.

Table 20 provides a summary of the regulated hazardous waste sites and non-regulated waste sites within the study area including site identification number, which corresponds to the regulatory identification (ID) number for the EPA RCRA sites, the hazard ID number for the ADEC contaminated sites, the site ID number for ADEC's Solid Waste Information Management System permit, and the map generated ID number for non-regulated waste sites from the desktop review. Table 20 includes site name (typically the business located on the site), property owner and type(s) of hazardous waste associated with the site.

Figure 22 provides the location of regulated hazardous waste sites and non-regulated waste sites within the study area which may pose a risk of encountering hazardous materials during construction. The largest concentration of sites occurs in the study area near downtown Juneau, near the airport, and along Industrial Boulevard west of the Mendenhall River. Few sites occur on Douglas Island.

Figure 22: Regulated Hazardous Sites and Non-regulated Waste Sites within Study Area

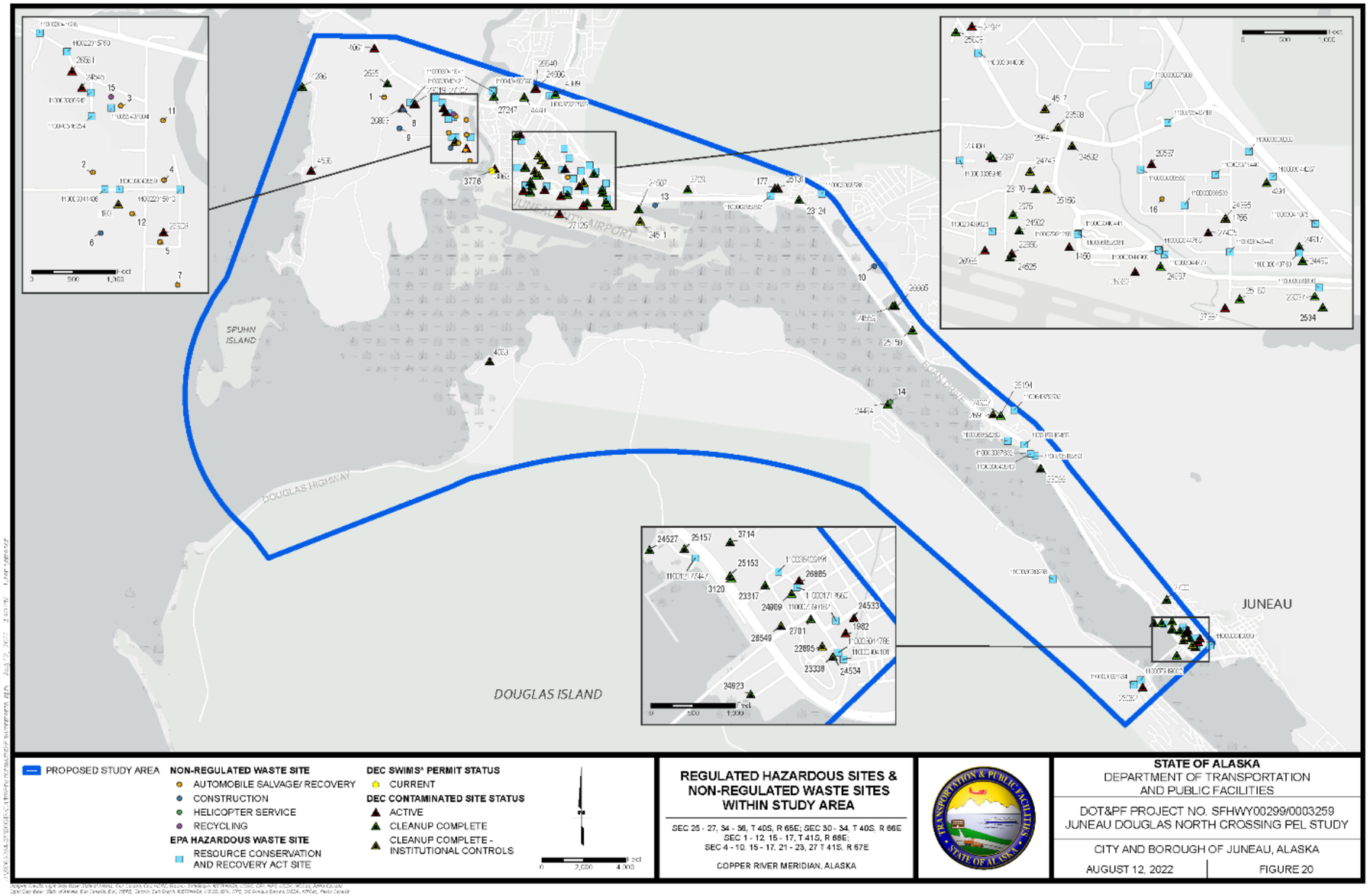

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Table 20: Regulated Hazardous Waste Sites and Non-regulated Waste Sites in the Study Area

