ENVIRONMENTAL ASSESSMENT

Tanana River Recreation Access Improvements Project

AK FNSB TANANA(1) Tanana River Recreation Access Improvements
June 2021

Submitted Pursuant to Public Law 91-190
National Environmental Policy Act

Prepared by
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

In Partnership with
Fairbanks North Star Borough Parks & Recreation

Digitally signed by
DANIEL D DONOVAN
Date: 2021.06.23
14:30:00 -07'00'

06/23/2021

Date Approved

Dan Donovan, Chief of
Business Operations

The following person may be contacted for additional information:

Stephen Morrow, Environmental Specialist
Western Federal Lands Highway Division
Federal Highway Administration
Mailing address: 610 East Fifth Street
Vancouver, Washington 98661-3801
Email: stephen.morrow@dot.gov

U.S. Department
of Transportation

Federal Highway Administration

June 2021

AK FNSB TANANA(1)

Tanana River Recreation Access Improvements

Environmental Assessment

Prepared by
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

In Partnership with
Fairbanks North Star Borough Parks & Recreation

The following person may be contacted for additional information:

Stephen Morrow, Environmental Specialist
Western Federal Lands Highway Division
Federal Highway Administration
Mailing address: 610 East Fifth Street
Vancouver, Washington 98661-3801
Email: stephen.morrow@dot.gov

U.S. Department of Transportation
Federal Highway Administration

Executive Summary

The National Environmental Policy Act of 1969 (NEPA) requires that all projects carried out by a federal agency or which involve federal funding, require a federal permit, or occur on federal land must consider the effects of their actions on the quality of the human environment. Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) has prepared this environmental assessment as the lead agency in accordance with NEPA for the Tanana River Recreation Access (TRRA) Improvements Project. This EA discloses the environmental consequences of the Proposed Action (Preferred Alternative) and a No Action (No Build) Alternative, and provides sufficient evidence to determine whether an environmental impact statement (EIS) will be prepared or whether a finding of "no significant impact" is appropriate.

The Fairbanks North Star Borough (FNSB) proposes to construct new and improved transportation elements linking the City of Fairbanks and the FNSB to the Tanana Lakes Recreation Area (TLRA) and the TLRA to federally-managed lands along the Tanana River. In addition to transportation elements, the FNSB proposes to bring electricity to the TLRA via overhead power line. The TRRA project is funded through the Alaska Federal Lands Access Program (AFLAP), the Fairbanks Area Surface Transportation (FAST) Planning, Alaska Congestion Mitigation and Air Quality (CMAQ) Program, and the FNSB.

The project is located 10 minutes south of downtown Fairbanks, 14 miles northwest of the City of the North Pole, and 3 miles southwest of the U.S. Department of Army's Fort Wainwright main gate. The TLRA, a 980-acre park, is a multi-use recreation area used year-round and serves as a gateway to the Alaskan wilderness. The purpose of this project is to complete the road infrastructure and associated transportation improvements to facilitate public access to the TLRA and to Federal, State and Native Alaskan lands within the Tanana and Yukon River watersheds.

The need for this project is illustrated by increasing public use of the TLRA amenities. The TLRA was constructed for a visitation level assumed to exceed 100,000 visitors upon the completion of the TLRA (FNSB 2007). However, visitation continues to far exceed this assumption with 198,468 visitors in 2017 to 207,954 users in 2018 (AFLAP 2019). It is likely that visitation would continue to increase as the TLRA amenities are fully developed with new uses attracting a wider range of visitors. The proposed project would resolve indirect access roads, lack of Americans with Disabilities Act (ADA)-compliant amenities, poor road surfaces, lack of road visibility, and a central entrance station that all contribute to inefficient access to the TLRA amenities.

Planning for the development of the TLRA as a recreation area was codified in the 2007 TLRA Master Plan. The TLRA Master Plan presented a conceptual design for the TLRA that was developed with public and agency input through a scoping process. The Preferred Alternative was developed consistent with the TLRA Master Plan (2007). The "No Build" alternative discusses the existing conditions, foreseeable conditions should the project not be approved, and effects of not implementing the proposed project and serves as the baseline for comparing the environmental impacts. The alternatives analyzed in this EA include the No Build Alternative and the Preferred Alternative. The project footprint is approximately 18.5 acres.

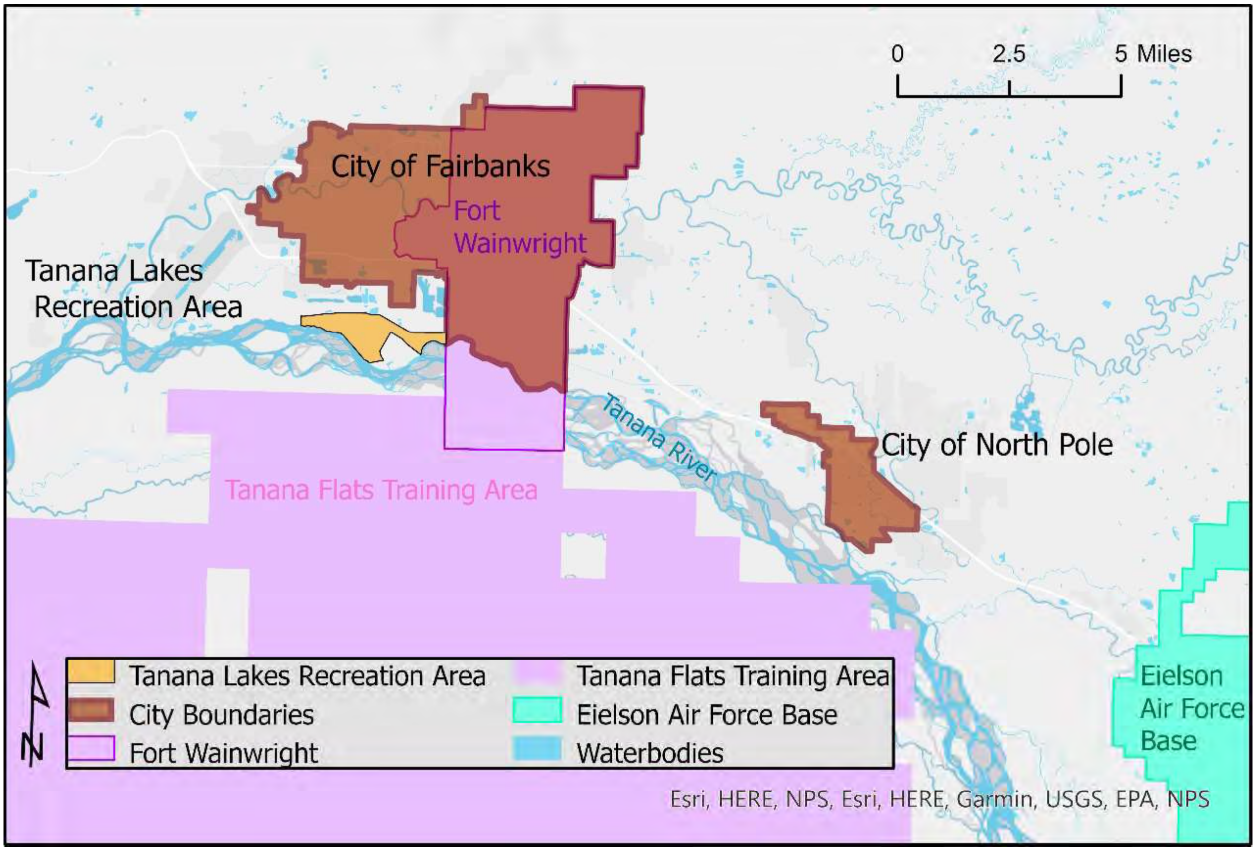


Figure ES-1 – Overview of TRRA Improvements Project region and federal lands

Table ES-1 – Summary of Impacts by Alternatives

Resource	No Build Alternative	Preferred Alternative
Transportation	**Temporary Construction Effects** • None **Direct and Indirect Effects** • Poor road surfaces, limited visibility and inefficient routing will continue to pose undue costs and not improve safety risks. • Unimproved roads within the TLRA would continue to deteriorate, resulting in increased maintenance and eventual replacement. • TLRA visitors would continue to increase, thereby adding to the capacity limit stressors of the existing transportation facilities.	**Temporary Construction Effects** There would be minor adverse impacts to transportation including: • Temporary delays and possible rerouting to traffic, businesses and TLRA users during construction. • Temporary closures or reduced capacity of park facilities. However, these impacts would be insignificant with the implementation of mitigation measures including advance notice of construction schedule, and rerouting, and because any potential delays would be temporary. **Direct and Indirect Effects** There would be beneficial impacts to transportation including: • Access to the TLRA would be improved and a more direct route to popular facilities would be provided. • New stop signs would improve safety at the railroad crossing and within the TLRA. • Speed and traffic volumes result in no significant impacts to safety performance with new intersections. • Provide safer access for users, eliminate visibility issues with clear line of sight, and provide improved, controlled access, and security, thus reducing illegal activities. • Rebuild the Alaska Railroad Corporation (ARRC) road-crossing to provide a safer crossing. • Addition of three stop signs at the intersection of South Lathrop Street and Sanduri/Pomm Avenues would provide safer roadway conditions at the railroad crossing.

Resource	No Build Alternative	Preferred Alternative
		• Decreases in the travel time and vehicle miles within the TLRA and access routes. • New trails, expanded parking areas, new wider roads, and non-motorized routes in the park would encourage multi-modal use and provide ample room for balancing bicyclist and pedestrian safety with vehicle access. • Minimizes the use of the levee system by off road vehicles and trucks. • The future entrance station provides an important interface with users and provide information about access to other recreation lands. • New roads designed to increase long-term reliability and accommodate the existing and future traffic capacity. • Reduces the annual maintenance obligations for FNSB.
Land Use and Utilities	**Temporary Construction Effects** • None **Direct and Indirect Effects** • Land use designations would remain unchanged. • TLRA lots would continue to convert to Outdoor Recreation upon cessation of gravel extraction leases. • Would not be consistent with existing land use plans such as the TLRA Master Plan.	**Temporary Construction Effects** There would be minor adverse impacts to land use including: • Potential temporary delays to traffic and access to businesses. However, these impacts would be insignificant because: • Traffic would be accommodated through the work zone or alternate detours would be used around the work zone, which may result in delays of less than 10 minutes for users accessing local businesses and the TLRA. **Direct and Indirect Effects** There would be minor adverse impacts to land use resulting from:

Resource	No Build Alternative	Preferred Alternative
		• Of the 18.5-acre project footprint, approximately 8 acres of undeveloped land would be converted to transportation use and utilities. These 8 acres represent approximately 0.7 percent of the remaining undeveloped land of the TLRA. • Potential for a small slope easement at the northwest corner of the intersection of the levee and South Lathrop Street within a privately-owned lot. • Bringing a source of electricity to the TLRA would benefit users and management of the TLRA. However, these impacts would be insignificant to Land Use and Utilities with implementation of mitigation measures. There are also permanent beneficial impacts including: • Providing a more direct route to the TLRA and connection with south Fairbanks. • Providing electrical utilities to TLRA consistent with the 2007 TLRA Master Plan.
Recreation	**Temporary Construction Effects** • None **Direct and Indirect Effects.** This would result in a significant impact because: • Access to the TLRA and federally managed lands would remain difficult for all members of the public. • TLRA would remain out of compliance with the ADA. • Not fulfilling the TLRA Master Plan.	**Temporary Construction Effects** There would be minor adverse impacts to recreation including: • Temporary closures that would affect users. However, this impact would be insignificant because: • Traffic would be accommodated through the work zone or alternate routes/detours would be established around the work zone, which may result in delays of less than 10 minutes for users accessing the TLRA. **Direct and Indirect Effects** There would be beneficial impacts to recreation including:

Resource	No Build Alternative	Preferred Alternative
		• Improving access to the TLRA and other recreation lands by providing new and improved entrance and road network. • Providing new ADA-compliant facilities and trails would improve access to wider user pool and meet ADA requirements. • Bringing electricity to power headbolt heaters benefits recreationists, especially during winter months. • Fulfilling the TLRA Master Plan results in a net benefit to a Section 4(f) property under the Transportation Act of 1966.
Water Resources/ Water Quality/ Floodplains	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** There could be minor adverse impacts to water resources, water quality, and floodplains including: • Soil disturbance, runoff, and spills could impact surface water quality, increase turbidity, reduce infiltration capacity, and increase surface runoff. • Temporary effects to the structure of the TFCL may occur during construction; however, the TFCL would maintain its function and physical capacity to hold back flood flows. • The alteration of the levee during construction would not affect the existing access, the operations, maintenance, and flood control capability of the local operator (FNSB). However, with the implementation of best management practices and compliance with all permit mitigation measures, these impacts would be reduced to insignificant and no adverse effect to the functionality of the levee during construction.

Resource	No Build Alternative	Preferred Alternative
		Direct and Indirect Effects There may be minor impacts to water resources, water quality, and floodplains including: • Potential future degradation of aquatic resources from vehicle pollutants and increases in impervious surfaces, erosion, sediment deposition, and storm water runoff. • Vegetation clearing and filling of the floodplain for the roads and overhead power line construction. • PCPs from treated poles have the potential to impact water resources and water quality. However, these impacts would be insignificant with the implementation of storm water best management practices, such as treating runoff using vegetated strips for infiltration and reducing impacts to floodplains during the design phase. The minimal impacts to the floodplain during the design phase would be documented and quantified through the No Net Rise analysis and certification. In addition, most new roads would be paved thus reducing the source of sediments. Impacts from PCPs would be reduced by treating wood offsite or not near waterways or wetlands and not cutting, drilling, sanding, or other measures onsite that will cause treated wood sawdust or coating to sluff off into waterways or wetlands. Beneficial impacts include: • Maintaining current drainage patterns.
Wetlands and Non-wetland Waters	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** There would be minor impacts to wetlands and non-wetland waters, including: • Could introduce increased sediment to wetlands and waters from construction and clearing activities.

Resource	No Build Alternative	Preferred Alternative
		• Could increase temporarily the turbidity of non-wetland waters, such as streams. • May require stream diversion during culvert installation to maintain water flows. However, these impacts would be insignificant with the implementation of best management practices and mitigation measures. **Direct and Indirect Effects** There would be minor permanent impacts to wetland and non-wetland waters including: • Loss of approximately 3 acres of wetlands and waters within study area out of approximately 650 acres of wetlands and waters in the TLRA. This is less than 0.5 percent of the wetlands and waters of the TLRA. • Loss of wetlands and waters would be avoided during design process to minimize impacts to the extent practicable (e.g., shifting road alignments and utility pole placement). • Introduction of nonnative species and pollutants to wetlands and vegetation communities adjacent to the new infrastructure. • Roads and trails would bisect wetlands and streams potentially resulting in wetland function disruptions and degradation of habitat. • Impoundment of waters would be avoided through design and maintaining existing drainage patterns. • PCPs from treated poles have the potential to impact water resources and water quality.

Resource	No Build Alternative	Preferred Alternative
		However, these impacts would be reduced to insignificant through the implementation of mitigation measures and compliance with all permits, including Clean Water Act Section 404 and providing compensatory mitigation for loss of wetlands and waters of the U.S. Impacts from PCPs would be avoided by treating wood offsite or not near waterways or wetlands and not cutting, drilling, sanding, or other measures onsite that will cause treated wood sawdust or coating to sluff off into waterways or wetlands. Poles will not be sited in wetlands and waters outside of the new project embankments.
Vegetation and Wildlife	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** There would be adverse impacts to vegetation and wildlife, including: • Temporary, localized disruption to local wildlife (including special status avian species) due to construction noise and vegetation clearing. • Construction activities potentially would remove or disturb nesting habitat for native birds (resulting in nest abandonment) if clearing and grading activities occur during the breeding season. However, these impacts could be reduced to insignificant through mitigation measures such as completing clearing and grubbing of vegetation outside of the bird breeding season and implementing mitigation measures such as restoring disturbed areas. **Direct and Indirect Effects** There may be permanent adverse impacts to vegetation and wildlife including:

Resource	No Build Alternative	Preferred Alternative
		• Loss of approximately 8 acres of undeveloped land resulting in permanent loss of habitat used by wildlife. This is a small area (approximately 0.7 percent) of undeveloped land remaining in the TLRA and the abundant undeveloped habitat in the 1,000s of acres surrounding the TLRA. • Avian mortality from nest abandonment during vegetation clearing, vehicle or structure collisions and contaminants. • Avian injury or mortality due to collisions with overhead power lines and infrastructure. • Injury or mortality from electrocution due to contact with overhead power lines. Bald eagles and other large birds have a higher risk of electrocution. • Changes in activity patterns and increased energy expenditures due to human disturbance. • Increase mortality by attracting more predators to new areas. Utility poles provide perching areas for avian predators. • Increase mortality from hunting by providing improved access to the TLRA and TFTA. • Potential for non-native plant and invasive weed introduction or dispersal from recreational users. • PCPs from treated poles have the potential to impact fish and wildlife habitat.

Resource	No Build Alternative	Preferred Alternative
		However, these impacts would be reduced to insignificant with the implementation of mitigation measures including; minimizing clearing and grubbing areas to previously disturbed areas, working outside of the breeding bird season, delineating work areas, and implementing all permit compliance requirements. Collision and electrocution would be reduced to insignificant with implementation of Avian Power Line Interaction Committee (APLIC) guidelines. Impacts from PCPs would be avoided by treating wood offsite or not near waterways or wetlands and not cutting, drilling, sanding, or other measures onsite that will cause treated wood sawdust or coating to sluff off into waterways or wetlands. Poles will not be sited in wetlands or waters outside of the new project embankments.
Social and Economic Changes	**Temporary Construction Effects** • None **Direct and Indirect Effects** • Would not improve access to the community.	**Temporary Construction Effects** There would be minor impacts to social and economic resources including: • Adjacent businesses and park visitors may experience brief traffic delays. • Short-term construction-related employment would be provided that could result in an economic boost to residents of the community. **Direct and Indirect Effects** There would be beneficial impacts to social, economic resources including: • Would support the community's economic goals by providing better access for hunting, fishing, and other recreation activities that would in turn increase spending on recreational goods and services. Local business would benefit with entrance located closer to businesses.

Resource	No Build Alternative	Preferred Alternative
		• Providing a more direct and accommodating route from the community and within the TLRA, as well as amenities like clean and secure restrooms, and ADA-accessible pathways and parking. • Reduces the illegal activities and dumping in the TLRA.
Soils and Geology	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** There would be minor impacts to soils and geology including: • Cut and fill slopes, placement of utility poles, retaining walls, and stream crossings through currently undeveloped areas would disturb the existing soils and permafrost layer. • Exposed soils would be subject to erosion. **Direct and Indirect Effects** • Could impact erosion and drainage functions of the surface soils. However, these impacts would be reduced to insignificant with the implementation of mitigation measures including: design and implementation of erosion and sediment control measures, and retaining weed-free native topsoil for future use in restoration.
Cultural Resources	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** • Potential for inadvertent discovery of cultural materials during construction. This impact would be reduced to insignificant with the implementation of work stoppage and immediate initiation of consultation with the Alaska OHA upon discovery.

Resource	No Build Alternative	Preferred Alternative
		Direct and Indirect Effects • None.
Air Quality/Noise/ Energy	**Temporary Construction Effects** • None **Direct and Indirect Effects** • Continue to contribute to fugitive dust conditions.	**Temporary Construction Effects** There would be minor adverse impacts to air quality, noise and energy including: • Would result in temporary adverse effects to air quality, primarily from dust and vehicle emissions during construction. • Noise levels would be higher during construction. • Increased energy consumed by vehicles and equipment used for construction. These would be reduced to insignificant with the implementation of mitigation measures including not idling construction equipment. **Direct and Indirect Effects** There would be no significant adverse impacts to air, noise, or energy because there are no noise receptors and impacts to air quality and energy from an increase in visitors would be offset by a decrease in vehicle miles traveled. • Improved roads, including a paved entrance road, would minimize existing fugitive dust conditions. • Reduction in vehicle miles traveled within and to the TLRA would compensate for any potential air quality impacts from higher user capacity. • Noise levels may increase or be redirected to new areas associated with new roads, new entrance and due to future increases in visitors; however, there are no residential noise receptors in the project vicinity which consists of recreation and industrial land use.

Resource	No Build Alternative	Preferred Alternative
		• Overhead power lines would increase energy expenditures; however, this would be a minor increase (approximately 7.2 kV power line). • Bringing power to the TLRA would benefit the management and use by allowing for headbolt heaters for vehicles and facilitate development of the entrance station. The TRRA Improvements Project will not create any new violations, or increase the severity or number of violations, or delay timely attainment of the national ambient air quality standards. FHWA finds that the TRRA Improvements Project conforms with the State Implementation Plan (SIP) in accordance with 40 CFR 93.
Visual Quality	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** • Construction activities would have temporary localized effects to visual quality. **Direct and Indirect Effects** • Small areas, approximately 8 acres of undeveloped land, would be converted to transportation infrastructure. This represents approximately 0.7 percent of the remaining undeveloped areas of the TLRA. • Impacts to visual quality from overhead power lines would be negative because there are no power lines or poles in the TLRA currently.

Resource	No Build Alternative	Preferred Alternative
		There would be no significant adverse impacts to visual quality because native habitats including trees are on both sides of the expanded road footprints, and the new and improved roads and power line are not within a scenic viewshed. The power line may impact visual quality negatively, but this would be considered an insignificant impact due to the location of the power line along the roads in a highly modified landscape. Any temporary construction impacts would be short in duration.
Hazardous Materials	**Temporary Construction Effects** • None **Direct and Indirect Effects** • None	**Temporary Construction Effects** • Potential for hazardous materials disturbance or release during construction. **Direct and Indirect Effects** • Potential leaks, drips, and spills from vehicles during operation and maintenance. • Pole-mounted transformers have the potential to leak oil. There would be no significant adverse impacts from hazardous materials with the implementation of best management practices and permit requirements.

This page left blank.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Appendix A – 2007 Tanana Lakes Recreation Area Master Plan
Appendix B – Wetlands Technical Reports
Appendix C – Biological Resources Study Reports and ESA Species Report
Appendix D – Transportation Conformity Meeting Summary
Appendix E – Section 4(f) Net Benefit Programmatic Evaluation
Appendix F – Tribal Coordination Letters

ACRONYMS & ABBREVIATIONS

ADA	Americans With Disabilities Act
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AKDOT&PF	Alaska Department of Transportation & Public Facilities
AFLAP	Alaska Federal Lands Access Program
AHRS	Alaska Heritage Resource Survey
APLIC	Avian Power Line Interaction Committee
ARRC	Alaska Railroad Corporation
APDES	Alaska Pollutant Discharge Elimination System
APE	Area of Potential Effects
ATV	all-terrain vehicle
AWC	Anadromous Waters Catalog
BMP	best management practice
CCA	chromate copper arsenate
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality
DOA	Department of the Army
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAST	Fairbanks Area Surface Transportation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FNSB	Fairbanks North Star Borough
GVEA	Golden Valley Electric Association
H	horizontal
HUC	Hydrologic Unit Code
INRMP	Integrated Natural Resource Management Plan
kV	kilovolt
kVA	kilovolt amperes
LWCF	Land and Water Conservation Fund
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OHA	Office of History and Archaeology

ORV	off-road vehicles
PCP	pentachlorophenol
PM	particulate matter
RMZ	Riparian Management Zone
ROW	right-of-way
RTP	Regional Transportation Plan
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SRB&A	Stephen R Braund and Associates
SWPPP	Storm Water Pollution Prevention Plan
TFCL	Tanana Flood Control Levee
TFTA	Tanana Flats Training Area
TIP	Transportation Improvement Program
TLRA	Tanana Lakes Recreation Area
TRRA	Tanana River Recreation Area
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
V	vertical
WFLHD	Western Federal Lands Highway Division

1 Purpose of and Need for Action

1.1 Introduction

The Fairbanks North Star Borough (FNSB) proposes to construct new and improved transportation elements linking the City of Fairbanks and FNSB to the Tanana Lakes Recreation Area (TLRA) and the TLRA to federally-managed lands along the Tanana River. The Federal Highway Administration (FHWA), as the lead agency, is intending to complete the design and National Environmental Policy Act (NEPA) documentation for the Tanana River Recreation Access (TRRA) Improvements Project. Cooperating agencies include the U.S. Army Corps of Engineers (USACE), Alaska Railroad Corporation (ARRC), Alaska Department of Environmental Conservation (ADEC), Alaska Department of Fish and Game (ADF&G), and Alaska Department of Natural Resources (ADNR).

The TRRA Improvements Project is within TLRA, a multi-use recreation area used all year round as a gateway to the Alaskan wilderness. This proposed project will address an existing transportation gap that currently prohibits Americans With Disabilities Act (ADA) access and multimodal transportation to the Tanana River. The project is located 10 minutes south of downtown Fairbanks, 14 miles northwest of the City of the North Pole, and 3 miles southwest of the Army's Fort Wainwright main gate. The Army's Tanana Flats Training Area (TFTA) is the nearest federal land, located across the Tanana River from the TLRA. The project is within Sections 21, 22, 27, and 28, Township 1 South, Range 1 West, Fairbanks Meridian.

The TRRA Improvements Project is funded through the Alaska Federal Lands Access Program (AFLAP), the Fairbanks Area Surface Transportation (FAST) Planning, and the Alaska Congestion Mitigation and Air Quality (CMAQ) Program. The FNSB submitted two AFLAP applications for funding improvements for the TLRA (Phase I and Phase II), as the TLRA provides public access to federally managed lands of the TFTA. Hereafter, Phase I and Phase II are collectively referred to as the TRRA Improvements Project.

The TLRA is located on the south (river) side of the Tanana Flood Control Levee (TFCL) in south Fairbanks (Figure 1-1). The recreation area has been established around Cushman Lake, which was formed by the impounded waters of an active slough of the Tanana River. The Goose Island Causeway (a groin extension of South Cushman Street (St.)) and Groin 9 (an extension of Cinch St.) were constructed to create the freshwater Cushman Lake, which is suitable for recreation activities and habitat conservation. Groin 9 also protects the motorized boat launch area. The area was cleaned up and developed after 2012 to include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch that connects with the active channel of the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake (FNSB 2007). Much of the area to the south of the TLRA and outside of the City of Fairbanks and other cities remains intact habitat.

1.2 Purpose and Need Statement

1.2.1 Purpose

The purpose of this project is to implement road infrastructure, multi-modal access, and site improvements identified in the 2007 TLRA Master Plan linking the City of Fairbanks and the FNSB to the TLRA and to federally-managed lands along the Tanana River. The TLRA, managed by the FNSB, serves as the gateway to the Tanana River and federal lands via boats in summer and via snow machines, snow bikes, dog sleds, and skis in winter. The proposed improvements would facilitate public access to the TFTA across the river, as well as other federal, State and Native Alaskan lands within the Tanana and Yukon

River watersheds. The proposed action fulfills recommendations of the 2007 TLRA Master Plan (Appendix A).

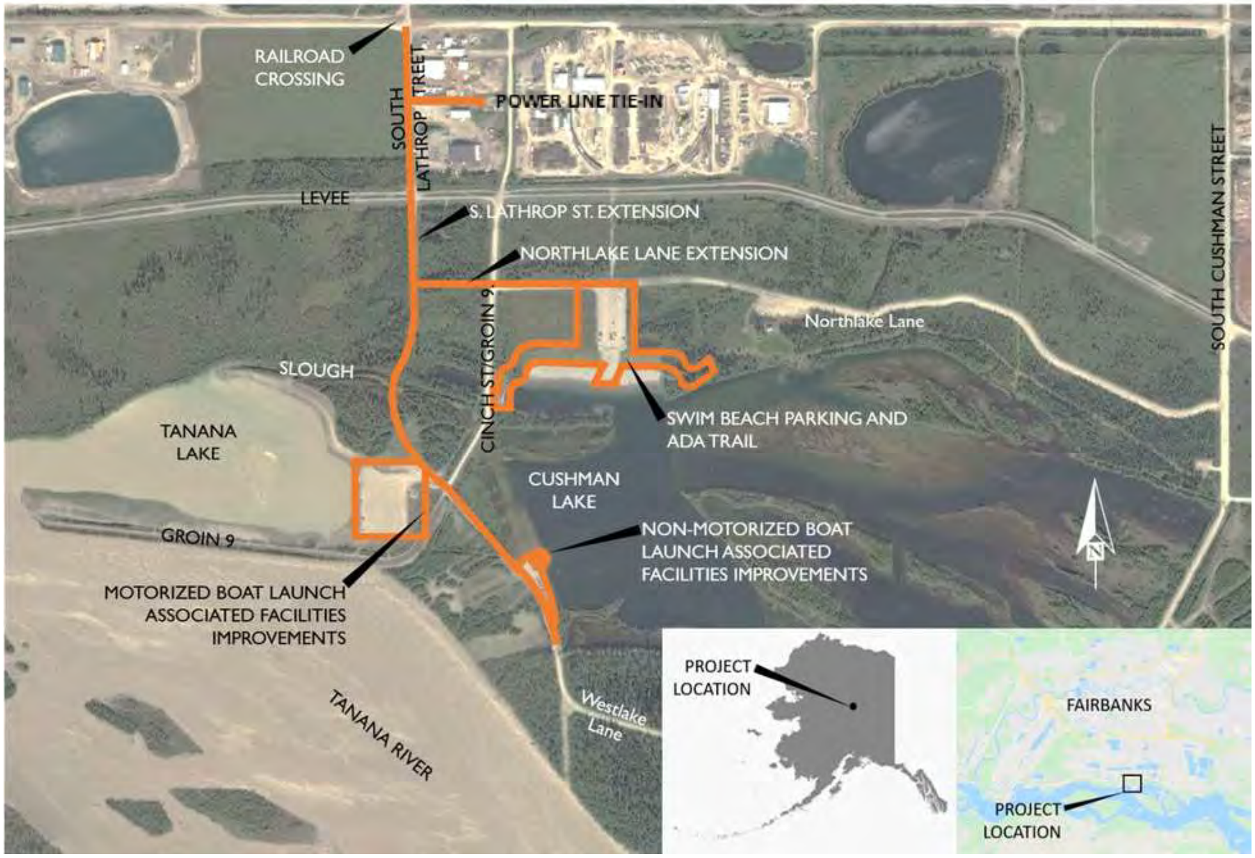


Figure 1-1 – Overview of the TRRA Improvements Project region

1.2.2 Need

The need for this project is illustrated by the increasing public use of the TLRA amenities. Initially the TLRA was constructed for a visitation level assumed to exceed 100,000 visitors annually upon the completion of the TLRA (FNSB 2007). However, visitation continues to far exceed this assumption with 198,468 users in 2017 to 207,954 users in 2018 (AFLAP 2019). It is likely that visitation would continue to increase as the TLRA amenities are fully developed with new uses attracting wider range of visitors. The proposed project would resolve the existing indirect access, lack of amenities, poor road surfaces, and lack of visibility that all contribute to inefficient and unsafe access to the TLRA facilities. Specifically, it would complete a new, shorter, safer, and more functional route via South Lathrop St., a new entrance station area, a Northlake Lane connection to South Lathrop St., new restrooms, expand the parking lot at the swim beach, provide ADA compliance and electrical services. Implementation also is needed to fulfill the public's needs and recommendations of the Master Plan. The specific needs addressed by the TRRA Improvements Project are described below.

1. *The existing single access route is constructed of poor, loose gravel surface that is costly to maintain.* The 2007 TLRA Master Plan only anticipated approximately half of the current volume of vehicle traffic on Northlake Lane and South Cushman Street. The existing roads were not constructed to accommodate the high use as exhibited by the development of unhardened, rutted, and dusty gravel surface. As a result, the existing roads require blading for pot holes up to three times each summer.

In addition, a skid steer and loader with new road materials are used about once a month to fill potholes at intersections and up to two calcium chloride applications for dust control are completed each spring.

2. *The route and conditions lead to an unsafe travel environment.* The pedestrian and bicycle traffic, overflow parking, poor visibility from dust and blind turns, and concerns of vehicles exceeding speed limits on Northlake Lane are significant safety hazards.
3. *The route to the TLRA boat launch is inefficient, costing the traveler and community in travel time and vehicle miles.* To reach the swim beach, boat launch and Tanana River, traffic routed from S. Cushman St. entrance requires an indirect route 1.75 miles west and south on loose gravel of Northlake Lane. Total travel distance is even farther out of the way for visitors traveling from the west side of Fairbanks.
4. *The Tanana River and Federal Lands along it are difficult to access.* The glacially-fed Tanana River water is opaque with silt, cold, fast moving, and complex with ever-evolving braided channels. These qualities make the river more challenging, unpredictable, and ultimately dangerous for launching boats. Currently, there is one underdeveloped sheltered boat launch in Tanana Lake that allows for a safer transition into the Tanana River.
5. *An existing at-grade road/rail crossing has fallen into disrepair and requires repair.* The rail crossing intersects both roads and travels in an east-west orientation parallel to Sanduri Avenue. There is currently no stop sign, lighted signal, or crossing arms to slow, alert, and stop a driver when a train is crossing. The line of sight at the crossing is also limited, making it difficult to see a crossing train.
6. *The TLRA lacks a centralized, controlled main entrance, site security and user information.* The existing route from the TLRA main entrance is about a mile farther east from the park amenities than the South Lathrop Street entry. Northlake Lane is surfaced with loose gravel. The TLRA lacks electricity to maintain an entrance station. There are concerns from visitors that vehicles often speed.
7. *Parking lots do not meet current and future growth demands.* The parking lot for the swim beach, one of the most popular attractions in the park, is too small to accommodate the large numbers of users. This lot often fills to capacity with overflow parking lining the sides of Northlake Lane, forcing users to walk in the road with vehicle traffic.
8. *Lack of ADA compliant parking and access to amenities.* The swim beach and boat launch parking lots do not provide parking or access to the amenities that meet current ADA regulations.
9. *The TLRA lacks secure, clean, and ADA-accessible restrooms.* The busiest facilities in the park - the swim beach and the non-motorized boat launch - do not have restrooms. Portable, chemical toilets are provided in the swim beach parking lot during summer. The non-motorized boat launch becomes extremely busy during the winter when it serves as a base for skiing, skating, and ice fishing.

1.3 NEPA COMPLIANCE

This environmental assessment (EA) was prepared by FHWA as the Federal lead agency in compliance with its regulations implementing NEPA, 23 CFR Part 771, which supplement the NEPA regulations of the Council on Environmental Quality, 40 CFR Parts 1500-1508. The decision to prepare an EA was made in April 2020 and development of the EA was initiated in May 2020.

This EA describes the project's purpose and need and evaluates the No Build Alternative and the Preferred Alternative. The impacts of these alternatives are analyzed in the context of the existing environmental conditions and measures proposed to avoid, minimize, or mitigate potential impacts. The EA also documents the agencies, tribes, and persons consulted during this process.

1.3.1 Scoping Process

The scoping process is an early, open, and continuous process during the preparation of the EA for the purpose of determining the range of issues that will be addressed in the EA and for identifying the significant issues related to the proposed action (23 CFR § 771.111). Please refer to Section 4 Consultation and Coordination for more information.

1.3.2 Agency Coordination

FHWA coordinated with the USACE, National Marine Fisheries Service (NMFS), ADNR, ADF&G, Transportation Interagency Group, and Alaska State Historic Preservation Office (SHPO).

2 Proposed Action and Alternatives

This chapter provides a description of the alternatives being considered, the No Build Alternative and the Preferred Alternative.

The No Build Alternative discusses the existing conditions, foreseeable conditions should the project not be approved, and effects of not implementing the proposed project. It serves as the baseline for comparing the environmental impacts of the Preferred Alternative. In addition, this chapter describes the development process conducted to identify the Preferred Alternative.

The Preferred Alternative is consistent with the TLRA Master Plan (2007) which was developed with significant public involvement. The TLRA Master Plan process presented a conceptual design for the TLRA that was developed with public and agency input through a scoping process. The scoping process included distribution of an agency scoping letter, a public meeting, and an online questionnaire to solicit agency and public comments. A Draft Master Plan was completed and distributed to the public in February 2007. The Final Master Plan considered all input received from the public and agencies. The TLRA Master Plan does not discuss additional alternatives.

2.1 NO BUILD ALTERNATIVE

Under the No Build Alternative, the proposed project would not be built and the existing access conditions such as indirect routing, poor road surfaces, speeding, and limited visibility that all contribute to inefficient, deteriorating, and unsafe transportation conditions would continue. In addition, no ADA-compliant facilities would be built, thereby limiting user access. The No Build Alternative is not consistent with the TLRA Master Plan (FNSB 2007).

Although some recent development of the TLRA has improved access to the Tanana River and the TFTA by providing roads, management, and facilities for recreational access, the current transportation network used to enter the recreation area continues to limit access to the TLRA. Access limitations are exemplified by indirect routing, poor road surfaces, speeding, limited visibility, and lack of ADA-compliant facilities that all contribute to inefficient and unsafe access to and within the TLRA and other resources beyond.

The No Build Alternative would not meet the purpose and need of the proposed project because the existing conditions would remain and worsen over time, access would continue to be limited to the TLRA and TFTA, would continue to exclude ADA-dependent recreational users, and would be inconsistent with the TLRA Master Plan.

2.2 PREFERRED ALTERNATIVE

The TLRA was developed after 2012 to include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch that connects with the active channel of the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake (FNSB 2007). The purpose of the project is to provide improved public access for recreational users to the TLRA, TFTA, and other Federal, State and Tribal lands within the Tanana and Yukon River watersheds. To meet the goals of the proposed project and the TLRA Master Plan, the project would complete the following:

- Establish a new entrance point to mitigate the existing speeding, safety, and dust issues associated with the existing Northlake Lane entrance.
- Construct roadways and other improvements to provide access to the motorized and non-motorized boat launches within the TLRA that serve as the primary access points to reach the TFTA.
- Connect the swim beach to the extension of South Lathrop Street that will provide access to all TLRA facilities from the new entrance point on South Lathrop Street.
- Install ADA-compliant facilities to provide access to a wider group of recreation users.
- Install outlets for vehicle headbolt heaters at the boat launch parking areas.

2.2.1 Project Description

The project components are presented below and depicted in Figure 3-4. The project comprises the extension of South Lathrop Street and Northlake Lane, an area for the future placement of an entrance station, parking improvements, restrooms, accessibility improvements, road surface paving and gravel improvements, and overhead power line installation. The project footprint is approximately 18.5 acres.

2.2.1.1 South Lathrop Street, Extension to Levee

The project will begin at the intersection of South Lathrop Street and Sanduri Avenue where an existing road/rail crossing intersects both roads and travels in an east-west orientation parallel to Sanduri Ave. The project will replace the current intersection/crossing (Figure 2-1) with an ARRC-approved road/rail at-grade crossing. The crossing will include all traffic control devices and signage as required to provide a functional, safer, road/rail at-grade crossing including signage for a 3-way stop intersection south of the crossing that would require northbound traffic to stop prior to the crossing and east and westbound traffic on Sanduri or Pomm Ave to stop prior to the crossing. The crossing will require minor grading and resurfacing extending 50 feet north of the crossing to tie the project into the existing South Lathrop Street. A new road prism will be constructed within the designated section line easement for South Lathrop Street for approximately 1,200 feet continuing due south. The roadway will be surfaced with asphalt concrete pavement. The roadway dimensions will include a 22-foot-wide driving surface with 5-foot shoulders. The roadway will have a 4Horizontal (H):1Vertical (V) slope within the clear zone and a 2H:1V foreslope that extends from the clear zone to create an embankment with a base width spanning up to 65 feet. A ditch will be constructed on the east side of the road to collect storm water and convey storm water to culverts draining to the west.

The roadway extension will cross the TFCL creating a direct route to the TLRA. The road will cross the levee at the same location a crossing was constructed for access during the construction of the levee. The finished grade of the roadway will be constructed approximately 12 inches above the crest of the levee to ensure there is no change in function of the levee. Within the footprint of the road (approximately 50-feet wide by 25 feet long), the top 24 inches of the levee crest will be excavated and backfilled and compacted with structural gravel to support the roadway. The existing access road that runs along the north side of the levee will be realigned to cross South Lathrop Street adjacent to the crest of the levee. This would provide a single crossing area for users on the crest as well as on the access road. Realignment of the access road will not require excavation of the levee. Warning and stop signs will be installed on the levee and access road either side of the crossing.

2.2.1.2 South Lathrop Street Extension, Levee to Non-Motorized Boat Launch

Figure 2-1 – View of existing railroad crossing at South Lathrop Street and Sanduri Avenue

Continuing south from the levee and leading into the TLRA, approximately 2,700 linear feet of road will be constructed. This section of roadway will be surfaced with asphalt concrete pavement. The roadway dimensions entering the park will include a 22-foot-wide driving surface with 5-foot shoulders constructed at least 2 feet above the modeled 50-year flood elevation of the Tanana River. The roadway will have a 4H:1V slope within the clear zone and a 2H:1V foreslope will extend from the clear zone creating an embankment with a base width spanning up to 110 feet. All slopes will be seeded to establish a permanent grass turf and 24-inch diameter culverts will be installed where the road crosses existing drainage paths to maintain existing water flow patterns. Approximately 1,200 linear feet south of the TFCL, a 48-inch diameter culvert will be placed under the roadway in an east-west orientation allowing water to continue to flow within the slough between Cushman Lake and Tanana Lake. The roadway extension will continue to a 3-way intersection at the TLRA Boat Launch parking area. The intersection will include all traffic-calming and informational and directional signage as required.

The roadway extension will then cross Groin 9 of the TFCL system (also known as Cinch Street). The finished grade of the roadway will be constructed approximately 12 inches above the top of the groin to ensure there is no change in function of the groin to redirect flood waters. Within the footprint of the road (approximately 40 feet wide by 40 feet long), the top 24 inches of the groin crest will be excavated, backfilled, and compacted with structural gravel to support the roadway. Once on the groin, gates will be installed to either side of the road to maintain pedestrian access to the groin, but eliminate non-maintenance vehicle access to the groin at this point.

The roadway extension will continue east along the same alignment as the existing Westlake Lane to the parking area for the Non-Motorized Boat Launch. This final portion of the roadway will use a modified shoulder configuration with 2 feet on the south and 8 feet on the north to closely match the width of the trail system around Cushman Lake.

Pedestrian and bicycle access along both sections of the South Lathrop St. extension will be provided within the roadway shoulders. The pavement will be striped to clearly delineate traffic lanes and shoulder areas.

2.2.1.3 New Entrance Station Area

A widened area in the South Lathrop St. extension south of the levee will be built to accommodate a future entrance station that will provide a gateway for the new, main entrance of the park. An area for a small vehicular turn-around will be provided to the south of the station.

2.2.1.4 Northlake Lane Extension

Approximately 700 linear feet into the TLRA, a 3-way intersection and a 500-linear-foot section of new road will be constructed to the east as access to the existing Northlake Lane. Traffic control measures and informational/directional signage will be implemented at this intersection. This section of roadway will be surfaced with crushed gravel. The roadway in this section will include a 22-foot-wide driving surface with 5-foot shoulders constructed at least 2 feet above the Tanana River 50-year flood elevation except as needed to tie into the existing road network. The roadway will have a 4H:1V slope within the clear zone and a 2H:1V vegetated foreslope will extend from the clear zone creating an embankment with a base width spanning up to 100 feet.

The Northlake Lane extension will cross Groin 9 (Cinch Street) near the intersection where the existing Northlake Lane terminates at the groin. The finished grade of the roadway will be constructed approximately 12 inches above the top of the groin to ensure there is no change in function of the groin to redirect flood waters. Within the footprint of the road (approximately 40 feet wide by 40 feet long), the top 24 inches of the groin crest will be excavated, backfilled, and compacted with structural gravel to support the roadway. Once on the groin, a gate will be installed to the north side of the road to maintain pedestrian access to the groin, but eliminate non-maintenance vehicle access to the groin at this point.

The grade of the existing Northlake Lane will be flattened east of the groin, prior to the tie-in to the existing road to improve sight distance and traffic operations.

Pedestrians and vehicles will continue to share the widened gravel roadway on Northlake Lane.

2.2.1.5 Expand Swim Beach Parking Lot

The existing parking lot (365 feet by 180 feet) will be expanded to 365 feet by 280 feet and will include two double-loaded (stalls on both sides) parking aisles with approximately 120 new parking spaces. Within the existing parking area, an area 170 feet by 25 feet would be graded, paved, and striped to meet ADA standards. Within the paved area, an area measuring 30 feet wide adjoining the paved path to the beach would be reserved for unloading vehicles and as an entry to the swim beach area, provide accessible routes to the new restrooms, and include linkages with the east-west ADA pathway leading to other park facilities.

The 365 feet by 280 feet expanded gravel parking lot will be regraded and a new crushed gravel surface course installed outside of the paved areas for a more compacted, easy-to-maintain surface (Figure 2-2). The embankments will be dressed with topsoil and seeded to provide a vegetated strip for treatment of storm water.

2.2.1.6 New Restroom Installation

Three vault-style restroom buildings will be installed, two at the swim beach parking lot and one at the non-motorized boat launch. The buildings will be constructed using precast concrete, and the restrooms will be ADA compliant. The precast units are designed for long life in extreme climate conditions and are installed at many locations throughout the State.

2.2.1.7 New ADA Pathways

An ADA-compliant asphalt-paved trail will provide the important connections between the existing playground/pavilion area to the east, the swim beach and parking area, the peninsula playground, and trails to the southwest. The trail will be 1,500 feet long and have a paved width of 10 feet with 2-feet wide gravel shoulders. The trail will include several ADA-compliant access points along the swim beach as well as an access point to a seasonal ADA non-slip beach access mat that will extend access across the beach and into the water (Figure 2-3).

Figure 2-2 – Existing swim beach view looking north towards parking lot and restrooms (AFLAP 2019)

A gate will be installed on Groin 9 (Cinch Street) just south of the playground parking lot to maintain pedestrian and ADA access to the groin, but eliminate non-maintenance vehicle access to the southern portion of the groin at this point.

Figure 2-3 – An example of a seasonal ADA beach access mat

2.2.1.8 Motorized Boat Launch Paving and Electrical Outlets

The existing motorized boat launch parking lot at Tanana Lake would be surfaced with asphalt concrete pavement and striped to indicate stalls for trailers and passenger vehicles including ADA-compliant stalls for both uses. Pedestrian crossings would also be striped. The driveway for the parking lot would be regraded to tie-in to the new South Lathrop St. extension and will maintain access to the north side of Tanana Lake. Approximately twelve electrical outlets for headbolt heaters would be installed at the parking area[1]. Vegetated strips would be included along the western edge of the paved parking area to manage storm water runoff via infiltration.

[1] The headbolt heaters would be installed under a differently funded (CMAQ) and separate project.

2.2.1.9 Non-Motorized Boat Launch Paving and Electrical Outlets

The non-motorized boat launch along the south shore of Cushman Lake and the end of Westlake Lane will be reconstructed and surfaced with asphalt concrete pavement. The project will pave an area approximately 675 feet long and up to 100 feet wide (approximately 1 acre) and expand the parking area up to 15 feet to the west and 50 feet to the south beyond the limits of the existing lot. This would reduce the footprint to the north allowing space for vegetative strips along Cushman Lake. An area 8 feet wide will be reserved as a pedestrian path along the north side of parking area connecting Eagle Trail to the widened shoulder on South Lathrop Street. The fence and gate at the east end of the parking area will be relocated approximately 50 feet further east on the other side of the Eagle Trail access point. The parking area will be striped to indicate both standard and ADA-compliant passenger vehicle stalls as well as dedicated launching and retrieval areas. The project will install approximately 12 electrical outlets for headbolt heaters.

2.2.1.10 Overhead Power Line Extension

The TRRA Improvements Project proposes to construct a new overhead power line to provide electricity to the TLRA. The Alaska Department of Transportation and Public Facilities (AKDOT&PF) would design the utility extension and Golden Valley Electric Association (GVEA) would construct, maintain, and own the infrastructure, as well as provide service[2].

General Description. The proposed power line would be approximately 4,000 feet long. The new overhead power lines would distribute singe-phase power at 7.2 kilovolt (kV). The proposed line would consist of two wires supported by single wood pole structures with or without horizontal crossarms. The wires will be spaced vertically approximately 36 inches if no crossarm in used. If a crossarm is used, wires would be spaced horizontally, approximately 9-feet apart. Wire spacing will be based on the National Electrical Safety Code.

The poles will be placed 10 to 30 feet from the west edge of the pavement (shoulder) of South Lathrop Street Extension within the embankment. Poles would not be placed within the footprint of the levee or groins. The wires would have a minimum vertical clearance of 18 feet above the ground wherever the wires cross pedestrian and vehicular traffic (e.g., crossing of roads, driveways, walkways, and the levee and groins).

Tie In, Route and Access. The overhead power line would tie in to the existing GVEA system at the end pole in the public utility easement approximately 470 feet south of the railroad crossing at approximately latitude 64° 48' 16.13" N, longitude 147° 44' 28.22" W. The line will extend west across South Lathrop Street, then south along South Lathrop Street, cross over the levee and groin, and terminate at the non-motorized boat launch parking area. Access for the construction and maintenance of the power line would be from public roads and South Lathrop Street Extension. Metering equipment would be installed at overhead service connections that will be constructed at the motorized boat launch and the non-motorized boat launch to supply power for the headbolt heaters via buried conduit from a junction box.

[2] The power line would be installed under a differently funded (CMAQ) and separate project.

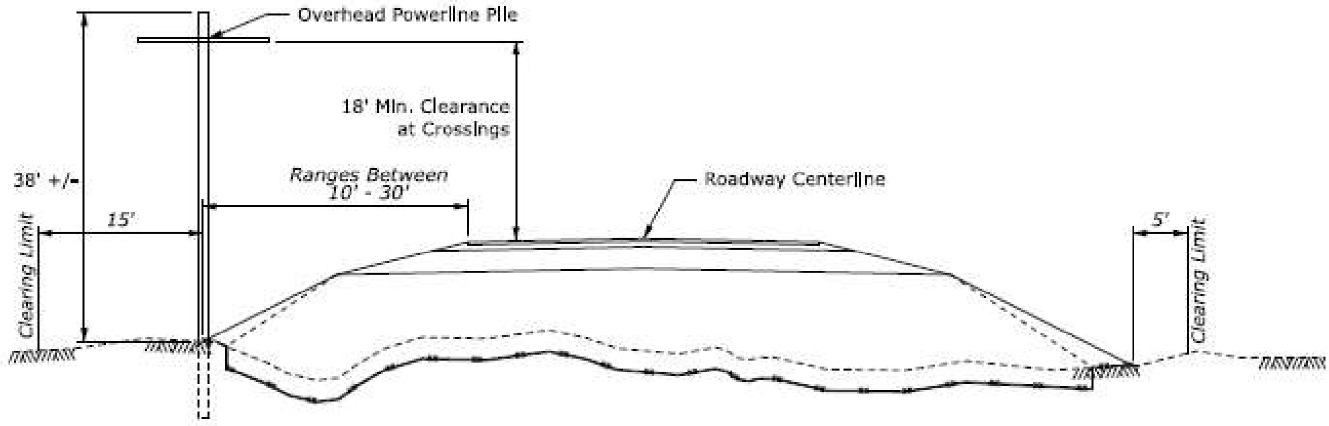


Figure 2-4 – General overview of road section and utility pole placement with clearances

Poles. The project would require approximately 20 utility poles with an average span length between poles of 150 to 330 feet. Pole length is approximately 45 feet and approximately 11 inches in diameter. The crossarm length is approximately 10 feet. The power poles will be pressure treated with pentachlorophenol (PCP).

Vegetation Clearance. An area 15 feet from centerline alignment of the poles would be cleared of vegetation. Vegetation in this area would be cut to the soil line and trees greater than 4 inches would be removed. Vegetation would be allowed to regrow beneath the line with vegetation maintenance scheduled approximately every five years. During the design phase, efforts would be made to avoid wetlands to the maximum extent practicable.