Site ID	Site Name	Property Owner	Type of Waste
Regulated Hazardous Waste Sites			
EPA RCRA Sites			
110003042421	ADEC Juneau Fire Training Center	City and Borough of Juneau	Petroleum
110070516254	AEL&P Industrial Blvd. Powerplant	Alaska Electric Light & Power	Chemical
110070516253	AEL&P Salmon Creek Powerplant	Alaska Electric Light & Power	Chemical
110003039809	Alaska Air National Guard AAOF Juneau	State of Alaska	Petroleum
110003040441	Alaska Airlines Juneau	City and Borough of Juneau Airport	Petroleum
110000885882	Alaska DOT&PF 6860 Glacier Hwy	State of Alaska DOT&PF	Unknown
110007919002	Alaska Housing Cedar Park Ak	Coogan Alaska LLC	Petroleum
110001717660	Alaska Laundry Inc-Ak Laundry & Dry Clea[8]	Mackinco DBA Alaska Laundry	Chemical
110003041486	Alaska Striping & Painting Inc	R & L Leasing Inc	Chemical
110003037909	Channel Construction	Jordan Creek Office Condominium Owners Association Inc	Petroleum/Chemical
110003044900	Channel Flying	Channel Flying Inc	Unknown
110007921286	Delta Air Lines Juneau	City and Borough of Juneau Airport	Unknown
110003043830	Delta Western Juneau Wharf	State of Alaska Department of Education and Early Development	Unknown
110003041636	Doh Environmental	Joshua D and Kara L Lockhart	Chemical
110003040959	E & L Auto	Nancy Marie Maki	Petroleum
110022315813	Fix Auto Juneau	Joseph M Smith and Jean P Smith	Petroleum
110055437004	Frontier Storage	Frontier Storage LLC and Doug Trucano	Chemical
110003038533	Hals Body Shop	Karla A Tollefson-Allwine and Steven J Allwine	Petroleum
110036409491	Harborview Elementary School	City and Borough of Juneau	Unknown

[8] *Intentional misspelling as shown in EPA database.*

Site ID	Site Name	Property Owner	Type of Waste
110003037632	Inside Passage Marine Inc	William R Tonsgard Jr	Petroleum
110006852263	Juneau Empire	Southeastern Newspaper Corp	Unknown
110006852281	Juneau Intl	City and Borough of Juneau Airport	Petroleum/Chemical
110003041075	Love Bros	TKP Juneau LLC	Unknown
110003371440	Mendenhall Auto Ctr	Karla A Tollefson-Allwine and Steven J Allwine	Petroleum
110064379603	Midnight Sun Oncology	Juneau Medical Office Building LLC	Unknown
110003039998	Mike Hatch Jeep	Compton-Munro Automotive LLC	Petroleum
110003043448	N C Machinery Co Juneau	Smith-Hall Inc	Petroleum
110020489826	Northstar Helicopter	City and Borough of Juneau Airport and R & L Leasing	Petroleum
110070540718	Petco Store #1194	CPIF Nugget Mall LLC	Petroleum
110003037534	Petro Marine Services Juneau	Trucano Family Partnership	Petroleum
110003040780	Petroleum Svcs Inc	DCI Properties LLC	Petroleum
110043460590	Safeway #1820	Safeway Inc C/O Albertsons Companies	Unknown
110015916455	Salmon Creek Water Filtration Plant	Alaska Electric Light & Power	Unknown
110003044768	Silver Bay Aviation	City and Borough of Juneau Airport, Aero Services Atlantic and Atlantic Aviation	Unknown
110003040913	Solid Waste Solutions	William R Tonsgard Jr	Petroleum/Chemical
110003036642	Southeast Antifreeze Recycling	Mark and Veronica Schultz	Chemical
110003036946	T W Hall	Dwan W and Cathy L Hall	Unknown
110012177447	UAS Marine Core Complex	University of Alaska Southeast	Unknown
110022315760	University Of Alaska, Bentwood Bldg	University of Alaska Board of Regents	Chemical
110003044786	Unocal 6431	Marian L Fiorella	Petroleum
110003044036	USDOT FAA Juneau	Federal Aviation Administration	Unknown
110003044287	USDA Fs Old Dairy Rd	RH Rentals LLC	Unknown
110037372535	USFS Duck Creek Administrative Site	Rainforest Properties LLC	Chemical
110007398182	USGSA Federal Bldg Ch & Po	U S General Services Administration	Unknown
110003038203	Valley Lumber	8525 Holdings LLC	Petroleum
110003041841	Vintage Dry Cleaners	Sablefish LLC	Chemical

Site ID	Site Name	Property Owner	Type of Waste
110003038588	Wal-Mart Supercenter 3814	Glacier Hwy LLC	Petroleum
110003044777	Ward Air Inc	City and Borough of Juneau Airport and Red Leasing LLC	Unknown
110003041011	Yukon Office Supply	Caelum AK LLC	Unknown
110003039550	Yukon Office Supply	Juneau Youth Services Inc	Unknown
ADEC Sites Contaminated Sites			
Site ID	**Site Name**	**Property Owner**	**Type of Waste/Status[9]**
25131	ADOT&PF Regional Complex Juneau	ADOT&PF	Petroleum/Active
26936	Aero Services USTs 1 & 2	City and Borough of Juneau Airport; Trajen Flight Services	Petroleum/Active
22996	Alaska Airlines - Juneau Cargo Facility	City and Borough of Juneau Airport; Alaska Airlines Inc	Petroleum/Active
26908	Bicknell Inc	Roscoe Bicknell IV	Petroleum/Active
26561	CBJ Capital Transit Building	City and Borough of Juneau	Petroleum/Active
24545	CBJ Capital Transit Bus Barn	City and Borough of Juneau	Petroleum/Active
23019	CBJ Hagevig Fire Training Center	City and Borough of Juneau	Petroleum/Active
27107	CBJ Hagevig Fire Training Center PFAS	City and Borough of Juneau	Chemical/Active
27384	CBJ Juneau Airport CCFR Engine A3 AFFF	City and Borough of Juneau Airport	Chemical/Active
27125	CBJ Juneau Airport Sitewide PFAS	City and Borough of Juneau Airport	Chemical/Active
26362	Channel Flying Juneau Airport	City and Borough of Juneau Airport	Petroleum/Active
26062	Cordova Heights Apartments	Grant Rentals LLC	Petroleum/Active
24941	FAA Juneau SFOP	Natalie Watson, Allan Breedlove, Mary Watson	Petroleum/Active
1450	FAA Juneau Station	City and Borough of Juneau Airport	Petroleum/Active
26537	Former Capital City Cleaners Nugget Mall	Cpif Nugget Lot 2 LLC	Petroleum and Chemical/Active

[9] *The ADEC contaminated sites database characterizes sites as active, cleanup complete, and IC.*

Site ID	Site Name	Property Owner	Type of Waste
1982	GSA Juneau Federal Building	U.S. General Services Administration	Petroleum and Chemical/Active
24533	GSA Juneau Federal Building LUST	U.S. General Services Administration	Petroleum/Active
2987	Juneau Airport Fueling Facility	City and Borough of Juneau Airport; Trajen Flight Services	Petroleum/Active
3863	Mendenhall WW Treatment Plant	City and Borough of Juneau	Petroleum/Active
26863	Miller Construction Fuel Truck	Sherwood Lane Development LLC	Petroleum/Active
4536	Residence - 10481 Ann Coleman Road HHOT	Ann Coleman LLC	Petroleum/Active
26885	Residence - 1125 Glacier Avenue	Douglas W Arends and Leah Scetlich	Petroleum/Active
4061	Residence - Knickerbocker Spill	Thunder Mountain LLC	Petroleum/Active
27405	St. Vincent de Paul Apartments	St. Vincent Depaul Society	Petroleum/Active
26640	Valley Tesoro	Tower Legacy I LLC	Petroleum/Active
1183	E&L Auto	Nancy Marie Maki	Petroleum and Chemical/IC
4517	Juneau Airport Travelodge Hotel	Avo Property Inc	Petroleum/IC
23568	Unocal - #5785- Airport Union	Brittney Sooter	Petroleum and Chemical/IC
24532	Chevron - Airport (Paul's Chevron)	St. Vincent Depaul Society	Petroleum/IC
24743	PTI- Juneau Cessna Drive	J D Phone Co	Petroleum/IC
25156	CBJ Juneau Airport Maintenance Facility	City and Borough of Juneau Airport and R & L Leasing Inc	Petroleum/IC
24511	Temsco Helicopters - Juneau Heliport	City and Borough of Juneau Airport and Temsco Helicopters	Petroleum/IC
2691	NETS Building	Southeast Alaska Regional Health Consortium	Petroleum/IC
4063	Residence - Misty Lane HHOT	Christopher D Holmes and Raeanna C Holmes	Petroleum/IC
26549	10th Street Tesoro	Delta Western Inc	Petroleum/IC