Installation. The poles will be directly embedded approximately 5 to 7 feet in the ground. A truck-mounted crane and auger will drill an oversized hole for placement of the pole. The hole would then be backfilled with gravel. The timber utility poles will stand approximately 35 to 40 feet above the ground.

In areas where the line changes direction, guy wires and anchors would be used to stabilize the pole. In areas where a pole cannot achieve the minimum embedment and cannot be relocated, guy wires and anchors would also be used. Anchors, such as helical screws, would be placed within a radius of 15 feet of the pole, using a skid steer or mini-excavator. Guy wires may extend outside of the roadway embankment, but within the clearing limits.

It is anticipated that a number 2-gauge electrical wire would be installed from a truck based on the existing roads. One pole-mounted 15- or 25-kilowatt (kVA) transformer, with an oil capacity of up to 20 gallons, would be installed at service connections located at the motorized and non-motorized boat launches. Insulators would be installed on poles if horizontal wire configuration is used.

Table 2-1 – Summary of Overhead Power Line Extension

Component	Description
Total Length	4,000 feet
Voltage	7.5 kV
Pole Type	Single wood pole
Average Pole Length	45 feet
Estimated Number of Poles	20
Span Length Between Poles	150 to 330 feet
Transformer Size	15 or 25 kVA
Estimated Number of Transformers	Two
Transformer Oil Capacity	Up to 20 gallons

2.2.2 Construction

2.2.2.1 Schedule

Construction is planned to take place during the summer months of 2022 and potentially 2023. Project construction will likely start in May of each year and end no later than October due to cold winter conditions. Winter construction in wetland areas is not anticipated. Vegetation clearing will be completed to avoid the bird nesting period to the extent practicable.

2.2.2.2 Construction steps

Generally, the project construction for each area will be sequenced as follows.

1. Install and maintain erosion and sediment control devices, stake sensitive areas, and mark clearing limits.
2. Install traffic control devices and establish detours.
3. Mobilize equipment and materials.
4. Clearing and grubbing of the project footprint.
5. Excavate the existing grade to remove deleterious materials or to allow room for the roadway structural section or vault restroom.
6. Place geotextile fabric.
7. Place and compact of various embankment materials.
8. Place culverts. Culverts in active waterways may require dewatering or stream diversion.
9. In areas with pavement, place asphalt pavement and striping.
10. Install overhead power line.

Figure 2-5 – Overview of Preferred Alternative

11. In areas of gravel surfacing, place surface course gravel and dust palliative.
12. Apply and establish seeding.
13. Install signs, gates, and other appurtenances.
14. Demobilize equipment and materials.
15. Remove traffic control devices and allow traffic on new road.
16. Remove erosion and sediment control devices.

2.2.2.3 Equipment

The project will require equipment typical of heavy civil roadway construction including excavators, bull dozers, loaders, vibratory compactors, motor graders, paving screed, various dump trucks, Hydro Ax, water trucks, vacuum trucks, and striping trucks as well as other various delivery, maintenance, and personnel vehicles. Construction may also require small supporting equipment such as skid steers, forklifts, generators, pumps, augers, chainsaws, and an assortment of hand tools.

3 Affected Environment, Environmental Consequences and Mitigation Measures

This chapter describes the current conditions of the environment and resources and documents the potential adverse, beneficial, or environmental consequences to the environmental resources associated with the No Build Alternative and the Preferred Alternative. Effects for the No Build Alternative are discussed in terms of direct effects and indirect effects that would occur as a result of not improving access to the TLRA. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8). Indirect effects defined as effects that are caused by the action at a later time or farther removed in distance but still reasonably foreseeable (40 CFR § 1508.08).

Since no project-related construction activities are associated with the No Build Alternative, temporary effects are not discussed for this alternative. The Preferred Alternative addresses temporary effects during construction, direct effects resulting from project construction and associated with the operation and maintenance of the improvements, and indirect effects. If applicable, mitigation measures are proposed to address potential adverse effects of the Preferred Alternative.

The following resources were identified as having potential impacts in association with implementation of the Preferred Alternative and were carried forward in the analysis:

- Transportation
- Land Use and Utilities
- Recreation
- Water Resources/Water Quality/Floodplains
- Wetlands and Non-Wetland Waters
- Vegetation, Fish, and Wildlife
- Social and Economic Changes
- Soils and Geology
- Cultural Resources
- Air Quality/Noise/Energy
- Visual Quality
- Hazardous Materials

There were no Environmental Justice (EJ) populations identified in the project impact area; therefore, EJ was dismissed from further consideration.

Cumulative effects of the project with other past, present, and reasonably-foreseeable future activities are documented in Section 3.13.

3.1 TRANSPORTATION

3.1.1 Affected Environment

3.1.1.1 Existing Road Conditions and Deficiencies

The existing entrance to the TLRA on the east side via South Cushman St. intersects with Northlake Lane. The existing TLRA transportation network and entrance point were not designed to accommodate the growing user capacity and are hampered by indirect routing, poor road surfaces, speeding, and limited visibility that contribute to inefficient and unsafe travel conditions to the TLRA and other recreation areas. The steep ramp and poor visibility of the main entrance point at South Cushman St. contribute to hazardous driving conditions during ingress and egress. Visitors currently access the TLRA from the east entrance and drive west on rough roads to access the boat launch and swim beach while encountering congested, rough, and unpaved roads. Furthermore, lack of parking results in users parking along roads and increasing congestion (Figure 3-3). These roads give rise to fugitive dust conditions that create poor visibility for driving and for pedestrians walking along the roads. The distance from the east entrance also encourages speeding along the Northlake Lane due to the distance from the entrance to the swim beach and boat launch.

3.1.1.2 Traffic Volume

In 2018, there were a total of 69,318 vehicles that visited the park. Traffic counts are from Parks and Recreation vehicle counters located at the existing South Cushman St. entrance (AFLAP 2019).

3.1.1.3 Crash History

The TLRA does not have crash data available. Anecdotal crash history includes an ARRC-reported limited crash or accident history at the proposed railroad crossing location; one traffic-related incident on Northlake Lane in 2014 when a vehicle collision was caused in part by poor visibility from dust.

Figure 3-1 – Overflow parking on Northlake Lane looking east toward Swim Beach Parking Area (2019 AFLAP)

3.1.2 Environmental Consequences

3.1.2.1 No Build Alternative

Direct Effects

If the TRRA improvements are not implemented, the needed transportation and access improvements would not be built and the existing transportation network, road conditions, related deficiencies, and safety conditions would continue.

Indirect Effects

Under the No Build Alternative, unimproved roads within the TLRA would continue to deteriorate, resulting in increased maintenance and eventual replacement. This costs the recreational user and community in travel time and vehicle miles (AFLAP 2016). The TLRA transportation facilities have already greatly exceeded the build capacity of existing roads and entrance. The TLRA was constructed for a visitation level assumed to exceed 100,000 visitors upon the completion of the TLRA (FNSB 2007). However, visitation continues to far exceed this assumption with 198,468 users in 2017 to 207,954 users in 2018 (AFLAP 2019). It is likely that visitation would continue to increase as the TLRA amenities are fully developed with new uses attracting wider range of visitors.

If the current problems are not addressed, the shared use of Northlake Lane by pedestrians and vehicles and the overflow of parking would continue to pose a safety issue. The lack of accessibility, lack of basic amenities, and lack of road and trail connections between existing facilities will continue to cause unnecessary travel time between the community, the TLRA, and TFTA, increasing costs to the users and costs for operations and maintenance work. Without the Northlake Lane connection, vehicle travel between the eastern end of the park and the boat launch follows an unnatural travel pattern within the park. The Northlake Lane connection, an expanded parking area, and associated amenities, as publicly approved in the 2007 TLRA Master Plan, would be more functional, safer, and relieve the burden on existing infrastructure from maintenance costs associated with the increasing traffic volume.

With the No Build Alternative, the current conditions are not addressed, the poor surface, limited visibility and extra distance of the current route will continue to pose undue costs and safety risks to the user and the FNSB. A South Lathrop entrance, as publicly approved in the 2007 TLRA Master Plan, would be more functional and relieve the existing infrastructure from such costs associated with the new traffic volume.

3.1.2.2 Preferred Alternative

The Preferred Alternative proposes to improve the existing transportation elements, construct a new entrance to the TLRA, and improve parking facilities (including the addition of ADA-compliant parking).

Temporary Construction Effects

The Preferred Alternative has the potential to result in temporary delays to traffic and businesses during the South Lathrop St. improvements and the new South Lathrop St. extension. Similar temporary delays and possible rerouting may affect users of the TLRA during the construction of roads and parking improvements. Parking facilities may be temporarily closed or reduced in capacity. Portions of the swim beach, existing pedestrian trail, and existing restroom may be temporarily closed or have restricted access during construction for a period of several weeks. These effects would be temporary, occurring during construction, and would be minimized by advance posting of construction schedules/information and with signage redirecting traffic.

Direct Effects

Access to the TLRA would be improved and a more direct route to popular facilities such as the swim beach and boat launch would be provided. The current road network in this area is composed of loose gravel. The project would improve roads by regrading and providing an asphalt pavement surface or using compacted surfacing gravel with a dust palliative for all new gravel surfacing. This would improve fugitive dust conditions significantly and immediately improve the safety of the transportation network within the recreation area. In addition, the proposed road development would provide more direct routing to the TLRA and amenities within the recreation area for users and maintenance staff, designate shorter routes within the park, formalize the road network, and provide more access points between the park and the community (South Lathrop St. and South Cushman St.).

The new entrance, a more direct route to popular facilities, intersections, stop signs and improved roads would reduce vehicle speeds. The new entrance would also reduce traffic congestion on South Cushman St. These transportation improvements would provide safer access for users, reduce speeding, eliminate visibility issues with clear line of sight, better control access and security thus reducing illegal activities, provide a more central access point to other facilities within park, and decrease the travel time and vehicle miles within the TLRA and access routes. New trails, expanded parking areas, new wider roads, and non-motorized routes in the park would encourage multi-modal use, take pressure off vehicle infrastructure, and provide safer, designated routes for bikes and pedestrians. In addition, the project would minimize the use of the levee system by off-road vehicles (ORV) and trucks that often drive along the levee system and Cinch St to access the boat launches or the swim beach. The use of the levee causes damage to the levee and requires additional and unplanned costs to FNSB to maintain the levee to ensure the proper height. The project would connect facilities to the road network of Fairbanks and discourage and restrict use of the levee for access. The project footprint would be within an existing road right-of-way and utilize existing facilities or corridors.

Indirect Effects

A centrally-located, main entrance station on South Lathrop St. would provide an important interface with users and provide information about access to military lands, river conditions, weather conditions, regulations, and other conditions. The entrance station would provide TLRA staff the ability to educate users on safer use practices of the park.

The new roads would be designed to increase long-term reliability and accommodate the existing and future traffic capacity of the TLRA with improved, hardened surfaces. This project would address capacity limits of the existing transportation network at the overused South Cushman St. entrance. In 2015, more than 100,000 vehicles entered the South Cushman Rifle Range via South Cushman St. Since the TLRA was opened in 2014, this gravel road entrance has seen a 60 percent increase in traffic with more than 60,000 vehicles entering the TLRA during 2015 (AFLAP 2019). The new entrance on South Lathrop St. Extension will relieve the high volume of traffic on South Cushman St., which was demonstrated to be approximately 5,000 vehicles higher than the average daily traffic on South Lathrop St. at the Van Horn Road intersection since the opening of the TLRA (AFLAP 2019). The addition of stops signs creating a three-way intersection at South Lathrop Street and Sanduri/Pomm Avenues would provide safer roadway conditions at the railroad crossing. Furthermore, the Preferred Alternative would reduce maintenance and operations costs by upgrading the existing road surfaces such that these can better withstand the vehicle volumes and require less frequent maintenance. A shorter, more hardened section of road would also be much easier and cheaper to improve and maintain than the mile-long gravel Northlake Lane. Though adding a South Lathrop St. entrance will increase the total miles of road that periodically need to be plowed and maintained, overall maintenance and costs will likely decrease. Routing traffic onto a more hardened road will likely decrease the need for regular maintenance of Northlake Lane and South Cushman St. that may include grading, filling potholes, and adding gravel after erosion.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Transportation:

- Communicate construction schedule, traffic, and access notifications to the public in advance using public notices, signage, and TLRA information boards.
- Coordinate and communicate construction schedule with the Department of the Army (DOA) Fort Wainwright in advance of construction.
- Install and coordinate temporary traffic control devices to minimize the impacts to motorists.
- Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians to manage traffic on affected roads during construction activities.
- Install new wayfinding signage to direct travelers to the new entrance.

3.2 Land Use and Utilities

3.2.1 Affected Environment

3.2.1.1 Land Use

Most of the land directly adjacent to the north, northeast, and northwest of the project area is privately owned industrial lands. To the south, the TLRA provides public access to federally managed lands of the TFTA. The TFTA is not accessible by roads but could be accessed by other boat launch sites. During winter, the TFTA is accessed via an ice crossing. The TFTA is managed by the Army for training and public recreation uses. All property within the project site is publicly owned by the FNSB or the State of Alaska.

The Fairbanks Regional Comprehensive Plan (2005) designated the TLRA area as a *Reserve Area.* This area was reserved under public ownership until sufficient data is available to make definitive planning judgments, such as the TLRA Master Plan. Permitted uses include mining, hunting, fishing, trapping, recreation, forestry, and agriculture. The area immediate to the north is *Heavy Industrial,* defined as manufacturing, processing, and storage that handle explosives or other hazardous materials, or emit noise, air, chemicals, or other pollutants detrimental to surrounding land uses and should therefore be developed in areas sufficiently buffered to avoid detrimental effects.

*Zoning***.** Most of the project site is currently zoned as *Heavy Industrial* and *General Use-1* by the FNSB. Conditional uses include gravel extraction. When gravel extraction is completed, the lots within the project site will be rezoned to *Outdoor Recreation*. The rezoning process will exclusively involve properties owned by the FNSB and require public involvement and opportunity for testimony. Properties owned by the State of Alaska would not be involved in this process (FNSB 2020).

HI (Heavy Industrial) is intended to provide for heavy manufacturing, fabricating assembly, disassembly, processing, and treatment activities (Ord. 88-010 § 2, 1988. 2004 Code § 18.40.010; FNSB 2020).
GU-1 (General Use-1) is intended to be in rural areas where community sewer and water systems are unavailable (Ord. 88-010 § 2, 1988. 2004 Code § 18.44.010; FNSB 2020).

HI/MNO (Heavy Industrial/Military Noise) has the same definition as HI with conditional uses approved that include shooting and explosives consistent with military noise. This area is located near South Cushman St. entrance and a small area inside the TLRA and west of the entrance.

Gravel Extraction. Gravel extraction has occurred within the project area for several years under permits issued by the USACE. The State of Alaska, through ADNR, regulates gravel mining and handles the sale of gravel extraction rights to private companies. All privately held rights within the project site are gravel extraction contracts between ADNR and the private companies. These leases would not be renewed upon expiration.

Between 1998 and 2006, the FNSB extracted gravel from a 28-acre portion of the project area south of the Tanana River Levee and west of Groin 9. In June 2006, the FNSB was permitted to begin gravel extraction from an 80-acre portion of the project area south of the Tanana River Levee and east of Groin 9. Remaining gravel extraction activities will continue in the north-central and northwest portions of the project area. Gravel from these areas will be used as daily cover material and cell construction at the FNSB landfill, and, as needed, for construction of the proposed recreation area.

*Land Use Plans***.** The FNSB Regional Plan (2005) designated the project area as a Reserve Area. Two years later, the TLRA Master Plan (2007) was released and, in 2019, the Tanana River Recreation Access Improvements Project (AFLAP 2016, 2019). A complete list of planning documents is presented in Table 3-1.

*Utilities***.** There are no utilities within or currently serving the project area. There are existing utilities running under South Lathrop St. at the Railroad Crossing and intersection with Sanduri Avenue and Pomm Road. Water and sanitary sewer mains are located nearby along South Lathrop St. and South Cushman St. These systems currently do not reach the project area. Water, sanitary sewer, and electric services are available to the north of the recreation area, and will be made available for use in the recreation area when needed. GVEA owns and maintains a northeast-southwest trending GVEA power line approximately 150 feet east of the gravel extraction pond east of the Goose Island Causeway.

Table 3-1 – Summary of Land Use Plans of the Proposed Action

Year	Plan Title	Purpose
2005	FNSB Regional Comprehensive Plan	The FNSB Regional Comprehensive Plan provides the framework for citizens and officials to make decisions related to land use and to form the basis for ordinances and programs to guide land development and use.
2007	TLRA Master Plan	This Master Plan outlines the FNSB's plan for the future development and use of the TLRA. The purpose of the plan is to provide the FNSB with a long-term planning guide for gravel extraction and development of the recreation area based on resource opportunities and constraints, development opportunities and constraints, and public needs.
2008	ADF&G Cooperative Agreement	To improve public recreational boating and sport fishing opportunity and access to the Tanana River by completing planning activities (preliminary design and permitting) for the future construction of a boat launch and recreation facility in Fairbanks at the TLRA.

Year	Plan Title	Purpose
2008	TLRA Acceleration Plan	The Acceleration Plan presents a viable means of developing a significant portion of the recreational assets proposed by the TLRA Master Plan in the short term, and should generate the potential for high use and user fees. The Acceleration Plan assumes that development efforts under the Acceleration Plan will be coordinated with the Solid Waste Landfill for on-going gravel extraction and stockpiling efforts.
2013	ADF&G Cooperative Agreement	To improve public recreational boating and sport fishing opportunity and access to the Tanana River by completing final design and construction of a boat launch and recreation facility in Fairbanks at the TLRA.
2013	Integrated Natural Resource Management Plan (INRMP), Fort Wainwright	The INRMP establishes policies, programs, prescriptions, projects, and procedures that U.S. Army Garrison Fort Wainwright uses to manage natural resources on Army training lands (e.g., TFTA) in Alaska.
2016	AFLAP Project Proposal - Tanana River Recreation Access Improvements Project Phase I[3]	The purpose of this road construction project is to improve access to the TLRA and to federally-managed lands along the Tanana River.
2017	FNSB TLRA Master Plan Amendment	This amendment adds approximately 196 acres to the 2007 TLRA Master Plan. The intended use of the addition includes, but is not limited to, development of an Off-road Vehicle Park and a Retriever Pond
2019	AFLAP Tanana River Recreation Access Improvements Project – Phase II[1]	This project is Phase Two of the TRRA Improvements Project that includes road access, ADA access, and associated amenities within the TLRA, providing more direct and enhanced recreation access to the TFTA on the Tanana River.

Easements and Right-of-Way. The project area is within the TLRA. FNSB owns several parcels of the TLRA and the ADNR also owns parcels within the TLRA. FNSB has a 55-year lease with ADNR to operate and maintain this part of the TLRA. North of the levee, South Lathrop St. runs along a section line with 33-feet of platted right-of-way (ROW) to the east and a 33-foot-wide public section line easement to the west. The Levee itself is within a 200-foot-wide ROW. The project area south of the levee is within the TLRA and under lease to FNSB from ADNR.

[3] The AFLAP Project Proposals - Tanana River Recreation Access Improvements Phase I and the AFLAP Tanana River Recreation Access Improvements Project – Phase II were both funded and collectively referred to as the TRRA Improvements Project or TRRA in this EA.

3.2.2 Environmental Consequences

3.2.2.1 No Build Alternative

Direct Effects

Existing land use designations would remain unchanged under the No Build Alternative. The public would continue to access the TLRA from the South Cushman St. entrance. Property access to the industrial properties along South Lathrop St. would not be affected by construction. The TLRA lots would convert to Outdoor Recreation upon cessation of gravel extraction leases. The No Build Alternative would not be consistent with existing land use plans such as the TLRA Master Plan.

Indirect Effects

The No Build Alternative would have no indirect effects to land use.

3.2.2.2 Preferred Alternative

Temporary Construction Effects

Temporary Easements and Rights-of-Way. The section of the project that begins at the intersection of South Lathrop St. and Sanduri Avenue with Pomm Road and heads south for 0.3 miles to the new entrance of TLRA would require an ARRC ROW Use Permit, ARRC Temporary Construction Permit, and an agreement to provide flagging during construction.

*Property Access***.** The Preferred Alternative would cause potential temporary property access delays to traffic and businesses during the South Lathrop St. improvements and the new South Lathrop St. extension. Similar temporary delays and possible rerouting would affect users of the TLRA during the construction. Parking facilities may be temporarily reduced in capacity to provide area to stage construction equipment and materials. Temporary closures of existing roads and facilities may be necessary during construction. Most construction activities will accommodate traffic through the work zone or use alternate detours around the work zone which may result in delays of less than 10 minutes for users accessing local businesses and the boat launches. The few times when traffic cannot be directed through or around the work zone, roadway closures will be limited to evening and night time windows when the businesses and parks are closed. Property access effects would be short-term, improved and restored upon completion of construction activities.

Direct Effects

The TRRA Improvements Project is consistent with land use plans of the FNSB (Table 3-1). The project fulfills elements of the Master Plan and improves access to amenities that have already been completed (e.g., swim beach, boat launches).

*Land Conversion***.** The TRRA Improvements Project will result in approximately 8 acres of land conversion from natural habitat to transportation uses. The project will otherwise not result in land conversion.

Property Access. The existing entrance at South Cushman St. would remain open. The new TLRA entrance on South Lathrop St. would provide a more direct route to the TLRA and would connect with south Fairbanks. The project includes the rebuilding of the ARRC rail/road-crossing corridor.

Easements and Right-of-Way. The section line easement used to extend the roadway is cleared and hardened but remains relatively undeveloped. ADNR Easement or ROW Use Permit and a Tanana Basin Riparian Management Zone (RMZ) Easement Vacation may be required for the Preferred Alternative.

There would be the potential for a small slope easement at the northwest corner of the intersection of the TFCL and South Lathrop St. within a privately-owned lot. The public use section line easement along the west side of South Lathrop St. may be converted to a public ROW. Slope easements may be necessary outside of the section line easement along the west side of South Lathrop St.

Utilities. The project includes the rebuilding of the ARRC rail/road crossing at South Lathrop St. and Sanduri Ave. The section line easement being used to extend the roadway is cleared and hardened but remains relatively undeveloped. At the time writing this EA, there are no known utilities within the project area that would require relocation.

The TRRA Improvements Project includes the construction of overhead power lines that would add electricity to the TLRA consistent with the Master Plan.

Indirect Effects

The TRRA Improvements Project would fulfill elements of the Master Plan and facilitate future completion of planned elements, as described in Plan Section 5 - Development of the 2007 TLRA Master Plan:

- Additions to the trail system within the park, including equestrian trails
- Expansions to picnic and open space areas for spring, summer and fall use (e.g., volleyball courts, horseshoe pits, fire rings, and covered pavilions)
- Campgrounds in three locations with the largest encompassing 26 acres and a 6-acre camping area near the Equestrian Park
- Additional restroom facilities
- Frisbee Golf Park
- Off-road Vehicle Park
- An archery range north of the Rifle Range
- Equestrian accommodations

The power line components and the headbolt heaters would be installed as a separately funded project and would benefit operation and maintenance and public use of the TLRA.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Land Use:

- Communicate construction schedule, traffic, and access notifications to the public in advance using public notices, signage, and TLRA information boards.
- Maintain access to the TLRA, TFTA and boat launch during construction.
- Minimize impacts to properties on South Lathrop St. north of the levee by reducing the need to convert industrial use lands to transportation uses, during the final design phase.

3.3 RECREATION

This section describes existing recreation opportunities within the project area. Information was gathered from the 2007 TLRA Master Plan and other TLRA planning documents (Table 3-1).

3.3.1 Affected Environment

3.3.1.1 Tanana Lakes Recreation Area

The project is located within the TLRA, an existing recreation area with summer and winter recreation activities that include bird watching, wildlife viewing, dog walking and training, and waterfowl hunting. This project will serve users of the Tanana River corridor, the TFTA, and the TLRA, whose main visitors include residents, active-duty military and their families, and out-of-state visitors who enjoy these activities.

In addition, the TLRA provides abundant recreation opportunities in and around Tanana Lake and Cushman Lake including:

- Areas for picnics and open spaces along the shoreline
- Cushman Lake swim beach and skating pond during winter
- Tanana Lake boat launch providing access to the Tanana River and access to other resource areas, including the TFTA
- Paddle boat launch on Cushman Lake
- Playground
- All-terrain vehicle (ATV) trails
- Motorized and non-motorized boating
- ADF&G stocked ponds for fishing in summer and winter
- Hiking trails in summer and winter
- Winter recreational uses such as ice skating, ice fishing, ski trails, snowmobiling, and ice racing

The TLRA also provides recreational users access to the South Cushman Rifle Range, the Bonnifield Trail and 100-mile Loop, and the Goose Island Off-Road Vehicle Area.

South Cushman Rifle Range

The South Cushman Rifle Range, managed by the FNSB, is situated to the east and accessed via the project site. Amenities include a 25-yard pistol range and a 300-yard rifle range.

Bonnifield Trail and 100-Mile Loop

The Bonnifield Trail is a winter access route to the Tanana Flats. The trail begins at the south end of Cushman St., runs along the Goose Island Causeway (South Cushman St.) through the eastern portion of the project area and across the Tanana River by way of an ice bridge.

Goose Island Off-Road Vehicle Area

A portion of the project site was used in the past by the Fairbanks Motorcycle Racing Association for off-road vehicle practice and competition under a use permit granted by the FNSB Division of Land Management; however, it is currently not used for this recreation. This land north of the gravel pit between Groins 8 and 9 is owned by the FNSB and remains an ideal site for this type of trail recreation.

3.3.1.2 Tanana Flats Training Area

Despite being the most defining geographic feature of the Fairbanks and Interior Alaska area (known as the "Tanana Valley"), the Tanana River has not been generally accessible from the main populated areas of Fairbanks. The recent development of the TLRA has vastly improved access to the Tanana River and the TFTA by providing roads, management, and facilities for recreational access.

The US Army manages the TFTA lands for military training, recreation, wildlife conservation and other natural resources. These are some of the most popular hunting grounds near Fairbanks for their abundant moose, waterfowl, and small game populations. From Fairbanks, summer and fall boaters travel across the Tanana River and up the many sloughs and creeks to get further into the flats and access their preferred hunting area. Larger tributaries (e.g., Wood River, Clear Creek, Little Delta River, and Salchaket Slough) provide even more remote access to distant areas in the flats. In wintertime, snowmachiners, dog mushers, skiers, and fat-tire bikers travel the Tanana and the many winter trails in the flats.

3.3.2 Environmental Consequences

3.3.2.1 No Build Alternative

Direct and Indirect Effects

The No Build Alternative would not change or otherwise directly or indirectly affect recreation opportunities in the project area. The existing conditions would remain such that without the addition of ADA-compliant facilities federally-managed lands would remain difficult to access by all members of the public. The No Build Alternative would remain out of compliance with the ADA. The No Build Alternative would not address the deficiencies of parking capacity and road system within the TLRA. The No Build Alternative would not be consistent with the TLRA Master Plan.

3.3.2.2 Preferred Alternative

Temporary Construction Effects

During construction, there would be temporary closures and redirecting of traffic that would affect users. These effects would be temporary and access would be restored upon completion of the project. Mitigation measures communicating construction schedules and TLRA road closures would minimize impacts to TLRA visitors.

Direct Effects

The Preferred Alternative would improve access to the TLRA by providing a new and improved entrance and road network within the recreation area. In addition, new ADA facilities and trails would improve access to the handicapped and elderly population, thereby expanding use to a larger segment of users. The new roads and improved amenities would also improve access to other recreation areas. The proposed project provides the public with an entry point to the Tanana River to access up to 590,760 acres of federally managed lands for recreational uses.

Indirect Effects

The addition of headbolt heaters for vehicles and a power source for the entrance station would benefit recreational users and management. The Preferred Alternative would increase the capacity of the TLRA in the long term, enabling more users to enjoy the recreation area.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Recreation:

- Communicate construction schedule, traffic, and access notifications to the public in advance using public notices, signage, and TLRA information boards.

3.4 WATER RESOURCES, WATER QUALITY, AND FLOODPLAINS

3.4.1 Affected Environment

The Tanana basin covers more than 116,000 km^2 and lies south of the Yukon River where discontinuous permafrost has thawed in recent decades (Jorgenson, 2001 as cited in Moran 2007). The basin drains the north side of the Alaska Range with glaciers present in the basin. The Tanana River is a glacier-fed river originating in the Yukon Territory, Canada, and flows west discharging into the Yukon River. The project area is located along the north bank of the Tanana River which flows generally northward for 531 river miles through an alluvial valley. The proposed project is within Hydrologic Unit Code (HUC) 19040507 with a permafrost class 12, generally discontinuous permafrost. Land cover are described as land class 1 and 4, needleleaf forest and low and tall shrublands (Moran 2007). The project area is a low-lying area in the alluvial plain with depths to groundwater estimated at 0 feet to 5 feet below the ground surface. The FNSB estimates the Maximum High-Water elevation of the project site to be 432 feet.

Water resources within the TLRA are used for recreation such as fishing, hunting, wildlife viewing, boating, and other water-dependent activities. The project area is surrounded by wetlands, artificial waterbodies, shrubs, trees, and slough as well as recreation facilities such as roads, parking lots, motorized and non-motorized boat launches and a swim beach.

Water Quality. The proposed project is not within an identified drinking water protection area and will not impact any known public drinking water sources. The Tanana River is not listed as an impaired waterbody under Section 303(d) of the Clean Water Act (ADEC 2020). The existing storm water runoff is treated by directing runoff to vegetated areas along the downslope edge of roads and parking lots.

Floodplain Setting. Much of the greater Fairbanks area is within the floodplains of the Chena and Tanana Rivers. The Chena River Lakes Project reduces flood damage from the Chena River by temporarily impounding floodwater behind the Moose Creek Dam and diverting it toward the Tanana River during flood events. Tanana River flooding in the Fairbanks area also is reduced by the Tanana River Levee, another element of the Chena River Lakes Project. The Tanana River Levee, on the north bank of the Tanana River, separates Tanana River flood waters from the south side of the Fairbanks area. It prevents floodwater from the Tanana River from flowing into part the river's natural floodplain around Fairbanks. The USACE acquired the lands for the dam and floodway, and the FNSB obtained the lands for the levee and drainage channels. The levee system was constructed by the Corps of Engineers and is owned and maintained by the Fairbanks North Star Borough. Chena River Lakes Project construction began after a 1967 flood that extensively damaged Fairbanks and surrounding communities. The project was completed in 1979 and was first operated for a test fill in 1981.

The entire TLRA area is located within the active floodplain of the Tanana River but the hydrology has been substantially altered by the construction of the levee system and the creation of Cushman Lake (ABR 2020e). The project area south of the TFCL is within the Tanana River Federal Emergency Management Agency (FEMA) floodplain. Portions of the project lie with the Tanana River Floodway and a 1992 FEMA map identifies that the project area is within Flood Zone A, a special flood hazard area inundated by 100-year flood events.

The portion of the project area located on the river side of the levee is protected by a series of groins extending from the levee to the shoreline of the Tanana River. The Tanana River floods annually and often inundates the TLRA, but the groins restrict floodwater from flowing over the project site and eroding the landscape. Surface water levels in the area are driven by water levels in the Tanana River and rainfall, but frequent flood events typical of undisturbed floodplains are moderated in the TLRA by the groins (ABR 2020e).

Since the TLRA was developed, an increased number of recreationists drive ATVs or trucks westward along the levee to enter the TLRA via the old Cinch St. corridor. The levee was not designed for this traffic. Consequently, the resulting damages and loss of gravel caused by vehicles require extra unanticipated costs to the FNSB, who now maintains the levee to ensure proper height.

Although owned and maintained by the FNSB, the TFCL and groin system were constructed by the USACE as a USACE Section 408 public works facility. The USACE is responsible for ensuring the integrity and primary function of public works projects are always maintained. The levee system is present in four locations of the project as shown in Figure 3-2:

1. South Lathrop St. TFCL crossing at Saddle Avenue.
2. North Lake Lane Groin 9 crossing at North Lake Lane extension.
3. Groin 9 south of the playground parking lot.
4. South Lathrop St Groin 9 crossing at the intersection with Westlake Lane.

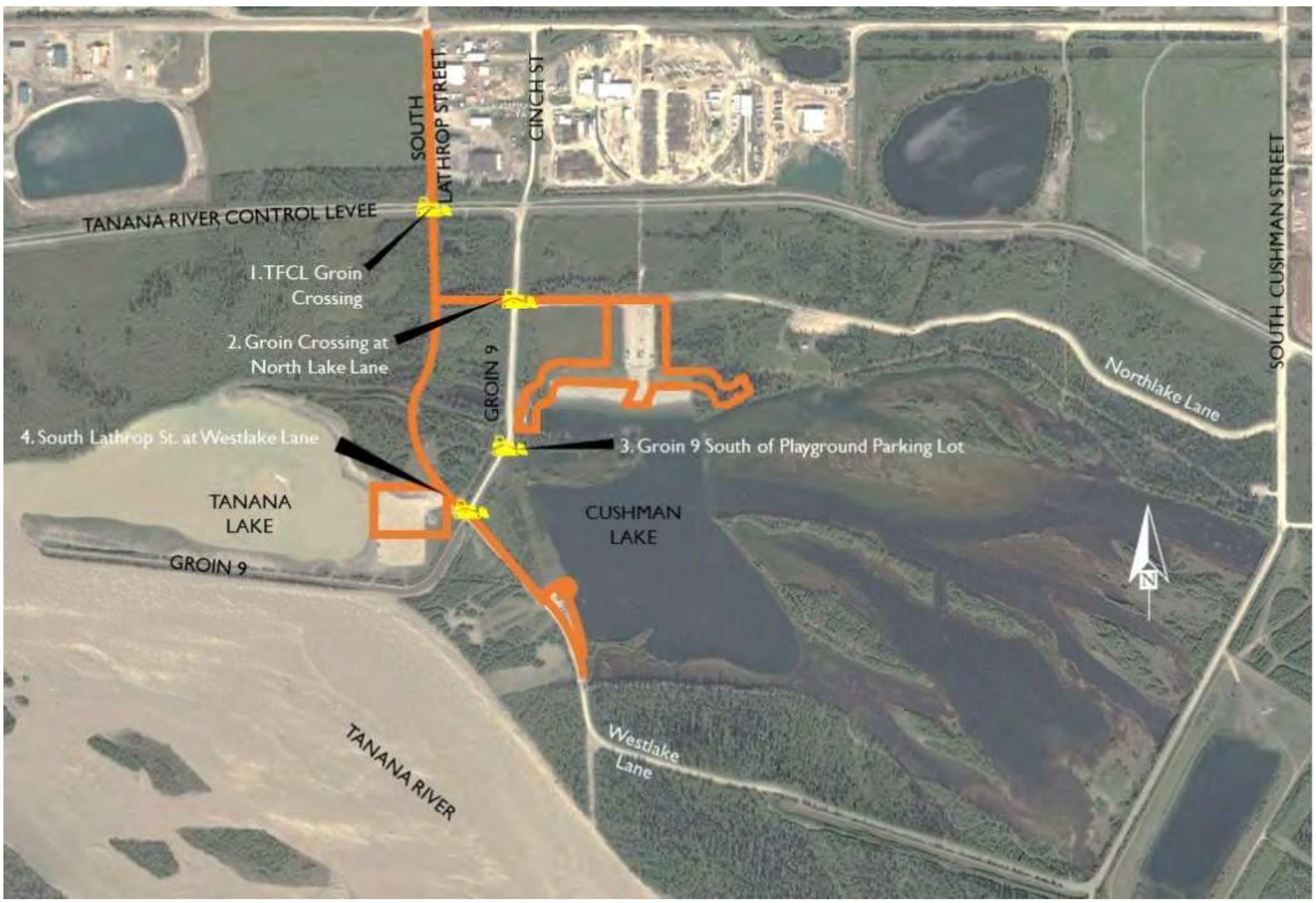


Figure 3-2 – Locations of Section 408 facilities crossed by the TRRA

3.4.2 Environmental Consequences

3.4.2.1 No Build Alternative

Direct and Indirect Effects

The No Build Alternative would not involve construction, and would not result in changes to water resources such as streams, sloughs, groundwater, water quality, or floodplains. The No Build Alternative would not have direct or indirect effects on water resources, water quality, or floodplains. No Build Alternative would have no effect to FNSB's Operations, Maintenance, Repair, Replacement, and Rehabilitation obligations. The No Build Alternative would have no direct effects to Section 408 facilities. However, the No Build Alternative would have an indirect effect to Section 408 facilities because access to the TFCL and Groin 9 by unauthorized vehicles (e.g., ORVs) would continue to degrade the facilities and require maintenance.

3.4.2.2 Preferred Alternative

Temporary Construction Effects

Soil disturbances and construction site materials, runoff, and waste would result in minimal impacts on surface water quality. Runoff would be controlled to avoid increases in turbidity and sedimentation in wetlands and lakes. However, construction activities that take place in aquatic resources, such as the construction of a 48-inch culvert between Cushman and Tanana Lakes and other culverts, could result in temporary elevated sediment concentrations and turbidity.

Soil compaction during construction would impact groundwater flows or permafrost conditions, which would reduce the infiltration capacity and increase surface runoff in localized areas. Accidental petroleum spills during construction could occur where water resources, such as groundwater, wetlands, and lakes, are present but the spills would be anticipated to be small in volume and would be contained quickly with the implementation of spill containment mitigation measures. Impacts to water quality during construction would be localized, short-term, and likely not exceed water quality criteria. The effects of the Preferred Alternative would be avoided and minimized with the implementation of mitigation measures. The following permits would be required to protect water quality during construction: Clean Water Act Sections 401, 402, 301(a) and Alaska Pollutant Discharge Elimination System (APDES).

There would be temporary effects to the structure of the TFCL during construction; however, the TFCL would maintain its function and physical capacity to hold back flood flows. The top 24 inches of the levee crest will be excavated, backfilled, and compacted with structural gravel to support the roadway. During excavation activities, the contractor will be required to backfill the excavation within 24-hour notice from FNSB, in the case of a potential flood event. The alteration of the levee during construction would not affect the ability of local operator to access, operate, and maintain the levee.

Direct Effects

Construction would require vegetation clearing, cut, and fill in floodplains; however, hydraulic analysis has shown there will be no increase in the base flood elevations because cut and fill does not extend above or beyond the existing levee groins in the floodplain. Additionally, the project will meet the requirements of the FNSB Floodplain Development Permit. A new 48-inch culvert would maintain hydrological connection between Cushman Lake and Tanana Lake. Installation of 24-inch culverts would be included in the South Lathrop St. design to retain natural drainage patterns and avoid entrapment of waters.

Vegetation removal, soil disturbance, and paving would increase impervious surfaces, erosion, sediment deposition, and storm water runoff that could affect water quality. Where possible, the Preferred

Alternative alignment would be designed to avoid stream crossings, stream buffer areas, and placement of fill within active stream channels and floodplains. In addition, final design and construction of the roadway would occur in accordance with applicable design standards and manuals. The South Lathrop St. extension and the power line would require vegetation clearing and the wetlands and floodplain would be filled for the road construction and the utility poles.

The design of the Preferred Alternative would reduce the potential impacts to water quality by following the existing South Lathrop St. footprint to the extent possible, which would reduce the amount of new construction as well as the amount of cut and fill. The entirety of the power line would be within the floodplain. While the project proposes areas of asphalt surfacing (including South Lathrop St., ADA Trail, and launch ramp parking areas), most of the construction footprint will be of a more permeable compacted gravel or vegetated slopes. Impacts to water quality would be addressed by accommodating storm water runoff with non-structural, best management practices (BMPs) such as vegetated infiltration areas (e.g., grass slopes and vegetated strips). The most significant drainage pattern runs east to west and would be impacted by the project but would be maintained with the installation of 24- and 48-inch culverts. Due to the elevated nature of the roadway within the floodplain and the steepened embankment slopes to minimize impacts to the existing wetlands, erosion control is required along the limits of the project in the form of surface roughening and turf establishment. Additionally, construction activities occurring in previously undeveloped areas would receive additional BMPs in the form of fiber rolls or silt fence. Previously developed areas were deemed not to require additional protections as they are unlikely to be adversely impacted by any sediment transport that may occur. Stabilized construction access locations should be utilized to reduce the tracking of sediments onto existing roadways. Direct effects to water quality, water resources, and floodplains would be considered insignificant with the addition of vegetated infiltration areas during design and by maintaining drainage patterns.

Since both the levee and the groin system are part of the USACE Section 408 program, the Preferred Alternative requires USACE review and authorization of any alteration to the levee and the groins to ensure that the alteration does not adversely impact the USACE facilities (33 United States Code (USC) § 408(a)). As such, USACE will act as a cooperating agency throughout the NEPA process to assess the direct and cumulative impacts from the proposed action. This process culminates with the issuance of a Section 408 authorization.

The Preferred Alternative includes the following levee system impacts:

- Road Improvements at South Lathrop St. TFCL crossing, North Lake Lane Groin 9 crossing, and the South Lathrop St. Groin 9 crossing.

  The top 24 inches of the levee/groin within the footprint of the road (approximately 40- to 50-feet wide) will be excavated, backfilled, and compacted with structural gravel to support the roadway and maintain the structural and functional integrity of the levee. Backfill materials would be functionally equivalent or superior to the gravel materials used to initially construct the levee and groin.

  The crossings would maintain or increase the elevation of the levee and groin crest, and slope surfaces. The finished grade of the roadway at the crossings will match or be up 12 inches above the levee/groin elevations at these locations.

- Gate Construction at All Locations

  Gates and signs will be installed on the TFCL to direct recreational traffic to a controlled crossing. The gates would allow access for levee operations and maintenance.

  At the Groin locations gates will be installed to either side of the roads to maintain pedestrian and bicycle access to the groin, but eliminate non-authorized vehicle access to the groin.

During the Section 408 permit application process and through coordination with the USACE, permission would be granted for the alteration or permanent occupation or use of the levee system because occupation or use would not be injurious to the public interest and would not impair the usefulness of the facility. The proposed modifications would have no permanent significant impact to the TFCL and groin system as these Section 408 facilities would continue to function as designed and the proposed alterations are beneficial to the public.

Implementation of mitigation measures including FNSB Department of Public Works Storm Water Design Guidelines would reduce direct effects of the project to insignificant.

Indirect Effects

The Preferred Alternative alignment could result in limited potential future degradation of aquatic resources as a result of the new entrance road coupled with increases in TLRA usage. Pollutants from vehicles could increase and could accumulate on the roadway before washing away as storm water runoff. The vehicle pollutants would include petroleum, nitrogen from exhaust, and trace heavy metals such as copper, lead, and chromium. The effect from vehicle pollutants is anticipated to be minimal with the implementation of mitigation measures that would reduce effects on water resources, water quality, and floodplains. Utility poles treated with PCP have the potential to leach PCP into waters and soils.

Existing levee access by ATVs result in damage to the levee system that is costly for the FNSB to repair; installation of gates at South Lathrop Street – Levee crossing and Groin 9 crossings will reduce damage to the levee system as well as maintenance costs to repair the levee system.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Water Resources, Water Quality and Floodplains:

- Minimize the contact of construction materials, equipment, and maintenance supplies with storm water.
- Reduce potential for turbid stormwater runoff from the site through use of measures such as perimeter silt fencing and fiber rolls.
- Reduce potential for soil erosion through use of methods such as temporary seeding, straw mulch, and plastic coverings.
- Maintain water quality using methods that may include using grass buffer strips, organic mulch layers, planting soil beds, and vegetated systems such as swales and grass filter strips that are designed to convey and treat runoff.
- Leave erosion and sediment control measures in place until vegetation becomes established and covers more than 70 percent of disturbed area.

- Do not store fuel, fuel vehicles, or perform maintenance within 100 feet of water bodies and wetlands.
- Stabilize and re-vegetate disturbed areas after work is completed.
- Incorporate measures to protect the water quality.
- Require contractor to prepare and execute an emergency repair plan in the event a major flood event during temporary excavation to the levee or groin.
- Maintain the integrity of the levee system by ensuring the finish grade of the levee at the road crossing to be above levee design elevation.
- Treat PCP poles offsite and not near waterways or wetlands.
- No cutting, drilling, sanding, or other measures will occur onsite that will cause treated wood sawdust or coating to sluff off into wetlands.
- PCP-treated poles will not be sited in wetlands or waters outside of the new project embankments.
- Implement all regulatory permit mitigation requirements to avoid significant potential impacts.

3.5 Wetlands and Non-Wetland Waters

The *Wetland and Stream Delineation Report* and the *Wetland Impact and Mitigation Report* for the TRRA project are incorporated into this section of the EA (ABR 2020a, 2020b 2020c, 2020d). Please refer to Appendix B Wetland and Stream Delineation Report and the Wetland Impacts and Mitigation Reports for more information.

3.5.1 Affected Environment

The study area encompasses a total of 31.1 acres (ABR 2020b, 2020d; PND Engineers 2021; Figure 6). The study area included all areas of proposed infrastructure improvements (project footprint) and an additional area around the improvements. These additional areas were defined as:

- 75 feet on either side of the proposed road centerlines
- 25 feet on either side of the proposed trail centerlines
- an additional 25 feet around the proposed parking areas boundaries
- an additional 50 feet around the proposed restroom locations

The mapping of wetlands for the proposed project indicates that 16 National Wetlands Inventory (NWI) wetland and water types occur in the study area. This includes 6 waters and 10 wetland types. Wetlands and waters combined account for 7.5 acres of the study area and the remaining area is classified as upland habitat, 23.7 acres (ABR 2020d, Appendix B; Figure 3-3). Waters and wetlands were recalculated by PND Engineers in 2021 to account for the addition of the overhead power line structures.

The project footprint includes all lands subject to direct disturbance from the project and associated infrastructure. The project footprint is approximately 18.5 acres with wetlands and water accounting for approximately 3.0 acres of the project footprint (approximately 16 percent). The project footprint is contained within the study area as noted above.

Wetlands

Wetlands encompass a total area of approximately 6.5 acres, or approximately 21 percent of the study area. The project footprint includes 3 semi-permanently flooded wetland types (1.1 acres), 1 seasonally flooded/saturated type (0.1 acres), 1 seasonally flooded type (0.1 acres), and 4 seasonally saturated types (1.5 acres). Approximately 2.8 acres of wetlands were mapped within the project footprint (approximately

15 percent). The wetlands are characterized as open sedge marshes, grass- and forb-dominated meadows, shrub wetlands dominated by willows (*Salix* species), and forested wetlands dominated by needleleaf (coniferous) trees and mixed needleleaf and broadleaf deciduous trees. Upland portions of the study area support both needleleaf and mixed needleleaf-broadleaf forests. Areas of gravel fill in the study area are extensive and were classified as Upland.

Waters

Six water classes, encompassing a total area of 0.9 acres or 3.0 percent of the study area, were mapped. These included 2 riverine (0.2 acres), 3 lacustrine (0.7 acres), and one palustrine (0.1 acres) area. Approximately 0.2 acres of waters fall within the project footprint (0.9 percent). The waters cover both lotic (active sloughs) and lentic (impounded) waters. The waters types include Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore, Palustrine Permanently Flooded Unconsolidated Bottom, Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom, and Riverine Seasonally Flooded Intermittent Unconsolidated Shore. Of the six waters types mapped in the study area, two do not occur within the project footprint. One of these types, Lacustrine Permanently Flooded Littoral Nonpersistent, occurs only outside the footprint along the eastern shore of Cushman Lake. The other, Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom, represents the waters of Cushman Lake at the end of the middle portion of the swim beach that will be made wheel-chair accessible and compliant with the ADA.

Dominant vegetation in the riverine class included emergent vegetation such as *Hippuris vulgaris* (common mare's-tail), *Schoenoplectus pungens* (common threesquare), and *Equisetum palustre* (marsh horsetail). The Lacustrine Class was a very well developed littoral area with both persistent emergent vegetation and rooted aquatic plants and the presence of obligate wetland plant species such as *S. tabernaemontani* (softstem bulrush) and *Typha latifolia* (broadleaf cattail) that indicate the area is typically flooded. The palustrine class includes a ditch that is likely flooded throughout the growing season in most years, and supports obligate wetland plants such as *S. tabernaemontani* , *E. palustre,* and *Juncus alpinoarticulatus* (northern green rush). Several small isolated depressional features, included as palustrine, were located in the upland forest types lack inflow or outflow, have poor littoral development, and are unvegetated.

Final area of wetland and waters affected environment would be determined during the post-construction analysis with the final as-built drawings.

3.5.2 Environmental Consequences

3.5.2.1 No Build Alternative

Direct and Indirect Effects

Under the No Build Alternative there would be no direct and indirect effects to wetlands or non-wetlands waters.

3.5.2.2 Preferred Alternative

Temporary Construction Effects

Temporary construction effects with the Preferred Alternative could include increased sediment to wetlands and waters from construction and clearing activities. A Storm Water Pollution Prevention Plan (SWPPP) would be prepared prior to construction to mitigate any impacts from sediment. Placement of equipment or movement of construction personnel could impact wetlands that are not within the project footprint resulting in damage to wetland plants.

The installation of culverts and road bed material have the potential to increase temporarily the turbidity of non-wetland waters, such as streams. A temporary diversion berm comprised of plastic sheathing, sand bags, and concrete barrier may be constructed on existing grade in Stream 2 to direct water around the work area for installation of the 48-inch culvert within the slough connecting Cushman and Tanana Lakes. The berm would be removed after the culvert is installed.

The use and staging of machinery outside of the project footprint during construction could damage wetland vegetation and could potentially compress wetland soils temporarily. Access and staging areas would be located within previously-disturbed areas or contained within the limits of clearing and grading. Contractors may also stage from their own equipment yards in the Fairbanks area.

Direct Effects

Impacts on wetlands in the study area as a result of the proposed project improvements will generally fall into several broad categories including (1) direct loss of wetlands from cut and fill work during construction; (2) direct alteration of wetlands in areas adjacent to the new infrastructure from construction activities; and (3) indirect alteration of wetlands adjacent to the new infrastructure from operation and maintenance activities. Direct loss of wetlands will occur as a result of cut and fill construction within the project footprint for the new proposed access road to the swim beach and the motorized boat launch, the construction of new trails and parking lots, and upgrades to the swim beach berm.

Direct alteration of wetlands in the mapping area outside of and adjacent to the project footprint will occur due to disturbance from construction activities. The use and staging of machinery outside of the project footprint during construction could damage wetland vegetation and could potentially compress wetland soils permanently. Approximately 0.2 acres of waters and 2.8 acres of wetlands would be converted to roads or other infrastructure for the project. A Clean Water Act Section 404 permit would be required for the conversion of any jurisdictional wetland habitat to upland habitat resulting from fill and/or discharge to waters of the U.S. Compensatory mitigation would be required as part of the Section 404 permit.

Indirect Effects

The wetlands and waters types occurring outside the footprint are likely to be altered from the operation and maintenance activities described above that will be associated with the new infrastructure. Indirect alteration of wetlands in those areas is likely to occur from use of the new infrastructure. During operation and maintenance of the infrastructure, especially the new access road, fugitive dust deposition may occur and may contribute to the alteration of vegetation in wetlands. Additional alteration to wetland vegetation may occur in areas outside of the project footprint from impounded drainages, drifted snow that can alter hydrologic patterns, and from snow plowing and snow dumping activities that can delay plant phenology during spring and contribute additional road gravel, fines, and contaminants to adjacent wetlands.

The proposed roads and trails would bisect wetlands and streams potentially resulting in effects to wetland functions and degradation of habitat due to impounded water if enough culverts are not installed.