Site ID	Site Name	Property Owner	Type of Waste
1755	Cameron Plumbing and Heating	Shawn J Obrien	Petroleum/IC
22895	CBJ Downtown Fire Station	City and Borough of Juneau	Petroleum/IC
2984	Mike's Airport Express	Brittney Sooter	Petroleum/IC
ADEC SWIMS Permit Holders			
Site ID	**Site Name**	**Property Owner**	**Type of Waste/Status[10]**
3776	Juneau Biosolid Treatment Facility	City and Borough of Juneau	Biosolids Treatment/Current
Non-regulated Waste Sites			
Other Sites			
Map ID	**Site Name**	**Property Owner**	**Type of Waste or Business**
1	2647 Engineers Cutoff	David O Ritter	Automobile salvage/recovery
2	Egan Express Lube	RPA Investments	Automobile salvage/recovery
3	Karl's Auto & Marine Repair	Kevin Williamson Trust	Automobile salvage/recovery
4	Broken Rudders, Inc.	Quad Properties LLC	Automobile salvage/recovery
5	Lawless Marine	Roscoe Bicknell IV	Automobile salvage/recovery
6	Alaska Painting and Striping	R & L Leasing	Construction
7	North Sales Company	Smith Properties	Automobile salvage/recovery
8	2500 Sherwood Ln	Sherwood Land Development	Construction
9	Alaska Juneau Construction	Jeremy J Sidney	Construction
10	Glacier Construction	Glacier Construction Inc.	Construction
11	Deckhands Marine & Dave's Custom Detail	Gold Creek Properties	Automobile salvage/recovery

[10] The ADEC Solid Waste Information Management System database characterizes permit status as active, inactive, closed, retired, removed, or expired.

Site ID	Site Name	Property Owner	Type of Waste
12	Willie's Marine	Tara J Harris	Automobile salvage/recovery
13	7900 Honsinger Dr	49th Investment Group LLC, Bicknell Inc,	Construction
14	6924 N Douglas Hwy	Northstar Trekking Inc.	Helicopter Service
15	D & S Recycling	L & H Rentals	Recycling
16	8876 Teal St	Alaska Glacier Seafoods Inc	Automobile salvage/recovery

2.3.3 Noise

2.3.3.1 Regulatory Framework

FHWA's regulations "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (23 CFR 772) provides procedures for noise studies and noise abatement measures to help protect the public health and welfare, supplies noise abatement criteria, and establishes requirements for information to be given to local officials for use in the planning and design of highways. All highway projects developed in conformance with these regulations are deemed to be in conformance with the FHWA noise standards. State highway agencies are required to adopt written highway traffic noise policies approved by FHWA. DOT&PF's Noise Policy (DOT&PF, 2018) is the primary document used to implement FHWA's regulations. Noise receptors and receivers are the discrete units or modeling locations, respectively, used to measure noise impacts. Receptors are the units that receive noise impacts and are classified into seven categories:

- A – Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential, if the area is to continue to serve its intended purpose
- B – Residential
- C – Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
- D – Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
- E – Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A through D or F

- F – Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
- G – Undeveloped lands that are not permitted

2.3.3.2 Existing Conditions

The study area was screened for the most sensitive noise receivers (Category A and B), as illustrated in Figure 23. Category A areas are primarily on the northern portion of Douglas Island set back from the Douglas Highway, throughout Mendenhall Peninsula, and all of Spuhn Island. Category B areas are also throughout the study area, primarily along Egan Drive, Douglas Highway, and along the east and west of Mendenhall Peninsula.

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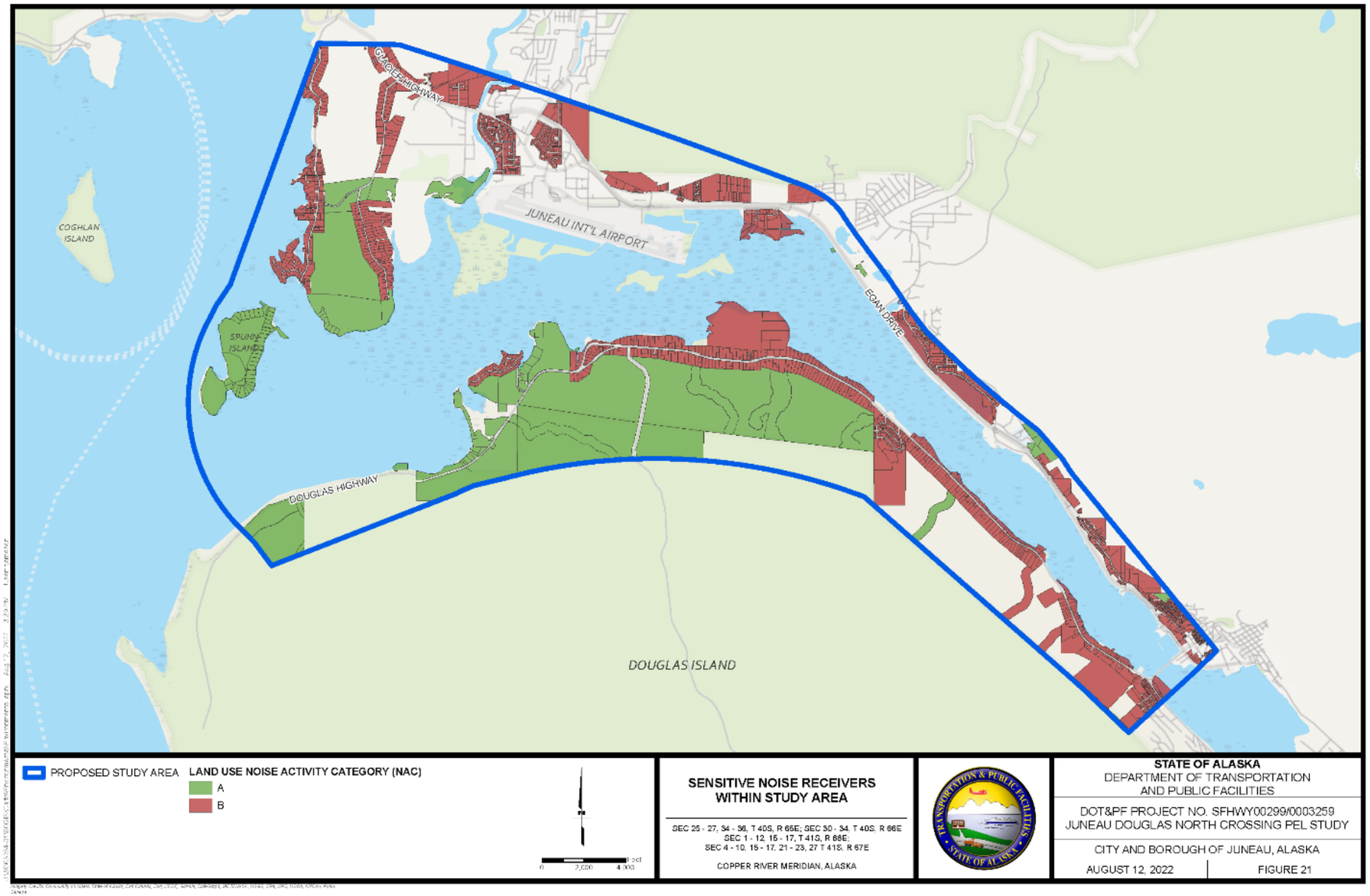
Figure 23: Sensitive Noise Receivers within Study Area



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2.3.4 Air Quality and Climate Change

2.3.4.1 Regulatory Framework

Transportation conformity is required by the Clean Air Act (CAA) (42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with air quality goals established by a state air quality implementation plan. Conformity means that transportation activities will not cause or contribute to new violations of air quality standards or delay the attainment of national ambient air quality standards. NEPA guidelines issued by the U.S. Department of Transportation (USDOT) outline federal requirements for air quality analyses for transportation projects. Where applicable, other requirements derive from the federal transportation conformity rule (40 CFR Parts 50 and 93). NEPA guidance for air quality analyses for transportation projects is found on the FHWA Office of Planning, Environment, and Realty website[11].