As part of the revised design plans for the project, the extension of South Lathrop St. will be paved which would reduce fugitive dust. Although the extension of Northlake Lane would not be paved, a higher-grade gravel would be used for the road surface that when combined with calcium chloride applications more effectively reduces fugitive dust. There is the potential for PCP from power poles to leach into wetlands and waters (Verbrugge, Kahn and Morton 2018).

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Wetlands and Non-wetland Waters:

Avoidance:

- Delineate work and staging areas, and clearly mark clearance and fill boundaries to avoid accidental impacts from inadvertent access, equipment operation, clearing of, and fill material placement to wetlands and waters, and other habitats.
- Do not store fuel, fuel vehicles, or perform maintenance within 100 feet of water bodies and wetlands.
- Contractor will not place fill material or debris from clearing or construction outside of the designated construction zone.
- Contractor will not clear vegetation or operate equipment outside the designated clearing zone.
- Coordinate with USACE to implement compensatory mitigation to offset unavoidable impacts to wetlands and waters of the U.S. This may include specifying the amount, type, and location of compensatory mitigation, including any out-of-kind compensation, or the intention to use an approved mitigation bank or in-lieu fee program.

Minimization:

- Reduce impacts to wetland and water resources during design to extent practicable.
- Where possible, the embankment will incorporate areas previously impacted by fill placement or off-road vehicle activity.
- Clearing will be selective and the minimum width necessary for project construction and safe operation.
- Road embankment slopes were steepened from 4:1 to 2:1 during the design refinement process, reducing the overall road width from 76 feet to 61 feet, or a 20 percent areal reduction. This would require 8.5 percent less fill material, overall. The steeper slopes are also anticipated to deter off-road vehicle users from leaving the roadway, which leads to erosion and dust impacts.
- Install culverts and drainage mat in wetland areas as appropriate to minimize road effects on natural drainage patterns and to restore hydrologic flow currently impacted by extensive off-road vehicle use.
- Retain native weed-free topsoil for use on site (e.g., restoring disturbed habitats and maintaining native seed stock). Contractor will store native weed-free topsoil at an approved site to be determined prior to clearing and grading.
- Reseed or replant disturbed areas with local native vegetation to the extent practicable.
- When clearing areas where revegetation is desired, cut vegetation flush with the ground to allow passive revegetation of disturbed areas.
- Treat PCP poles offsite and not near waterways or wetlands.
- No cutting, drilling, sanding, or other measures will occur onsite that will cause treated wood sawdust or coating to sluff off into wetlands.
- PCP-treated poles will not be sited in wetlands or waters outside of the new project embankments.
- Implement all regulatory permit mitigation requirements to avoid significant potential impacts.

3.6 VEGETATION, FISH, AND WILDLIFE

The *Biological Resources Survey Report for the Proposed Tanana Lakes Recreation Area Access Improvements: AK FNSB TANANA(1)* is incorporated into this section of the EA. Please refer to Appendix C Biological Resources Survey Report (ABR 2020e), the Biological Resources Impacts and Mitigation Reports (ABR 2020f) and the U.S. Fish and Wildlife Service (USFWS) ESA Species report (USFWS 2021) for more information.

3.6.1 Affected Environment

The purpose of the biological resources study was to review and summarize existing data on biological resources, and complete site-specific field surveys to collect current data on botanical and wildlife resources in the project area. The biological resources study area was approximately 23 acres. Field surveys and mapping for vegetation were conducted in July 2020 for non-native and invasive plant species, and potential occurrence of rare plant species. Field surveys for bald eagle (*Haliaeetus leucocephalus*) nests were conducted in early June 2020. A breeding bird survey was conducted in June 2020 to determine the occurrence and abundance of breeding birds and species of conservation concern. Further information can be found in the Biological Resources Study, Appendix C, of this EA.

Vegetation. Most of the study area is a recreation park consisting of existing roads, other constructed facilities, and undisturbed habitats. Outside of the park, the study area includes existing roads, a railroad crossing, and an existing levee. The landscape is characterized by 16 land cover types and 14 vegetation communities. The vegetated portions of the study area support open broadleaf forests, open mixed white spruce (*Picea glauca*) and paper birch (*Betula neoalaskana*) forest stands, open black spruce (*P. mariana*) and tamarack (*Larix laricina*) forests, low and tall willow (*Salix* spp.) scrub, tall alder (*Alnus incana*) scrub, moist forb and bluejoint grass (*Calamagrostis canadensis*) meadows, and aquatic sedge marshes. Barren/gravel fill was the dominant land cover type (9.49 acres) characteristic of the South Lathrop St. Extension, parking lots, and the swim beach. Open water cover includes a small outlet draining a shrub wetland on the east side of the swim beach, an active slough draining Cushman Lake to the Tanana River, and two small isolated and inundated depressions.

Forest stands occupy the uncleared and undisturbed portions of the study area, with the broadleaf and mixed broadleaf-needleleaf types typically occurring on raised abandoned banks and needleleaf forest types dominant in the low-lying, less well-drained areas. Herb and forb communities occur exclusively on disturbed and often reseeded surfaces, including the fallow field adjacent to South Lathrop St. and the vegetated berm adjacent to the swim beach.

Non-native Plant Species. Nine invasive species are known to occur within the boundaries of the TLRA and at the southern end of South Lathrop St. (Alaska Center for Conservation Science). (Please refer to Appendix C Biological Resources Survey Report, Table 2.) Thirteen non-native plant species were recorded throughout the study area with concentrations around the swim beach parking lot and berm and the fallow field along the western edge of South Lathrop St. Seven high-priority invasive plant species are known to occur in the TLRA and five of these were observed during the survey.

Rare Plant Species. A record search for rare plants within a 100 km radius of the study area resulted in 28 species for which suitable habitat exists in the TLRA; there are no documented records of rare vascular plant species (those with listings of S3 or rarer) in the study area and none were observed during the 2020 field survey.

Wildlife. A list of bird species was compiled using eBird (an online bird observation program created by Cornell Lab of Ornithology; 2020). The eBird database identified 131 bird species composed of 34 waterbirds (waterfowl, loons, grebes, and cranes), 7 seabirds (gulls, terns, and jaegers), 20 shorebirds, 14 raptors (eagles, hawks, falcons, and owls), and 56 landbirds (mostly passerines). Two avian surveys conducted during the breeding season in early June 2020 recorded 34 bird species (3 waterbird, 2 gull, 4 shorebird, 2 raptor, and 23 landbird species). No raptor nests were found during the survey, but an osprey (*Pandion haliaetus*) was observed flying across Cushman Lake adjacent to the swim beach and may be one of a pair that regularly nests on a nest platform along the GVEA Northern Intertie transmission line, approximately 1 mile west of the study area boundary or on a nest platform located 0.5 miles to east of the project site near the racetrack.

Thirty-four mammal species with the potential to occur in the area include 13 species of small mammals (mice, voles, lemmings, and shrews), 2 squirrel species, 1 bat species, 15 furbearer species (including beaver, coyote, and fox), and 3 species of large mammals (including bear), (MacDonald and Cook 2009; UAMN 2020). Wetlands and other waterbodies provide habitat for one amphibian species, wood frog (*Lithobates sylvaticus*). This species was not observed during the survey. The TLRA is connected to the Tanana River, which supports anadromous fish and other native fish species. Wetlands in the study area may support macroinvertebrate species and fish species during flood events. The Tanana River was not within the study area and not part of the biological resources study. Fish surveys were not conducted during the study.

Bald Eagle Survey. No bald eagles or eagle nest platforms were observed in the survey area. Few balsam poplar trees in the study area are large enough to support an eagle nest. The nearest known bald eagle nest, last recorded active in 2004, is located 1.3 km to the southeast from the nearest outer boundary of the survey area. The current status of this nest is unknown.

Breeding Birds. Suitable breeding bird habitat is present throughout the study area. Twenty-six bird species and 111 total birds were recorded during the one-day survey period. Two species, a Boreal chickadee (*Poecile hudsonicus*) and white-crowned sparrow (*Zonotrichia leucophrys*) were observed exhibiting breeding behavior (e.g., carrying food or exhibiting aggressive behaviors consistent with nest/territorial defense).

Endangered Species Act and Special Status Species. No species listed or proposed as endangered or threatened under the Endangered Species Act (ESA) are documented in the study area, and no designated or proposed critical habitat is in the study area (Appendix C ESA Species Report; USFWS 2021). Eight bird species that occur in the study area are species of conservation concern (USFWS 2008). ADF&G lists 42 bird species as at-risk species; twenty-seven of these species are relatively common in abundance in the TLRA study area. The following special status birds were observed in the study area: solitary sandpiper (*Tringa solitaria*), a species of conservation concern by the USFWS (2008) and an at-risk species by ADF&G (2015); lesser yellowlegs (*T. flavipes*), an at-risk species, and blackpoll warblers (*Setophaga striata*), an at-risk species (ADF&G 2015). There are no other federal or state listed species likely to occur in the study area. Please refer to the Appendix C Biological Resources Survey Report for a complete list of avian and mammal species.

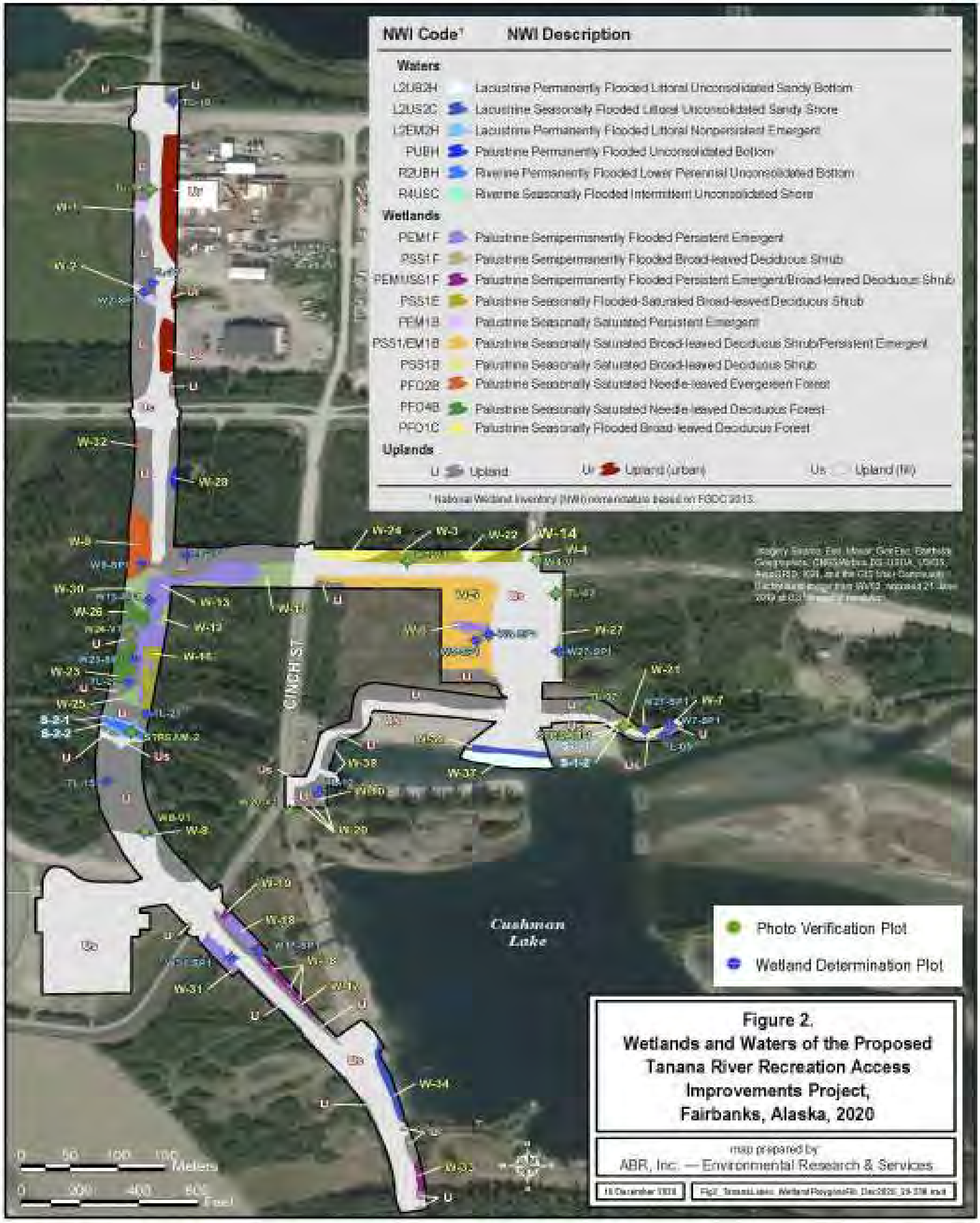


Figure 3-3 – Wetlands and Waters in the study area of the TRRA Improvements Project (ABR 2020a)

Essential Fish Habitat. There is no essential fish habitat (EFH) mapped in the Alaska Anadromous Waters Catalog (AWC) in the project area. However, Alaska recognizes any fish-bearing waterbody as essential fish habitat regardless of species and life stage. Cushman Lake is stocked for recreational fishing purposes but also likely contains native non-stocked species. NMFS considers all freshwaters classified anadromous waters as essential fish habitat but defers to the AWC for classifications. A review of the AWC resulted in chum, coho, Chinook, and sockeye salmon for the Tanana River, chum, and Chinook at the confluence with the Chena River in Fairbanks, and upstream of the mouth of the Chena River on the Tanana, chum salmon. The closest AWC point to the project area lists only chum salmon. Tanana Lake is connected to the Tanana River; however, Cushman and Tanana Lakes are not identified as anadromous waters in the AWC (ADF&G 2021).

3.6.2 Environmental Consequences

3.6.2.1 No Build Alternative

Direct and Indirect Effects

With the No Build Alternative, no construction would be implemented and no direct or indirect effects to vegetation, fish, or wildlife would occur.

3.6.2.2 Preferred Alternative

Temporary Construction Effects

Vegetation. Temporary construction effects related to ground disturbance during construction would be considered low with respect to vegetation. Access and staging areas would be located within previously-disturbed areas or contained within the limits of clearing and grading. Contractors may also stage from their own yards in the Fairbanks area. Some trampling of vegetation would occur on the edges of project footprint but these effects would be considered to have a minimal impact on vegetation and land cover. Furthermore, vegetation along trampled areas would likely recolonize during the following growing season.

Wildlife. During construction of the project, there would be temporary, localized disruption to local wildlife (including special status avian species) due to construction noise and vegetation clearing. Construction of the Preferred Alternative would require the use of heavy equipment typically used for road construction. Increased noise disturbance in the immediate area and up to approximately 0.25 mile from the construction activity would occur; however, the increased noise levels would be temporary, occurring only during construction activities. This disturbance would cause some wildlife to reduce their use of habitat during construction activities and noise from heavy equipment could invoke a startle response causing short-term modification of behaviors or abandonment of habitats. This could result in increased expenditure of energy that would be detrimental to individuals especially during sensitive times of the year, such as breeding and rearing, and could result in wildlife abandoning nests or dens or young potentially resulting in breeding failures or juvenile mortality. The effects would depend upon tolerance levels of species and individuals within species as well as the location of construction activity. Where construction would be adjacent to the Heavy Industrial zones, the impact due to noise and activity would be considered low as wildlife species inhabiting these areas likely would be acclimated to increased noise levels. There would be no temporary construction effects to ESA-listed species and critical habitats as they are not present in FNSB area.

Overall, temporary construction effects related to ground disturbance and noise during construction would be considered low with respect to common wildlife species because abundant habitat is available and noise would be temporary and localized.

Direct Effects

Vegetation. A large portion of the Preferred Alternative would be constructed on previously disturbed land that is part of the TLRA and part of the existing road network north of the levee. The Preferred Alternative would result in permanent conversion or degradation of habitat for vegetation by increasing the area of the road prisms, addition of new roads, construction of a visitor entrance station, construction of overhead power line, and expansion of parking lots and other facilities. The existing roads are approximately 24 feet at South Lathrop St. (with a 1- to 3-foot shoulder) and Northlake Lane is 30 feet wide (with an approximate 15-foot side slope on either side) and will expand to approximately 75 to 100 feet wide (30-foot driving surface and 36 feet on either of side slopes). The project also would result in a small area of permanent conversion of aquatic habitat. Aquatic habitats considered jurisdictional under the Clean Water Act would be mitigated through the permitting process. Approximately 8 acres of vegetation (undeveloped land) would be permanently removed with Low Willow and Open Spruce-Paper Birch as the largest communities affected by permanent conversion. Maintenance requirements for the overhead power line include clearing a radius of 15 feet from utility pole along the entire alignment. With clearing maintenance every five years, this impact is considered permanent direct effect. This increases the acres of vegetation (undeveloped land) permanently removed to approximately 7.5 acres. Effects to plant species and communities would be considered low impact given the rich and abundant availability of habitat within the TLRA and surrounding area. In addition, measures would be implemented during construction to reduce direct effects such as minimizing clearing and grading areas and using only native plant species for planned restoration activities. There were no special status plant species previously recorded or observed during field surveys, thus, no direct effects. Refer to Appendix C Biological Resources Impacts Report for a complete list of affected communities and acreages.

Wildlife. The Preferred Alternative would result in permanent loss of habitat used by wildlife (including special status species). The impact of the loss of habitat would be considered low due to the small size and quality of the habitat lost, the habitat availability in the surrounding area, and conservation areas set aside within the TLRA. Vegetation clearing, grading, and tree removal would be timed outside of the breeding season to minimize impacts to nesting bird species to the maximum extent practicable. Construction activities would take place in habitat for non-special status wildlife species and could result in mortality of individuals of species. In addition, the construction of a new culvert could result in sedimentation and disturbance of aquatic species. However, the culvert would maintain a connection between Cushman Lake and Tanana Lake for aquatic species. Construction activities potentially would remove or disturb nesting habitat for native birds (resulting in nest abandonment and mortality) if clearing and grading activities occur during the breeding season. The impacts to wildlife populations would be considered low due to the abundant wildlife populations in the area, construction on previously disturbed habitat, historic use of area by recreation enthusiasts and the small area of disturbance. The project would not adversely affect bald eagles as no active nests were observed in the project vicinity and measures would be evaluated and implemented if a new nest or eagle activity is observed in the vicinity.

The installation of overhead power lines would result in avian injury or mortality due to collisions with power lines and infrastructure; avian injury or mortality from electrocution; and an increase in wildlife mortality from predation by attracting more predators to new areas. Utility poles provide perching areas for avian predators. Bald eagles and other large birds have a higher risk of electrocution if electrical wires are not spaced appropriately.

ESA and Species of Concern. There would be no direct effects to ESA-listed species because these are currently absent for this part of Interior Alaska. Effects to species of concern would be similar to those effects discussed for wildlife species.

Essential Fish Habitat. Although Tanana Lake and the Tanana River are hydrologically connected, no impacts would be anticipated to Tanana Lake or Tanana River. The Preferred Alternative would have no effect to EFH because the proposed actions would not occur within EFH of the Tanana River.

Indirect Effects

Vegetation. Construction activities could degrade vegetation outside of but adjacent to the project footprint. The loss of habitats that would be converted to a roadway and other improvements or the potential degradation would have a negligible effect on overall vegetation and land cover of the project area. Furthermore, the habitat within the project is of relatively low quality due to the previous and on-going disturbance from recreational activities such as off-the-road vehicle usage, boating, fishing, gravel extraction, and other recreational activities. There is the potential for non-native plants and invasive weeds to be introduced or dispersed from recreational users. The TLRA would continue to implement the Invasive Weed Management Plan and would provide information to visitors to assist in the control invasive species in the area (FNSB 2005). Through public education and implementation of the weed management plan, indirect effects related to invasive plant species would be considered low. In addition, heavy equipment will have to be steam cleaned prior to entry onto project site and material sources be weed free to reduce the potential of introduction of weeds onto the site.

Wildlife. The loss of habitats that would be converted to transportation and other improvements would have a small negligible effect on local wildlife populations given the availability of habitat and abundant wildlife populations of the TLRA and vicinity. Wildlife species would be able to move out of harm's way during construction and operations; however, the potential for vehicle strikes resulting in injury or mortality of individuals on the improved roads would remain. Changes in wildlife activity patterns due to human activity could result in additional energy consumption by individuals and increase predators resulting in mortality of wildlife. The project is within a popular recreation area so many of the effects would be similar to any existing risks to wildlife. PCPs from power poles have the potential to leach into waters potentially affecting fish and wildlife and their habitat (Verbrugge, Kahn and Morton 2018).

ESA and Species of Concern. There would be no indirect effects to ESA-listed species because they are absent for the area. Effects to species of concern would be like those discussed for wildlife species.

Essential Fish Habitat. The Preferred Alternative would have no indirect effect to EFH because the proposed actions would not occur on EFH of the Tanana River. PCPs from power poles have the potential to leach into waters potentially affecting EFH (Verbrugge, Kahn and Morton 2018).

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Vegetation and Wildlife:

- To avoid disturbance impacts to nesting migratory birds and their nests, the Contractor will implement all guidelines including but not limited to, avoiding tree removal, vegetation clearing, and grading during breeding bird season, and implementing pre-construction nest surveys during the breeding bird season in accordance with Land Clearing Timing Guidance for Alaska (USFWS and ADF&G 2009). Nest surveys will be conducted by qualified biologists within 500 feet of the construction limits of disturbance and appropriate avoidance buffers around nests would be marked.

- To avoid disturbance impacts to bald eagle and their nests, the Contractor will implement National Bald Eagle Management Guidelines (2007) including conducting bald eagle nest surveys within ½ mile of construction and monitoring of active bald eagle nests, prior to and during construction as applicable. To avoid disturbing nesting bald eagles, recommendations include (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites.
- Implement APLIC guidelines to prevent collision and electrocution with power line infrastructure. This includes the use of flight diverters, perch guards, and wire covers.
- Implement measures to keep all equipment working in project area free of weed seed.
- Prevent introduction and spread of weeds by using appropriate measures during movement of sand, gravel, borrow, and fill material as well as sourcing weed-free materials.
- Delineate work and staging areas, and clearly mark clearance and fill boundaries to avoid accidental impacts to wetlands, waters, wildlife, and other habitats from inadvertent access, equipment operation, and clearing of and fill material placement.
- Retain native weed free topsoil for use on site (e.g., restoring disturbed habitats and maintaining native seed stock). Contractor will store native weed free topsoil at an approved site to be determined prior to clearing and grading.
- Clear minimum width necessary for project construction and safer operation. Clearing will be selective and limited to upland trees with diameters 4-inches or less to the extent practicable.
- When clearing areas where revegetation is desired, cut vegetation flush with the ground to allow passive revegetation of disturbed areas.
- Maintain good housekeeping and implement all BMPs at construction sites (e.g., keep construction areas free of trash, implement SWPPP).
- Reseed or replant disturbed areas with local native vegetation to the extent practicable.
- Treat PCP poles offsite and not near waterways or wetlands.
- No cutting, drilling, sanding, or other measures will occur onsite that will cause treated wood sawdust or coating to sluff off into wetlands.
- PCP-treated poles will not be sited in wetlands or waters outside of the new project embankments.
- Implement all regulatory permit mitigation requirements to avoid significant potential impacts.

3.7 SOCIAL AND ECONOMIC

3.7.1 Affected Environment

Population and Community. FNSB includes the cities of Fairbanks and North Pole, Fort Wainwright Army Base, Eielson Air Force Base, and surrounding communities. There are no residential communities or residences adjacent to or within proximity of the proposed project.

The FNSB population is estimated at 96,849 (US Census 2019). The City of Fairbanks estimate for 2020 indicates a population of 30,996. The TLRA provides recreational opportunities to the community. TLRA provides outdoor recreation access for underserved neighborhoods of South Fairbanks and South Cushman. In many of the blocks in these neighborhoods, most households are classified as low to moderate income. Languages spoken in the FNSB across all age groups are Only English, 89.9 percent, Spanish, 3.35 percent, Other Indo-European Languages, Asian and Pacific Island Languages and Other

Languages combined, 6.73 percent. No Environmental Justice populations were identified within a 1-mile radius of the TRRA.

Adjacent properties. Most of the land directly adjacent to the north, northeast, and northwest of the area are privately owned industrial lands. Three commercial lots are adjacent to the east side of the proposed South Lathrop St. extension (GWC Properties LLC, Fountainhead Development Incl, and Jose L. Mojica). Landowners of properties to the north of the project include USA, Metro Company, Greater Fairbanks Racing Association, Killion Land Company, Alaska West Express, Northland Wood Products, and other private landowners. Industrial and commercial properties include Golden Heart Utilities Wastewater Treatment Facility, Mitchell Raceway, Alaska West Express operations, and Northland Wood Products retail facility. These properties are separated from the TLRA by the Tanana River Levee. There are no residences adjacent to the TRRA project.

Economy. FNSB has a high percentage of younger and prime working age population that could be attributed to government and educational employment related to military bases (Fort Wainwright and Eielson Air Force Base) and the University of Alaska. Tourism and mining also comprise a large percentage of the commercial activity in the region. The TLRA contributes to the local tourism economy and currently has private businesses for boat rentals, guiding, and dog-sled tours that use park resources. High-use Federal recreation sites and Federal economic generators that are accessed by this project include the TFTA and the TLRA, Bonnifield Trail, and the Tanana River corridor. The TLRA currently has private businesses (for boat rentals, guiding, and dog-sled tours) that use park resources and contribute to the local economy. Improving access will increase use of the area and therefore increase spending on sporting goods and services resulting in a beneficial impact upon local sporting retailer and guide services.

3.7.2 Environmental Consequences

3.7.2.1 No Build Alternative

Direct Effects

The No Build Alternative would not be consistent with the TLRA Master Plan and would not improve access to the community. The No Build Alternative would not affect property access to adjacent properties.

Indirect Effects

The No Build Alternative could limit the economic growth of Fairbanks from tourism and recreational businesses that use the TLRA.

3.7.2.2 Preferred Alternative

Temporary Construction Effects

During construction, adjacent businesses and park visitors may experience brief traffic delays on the South Lathrop St. improvements north of the levee and within the park. Project construction would provide short-term construction-related employment which could result in an economic boost to residents of the community. Construction may temporarily close facilities such as restrooms and parking lots. These effects are expected to be short in duration.

Direct Effects

There are no residential uses in or adjacent to the project area. The project would not result in displacement of businesses and residences. This project would improve the transportation network to support the community's economic goals by providing better access for hunting, fishing, and other recreation activities. The improvements proposed with this project will enhance access to these areas by providing a more direct and accommodating route from the community as well as amenities like restrooms, better parking, and ADA accessible pathways. The project is consistent with the TLRA Master Plan which was developed with significant public involvement.

This project serves all manners of recreationists who wish to more conveniently and safely access the TLRA, the Tanana River, and the TFTA. The boat launch is very popular for hunting and boating access to the Tanana Flats. This facility is especially serving of mobility-impaired recreationists with its unparalleled ADA compliant access to the lakes and Tanana River. The TLRA also provides outdoor recreation access for underserved neighborhoods of South Fairbanks and South Cushman. In many of the blocks in these neighborhoods, most households are classified as low to moderate income. The TLRA, the Tanana River and the TFTA provide unique and vital opportunities for the greater Fairbanks and Alaska communities. This project will help realize the full potential of these special places.

The ADA-compliant pathways, access, and road connections to the surrounding community are supported by the Eielson Air Force Base Regional Growth Plan's recommended strategy to "continue to work with landowners and developers to establish designated recreation areas, including creating and preserving access to trails and recreation from residential areas" in order to strengthen community-military partnerships. These improvements are also supported by Action 6.6 in the Alaska Statewide Long-Range Transportation Plan, *Let's Keep Moving 2036* (AKDOT&PF 2016) that states facilities shall "incorporate the needs of the mobility-impaired in facility design to develop a transportation system that is accessible by all Alaskans."

Indirect Effects

Private businesses currently use the TLRA for boat rentals, guiding, and dog-sled tours that contribute to the local economy. Improving access to this area would increase use of the area and therefore increase spending on recreational goods and services resulting in a beneficial impact to the local economy. The local neighborhood would benefit by providing more convenient access into a popular recreation area and increase exposure to nearby businesses by visitors from the greater Fairbanks area and other areas (AFLAP 2019).

There is potential to improve neighborhood character and stability by reducing the illegal activities, such as dumping, in the TLRA and vicinity. The TRRA Improvements Project may indirectly improve the commercial/industrial area along South Lathrop St. with the increased exposure to businesses in the area, particularly those related to recreational and tourism activities. The project would also be anticipated to improve access to the TLRA from nearby neighborhoods (approximately 1.25 miles away).

Mitigation Measures

No adverse impacts are expected to result from the Preferred Alternative; however, the following mitigation measures would facilitate ongoing public involvement and public education and would avoid and minimize impacts to the public.

- Continue coordination and outreach with interested stakeholders using multimedia platforms (e.g., newspapers, radio, websites, and virtual meetings).
- Communicate construction schedule, traffic, and access notifications to the public in advance using public notices, signage, and TLRA information boards.

3.8 SOILS AND GEOLOGY

3.8.1 Affected Environment

Fairbanks is located approximately 100 miles south of the Arctic Circle in the Tanana River Valley. The terrain of the Tanana Valley is characterized as flat to undulating, marked by abandoned river channels, depressions, levees, and gravel pits. The elevation range within the TRRA project area ranges from 420 feet to 440 feet in elevation above mean sea level. Permafrost, generally absent from under rivers and lakes, is present in floodplain sediments (Péwé 1993). Soils of the Tanana Valley are predominantly alluvial deposits ranging from several inches to more than 128 feet thick. Soils within the project area are classified as a mosaic of Eielson fine sandy loam, Eielson/Piledriver complex, Tanana mucky silt loam, Tanana/Mosquito complex, and riverwash (U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) 2020). Gravel deposits along the Tanana River occur up to 154 feet thick and are significant reservoirs for groundwater. The gravel deposits along the portion of the Tanana River within and near the TLRA are ideal for extraction. Gravels previously extracted from this area have been characterized by a grain-size distribution suitable for landfill daily cover or cell construction material and generally "clean" or free of contaminants.

There are several earthquake faults in the Fairbanks region that are considered active (Péwé 1993). The largest, the Denali Fault, is approximately 80 miles south of Fairbanks.

3.8.2 Environmental Consequences

3.8.2.1 No Build Alternative

Direct and Indirect Effects

The No Build Alternative would not result in direct effects or indirect effects because this alternative avoids disruption to the local soils and geology that would be caused by clearing and grading, excavation, and filling of depressions (such as wetlands) and the operation of heavy machinery.

3.8.2.2 Preferred Alternative

Temporary Construction Effects

Construction of the Preferred Alternative could require long linear cut and fill slopes, retaining walls, and stream crossings through currently undeveloped areas of the TLRA that would disturb the existing soils and permafrost layer. Exposed areas of fresh cuts, grading and fills would be subject to erosion. However, the implementation of sediment and erosion control BMPs would be installed before and during the construction and after construction to limit effects of erosion until vegetation is established.

Direct Effects

Clearing of existing vegetation within the Preferred Alternative alignment would have an impact on the erosion and drainage capabilities of the surface soils, but these issues would be mitigated throughout the design process and with the implementation of BMPs, to avoid or limit impacts on soils and geology. The Preferred Alternative would have low and localized impacts to soils and geology of the area primarily in the areas of the project where new roads are constructed or existing roads widened and improved.

Indirect Effect

The Preferred Alternative would construct new roads and improve existing roads and facilities; these activities would have negligible potential indirect effects to the soils and geology of the area because much of the TRRA project would be built on previously disturbed areas with only a small area affecting undeveloped habitat, approximately 8 acres.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Soils and Geology:

- Design and implement erosion and sediment control measures prior to beginning construction. Maintain these erosion and sediment control measures throughout the entire construction phase, regardless of season until vegetation is established. These could include slope protection, erosion, surface water drainage, sediment containment, covering stockpiled materials and construction hauling techniques.
- Retain native weed free topsoil for use on site (e.g., restoring disturbed habitats and maintaining native seed stock). Contractor will store native weed free topsoil at an approved site to be determined prior to clearing and grading.
- Reseed or replant disturbed areas with local native vegetation to the extent practicable to improve the revegetation rate and soil stabilization.
- The project will reuse existing road base material to the extent practicable.
- Store materials (e.g., soil, sand, gravel, vegetation, etc.) at an approved site to be determined prior to construction activities. This includes all materials used for construction and materials to be disposed of (e.g., cleared vegetation) at an approved disposal site.
- Implement all regulatory permit mitigation requirements to avoid significant potential impacts.

3.9 CULTURAL RESOURCES

The *Cultural Resources Literature Review and Field Survey Report for Tanana River Recreation Access Improvements Project WFLHD Project Number: AK FNSB TANANA (1)* (SRB&A 2020) is incorporated into this section of the EA.

3.9.1 Affected Environment

FHWA, as the lead federal agency for the project, defined the Study Area for the proposed project as consisting of a one-mile radius around the Project Area of Potential Effects (APE). The FHWA has defined the APEs for the proposed project to consist of the area within 75 feet on each side of proposed road centerlines, the area within 25 feet on each side of proposed trail improvement centerlines, 25 feet around the proposed parking expansion and improvement areas, and 50 feet around proposed restroom upgrades.

Athabascan bands and groups have been present in the area now known as the Fairbanks North Star Borough for many centuries. Historic uses of the Tanana River Valley include subsistence uses. Each band's subsistence activities were dependent on the availability of food resources but consisted mainly of hunting, snaring, and fishing. The proposed project would improve access to federal lands for subsistence use.

A review of the Alaska Heritage Resource Survey (AHRS) to identify previous cultural resources surveys conducted in the study area or APE of the proposed project indicated that no previous surveys have occurred within the study area. A review of the AHRS for any previously documented sites within the study area and APE of the proposed project and did not identify any sites.

Between July 21 and 23, 2020, Steven R. Braund & Associates (SRB&A) conducted a pedestrian survey of the APE which revealed that, overall, the APE has a very low likelihood of containing intact archaeological deposits due to its geographic position within the active floodplain of the Tanana River, and likewise has a low potential of containing intact historic resources due to the extensive disturbance of the area resulting from natural (e.g., seasonal flooding) processes. In addition to the geographic and environmental characteristics of the APE that do not support the preservation of archaeological materials and/or historic features. The TLRA clearly has been subject to large-scale mechanized landscape modifications in the recent past (e.g., gravel mining, earthen berm, and flood control construction, clearing, grading, and extensive filling), possibly associated with the construction of the TLRA itself. The general location has been heavily used in modern times as a recreational area, and modern debris and refuse (e.g., plastic bottles and jugs, discarded appliances, and dimensional lumber fragments) were noted throughout the APE.

The field investigation did not result in the identification of any high potential areas for intensive archaeological investigation or extensive subsurface testing, and no previously-undocumented cultural resource sites were identified during fieldwork. In general, the TLRA APEs are all either located in areas of extensive previous disturbance or modification, or located in areas of low archaeological and historic potential due to saturated ground and/or standing water within a dynamic riverine environment subject to seasonal flooding episodes and a high-water table. The presence of substantial amounts of gravel fill used to construct the modern TLRA components supports this assessment, and it is unlikely that unidentified intact archaeological deposits or historic structures or sites are present within the APEs.

In November 2020, the project was modified to include additional paving and electrical utility installation within the existing roadbeds and parking area. The revised APE included the expansion of the existing parking area and beach access at Cushman Lake, upgrades to the existing boat launch parking area at Tanana Lake, extension of the APE along an existing road for access improvements to the restroom upgrade along the southwestern shore of Cushman Lake, and very minor adjustments to the alignments of the South Lathrop St. and Northlake Lane extension. All other areas included in the revised APE are located within the boundary of the original Project APE. Based on the results of the July field pedestrian and windshield survey, which did not identify any undocumented cultural resources, SRB&A considers the areas within the revised APE to have low potential for previously undocumented archaeological or historic resources.

3.9.2 Environmental Consequences

3.9.2.1 No Build Alternative

Direct Effects and Indirect Effects

The No Build Alternative would have no direct or indirect effects to historic or archaeological resources because there would be no change of existing conditions.

3.9.2.2 Preferred Alternative

Temporary Construction Effects

The Preferred Alternative would have no temporary effect to cultural resources because research and field investigation did not result in the identification of any resources eligible for listing in the National Register of Historic Places (Register) and no previously undocumented cultural resource sites were identified during fieldwork. Although no cultural resources were identified, there is always a possibility that unanticipated resources will be found through ground disturbance.

Direct Effects

The Preferred Alternative would have no direct effect to cultural resources because TLRA APEs are all either located in areas of extensive previous disturbance or modification, or are in areas of low archaeological and historic potential due to saturated ground and/or standing water within a dynamic riverine environment subject to seasonal flooding episodes and a high-water table. The presence of substantial amounts of gravel fill used to construct the modern TLRA components supports this assessment, and it is unlikely that unidentified intact archaeological deposits or historic structures or sites are present within the APEs. No historical properties would be affected by the proposed project under Section 106.

Indirect Effects

The Preferred Alternative would have no indirect effects to cultural resources.

Mitigation Measures

The following mitigation measure will be implemented to minimize potential impacts of the Preferred Alternative to cultural resources:

- Should unidentified archaeological resources or human remains be discovered during the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with Alaska SHPO, and pending further recommendation from the FHWA in consultation with the Alaska Office of History and Archaeology (OHA). Please note that some sites can be deeply buried and that fossils are considered cultural resources subject to the Alaska Historic Preservation Act.

3.10 AIR QUALITY, NOISE AND ENERGY

3.10.1 Affected Environment

3.10.1.1 Air Quality

The TLRA is located within the Fairbanks Air Quality Zone and within an area of the FNSB that was designated as a PM2.5 nonattainment area in December 2009. The U.S. Environmental Protection Agency (EPA) National Ambient Air Quality Standards (NAAQS) designate six principal criteria pollutants and particulate matter (PM) is one of them. Particulate pollution includes a complex mixture of both solid particles and liquid droplets found in the air with sources from all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. Major contributors to particulate emissions include solid fuel burning (e.g., wood) and heating fuel burning (e.g., oil). Other sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads (ADEC 2019). As of May 2017, the EPA determined the area “Failed to Attain” and reclassified the area as “Serious”. Although the FNSB showed improvements at all monitoring stations, FNSB applied for a five-year extension to achieve compliance with the FNSB Serious Area Attainment Plan (conformity with the plan was due 2019). The Serious State Implementation Plan was adopted on November 19, 2019 (ADEC 2019).

Regulations governing transportation conformity are found in Title 40 of the Code of Federal Regulations (40 CFR Parts 51 and 93). Transportation conformity ("conformity") is a way to ensure that Federal funding and approval goes to those transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, Transportation Improvement Programs (TIP), and projects funded or approved by the FHWA or the Federal Transit Administration in areas that do not meet or previously have not met air quality standards for ozone, carbon monoxide, PM, or nitrogen dioxide. These areas are known as "nonattainment areas" or "maintenance areas," respectively.

3.10.1.2 Noise

Ambient noise levels are consistent with a recreational use area that includes a rifle range, motorized vehicle use, including off-road vehicle use and motorized and non-motorized boat use. Adjacent properties also contribute to the ambient noise levels associated with heavy industrial land use. There are no residential noise receptors in the project vicinity.

3.10.1.3 Energy

Energy use in the project area is primarily from fuel consumed by vehicles traveling to the park's existing entrance and within the TLRA, as well as road maintenance activities within the park. Overhead power lines would increase energy expenditures; however, this would be a minor increase (approximately 7.2 kV power line). Bringing power to the TLRA would benefit the management and use by powering headbolt heaters for vehicles and the entrance station.

3.10.2 Environmental Consequences

3.10.2.1 No Build Alternative

Direct Effects and Indirect Effects

There would be no direct or indirect effects to noise, or energy resources under the No Build Alternative because no construction would be implemented. The existing roads would continue to contribute to fugitive dust conditions of the TLRA and, without the project road improvements, air quality conditions would continue.

3.10.2.2 Preferred Alternative

Temporary Construction Effects

Construction of the Preferred Alternative would result in temporary adverse effects to air quality, primarily from dust and vehicle emissions. Earthwork activities, such as land clearing and ground excavation, could result in the generation of dust associated with the movement of dirt. Construction vehicle and equipment emissions would also occur along the project area during construction. These effects would be localized, temporary in nature, and would not result in violations of air quality standards.

Air Quality. Fairbanks is particularly susceptible to air quality problems during the winter due to increased heating requirements combined with temperature inversions during cold weather. Surrounded by hills on three sides, temperature inversions can trap a layer of cold air close to the ground. Even relatively small amounts of pollution can accumulate to unacceptable levels over periods of days or even weeks at a time. Most of the PM2.5 in Fairbanks is thought to be generated by combustion of fuel and wood for heat, electricity, and transportation. Typical PM2.5 sources include power plants, vehicles, wood burning stoves, and wildland fires. Construction of this project would occur during the summer, when cold air inversions do not occur. The exhaust and dust produced during construction would be temporary in nature and a one-time occurrence; this is not the situation with the current PM2.5 nonattainment issue, which is seasonal and chronic.

Noise. Noise levels may be higher during construction, especially in undisturbed habitats that would be cleared and graded for construction of roads, than the ambient noise level. The Preferred Alternative would generate the highest and most prevalent construction noise levels during earthwork activities and hauling of materials. Construction noise levels typically would decrease at a rate of 6 to 8 decibels per doubling of distance from the source. Temporary effects of noise would be considered low given the project would be in high industrial use areas and in proximity to gravel extraction facilities within the TLRA.

Energy. Energy use under the Preferred Alternative would result in short-term construction effects due to energy consumed by vehicles and equipment used for construction.

Direct Effects

Air quality. The Preferred Alternative would reduce vehicle emissions by reducing trip distances to the new entrance by approximately 1.25 miles from the City of Fairbanks. Vehicle miles traveled by visitors outside of Fairbanks would be reduced because the new entrance is closer to Mitchell Expressway, a major highway. The project would also improve the roads in the park and minimize the existing fugitive dust conditions related to existing rough, dusty gravel roads by paving and improving the new and existing roads. Potential air quality affects from an increase in user capacity would be offset by road improvements and a reduction in vehicle miles traveled.

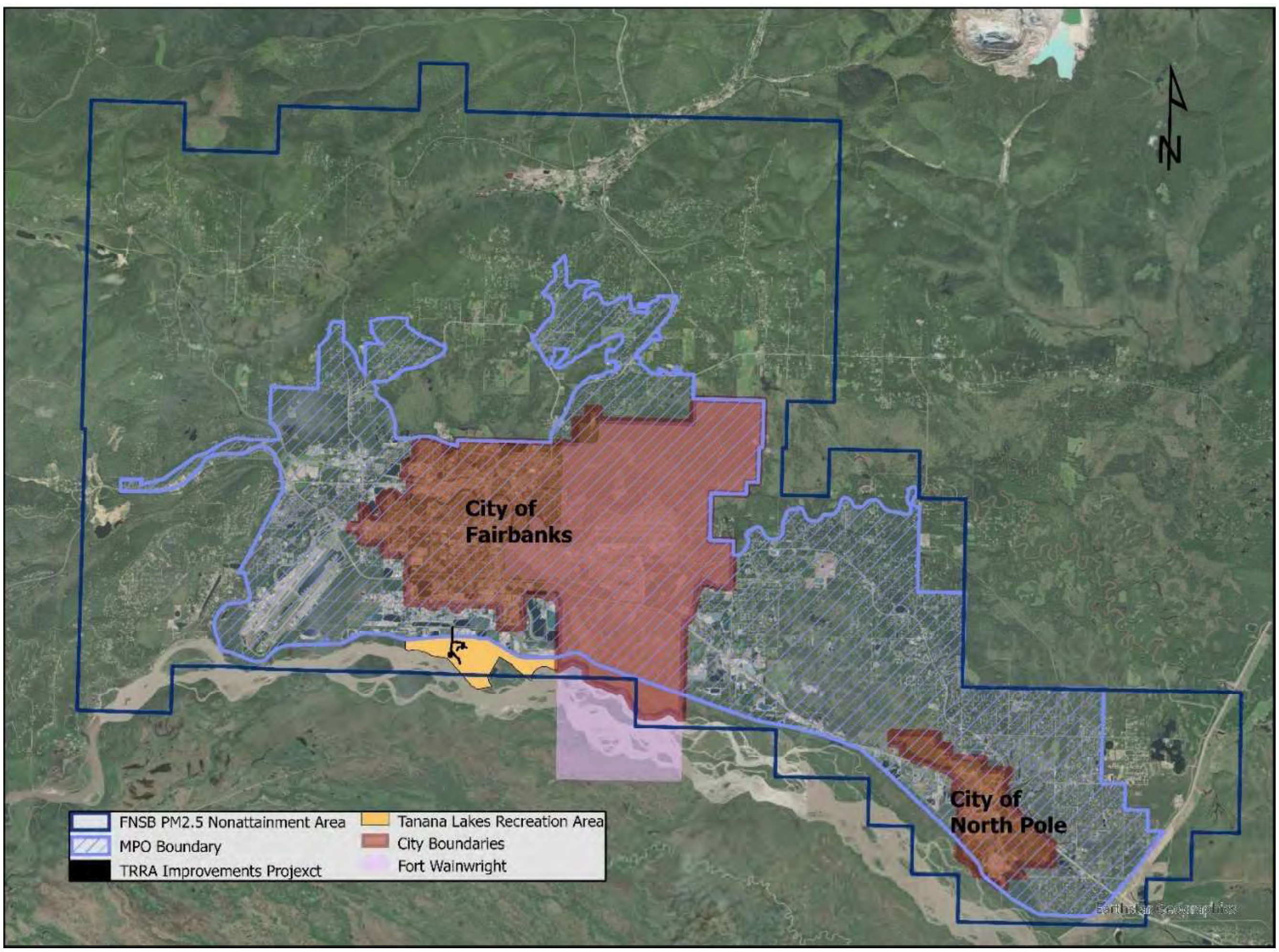


Figure 3-4 – The figure shows the boundaries of the MPO, PM2.5 Nonattainment Area, and project location.

Transportation Conformity

The EPA designated Fairbanks, Alaska as a nonattainment area for the 2006 PM2.5 standard, effective December 14, 2009[4]. Conformity for the PM2.5 standard applies one year after the effective date (December 14, 2010). EPA published the Transportation Conformity Rule PM2.5 and PM10 Amendments on March 24, 2010; the rule became effective on April 23, 2010[5]. This PM Amendments Final Rule amends the conformity regulation to address the 2006 PM2.5 NAAQS.

The TRRA Improvements Project is in the Fairbanks PM 2.5 nonattainment area. As such, the project is required to meet Transportation Conformity Rule requirements found in 40 CFR Part 93.

Fairbanks Area Surface Transportation (FAST) Planning is the Metropolitan Planning Organization (MPO) for the urbanized areas of the FNSB, including the cities of North Pole and Fairbanks. The TRRA Improvements Project, while located just beyond the southern boundary of the MPO area, is within the same PM 2.5 nonattainment area as the MPO, also known as the "donut area" (Figure 3-4). The TRRA Improvements Project was included in the regional emissions analysis for the FAST Planning 2045 Regional Transportation Plan (RTP). On January 30, 2019 the FHWA approved a conformity determination for the FAST 2045 RTP. The TRRA Improvements Project design for the Recommended Preferred Alternative has not changed significantly from what is included the FAST RTP and TIP.

An interagency consultation meeting on the TRRA Improvements Project was held on March 3, 2021. During the meeting the interagency consultation partners concurred that the project was not of local air quality concern and therefore no hot-spot analysis was required. A summary of the meeting is available in Appendix D.

The TRRA Improvements Project will not create any new violations, or increase the severity or number of violations, or delay timely attainment of the national ambient air quality standards. FHWA finds that the TRRA Improvements Project conforms with the SIP in accordance with 40 CFR 93.

Noise. Overall, the noise levels are not likely to increase in the TLRA which is a heavily-used recreation area. Although noise may be redirected to new areas associated with the new entrance, there are no new noise receptors, including no residential areas. In addition, the new entrance road passes through Heavy Industrial areas north of the levee.

Energy. The Preferred Alternative would reduce the travel distance to the entrance of the park by approximately 1.25 miles from the City of Fairbanks. The project would reduce vehicle travel distance within the park to popular park amenities; therefore, the project may result in positive effects to fuel and energy consumption.

Indirect Effects

This shift in vehicle volumes from the east entrance to the new South Lathrop St. entrance would result in minor changes in the location of vehicle emissions; however, this would not be expected to result in

[4] *The PM2.5 nonattainment area includes Fairbanks, the Goldstream Valley area to the north, and the North Pole area to the southeast.*

[5] *U.S. Environmental Protection Agency, 2010. 40 CFR Part 93. "Transportation Conformity Rule PM2.5 and PM10 Amendments; Final Rule." Federal Register, March 24, 2010, Vol. 75, No. 56, p. 14260.*

measurable long-term changes in the local and regional air quality because any increase in visitation would be offset by reduced vehicle miles traveled and reduced fugitive dust once roads are paved.

Mitigation Measures

No long-term adverse air quality effects are expected; however, during construction, the following BMPs and mitigation measures would be implemented to avoid and minimize temporary effects of the Preferred Alternative to air quality, noise, and energy:

- All equipment would have sound control devices no less effective than those provided on the original equipment. All equipment would have muffled exhaust.
- All equipment would comply with relevant noise standards of the EPA.
- Use of plant-based, organic tackifiers or water to control dust in the clearing of land and road grading and on unpaved roads, material stockpiles, and other surfaces which can create airborne dust.
- Fully or partially enclose material stockpiles in cases where application of tackifiers is not sufficient to prevent PM from becoming airborne.
- Cover open-bodied trucks transporting materials that could become airborne when in motion.
- Promptly remove materials from paved streets that have the potential to become airborne.
- Operate all equipment in accordance with manufacturer's recommendations to minimize emissions.
- Shut down idling heavy equipment when not in use.

Since there would be no significant long-term changes to noise levels in the project area from vehicles using the new entrance, no noise mitigation measures would be needed for the Preferred Alternative. To minimize temporary higher noise levels during construction, all construction vehicles and equipment would be required to comply with FHWA's standard noise mitigation measures.

No energy mitigation measures would be required or proposed for the Preferred Alternative.

3.11 VISUAL QUALITY

3.11.1 Affected Environment

The project area is not part of a state or federal scenic route or designated as a National Wild and Scenic River. The project area is located within an existing recreation area on the northern edge of the Tanana-Kuskokwim Lowland on the northern bank of the Tanana River, a scenic riparian corridor of Interior Alaska. The project area additionally consists of a mosaic of surface water bodies and land, which makes the area well suited for both water-based recreation and land-based recreation.

3.11.2 Environmental Consequences

3.11.2.1 No Build Alternative

Direct Effects and Indirect Effects.

The No Build Alternative would result in no change to the visual quality of the project area. Therefore, there would be no direct or indirect effects.

3.11.2.2 Preferred Alternative

Temporary Construction Effects

Temporary closures of the TLRA and the presence of construction activities would have temporary localized effects to visual quality. The effects would be considered low to moderate for users of the TLRA.

Direct Effects

The Preferred Alternative constructs new roads and amenities in an existing recreation area. Changes to visual quality would be minimal in relation to the existing landscape, which has been heavily modified by industrial and recreational uses. Approximately 8 acres of undeveloped land would be converted to transportation infrastructure. The area north of the levee would experience widening of the road for a short distance which would have a low effect to the visual quality of the local area. The project is also located within a heavy industrial area. Given the highly modified landscape, existing levee and groins, industrial and recreation facilities, direct effects of the project would be considered very low. In fact, the project would enhance the scenic experience of bicyclists, pedestrians, and other users of the TLRA by providing an enhanced and safer transportation network.

The addition of utility poles would be inconsistent with the character of the immediate landscape; however, the impact likely would be a short-term, adverse impact limited to the area of the TRRA Improvements Project. Impacts to visual quality from overhead power lines would be negative because there are no power lines or poles in the TLRA currently but insignificant because the area is already modified by human development.

Indirect Effects

The project would facilitate the future expansion of the TLRA to other undisturbed habitats. However, the indirect effects would be considered low in relation to the vast area of scenic value remaining in the TLRA.

Mitigation Measures

The following mitigation measures would be implemented to avoid, minimize, and mitigate impacts of the Preferred Alternative to Visual Quality:

- Reseed or replant disturbed areas with local native vegetation to the extent practicable.

3.12 Hazardous Materials

This section describes the potential impacts of the TRRA project from hazardous materials and spills. This section is based on the *Phase I Environmental Site Assessment. Tanana River Recreation Access Report* (Shannon and Wilson 2020).

3.12.1 Affected Environment

Prior to its conversion to a recreation area, TLRA was an unmanaged natural area often used for illegal activities like trash-dumping, burning cars, shooting, and criminal activities. A Phase I Environmental Site Assessment field reconnaissance was conducted on July 30, 2020. Evidence of illegal dumping of small amounts of household trash, small car parts, appliances, and miscellaneous debris were along roadways, primarily in the unimproved southern extent of South Lathrop St. south of the Tanana Levee (Shannon and Wilson 2020). No hazardous materials were observed in the study area during the field reconnaissance.

A review of the National Priorities List (NPL), those properties assigned the EPA's highest cleanup priority, found no listed NPL sites for the property or within a one-mile radius of the property. Areas surrounding the project are used for commercial and industrial purposes that may affect the TRRA project, including the TLRA. Some of these sites appear on the ADEC Contaminated Sites Database but do not meet the definition of a Recognized Environmental Condition (REC) for the project (Shannon & Wilson 2020). However, there may be RECs associated with the study area and with nearby properties that have the potential to impact the TLRA (Shannon and Wilson 2020). No locations of concern were observed or otherwise identified within the TLRA but properties adjacent to the project have the potential for releases to the project area and the TLRA. These include active and/or abandoned above- or below-ground heating oil storage tanks located on the property or adjoining properties; potential leaks, drips, and spills originating from vehicles or heavy equipment; potential releases of hazardous materials and petroleum products originating from illicit dumping of abandoned vehicle and miscellaneous debris. Potential for contaminant releases from current use of the properties along South Lathrop St. include wholesale chemical distributor and an auto body shop (Shannon & Wilson 2020).

3.12.2 Environmental Consequences

3.12.2.1 No Build Alternative

Direct and Indirect Effects

The No Build Alternative would not be expected to have a direct or indirect effect on the release of hazardous materials into the environment because no known hazardous materials were identified within the project area and no construction activities that could result in an incidental release would take place.

3.12.2.2 Preferred Alternative

Temporary Construction Effects

Prior to the development of the TLRA, the area was used for illegal activities and illegal dumping. Although the area was cleaned prior to the development, the potential for hazardous materials disturbance or release during construction remains. Any release to the environment during construction has the potential to adversely affect the health and safety of construction workers. Construction activities may result in release of hazardous materials should BMPs fail. Potential releases associated with construction include solvents and motor and lubricating oils. ADEC regulations for accidental spills of hazardous materials would be followed for any spills that occur. Together with proposed mitigation measures, effects to the environment would be low.

Direct Effects

As there are no known hazardous materials in the project area, the Preferred Alternative would have no direct effect on the release of hazardous materials into the environment. While there are no known hazardous materials in the study area, there is the potential for hazardous materials to be found.

Indirect Effects

The project would introduce a new entrance road and redirect user traffic to this new entrance as well as accommodate an increase in TLRA users. This has the potential to introduce leaks, drips, and spills from vehicles. In addition, there is the potential for hazardous materials releases that originated from historic illicit dumping and illegal activities on the project area during construction. Pole mounted transformers have the potential leak oil.

Mitigation Measures

The following mitigation measures are required by the FHWA to avoid, minimize, and mitigate impacts of hazardous materials during the construction of the Preferred Alternative:

- The contractor would prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan during construction.
- If unexpected contamination is encountered during construction, all work in the contaminated area would be halted and the contracting officer contacted immediately.
- All contaminated material will be handled and disposed of in accordance with ADEC regulations.

3.13 CUMULATIVE OR INTERRELATED EFFECTS

Cumulative effects are defined as effects which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period (40 CFR § 1508.7).

The scope of a cumulative effects analysis is related to the magnitude of the impacts of the proposed action. If a project does not have permanent adverse impacts on a particular resource, the project cannot contribute to cumulative effects on that specific resource. Only those resources with permanent adverse impacts are discussed in this section.

Past actions that have had the most measurable effect on the project area include implementation of the TLRA Master Plan and amendments such as the development of roads, picnic areas, and the swim beach and continued gravel extraction operations. Currently, there are no known planned future public projects in the vicinity of the TLRA, including the TFTA. Future development and expansion of the TLRA is planned in accordance with the existing regional plans and the TLRA Master Plan. These include additional recreation facilities such as an archery range, frisbee golf park, ice skating, ski loop trail, and an equestrian park and trail system. Future site development of the TLRA would be dependent upon funding. While the Preferred Alternative would facilitate future development of the TLRA, these effects combined with past and future development would have no cumulative effects to the following resources: Transportation, Land Use, Social, Environmental Justice, Economic and Community, Noise, Soils and Geology, Air Quality, Noise, Visual Quality, and Hazardous Materials. Therefore, these resources are not analyzed further.

3.13.1 No Build Alternative

Effects of the No Build Alternative when combined with past, present, and reasonably foreseeable future actions are not expected to adversely affect resources described above.

3.13.2 Preferred Alternative

Water resources, water quality, and floodplains. The greatest impacts to the floodplain are from past construction of a flood control levee that is protected by a series of groins extending from the levee to the bank of the Tanana River. Past, present, and future use of the TLRA could result in cumulative effects to water quality but with the implementation of mitigation measures and BMPs any effects would be low. Combined with past, present, and reasonably foreseeable future actions, the Preferred Alternative would not be expected to significantly contribute to cumulative effects to water resources, water quality and floodplains.

Wetlands. Past activities in the project area have impacted wetlands through ground-disturbing and development activities, though most of the land outside of the TLRA remains undisturbed (except for Fairbanks and other cities). Future development plans are identified in the TLRA Master Plan (FNSB 2007). These future developments could impact wetlands (except for areas identified as conservation areas). The proposed project and future development would increase access to the TLRA that could in turn facilitate the spread of invasive wetland plant species from within and outside the project corridor. Combined with past, present, and reasonably foreseeable future actions, the Preferred Alternative would not be expected to significantly contribute to cumulative effects to wetlands.

Fish, Wildlife, and Vegetation. The TLRA covers 980 acres consisting of approximately 900 acres of wetland, water forest, and other habitats that is surrounded by thousands of acres of undeveloped land/natural habitat. The current developed land within the TLRA is approximately 70 acres (including roads, levee system, parking lots, and trails). The 18.5-acre project footprint includes the development of approximately 8 acres of undeveloped land (habitat). The TRRA would facilitate future planned development; however, the proposed and existing development is small, approximately 7.7 percent, of the recreation area. Future development as noted in the Master Plan could develop an additional approximately 160 acres (not including proposed new roads). This would leave approximately 745 acres of undeveloped land (of 980 acres). Additionally, mitigation measures would be implemented to avoid and minimize effects. Combined with past, present, and reasonably foreseeable future actions, the Preferred Alternative would not be expected to significantly contribute to cumulative effects to fish, wildlife, and vegetation.

3.14 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitment of resources refers to impacts on or losses to resources that cannot be recovered or reversed. An irreversible commitment is an impact to a resource that cannot be regained, such as the extinction of a species or loss of cultural resources. An irretrievable commitment is and impact on a resource that is lost for a period, such as the loss of agricultural production or use of renewable resources. Labor and fossil fuels would be consumed during operation of construction equipment for grading, material movement, and construction activities. In addition, labor and natural resources would be used in the fabrication and preparation of construction materials. Construction would also require an expenditure of federal funds that could not be used for any other projects.

3.15 Section 4(f) and Section 6(f) Evaluation

The U.S. Department of Transportation (USDOT) Act of 1966 includes a special provision, Section 4(f), which stipulates that the FHWA and other USDOT agencies may not grant approval for a project if it uses land that is a publicly-owned park, recreation area, wildlife and waterfowl refuge, or any significant historic site unless: 1) there is no prudent and feasible alternative to the use of such land, and 2) any such program or project includes all possible planning to minimize harm to these resources.

Section 4(f) applies to the TRRA project, because there is a use of the 4(f) property (the TLRA). As it applies to the project, the use is the permanent incorporation of TLRA land into a transportation facility, specifically the South Lathrop St. extension and the new Northlake Lane Extension.

A Section 4(f) Net Benefit Programmatic Evaluation (Appendix E) was issued for the proposed project. In order to qualify, a "net benefit" is achieved when the transportation use, the measures to minimize harm, and the mitigation incorporated into the project results in an overall enhancement of the Section 4(f) property when compared to the future No Build Alternative, the avoidance alternatives, and the present condition of the Section 4(f) property, considering the activities, features, and attributes that qualify the property for Section 4(f) protection.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 applies to projects, regardless of funding source, that cause impacts to any public park, recreation area, or facility acquired or developed with LWCF. The LWCF Act of 1965 (Public Law 88-578, which is codified as 16 USC 460), provides funding for parks and recreational facilities across the United States. Section 6(f)(3) of the LWCF Act, hereinafter referred to as Section 6(f), contains provisions to protect federal investments in park and recreation resources and to ensure that the public outdoor recreation benefits achieved via the use of these funds are maintained.

The following LWCF Section 6(f) properties are within the TLRA listed by LWCF Reference Number, Tax Lot, and Parcel Number, respectively: 02-00392, 2709, 171654; 02-00404, 2702, 171565, and 02-00413, 2707, 171620. There are no affected Section 6(f) properties within the project area. Therefore, a Section 6(f) evaluation is not warranted because the project would not impact Section 6(f) properties of the TLRA and would not convert existing recreational use lands of the TLRA to any other land use.

4 Consultation and Coordination

This section describes the consultation and coordination activities implemented during the environmental review process with potential project stakeholders, including local, state, and agencies, tribes, and the public. The purpose of consultation and coordination is to ensure public awareness and understanding of the project, gain input of potentially affected interests, and appropriately consider input in the project development process.

An integral part of the environmental review process is engagement of stakeholders, such as other agencies, Tribes, and the public. The goal of the consultation and coordination process is to develop public awareness and understanding of the project, gain input from potentially affected interests, and then to appropriately consider that input in the project development process.

4.1 Agency Involvement and Coordination

The FHWA initiated pre-application coordination with USACE regarding Section 404 and Section 408 facilities. The first meeting, held on June 11, 2020, included a discussion of USACE Section 404 and a focus on Section 408 requirements for TRRA Project. USACE was provided with a project overview and preliminary details to inform discussion. USACE outlined the typical process and expectations for the proposed project. A second meeting, held on January 6, 2021, focused on identifying any concerns USACE may have prior to submittal of the Section 408 review package.

The FHWA submitted a Section 106 consultation request, dated January 29, 2021, to the Alaska SHPO for concurrence with the results of the cultural resources technical finding of No Historic Properties Affected for the TRRA Improvements Project and concurrence with the FHWA Categorical Exclusion for geotechnical studies. On February 23, 2021, SHPO notified the FHWA that SHPO concurs with the findings. As stipulated in 36 CFR 800.3, other consulting parties such as the local government and Tribes are required to be notified of the undertaking.

The FHWA initiated Transportation Interagency Group meeting to evaluate the project's transportation conformity with air quality regulations in February 2021. The interagency group meeting was held on March 3, 2021. During the meeting, the interagency consultation partners concurred that the project was not of local air quality concern and therefore no hot-spot analysis was required. The TRRA Improvements

Project will not create any new violations, increase the severity or number of violations, or delay timely attainment of the national ambient air quality standards. FHWA finds that the TRRA Improvements Project conforms with the SIP in accordance with 40 CFR 93. A meeting summary is available in Appendix D.

4.2 TRIBAL COORDINATION

On October 7, 2020, the FHWA contacted the following eight tribal governments requesting consultation via letters sent by email (Appendix F).

- Healy Lake Village
- Mentasta Traditional Council
- Native Village of Eagle
- Native Village of Tanacross
- Native Village of Tetlin
- Northway Village
- Village of Dot Lake
- Tanana Chiefs Conference

On December 22, 2020, January 13, 2021, and January 14, 2021 the FHWA followed the letters with telephone calls to confirm contact information and receipt of the consultation letter.

On February 22, 2021 the FHWA sent an additional email regarding tribal interest in participating in government-to-government consultation regarding the project with a request to select one of three options in response to the email:

- Interested in participating in this undertaking as a consulting party in the project;
- Interested in continuing to receive periodic updates on the project development; determine at a time of their choosing if contact Western Federal Lands Highway Division (WFLHD) to participate as a consulting party in the project; or
- Not interested in participating in this undertaking as a consulting party in the project.

4.3 PUBLIC INVOLVEMENT

FNSB has been leading the project's public outreach. FNSB staff have provided project briefings at borough ordinance and budget meetings. The FHWA will host an online public meeting to present the TRRA Improvements project and the EA.

4.4 LIST OF PREPARERS

This EA was prepared by the FHWA with assistance from FSNB and DOA Fort Wainwright and technical assistance from PND Engineers, Inc. Table 4-1 identifies name, organization, and role on the project.

Table 4-1 – Preliminary List of Environmental Assessment Preparers

Name	Organization	Project Role
Brandon Stokes	FHWA-WFL Highway Division	Project Manager
Stephen Morrow	FHWA-WFL Highway Division	Environmental Specialist
Paul Kendall	PND Engineers, Inc., Anchorage, AK	Project Manager
Anna Kopitov	PND Engineers, Inc., Seattle, WA	EA Author

4.5 ENVIRONMENTAL ASSESSMENT DISTRIBUTION

The FHWA will document the distribution of electronic copies of the EA by email to interested parties identified as project stakeholders.

5 Permits and Authorizations Needed

The FHWA identified permits and authorizations that may be required for the project prior to construction as shown below in Table 5-1.

Table 5-1 – List of Permits and Approvals by Agency

Agency	Code	Permit	Authorization
FHWA	NEPA		Lead Agency
FHWA	Dept of Transportation Act		Section 4(f) Net Benefit Programmatic Evaluation completed June 2021.
USACE/ADEC	Clean Water Act	Section 401 Water Quality Certification	
	Clean Water Act Alaska Administrative Code (AAC) 18 AAC 83.015	Section 402, Section 301(a), NPDES /APDES, regulates all discharges to waters of the U.S. from construction sites and water management facilities. Excavation Dewatering General Permit Antidegradation Analysis	
	Clean Water Act	Section 404 regulates the discharge of dredged and fill material into waters of the U.S., including wetlands.	
	33 USC Section 408		Section 408 Authorization provides that USACE may grant permission for another party to alter a Civil Works project upon a determination that the alteration will not be injurious to the public interest and will not impair the usefulness of the Civil Works project.
ADNR/State Historic Preservation Office	National Historic Preservation Act		Section 106, No Historic Properties Affected. Completed in June 2021.

Agency	Code	Permit	Authorization
ADNR	AS 46.15		Temporary Water Use Authorization
	AS 38.05.127		Tanana Basin Area RMZ Easement Vacation
FNSB	FNSB 15 Building & Construction	Floodplain Permit	Title 15.04 Floodplain Management Regulations Floodway No-Rise Certification Excavation within 250-feet of Levee Centerline
ARRC		Right-of-way Temporary construction	

6 Project Commitments and Conservation Measures

This section provides a list of the commitments and conservation measures associated with the Preferred Alternative (Table 6-1). The purpose of these measures is to avoid, minimize or mitigate for potential impacts to the resources discussed in Chapter 3.

Table 6-1 – List of Project Commitments and Conservation Measures

Resources	Commitment and Conservation Measures
Design Phase	
• Land Use • Utilities	Minimize impacts to properties on South Lathrop St. north of the levee by reducing the need to convert industrial use lands to transportation uses during the final design phase.
• Social and Economic	Continue ongoing coordination and outreach with interested stakeholders using multimedia platforms (e.g., newspapers, radio, websites, and virtual meetings).
• Soils and Geology	Design erosion and sediment control measures prior to beginning construction.
• Wetlands	Reduce impacts to wetland and water resources during design to the extent practicable.
	Use steeper (1 V:2 H) road embankment slopes on wetland crossings to minimize the footprint width while providing long-term stability. The steeper slopes are anticipated to deter ORV users from leaving the roadway and causing additional impacts.
	Where possible, design of the embankment will incorporate areas previously impacted by fill placement or off-road vehicle activity.

Resources	Commitment and Conservation Measures
	Design installation of culverts and/or drainage mats in wetland areas as appropriate to minimize road effects on natural drainage patterns and to restore hydrologic flow currently impacted by extensive off-road vehicle use.
	Coordinate with USACE to implement compensatory mitigation to offset unavoidable impacts to wetlands and waters of the U.S. This may include specifying the amount, type, and location of compensatory mitigation, including any out-of-kind compensation, or the intention to use an approved mitigation bank or in-lieu fee program.
Construction Phase	
All	Implement all regulatory permit mitigation requirements to avoid potential significant impacts.
• Transportation • Land Use • Recreation • Social and Economic	Communicate construction schedule, traffic, and access notifications to the public in advance using public notices, signage, and TLRA information boards.
• Transportation	Coordinate and communicate construction schedule with the DOA Fort Wainwright in advance of construction.
	Install and coordinate temporary traffic control devices to minimize the impacts to motorists.
	Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians to manage traffic on affected roads during construction activities.
	Install new wayfinding signage to direct travelers to the new entrance.
• Land Use	Maintain access to the TLRA, TFTA, and boat launch during construction.
• Water Resources • Water Quality • Floodplains • Wetland • Non-wetland Waters	Do not store fuel, fuel vehicles, or perform maintenance within 100 feet of water bodies and wetlands.
• Water Resources • Water Quality • Floodplains	Incorporate measures to protect the water quality.
	Reduce potential for turbid stormwater runoff from the site through use of measures such as perimeter silt fencing and fiber rolls.

Resources	**Commitment and Conservation Measures**
	Reduce potential for soil erosion through use of methods such as temporary seeding, straw mulch, and plastic coverings.
	Maintain water quality using methods that may include using grass buffer strips, organic mulch layers, planting soil beds, and vegetated systems such as swales and grass filter strips that are designed to convey and treat runoff.
	Stabilize and revegetate disturbed areas after work is completed.
	Leave erosion and sediment control measures in place until vegetation becomes established and covers more than 70 percent of disturbed area.
	Minimize the contact of construction materials, equipment, and maintenance supplies with storm water.
	Require contractor to prepare and execute an emergency repair plan in the event a major flood event during temporary excavation to the levee or groin.
	Maintain the integrity of the levee system by ensuring the finish grade of the levee at the road crossing to be above levee “design elevation”.
• Wetlands • Fish • Wildlife • Water Resources • Water Quality • Floodplains	Treat PCP poles offsite and not near waterways or wetlands.
	No cutting, drilling, sanding, or other measures will occur onsite that will cause treated wood sawdust or coating to sluff off into wetlands.
	PCP-treated poles will not be sited in wetlands or waters outside of the new project embankments.
• Wetlands • Vegetation • Fish • Wildlife	Delineate work and staging areas, and clearly mark clearance and fill boundaries to avoid accidental impacts to wetlands, waters, wildlife, and other habitats from inadvertent access, equipment operation, and clearing of and fill material placement.
	Install culverts and drainage mat in wetland areas as appropriate to minimize road effects on natural drainage patterns and to restore hydrologic flow currently impacted by extensive off-road vehicle use.
	Clearing will be selective and the minimum width necessary for project construction and safer operation.
• Wetlands • Vegetation • Soils	Retain native weed-free topsoil for use on site (e.g., restoring disturbed habitats and maintaining native seed stock). Contractor will store native weed-free topsoil at an approved site to be determined prior to clearing and grading.

Resources	Commitment and Conservation Measures
• Wetlands • Vegetation • Soils • Visual Quality	Reseed or replant disturbed areas with local native vegetation to the extent practicable.
• Wetlands	Contractor will not clear vegetation or operate equipment outside the designated clearing zone.
	Contractor will not place fill material or debris from clearing or construction outside of the designated construction zone.
• Wetlands • Vegetation	When clearing areas where revegetation is desired, cut vegetation flush with the ground to allow passive revegetation of disturbed areas.
• Vegetation • Wildlife • Special Status Species	To avoid disturbance impacts to nesting migratory birds and their nests, the Contractor will implement all guidelines including but not limited to, avoid tree cutting, vegetation clearing, and grading during breeding bird season and implementing pre-construction nest surveys during the breeding bird season in accordance with Land Clearing Timing Guidance for Alaska (USFWS and ADF&G 2009). Nest surveys will be conducted by qualified biologists within 500 feet of the construction limits of disturbance and appropriate avoidance buffers around nests would be marked.
	To avoid disturbance impacts to bald eagle and their nests, the Contractor will implement National Bald Eagle Management Guidelines (2007) including conducting bald eagle nest surveys within ½ mile of construction and monitoring of active bald eagle nests, prior to and during construction as applicable. To avoid disturbing nesting bald eagles, recommendations include (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites.
	Implement APLIC guidelines to prevent collision and electrocution with power line infrastructure. This includes the use of flight diverters, perch guards, and wire covers.
	Implement measures to keep all equipment working in project area free of weed seed.
	Prevent introduction and spread of weeds by using appropriate measures during movement of sand, gravel, borrow, and fill material as well as sourcing weed-free materials.

Resources	Commitment and Conservation Measures
	Clear minimum width necessary for project construction and safer operation. Clearing will be selective and limited to upland trees with diameters 4-inches or less to the extent practicable.
	Maintain good housekeeping and implement all BMPs at construction sites (e.g., keep construction areas free of trash, implement SWPPP).
• Soils and Geology	Implement erosion and sediment control measures prior to beginning construction.
	Maintain erosion and sediment control measures throughout the entire construction phase, regardless of season until vegetation is established. These could include slope protection, erosion, surface water drainage, sediment containment, covering stockpiled materials and construction hauling techniques.
	The project will reuse existing road base material to the extent practicable.
	Store materials (e.g., soil, sand, gravel, vegetation, etc.) at an approved site to be determined prior to construction activities. This includes all materials used for construction and materials to be disposed (e.g., cleared vegetation) at an approved disposal site.
• Cultural Resources	Should unidentified archaeological resources or human remains be discovered during the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with AK SHPO, and pending further recommendation from the FHWA in consultation with the Alaska OHA. Please note that some sites can be deeply buried and that fossils are considered cultural resources subject to the Alaska Historic Preservation Act.
• Air Quality • Noise • Energy	All equipment would have sound control devices no less effective than those provided on the original equipment. All equipment would have muffled exhaust.
	All equipment would comply with pertinent noise standards of the EPA.
	Use of plant-based, organic tackifiers or water to control dust, during construction, in the clearing of land and road grading and on unpaved roads, material stockpiles, and other surfaces which can create airborne dusts.
	Fully or partially enclose material stockpiles in cases where application of tackifiers is not sufficient to prevent PM from becoming airborne.

Resources	Commitment and Conservation Measures
	Cover open-bodied trucks transporting materials that could become airborne when in motion.
	Promptly remove materials from paved streets that have the potential to become airborne.
	Operate all equipment in accordance with manufacturer's recommendations to minimize emissions.
	Shut down idling heavy equipment when not in use.
• Hazardous Materials	The contractor will prepare and implement a SPCC Plan during construction.
	If unexpected contamination is encountered during construction, all work in the contaminated area would be halted and the contracting officer contacted immediately.
	All contaminated material will be handled and disposed of in accordance with ADEC regulations.

7 References

ABR, Inc. 2020a. Wetland and Stream Delineation for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Prepared for PND Engineers Inc., on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ABR, Inc. 2020b. Wetland Impacts and Mitigation Report for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Prepared for PND Engineers Inc., on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ABR, Inc. 2020c. Wetland and Stream Delineation for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1), revised. Prepared for PND Engineers Inc., on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ABR, Inc. 2020d. Wetland Impacts and Mitigation Report for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Prepared for PND Engineers Inc., on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ABR, Inc. 2020e. Biological Resources Survey Report for the Proposed Tanana Lakes Recreation Area Access Improvements: AK FNSB Tanana(1). Prepared for the PND Engineers, Inc on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ABR, Inc. 2020f. Biological Resources Impacts Report for the Proposed Tanana Lakes Recreation Area Access Improvements: AK FNSB Tanana(1). Prepared for the PND Engineers, Inc on behalf of Federal Highway Administration Western Federal Lands Highway Division.

ADEC. 2019. State Air Quality Control Plan. Serious State Implementation Plan. Adopted November 19, 2019. Accessed online on August 5, 2020 at https://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/

ADEC. 2018. Alaska's List of Impaired or 303(D) Listed Waterbodies. Accessed online on August 6, 2020 at https://dec.alaska.gov/water/water-quality/integrated-report.

ADF&G. 2015. Alaska wildlife action plan. Juneau, AK. 228 p.

ADF&G. 2021. Anadromous Waters Catalog (AWC). Accessed online in January 2021 at https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.displayViewer.

Alaska Department of Transportation and Public Facilities (AKDOT&PF). 2016. Let’s Keep Moving 2036: Policy Plan.

Alaska Federal Lands Access Program (AFLAP). 2016. Tanana River Recreation Access Improvements. Phase I. Submitted by Fairbanks North Star Borough.

AFLAP. 2019. Tanana River Recreation Access Improvements. Phase II. Submitted by Fairbanks North Star Borough.

Applied Development Economics, Inc. 2016. Fairbanks North Star Borough Comprehensive Economic Development Strategy.

Fairbanks North Star Borough (FNSB). Department of Parks & Recreation. 2007. Tanana Lakes Recreation Area (TLRA) Master Plan. Prepared by USKH, Inc.

FNSB. 2005. Fairbanks North Star Borough Regional Comprehensive Plan. Adopted by FNSB Borough Assembly September 13, 2005 (Ordinance No. 2005-56). Accessed on July 24, 2020 at http://fnsb.us/cp/Documents/CompPlan_2005-0913_FullyAdoptedDocument.pdf

FNSB. 2020. Borough Code as accessed on July 24 2020 at https://gisportal.fnsb.us/enterprise/apps/webappviewer/index.html?id=8b49f3ccf21a4c76a46023d6b073d1fa

Federal Highway Administration (FHWA). 2020. Biological Resources Survey Report for the Proposed Tanana Lakes Recreation Area Access Improvements: AK FNSB Tanana (1). Prepared by ABR, Inc Environmental Research and Services. Fairbanks, Alaska.

Jorgenson, M.T., Racine, C.H., Walters, J.C., and Osterkamp, T.E., 2001, Widespread and rapid permafrost degradation and associated ecological changes caused by a warming climate on the Tanana Flats, Central Alaska: Climatic Change, v. 48, p. 551-579.

MacDonald, S. O., and J. A. Cook. 2009. Recent mammals of Alaska. University of Alaska Press, Fairbanks, AK. 387 p.

Moran, E.H., 2007, Water quality in the Tanana River basin, Alaska, water years 2004–06: U.S. Geological Survey Open-File Report 2007–1390, 6 p

Péwé, Troy. 1993. Special Report 15 Geologic Hazards of the Fairbanks Area, Alaska. First Edition 1982. Reprinted 1993. Alaska Department of Natural Resources (ADNR). Division of Geological & Geophysical Surveys. Fairbanks, Alaska.

Shannon and Wilson. 2020. Draft Phase I Environmental Site Assessment. Tanana River Recreation Access. AK FNSB Tanana (1). Fairbanks, Alaska. Shannon and Wilson No. 105375=001.

Stephen R. Braund & Associates. 2020. Cultural Resources Literature Review and Field Survey Report for Tanana River Recreation Access Improvements Project WFLHD Project Number: AK FNSB TANANA (1) Prepared for U.S. Department of Transportation, Federal Highway Administration Western Federal Lands Highway Division and PND, Inc.

University of Alaska Museum of the North (UAMN). 2020. Mammals of Alaska [website]. Available at: <https://www.uaf.edu/museum/collections/mammal/current-mammal-species-of/>. Accessed 20 July 2020.

United States (U.S.) Department of Agriculture Natural Resources Conservation Service. 2020. Web Soil Survey. Accessed on August 5, 2020 at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

U.S. Army Garrison Fort Wainwright. 2013. Integrated Natural Resources Management Plan.

U.S. Census. 2019. accessed online at https://www.census.gov/quickfacts/fairbanksnorthstarboroughalaska on 7/31/2020.

U.S. Fish and Wildlife Service (USFWS). 2021. Information for Planning and Consultation (IPaC). Accessed online at IPaC: Home (fws.gov) on May 20, 2021.

_______. 2009. Land Clearance Timing Guidance for Alaska *Plan Ahead to Protect Nesting Birds*.

_______. 2008. Birds of conservation concern 2008. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Movements, Arlington, VA. 85 pp.

_______. 2007. National Bald Eagle Management Guidelines. Accessed online at https://www.fws.gov/pacific/ecoservices/documents/NationalBaldEagleManagementGuidelines.pdf on March 15, 2021.

U.S. Geological Survey (USGS). 2020. Water Quality in the Tanana River Basin, Alaska, Water Years 2004-2006. Accessed online on 8/6/2020 at https://water.usgs.gov/wsc/cat/19040508.html.

Verbrugge, L.A., Kahn, L. & Morton, J.M. Pentachlorophenol, polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo furans in surface soil surrounding pentachlorophenol-treated utility poles on the Kenai National Wildlife Refuge, Alaska USA. Environ Sci Pollut Res 25, 19187–19195 (2018). https://doi.org/10.1007/s11356-018-2269-7

Viereck, L.A. Dyrness, C.T. Batten, A.R. Wenzlick, K.J. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 278 p.

This page left blank.

Appendix A – 2007 Tanana Lakes Recreation Area Master Plan

Appendix B – Wetlands Technical Reports

Appendix C – Biological Resources Study Reports and ESA Species Report

Appendix D – Transportation Conformity Meeting Summary

Appendix E – Section 4(f) Net Benefit Programmatic Evaluation

Appendix F – Tribal Coordination Letters

Appendix A – 2007 Tanana Lakes Recreation Area Master Plan

Tanana Lakes Recreation Area Master Plan

Fairbanks North Star Borough
Department of Parks & Recreation

2007

Tanana Lakes Recreation Area
Master Plan

2007

Planning Team:

Fairbanks North Star Borough,
Department of Parks & Recreation

USKH, Inc.

Executive Summary

This Master Plan outlines the Fairbanks North Star Borough's (FNSB's) plan for the future development and use of the Tanana Lakes Recreation Area, a 750-acre multi-use park south of the City of Fairbanks along the Tanana River. The purpose of the Master Plan is to provide the FNSB with a long-term, planning guide for gravel extraction and development of the recreation area based on resource opportunities and constraints, development opportunities and constraints, and public needs. The Master Plan details the planning purpose and process, existing site conditions and land use, resources assessment, public process and demand, development plan, maintenance and operations considerations, and permits and authorizations required for development of the recreation area.

The project concept originated approximately 15 years ago by the FNSB and its need to extract gravel for use at the South Cushman Landfill. The unsecured site has historically been a common place for illegal dumping of junk or abandoned vehicles and other refuse, as well as other unauthorized and criminal activities. Passing years have brought to the forefront the desire to clean up the site in order to enhance the wildlife habitat and natural features of the area in conjunction with the FNSB's plan to extract gravel. As a result, this Master Plan has become a priority driven by both public safety and the importance of establishing this area for the community's use and enjoyment.

The development concept presented in this Master Plan includes both summer and winter recreational uses, which were largely motivated by public and agency input. An intensive scoping process was conducted during development of the Master Plan to identify and involve agencies early in the process; include the public in the development of the Master Plan; solicit agency and public comments to be considered and addressed in the Master Plan; and determine the need for special studies. The scoping process included distribution of an agency scoping letter, a public meeting, and an online project questionnaire. The results of the scoping process were summarized in the Agency and Public Scoping Summary Report – January 2007, attached as Appendix A to this Master Plan. The agency and public comments received were used to form the Draft Master Plan, which was presented by the FNSB to the public in February 2007. The Master Plan considers all input received from the scoping process and public meetings. Additionally, the Master Plan examines maintaining existing land uses, mitigating wetlands impacts, preserving areas of high wildlife habitat value, avoiding user conflicts, sequencing gravel extraction, and securing the site to help deter illegal activities.

Once development of the Tanana Lakes Recreation Area is complete, visitation is assumed to exceed 100,000 visitors per year. Preliminary estimates also suggest there is enough gravel to support operations at the South Cushman Landfill for at least 15 to 20 years.

Table of Contents

Table of Contents-*continued*

3 ***Resource Assessment***

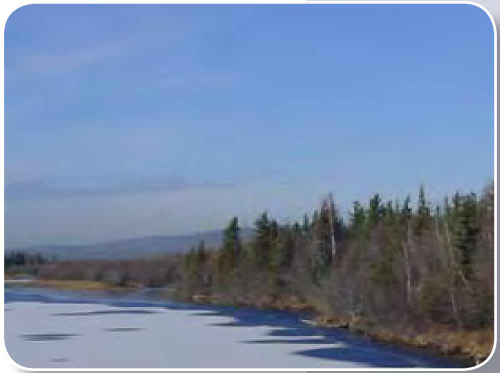


Table of Contents-*continued*

Table of Contents-*continued*

Figures

Appendices

Acronyms and Abbreviations

°F	degrees Fahrenheit
ADA	Americans with Disabilities Act
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ARRC	Alaska Railroad Corporation
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FITA	International Archery Association
FNSB	Fairbanks North Star Borough
GVEA	Golden Valley Electric Association
NFAA	National Field Archery Association
NMFS	National Marine Fisheries Service
NPS	National Park Service
OHMP	Office of Habitat Management and Permitting
OPMP	Office of Project Management and Permitting
ORV	Off Road Vehicle
ppm	parts per million
SHPO	State Historic Preservation Office
TESS	Threatened and Endangered Species System
USA	Utility Services of Alaska, Inc.
USACE	U.S. Army Corps of Engineers
USAR-AK	U.S. Army Alaska
USFWS	U.S. Fish and Wildlife Service

Introduction 1

Fairbanks North Star Borough
Department of Parks and Recreation
2007

1 Introduction

Project Overview

This Master Plan outlines the Fairbanks North Star Borough's (FNSB's) plan for the future development of the Tanana Lakes Recreation Area, a 750-acre multi-use park south of the City of Fairbanks along the Tanana River. The recreation area would offer year-round, convenient access to a variety of recreational and educational opportunities. The location is ideal for a community recreation area given its proximity to Fairbanks and Fort Wainwright. The site is also well situated for expansion, as the adjacent lands are owned by the FNSB and/or the State of Alaska. In addition to the multiple recreational opportunities the area will offer, the Tanana Lakes Recreation Area will enhance the integrity of the area's natural assets and unique wildlife and bird habitat.

The project concept originated approximately 15 years ago by the FNSB and its need to extract gravel for use at the South Cushman Landfill. The unsecured site has become a common place for dumping stolen and abandoned vehicles, hosting drug users and parties, indiscriminate shooting, joyriding, homicides, and other unauthorized and criminal activities. Passing years have brought to the forefront the desire to clean up the site in order to enhance the wildlife habitat and natural features of the area in conjunction with the FNSB's intent to extract gravel. Considering the size and locality of the site, and its natural setting and resources, its potential as a recreational area was also realized.

The project is a long-range, multi-phased effort, with gravel extraction and park development spanning the course of 15-20 years or more. In June 2006, the FNSB was permitted by the U.S. Army Corps of Engineers (USACE) to begin gravel extraction from a portion of the site and began dredging in August.

In September 2006, the FNSB hired a local contractor to remove approximately 400 tons of debris, and launched a volunteer clean-up effort to remove other refuse. In October 2006, the FNSB contracted with USKH, Inc., an Alaska-based architecture, engineering, surveying, and planning firm, to prepare this Master Plan.

Purpose of the Master Plan

The purpose of master planning is to identify the most appropriate uses based on resource opportunities and constraints, development opportunities and constraints, and public needs. A master plan serves as a basis for preparing budget and management priorities, and development and management guidelines, and for requesting land use approval and/or permits from affected agencies for planned projects.

The Tanana Lakes Recreation Area Master Plan is a written and illustrated development plan for the proposed gravel extraction, natural habitat preservation, and recreational facility construction. Specifically this Master Plan provides:

- An analysis of the existing site conditions and natural resources
- Recommendations on how to preserve, restore, or enhance the existing natural resources in the area
- Explanations of the planning framework, including public participation and demands
- Proposed recreational facilities, including size and location
- Recommended phasing of gravel extraction, park development, and facility construction to meet ongoing community needs and funding
- A prioritized projects list to help guide the process of implementation over the next 20 years
- Estimated cost and funding, including recommendations to maximize development efficiency and construction and maintenance funding
- Operations and maintenance considerations

General Parameters

Development concepts in the Tanana Lakes Recreation Area Master Plan describe the appropriate sizes, types, and locations for the planned facilities and land uses. Thoughtful consideration was given to the issues identified in the planning process. Understanding the resource opportunities and constraints determined how the proposed facilities best fit into the area. The following general parameters guided the development of the concept:

- Avoid or minimize conflict between recreation types
- Provide navigable and understandable site access for both vehicles and pedestrians
- Avoid significant impacts to important natural and scenic resources within and adjacent to the area
- Comply with regulatory requirements
- Provide access and opportunities for visitors with disabilities
- Provide a variety of recreation opportunities
- Develop the area in harmony with the natural setting

Master Plan Process

The purpose of the master planning process is to plan for the protection and public enjoyment of existing resources in the area. The first step to developing the Tanana Lakes Recreation Area Master Plan was to assess the resources; inventory the existing facilities and land uses in and adjacent to the area; and inform the public and affected agencies about the process. Next, issues involving the use, development, and management of the area were identified through meetings with the FNSB staff, an agency scoping letter, a project questionnaire, and two public meetings. This scoping process helped establish the goals and priorities of the Master Plan, including resource management guidelines and development concepts.

This information was compiled into a Draft Master Plan that was presented to and reviewed by the FNSB Parks and Recreation Commission, and by the interested public and affected agencies. The following flow chart illustrates the process used to develop the Tanana Lakes Recreation Area Master Plan.

Master Plan Implementation

Once the Tanana Lakes Recreation Area Master Plan is adopted by the FNSB, any development in the area must be consistent with the Master Plan. Minor variations from the adopted Master Plan may be allowed if the FNSB and affected agencies determine them to be consistent with the Master Plan. Special attention and adherence shall also be provided to the conditions of any project permits or authorizations acquired, as well as the requirements of funding sources, pursuant to the development of the site in coordination with the Master Plan. Any use that is not consistent with the Master Plan will require an amendment to the Master Plan.

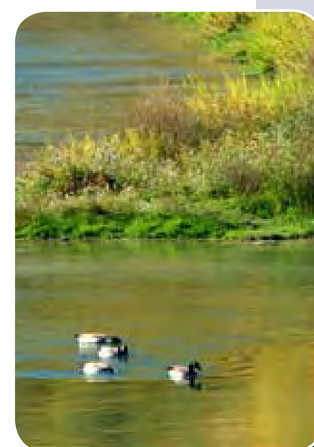
Why Master Plan the Tanana Lakes Recreation Area Now?

The concept for the Tanana Lakes Recreation Area was originally developed about 15 years ago by the FNSB and their need to extract gravel for use at the South Cushman Landfill. There is a financial benefit linked to extracting gravel from within the proposed recreation area. The State of Alaska Department of Natural Resources (ADNR) owns lands within the project area.

As of January 1, 2007, ADNR charges the FNSB a royalty fee of $3.00 per cubic yard for gravel extracted from these lands. However, this fee would be waived if the extracted lands were reclaimed to contribute to a public use area, such as a recreation area or park.

Aside from the economic benefit, there is a more critical benefit to be realized: public safety. Today the area is host to a variety of illicit and criminal activities, making it difficult, even impossible at times, for the community to enjoy the scenic views, wildlife, and other resources the area has to offer. While gravel extraction remains a key component of planning and developing the site, the FNSB also recognizes the need to reclaim this deteriorating area and launched a restoration effort in the fall of 2006 to begin cleaning up the area.

As with many Master Plans, there is strong public demand to add recreational resources for the community and preserve existing natural resources in the Tanana Lakes area. The Tanana Lakes Recreation Area Master Plan has become a priority, not only driven by recreation and preservation, but also by public safety, and the importance of establishing this area for the community's use and enjoyment.



Existing Conditions and Land Use 2

Fairbanks North Star Borough
Department of Parks and Recreation
2007

2 Existing Conditions and Land Use

Site Location

The Tanana Lakes area is located in the FNSB just 10 minutes south of downtown Fairbanks. The area is conveniently located, approximately 14 miles northwest of the City of North Pole, and approximately 3 miles southwest of Fort Wainwright's main post. The Location and Vicinity Map (Figure 1) illustrates the general location of the area relative to the surrounding communities, roadways, and major water bodies.

Project Boundary

The project area is comprised of approximately 750 acres. It is located at Latitude 64.797°N and Longitude -147.737°W, and is within Sections 26, 27, 28, and 34, Township 1 South, Range 1 West, Fairbanks Meridian. This site is generally bound on the north by the Tanana River Levee, south by the Tanana River, west by Groin 8 of the Tanana River Levee, and east by the Goose Island Causeway, an extension of South Cushman Street. An outline of the project boundary is shown on Figure 2.

Landscape

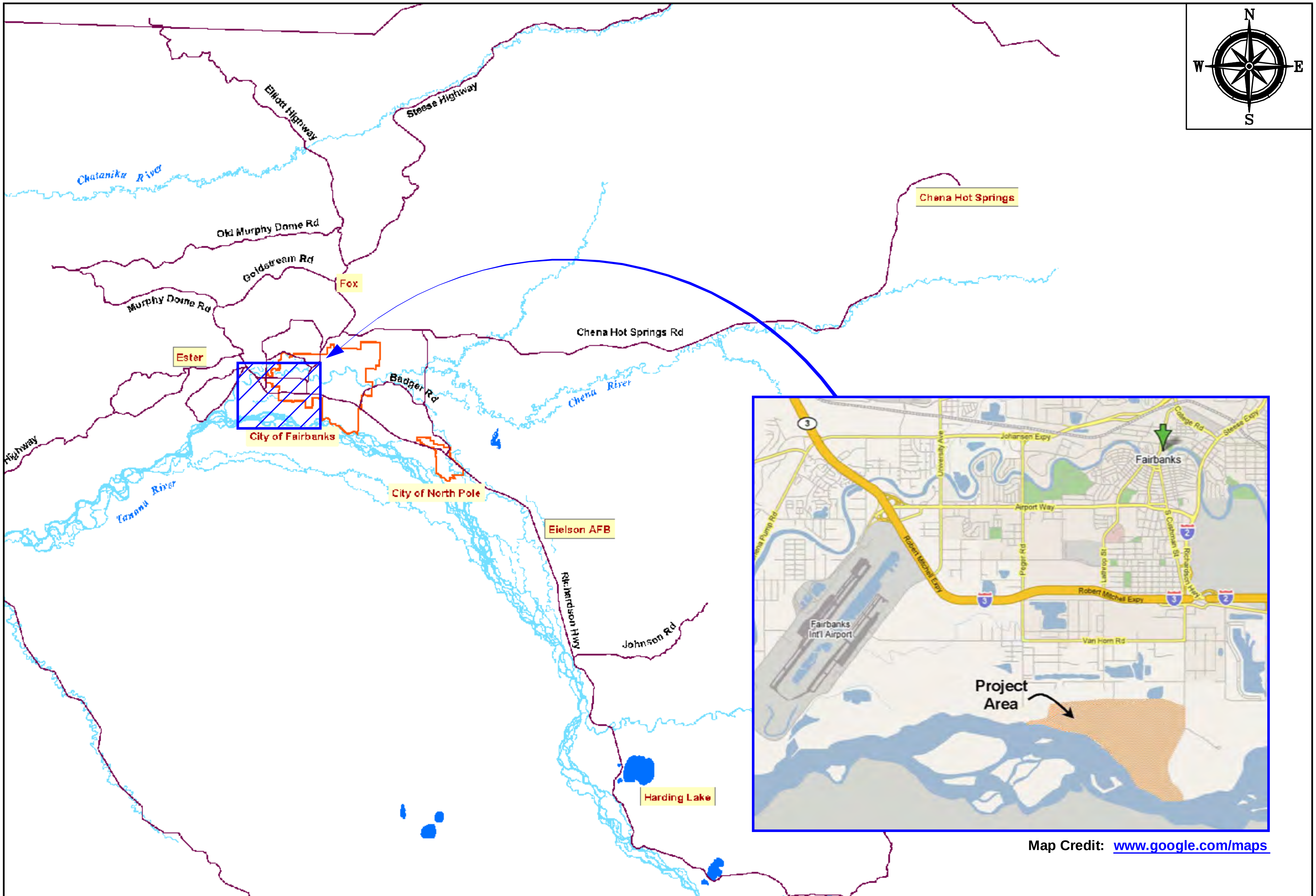
The landscape of the area is a reflection of the fluvial activity on the floodplain of the Tanana River and of the gravel extraction activity common to the site. The terrain is flat to undulating, consisting of flood deposited silts, sands, and gravels, and is marked by abandoned river channels, depressions, levees, and gravel pits. The east end of the area is characterized by permanent and seasonal wetlands. Higher floodplain terraces exist along the north edge and the south tip of the project area, which are a mix of forested wetlands and uplands.

Neighborhood

The majority of the lands directly adjacent to the north, northeast, and northwest of the area are privately owned industrial lands. All property within the project site is publicly owned by the FNSB or the State of Alaska. Parcels owned by the FNSB and State of Alaska are identified on Figure 2.

Zoning

The project site is currently zoned as Heavy Industrial and General Use-1 by the FNSB. Once gravel extraction is completed, the lots within the project site will be rezoned to Outdoor Recreation. The rezoning process will require public involvement and opportunity for testimony, and exclusively involve properties owned by the FNSB. Properties owned by the State of Alaska would not be involved in this process.



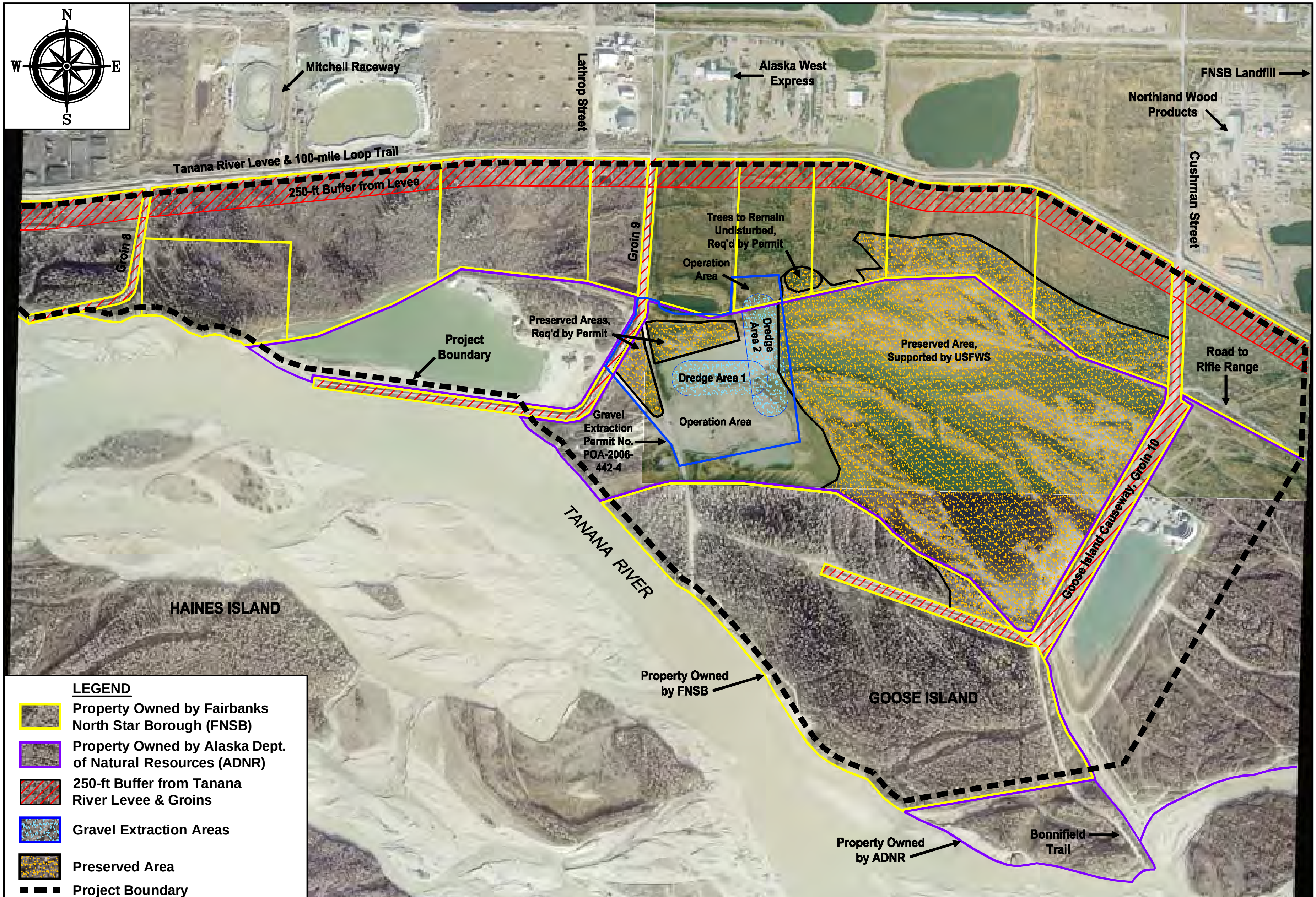
Map Credit: www.google.com/maps

Tanana Lakes Recreation Area Master Plan
Fairbanks, Alaska
Fairbanks North Star Borough

Location & Vicinity Map

MAR 2007

FIGURE 1



Tanana Lakes Recreation Area Master Plan Fairbanks, Alaska Fairbanks North Star Borough	Existing Conditions	MAR 2007 FIGURE 2

Existing Land Use and Facilities

Recreation Use

Recreational activities in the area currently include bird watching/wildlife viewing, dog walking/training, waterfowl hunting, walking/hiking, fishing, horseback riding, biking, picnicking, camping, swimming, off-road vehicle use, motorized and non-motorized boating, and skiing. Additionally, there is a rifle range east of the project area.

Gravel Extraction

Gravel extraction has occurred within the project area for a number of years under permits issued by the USACE. The State of Alaska, through the ADNR, regulates gravel mining and handles the sale of gravel extraction rights to private companies. All privately held rights within the project site are gravel extraction contracts between ADNR and the private companies. These leases will soon expire and will not be renewed.

Between 1998 and 2006, the FNSB extracted gravel from a 28-acre portion of the project area south of the Tanana River Levee and west of Groin 9. In June 2006, the FNSB was permitted to begin gravel extraction from an 80-acre portion of the project area south of the Tanana River Levee and east of Groin 9, as shown on Figure 2. Remaining gravel extraction activities will occur in the north-central and northwest portions of the project area. Gravel from these areas will be used for daily cover material and cell construction at the FNSB landfill, and as needed for construction of the proposed recreation area.

Utilities and Easements

Utility Services of Alaska, Inc. (USA) operates and maintains the water and sanitary sewer systems within the Fairbanks area. Water and sanitary sewer mains are located nearby along Lathrop Street and South Cushman Street. These systems terminate before reaching the project area and currently do not serve the project area.