Per the CAA, National Ambient Air Quality Standards (NAAQS) have been established for six criteria pollutants by the EPA and communities that do not meet NAAQS are listed as "non-attainment areas." States are required to develop a plan to control source emissions and ensure future attainment of NAAQS. Additionally, greenhouse gas emissions such as carbon dioxide (CO_2), are primary drivers of global climate change. The threshold for considering greenhouse gas emissions is set at 25,000 metric tons[12] (Save Strawberry Canyon v. U.S. Department of Energy, District Court for the Northern District of California, November 14, 2011).

2.3.4.2 Existing Conditions

Juneau has been designated as an area where the region meets the NAAQS for each pollutant or there are insufficient data to make a determination. In 1991, the Mendenhall Valley area was identified as a moderate nonattainment area for the NAAQS particulate matter 10 standard based on violations in the 1980s. In 2013, the EPA approved the first 10-year Limited Maintenance Plan (LMP) and concurrently re-designated the area to attainment for the PM10 NAAQS, effective July 8, 2013 (Federal register 78 FR 27071: May 9, 2013). Mendenhall Valley currently meets and will continue to meet the 1987 NAAQS for PM10 through 2033. EPA approved the second 10-year LMP, effective November 25, 2021 (Federal Register 86 FR 58807: October 25, 2021).

According to a 2007 report by the CBJ on climate change (Kelly et. al., 2007) temperatures in Juneau have increased as much as 3.6˚F during the 20th century, with the largest increase occurring during the winter months. Rates of warming appear to be increasing over time. Climate models predict that CBJ will see overall warmer and wetter weather, particularly in Fall and Winter. The Juneau Icefield is expected to continue to

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[11] https://www.fhwa.dot.gov/environment/air_quality/

[12] 25,000 metric tons of CO_2 is equivalent to 57,880 barrels of oil consumed, or 5,387 gas powered passenger vehicles driven for one year.

retreat over time. Sea level is rising as a result of the melting of glaciers and ice sheets and the warming of ocean waters. However, the land surface in CBJ is also rising as a result of the loss of glacial ice (isostatic rebound). The rate of isostatic rebound is expected to exceed the rate of the rising sea level. According to 2007 climate change report, the relative sea level in the CBJ likely will decrease between 1.0 and 3.6 feet.

2.3.5 Visual Effects

2.3.5.1 Regulatory Framework

FHWA's Guidelines for Visual Impact Assessment (January 2015) respond to NEPA, and other federal requirements outlined in subsequent transportation funding authorization bills, several Presidential Executive Orders related to the visual character of federal lands and projects, and FHWA programs and initiatives such as Context Sensitive Solutions, and Complete Streets.

2.3.5.2 Existing Conditions

An Area of Visual Effect would be determined once a preferred alternative is selected. Visual resources vary widely throughout the study area. Important visual resources that the CBJ is regarded for include Mendenhall Glacier, steep mountainous terrain, and abundant rainforest. Localized visual resources and potential impacts will be evaluated in future projects as impacts are best characterized in relation to the specific project under consideration.

2.3.6 Utilities

2.3.6.1 Regulatory Framework

The study area contains multiple public and private entities which route telecommunications, water, wastewater, and electrical services. Identifying utilities and their locations are important to avoid costly conflicts where possible, and to minimize potential encroachment and right-of-way acquisition for utility relocations.

2.3.6.2 Existing Conditions

Electrical transmission lines are present along Douglas Highway south of Bonnie Doon Drive, Glacier Highway between Egan Drive and Vanderbilt Road, Glacier Highway between the former Wal-Mart site and Fred Meyer, along Fritz Cove Road, and along Engineer's Cutoff Road (Figure 24). There are 249 light poles in the study area. Of these, 118 (47 percent) are in downtown Juneau, 68 (27 percent) are in Mendenhall Valley between Juneau International Airport and Egan Drive, 17 (seven percent) are on Douglas Island near the Douglas Island bridge, 14 (six percent) are in the Bayview Subdivision on Douglas Island, and 13 (five percent) are near Bartlett Regional Hospital.