Golden Valley Electric Association (GVEA) owns and maintains most overhead and underground electrical systems within the Fairbanks area. There is a northeast-southwest trending GVEA power line approximately 150 feet east of the gravel extraction pond east of the Goose Island Causeway.

There are no other utilities within or currently serving the project area.

South Cushman Rifle Range

The South Cushman Rifle Range, managed by the FNSB, is located east of and accessed through the project site. Amenities include a 25-yard pistol range and a 300-yard rifle range. The rifle range is open 8 a.m. to 10 p.m., and closed Wednesdays 8:00 a.m. to noon for maintenance.

Bonnifield Trail and 100-Mile Loop Trail

The Bonnifield Trail is a winter access route to the Tanana Flats. The trail begins at the south end of Cushman Street, runs along the Goose Island Causeway (South Cushman Street) through the eastern portion of the project area and across the Tanana River by way of an ice bridge. After crossing the Tanana River, the Bonnifield Trail heads south through the U.S. Army Alaska (USAR-AK) Tanana Flats training area. The trail is estimated to have been constructed in 1908 as a winter sled route to the mines of the Bonnifield mining district located along Bonnifield Creek, a tributary to the Wood River. The Bonnifield trail is one of the longest routes in Interior Alaska that was privately constructed and maintained. The trail is still used today by snowmachines accessing hunting areas and trap lines. The USAR-AK currently uses the trail as vehicle access to training areas. Frequent winter snowmachine use keeps vegetation from growing back over the trail. The USAR-AK constructs and maintains the ice bridge every winter, and civilian access is authorized by recreation permit.

The FNSB has allocated funds to map portions of the 100-Mile Loop Trail. The 100-Mile Loop Trail, an idea first conceived years ago, would connect six or seven existing historic trails to create a loop encircling Fairbanks. As proposed, the loop would include a trail running along the Tanana River Levee on the north boundary of the proposed Tanana Lakes Recreation Area. The trail is currently classified in the FNSB Comprehensive Recreational Trail Plan as a multi-use facility; therefore it would permit motorized uses along its corridor. Currently, the FNSB is working to acquire easements to connect the existing trails.

Goose Island Off-Road Vehicle Area

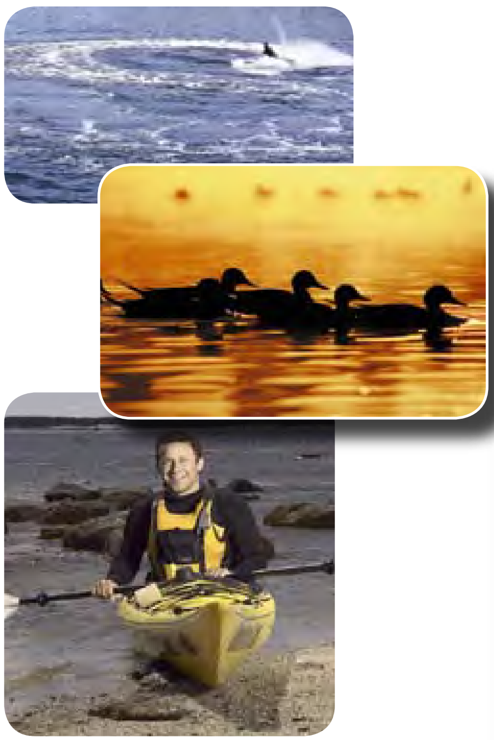
A portion of the project site has been used in the past by the Fairbanks Motorcycle Racing Association for off-road vehicle practice and competition under a use permit granted by the FNSB Division of Land Management. However, the FNSB soon realized the area actually used by the racing association was ADNR property and discontinued issuing of the permit in 1996/1997. Since then, the FNSB offered the uplands north of the gravel pit between Groins 8 and 9 for use by the association. However, the racing association decided they were not interested due to the insurance requirements of the FNSB, and have since relocated to the Dennis Road area in North Pole.

This land north of the gravel pit between Groins 8 and 9 is owned by the FNSB and remains an ideal site for this particular type of trail recreation. It is recommended that the FNSB work with the Fairbanks Motorcycle Racing Club and or other interested organizations to more permanently establish this area for motorized recreational use.

Adjacent Properties

USA, Metro Company, Greater Fairbanks Racing Association, Killion Land Company, Alaska West Express, Northland Wood Products, and other private landowners own properties north of the project site. These properties, separated from the project site by the Tanana River Levee, include the Golden Heart Utilities Wastewater Treatment Facility, Mitchell Raceway, Alaska West Express operations, and Northland Wood Products retail facility.

Resource Assessment 3



Fairbanks North Star Borough
Department of Parks and Recreation
2007

3 Resource Assessment

The Tanana Lakes is an ideal location for developing a recreation area. The scenic area is conveniently located, offers great potential for expansion; complements gravel extraction, is a habitat for migratory birds and other wildlife, and is along the shoreline of the Tanana River.

This section summarizes the assessment of key resources used to prepare the Master Plan. The resource management guidelines recommended in the Master Plan were based on the inventories of key resources of the area.

Floodplain Setting

The project area is located along the north bank of the Tanana River. The Tanana River flows generally northward for 531 river miles through a broad alluvial valley. The channel pattern of the Tanana River changes near Fairbanks from a more open braiding to a narrower braiding. Upstream of Fairbanks the river is strongly braided, characterized by unstable, unvegetated gravel bars and multiple channels; downstream of Fairbanks the river meanders across the floodplain with one or more major channels and stable, vegetated islands.

A 1992 Federal Emergency Management Agency (FEMA) map identifies that the project area is within Flood Zone A, a special flood hazard area inundated by 100-year flood events. Major, destructive flooding of the Tanana River may occur every 50 to 100 years. The project area is located on the riverside of a flood control levee, protected by a series of groins extending from the levee to the shoreline of the Tanana River. The Tanana River floods annually and often inundates the project area, but the groins restrict floodwater from flowing over the project site and eroding the landscape.

Minor flooding occurs frequently, depositing sediment and raising the height of terraces. The entire project area is subject to biannual flooding: in the spring during snowmelt, and in the fall during high precipitation. Old slough beds fill up with water and much of the area fills with shallow water. Approximately half of the project area is inundated by high water events in the spring, but the water quickly recedes and the area dries out in early summer.

Based on studies measuring erosion rates of the Tanana River near Fairbanks, average bank recession rates were determined to vary from 12 to 33 feet per year per lineal feet of riverbank. The flood control levee and associated groins, however, have proven to fully protect lands from erosion on the dry side of the levee.

Topography

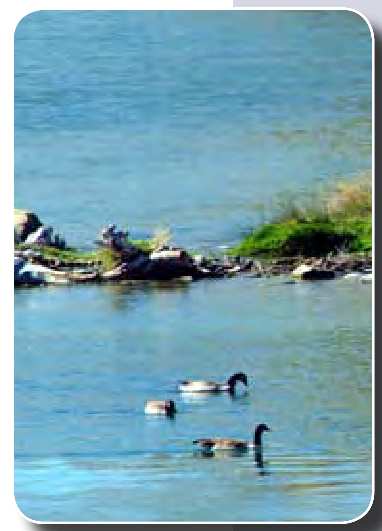
The terrain is flat to undulating consisting of flood deposited silts, sands, and gravels, and marked by abandoned river channels, depressions, levees, and gravel pits. The elevation difference between the highest and lowest locations within the project area is no more than 20 feet, ranging from 420 feet to 440 feet in elevation.

Geology & Soils

Climactic fluctuations during the Quaternary Period caused glacial expansion and recession throughout Alaska. Interior Alaska was not glaciated during this period; however, glaciers surrounded the area during glacial advances. Rivers flowing from surrounding glaciers deposited several hundred feet of silt, sand, and gravel in the Tanana Valley. A layer of loess ranging from several inches to more than 128 feet thick covers most of the Tanana Valley. Gravel deposits along the Tanana River occur up to 154 feet thick and are significant reservoirs for groundwater. Soils within the project area are classified by the U.S. Department of Agriculture Natural Resources Conservation Service as a mosaic of Eielson fine sandy loam, Eielson/Piledriver complex, Tanana mucky silt loam, Tanana/Mosquito complex, and riverwash.

Hydrology

The alluvial plain between the Tanana and Chena Rivers near Fairbanks generally consists of highly transmissive sands and gravels in below-water-table conditions. Depending on topography, depths to groundwater in the Fairbanks area range from 0 feet (surface water) to 21 feet below the ground surface. Depths to groundwater in the alluvial plain are within 10 feet of the ground surface in most areas, and within 5 feet of the ground surface in low-lying areas. The project area is a low-lying area in the alluvial plain and depths to groundwater are estimated at 0 feet to 5 feet below the ground surface. The FNSB estimates the Maximum High Water Elevation of the project site to be 432 feet.



Wetlands

A Wetland Delineation and Functional Assessment Report analyzing the project site was completed and submitted to the USACE for a Preliminary Jurisdictional Determination in April 2007. The study area encompassed approximately 830 acres, and was classified into 13 different wetland habitat types. Wetlands account for approximately 660 acres (80 percent) of the project area. All wetlands in the project area appear to have a downstream connection to the Tanana River, which is a Navigable Water according to the USACE regulatory web site. All wetlands within the project area are therefore considered jurisdictional. There are no isolated, non-navigable, intra-state waters or wetlands within the project area. The only uplands identified within the project area are the Tanana River Levee and associated groins; the southern portion of Goose Island; and a small upland (~10 acres) west of Groin 9. A Wetlands Map is included as Figure 3.

In June 2007, a field verification of the wetland delineation report will be conducted. Fieldwork will involve verifying vegetation types, digging soil pits to verify hydrology and soil types, and completing Alaska Region Wetland Determination forms. Upon completion, a letter report of the findings will be delivered to the USACE for concurrence and final approval of the Jurisdictional Determination.

Tanana Lakes Recreation Area Master Plan Fairbanks, Alaska Fairbanks North Star Borough	Wetlands Map	MAR 2007 FIGURE 3

Climate

Located in Interior Alaska, Fairbanks has a continental climate characterized by warm summers and cold winters. Average January temperatures range from -19 degrees Fahrenheit (°F) to -2°F, and average July temperatures range from 52°F to 72°F. Average annual precipitation is 10.5 inches, and average annual snowfall is 67.1 inches. Snow cover is persistent in the area from October through April, and the transition between winter and summer seasons is rapid. Precipitation is typically heaviest in late July and August. Blizzard conditions are rare, as winds in Fairbanks exceed 20 miles per hour less than one percent of the year.

Vegetation

Native vegetation in the project area is typical of wetland plant communities in Interior Alaska. The project area primarily consists of saturated deciduous and evergreen scrub-shrub, and forests composed of willow, alder, cottonwood, tamarack, and black and white spruce, with underlying native grasses and sedges.

Fish and Wildlife

Fish

According to the Alaska Department of Fish and Game (ADF&G) Anadromous Waters Catalog, chinook, coho, and chum salmon are present in the Tanana River (ADF&G No. 334-40-11000-2490), which borders the southern project area boundary. The Tanana River also supports populations of arctic grayling, whitefish, northern pike, burbot, blackfish, and longnose sucker.

The project area is hydrologically-connected to the Tanana River during high water events, and northern pike have been observed in the project area. Nearby mudflats and deeper water may support fish, but fish appear to be incidental to the project area due to limited over-wintering habitat.

Birds

The Tanana River is a migratory corridor for birds during the spring and fall for feeding, resting, and nesting activities. Over 115 bird species have been documented within the project area comprising a variety of songbirds, shorebirds, ducks, grebes, geese, and swans. The U.S. Fish & Wildlife Service (USFWS) conducted brood surveys of ducks and grebes in 30 distinct wetland areas near Fairbanks between 1994 and 1995. Based on data collected, the wetland complex within the project area was ranked as the highest avian waterbird production site near Fairbanks, with nearly twice as many duck and grebe offspring as Creamer's Field. Notable waterfowl species nesting in the wetland complex include mallard, northern pintail, American widgeon, green-winged teal, northern shovelor, horned grebes, and red-necked grebes. Canada geese, trumpeter and mute swans, ringneck ducks, greater and lesser scaup, canvasback, and bufflehead also frequent the area during migratory periods. One bald eagle nest also exists within the project area in the southeast corner of Goose Island.

Other Wildlife

The following wildlife are present in the Fairbanks area and may inhabit or travel through the project area: moose, red fox, lynx, snowshoe hare, marten, weasels, voles, shrews, mice, river otter, woodchuck, black bear, grizzly bear, wolf, coyote, and lemmings. The wood frog is the only amphibian species present.

Threatened and Endangered Species

The USFWS Threatened & Endangered Species System (TESS) identifies 11 threatened or endangered animal species and one endangered plant species listed and occurring in Alaska. The T&E species are primarily distributed along the coast of Alaska. Jim Zelenak of the USFWS reported there are no threatened or endangered species in the project area.

Recreation Resources

There are no existing recreation facilities within the project area, except the South Cushman Rifle Range, which is west of and accessed through the project area. Though there are no existing facilities to accommodate recreation, current activities within the project area include bird watching/ wildlife viewing, dog walking/training, waterfowl hunting, walking/hiking, fishing, horseback riding, biking, picnicking, camping, swimming, off-road vehicle use, non-motorized boating, and skiing.

The Bonnifield Trail, a winter access route to the Tanana Flats, is also accessed through the project area. Civilian recreational use of this trail is permitted by the USAR-AK by recreation permit. Typical recreational activities south of the Tanana River include snowmachining, hunting, and trapping.

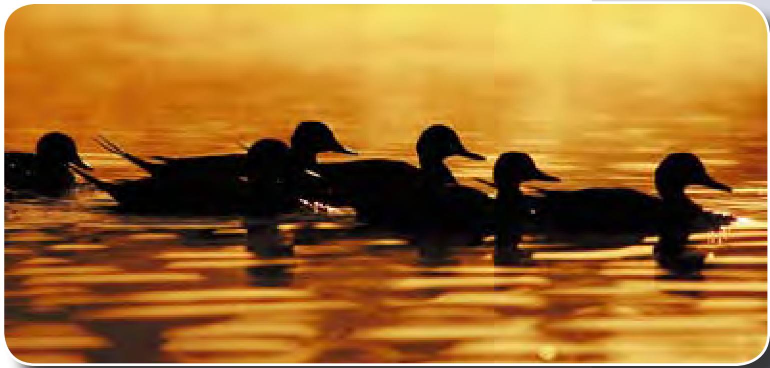
Gravel Resources

Braided rivers such as the Tanana River move tremendous amounts of gravel; this fluvial process leads to the deposits of sand and gravel along the river. Therefore, floodplains are generally a good source of unconsolidated sediments such as sand and gravel.

The deposits along the portion of the Tanana River within and near the project area are an ideal site for extraction. Gravels previously extracted from this area have been characterized by a grain-size distribution suitable for daily cover or cell construction material, have been generally "clean" or free of contaminants, and relatively inexpensive to extract, due to the close proximity to the landfill.

Scenic Resources

The scenic qualities of the project area include landscape patterns and features that are visually and aesthetically pleasing to the recreation experience of the visitors. The project area is located on the northern edge of the Tanana-Kuskokwim Lowland on the northern bank of the Tanana River, a scenic riparian corridor in Interior Alaska. The project area additionally consists of a mosaic of surface water bodies and land, which makes the area well suited for both water-based recreation and land-based recreation.



Public Process and Demand 4

Fairbanks North Star Borough
Department of Parks and Recreation
2007

4 Public Process and Demand

Population and Growth

The revised 2005 U.S. Census estimates indicate the FNSB population is 87,560; while 31,324 people live in the city of Fairbanks, and 1,778 people live in North Pole. The population estimate for the city of Fairbanks includes the military population living on Fort Wainwright, which was approximately 4,050 in 2001. FNSB populations include the cities of Fairbanks and North Pole, Fort Wainwright Army Base, Eielson Air Force Base, and surrounding communities.

Data developed in 1998 by the State of Alaska indicates the population of the FNSB is expected to exceed 100,000 by the year 2018. In comparison to statewide population growth, the FNSB population grew at an annual rate of about 0.6 percent between 1990 and 2005, which is slower than the statewide average annual growth rate of one percent.

Other Local Recreation Areas

Other local recreation areas of similar size and amenities offered within 50 miles of the project area are the Chena Lake Recreation Area, Chena River State Recreation Area, and Harding Lake State Recreation Area.

The Chena Lake Recreation Area, managed by the FNSB, covers 2,100 acres approximately 23 miles east of Fairbanks and approximately 5 miles northeast of North Pole. The area includes two distinct parts – a Lake Park and a River Park. The Lake Park is centered about the 260-acre Chena Lake, which is stocked annually by ADF&G with rainbow trout, coho salmon, and arctic char. No motorized boats or aircraft are permitted on the lake. The area offers several day-use picnic sites, fire rings, covered pavilions, changing rooms/warming buildings, designated swim areas with sand beaches, bicycle trails, nature trails, boat rentals, fishing docks, boat launch, playground, volleyball courts, horseshoe pit, restroom facilities, and drinking water stations.

The Lake and River Park areas each contain a campground, for a combined total of 80 campsites. Each camping area contains potable water and restrooms that are available during the summer and early fall seasons. A third campground on an island on Chena Lake is accessed only by boat and contains five tent sites, a restroom and a picnic site. During the winter months, Chena Lake offers ice-fishing, groomed classical cross-country ski trails and multi-use trail loops for snowmachining, skijoring, dog mushing, and hiking.

The Chena River State Recreation Area, managed by the ADNR Division of Parks & Outdoor Recreation, is almost 400 square miles (254,000 acres) in size and located east of Fairbanks. The recreation area is accessed by Chena Hot Springs Road, which parallels the river, providing users many entry and exit points for fishing, boating, camping, and access to the large trail system. There are four stocked fish ponds, and three campgrounds with a combined total of 73 campsites. Each camping area is accessible by road and offers access to fishing, picnic sites, restrooms, and drinking water. There are additional opportunities for camping in undeveloped areas along gravel bars and river access roads. ADNR also rents seven public use cabins, all of which are accessible from trailheads located along the road. Four backcountry first-come, first-serve shelters also exist with the recreation area. The largest facility within the recreation area, Twin Bears Camp, is located at Milepost 30 on the road, about 35 miles east of Fairbanks. It is operated year-round by the Twin Bears Outdoor Education Association and offers facilities for individuals or groups to rent. The camp contains 12 rustic cabins and two handicap accessible buildings with electricity, heat, and cooking facilities.

The camp also features a volleyball court, baseball field, horseshoe pit, basketball hoop, picnic tables, and a fire ring. In the winter, there is a 5-kilometer cross country ski trail loop and access to the Chena Hot Springs Winter trail for snowmachiners.

The Harding Lake State Recreation Area, managed by the ADNR Division of Parks & Outdoor Recreation, is located 45 miles south of Fairbanks along the Richardson Highway. Facilities include picnic sites, two picnic shelters, camping areas, nature trails, and areas for baseball, volleyball, and horseshoe. There is a boat launch that provides access to Harding Lake for motorized and non-motorized watercraft, and fishing opportunities are provided for lake trout, arctic char, and burbot. The main campground, located in a spruce-birch forest, has 78 vehicle and 5 walk-in campsites. Each site has a picnic table and a fire ring, and the campground has a sanitary dump station. There are additional camping units available at the day-use area and camp lot areas by the lake.

Public Input

The project team conducted a public meeting on December 6, 2006, at the Alaska Centennial Center for the Arts at Pioneer Park in Fairbanks, Alaska. The public comment period for this project was open from November 21 to December 31, 2006. Public comments were solicited during and subsequent to the public meeting, as well as through an online project questionnaire. The most prevalent comments received during and after the public meeting, and results of the project questionnaire, are presented on the following page. Copies of all public comments, including the results of the online project questionnaire, are provided in the Agency and Public Scoping Summary Report located in Appendix A.

Public Input *(continued)*

Planning and Design

- Include the Bonnifield and 100-mile Trails in Master Plan
- Consider expanding project area
- Litter and illegal dumping remains a problem in the area
- How will FNSB determine “appropriate uses” of the area?
- Survey does not reflect desires of tourists or a balanced cross-section of recreational users
- Ensure gravel extraction plan is concurrent with development of the recreation area

User Accommodations

- Conflicts between uses can be addressed through separation in space or time
- Include horse trails and facilities in the recreation area
- Camping and RVs are not a good fit for the area
- Include an archery range in the plan
- Area does not seem suitable for swimming (i.e. leeches and swimmer’s itch)
- Closing access to the recreation area at Cushman Street would affect users of the rifle range

Fish and Wildlife

- Walkways and viewing platforms in “preserved area” may be counterproductive to bird nesting
- Gravel extraction activities may diminish habitat value
- Pike are present in project area

The FNSB received a total of 173 completed project questionnaires during the public comment period. The following summarizes the results of the questionnaire.

- 70% of the questionnaire respondents currently visit the area.

- The most common activities respondents currently participate in during their visits are:
    - **Bird Watching/Wildlife Viewing – 32%**
    - Dog Walking/Training – 15%
    - Waterfowl Hunting – 10%
    - Walking/Hiking – 9%
    - Use of Rifle Range – 8%
    - Other activities listed – 5% or less, each

- The most common facilities respondents would like to see at the recreation area are:
    - **Walking/Hiking Trails – 12%**
    - Bird Watching/Wildlife Viewing Platforms – 10%
    - Restrooms – 9%
    - Picnic/Open Areas – 8%
    - Cross Country Skiing Trails – 8%
    - Non-motorized Boating – 7%
    - Biking Trails – 7%
    - Other facilities listed – 5% or less, each

- The top three facility priorities (listed in order of priority) are:
  1) **Bird Watching/Wildlife Viewing Platforms**
  2) Walking/Hiking Trails
  3) Cross Country Skiing Trails

- Respondents felt Preservation and Recreation were equally important for the recreation area. 50% of the respondents chose Preservation to be more important than Recreation, and 50% of the respondents chose Recreation to be more important than Preservation.

- 93% or respondents felt preservation and recreation can coexist in the area.

- The most common activities respondents indicated as a potential conflict between users are:
    - **Motorized Use <vs> Wildlife Viewing/Habitat Preservation – 33%**
    - Motorized Use <vs> Non-motorized Use – 24%
    - Other activities listed – 10% or less, each

Public Input *(continued)*

- The most common activities respondents indicated they did not want to see on site are:
  - » **Motorized Use – 59%**
  - » Discharge of Firearms – 19%
  - » Other activities listed – 5% or less, each

- **55% of respondents indicated motorized and non-motorized activities should be separated from each other**; 34% indicated motorized activities should not be allowed in the area; and 11% indicated they do not see a potential user conflict between motorized and non-motorized activities.

- If the recreation area were developed in line with their priorities, respondents said they would visit the area during:
  - » **Year-round – 56%**
  - » Summer only – 43%
  - » Winter only – 1%

- If the recreation area were developed in line with their priorities, respondents said they would visit the area the following number of times per year:
  - » **Over 20 times – 41%**
  - » 10-20 times – 31%
  - » 6-10 times – 22%
  - » 1-5 times – 6%

- Respondents indicated they would support the following entrance fee:
  - » Up to $50 per household per year – 11%
  - » Up to $25 per household per year – 25%
  - » Up to $10 per vehicle per day – 8%
  - » **Up to $5 per vehicle per day – 40%**
  - » No entrance fee – 16%

Agency and Organization Input

Federal, state, tribal, and local organizations were informed of the development of the Master Plan in November 2006, and their comments were solicited. Scoping comments were received from eight agencies and one local organization – USFWS, FNSB Department of Community Planning, FNSB Department of Land Management, FNSB Department of Public Works, National Marine Fisheries Service (NMFS), City of Fairbanks, Alaska Department of Environmental Conservation (ADEC) Division of Water, ADNR Office of Project Management and Permitting (OPMP), ADNR State Historic Preservation Office (SHPO), and The Wildlife Society. Copies of all comments are provided in the Agency and Public Scoping Summary Report located in Appendix A. Their comments are summarized by resource category as follows:

Fish and Wildlife

- A bald eagle nest exists within the project boundaries in the southeast corner of Goose Island, along an old slough channel, and near a proposed multi-use trail. Care will be needed in managing the area and activities around this nest.
- The value of the area to water birds will be diminished wherever shallow edge habitat is replaced by deep pits. Reclamation of the shorelines surrounding the extraction areas should be a high priority.
- Stocking of fish, or increased access by northern pike, can diminish the value of the area to waterfowl through competition for food and direct predation.
- The described action will not result in any adverse effect to Essential Fish Habitat (EFH).
- The portion of the project area designated as a natural area will provide for the conservation of birds, fish, mammals, amphibians, invertebrates, and native plant species over time if recreational use and gravel extraction are managed to minimize disturbance to wildlife and prevent degradation of habitat.

Fish and Wildlife (cont'd)

- The FNSB should seek out methods to maintain current habitat values to the greatest extent possible.
- The FNSB should consider habitat manipulations that will enhance benefits to birds and mammals.
- Shorelines with dense vegetation should be preserved because of their value as nesting and brood-rearing habitat.
- Maintaining wetland values in the designated natural area may help reduce aircraft strike hazard by attracting waterfowl away from the Fairbanks International Airport during migration periods.
- Fisherman walking along pond shores could disturb birds during the nesting and brood-rearing seasons. The FNSB should consider stocking fish only outside the designated natural area.
- The FNSB should recognize the benefits amphibians and insects provide to birds, mammals, fish, and plant species and consider impacts of proposed uses on these taxa.

Vegetation

- The designated natural area should be managed for native plant species and strive to keep invasive or non-native plant species from becoming established in the area.

Land Use

- More thought will be needed regarding what constitutes multi-use, motorized, and non-motorized recreation. Care will be needed to separate incompatible activities in time and/or space.
- Phasing of the gravel mining operation will likely result in many years of disturbance to wildlife and users. The timing of gravel extraction should be considered a tool for minimizing conflicts.

- Currently the zoning of this area is Heavy Industrial and General Use-1. It is recommended this area be rezoned to Outdoor Recreation after gravel extraction is completed.
- Sequence of development must consider minimizing conflict between patron activities within the park and gravel extraction and hauling activities to the landfill.
- Allow adequate space for gravel storage stockpiles and establish truck routes to the landfill facility.
- A traffic analysis is recommended to project traffic flow generated by this new facility. Necessary upgrades to Lathrop Street should be projected. A cul-de-sac needs to be added to South Cushman Street if this street is going to be dead-ended.
- The FNSB should manage the designated natural area for uses that are compatible with species conservation and wildlife-dependent recreation.
- The proposed area has great potential for recreation development including access to the Tanana River. Over time, development will also discourage unwanted dumping and shooting which are instrumental to public health and safety.

Floodplains

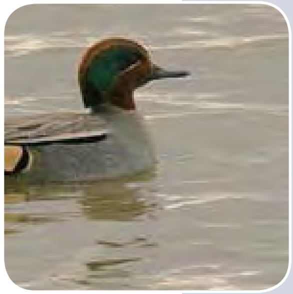
- The 1992 FEMA Map identifies this area as being within Flood Zone A, a special flood hazard area inundated by a 100-year flood.

Water Quality

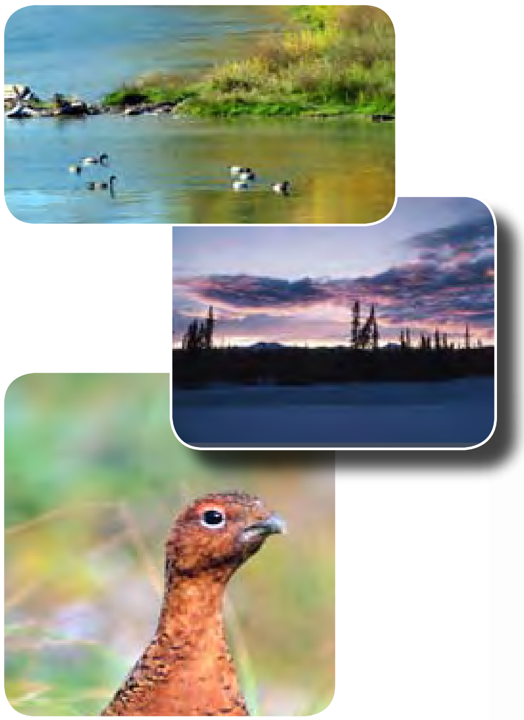
- The development is not within an identified drinking water protection area and will not impact any known public drinking water sources.

Cultural and Historic Resources

- The Alaska Heritage Resources Survey database does not list any reported archeological or historic sites within the proposed project boundaries. Additionally, the proposed project is in an area of relatively low archeological potential.



Development Plan 5



Fairbanks North Star Borough
Department of Parks and Recreation
2007

5 Development Plan

Opportunities and Constraints Affecting Development of the Area

Opportunities are those site characteristics that may encourage certain types of use or development. For example, a site that provides scenic vistas would be a desirable destination for both picnickers and hikers. Constraints are those characteristics that might limit or restrict use. Examples include steep slopes or sensitive wildlife habitat.

There are some inherent conflicts between opportunities and constraints. For example, creeks, which are sensitive ecosystems, are also desirable locations for trails and other recreational pursuits. These potential conflicts have been evaluated with the intent of balancing recreational opportunities with the need to protect valuable resources.

An overview of the opportunities and constraints affecting the development of the recreation area is shown below.

Opportunities

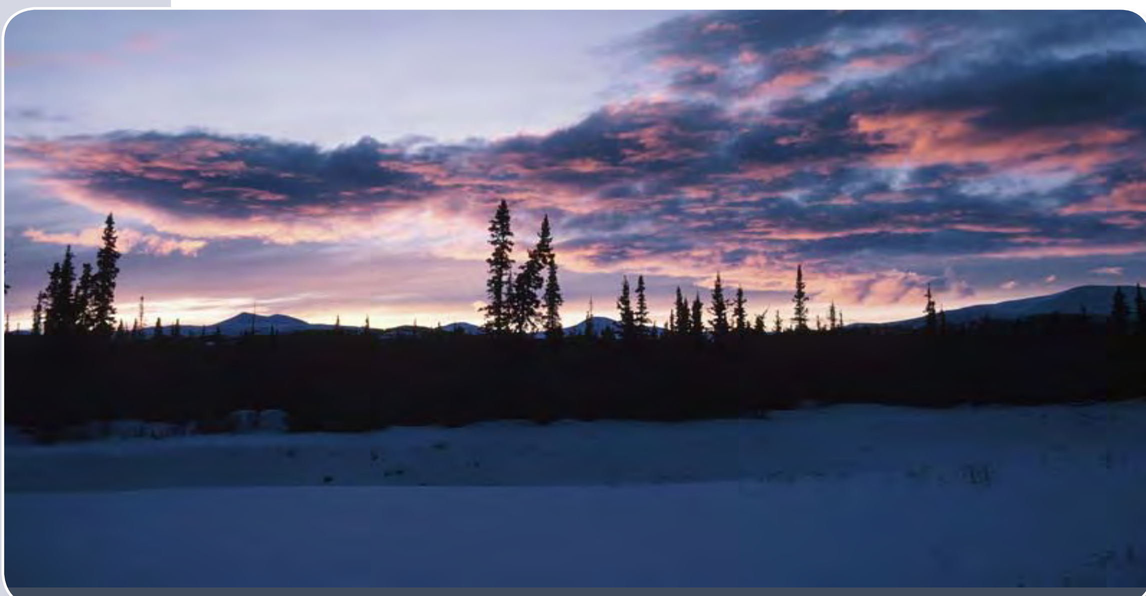
- Close proximity to Fairbanks and Fort Wainwright
- Scenic
- Habitat for migratory birds and other wildlife
- Tanana River Shoreline
- Complements gravel extraction for FNSB landfill
- Potential for expansion

Constraints

- Development restrictions within the 250-foot buffer from Tanana River Levee
- Project area highly susceptible to flooding in spring during snowmelt and in the fall during high precipitation events
- Alaska Rail Road Corporation (ARRC) South Fairbanks Rail Alignment project on the Tanana River Levee

Habitat Preservation

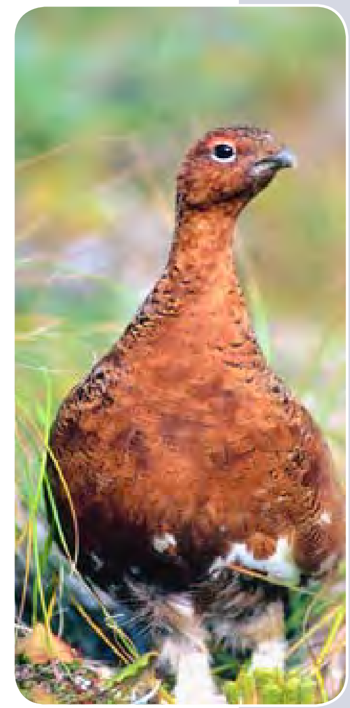
Two habitat areas totaling 188 acres within the project boundary will be preserved as shown on Figure 4. One habitat area adjoins the east side of Groin 9, and is a condition under the June 2006 USACE permit (POA-2006-442-4) for gravel extraction. The habitat area totals 7.5 acres and is separated by a gravel roadway into two similar size areas. The FNSB has proposed to remove the section of roadway separating the areas to combine the preserved habitat area into a 9-acre area.



The second habitat area encompasses 179 acres, and was supported by the USFWS early in the Master Plan process to preserve the highest value habitat for migratory birds and other wildlife within the project limits. This habitat area was originally negotiated by the USFWS with the FNSB to set aside 150 acres of the project site's prime habitat. Since that negotiation, the FNSB has expanded the area to 179 acres to better align the recreation amenities with the natural setting.

Both habitat areas will be in a designated "Non-Motorized" Use Zone to help protect the integrity of the areas' habitat values. Motorized use will be permitted outside of this zone as shown on Figure 5.

The intent of the "Motorized" versus "Non-Motorized" Use Zones is to divide the project area into passive and active regions to accommodate the diversity of, and prevent conflicts between, recreation uses.

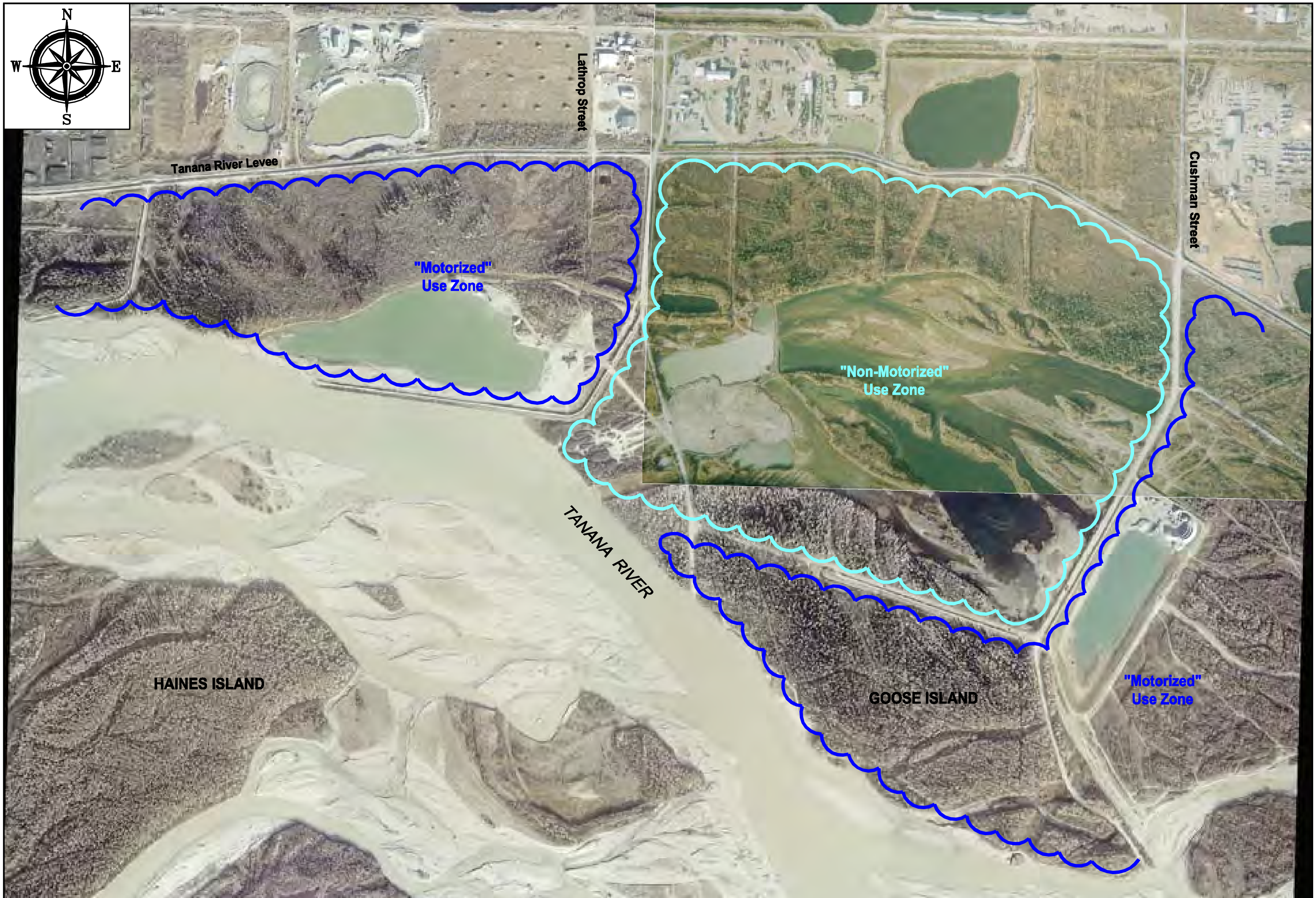


Tanana Lakes Recreation Area Master Plan
Fairbanks, Alaska
Fairbanks North Star Borough

Preserved Areas

MAR 2007

FIGURE
4



Tanana Lakes Recreation Area Master Plan Fairbanks, Alaska Fairbanks North Star Borough	"Motorized" and "Non-Motorized" Use Zones	MAR 2007 FIGURE 5

Proposed Facilities and Infrastructure

Site Security

Securing the site will be key to providing recreational opportunities, as well as perpetuating recent and future efforts to enhance the area's natural assets. To provide oversight and an enforcement presence in the area, a single entrance/exit access road to the recreation area with a staffed entrance station is planned. This will help deter illegal activities such as vandalism and illicit dumping of junk or abandoned vehicles and other refuse.

Entrance Station

The entrance station will be constructed on the river-side of the levee on the entrance/exit access road, which will ultimately be an extension of Lathrop Street. The entrance station is planned to be staffed 24 hours/day during the summer months, and during daylight hours during the winter months. General architectural, structural, and mechanical design considerations should include building structure, electrical, and heating and cooling needs. General civil design considerations should provide up to five parking stalls and restroom facilities for station staff.

Site Access and Circulation

Due to the site's close proximity to Fairbanks and Fort Wainwright, it is assumed visitation will exceed that of the Chena Lake Recreation Area. The FNSB recorded 108,117 visitors for the fiscal year of 2003/2004 at the Chena Lake Recreation Area, and 92,389 visitors for the fiscal year 2004/2005. Once development of the Tanana Lakes Recreation Area is complete, visitation is assumed to greatly exceed these values.

Traffic will be directed to enter and exit the site from a single access road. Currently, the site can be accessed from South Cushman Street and Lathrop Street by way of the Goose Island Causeway (Groin 10) and Groin 9, respectively. To secure the site and limit traffic to a single access road, a gate would be placed on the river-side of the levee at its intersection with Groin 9 and 10 to block traffic from accessing the site at these locations. As shown on Figure 6, Lathrop Street would be extended and become the single access road to the site.

Road System

Nearly 4 miles of new or improved road systems will provide vehicular access throughout the recreation area. The Lathrop Street extension will require approximately 1,600 linear feet of roadway improvements. New and improved roads within the recreation area will serve as access to the various amenities across the site and terminate at three locations – the Equestrian Park and trail (0.7 miles), Rifle Range (1.2 miles), and Bonnifield Trail (1.7 miles). A section of the Goose Island Causeway is also planned to be gated off, between the south side of the rifle range road and the access road to the Bonnifield Trail, to limit traffic circulation near the preserved area.

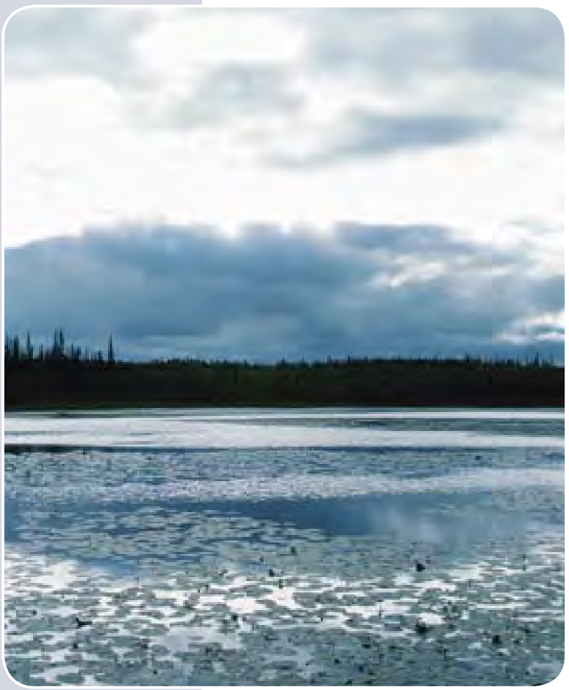
It is recommended that improved roads be constructed to accommodate design loads for H-20 rated traffic loads. Fill material should consist of fast draining, non-frost susceptible material. Groundwater elevation in relation to the structural section should be evaluated to determine adequate structural thicknesses, and/or subbase applications that will provide a stable, long-lasting roadbed. The roadway should be crowned to accommodate surface drainage to ditches along the roadside. Existing drainages will need to be evaluated to determine where proper culverts and ditching will be required.

Examination of site runoff for the new roadway will need to address runoff treatment prior to outfall to wetlands and water bodies. Consideration of initial and life-cycle costs of gravel surfacing and/or asphalt surfacing should be evaluated as well.

This Master Plan assumes the use of gravel for roadways with a typical roadway section comprised of a 4-foot depth, 30-foot width, and 3:1 sloped shoulders.

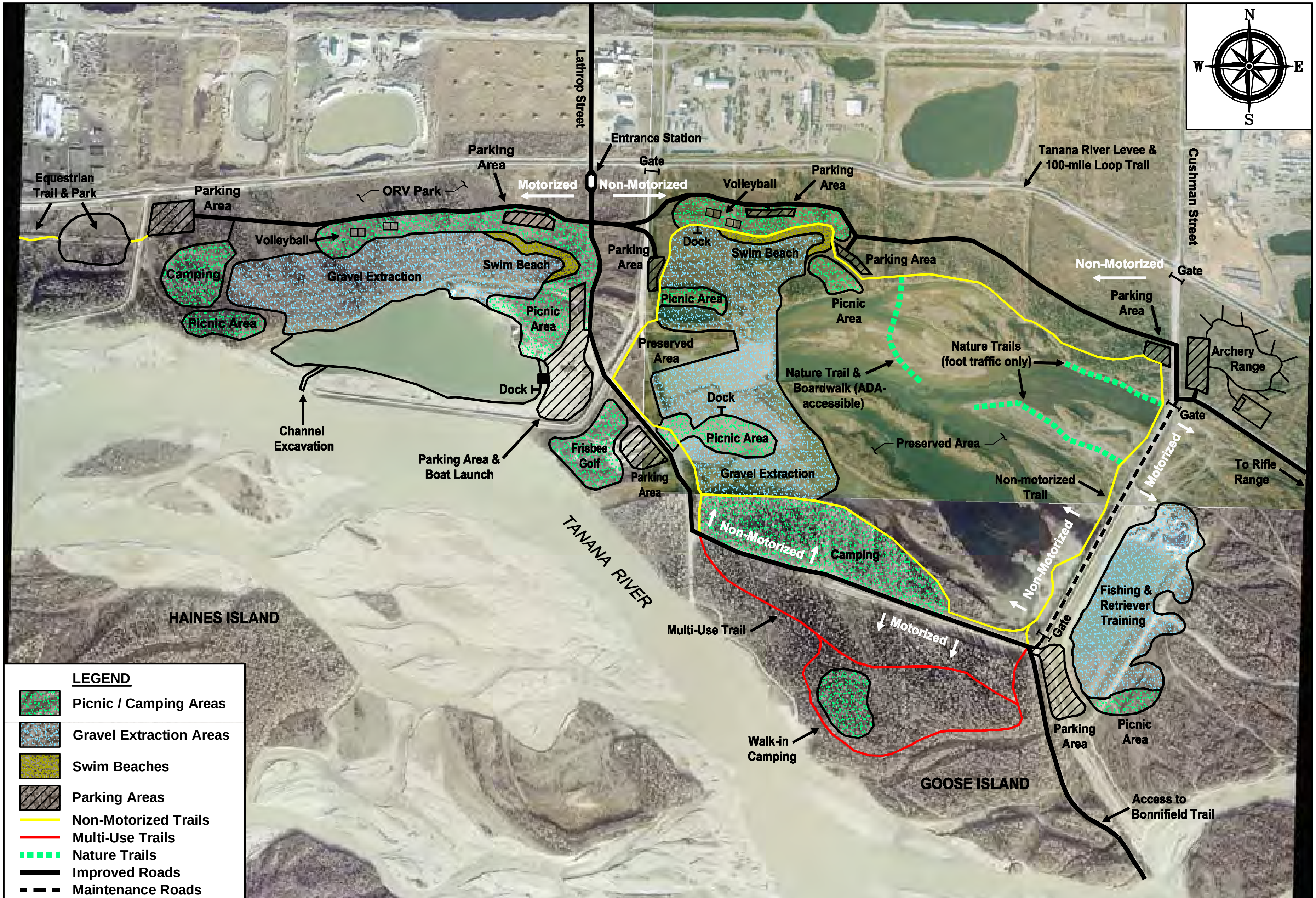
Parking Areas

Ten parking areas are planned to serve various amenities throughout the recreation area as shown on Figure 6. Parking lot sizes and the total number of spaces will be determined during the final design; however at this stage of the planning, approximately 21 acres have been allotted as parking areas.



All parking areas should be constructed to accommodate H-20 rated traffic loads. Fill material should consist of fast draining, non-frost susceptible material. Groundwater elevation in relation to the structural section should be evaluated for determination of adequate structural thicknesses, and/or subbase applications to ensure a stable, long-lasting parking surface. Proper grading of the parking areas will need to accommodate and properly treat site runoff prior to outfall to wetlands and water bodies. Consideration of initial and life-cycle costs of gravel surfacing and/or asphalt surfacing should be evaluated as well.

This Master Plan assumes the use of gravel for parking lots having a typical depth of 3 feet with 3:1 sloped edges.



Tanana Lakes Recreation Area Master Plan
Fairbanks, Alaska
Fairbanks North Star Borough

Site Concept - Summer Use

MAR 2007

FIGURE 6

Proposed Recreational Uses

Summer Use

Predominant use of the recreation area will occur during the summer. For planning purposes, this section defines summer as the spring, summer, and fall months when snow cover is absent. The following recreation amenities are included on the Summer Use Site Concept (Figure 6).

Trail System

The trail system within the recreation area will consist of 2.7 miles of non-motorized trail in the central portion of the site, a 1.5-mile multi-use trail in the southern portion of Goose Island, and an equestrian trail extending west of Groin 8. Approximately 0.7 miles of nature trails will also be provided within the preserved area for wildlife viewing.

All trails within the park, regardless of classification of use, should be constructed to accommodate their respective design loads using fast draining, non-frost susceptible material. Groundwater elevation in relation to the trail elevation should be evaluated for determination of adequate structural thicknesses, and/or subbase applications to ensure a stable, long-lasting trail. The nature trails should also consider the use of "foot traffic only," particularly in wetland areas where the use of fill material may be prohibitive. Boardwalk design should consider the proper selection of structural and foundation elements. These elements may include combinations of timber or metal decking and railing. Foundation design of boardwalks will need to consider the underlying soil conditions for the proper use of post and pad foundations, pile foundations, helical pier anchor foundations, or a combination of all three. Water level fluctuation and elevations should also be considered during the design of the boardwalk(s).

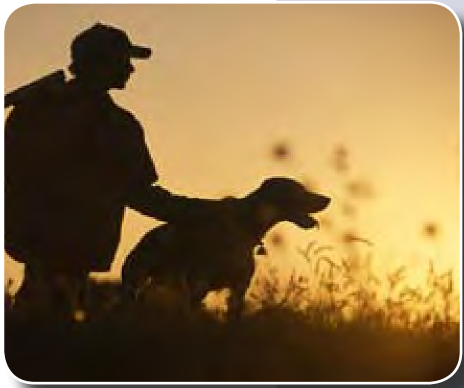
The following criteria should be followed for designated trails:

- Trail tread should be reasonably free of logs, brush, rocks, man-made hazards, and other obstructions
- Trail should be well signed so that an average user can follow the trail in any kind of weather during its normal season of use
- Sufficient map information should be available so that an average user can find the trailhead and know where the trail leads

Picnic and Open Areas

Nearly 36 acres has been set aside for picnic and open areas that will be available during the spring, summer, and fall. Each of the six picnic and open areas are located on a shoreline close to the summer recreation facilities including the two swim beaches, a fishing and retriever training pond, a motorized-use lake, and the Tanana River. At a minimum, the picnic areas will offer picnic tables and restroom facilities. Some picnic areas may also include playgrounds, volleyball courts, horseshoe pits, fire rings, and/or covered pavilions.

Picnic and open areas should be offset, yet easily accessible from trails and parking areas. This would allow ease of user accessibility, and keep primary trail and vehicle traffic outside of these areas. Design of picnic and open spaces, especially those in close proximity to bodies of water, should consider water level fluctuations and adequate fill to keep these areas as “high and dry” as possible. Proper grading of the areas will need to accommodate site runoff and proper treatment prior to outfall to wetlands and water bodies. Use of a proper seed mix and accompanying vegetation should be examined for fast establishment and hardiness, particularly in relation to high summer use and mitigation as an animal food source. Consideration of furniture (i.e. picnic tables) in the picnic areas should examine high use versus long-term durability, and anti-theft and vandalism measures.



Campgrounds

Camping facilities are planned at three locations within the recreation area. The largest planned camping area, consisting of approximately 26 acres, lies north of Groin 10 and will be connected to the improved road system. Camping in this area, and the 6-acre camping area near the Equestrian Park, is intended for both RV and tent campers. The camping area near the Equestrian Park will provide campground guests immediate access to equestrian activities, the motorized lake, and to a picnic area to the south. The approximate 5-acre camping area on Goose Island will be for walk-in campers only.

For all vehicle-accessible camping areas, general layout considerations will include layout and vehicle circulation, vehicle parking, and campsite layout considerations. Individual campsites may include a fire ring, picnic table, and tent area. Vehicle parking areas should be constructed similar to the requirements for the general parking areas and should consider fill materials, underlying soils, groundwater elevations and water level fluctuations. Walk-in camping facilities should be located within reasonable proximity to the trail system and nearby parking areas.

Restroom Facilities

Restroom facilities should be included at all parking areas, vehicle-accessible camping areas, and the entrance station. Cost benefit analysis and wastewater regulations should be examined to determine if permanent structures with self-contained above ground tanks, or portable/serviceable systems should be used. Proper location and placement of the facilities should be considered for traffic and ease of accessibility. Proper containment measures for wastewater spills should be included in the design of the facilities to protect the environment. Maintenance of either type of facility should include pumping, service, and cleaning on both a regular schedule and increased service during peak use.

Swim Beaches

Two swim beaches are planned for the Tanana Lakes Recreation Area – one in the non-motorized area and one in the motorized area. Swim beach locations were chosen so that they receive maximum sun exposure. Swim beaches should include placement of a properly screened material to use for the beach, higher than the high water mark, yet lower in elevation than the low water mark. The material selected should discourage vegetation growth along the beach so that maintenance is limited. Construction of the swim beaches should consider the flow of water along the beachfront to characterize the rate of erosion and/or sedimentation. Ideally, the beach should be located so that flows along the beachfront will be such that erosion and sedimentation is minimized. For safety, it is proposed that finish grades of shoreline areas have 6:1 slopes to a minimum depth of 5 feet off shore. This will allow safe access for swimming as well as launching canoes and kayaks and landing personal watercraft such as jet skis.

Motorized and Non-Motorized Boating

Motorized boating will be limited to the west gravel pit and river access. A parking area, dock, and boat launch is planned to serve the motorized boating area. Each of these facilities should consider a common maximum boat size for both design and future use. The planned parking area should be designed and constructed with considerations previously discussed, and to provide adequate circulation and parking for vehicles with boat trailers. Dock facilities should consider proper location to separate boat mooring and launch activities. In regards to the appropriate type of dock facility, considerations should include shoreline topography, water level fluctuations, general accessibility, and maintenance. The boat launch facility should consider location with respect to boat traffic circulation in the water and vehicle traffic circulation performing launch activities. The facility should consider water level fluctuation and usability related to the water level.

To accommodate river access for boaters, a channel may be excavated between the pit and the Tanana River. The construction of this channel should consider the proper installation of an appropriate “river training structure” such as a riprap spur dike or similar protruding dike to divert river flow. Such diversion may be required to mitigate bank erosion and sedimentation that could result from the stream bank modification associated with construction of the channel. Construction of the structure and the final operating structure should properly accommodate fish passage.

Non-motorized boating will be offered in the central and east gravel pit areas. Parking areas, picnic areas, and dock facilities will serve the area. Parking areas should be designed and constructed with considerations previously discussed and to provide adequate circulation and vehicle parking. Easy access to picnic areas and dock facilities should be considered with the design of the parking layout. An appropriate type of dock facility and location should consider ease of mooring for common non-motorized boats such as canoes, kayaks, rowboats, and paddle boats. Other considerations related to appropriate dock facilities should include shoreline topography, water level fluctuations, and general accessibility and maintenance.

Fishing

The ADF&G is currently constructing a new fish hatchery in Fairbanks, but annually stocks ponds throughout the FNSB with fish produced in Anchorage. To provide fishing opportunities during the summer and winter, the gravel pit east of the Goose Island Causeway (Groin 10) was selected for stocking. Due to the geometry and depth of this gravel pit, it is currently not aesthetically pleasing as a fishing pond or suitable for fish habitat. Modification of this gravel pit will be necessary for stocking and public use.

Some recommendations from the ADF&G are as follows:

- Maintain a substantial portion of the water volume with a depth greater than 20 feet for overwintering habitat. Expected ice thickness in Tanana Valley gravel pits is 26 to 48 inches.
- Shoreline configuration should be irregular where possible, creating large and small bays, peninsulas, and islands where possible.
- Construct littoral zones (out to 10 feet from shore) with slopes 5:1 to 7:1 out to a maximum depth of 6 feet.
- To the extent possible, place an approximately 4-inch layer of overburden onto the littoral zone out to a depth of ten feet. Plant colonization of the littoral zone at depths greater than three feet is beneficial.
- Submerged or partially submerged large woody debris should be installed in the littoral zone if possible.
- Deepest littoral and benthic (six feet deep and deeper) lake bottom should be rough with structures (i.e. drop-offs, mounds, trenches, and ridges).
- Dissolved oxygen levels above 2.0 parts per million (ppm) are necessary; 10.0 ppm is ideal.
- Summer water temperature should not exceed 65ºF.

To contain stocked fish in this pond during high water events, a containment berm around the pond will need to be constructed above the high water elevation. This berm will need to be traversable and accessible to the trail and road system. Considerations of the construction of the berm should address traversable slopes for fishermen, stability against erosion, and aesthetically pleasing vegetation. Footpaths up and along the berm slopes should examine and tie to a perimeter footpath, which would encompass the perimeter of pond. Proper design considerations of the berm should also include evaluation and analysis of the underlying soils and design footprint for stability, as well as proper berm dimensions, materials and construction to ensure stability during flood events, and prevent a “blow-out” due to high water pressures.

Archery Range

The archery range will be developed north of the Rifle Range access road and east of Groin 10. It will include an open range and 3-D target field range, as well as a parking area to accommodate approximately 30 vehicles. Design of the open range should adhere to National Field Archery Association (NFAA) or International Archery Association (FITA) guidelines, and include proper grading for site runoff and stormwater treatment. Typical open range layouts are designed with groups of 14 targets. One 14-target course would likely be sufficient for the open range, with target distances varying from 10 to 80 yards. Shooting lane widths are recommended to be at least 10 feet with a safety buffer greater than 15 yards on either side of the range. Installation of benches or workstations at the open range is also recommended.

The 3-D target field range will be attached and accessible to the open range, and will consist of a winding loop with approximately 14 shooting lanes perpendicular to the outside of the loop. By adding a gravel access road inside the winding loop, target placement and pick-up before and after scheduled/supervised shoots may be facilitated. Preservation of existing vegetation to define the shooting lanes by minimizing the clearing of trees and brush to construct alleyways should also be considered.

Prior to the design of the 3-D target field range and open range, local archery associations in Fairbanks and North Pole should be consulted on the layout of the facilities and selection of NFAA and/or FITA design guidelines.

Equestrian Accommodations

An area for an equestrian park and trail system has been allocated at the park's west edge. Design and construction of this facility will be user-group driven.

Frisbee Golf Park

An 18-hole frisbee golf park will be developed on 6.6 acres on the north shoreline of the Tanana River and south of Groin 9. Design of the park should consider water level fluctuations and adequate fill where needed to keep this area as "high and dry" as possible. Proper grading of the areas will need to accommodate site runoff and proper stormwater treatment prior to outfall to wetlands and water bodies. Use of proper seed mix and accompanying vegetation should be examined for fast establishment and hardiness. Consideration of proper furnishing selection for the park (i.e. frisbee golf baskets) should be examined for long-term durability, and anti-theft and vandalism protection measures. Preservation of existing vegetation may be possible on the park grounds provided the seasonal high water elevation is low enough. Stream bank protection considerations along the south and west sides of the park area may also be needed.

ORV Park

An area for an Off-Road-Vehicle (ORV) Park has been allocated to north of the west gravel pit between Groins 8 and 9. The ORV Park will take advantage of its close proximity to the largest planned gravel extraction area by using overburden from the development of the excavation site for development of ORV obstacles. Design and construction of this facility will be user-group driven.

Winter Use

This section defines winter as the months when snow cover is present. The following recreation amenities are included on the Winter Use Site Concept (Figure 7).

Trail System

During the winter, the non-motorized trail identified on the Summer Use Site Concept will become a 2.7-mile ski loop trail. The ski loop trail will connect with the multi-use trail in the motorized, southern portion of Goose Island, adding 1.5 miles of trail to the ski loop. Parking areas adjacent to the trails will be plowed in the winter to serve as trailheads for the ski trail network.

Ice Skating

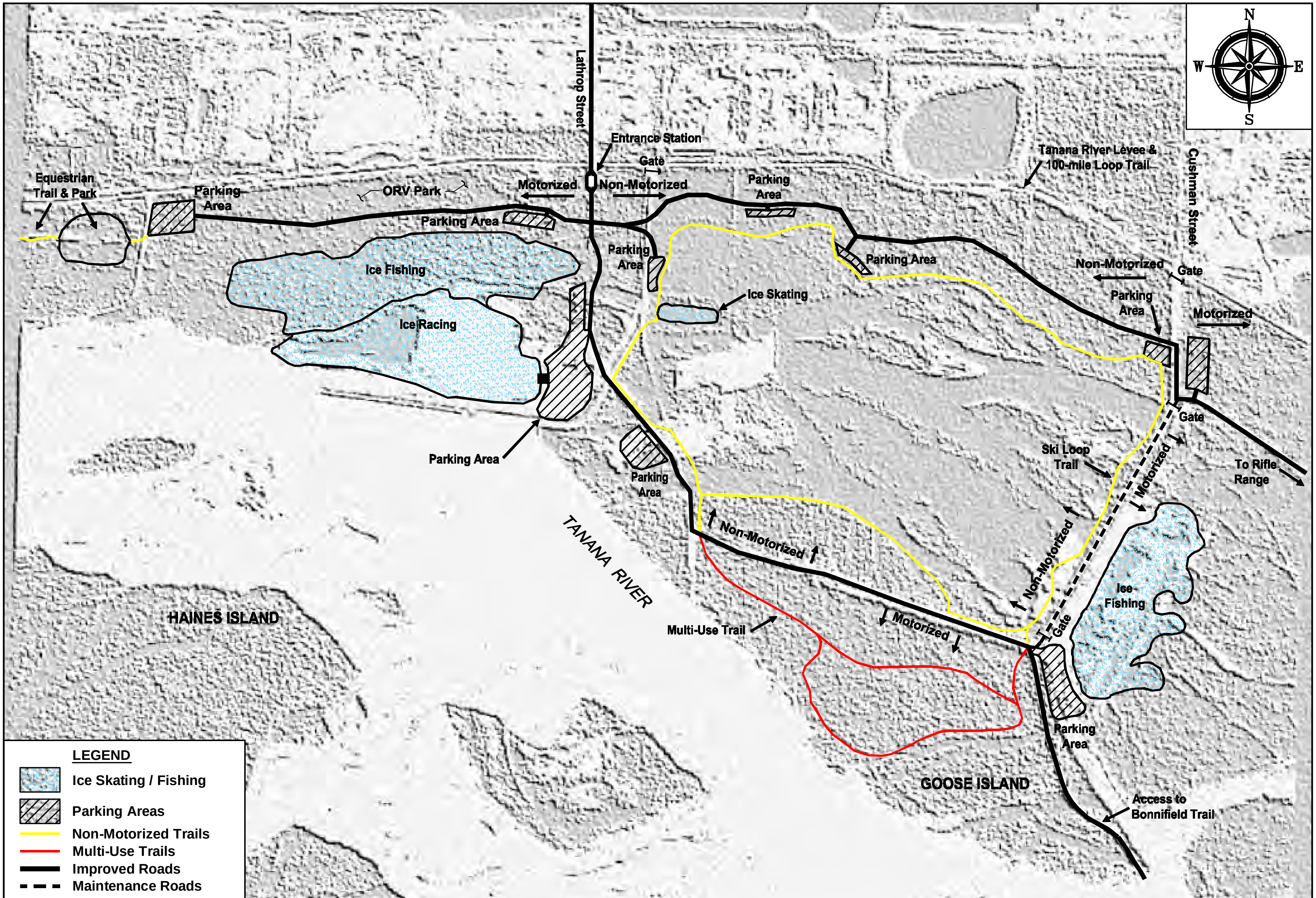
Ice skating will be offered at an existing body of water adjacent to and east of Groin 9, as shown on Figure 7. Opportunity for ice skating may be offered in the future at the two swim beach locations.

Ice Fishing

Fish are incidental to most of the water bodies on site in the winter due to shallow waters, which limits over-wintering habitat for fish. However, all of the water bodies on site will remain open to ice fishing. Ice fishing will be promoted at the gravel pit east of the Goose Island Causeway (Groin 10), which has been selected for stocking. The existing depth of this gravel pit provides suitable over-wintering habitat.

Motorized Activities

Motorized activities on site during the winter months would primarily include snowmachine use and ice-racing. Snowmachine use will be allowed across the entire site with the exception of the non-motorized area. Access to the Bonnifield Trail, the ice bridge and winter route to the Tanana Flats, will be maintained. The USAR-AK constructs and maintains the ice bridge every winter, and civilian access is authorized by recreation permit. The parking lot south and east of the Goose Island Causeway will be plowed to serve as a parking and staging area for access to the Bonnifield Trail. Organized ice-racing will also be available west of Groin 9 as shown on Figure 7.



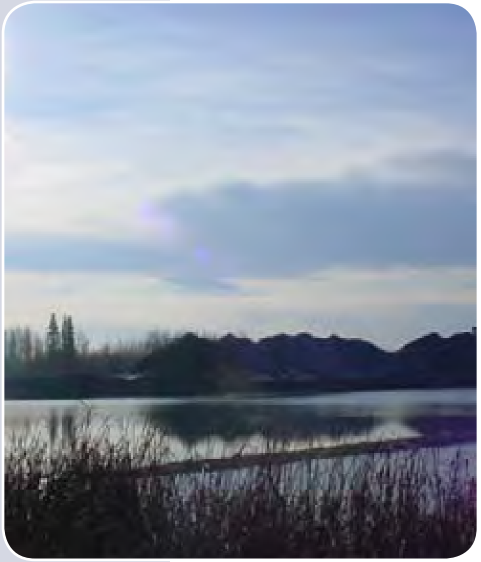
Tanana Lakes Recreation Area Master Plan Fairbanks, Alaska Fairbanks North Star Borough	Site Concept - Winter Use	MAR 2007 FIGURE 7

Gravel Extraction

The schedule for developing the recreation area is largely dependent on the gravel requirements of the landfill. Although gravel extraction operations within the project area must complement the development and use of the recreation area, extraction must also correspond with the landfill's gravel needs for cell construction and daily cover operations.

FNSB Landfill Background

The FNSB municipal solid waste landfill is comprised of a series of 9 lined cells. Construction of the first cell, Cell 1, began in April 1998. At the time cell construction began, it was estimated that a total of 5.8 million cubic yards of gravel would be needed to complete cell construction and daily operations. In 2006, the ADEC, at the request of the FNSB, permitted raising the closure height of the landfill cells an additional 50 feet. Based on the revised closure height, the FNSB estimates a remaining 10.7 million cubic yards is required to construct and operate the landfill through 2047, when the cells are expected to reach closure capacity.



According to FNSB Department of Public Works, approximately 150 to 200 cubic yards of gravel is delivered to the landfill daily for use as cover material. Historically, the landfill uses 80,000 to 100,000 cubic yards of gravel for daily cover material on an annual basis.

Cell construction is typically performed in two, four-month phases, generally from mid-May through mid-September. During this period, approximately 400,000 cubic yards of gravel is required for cell construction, in addition to the gravel needed for daily cover material. Each of the nine cells has an estimated life span of five to six years. In the fall of 2006, the FNSB opened Cell 2 and began placing solid waste there. The FNSB expects construction of Cells 3 and 4 to begin in approximately 2014.

The information in Table 1 was provided by the FNSB Public Works Department in February 2007. The table summarizes the development schedule for the South Cushman Landfill and the estimated amounts of gravel needed for both daily cover operations and cell construction.

Table 1. South Cushman Landfill Development Schedule

Year	Cells	Volume of Gravel Needed for Daily Cover		Annual Daily Cover Needed	Cumulative Daily Cover Needed	Gravel Needed for Cell Construction	Total Annual Gravel Needed	Cumulative Volume of Gravel Needed
		Cells	CD Landfill					
2007	1/2	46,069	33,000	79,069	79,069		79,069	79,069
2008		48,003	34,320	82,323	161,392		82,323	161,392
2009		50,020	35,693	85,713	247,105		85,713	247,105
2010		52,120	37,121	89,241	336,346		89,241	336,346
2011		54,309	38,605	92,914	429,260		92,914	429,260
2012		56,590	40,150	96,740	526,000		96,740	526,000
2013		58,967	41,756	100,723	626,723		100,723	626,723
2014		61,444	43,426	104,870	731,593	400,000	504,870	1,131,593
2015		64,024	45,163	109,187	840,780	350,000	459,187	1,590,780
2016	2/3/4	66,714	46,969	113,683	954,463		113,683	1,704,463
2017		69,515	48,848	118,363	1,072,826		118,363	1,822,826
2018		72,435	50,802	123,237	1,196,063		123,237	1,946,063
2019		75,477	52,834	128,311	1,324,374		128,311	2,074,374
2020		78,647	54,947	133,594	1,457,968		133,594	2,207,968
2021	3/4	81,951	57,145	139,096	1,597,064		139,096	2,347,064
2022		85,393	59,431	144,824	1,741,888		144,824	2,491,888
2023		88,979	61,808	150,787	1,892,675	400,000	550,787	3,042,675
2024		92,716	64,281	156,997	2,049,672	350,000	506,997	3,549,672
2025	4/5/6	96,610	66,852	163,462	2,213,134		163,462	3,713,134
2026		100,668	69,526	170,194	2,383,328		170,194	3,883,328
2027		104,896	72,307	177,203	2,560,531		177,203	4,060,531
2028		109,302	75,199	184,501	2,745,032		184,501	4,245,032
2029		113,892	78,207	192,099	2,937,131		192,099	4,437,131

Table 1. South Cushman Landfill Development Schedule *(continued)*

Year	Cells	Volume of Gravel Needed for Daily Cover		Annual Daily Cover Needed	Cumulative Daily Cover Needed	Gravel Needed for Cell Construction	Total Annual Gravel Needed	Cumulative Volume of Gravel Needed
		Cells	CD Landfill					
2030	5/6	118,676	81,336	200,012	3,137,143		200,012	4,637,143
2031		123,660	84,589	208,249	3,345,392		208,249	4,845,392
2032		128,854	87,973	216,827	3,562,219		216,827	5,062,219
2033		134,266	91,492	225,758	3,787,977	600,000	825,758	5,887,977
2034		139,905	95,151	235,056	4,023,033	525,000	760,056	6,648,033
2035	6/7/8/9	145,781	98,957	244,738	4,267,771		244,738	6,892,771
2036		151,904	102,915	254,819	4,522,590		254,819	7,147,590
2037		158,284	107,032	265,316	4,787,906		265,316	7,412,906
2038		164,932	111,313	276,245	5,064,151		276,245	7,689,151
2039		171,859	115,766	287,625	5,351,776		287,625	7,976,776
2040	7/8	179,077	120,397	299,474	5,651,250		299,474	8,276,250
2041		186,598	125,212	311,810	5,963,060		311,810	8,588,060
2042		194,435	130,221	324,656	6,287,716		324,656	8,912,716
2043		202,601	135,430	338,031	6,625,747		338,031	9,250,747
2044	8/9	211,111	140,847	351,958	6,977,705		351,958	9,602,705
2045		219,977	146,481	366,458	7,344,163		366,458	9,969,163
2046		229,216	152,340	381,556	7,725,719		381,556	10,350,719
2047		238,843	158,434	397,277	8,122,996		397,277	10,747,996

Tanana Lakes Gravel Source Areas

Figure 8, Gravel Extraction Areas, identifies four gravel source areas within the project area from which the FNSB intends to extract gravel for use at the landfill. Gravel Extraction Areas A, B, and C are located in the proposed non-motorized area of the site, south of the levee, west of Groin 8, east of the preservation area. Gravel Extraction Area D is located within the motorized area of the site, south of the levee, between Groins 8 and 9, and would eventually tie into the existing gravel pond to the south. *(Note: The gravel extraction areas are referred to as areas A, B, C, and D; however this is for identification purposes only and is not an indication of the extraction sequencing/phasing.)*

Gravel Extraction Area A

In the summer of 2006, the USACE issued the FNSB a permit to extract gravel from Area A. It was estimated that Area A would provide about 700,000 cubic yards of gravel material. Figure 2, Existing Conditions, identifies two dredge areas associated with Gravel Extraction Area A. The first area to be dredged, Dredge Area 1, is the east-west trending dredge; Dredge Area 2 is the north-south trending dredge. According to the general conditions of the permit, extraction from Dredge Area 2 cannot begin until dredging from Dredge Area 1 is at least 85% complete.

The FNSB began extraction from Dredge Area 1 in the fall of 2006. Once all gravels have been removed from Gravel Extraction Area A, the remaining pond will become part of the waters of the non-motorized use area, serving kayaks, canoes, and paddle boats. Recreation area amenities to be developed in or around Gravel Extraction Area A include:

- A picnic area to the south
- A picnic area to the northwest
- A dock to the south, providing access for non-motorized boaters
- Preserved areas along the east shore
- Preserved areas to the west

Gravel Extraction Areas B, C, and D

Gravel Extraction Area B consists of approximately 12 acres located in the northwest portion of the non-motorized area. Recreation area amenities to be developed in or around Gravel Extraction Area B include:

- A swim beach along the northeast shore, including two beach volleyball courts
- Two picnic areas, one each to the southwest and southeast
- Three parking lots, one each to the west, north, and east
- A dock to the northwest, providing access for non-motorized boaters
- The northwest portion of the non-motorized trail loop

Gravel Extraction Area C is also located in the non-motorized area, to the west/southwest, and consists of approximately 12 acres. Recreation area amenities to be developed in or around Gravel Extraction Area C include:

- A picnic area to the north
- A parking lot to the west
- A camping area to the south
- Preserved areas along the east shore
- Portions of the non-motorized trail along the west and south shores

Gravel Extraction Area D consists of 35 acres located in the central portion of the motorized area. Recreation area amenities to be developed in or around Gravel Extraction Area D include:

- A swim beach along the northeast shore
- Two picnic areas, one each to the southwest and along the northeast shoreline
- Three parking lots, one each to the northwest, north, and southeast
- A camping area to the west
- Two beach volleyball courts to the northwest

Gravel Extraction Volumes

Gravel extraction volumes for each area were estimated based on an excavation depth of 40 feet and 80 feet. Volumes for each area were estimated based on shorelines having a finished grade of 6:1 to a minimum depth of 5 feet off shore and 2:1 side slopes in open waters. Table 2 provides a summary of the areas and estimated volumes of gravel available from each area.

Table 2. Gravel Extraction Volumes

Gravel Extraction Area	Area (acres)	Estimated Gravel Volume (cy)	
		Based on 40' Depth	Based on 80' Depth
B	12	508,836	676,090
C	12	524,872	701,735
D	35	1,764,911	2,752,698
TOTAL		**2,798,619**	**4,130,523**

The volumes shown are preliminary estimates. Gravel extraction volumes were estimated based on an assumed existing grade elevation of zero and assume the entire volume of material excavated is available for use. It is recommended that a topographic survey and geotechnical investigation of the area be performed in order to produce a more accurate estimate. A topographic survey would provide surface elevation data, and the geotechnical investigation would determine if material requires processing prior to use and whether material exists that is not suitable for use in landfill cell construction or daily cover operations.

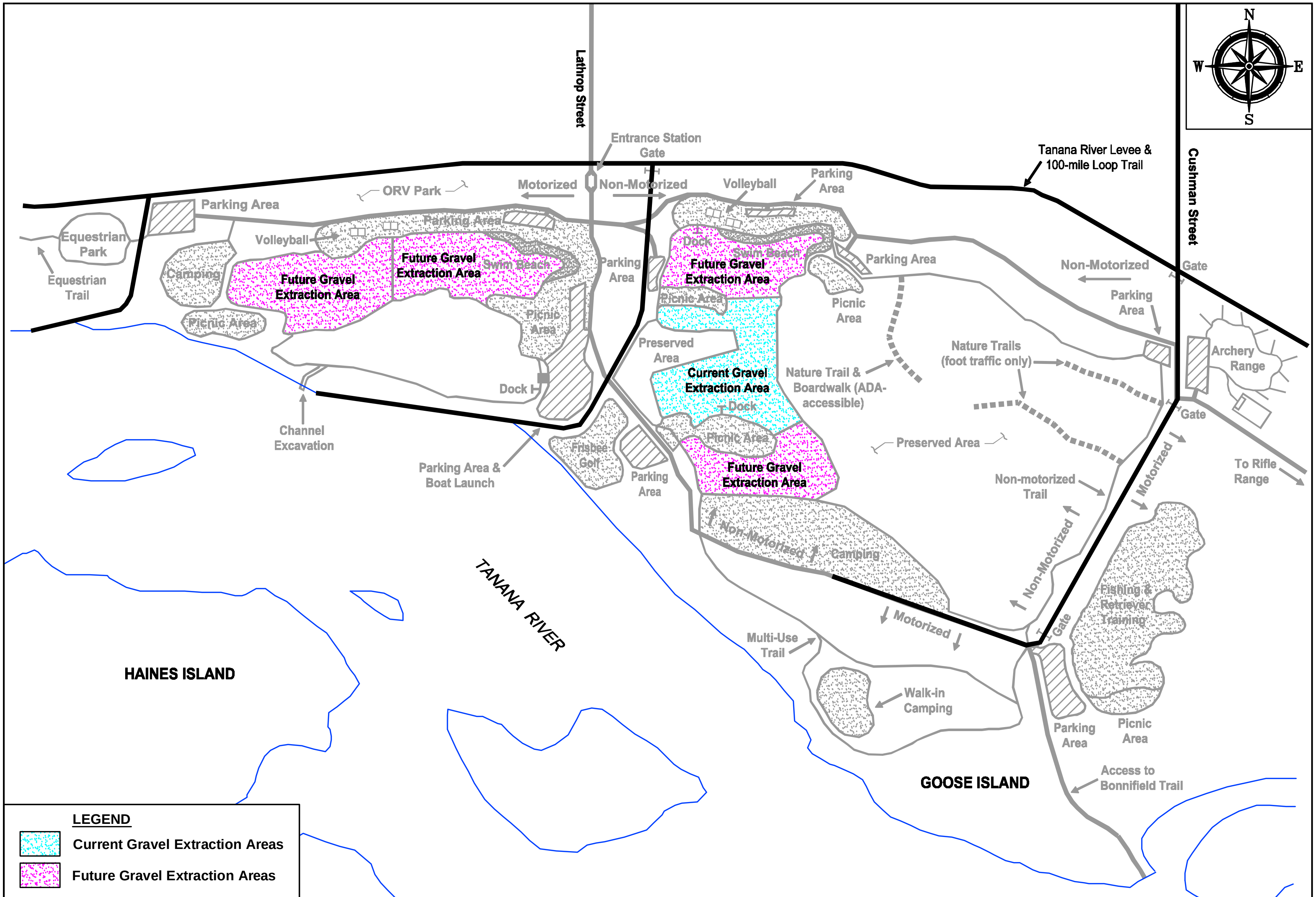
Assuming all of the gravel material is suitable for use, there is potentially enough gravel to support landfill operations for at least 15 years (based on a 40-feet deep excavation). Based on an 80-feet deep excavation, there could be enough gravel to support the landfill for an additional five years, until approximately the years 2027-2028.

It is likely that some of the gravel extracted from the Tanana Lakes area would be used to construct the permanent access roads and parking lots. Table 3 provides a summary of the area and volumes of gravel fill required to construct access roads and parking lots. A more detailed breakdown of these quantities is attached in Appendix B.

Table 3. Gravel Volumes Required for Road Systems and Parking Lots

Site Amenity	Quantity	Estimated Gravel Volume Required
Road Systems	21,117 LF	131,395 CY
Parking Lots	913,895 SF	95,269 CY
Entrance Station Area	1 Each	556 CY
TOTAL	**-**	**227,219 CY**

The gravel required for constructing site amenities was estimated based on the guidelines previously outlined (i.e. roads being 30 feet wide and 4 feet deep with 3:1 shoulders). The amount of gravel estimated for constructing the park roads and parking lots is relatively minimal with respect to the amount of gravel available and should not significantly deter or impact the landfill development schedule if planned appropriately.



Tanana Lakes Recreation Area Master Plan
Fairbanks, Alaska
Fairbanks North Star Borough

Gravel Extraction Areas

MAR 2007

FIGURE 8

Sequencing/Phasing

Sequencing and phasing of the recreation area development is dependent on many factors including but not limited to funding; user group interest, and gravel extraction operations.

Extraction Operations

Sequencing of development and gravel extraction must consider minimizing conflicts between user activities within the recreation area and gravel extraction and hauling operations. Hauling operations should be planned such that truck traffic is routed on roads not used by park patrons. Gravel extraction operations should also be separated from recreational areas as much as possible for the park patrons' safety. Development planning also needs to account for gravel stockpile storage areas and haul routes to the landfill. For example, in the summer months the landfill may run as many as three trucks per day. On average the trucks make two trips per hour from the Tanana Lakes area to the landfill, which means there could be as many as six trucks per hour traveling back and forth throughout the recreation area.

FNSB Funded Development

The FNSB will be responsible for the development of the main infrastructure, including roadways, parking lots, and the entrance station. In addition, the FNSB will construct the swim beaches, picnic areas, camping areas, restrooms, and the non-motorized and multi-use trails. Although this Master Plan does not establish a sequence for development, the FNSB has identified several areas of development that are priority.

The first priority would be the non-motorized swim beach including the east-west trending road north of the proposed swim beach from Cushman Street along with the parking lot(s) north and/or east of the swim beach. The next priority would be to develop the boat launch and associated parking lot and picnic area for access to the Tanana River. The swim beach in the motorized area is also a high priority, which could be preliminarily located on the existing gravel pond between Groins 7 and 8 until Gravel Extraction Area D is excavated. It is further a priority for the FNSB to construct the entrance station to secure the site and prevent further vandalism and other illegal activities from continuing in the area.

User Group Driven Development

User group driven development includes:

- Equestrian Park and Trail
- ORV Park
- Nature Trails and Viewing Platforms
- Frisbee Golf Park
- Archery Range

The FNSB has allocated sufficient land for these uses; however, it is intended to be the responsibility of the user groups to fund and construct these amenities.

Maintenance and Operations 6

Fairbanks North Star Borough
Department of Parks and Recreation
2007

6 Maintenance and Operations

The Tanana Lakes Recreation Area will be maintained and operated by the FNSB Department of Parks and Recreation. Several recommendations were made regarding the maintenance and operations of the recreation area during the Master Plan process. This section of the Master Plan discusses those recommendations.

Staffing

Management and operation of the Tanana Lakes Recreation Area will likely require two full-time Park Rangers with one or more part-time Park Aides to provide basic day-to-day service and maintenance functions for a recreation area of this size. The primary duties of these staff will include visitor information, fee collections, emergency response, trail and swim beach maintenance, and routine facility maintenance. The FNSB Department of Parks and Recreation will provide both administrative support, and personnel for large-scale maintenance projects on an as-needed basis.

The FNSB may also rely on volunteers for maintenance and operations of user-group driven facilities such as the equestrian park and trail, ORV park, nature trails and viewing platforms, frisbee golf park, and archery range, as these facilities will likely be designed and constructed by local organizations. Additional volunteer groups may include scouts, churches, school organizations, work program participants, and environmental support groups. Such groups could provide a wide range of assistance including clean-up efforts, habitat restoration, special events, and general park maintenance. Under the direction of Park staff, volunteers could potentially supplement Park staff at times.

Public Safety

Public safety was a common concern expressed by the public during the Master Plan process. Primary concerns included illicit activities such as vandalism and illegal dumping of junk or abandoned vehicles and other refuse. Securing the site is essential to protecting the recent and future efforts to clean up and improve the area. To provide oversight and an enforcement presence in the area, a single entrance/exit access road to the recreation area with a staffed entrance station is planned. The Park Rangers may assist with traffic flow and the Alaska State Troopers would provide law enforcement. The Park Rangers should be trained to handle minor incidents of fire and emergency response, and work closely with the Alaska State Troopers to ensure public safety at the recreation area.

The recreation area is within both the North Star and University Ambulance Service Areas. The University Fire Service Area serves several parcels directly north of the recreation area's boundary and fire protection could be obtained from this service area

Utilities

There are currently no utilities serving the project area. Water, sanitary sewer, and electric services are available to the north of the recreation area, and will be made available for use in the recreation area when needed. These needs will be dictated by development and operations of the recreation area.

Funding and Revenue

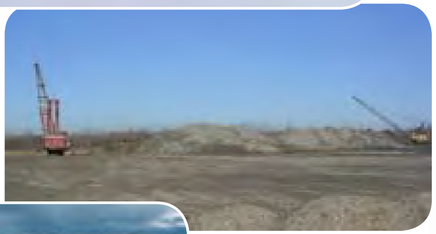
The FNSB will be responsible for allocating funds for the development of the main infrastructure of the recreation area. However, since this development has a direct benefit to the residents of Fairbanks, Fort Wainwright, and other surrounding communities, supporting part of the development through grant monies and other local funding sources should be pursued. The FNSB should additionally consider seeking corporate or private sponsors for the development of specific facilities such as the nature trails and viewing platforms, where the FNSB can participate in a public/private partnership.

As described earlier, this Master Plan also includes some user-group driven development. The FNSB has allocated sufficient land for these uses; however, it is intended to be the responsibility of the user groups to fund, design, and construct these amenities.

For all amenities on site, preventative maintenance and attentive operations of the recreation area will help keep operating costs low. As part of the online project questionnaire during the Master Plan process, an entrance fee to the recreation area was proposed to help cover a portion of the operating costs. Most respondents indicated they would support a $5 fee per day per vehicle, or a $25 fee per household per year. This fee would support the maintenance and operations of the recreation area.

Additional revenue may be generated through the receipt of donations. These funds could be applied directly to maintenance and operations of the recreation area, and/or specific projects at the recreation area.

Summary of Estimated Costs 7



Fairbanks North Star Borough
Department of Parks and Recreation
2007

7 Summary of Estimated Costs

Fairbanks North Star Borough			USKH
Tanana Lakes Recreation Area Master Plan			544 4th Avenue, Suite 102
April 9, 2007			Fairbanks, Alaska 99701
Planning Level Cost Estimate			WO 926402
Project	Description	2007 Recommended Allowance	Remarks
1	**Road System**		
A	Lathrop Street Improvements	$280,527	
B	Lathrop Street Extension & Central Access Road to Bonnifield Trail	$1,776,937	
C	Northwest Access Road to Equestrian Park	$711,286	
D	Northeast Access Road to Rifle Range	$1,265,824	
E	Auxiliary Roads (leading to parking lots, camp grounds, etc)	$184,048	
2	**Parking Accommodations**		
A	Equestrian Park Parking Lot	$499,345	
B	ORV Park & West Swim Beach Parking Lot	$271,960	
C	Boat Launch Parking Lot	$1,220,811	
D	Frisbee Golf Parking Lot	$432,449	
E	East Swim Beach Parking Lot - West	$144,621	
F	East Swim Beach Parking Lot - North	$142,588	
G	East Swim Beach Parking Lot - East	$108,966	
H	East Trail Head Parking Lot	$168,513	
I	Archery Range Parking Lot	$410,933	
J	Fishing/Retriever Pond & Bonnifield Trail Access Parking Lot	$711,259	
3	**Other Site Amenities**		
A	Entrance Station	$261,508	
B	Docks & Boat Launch	$184,653	
C	Gates	$36,288	
4	**Trail Systems**		
A	Nature Trail (by FNSB)	$42,922	
B	Nature Trails (by Others)	$87,013	3
C	Non-Motorized Trails	$399,995	
D	Multi-Use Trails	$226,302	
5	**Camping Areas**		
A	West of Motorized Lake	$541,741	
B	South of Non-Motorized Lake	$1,842,987	
C	Goose Island	$438,583	

Fairbanks North Star Borough			**USKH**
Tanana Lakes Recreation Area Master Plan			544 4th Avenue, Suite 102
April 9, 2007			Fairbanks, Alaska 99701
Planning Level Cost Estimate			WO 926402
Project	Description	2007 Recommended Allowance	Remarks
6	**Picnic Areas**		
A	West of Motorized Lake	$371,087	
B	Motorized Lake Swim Beach	$1,835,607	
C	Southwest of Non-Motorized Swim Beach	$288,677	
D	East of Non-Motorized Swim Beach	$282,830	
E	East of Frisbee Golf Park	$489,211	
F	South of Fishing/Retriever Pond	$304,125	
	Total Project Costs	$15,963,597	

Notes:

1 - Estimate based on 2007 costs. Escalation to actual project date is not included.

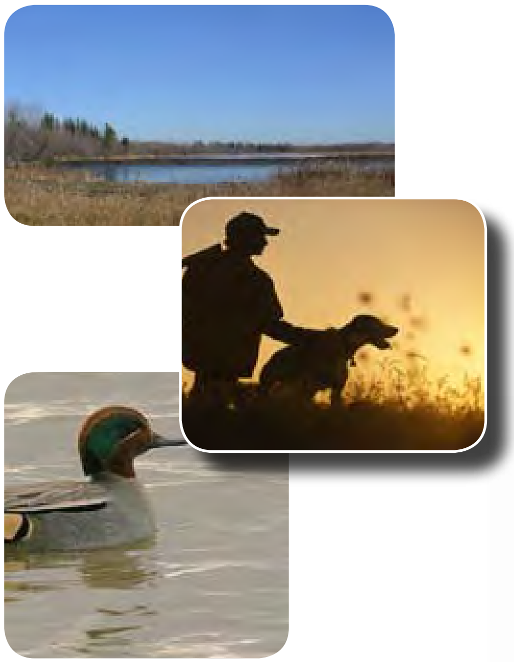
2 - Estimates are based on conceptual information only.

3 - Potentially funded fully or partially by private sector.

4 - Private sector funding in addition to amount indicated is anticipated for full project development.

5 - This table was developed from the ‘Cost Summary’ sheet of the Planning Level Cost Estimate completed on April 9, 2007. The Planning Level Cost Estimate includes an additional 31 pages of cost details, and is available by request from the FNSB Department of Parks & Recreation.

Permits and Authorizations 8



Fairbanks North Star Borough
Department of Parks and Recreation
2007

8 Permits and Authorizations

The following permits and authorizations were identified by agencies as required for this project:

- USACE Department of the Army (DOA) Section 404 & 10 Permit (Clean Water Act and Rivers & Harbors Act)
- FNSB Floodplain Permit
- ADNR SHPO Section 106 Consultation (National Historic Preservation Act)
- ADNR Tanana Basin Area Riparian Management Zone (RMZ) Easement Vacation

References 9

Fairbanks North Star Borough
Department of Parks and Recreation
2007

9 References

Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation. 2005. Chena River State Recreation Area. URL http://www.dnr.state.ak.us/parks/units/chena.htm. Accessed 03 February 2007.

Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation. 2006. Harding Lake State Recreation Area. URL http://www.dnr.state.ak.us/parks/units/harding.htm. Accessed 03 February 2007.

Alaska Railroad Corporation. 2006. Fairbanks Projects Matrix. URL http://www.akrr.com/pdf/08_2006 SFRR Alternatives - est costs.pdf. Accessed 02 February 2007.

Alaska Railroad Corporation. 2007. Fairbanks Area Rail Realignment. URL http://www.akrr.com/pdf/2007 Fairbanks Area Rail Realignment1.pdf. Accessed 02 February 2007.

Alaska Trails. 2006. Alaska Trails Newsletter, December 2006. URL http://www.alaska-trails.org/about_us/Documents/Newsletters/Dec06.pdf. Accessed 02 February 2007.

Design Alaska. 2006. Isberg Recreation Area Investigation Report. Fairbanks North Star Borough, Alaska.

Fairbanks North Star Borough. 1985. FNSB Comprehensive Recreational Trail Plan, adopted 13 June 1985 by Ordinance 85-053. Updated 05 May 2006.

Fairbanks North Star Borough. 2005. Comprehensive Economic Development Strategy, adopted 23 June 2005.

Fairbanks North Star Borough. 2006. Community Research Quarterly, Volume XXIX, No. 3, Fall.

Formoso, Daniel. 2005. Draft Real Property Master Plan, U.S. Army Garrison, Alaska. S&K Technologies, St. Ignatius, Montana.

Glass, R.L., Lilly, M.R., and Meyer, D.F., 1996, Ground-water Levels in an Alluvial Plain between the Tanana and Chena Rivers near Fairbanks, Alaska, 1986-93: U.S. Geological Survey Water-Resources Investigations Report 96-4060, 39 p. + 2 appendixes.

Johnson, J., and E. Weiss. Special Publication No. 06-15: Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes – Interior Region, Effective September 15, 2006. Alaska Department of Fish and Game.

U.S. Army Alaska Natural Resources Branch. 2002. Integrated Natural Resources Management Plan 2002-2006. U.S. Army Alaska, Fort Wainwright.

U.S. Army Garrison Alaska. 2003. Early Transportation Routes, Fort Wainwright, Alaska. U.S. Army Alaska, Center for Environmental Management of Military Lands, Fort Wainwright.

U.S. Army Garrison Alaska. 2006. Draft 2007 –2011 Integrated Natural Resource Management Plan, Volume II, Appendix E, Outdoor Recreation Management. U.S. Army Alaska, Fort Wainwright.

U.S. Department of Agriculture. 2004. National Resource Conservation Service. Soil Survey of Greater Fairbanks Area, Alaska.

U.S. Fish & Wildlife Service. Threatened and Endangered Species System. URL http://ecos.fws.gov/tess_public/SpeciesReport.do?lead=7&listingType=L. Accessed 03 January 2007.

Western Regional Climate Center online database. Fairbanks WSO Airport, Alaska, Monthyl Climate Summary 090/1/1949 thru 12/31/2005. URL http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak2968. Accessed 03 January 2007.

Appendix A

Fairbanks North Star Borough
Department of Parks and Recreation

2007

Appendix A – Agency and Public Scoping Summary Report

Appendix *B*

Fairbanks North Star Borough
Department of Parks and Recreation
2007

Fairbanks North Star Borough
Parks and Recreation

Appendix B – Summary of Site Amenity Quantities/Calculations

Road Systems	Quantity	Units	Estimated Gravel Volume Required (CY)
Lathrop Street Improvements	1,581	LF	9,837
Lathrop Street Extension & Central Access Road to Bonnifield Trail	8,801	LF	54,762
Northwest Access Road to Equestrian Park	3,523	LF	21,921
Northeast Access Road to Rifle Range	6,313	LF	39,281
Auxiliary Roads (leading to parking lots, camp grounds, etc)	899	LF	5,594
Total	**21,117**	**LF**	**131,395**

Parking Accommodations	Quantity	Units	Estimated Gravel Volume Required (CY)
Equestrian Park Parking Lot	106,353	SF	11,186
ORV Park & West Swim Beach Parking Lot	54,184	SF	5,470
Boat Launch Parking Lot	309,684	SF	32,936
Frisbee Golf Park Parking Lot	91,923	SF	9,647
East Swim Beach Parking Lot - West	28,918	SF	2,847
East Swim Beach Parking Lot - North	28,422	SF	2,720
East Swim Beach Parking Lot - East	22,082	SF	2,073
East Trail Head Parking Lot	35,098	SF	3,552
Archery Range Parking Lot	86,695	SF	9,008
Fishing/Retriever Pond & Bonnifield Trail Access Parking Lot	150,536	SF	15,831
Total	**913,895**	**SF**	**95,269**

Appendix B – Summary of Site Amenity Quantities/Calculations *(continued)*

Other Site Amenities	Quantity	Units	Estimated Gravel Volume Required (CY)
Entrance Station	1	Each	556
Docks	3	Each	0
Gates	4	Each	0
Total	**N/A**		**556**

Estimated Total Gravel Volume (CY) Required for Park Construction	***227,219***

Trail Systems	Quantity	Units
Nature Trail (by FNSB)	934	LF
Nature Trails (by Others)	2,605	LF
Non-Motorized Trails	14,360	LF
Multi-Use Trails	7,939	LF
Total	**25,838**	**LF**

Camping Areas	Quantity	Units
West of Motorized Lake	6.2	Acres
South of Non-Motorized Lake	26.1	Acres
Goose Island	4.9	Acres
Total	**37**	**Acres**

Appendix B – Summary of Site Amenity Quantities/Calculations *(continued)*

Picnic Areas	Quantity	Units
West of Motorized Lake	3.4	Acres
Motorized Lake Swim Beach	20.3	Acres
Southwest of Non-Motorized Swim Beach	2.2	Acres
East of Non-Motorized Swim Beach	2.1	Acres
East of Frisbee Golf Park	5.6	Acres
South of Fishing/Retriever Pond	2.3	Acres
Total	**36**	**Acres**

Other Site Recreation	Quantity	Units
Boat Launch	1	Each
Beach Volleyball Courts	4	Each
Equestrian Park	5.3	Acres
Equestrian Trails	531.0	LF
ORV Park	5.9	Acres
Frisbee Golf Park	6.6	Acres
Archery Range	6.8	Acres
Total	**N/A**	

Tanana Lakes Recreation Area

Master Plan

Fairbanks North Star Borough Department of Parks and Recreation

2007

Appendix B – Wetlands Technical Reports

WETLAND AND STREAM DELINEATION FOR THE TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT, FAIRBANKS, ALASKA, 2020: AK FNSB TANANA(1)

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave
Anchorage, Alaska 99503

and

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th Street
Vancouver, Washington 98661

Prepared by:

ABR, Inc.—Environmental Research & Services
P.O. Box 240268
Anchorage, AK 99518

October 2020

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

INTRODUCTION

The Tanana River Recreation Access Improvements Project is managed by the Federal Highway Administration, Western Federal Lands Highway Division (WFLHD). The project is intended to improve access to the Tanana Lakes Recreation Area (TLRA; managed by Fairbanks North Star Borough) and NEPA documentation is required. PND Engineers Inc. (PND) is the engineering and environmental contractor to WFLHD for the project and ABR, Inc.—Environmental Research & Services (ABR) is the subcontractor providing wetland information. A Clean Water Act (CWA) Section 404 wetland permit will be required for the project if there are direct impacts to wetlands (gravel fill) within the project area. To assist in the assessment of impacts to wetlands and possible design alterations for avoidance and minimization in the project area, this report presents the results of the field wetland determinations, the mapping of wetlands in the proposed development area, a proposed jurisdictional determination for the wetland types identified, and an assessment of functional values for the wetland types occurring in the project area.

PROJECT LOCATION

The project area is located immediately south of the city of Fairbanks within the Fairbanks North Star Borough (Figure 1). The coordinates for the center point of the main portion of the project are: 64.800963°,-147.741609° and the legal land description is: Sections 21-22, and 27-28, Township 1South, Range 1West, Fairbanks Meridian, Alaska.

STUDY AREA

The TLRA is located on the south (river) side of the Tanana Flood Control levee in south Fairbanks, and the majority of the proposed access improvements would occur within the TLRA. The portion of the study area north of the levee is outside of the TLRA boundary. The recreation area has been established around Cushman Lake, which was formed by the impounded waters of an active slough of the Tanana River (Figure 1). The Goose Island Causeway (a groin extension of South Cushman Street) and Groin 8 (an extension of Cinch Street) were constructed to create the freshwater Cushman Lake, which is suitable for recreation activities and habitat conservation. Groin 8 also protects the motorized boat launch area. The area was developed after 2012 to

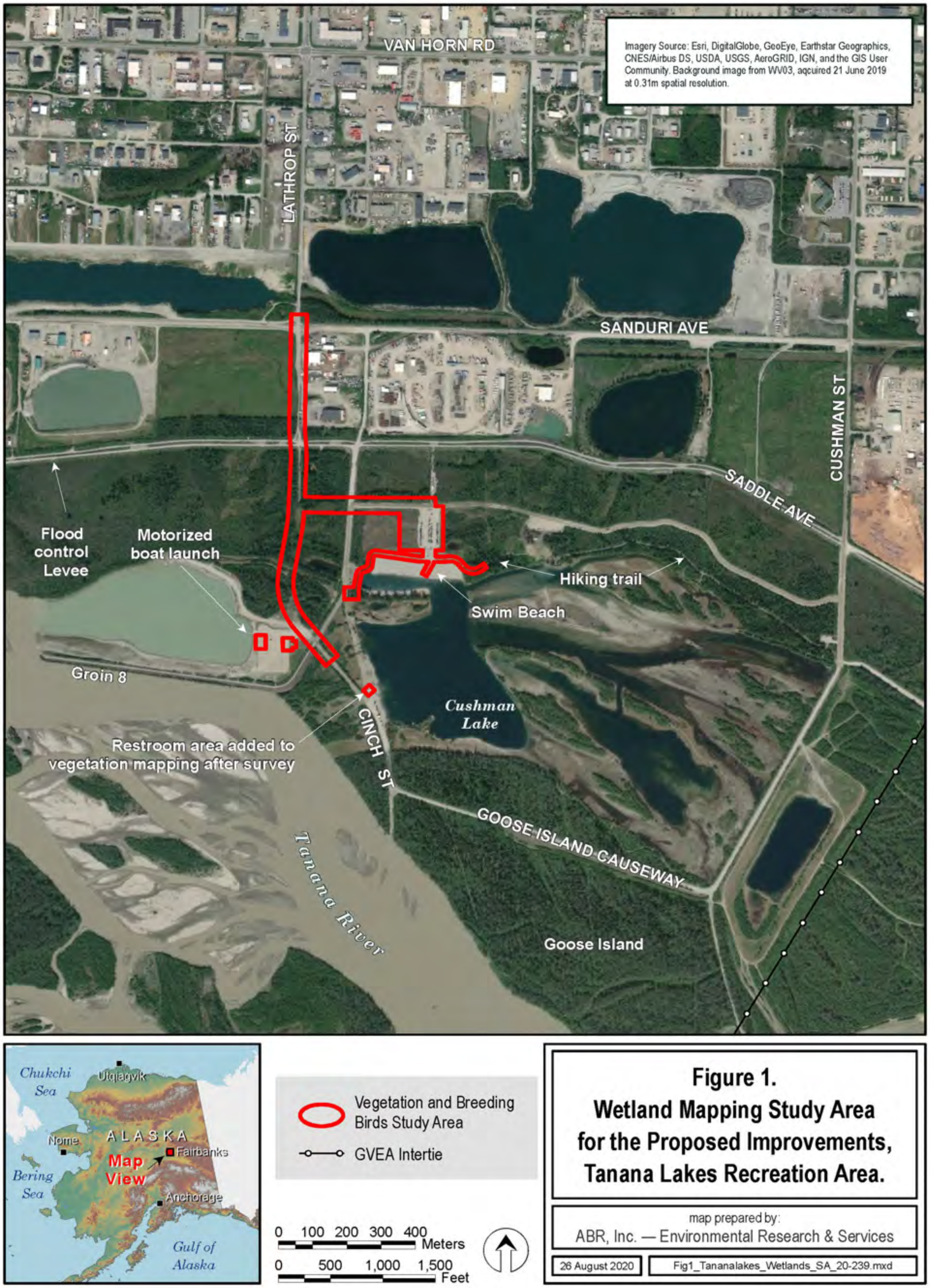


Figure 1. Wetland Mapping Study Area for the Proposed Improvements, Tanana Lakes Recreation Area.

include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch that connects with the active channel of the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake (FNSB 2007).

The wetland study area encompasses a total of 23 acres, and includes the areas for the proposed extension of South Lathrop Street, a spur road from South Lathrop Street to access the existing swim beach, as well as the areas of proposed improvements to the motorized boat launch facilities on the Tanana River, the non-motorized boat launch facilities on the southwest side of Cushman Lake, and the facilities at the swim beach on the north side of Cushman Lake. With the exception of a short section of South Lathrop Street north of the Tanana Flood Control levee, the majority of the study area is on the Tanana River side of the levee, and occurs on both the east and west sides of Groin 8. The wetland study area was defined in the FHWA Statement of Work as specific buffer zones surrounding areas of proposed infrastructure improvements. This included a buffer of 75 feet of either side of the proposed road centerlines, a buffer of 25 feet on either side of the proposed trail centerlines, a buffer of 25 feet around the proposed parking areas, and a buffer of 50 feet around the proposed restroom locations (Figure 1).

The entire TLRA area is located within the active floodplain of the large, braided Tanana River, but the hydrology has been substantially altered by the construction of the levee system and the creation of Cushman Lake. Surface water levels in the area are driven by water levels in the Tanana River and rainfall, but frequent flood events typical of undisturbed floodplains are moderated in the TLRA by the groins. Waters in the area have been formed by the impoundment of active sloughs of the Tanana River, the filling of gravel excavation depressions, and there is one flowing slough crossing the study area north of the motorized boat launch area. Overall, the terrain is characterized by flat, riverine-influenced lowlands, with small variations in elevation along the edges of abandoned river channels and depressions. North of the levee along South Lathrop Street, the study area is composed of a fallow field and an industrial park. According to the 2007 TLRA Master Plan, historically the area was composed of over 80% jurisdictional wetlands prior to any facility development (FNSB 2007). Surficial deposits are composed of alluvial sands and silts, with shallow organic layers developing in wetland areas. The geomorphology of the area consists of fluvial landscape features. As is much of Interior Alaska, the TLRA is located in a discontinuous permafrost zone. A variety of wetland types are present in the study area, including forested wetlands, low and tall shrub wetlands, semipermanently flooded emergent wetlands, and both lotic (active sloughs) and lentic (impoundments) waters. Upland portions of the study area support both needleleaf and mixed needleleaf-broadleaf forests.