Although mapping data was unavailable, CBJ has a water network consisting of 180 miles of pipes, six reservoirs and three contact tanks, nine pump stations, 37 pressure reducing valves, 1,450 fire hydrants, and 9,705 water connections. Water distribution lines convey roughly 1.2 billion gallons of drinking water annually from one of the two water sources (Last Chance Basin or Salmon Creek Water Filtration Plant).

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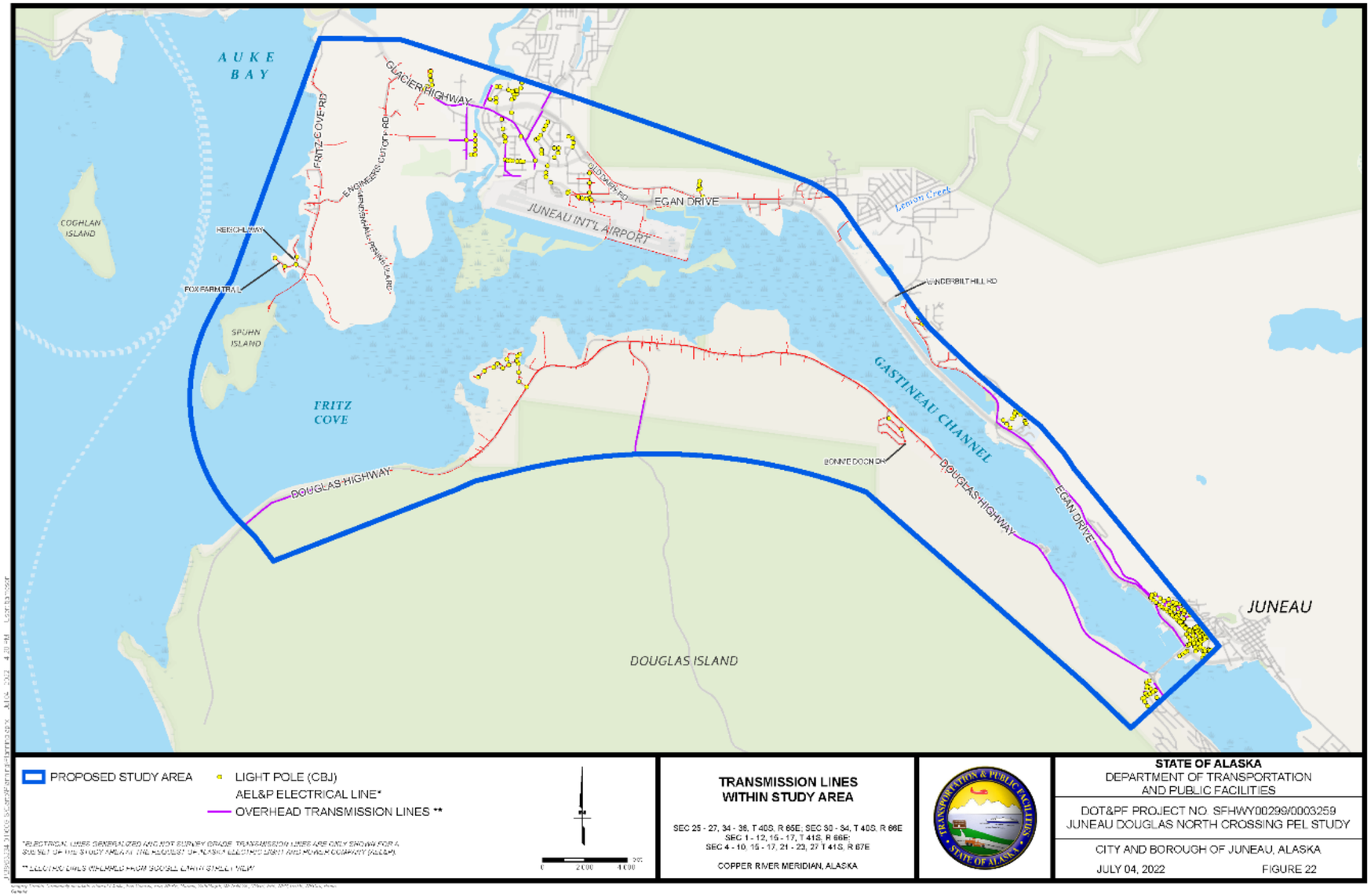
Figure 24: Transmission Lines within Study Area



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