METHODS

FIELD SURVEY

The field wetland determination survey was conducted from 7–8 July 2020 by Julie Parrett and Wendy Davis of ABR. Routine wetland determinations were performed at 19 plots, using the U.S. Army Corp of Engineers (USACE) three-parameter approach (USACE 2007). Field plot locations were selected within uniquely identifiable photo-signatures, with replication, to adequately describe characteristics of naturally occurring wetlands and uplands in the study area. In cases in which photo-signatures were ambiguous or the wetland boundary was not identifiable by delineating the plant community boundary, additional plots were added to confirm the wetland boundary. Boundaries confirmed by wetland determination plots were delineated in the field using a global positioning system (GPS) tracking feature in ArcGIS Collector. Identified boundaries were confirmed directly in the field by comparison with the imagery used for the wetland mapping and were used as a preliminary mapping layer for further editing in the office (see Wetland Classification and Mapping below).

To be classified as a wetland, this approach requires that wetlands be dominated by hydrophytic plants, have hydric soils, and show evidence of a wetland hydrologic regime. In addition to full wetland determination plots, field verification plots were sampled at 10 locations. Field verification plots involve rapid assessments to document photo-signatures and improve mapping accuracy (see below).

At each wetland determination plot the following variables were recorded: National Wetland (NWI) type, physiographic type, hydrogeomorphic (HGM) type, and Level IV vegetation class (Viereck et al. (1992), as well as the required USACE data on plant cover by vegetation strata, wetland hydrology, and hydric soils. Observations of wildlife use (e.g., browse, scat) or human activity (e.g., foot trails) were also recorded to support the wetland mapping and functional assessment. GPS coordinates were recorded at each plot along with photos of site characteristics, vegetation, and soils. Wetland plant taxonomy and indicator status were recorded per the *2018 National Wetland Plant List: Alaska* (Lichvar et al. 2018). At verification plots, a subset of the data collected at wetland determination plots was collected, including GPS coordinates, NWI type, plant cover data (for dominant species only), and site photographs.

Navigation in the study area was accomplished using ESRI's *ArcGIS Online Collector* program, running on Android tablet computers. *ArcGIS Collector* allows point-location data to be recorded using a geographically referenced image background (in this case the same imagery that was used in the wetland mapping process, see Wetland Classification and Mapping below). Wetland data were recorded electronically in the field using an Android tablet app developed by ABR specifically for collecting USACE-required wetlands data. The supplementary field data collected for the wetland functional assessment were recorded using a separate ABR-developed Android app. In addition to storing data in a relational database, these apps will produce USACE standard data forms (USACE 2007) in a PDF format for each wetland determination plot (see Appendix A). Verification plot information and documentary photographs are presented in Appendix B.

Wetland determination plots were named according to the wetland number assigned to each wetland within the final mapping as follows: W(wetland number)-SP(soil pit number within the wetland). Examples plot names are W1-SP1, W1-SP2, W2-SP1, W2-SP2, etc. Upland polygons were not numbered and naming conventions for wetland determination plots within those polygons were named sequentially (TL-01, TL-02, etc.). Wetland determination plots describing lotic waters were named sequentially (STREAM-1, STREAM-2, etc.) and Ordinary High Water Mark boundaries were labeled (OHWM 1-1, OHWM 1-2, etc.) depending on the stream number and the number of edges delineated along each stream.

WETLAND CLASSIFICATION AND MAPPING

The wetland mapping strategy is based on a combination of aerial photo interpretation and ground-truth data. Field data are collected for identifiable photo signatures where the wetland boundaries coincide with the plant community boundaries or topographic features visible in aerial imagery. The U.S. Fish and Wildlife Services NWI program methodology for remotely mapping wetland boundaries is described in Dahl et al (2015). In cases where boundaries were not visible in the imagery additional field plot data within the same photo signature were used to define the boundaries. This combined approach of photo interpretation and detailed field collection is well suited to Alaska where wetlands often extend widely, mapping areas are often very large with relatively little previous disturbance.

As noted above, wetland boundaries were identified in the field and recorded with GPS coordinates and were then delineated on-screen for the wetland map using ArcGIS software. Boundaries were identified using the field ground-reference data collected for this project (see above) in combination with existing wetland mapping data and interpretation of aerial photo-signatures. Wetland types were mapped at a scale of 1:1,000 and each mapped polygon was assigned a wetland class using NWI notation (FGDC 2013; Dahl et al. 2015). High-resolution, digital, ortho-corrected photography and satellite imagery for the study area were obtained through ESRI's "World Imagery" database. The best data layer was selected as the basemap for this study (WorldView-3 satellite imagery acquired 21 June 2019, with 0.31 m pixel resolution). Additional data sources used during the mapping phase included existing NWI mapping (USFWS 2020), existing wetland mapping and field data (USKH 2007, HDR 2013), a vegetation mapping layer prepared for the biological resources survey report for this project (ABR 2020), soil survey data (NRCS 2020), fish presence or absence data (ADF&G 2020), Alaska Department of Natural Resources (ADNR) navigable waters web map (ADNR 2020), weather data (NOAA 2020), and the Tanana River hydrograph (USGS 2020).

WETLAND FUNCTIONAL ASSESSMENT

Under the current USACE procedures for Alaska, a site-specific assessment of wetland function is used with the wetland debit-credit calculation protocol (USACE 2016) to establish debits for a proposed project and to determine the extent of mitigation that may be necessary. Mitigation is not required for all projects. For the Tanana River Recreation Access Improvements Project, ABR used a rapid wetland functional assessment method that the company has developed over the past 8 years specifically for use in Alaska. This approach has been successfully used for wetland permitting in several recent highway improvement projects in Interior Alaska, because it provides numerical functional capacity index scores required to calculate project debits and credits.

The rapid functional assessment method involves a flexible scoring system that relies on available site-specific literature and quantitative data (when available) to determine the presence or absence of specific wetland function indicators. The functional indicators are developed specifically to address the wetland functions known or expected to occur in a given region in Alaska. For this study, site-specific field data, satellite imagery interpretation, and review of the scientific literature on wetland functions were used to evaluate the presence or absence of wetland function indicators.

WETLAND FUNCTIONS

To reduce duplication and complexity, prior to the ranking of wetland functions, the NWI wetland types mapped in the study area that share the same wetland functions were aggregated into a smaller set of wetland functional classes. This reduces the number of wetland classes to be assessed. For each wetland functional class, the functional indicators applicable to each wetland function were ranked as present (1) or absent (0). The Functional Capacity Index (FCI) score for each wetland function for each wetland functional class was then calculated as a proportion of the total possible score (e.g., 3 of 4 possible functional indicators present results in an FCI score of 0.75). This protocol satisfies the requirement of the current USACE wetland mitigation methods (USACE 2016) that wetland functions be numerically scored between 0 and 1. For the proposed project, 8 wetland functions were evaluated as described below. Details on the scoring of wetland functions for the wetland functional classes present in the study area are provided in Appendix C.

Flood flow regulation (storage) is the capacity of a wetland to control surface-water flow and subsequently moderate downstream flooding. Waters below ordinary high water and wetlands that do not flood at least seasonally were not considered to perform this function. Indicators of flood flow regulation function include a high degree of surface roughness, a depressional HGM class conducive to storage, visible signs of variable water level (and thus storage), and the likelihood that flooding will occur.

Sediment, nutrient, and toxicant removal is the capacity of a wetland to retain suspended sediment and nutrients and/or toxicants adsorbed to inorganic sediments. The indicators of floodwater storage, as described above, are important indicators of this function as well.

Erosion control and shoreline stabilization is the degree to which a wetland reduces erosion at the edges of relatively permanent flowing waters. There are no flowing waters in the project footprint; therefore this function was not assessed.

Organic matter production and export is the capacity of a wetland to make organic matter contributions to the ecosystem through primary production. Field data for the project footprint were used to assess production of organic matter through the occurrence of herbaceous or deciduous woody vegetation, and the potential export of organic matter contributions was assessed by evaluating surface-water connections and flooding.

Threatened and endangered species (TES) support is the capacity of a wetland or water to support federal or state listed threatened or endangered species. No threatened or endangered species are known to occur in the study area, and their occurrence is extremely unlikely given the known ranges of TES species in Alaska. For these reasons, this function was not assessed for any wetland type and is not included in the analyses presented in Appendix C.

Avian/mammal habitat suitability is the capacity of a wetland to support a diversity of wildlife species. This function was assessed from a local-scale understanding of the habitat characteristics of the wetlands, waters, and landscape features in the project footprint. This is a general habitat suitability assessment and does not account for actual or expected species richness within a given functional class or species-specific habitat preferences. The functional indicators considered important for a wide variety of avian and mammal species include level of human disturbance at the site, recorded use of the wetland type by wildlife, interspersion of open water and vegetation, and stratification (complexity) of vegetation.

Fish habitat suitability was evaluated by assessing the degree to which a wetland or water directly supports fish. Only those wetlands and waters with at least a seasonal, intermittent connection to known or likely fish-bearing waters have the potential to perform this function.

Educational, scientific, recreational, or subsistence use reflects the degree to which a wetland provides direct support of hunting and gathering activities, local travel, and/or education. The criteria used to determine if the study area is important for educational or scientific use include whether long term research sites or permanent sample plots are present and could be directly affected by the proposed project. Established trails visible on aerial photos or documented in field data are considered indicative of local travel.

PROPOSED JURISDICTIONAL STATUS

Wetlands and waters within the study area were assessed to determine if they met the definition of a water of the U.S., subject to jurisdiction under Section 404 of the CWA, and/or a navigable water of the U.S., subject to jurisdiction under Section 10 of the Rivers and Harbors Act. The Navigable Waters Protection Rule (NWPR, Clean Water Act 33 CFR Part 328), which recently came into effect, clarifies the scope of jurisdictional waters of the U.S. in light of three U.S. Supreme Court cases: *U.S. v. Riverside Bayview Homes* (*Bayview*), *Solid Waste Agency of Northern Cook County v. U.S.* (*SWANCC*), and *Rapanos v. U.S.* (*Rapanos*).

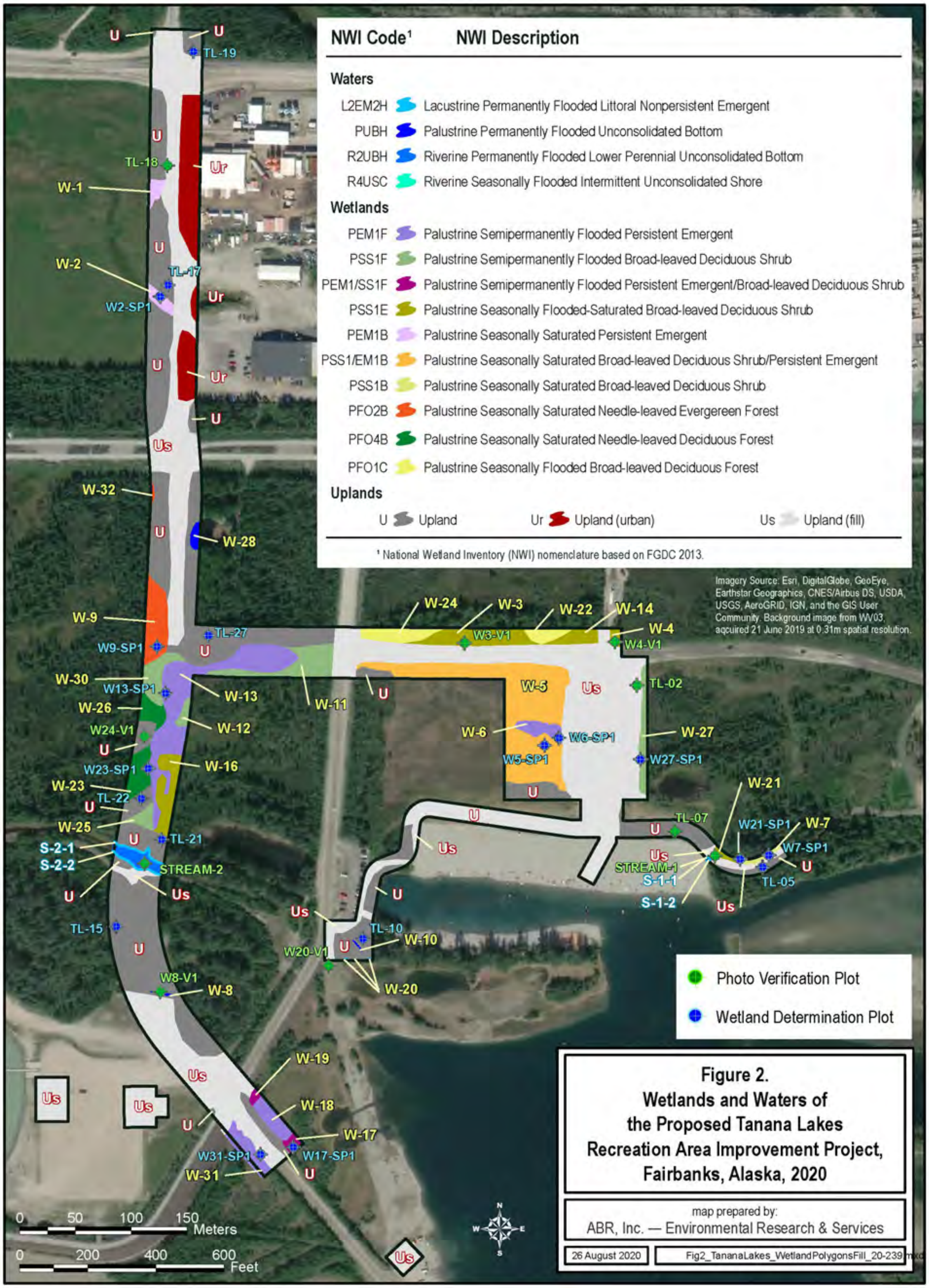
Under the new NWPR, jurisdiction is applied to four categories of waters of the U.S.: (1) the territorial seas and traditional navigable waters (TNW)s; (2) perennial and intermittent tributaries to those waters; (3) certain lakes, ponds, and impoundments; and (4) adjacent wetlands as defined by 33 CFR Parts 328 and 120—Definition of Waters of the United States. To classify wetlands and waters within the study area into jurisdictional categories and to establish connectivity to TNWs, the EPA Training and Implementation Materials were also consulted (EPA 2020). TNWs are defined as “all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide” [33 C.F.R. Section 328 3(a)]. For the purposes of this survey the USACE navigable waters list was used to determine navigability (USACE 2020).

RESULTS AND DISCUSSION

FIELD SURVEY AND HYDROLOGICAL CONDITIONS

Standard USACE three-parameter wetland determinations were completed at 19 field plots; 11 were classified as wetlands or waters and 8 as uplands (Figure 2, Appendix A). In addition, field verification plots were completed at 10 locations (Appendix B).

Two meteorological stations are in operation near the study area: the Fairbanks Airport located 4.9 miles west of the study area, and Aurora located 4.0 miles north of the study area. Compared to long-term averages for National Climatic Data Center normal mean air


NWI Code[1] NWI Description
Waters
L2EM2H Lacustrine Permanently Flooded Littoral Nonpersistent Emergent
PUBH Palustrine Permanently Flooded Unconsolidated Bottom
R2UBH Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom
R4USC Riverine Seasonally Flooded Intermittent Unconsolidated Shore
Wetlands
PEM1F Palustrine Semipermanently Flooded Persistent Emergent
PSS1F Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub
PEM1/SS1F Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub
PSS1E Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub
PEM1B Palustrine Seasonally Saturated Persistent Emergent
PSS1/EM1B Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent
PSS1B Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub
PFO2B Palustrine Seasonally Saturated Needle-leaved Evergereen Forest
PFO4B Palustrine Seasonally Saturated Needle-leaved Deciduous Forest
PFO1C Palustrine Seasonally Flooded Broad-leaved Deciduous Forest
Uplands
U Upland
Ur Upland (urban)
Us Upland (fill)
[1] National Wetland Inventory (NWI) nomenclature based on FGDC 2013.
Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Background image from WV03 acquired 21 June 2019 at 0.31m spatial resolution.
Photo Verification Plot
Wetland Determination Plot
Figure 2.
Wetlands and Waters of the Proposed Tanana Lakes Recreation Area Improvement Project, Fairbanks, Alaska, 2020
map prepared by:
ABR, Inc. — Environmental Research & Services
26 August 2020
Fig2_TananaLakes_WetlandPolygonsFill_20-239
0 50 100 150 Meters
0 200 400 600 Feet

temperatures and total monthly precipitation, May 2020 was slightly warmer and drier than normal, while April and June 2020 were characterized by normal air temperatures but two to three times the normal precipitation (Table 1). Heavy precipitation in June 2020 was apparent in local rivers and streams. Although flows were close to the daily median in early July, the Tanana River gage at Fairbanks (15485500) recorded an approximate 25-year flow event in late June (USGS 2020).

Table 1. Monthly mean and long-term normal values for air temperature (°C) and total monthly precipitation (mm) at two meteorological stations within 5 miles of the study area.

	Aurora				Fairbanks Airport			
	Temperature (°C)		Precipitation (mm)		Temperature (°C)		Precipitation (mm)	
Month	1981–2010	2020	1981–2010	2020	1981–2010	2020	1981–2010	2020
April	0.3	0	8.1	28.1	0.3	-0.8	7.9	32.3
May	9.6	11.6	19.8	10.8	9.7	11.8	15.2	13.2
June	15.6	15	42.4	110.3	15.8	15.4	34.8	79.7

The higher than average precipitation for the months preceding the field survey in July 2020 and the high water table, which is assumed to be associated with high water in the Tanana River, likely accounted for the higher water line in Cushman Lake and flooding of saturated wetlands upslope of the existing site access roads. In this situation, surface runoff from precipitation is essentially perched on a high groundwater level causing flooding in wetland communities that are typically only saturated during the growing season.

WETLAND CLASSIFICATION AND MAPPING

WETLANDS

Ten wetland classes were mapped within the study area, including forested, shrub, and emergent wetlands, with hydrology ranging from seasonally saturated to semipermanently flooded. Their combined total area encompassed approximately 6.09 acres, or 26 percent of the study area (Table 2).

Table 2. Acreages of wetlands, waters by wetland type and name, and acreages of uplands within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, AK, 2020.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	Percent of Study Area
Waters		**Total**	**0.22**	**0.96**
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	Subtotal	0.07	0.30
		W-10	0.01	0.04
		W-28	0.04	0.17
		W-8	0.01	0.04
R2UBH	Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	Stream-2	0.14	0.61
R4USC	Riverine Seasonally Flooded Intermittent Unconsolidated Shore	Stream-1	0.01	0.04
L2EM2H	Lacustrine Permanently Flooded Littoral Nonpersistent	W-20	0.01	0.04
Wetlands		**Total**	**6.09**	**26.47**
PEM1F	Palustrine Semipermanently Flooded Persistent Emergent	Subtotal	1.43	6.21
		W-13	0.99	4.30
		W-18	0.14	0.61
		W-31	0.18	0.78
		W-6	0.13	0.56
PEM1/SS1F	Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	Subtotal	0.07	0.30
		W-17	0.04	0.17
		W-19	0.02	0.09
PSS1F	Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	Subtotal	0.85	3.69
		W-11	0.37	1.61
		W-12	0.04	0.17
		W-25	0.08	0.35
		W-27	0.16	0.70
		W-30	0.20	0.87
PSS1E	Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	Subtotal	0.78	3.39
		W-14	0.12	0.52
		W-16	0.24	1.04
		W-21	0.03	0.13
		W-3	0.35	1.52
		W-4	0.04	0.17
PEM1B	Palustrine Seasonally Saturated Persistent Emergent	Subtotal	0.16	0.70
		W-1	0.07	0.30
		W-2	0.09	0.39

Table 2. Continued.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	Percent of Study Area
Wetlands (cont.)				
PSS1/EM1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	W-5	1.71	7.43
PSS1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	W-7	0.05	0.22
PFO2B	Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	Subtotal	0.40	1.74
		W-9	0.21	0.91
		W-32	0.02	0.09
PFO4B	Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	Subtotal	0.34	1.48
PFO1C	Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	Subtotal	0.32	1.39
		W-22	0.11	0.48
		W-24	0.21	0.91
Uplands		**Total**	**16.70**	**72.58**
U	Uplands	n/a	6.38	27.73
Ur	Uplands (urban)	n/a	0.86	3.74
Us	Uplands (fill)	n/a	9.46	41.11

[a] National Wetland Inventory (NWI) annotation based on FGDC (2013) classification system.
[b] All values rounded to the nearest 0.01 acre.

Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent (PSS1/EM1B) is the wetland type with the greatest mapped extent (1.71 acres) within the study area (Table 2). The dominant shrub species include *Betula nana* (dwarf birch), *Salix pulchra* (diamondleaf willow), *Myrica gale* (sweetgale), and *Chamaedaphne calyculata* (leatherleaf). The herb layer is dominated by *Equisetum arvense* (field horsetail) and *Calamagrostis canadensis* (bluejoint). Soils met the histic epipedon hydric criteria and were saturated to the surface at the time of sampling. This wetland type is located in a cleared area surrounded by roads and berms, to the west of the swim beach parking lot (see plot W5-SP1 in Appendix A and Figure 2). Hydrology in this type may be affected by the surrounding roadways, but vegetation and soils clearly indicate that wetland conditions were present prior to disturbance.

Palustrine Semipermanently Flooded Persistent Emergent (PEM1F) wetlands are nearly as abundant in the study area as PSS1/EM1B wetlands (above), with a total mapped area of 1.43 acres (Table 2). This wetland type occurs in wet sedge meadows along the proposed new road alignment (see plot W13-SP1 in Appendix A), near the non-motorized boat launch (see plot W31-SP1 in Appendix A), and in an inundated swale within the shrubby area adjacent to the swim beach parking lot (see plot W6-SP1 in Appendix A and Figure 2). Dominant species include *Carex aquatilis* (water sedge), *C. utriculata* (Northwest Territory sedge), *Calamagrostis canadensis*, *Comarum palustre* (marsh cinquefoil), and *Equisetum fluviatile* (water horsetail). All plots of this type were inundated at the time of sampling and hence no soil pits were dug. Deep surface water (>12 inches in depth) was present in some areas.

Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub (PSS1F) encompasses a total of 0.85 acre within the study area (Table 2). This wetland type occurs mainly at locations where water has been impounded, for example in the area adjacent to the swim beach parking lot (see plot W27-SP1 in Appendix A). The dominant shrub species is *M. gale*. These wetlands were flooded at the time of sampling and soil pits were not dug. Based on the prevalence of obligate wetland species, it is assumed that soils are hydric.

Palustrine Seasonally Saturated Needle-leaved Deciduous Forest (PFO2B) was mapped at 2 locations, with a total area of 0.40 acre (Table 2). The dominant tree species is *Larix laricina* (tamarack), with a shrub understory consisting primarily of *Rhododendron groenlandicum* (bog Labrador tea), *Betula glandulosa* (resin birch), and *Chamaedaphne calyculata*. Soils were histic epipedons, saturated to the surface.

Palustrine Seasonally Saturated Needle-leaved Evergreen Forest (PFO4B) occupies 0.34 acre within the study area (Table 2). This forested wetland type is part of the undisturbed riverine wetland complex along the proposed new road alignment and is dominated by *P. mariana* with an understory of *Ledum groenlandicum*. Soils were saturated histic epipedons with seasonal frost reached at 17 inches (see plot W23-SP1 in Appendix A).

Palustrine Seasonally Flooded Broad-leaved Deciduous Shrub (PSS1E) was mapped at several locations, with a total area of 0.78 acre (Table 2). This wetland type appears to occur within the study area mainly as a result of recent flooding; the areas do not appear inundated in

2019 imagery. In the area described at plot W21-SP1 (Appendix A), the vegetation was dominated by the non-native, invasive *Prunus padus* (European bird cherry), the remaining co-dominant shrub types did not constitute hydrophytic vegetation but the bare soil surface indicates flooding has been present long enough to modify the original plant community, with non-native species recolonizing. The verification plots W3-V1 and W4-V1 describe a similar situation with vegetation dominated by *Salix alaxensis* (feltleaf willow), *Populus balsamifera* (balsam poplar), *B. glandulosa*, *Alnus incana* (gray alder), *Rosa acicularis* (prickly rose), and *Chamaedaphne calyculata*. All sites were inundated at the time of sampling so no pits were dug. The flooding appears to be extensive and is at least frequent enough to impact the emergent plant stratum. For the purposes of the current field investigation these areas were determined to be wetlands with problematic vegetation. Further investigation may be required to determine the cause and frequency of the flooding.

Palustrine Seasonally Flooded Broad-leaved Deciduous Forest (PFO1C) was mapped at 2 locations along the road near the swim beach parking lot, with a combined area of 0.32 acres in the study area (Table 2). These areas are birch forests that are apparently usually uplands, but were flooded during the field survey and thus no soil pits were dug. This wetland type was classified on the basis of extensive flooding present at the time of the field survey. Additional data may be required to determine how often this site is inundated and if the hydrology of the area is altered permanently.

Palustrine Seasonally Saturated Persistent Emergent (PEM1B) wetlands in the study area (0.16 acre; Table 2) consisted of small drainage features in a fallow field along the west side of South Lathrop Avenue (see plot W2-SP1 in Appendix A). The presence of non-native plant species and vehicle tracks, as well as altered drainage due to the road, indicates that vegetation, soils, and hydrology are significantly disturbed. The vegetation is dominated by *Calamagrostis canadensis* and *E. arvense*. Non-native species recorded included *Sonchus arvensis* (sow thistle), *Hordeum jubatum* (foxtail barley), *Trifolium hybridum* (Alsike clover), and *Plantago major* (broadleaf plantain). The site has a thick organic layer underlain by a silt loam mineral layer with Alaska Redox hydric soil characteristics. At the time of sampling. the soil pit lacked primary hydrology indicators but met wetland criteria with secondary characteristics.

Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub (PEM1/SS1F) occupies 0.07 acre in the study area (Table 2). This wetland type consists of a wet sedge meadow with interspersed sparse tall shrubs; it occurs adjacent to the Cushman Lake shoreline and along the edge of a PEM1F wetland (see plot W17-SP1 in Appendix A and Figure 2). Co-dominant shrub species are *Salix lasiandra* (Pacific willow), *S. interior* (sandbar willow), and *S. alaxensis*. Important herbaceous species include *Equisetum palustre* (marsh horsetail) and *Calamagrostis canadensis*. The site was inundated at the time of sampling with approximately 5 inches of surface water.

Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub (PSS1B) encompasses 0.05 acre in the study area, at a single site adjacent to a recently constructed walking trail. The water table at the site was much higher than would be indicated by the vegetation composition. Water may be originating from flooded wetlands upslope, possibly impounded by the trail. High water levels in the Tanana River may also have been a contributing factor at the time of the field survey. The dominant shrub species is *Rosa acicularis*, with lower cover of *S. alaxensis*, *A. incana*, and *Ribes hudsonianum* (northern black currant). Sparse tree cover consisting of *Populus balsamifera* and *Picea glauca* is also present. The understory consists primarily of *E. arvense* and *Cornus canadensis* (dwarf dogwood).

STREAMS AND WATERS OF THE U.S.

Four water classes were mapped in the study area, including 2 riverine, 1 lacustrine, and 1 palustrine. Their combined total area was approximately 0.22 acres, or 0.96 percent of the study area.

Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom (R2UBH) occupies 0.14 acre within the study area (Table 2). This actively flowing slough drains Cushman Lake to the west via a culvert under the boat launch access road. Water depth was approximatley 6 inches at the time of the field survey. Emergent vegetation includes *Hippuris vulgaris* (common mare's-tail), *Schoenoplectus pungens* (common threesquare), and *E. palustre*.

Palustrine Permanently Flooded Unconsolidated Bottom (PUBH) encompasses 0.07 acre in the study area (Table 2). This class includes a ditch that is likely flooded throughout the growing season in most years, and supports obligate wetland plants such as *Schoenoplectus* *tabernaemontani* (softstem bulrush), *E. palustre*, and *Juncus alpinoarticulatus* (northern green rush). Several small isolated depressional features within upland forest types were also classified as PUBH. They lack inflow or outflow, have poor littoral development, and are unvegetated.

Riverine Seasonally Flooded Intermittent Unconsolidated Shore (R4USC) occupies 0.01 acre in the study area (Table 2). This small channel was constructed with landscaping fabric within the sand of the swim beach to drain the upslope wetland across the beach to Cushman Lake. At the time of the field survey, the landscaping fabric was torn and degraded. No flow was occurring, but stagnant water was present.

Lacustrine Permanently Flooded Littoral Nonpersistent Emergent (L2EM2H) encompasses 0.01 acre in the study area (Table 2) along the shoreline of Cushman Lake. This is a very well developed littoral area with both persistent emergent vegetation and rooted aquatic plants. The shoreline at the time of the field survey was much higher than in the June 2019 aerial photograph used for mapping the site. However, the presence of obligate wetland plant species such as *S. tabernaemontani* and *Typha latifolia* indicate that the area is typically flooded.

UPLANDS

Uplands occupied a total of 16.7 acres, or 73% of the study area (Table 2). Uplands (fill; Us) constituted the largest portion of the acreage (approximately 9.5 acres). Natural Uplands (U) included mature black spruce, poplar, birch, and mixed forests, as well as fallow fields and dry roadsides; these areas combined occupy approximately 6.4 acres. The industrial area along South Lathrop Avenue north of the levee was classified as Uplands (urban; Ur) and occupies approximately 0.9 acre in the study area.

WETLAND FUNCTIONAL ASSESSMENT

The 14 mapped NWI wetlands and waters types were aggregated into 8 wetland functional classes for analysis (Table 3, Appendix C). Of the 8 wetland functional classes, 4 are waters and 4 are wetlands. NWI wetland types with similar functions were grouped first according to HGM class, then NWI classification system and subsystem breaks, and finally by water regime (see Table 3 for NWI groupings within wetland functional classes).

Table 3. Functional Capacity Index (FCI) scores for wetlands and waters functional classes within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, AK, 2020.

Wetland Functional Class	Flood Flow Regulation	Sediment/ Nutrient/ Toxicant Removal	Erosion Control & Shoreline Stabilization	Organic Matter Production and Export	Avian and Mammal Habitat Suitability	Fish Habitat Suitability	Education/ Science/ Rec/ Subsist Use
Waters							
Lower Perennial Stream R2UBH	0.25	1.00	0.33	1.00	0.33	0.80	1.00
Intermittent Stream R4USC	0.25	0.75	0.00	0.50	0.00	0.00	1.00
Lacustrine Lentic Waters L2EM2H	0.75	1.00	0.00	1.00	0.33	1.00	1.00
Palustrine Lentic Waters PUBH	0.50	0.50	N/A	0.00	0.00	0.20	1.00
Wetlands							
Semipermanently Flooded Wetlands PEM1F, PEM1/SS1F, PSS1F	0.75	0.66	N/A	1.00	0.75	N/A	1.00
Seasonally Flooded Wetlands PSS1E, PFO1C	0.75	0.66	N/A	1.00	0.50	N/A	1.00
Seasonally Saturated Emergent and Shrub Scrub PEM1B, PSS1/EM1B, PSS1B	0.50	0.50	N/A	0.00	0.50	N/A	1.00
Seasonally Saturated Needle-leaved Forest PFO2B, PFO4B	0.50	0.50	N/A	0.66	0.50	N/A	1.00

The TLRA is in public use and provides numerous educational, recreational, and subsistence uses since the area has been improved to include swim beaches, playgrounds, boat rentals, and boat launches. All wetland functional classes were rated with an FCI value of 1 for this function.

Fish habitat suitability and erosion control and shoreline stabilization were not assessed for any wetlands because they are not directly bordering any waterbodies, The waters present in the study area were assessed (Table 3).

Flood flow regulation was ranked under 0.50 FCI for all waters except Lacustrine Lentic Waters and >0.50 for all wetlands. Most waters in the study area are inherently poor in regulating floodwaters except where storage is available in depressional features or where dense shoreline vegetation persists as for Lacustrine Lentic Waters. Semipermanently Flooded and Seasonally Flooded wetlands scored high on the basis of thick emergent vegetation and the capacity for emergent vegetation to attenuate floodwaters through sheet flow.

Rankings for sediment/nutrient and toxicant removal were >0.50 for waters and >0.50 and <0.66 for wetlands. Lower Perennial Stream and Lacustrine Lentic Waters have dense emergent vegetation bordering a waterbody with the capacity to filter pollutants that may result from roadway runoff. Wetlands also had dense vegetation and thick organic mats to filter runoff but did not have extensive interspersion of vegetation and water and did not show evidence of repeat flooding events.

Erosion control and shoreline stabilization was rated <0.33 for all waters and not assessed for wetlands because the wetlands in the study area do not directly abut any waterbodies. Most of the substrates in the area are composed of highly erodible sands and silts, and review of historical imagery indicates that shorelines are changing rapidly in the area due to increased flooding and changes in channel morphology.

Organic matter production and export ranked >0.66 to 1.00 for all wetlands and waters in the study area. Lower Perennial Stream, Lacustrine Lentic Waters, Semipermanently Flooded, and Seasonally Flooded wetlands all had FCI values of 1.00, on the basis of dense vegetation, frequent flood events, and availability of organic materials.

Avian and mammal habitat suitability was rated between 0.33 and 0.50 FCI for most functional classes, though Semipermanently Flooded Wetlands (marsh habitats) had an FCI score of 0.75. Breeding bird species were observed in June 2020 (ABR 2020) in habitats in all four wetland functional classes but not in any of the four waters classes. The waters classes in the study area are represented by small, isolated waterbodies and are relatively unattractive to breeding birds. They will also be sparingly used by foraging shorebirds and waterbirds. Suitable habitat structure (vegetation strata) for use by bird and mammal species was present throughout the study area.

The Lacustrine Lentic Waters were mapped at the edge of Cushman Lake in an area that appears to be seasonally flooded based on analysis of historical imagery. Based on the well-developed vascular aquatic and emergent aquatic plant community on the shoreline the area is very likely to be connected to Cushman Lake for significant periods throughout the growing season. Lacustrine Lentic Waters ranked high for Fish Habitat Suitability with an FCI score of 1.00. It was assumed that Cushman Lake was deep enough to provide overwintering habitat, connectivity to the fish bearing Tanana River (ADF&G 2020) indicated that fish are present and suitable rearing and spawning habitat is available. The Lower Perennial Stream also ranked high with an FCI of 0.80, lacking only the capacity to provide overwintering habitat based on the shallow channel depth.

PROPOSED JURISDICTIONAL STATUS

The nearest TNW to the study area is the Tanana River (USACE 2020; Figure 1). Cushman Lake is a permanently flooded waterbody created through the impoundment of river water. It is immediately abutting the active channel (the edge of the lake is only separated by a natural levee with a surface water connection to the main channel) of the Tanana River and also connected via surface water flowing in a side slough (STREAM-2). STREAM-2 was considered a jurisdictional tributary on the basis that it connects directly to the Tanana River (Figures 1 and 2). STREAM-1 is intermittent lotic water that conveys water intermittently from upslope wetlands into Cushman Lake on the east side of the swim beach (Figure 2). STREAM-1 was considered a tributary on the basis of downstream connectivity to the Tanana River via Cushman Lake (Table 4).

The majority of the wetlands identified in the study area were considered to be adjacent wetlands on the basis that they abut Cushman Lake, STREAM-2, are drained by STREAM-1, or are part of the naturally occurring riverine wetland complex that directly abuts the Tanana River. PUBH waters mapped as W-8, W-10, and W-28 are proposed as non-jurisdictional on the basis that they are formed in depressions likely resulting from prior gravel mining or construction in the area; they are completely surrounded by uplands and no surface water inlets or outlets were observed during the field survey (Figure 2 and Table 4).

Table 4. Connectivity characteristics and proposed jurisdictional classification for each mapped wetland within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, AK, 2020.

Wetland Name	NWI Code	Area (acres)	Jurisdictional class	Characteristics
Stream-1	R4USC	0.01	tributary	Constructed ditch contributing intermittent flow from upstream wetlands to Cushman lake, to STREAM-2, and then to the Tanana River
Stream-2	R2UBH	0.14	tributary	Active riparian slough with perennial flow connecting directly to the Tanana River
W-1	PEM1B	0.07	review required	Possibly non-jurisdictional as an exemption for prior converted cropland with no direct surface water connection
W-2	PEM1B	0.09	review required	Possibly non-jurisdictional as an exemption for prior converted cropland with no direct surface water connection
W-3	PSS1E	0.35	review required	Impounded wetlands with no direct surface water connection
W-4	PSS1E	0.04	review required	Impounded wetlands with no direct surface water connection
W-5	PSS1/EM1B	1.71	adjacent wetlands	Wetland abuts Cushman Lake, connected directly to the Tanana River through STREAM-2
W-6	PEM1F	0.13	adjacent wetlands	Wetland abuts W-5
W-7	PSS1B	0.05	adjacent wetlands	Wetland abuts W-21
W-8	PUBH	0.01	non-jurisdictional	Constructed ditch within surrounding uplands, flooding likely to be solely from precipitation
W-9	PFO2B	0.38	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-10	PUBH	0.01	non-jurisdictional	Depression possibly from prior gravel mining operations, flooding likely to be solely from precipitation
W-11	PSS1F	0.37	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-12	PSS1F	0.04	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-13	PEM1F	0.99	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-14	PSS1E	0.21	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-16	PSS1E	0.24	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-17	PEM1/SS1F	0.04	adjacent wetlands	Wetland directly abuts Cushman Lake
W-18	PEM1F	0.14	adjacent wetlands	Wetland directly abuts Cushman Lake
W-19	PEM1/SS1F	0.02	adjacent wetlands	Wetland directly abuts Cushman Lake
W-20	L2EM2H	0.01	adjacent wetlands	Wetland directly abuts Cushman Lake
W-21	PSS1F	0.03	adjacent wetlands	Wetland connects to Cushman Lake via STREAM-1

Table 4. Continued.

Wetland Name	NWI Code	Area (acres)	Jurisdictional class	Characteristics
W-22	PFO1C	0.11	review required	Impounded wetlands with no surface water connection
W-23	PFO4B	0.12	review required	Impounded wetlands with no surface water connection
W-24	PFO1C	0.21	review required	Impounded wetlands with no surface water connection
W-25	PSS1F	0.08	adjacent wetlands	Wetland directly abuts STREAM-2
W-26	PFO4B	0.13	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-27	PSS1F	0.16	adjacent wetlands	Wetland drains to Cushman Lake through STREAM-1
W-28	PUBH	0.04	non-jurisdictional	Flooded depression, possibly from prior gravel mining, surrounded by uplands, no surface water inlets or outlets observed during field survey
W-30	PSS1F	0.20	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-31	PEM1F	0.18	adjacent wetlands	Wetland directly abuts the Tanana River
W-32	PFO2B	0.02	adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River

Based on the new NWPR, seven wetlands are potentially in a non-jurisdictional category but further review should be provided by the USACE. Wetlands W-3, W-4, W-22, W-23, and W-24 are all located on the river side of the flood control levee but have impounded waters due to the presence of existing site access roads with no active culverts. These wetlands may not meet the criteria of adjacency because they are separated from the active Tanana River floodplain by an artificial structure with no built-in surface water connection. We believe that these wetlands were flooded at the time of field sampling because of high rainfall in the Fairbanks area combined with a high water table due to peak flows in the Tanana River. Further review will be required to determine adjacency of these wetlands in light of the NWPA.

LITERATURE CITED

ABR, Inc.—Environmental Research & Services (ABR). 2020. Biological Resources Report for the Proposed Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020. Draft report prepared for PND Engineers, Inc., and Federal Highway Administration, Western Federal Lands Highway Division. 32 pp.

Alaska Department of Fish and Game (ADF&G). 2020. Alaska Anadromous Waters Catalog: Interactive Mapping. [Online] https://www.adfg.alaska.gov/sf/SARR/AWC/. Accessed August 2020.

Alaska Department of Natural Resources (ADNR). 2020. Navigable Waters Web Map. Available online: http://www.navmaps.alaska.gov/navwatersmap/. Accessed August 2020.

Dahl, T. E., J. Dick, J. Swords, and B. O. Wilen. 2015. Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States. Division of Habitat and Resource Conservation (version 2), National Standards and Support Team, Madison, WI. 92 pp.

Environmental Protection Agency (EPA). 2020. Navigable Waters Protection Rule: Training and Implementation Materials. [Online] https://www.epa.gov/nwpr/training-and-implementation-materials. Accessed August 2020.

Fairbanks Northstar Borough (FNSB) 2007. Tanana Lakes Recreation Area Master Plan. Prepared by the FNSB Department of Parks and Recreation and USKH Inc. Fairbanks, AK.

36 pp. Federal Geographic Data Committee (FGDC). 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Lichvar R. W., D. L. Banks, W. N. Kirchner, and N. C. Melvin. 2018. The National Wetland Plant List: 2018 Wetland Ratings. [Online] http://wetland-plants.usace.army.mil/nwpl_static/v34/home/home.html

U.S. Army Corps of Engineers (USACE). 2020. Navigable Waters of Alaska. [Online] https://www.poa.usace.army.mil/Missions/Regulatory/Recognizing-Wetlands/Navigable-Waters/ Accessed August 2020.

U.S. Army Corps of Engineers (USACE). 2016. Methodology for assessing functional gains and losses for permittee responsible compensatory mitigation and calculating compensatory mitigation credits and debits for third party mitigation providers in the Alaska District. USACE and Alaska SIRT. 12 pp.

———. 2007. Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region Version 2.0. Wetlands Regulatory Assistance Program, U.S. Army Engineer Research and Development Center, Vicksburg, MS. 72 pp. + appendices.

U.S. Fish and Wildlife Service (USFWS). 2020. National Wetlands Inventory (NWI) Program. Wetlands Mapper. Available online at https://www.fws.gov/wetlands/Data/Mapper.html. Accessed August 2020.

U.S. Geological Survey (USGS). 2020. USGS gage 15485500 Tanana R at Fairbanks AK [Online] https://waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=gif_default&site_no=15485500&period=&begin_date=2020-08-17&end_date=2020-08-24. Accessed July 2020

Viereck, L. A., C. T. Dyrness, A. R. Batten, and K. J. Wenzlick. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Serv., Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-286. 278 pp.

Appendix A. Wetland Determination Plot Forms

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W2-SP1
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.): Water Tracks Or Feather Pattern
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 464
Subregion: Alaska Lat.: 64.8039 Long.: -147.7449 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: PEM1B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland?	Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___		
Wetland Hydrology Present?	Yes ✓ No ___		

Remarks: Swale visible in imagery within the fallow field on the west side of S. Lathrop St. Assume veg, soil and hydrology significantly disturbed because of the presence of non-native plants, evidence of vehicle tracks and altered drainage because of the road.

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
	Total Cover:	0.0		
	50% of total cover: 0.0		20% of total cover: 0.0	
	Sapling/Shrub Stratum			
	Total Cover:	0.0		
	50% of total cover: 0.0		20% of total cover: 0.0	
	Herb Stratum			
1.	Calamagrostis canadensis	45.0	✓	FAC
2.	Equisetum arvense	10.0		FAC
3.	Sonchus arvensis	5.0		FACU
4.	Carex utriculata	5.0		OBL
5.	Carex aquatilis	5.0		OBL
6.	Hordeum jubatum	4.0		FACU
7.	Achillea millefolium	2.0		FACU
8.	Poa pratensis	2.0		FACU
9.	Beckmannia syzigachne	2.0		OBL
10.	Trifolium hybridum	2.0		FAC
11.	Rorippa hispida	2.0		
12.	Plantago major	1.0		FAC
13.	Moehringia lateriflora	1.0		FACU
	Total Cover:	86.0		
	50% of total cover: 43.0		20% of total cover: 17.2	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	12.0	× 1 =	12.0
FACW Species	0.0	× 2 =	0.0
FAC Species	58.0	× 3 =	174.0
FACU Species	14.0	× 4 =	56.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	84.0 (A)		242.0 (B)

Prevalence Index = B/A = 2.881

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 1m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Unk gram 1 = poa pratensis Unk gram 2 = beckmannia syzigachne

SOIL

Sampling Point: W2-SP1

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-1			0.0						peat		
1-9			0.0						muck		
9-11			0.0						muck		
11-14	5y	3/2	90	7.5yr	4/6	10	C	PL	silt loam		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ✓ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ✓ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	✓	Depth (inches):	0
Water Table Present?	Yes		No	✓	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes		No	✓	Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Swale within agricultural field, microtopgraphic depressions wth evidence of fooding

Sampling Point: W2-SP1
NWI classification: PEM1B

Hydric Soil Indicators: Alaska Redox (A14)
Wetland Hydrology Indicators: Geomorphic Position (D2), Drainage Patterns (B10)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W5-SP1
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 473
Subregion: Alaska Lat.: 64.8004 Long.: -147.7374 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: PSS1/EM1B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____	Is the Sampled Area within a Wetland?	Yes ✓ No ____
Hydric Soil Present? Yes ✓ No ____		
Wetland Hydrology Present? Yes ✓ No ____		

Remarks: Located in a cleared field adjacent to the beach parking area. Completely surrounded by roads and berms.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Sapling/Shrub Stratum			
1. Betula nana	15.0	✓	FAC
2. Salix pulchra	10.0	✓	FACW
3. Myrica gale	10.0	✓	OBL
4. Chamaedaphne calyculata	10.0	✓	FACW
5. Salix niphoclada	5.0		
6. Salix interior	5.0		FACW
7. Salix alaxensis	5.0		FAC
8. Rhododendron groenlandicum	5.0		FAC
9. Vaccinium uliginosum	1.0		FAC
Total Cover:	66.0		
50% of total cover: 33.0		20% of total cover: 13.2	
Herb Stratum			
1. Equisetum arvense	15.0	✓	FAC
2. Calamagrostis canadensis	15.0	✓	FAC
3. Dasiphora fruticosa	4.0		FAC
4. Iris setosa	1.0		FAC
Total Cover:	35.0		
50% of total cover: 17.5		20% of total cover: 7.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	10.0	× 1 =	10.0
FACW Species	25.0	× 2 =	50.0
FAC Species	61.0	× 3 =	183.0
FACU Species	0.0	× 4 =	0.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	96.0	(A)	243.0 (B)

Prevalence Index = B/A = 2.531

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 5.0
% Bare Ground 0.0
Total Cover of Bryophytes 25.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: W5-SP1

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-3			0.0						peat		
3-7	10yr	3/2				0			mucky peat		
7-9	7.5yr	2.5/2				0			muck		
9-12	10yr	4/2	90	7.5yr	4/6	10	C	PL	silt		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ✓ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

	Yes		No		Depth (inches):
Surface Water Present?	Yes		No	✓	Depth (inches):
Water Table Present?	Yes	✓	No		Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes	✓	No		Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Hydrology may be disturbed by surrounding roadways but vegetation and soils clearly indicate wetland conditions predating disturbance.

Sampling Point: W5-SP1
NWI classification: PSS1/EM1B

Hydric Soil Indicators: Histic Epipedon (A2)
Wetland Hydrology Indicators: High Water Table (A2), FAC-Neutral Test (D5), Saturation (A3)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W6-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 498
Subregion: Alaska Lat.: 64.7988 Long.: -147.7407 Datum: WGS84
Soil Map Unit Name: Salchaket very fine sandy loam NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** **Yes ✓ No ___**
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks: Inundated swale within the shrubby meadow adjacent to the parking area. Vehicle tracks running through plot.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Sapling/Shrub Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Herb Stratum			
1. Equisetum fluviatile	25.0	✓	OBL
2. Schoenoplectus tabernaemontani	5.0		OBL
3. Comarum palustre	5.0		OBL
4. Carex aquatilis	5.0		OBL
5. Calamagrostis canadensis	2.0		FAC
Total Cover:	42.0		
50% of total cover: 21.0		20% of total cover: 8.4	

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	40.0	× 1 =	40.0
FACW Species	0.0	× 2 =	0.0
FAC Species	2.0	× 3 =	6.0
FACU Species	0.0	× 4 =	0.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	42.0	(A)	46.0 (B)

Prevalence Index = B/A = 1.095

Hydrophytic Vegetation Indicators:
✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 1m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes ✓ No ___**

Remarks:

Soil

Sampling Point: W6-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ✓ No ___

Remarks: No pit, site inundated

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	✓	No		Depth (inches):	6
Water Table Present?	Yes	✓	No		Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes	✓	No		Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Vehicle tracks running through the plot

Sampling Point: W6-SP1
NWI classification: PEM1F

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: Surface Water (A1), FAC-Neutral Test (D5), Saturation (A3), High Water Table (A2)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W7-SP1
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): none Slope: 0.0 % / 0.0 ° Elevation: 478
Subregion: Alaska Lat.: 64.7996 Long.: -147.7331 Datum: WGS84
Soil Map Unit Name: Eielson-Piledriver complex NWI classification: PSS1B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ✓, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____ Hydric Soil Present? Yes ✓ No ____ Wetland Hydrology Present? Yes ✓ No ____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ____

Remarks: Open mixed forest, water table much higher than would be indicated by vegetation composition. Water flowing from flooded upstream wetlands possibly impounded by downslope hiking trail and also high river water. Vegetation may be considered problematic.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.	Populus balsamifera	10.0	✓	FACU
2.	Picea glauca	5.0	✓	FACU
	Total Cover:	15.0		
	50% of total cover: 7.5		20% of total cover: 3.0	
	Sapling/Shrub Stratum			
1.	Rosa acicularis	25.0	✓	FACU
2.	Salix alaxensis	5.0		FAC
3.	Alnus incana	5.0		FAC
4.	Ribes hudsonianum	4.0		FAC
	Total Cover:	39.0		
	50% of total cover: 19.5		20% of total cover: 7.8	
	Herb Stratum			
1.	Equisetum arvense	65.0	✓	FAC
2.	Cornus canadensis	35.0	✓	FACU
3.	Calamagrostis canadensis	5.0		FAC
	Total Cover:	105.0		
	50% of total cover: 52.5		20% of total cover: 21.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	0.0	× 2 =	0.0
FAC Species	84.0	× 3 =	252.0
FACU Species	75.0	× 4 =	300.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	159.0	(A)	552.0 (B)

Prevalence Index = B/A = 3.472

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is > 50%
- ___ Prevalence Index is ≤ 3.0
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width): 5m radius

% Cover of Wetland Bryophytes (Where applicable): ___

% Bare Ground: 0.0

Total Cover of Bryophytes: 1.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: Both hydric soil and hydrologic indicators are present, the site is located on an active floodplain and there is evidence that the newly constructed hiking trail may be altering the hydrology. Since the trail was constructed recently the vegetation may not have had time to adjust to a higher water table periodically through the growing season.

SOIL

Sampling Point: W7-SP1

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-5	Not Assessed	NA	100						peat		
5-9	10yr	3/1	80	10yr	3/6	20	C	PL	sandy loam		
9-10			0.0						muck		
10-12	10yr	3/1	90	10yr	4/6	10	C	PL	sandy loam		
12-15			0.0						muck		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ✓ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: Unknown
Depth (inches): 1000

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?	✓		5
Saturation Present? (includes capillary fringe)	✓		0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Water table much higher than expected for this site, see site remarks

Sampling Point: W7-SP1
NWI classification: PSS1B

Hydric Soil Indicators: Histic Epipedon (A2)
Wetland Hydrology Indicators: Saturation (A3), Presence of Reduced Iron (C4), High Water Table (A2), Geomorphic Position (D2)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W9-SP1
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): none Slope: 0.0 % / 0.0 ° Elevation: 476
Subregion: Alaska Lat.: 64.8011 Long.: -147.7448 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: PFO2B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? **Yes** ✓ **No** ___

Remarks: Tamarack forest along border of sedge marsh

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
1.	Larix laricina	55.0	✓	FACW
	Total Cover:	55.0		
	50% of total cover:	27.5	20% of total cover:	11.0
	Sapling/Shrub Stratum			
1.	Rhododendron groenlandicum	65.0	✓	FAC
2.	Betula glandulosa	40.0	✓	FAC
3.	Chamaedaphne calyculata	15.0		FACW
4.	Salix glauca	5.0		FAC
5.	Picea glauca	5.0		FACU
6.	Vaccinium uliginosum	1.0		FAC
	Total Cover:	131.0		
	50% of total cover:	65.5	20% of total cover:	26.2
	Herb Stratum			
1.	Equisetum arvense	5.0	✓	FAC
2.	Dasiphora fruticosa	4.0	✓	FAC
3.	Calamagrostis canadensis	1.0		FAC
	Total Cover:	10.0		
	50% of total cover:	5.0	20% of total cover:	2.0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	70.0	× 2 =	140.0
FAC Species	121.0	× 3 =	363.0
FACU Species	5.0	× 4 =	20.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	196.0 (A)		523.0 (B)

Prevalence Index = B/A = 2.668

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 75.0
% Bare Ground 0.0
Total Cover of Bryophytes 75.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: Tamarack stand, moss cover is entirely live sphagnum

SOIL

Sampling Point: W9-SP1

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-6							peat		
6-8							mucky peat		
8-12							muck		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent   [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ✓ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: Seasonal Frost
Depth (inches): 14

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?	✓		6
Saturation Present? (includes capillary fringe)	✓		0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: W9-SP1
NWI classification: PFO2B

Hydric Soil Indicators: Histosol or Histel (A1)
Wetland Hydrology Indicators: FAC-Neutral Test (D5), Saturation (A3), High Water Table (A2)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W13-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 474
Subregion: Alaska Lat.: 64.8008 Long.: -147.7445 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? **Yes** ✓ **No** ___

Remarks: Wet sedge marsh, disturbed by 4 wheeler trail along the proposed road alignment

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Sapling/Shrub Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Herb Stratum			
1. Carex aquatilis	40.0	✓	OBL
2. Calamagrostis canadensis	35.0	✓	FAC
3. Carex utriculata	30.0	✓	OBL
4. Comarum palustre	20.0		OBL
Total Cover:	125.0		
50% of total cover: 62.5		20% of total cover: 25.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 3 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	90.0	× 1 =	90.0
FACW Species	0.0	× 2 =	0.0
FAC Species	35.0	× 3 =	105.0
FACU Species	0.0	× 4 =	0.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	125.0	(A)	195.0 (B)

Prevalence Index = B/A = 1.560

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: W13-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ✓ No ___

Remarks: Site inundated, no pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	✓	No		Depth (inches):	6
Water Table Present?	Yes	✓	No		Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes	✓	No		Depth (inches):	0

Wetland Hydrology Present? Yes ✓ **No** ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: W13-SP1
NWI classification: PEM1F

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: Surface Water (A1), FAC-Neutral Test (D5), Saturation (A3), High Water Table (A2)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W17-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 476
Subregion: Alaska Lat.: 64.7975 Long.: -147.7426 Datum: WGS84
Soil Map Unit Name: Salchaket very fine sandy loam NWI classification: PEM1/SS1F
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ___		**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___
Hydric Soil Present? Yes ✓ No ___		
Wetland Hydrology Present? Yes ✓ No ___		

Remarks: Wet meadow on the edge of the lake interspersed with tall willow.

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
	Total Cover:	0.0		
	50% of total cover: 0.0		20% of total cover: 0.0	
	Sapling/Shrub Stratum			
1.	Salix alaxensis	10.0	✓	FAC
2.	Salix lasiandra	10.0	✓	FACW
3.	Salix interior	10.0	✓	FACW
	Total Cover:	30.0		
	50% of total cover: 15.0		20% of total cover: 6.0	
	Herb Stratum			
1.	Equisetum palustre	15.0	✓	FACW
2.	Calamagrostis canadensis	10.0	✓	FAC
3.	Comarum palustre	5.0		OBL
4.	Equisetum arvense	5.0		FAC
5.	Chamaenerion angustifolium	3.0		FACU
6.	Carex saxatilis	1.0		FACW
	Total Cover:	39.0		
	50% of total cover: 19.5		20% of total cover: 7.8	

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	5.0	× 1 =	5.0
FACW Species	36.0	× 2 =	72.0
FAC Species	25.0	× 3 =	75.0
FACU Species	3.0	× 4 =	12.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	69.0	(A)	164.0 (B)

Prevalence Index = B/A = 2.377

Hydrophytic Vegetation Indicators:
✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: W17-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks: No pit, site inundated

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches):	5
Water Table Present?	Yes ✓	No ___	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: W17-SP1
NWI classification: PEM1/SS1F

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: Saturation (A3), Surface Water (A1), FAC-Neutral Test (D5), High Water Table (A2)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W21-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): none Slope: 0.0 % / 0.0 ° Elevation: 504
Subregion: Alaska Lat.: 64.7995 Long.: -147.7336 Datum: WGS84
Soil Map Unit Name: Eielson-Piledriver complex NWI classification: PSS1E
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ✓ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ___	**Is the Sampled Area within a Wetland?**	**Yes ✓ No ___**
Hydric Soil Present? Yes ✓ No ___		
Wetland Hydrology Present? Yes ✓ No ___		

Remarks: Site is located upslope of the hiking trail and water appears to impounded. Forest floor is barren, understory vegetation appears to be impacted but flooding may not have been present long enough for obligate plant species to establish and for overstory species to begin dying out.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Sapling/Shrub Stratum			
1. Prunus padus	85.0	✓	FACU
2. Alnus incana	10.0		FAC
3. Rosa acicularis	5.0		FACU
4. Salix bebbiana	4.0		FAC
Total Cover:	104.0		
50% of total cover: 52.0		20% of total cover: 20.8	
Herb Stratum			
1. Equisetum arvense	1.0		FAC
Total Cover:	1.0		
50% of total cover: 0.5		20% of total cover: 0.2	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	0.0	× 2 =	0.0
FAC Species	15.0	× 3 =	45.0
FACU Species	90.0	× 4 =	360.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	105.0	(A)	405.0 (B)

Prevalence Index = B/A = 3.857

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 25.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Forest floor is mostly composed of dead woody debris with few surviving plants in the herb stratum.

SOIL

Sampling Point: W21-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks: No pit due to flooding but assume histic epipedon similar to neighboring plot

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches):	2
Water Table Present?	Yes ✓	No ___	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Water may be impounded upslope of trail, creating wetlands

Sampling Point: W21-SP1
NWI classification: PSS1E

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: Saturation (A3), Surface Water (A1), Hydrogen Sulfide Odor (C1), High Water Table (A2), Water-Stained Leaves (B9), Geomorphic Position (D2)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W23-SP1
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.):
Local relief (concave, convex, none): none Slope: 0.0 % / 0.0 ° Elevation: 490
Subregion: Alaska Lat.: 64.8002 Long.: -147.7449 Datum: WGS84
Soil Map Unit Name: Tanana mucky silt loam NWI classification: PFO4B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ___	**Is the Sampled Area within a Wetland?**	**Yes** ✓ **No** ___
Hydric Soil Present? Yes ✓ No ___		
Wetland Hydrology Present? Yes ✓ No ___		

Remarks:

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
1. Picea mariana	20.0	✓	FACW
2. Betula neoalaskana	10.0	✓	FACU
Total Cover:	30.0		
50% of total cover: 15.0		20% of total cover: 6.0	
Sapling/Shrub Stratum			
1. Rhododendron groenlandicum	35.0	✓	FAC
2. Betula glandulosa	10.0	✓	FAC
3. Betula neoalaskana	10.0	✓	FACU
4. Vaccinium vitis-idaea	10.0	✓	FAC
5. Chamaedaphne calyculata	5.0		FACW
6. Myrica gale	1.0		OBL
7. Larix laricina	1.0		FACW
Total Cover:	72.0		
50% of total cover: 36.0		20% of total cover: 14.4	
Herb Stratum			
1. Calamagrostis canadensis	25.0	✓	FAC
2. Equisetum arvense	5.0		FAC
Total Cover:	30.0		
50% of total cover: 15.0		20% of total cover: 6.0	

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across all Strata: 7 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	1.0	× 1 =	1.0
FACW Species	26.0	× 2 =	52.0
FAC Species	85.0	× 3 =	255.0
FACU Species	20.0	× 4 =	80.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	132.0 (A)		388.0 (B)

Prevalence Index = B/A = 2.939

Hydrophytic Vegetation Indicators:
✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 5.0
% Bare Ground 0.0
Total Cover of Bryophytes 30.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: W23-SP1

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Mod	Remarks
0-4									peat		
4-8									mucky peat		
8-12	5gy	5/1	90	5yr	4/6	10	C	M	silt		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ✓ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: Seasonal Frost
Depth (inches): 17

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks: Reached frozen layer with the shavel blade, a a dip positive

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?		✓	5
Saturation Present? (includes capillary fringe)		✓	1

Wetland Hydrology Present? **Yes** ✓ **No** ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: W23-SP1
NWI classification: PFO4B

Hydric Soil Indicators: Histic Epipedon (A2)
Wetland Hydrology Indicators: High Water Table (A2), Presence of Reduced Iron (C4), Saturation (A3)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W27-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 479
Subregion: Alaska Lat.: 64.8003 Long.: -147.7356 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: PSS1F
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ✓ , Soil ___ , or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks: Water impounded due to parking lot and poor drainage, vegetation covered in dust.

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
	Total Cover:	0.0		
	50% of total cover:	0.0	20% of total cover:	0.0
	Sapling/Shrub Stratum			
1.	Myrica gale	20.0	✓	OBL
2.	Salix alaxensis	5.0		FAC
3.	Betula nana	5.0		FAC
4.	Salix niphoclada	1.0		
	Total Cover:	31.0		
	50% of total cover:	15.5	20% of total cover:	6.2
	Herb Stratum			
1.	Carex aquatilis	10.0	✓	OBL
2.	Schoenoplectus tabernaemontani	5.0	✓	OBL
3.	Equisetum fluviatile	5.0	✓	OBL
4.	Equisetum arvense	5.0	✓	FAC
5.	Calamagrostis canadensis	5.0	✓	FAC
	Total Cover:	30.0		
	50% of total cover:	15.0	20% of total cover:	6.0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across all Strata: 6 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	40.0	× 1 =	40.0
FACW Species	0.0	× 2 =	0.0
FAC Species	20.0	× 3 =	60.0
FACU Species	0.0	× 4 =	0.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	60.0 (A)		100.0 (B)

Prevalence Index = B/A = 1.667

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 2x10m
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: Site is likely flooded regularly during the growing season based on the presence of obligate plant species

SOIL

Sampling Point: W27-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ✓ No ___

Remarks: No pit, plot inundated, assume hydric soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	✓	No		Depth (inches):	6
Water Table Present?	Yes	✓	No		Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes	✓	No		Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Flooded ditch adjacent to parking lot, water may be higher than usual due to heavy rains a

Sampling Point: W27-SP1
NWI classification: PSS1F

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: High Water Table (A2), Geomorphic Position (D2), Saturation (A3), Surface Water (A1), FAC-Neutral Test (D5)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: W31-SP1
Investigator(s): WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 474
Subregion: Alaska Lat.: 64.7970 Long.: -147.7425 Datum: WGS84
Soil Map Unit Name: Salchaket very fine sandy loam NWI classification: PEM1F
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks: Wet sedge meadow. Most of the plants in the wetland are coated with dust from the road.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Sapling/Shrub Stratum			
Total Cover:	0.0		
50% of total cover: 0.0		20% of total cover: 0.0	
Herb Stratum			
1. Carex utriculata	45.0	✓	OBL
2. Calamagrostis canadensis	10.0		FAC
3. Equisetum arvense	5.0		FAC
Total Cover:	60.0		
50% of total cover: 30.0		20% of total cover: 12.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	45.0	× 1 =	45.0
FACW Species	0.0	× 2 =	0.0
FAC Species	15.0	× 3 =	45.0
FACU Species	0.0	× 4 =	0.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	60.0 (A)		90.0 (B)

Prevalence Index = B/A = 1.500

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

Soil

Sampling Point: W31-SP1

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Mod	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ✓ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: Not Assessed
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks: No pit, site inundated

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches):	6
Water Table Present?	Yes ✓	No ___	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches):	0

Wetland Hydrology Present? Yes ✓ No ___

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Hydrology does not appear to be significantly disturbed despite proximity to roadways.

Sampling Point: W31-SP1
NWI classification: PEM1F

Hydric Soil Indicators: Other (explain in remarks)
Wetland Hydrology Indicators: High Water Table (A2), Saturation (A3), FAC-Neutral Test (D5), Surface Water (A1)

No Soil Pit Photo Taken

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-05
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.):
Local relief (concave, convex, none): ______ Slope: 0.0 % / 0.0 ° Elevation: 450
Subregion: Alaska Lat.: 64.7994 Long.: -147.7332 Datum: WGS84
Soil Map Unit Name: Eielson-Piledriver complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No ✓	**Is the Sampled Area within a Wetland?**	**Yes ___ No ✓**
Hydric Soil Present?	Yes ___ No ✓		
Wetland Hydrology Present?	Yes ___ No ✓		

Remarks: Site is located directly downstream from TL-04, with similar vegetation but separated by the newly constructed hiking trail. No wetland indicators observed at this site.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
1. Populus balsamifera	35.0	✓	FACU
2. Picea glauca	5.0		FACU
Total Cover:	40.0		
50% of total cover: 20.0		20% of total cover: 8.0	
Sapling/Shrub Stratum			
1. Rosa acicularis	45.0	✓	FACU
2. Salix bebbiana	10.0		FAC
3. Prunus padus	5.0		FACU
4. Salix alaxensis	5.0		FAC
5. Salix lasiandra	5.0		FACW
Total Cover:	70.0		
50% of total cover: 35.0		20% of total cover: 14.0	
Herb Stratum			
1. Equisetum arvense	45.0	✓	FAC
2. Equisetum pratense	40.0	✓	FACW
3. Calamagrostis canadensis	10.0		FAC
4. Chamaenerion angustifolium	10.0		FACU
Total Cover:	105.0		
50% of total cover: 52.5		20% of total cover: 21.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across all Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	45.0	× 2 =	90.0
FAC Species	70.0	× 3 =	210.0
FACU Species	100.0	× 4 =	400.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	215.0 (A)		700.0 (B)

Prevalence Index = B/A = 3.256

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: Prupad found throughout the riparian forest and shrub types at Tanana Lakes.

SOIL

Sampling Point: TL-05

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Color (moist)		%	Type[1]	Loc[2]	Texture	Mod	Remarks
0-5			0.0						peat		
5-12	10yr	3/2	95	5yr	4/4	5	C	PL	sand		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ___ No ✓

Remarks: No hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	✓	Depth (inches):
Water Table Present?	Yes		No	✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	✓	Depth (inches):

Wetland Hydrology Present? Yes ___ No ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Site is located in active floodplain but no other hydrology indicators are present.

Sampling Point: TL-05
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: Geomorphic Position (D2)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-10
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): convex Slope: 0.0 % / 0.0 ° Elevation: 481
Subregion: Alaska Lat.: 64.7988 Long.: -147.7408 Datum: WGS84
Soil Map Unit Name: Salchaket very fine sandy loam NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No ✓	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓
Hydric Soil Present?	Yes ___ No ✓	
Wetland Hydrology Present?	Yes ___ No ✓	

Remarks: Disturbed poplar forest, convex topography, surface soil layers composed of fill and also garbage. A small inundated puddle was delineated close to the plot.

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
1.	Populus balsamifera	80.0	✓	FACU
	Total Cover:	80.0		
	50% of total cover:	40.0	20% of total cover:	16.0
	Sapling/Shrub Stratum			
1.	Rosa acicularis	75.0	✓	FACU
2.	Alnus incana	5.0		FAC
3.	Rubus idaeus	5.0		FACU
4.	Salix bebbiana	1.0		FAC
	Total Cover:	86.0		
	50% of total cover:	43.0	20% of total cover:	17.2
	Herb Stratum			
1.	Galium boreale	5.0	✓	FACU
2.	Chamaenerion angustifolium	5.0	✓	FACU
3.	Calamagrostis canadensis	4.0	✓	FAC
	Total Cover:	14.0		
	50% of total cover:	7.0	20% of total cover:	2.8

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	0.0	× 2 =	0.0
FAC Species	10.0	× 3 =	30.0
FACU Species	170.0	× 4 =	680.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	180.0 (A)		710.0 (B)

Prevalence Index = B/A = 3.944

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground ___
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks: Other cover is leaf litter

SOIL

Sampling Point: TL-10

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Mod	Remarks
0-2			0.0						peat		
2-4	10yr	2/1				0			mucky peat		
4-12	10yr	3/2				0			sand	gravelly	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: None
Depth (inches): -1000

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks: Soil pit significantly disturbed, digging up trash

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	✓	Depth (inches):
Water Table Present?	Yes	___	No	✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	___	No	✓	Depth (inches):

Wetland Hydrology Present? **Yes** ___ **No** ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: No hydrology indicators, except for small inundated puddle just outside plot radius. Water table is well below the average surface within the forest.

Sampling Point: TL-10
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: None

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-07
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-15
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): none Slope: 0.0 % / 0.0 ° Elevation: 451
Subregion: Alaska Lat.: 64.7988 Long.: -147.7453 Datum: WGS84
Soil Map Unit Name: Eielson-Piledriver complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks: Balsam poplar forest, well drained substrates, no evidence of surface water or periodic flooding.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.	Populus balsamifera	75.0	✓	FACU
	Total Cover:	75.0		
	50% of total cover: 37.5		20% of total cover: 15.0	
	Sapling/Shrub Stratum			
1.	Alnus incana	35.0	✓	FAC
	Total Cover:	35.0		
	50% of total cover: 17.5		20% of total cover: 7.0	
	Herb Stratum			
1.	Chamaenerion angustifolium	10.0	✓	FACU
2.	Orthilia secunda	10.0	✓	FACU
3.	Cornus canadensis	5.0		FACU
4.	Pyrola asarifolia	5.0		FACU
5.	Calamagrostis canadensis	2.0		FAC
6.	Geocaulon lividum	1.0		FACU
7.	Moehringia lateriflora	1.0		FACU
	Total Cover:	34.0		
	50% of total cover: 17.0		20% of total cover: 6.8	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	0.0	× 2 =	0.0
FAC Species	37.0	× 3 =	111.0
FACU Species	107.0	× 4 =	428.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	144.0	(A)	539.0 (B)

Prevalence Index = B/A = 3.743

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 5.0

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks: Predominant ground cover is leaf litter

SOIL

Sampling Point: TL-15

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-1			0.0						peat		
1-5									mucky peat		
5-13	10yr	3/2	90	5yr	3/4	10	C	PL	sand		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ___ No ✓

Remarks: No hydric soil indicators observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches):
Water Table Present? Yes ___ No ✓ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches):

Wetland Hydrology Present? Yes ___ No ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: No hydrology indicators observed other than the site being on the active floodplain.

Sampling Point: TL-15
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: None

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-17
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): ______ Slope: 0.0 % / 0.0 ° Elevation: 460
Subregion: Alaska Lat.: 64.8040 Long.: -147.7447 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ✓, Soil ✓, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓
Is the Sampled Area within a Wetland?		✓

Remarks: Fallow cleared field, supports multiple non-native potentially invasive species.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
	Total Cover:	0.0		
	50% of total cover: 0.0		20% of total cover: 0.0	
	Sapling/Shrub Stratum			
1.	Salix alaxensis	5.0	✓	FAC
2.	Salix glauca	5.0	✓	FAC
3.	Salix interior	5.0	✓	FACW
	Total Cover:	15.0		
	50% of total cover: 7.5		20% of total cover: 3.0	
	Herb Stratum			
1.	Equisetum arvense	25.0	✓	FAC
2.	Senecio viscosus	20.0	✓	
3.	Melilotus albus	10.0		
4.	Trifolium hybridum	5.0		FAC
5.	Vicia cracca	5.0		
6.	Achillea millefolium	4.0		FACU
7.	Sonchus arvensis	3.0		FACU
8.	Iris setosa	2.0		FAC
9.	Festuca rubra	1.0		FAC
10.	Carex aurea	1.0		FACW
11.	Calamagrostis canadensis	1.0		FAC
12.	Solidago multiradiata	1.0		FACU
13.	Platanthera aquilonis	1.0		FACW
14.	Juncus castaneus	1.0		FACW
	Total Cover:	80.0		
	50% of total cover: 40.0		20% of total cover: 16.0	

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	8.0	× 2 =	16.0
FAC Species	44.0	× 3 =	132.0
FACU Species	8.0	× 4 =	32.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	60.0 (A)		180.0 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:
✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 5.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Invasives, senvis, melalb and viccra do no have indicator status and not included in the calculations, however, vegetation is not likely to be considered hydrophytic if these plants with the majority of cover at the site are considered UPL plants. ADD Galeopsis bifida to species list.

SOIL

Sampling Point: TL-17

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-1			0.0						peat		
1-5	10yr	2/1				0			muck		
5-9	10yr	4/1	85	5yr	5/6	15	C	PL	silt loam		
9-11	5y	4/2	95	10gy	4/1	5	RM	PL	silt loam		Very few root channels with reduced matrix observed in the lowest horizon.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

____ Histosol or Histel (A1)
____ Histic Epipedon (A2)
____ Hydrogen Sulfide (A4)
____ Thick Dark Surface (A12)
____ Alaska Gleyed (A13)
____ Alaska Redox (A14)
____ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

____ Alaska Color Change (TA4)[4]
____ Alaska Alpine Swales (TA5)
____ Alaska Redox With 2.5Y Hue
____ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
____ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches):

Hydric Soil Present? **Yes** ____ **No** ✓

Remarks: No alpha reaction

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

____ Surface Water (A1)
____ High Water Table (A2)
____ Saturation (A3)
____ Water Marks (B1)
____ Sediment Deposits (B2)
____ Drift Deposits (B3)
____ Algal Mat or Crust (B4)
____ Iron Deposits (B5)
____ Surface Soil Cracks (B6)
____ Inundation Visible on Aerial Imagery (B7)
____ Sparsely Vegetated Concave Surface (B8)
____ Marl Deposits (B15)
____ Hydrogen Sulfide Odor (C1)
____ Dry-Season Water Table (C2)
____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

____ Water Stained Leaves (B9)
____ Drainage Patterns (B10)
____ Oxidized Rizospheres along Living Roots (C3)
____ Presence of Reduced Iron (C4)
____ Salt Deposits (C5)
____ Stunted or Stressed Plants (D1)
____ Geomorphic Position (D2)
____ Shallow Aquitard (D3)
____ Microtopographic Relief (D4)
✓ FAC-neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches):
Water Table Present? Yes ____ No ✓ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches):

Wetland Hydrology Present? Yes ____ **No** ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: No hydrology indicators observed.

Sampling Point: TL-17
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: FAC-Neutral Test (D5)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-19
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 ° Elevation: 471
Subregion: Alaska Lat.: 64.8059 Long.: -147.7443 Datum: WGS84
Soil Map Unit Name: Urban land NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland?	Yes ___ No ✓
Hydric Soil Present?	Yes ✓ No ___		
Wetland Hydrology Present?	Yes ___ No ✓		

Remarks: Disturbed patch next to railroad. Hydrophytic vegetation present not with 1 dominant an NI indicator not included in veg analysis. Hydric soils present but hydrology absent. Potentially borderline plot but classed as an upland because hydrology should be present given the wet spring and early summer in Fairbanks.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
	Total Cover:	0.0		
	50% of total cover: 0.0		20% of total cover: 0.0	
	Sapling/Shrub Stratum			
1.	Salix glauca	65.0	✓	FAC
2.	Rosa acicularis	55.0	✓	FACU
3.	Myrica gale	30.0		OBL
4.	Salix interior	15.0		FACW
5.	Betula neoalaskana	5.0		FACU
6.	Populus balsamifera	5.0		FACU
	Total Cover:	175.0		
	50% of total cover: 87.5		20% of total cover: 35.0	
	Herb Stratum			
1.	Iris setosa	8.0	✓	FAC
2.	Calamagrostis canadensis	5.0	✓	FAC
3.	Vicia cracca	5.0	✓	
4.	Petasites frigidus	4.0		FACW
5.	Dasiphora fruticosa	2.0		FAC
6.	Carex aurea	2.0		FACW
7.	Achillea millefolium	2.0		FACU
8.	Rumex arcticus	2.0		FAC
9.	Carex utriculata	2.0		OBL
10.	Galium boreale	1.0		FACU
	Total Cover:	33.0		
	50% of total cover: 16.5		20% of total cover: 6.6	

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	32.0	× 1 =	32.0
FACW Species	21.0	× 2 =	42.0
FAC Species	82.0	× 3 =	246.0
FACU Species	68.0	× 4 =	272.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	203.0	(A)	592.0 (B)

Prevalence Index = B/A = 2.916

Hydrophytic Vegetation Indicators:
✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 1m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: TL-19

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (moist)	%	Type¹	Loc²	Texture	Mod	Remarks
0-1		0.0					peat		
1-3		0.0					muck		
3-5	10yr 3/2			0			silt loam		
5-6		0.0					muck		
6-14	5y 3/1	85	7.5yr 5/6	15	C	PL	silt loam		Organic inclusions throughout

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ✓ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: None

Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	✓	Depth (inches):
Water Table Present?	Yes	___	No	✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	___	No	✓	Depth (inches):

Wetland Hydrology Present? Yes ___ No ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Depressed area beside the road, receiving runoff from road. A few small depressions supporting car utr that may be flooded periodically during growing season. Site should have some hydrology indicators given the wet spring and early summer in Fairbanks.

Sampling Point: TL-19
NWI classification: U

Hydric Soil Indicators: Alaska Redox (A14)
Wetland Hydrology Indicators: None

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-21
Investigator(s): JPP, WAD Landform (hillside, terrace, hummocks, etc.): Bluffs or Banks
Local relief (concave, convex, none): convex Slope: 1.7 % / 1.0 ° Elevation: 463
Subregion: Alaska Lat.: 64.7996 Long.: -147.7445 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks: Convex bank, supporting tall shrubs next to the slough.

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
	Total Cover:	0.0		
	50% of total cover:	0.0	20% of total cover:	0.0
	Sapling/Shrub Stratum			
1.	Salix alaxensis	35.0	✓	FAC
2.	Alnus incana	25.0	✓	FAC
3.	Rhododendron groenlandicum	5.0		FAC
4.	Salix interior	5.0		FACW
5.	Prunus padus	4.0		FACU
6.	Rosa acicularis	1.0		FACU
	Total Cover:	75.0		
	50% of total cover:	37.5	20% of total cover:	15.0
	Herb Stratum			
1.	Equisetum pratense	50.0	✓	FACW
2.	Chamaenerion angustifolium	30.0	✓	FACU
	Total Cover:	80.0		
	50% of total cover:	40.0	20% of total cover:	16.0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	55.0	× 2 =	110.0
FAC Species	65.0	× 3 =	195.0
FACU Species	35.0	× 4 =	140.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	155.0 (A)		445.0 (B)

Prevalence Index = B/A = 2.871

Hydrophytic Vegetation Indicators:

✓ Dominance Test is > 50%
✓ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width): 1m radius
% Cover of Wetland Bryophytes (Where applicable): 0.0
% Bare Ground: ___
Total Cover of Bryophytes: 5.0

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: Other ground cover is leaf litter

Soil

Sampling Point: TL-21

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Mod	Remarks
0-2								peat		
2-4								mucky peat		
4-12	5y	3/2	75	7.5yr	4/6	25	C	PL	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ✓ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: No Data
Depth (inches): -1000

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches):
Water Table Present? Yes ___ No ✓ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches):

Wetland Hydrology Present? Yes ___ **No** ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks: Hydrology indicators absent, alpha alpha negative, no surface evidence of periodic flooding.

Sampling Point: TL-21
NWI classification: U

Hydric Soil Indicators: Alaska Redox (A14)
Wetland Hydrology Indicators: None

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-22
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.): Flat or fluvial related
Local relief (concave, convex, none): convex Slope: 0.0 % / 0.0 ° Elevation: 504
Subregion: Alaska Lat.: 64.8002 Long.: -147.7449 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓
Is the Sampled Area within a Wetland?		✓

Remarks: Black spruce stand immediately adjacent to flooded 4-wheeler trail. Frozen soils but not ice rich.

VEGETATION - Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
1. Picea mariana	45.0	✓	FACW
2. Betula neoalaskana	5.0		FACU
Total Cover:	50.0		
50% of total cover: 25.0		20% of total cover: 10.0	
Sapling/Shrub Stratum			
1. Rosa acicularis	10.0	✓	FACU
2. Vaccinium vitis-idaea	5.0	✓	FAC
3. Rhododendron groenlandicum	2.0		FAC
Total Cover:	17.0		
50% of total cover: 8.5		20% of total cover: 3.4	
Herb Stratum			
1. Geocaulon lividum	50.0	✓	FACU
2. Equisetum pratense	1.0		FACW
Total Cover:	51.0		
50% of total cover: 25.5		20% of total cover: 10.2	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across all Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	46.0	× 2 =	92.0
FAC Species	7.0	× 3 =	21.0
FACU Species	65.0	× 4 =	260.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	118.0	(A)	373.0 (B)

Prevalence Index = B/A = 3.161

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) 5m radius
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 80.0

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Soil

Sampling Point: TL-22

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-7									peat		
7-10	10yr	4/2	5	5yr	5/6	95	C	PL	sand		Frozen at bottom

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type: Seasonal Frost
Depth (inches): 10

Hydric Soil Present? Yes ___ No ✓

Remarks: Frozen layer is not ice rich, mineral soil texture is sand, did not consider it a saturated layer

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?		✓	
Saturation Present? (includes capillary fringe)		✓	

Wetland Hydrology Present? Yes ___ No ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: TL-22
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: Shallow Aquitard (D3)

WETLAND DETERMINATION DATA FORM - ALASKA REGION

Project/Site: TLRA Improvements; Wetland Delineation Borough/City: Fairbanks Northstar Borough Sampling Date: 2020-07-08
Applicant/Owner: Federal Highway Administration (FHWA) Sampling Point: TL-27
Investigator(s): WAD, JPP Landform (hillside, terrace, hummocks, etc.):
Local relief (concave, convex, none): convex Slope: 8.7 % / 5.0 ° Elevation: 476
Subregion: Alaska Lat.: 64.8012 Long.: -147.7438 Datum: WGS84
Soil Map Unit Name: Tanana-Mosquito complex NWI classification: U
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** ✓
Hydric Soil Present?	Yes ___	No ✓		
Wetland Hydrology Present?	Yes ___	No ✓		

Remarks: Base of s shallow ridge dominated by mature paper birch

VEGETATION - Use scientific names of plants. List all species in the plot.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum			
1.	Betula neoalaskana	85.0	✓	FACU
2.	Picea glauca	5.0		FACU
	Total Cover:	90.0		
	50% of total cover: 45.0		20% of total cover: 18.0	
	Sapling/Shrub Stratum			
1.	Rosa acicularis	75.0	✓	FACU
2.	Salix bebbiana	2.0		FAC
	Total Cover:	77.0		
	50% of total cover: 38.5		20% of total cover: 15.4	
	Herb Stratum			
1.	Calamagrostis canadensis	5.0		FAC
	Total Cover:	5.0		
	50% of total cover: 2.5		20% of total cover: 1.0	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 2 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0.0	× 1 =	0.0
FACW Species	0.0	× 2 =	0.0
FAC Species	7.0	× 3 =	21.0
FACU Species	165.0	× 4 =	660.0
UPL Species	0.0	× 5 =	0.0
Column Totals:	172.0	(A)	681.0 (B)

Prevalence Index = B/A = 3.959

Hydrophytic Vegetation Indicators:

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators or hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Plot size (radius, or length × width) -
% Cover of Wetland Bryophytes (Where applicable) 0.0
% Bare Ground 0.0
Total Cover of Bryophytes 0.0

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks: Other cover is leaf litter

SOIL

Sampling Point: TL-27

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Mod	Remarks
0-4							peat		
4-12							mucky peat		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, A=Absent [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators:

- ____ Histosol or Histel (A1)
- ____ Histic Epipedon (A2)
- ____ Hydrogen Sulfide (A4)
- ____ Thick Dark Surface (A12)
- ____ Alaska Gleyed (A13)
- ____ Alaska Redox (A14)
- ____ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ____ Alaska Color Change (TA4)[4]
- ____ Alaska Alpine Swales (TA5)
- ____ Alaska Redox With 2.5Y Hue
- ____ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ____ Other (Explain in Remarks)

[3]One indicator or hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? **Yes** ____ **No** ✓

Remarks: No frost detected, soil profile is organic but not saturated

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Dry-Season Water Table (C2)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Stained Leaves (B9)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Salt Deposits (C5)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	✓	Depth (inches):
Water Table Present?	Yes	____	No	✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	____	No	✓	Depth (inches):

Wetland Hydrology Present? Yes ____ **No** ✓

Recorded Data (stream gauge, monitor well, aerial photo, previous inspection) if available:

Remarks:

Sampling Point: TL-27
NWI classification: U

Hydric Soil Indicators: None
Wetland Hydrology Indicators: None

Appendix B. Map Verification Plot Information and Photos

Sampling Point: STREAM-1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: R4SBC

Viereck code:

Species:

Notes: Site is a constructed drainage channel from upslope wetland to Cushman lake across the beach. The channel was lined with landscaping fabric but channel bed has been eroded and the fabric is exposed. Assumed that veg, soil and hydrology are significantly disturbed because it's a constructed drainage channel that been degraded from original condition. R4USC

Sampling Point: STREAM-2

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: R2UBH

Viereck code:

Species: *Hippuris vulgaris, Equisetum palustre, Schoenoplectus pungens*

Notes: Flowing slough, water 6 inches deep

Sampling Point: W3-V1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-08

NWI classification: PSS1E

Viereck code:

Species: *Chamaedaphne calyculata, Salix bebbiana, Rosa acicularis, Alnus incana, Betula glandulosa, Iris setosa, Calamagrostis canadensis, Equisetum palustre*

Notes: Inundated through the width of study area, not evident in 2019 imagery. Inundation is likely due to the combination of impounded waters accumulating from rainfall and not draining due to high flood stage on the Tanana River. Vegetation is not yet supporting obligate plants and existing shrubs and trees are not yet dying. Flooding may be very intermittent.

Sampling Point: W4-V1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-08

NWI classification: PSS1E

Viereck code:

Species: *Populus balsamifera, Betula glandulosa, Salix alaxensis, Calamagrostis canadensis*

Notes: Inundated through the width of study area, not evident in 2019 imagery. Inundation is likely due to the combination of impounded waters accumulating from rainfall and not draining due to high flood stage on the Tanana River. Vegetation is not yet supporting obligate plants and existing shrubs and trees are not yet dying. Flooding may be very intermittent.

Sampling Point: W8-V1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: PUBH

Viereck code:

Species: *Salix interior, Equisetum palustre, Juncus alpinoarticulatus, Schoenoplectus tabernaemontani, Equisetum variegatum*

Notes: Ditch impounding water supporting obligate plants, likely flooded throughout the growing season in most years.

Sampling Point: W20-V1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: L2EM2H

Viereck code:

Species: *Salix interior, Schoenoplectus tabernaemontani, Typha latifolia*

Notes: The shoreline of the lake is much higher upslope during the time of sampling than indicated in the 2019 aerial photograph. However the presence of obligate aquatic wetland plants such as scival and typlat indicate that the area is typically flooded.

Sampling Point: W24-V1

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-08

NWI classification: U

Viereck code:

Species: *Picea mariana, Rosa acicularis, Vaccinium vitis-idaea, Salix bebbiana, Geocaulon lividum*

Notes: Similar black spruce upland on slightly raised ridge. Assume upland based on veg composition and lack of hydrology.

Sampling Point: TL-02

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: Us

Viereck code:

Species: *Salix lasiandra, Salix interior, Populus balsamifera, Salix niphoclada, Epilobium palustre, Melilotus albus, Crepis tectorum*

Notes: Edge of parking lot with a large population of white sweet clover. Verification plot to document invasive population.

Sampling Point: TL-07

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-07

NWI classification: U

Viereck code:

Species: *Populus balsamifera, Achillea millefolium, Equisetum arvense, Equisetum palustre, Festuca rubra, Hordeum jubatum, Juncus sp., Melilotus albus, Piperia dilatata, Platanthera aquilonis, Plantago major, Poa pratensis, Potentilla recta, Taraxacum officinale, Trifolium hybridum, Vicia cracca*

Notes: Constructed berm above beach area, colonized by some non native plants.

Sampling Point: TL-18

Site: TLRA Improvements; Wetland Delineation

Date: 2020-07-08

NWI classification: U

Viereck code: Moist Forb Meadow

Species: *Vicia cracca*

Notes: Extensive infestation of viccra alongside road and extending into the field.

Appendix C. Wetland Functional Assessment Worksheets

NWI Code(s): R2UBH [Lower Perennial Stream]
HGM: Riverine

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	N/A	
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	The waterbody is an active slough draining Cushman Lake.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	Extensive lodged debris and sediment deposits were observed during the field survey.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	0	The waterbody is an active channel.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	0	The waterbody is a perennial stream.
Functional score = sum of ratings for indicators/total possible score = 1/4	0.25	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	Slow moving water was observed near the banks, within areas of emergent vegetation.
2. Low to tall woody vegetation present (N/A if assessing waters).	N/A	
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	1	An area of well developed riparian emergent vegetation is present, as well as rooted aquatic vegetation within the stream.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	1	Extensive sediment deposits were observed during the field survey.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	N/A	
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The study area is completely surrounded by urban development, floodwaters present during the field survey are likely to contain pollutants from surrounding access roads and groins
Functional score = sum of ratings for indicators/total possible score = 4/4	1	
C. Erosion Control and Shoreline Stabilization		
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	1	Dense emergent obligate wetland vascular plants on the banks and in-stream rooted aquatics within the channel.
2. Soils are not predominantly sandy or silty, and are not ice rich.	0	The soil profiles are dominated by riverine sands and silts.
3. Historical aerial photography (if available) indicates stable shoreline features.	0	Shorelines of sloughs are typically susceptible to rapid change in active riverine systems.
Functional score = sum of ratings for indicators/total possible score= 1/3	0.33	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1	Well developed emergent vegetation in channel.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	N/A	
3. Surface water outflow occurs regularly throughout the growing season.	1	The waterbody is an active flowing channel.
Functional score = sum of ratings for indicators/total possible score = 2/2	1	

NWI Code(s): R2UBH [Lower Perennial Stream]
HGM: Riverine

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	0	No breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	1	The cover of emergent vegetation is at least 10%.
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	N/A	
Functional score = sum of ratings for indicators/total possible score = 1/3	0.33	
F. Fish Habitat Suitability		
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	0	Channel was up to 12 inches deep at the time of sampling but expected to fluctuate throughout the growing season and potentially dry up during the winter
2. Fish are present.	1	Fish are assumed to be present due to the close proximity to the Tanana River.
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	1	A well developed littoral zone is present.
4. Suitable spawning areas are present.	1	Well developed bank vegetation and in-channel vegetation providing cover, substrate is sands and silts
5. Juvenile rest areas present.	1	Well developed bank vegetation and in-channel vegetation providing cover, substrate is sands and silts
Functional score = sum of ratings for indicators/total possible score = 4/5	0.8	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): R4USC [Intermittent Stream]
HGM: Riverine

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	N/A	
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	The waterbody is an active riverine feature
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	The waterbody is a small constructed drainage channel draining a semipermanently flooded wetland into Cushman Lake across the swim beach.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	0	The waterbody is an active channel.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	0	The waterbody is not a lake.
Functional score = sum of ratings for indicators/total possible score = 1/4	0.25	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	Water was not flowing in the channel at the time of the field survey, but patches of stagnant surface water were present.
2. Low to tall woody vegetation present (N/A if assessing waters).	N/A	
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	The waterbody is a constructed channel with landscaping fabric and no bank vegetation.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	1	The landscaping fabric and banks were eroded indicating higher water levels in the past.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	N/A	
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The study area is completely surrounded by urban development; floodwaters present during the field survey are likely to contain pollutants from surrounding access roads and groins.
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
C. Erosion Control and Shoreline Stabilization		
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	0	No vegetation present.
2. Soils are not predominantly sandy or silty, and are not ice rich.	0	Channel is constructed with landscaping fabric and sand from the swim beach.
3. Historical aerial photography (if available) indicates stable shoreline features.	0	Channel was recently constructed.
Functional score = sum of ratings for indicators/total possible score = 0/3	0	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	0	No vegetation present.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	N/A	
3. Surface water outflow occurs regularly throughout the growing season.	1	Assume that channel is active periodically during the growing season
Functional score = sum of ratings for indicators/total possible score = 1/2	0.5	

NWI Code(s): R4USC [Intermittent Stream]
HGM: Riverine

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	0	No breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	No in-stream vegetation, channel is a degraded constructed feature
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	N/A	
Functional score = sum of ratings for indicators/total possible score = 0/3	0	
F. Fish Habitat Suitability		
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	0	
2. Fish are present.	0	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	0	0
4. Suitable spawning areas are present.	0	
5. Juvenile rest areas present.	0	
Functional score = sum of ratings for indicators/total possible score = 0/5	0	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): L2EM2H [Lacustrine Lentic Waters]
HGM: Depressional

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	N/A	
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	1	The waterbody is a lacustrine fringe surrounding a depressional lake (Cushman Lake).
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	Based on comparison with historical imagery, the entire littoral area has developed within the past 3 years since the construction of TLRA.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	0	Channelized outflow was observed on the west side of the lake.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	1	The waterbody is a lacustrine fringe surrounding a lake >20 acres in size.
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	Still water is present (Cushman Lake).
2. Low to tall woody vegetation present (N/A if assessing waters).	N/A	
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	1	Persistent Emergent vegetation is present along the shoreline, and extensive rooted aquatic vegetation is also present.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	1	Assume significant fluctuation in water levels by comparison to historical imagery.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	N/A	
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The study area is completely surrounded by urban development; waterbody is likely to contain pollutants from surrounding access roads and groins.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	
C. Erosion Control and Shoreline Stabilization		
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	0	Vegetation is primarily rooted aquatic plants, with little lacustrine shoreline vegetation development
2. Soils are not predominantly sandy or silty, and are not ice rich.	0	The soil profiles were dominated by riverine sands and silts.
3. Historical aerial photography (if available) indicates stable shoreline features.	0	Comparison with historical imagery indicates increasing water levels with the rapid development of a vegetated littoral zone.
Functional score = sum of ratings for indicators/total possible score = 0/3	0	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1	A well developed littoral zone is present.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	N/A	
3. Surface water outflow occurs regularly throughout the growing season.	1	Active outflow was occurring through a culvert on the east side of Cushman Lake at the time of the field survey.
Functional score = sum of ratings for indicators/total possible score = 2/2	1	

NWI Code(s): L2EM2H [Lacustrine Lentic Waters]
HGM: Depressional

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	0	No breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	1	Well developed rooted aquatic vegetation is present.
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	N/A	
Functional score = sum of ratings for indicators/total possible score = 1/3	0.33	
F. Fish Habitat Suitability		
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	1	Assume Cushman lake is deep enough to allow overwintering.
2. Fish are present.	1	Cushman Lake is assumed to support fish based on its close proximity to the Tanana River.
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	1	A well developed littoral zone is present.
4. Suitable spawning areas are present.	1	Cushman Lake has vegetated littoral zones and some areas of overhanging vegetation
5. Juvenile rest areas present.	1	Cushman Lake has vegetated littoral zones and some areas of overhanging vegetation
Functional score = sum of ratings for indicators/total possible score = 5/5	1	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): PUBH [Palustrine Lentic Waters]
HGM: Depressional

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	N/A	
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	1	HGM class is depressional.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	Small ponds are present in isolated depressions with no evidence of inflow or outflow; shorelines show limited evidence of fluctuation.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	0	No evidence of throughflow; these small features are not in landscape positions that would receive floodflow. Due to their very small size, they do not provide significant storage function.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	0	Waterbodies <20 acres, shallow water, forming in depressions caused by prior disturbance
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	PUBH waters were assumed to be flooded throughout the growing season.
2. Low to tall woody vegetation present (N/A if assessing waters).	N/A	
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	No islands are present; floating vegetation and lacustrine fringe development are limited.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	0	No sediment deposits were observed during the field survey.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	N/A	
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	Small waterbodies completely surrounded by disturbance
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
C. Erosion Control and Shoreline Stabilization	N/A	The PUBH waters are surrounded entirely by uplands.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	N/A	
2. Soils are not predominantly sandy or silty, and are not ice rich.	N/A	
3. Historical aerial photography (if available) indicates stable shoreline features.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	0	No emergent vegetation is present.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	0	
3. Surface water outflow occurs regularly throughout the growing season.	0	No inflow or outflow was observed.
Functional score = sum of ratings for indicators/total possible score = 0/3	0	

NWI Code(s): PUBH [Palustrine Lentic Waters]
HGM: Depressional

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	0	No breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	N/A	
Functional score = sum of ratings for indicators/total possible score = 0/3	0	
F. Fish Habitat Suitability		
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	0	
2. Fish are present.	0	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	1	PUBH in the study area are surrounded by forested uplands, very little littoral development is present but forest canopy overhangs the waterbody.
4. Suitable spawning areas are present.	0	
5. Juvenile rest areas present.	0	
Functional score = sum of ratings for indicators/total possible score 1/5	0.2	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): PEM1F, PEM1/SS1F, PSS1F [Semipermanently Flooded Wetlands]
HGM: Slope

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	1	Wetlands in this functional class have dense graminoid vegetation or closed canopies of tall, broad-leaved deciduous shrubs.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	All wetlands in this functional class are classified as HGM slope.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	Wetlands in this functional class were flooded at the time of the field survey. Prior disturbances (ATV tracks) indicate that water levels have not always been as high.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	1	The area is within an active floodplain with evidence of impounded waters throughout. No channelized features were observed.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	N/A	
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	Substantial surface water was present during the field survey.
2. Low to tall woody vegetation present (N/A if assessing waters).	1	Woody vegetation is the dominant stratum.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	The wetlands were completely flooded at the time of the field survey.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	0	No sediment deposits were observed during the field survey,
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	1	The organic layer wasn't directly assessed because the wetlands were flooded. The organic layers are expected to be thick histosols.
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The wetlands are completely surrounded by urban development; floodwaters present during the field survey are likely to contain pollutants from surrounding access roads and groins.
Functional score = sum of ratings for indicators/total possible score = 4/6	0.66	
C. Erosion Control and Shoreline Stabilization	N/A	None of the wetlands in this class borders a waterbody; thus this function was not assessed.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	N/A	
2. Soils are not predominantly sandy or silty, and are not ice rich.	N/A	
3. Historical aerial photography (if available) indicates stable shoreline features.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1	The wetlands in this functional class have at least 30% cover of herbaceous vegetation, woody vegetation when present is composed of broad-leaved deciduous shrubs.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	1	The wetlands were completely flooded at the time of the field survey.
3. Surface water outflow occurs regularly throughout the growing season.	1	These wetlands are likely to be flooded throughout most of the growing season, and are assumed to be draining downstream to the Tanana River
Functional score = sum of ratings for indicators/total possible score = 3/3	1	

NWI Code(s): PEM1F, PEM1/SS1F, PSS1F [Semipermanently Flooded Wetlands]
HGM: Slope

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	1	Breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	1	Emergent vegetation and tall shrub canopy cover provide interspersion.
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	1	Wetlands in this class are dominated by emergent vegetation, shrubs are typically also present and may be low shrubs within the emergent canopy or tall shrubs above the emergent canopy.
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
F. Fish Habitat Suitability		This function is not assessed for terrestrial wetland types that are not immediately adjacent to a fish-bearing waterbody.
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	N/A	
2. Fish are present.	N/A	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	N/A	
4. Suitable spawning areas are present.	N/A	
5. Juvenile rest areas present.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): PSS1E, PFO1C [Seasonally Flooded Wetlands]
HGM: Slope

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	1	Wetlands in this functional class have open canopies of low or tall shrubs or broad-leaved deciduous trees.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	All wetlands in this functional class are classified as HGM slope.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	These wetlands have vegetation typical of upland or seasonally saturated communities, but at least 12 inches of water was observed during the field survey. Frogs, aquatic invertebrates and algal covering on substrate were present but obligate wetland vegetation had not yet developed
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	1	The area is within an active floodplain with evidence of impounded waters throughout. No channelized features observed
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	N/A	
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	1	Substantial surface water present was present during the field survey.
2. Low to tall woody vegetation present (N/A if assessing waters).	1	Woody vegetation is the dominant stratum.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	The wetlands were flooded at the time of the field survey.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	0	No sediment deposits were observed during the field survey
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	1	The organic layer was not directly assessed because the area was flooded at the time of the field survey. The organic layer is expected to be similar to that of a typical seasonally saturated wetland.
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The wetlands are completely surrounded by urban development; floodwaters present during the field survey are likely to contain pollutants from surrounding access roads and groins.
Functional score = sum of ratings for indicators/total possible score = 4/6	0.66	
C. Erosion Control and Shoreline Stabilization	N/A	None of the wetlands in this class borders a waterbody; thus this function was not assessed.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	N/A	
2. Soils are not predominantly sandy or silty, and are not ice rich.	N/A	
3. Historical aerial photography (if available) indicates stable shoreline features.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	1	The wetlands have at least 30% cover of vegetation, including an open canopy of shrubs or broad-leaved deciduous trees.
2. At least 10% of wetland is seasonally flooded (N/A for waters).	1	These wetlands may receive floodwaters due to impoundment of water by TLRA access roads.

NWI Code(s): PSS1E, PFO1C [Seasonally Flooded Wetlands]
HGM: Slope

Function and Indicators	Rating	Project Rationale
3. Surface water outflow occurs regularly throughout the growing season.	1	Floodwaters are likely to recede periodically through the growing season.
Functional score = sum of ratings for indicators/total possible score = 3/3	1	
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	1	Breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	Surface water was continuous during the field survey, based on the vegetation at the site very little interspersion is expected when floodwaters recede
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	1	Wetlands in this class have an open canopy of broad-leaved deciduous trees with an understory of deciduous shrubs, or an open tall deciduous shrub canopy with an herbaceous understory.
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
F. Fish Habitat Suitability		This function is not assessed for terrestrial wetland types that are not immediately adjacent to a fish-bearing waterbody.
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	N/A	
2. Fish are present.	N/A	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	N/A	
4. Suitable spawning areas are present.	N/A	
5. Juvenile rest areas present.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): PEM1B, PSS1/EM1B, PSS1B [Seasonally Saturated Emergent and Shrub Scrub] HGM: Slope

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	1	Wetlands in this functional class have dense graminoid cover or closed tall shrub canopies.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	All wetlands in this functional class are classified as HGM slope.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	0	No signs of storage or fluctuating surface water levels were observed during the field survey.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	1	The area is within an active floodplain with evidence of impounded waters throughout. No channelized features were observed; the wetlands are seasonally saturated.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	N/A	
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	0	No surface water was observed during the field survey.
2. Low to tall woody vegetation present (N/A if assessing waters).	1	Woody vegetation is present.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	No surface water was observed during the field survey.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	0	No sediment deposits were observed during the field survey
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	1	The organic layer is more than 8 inches in depth.
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The wetlands are completely surrounded by urban development; in the unlikely event of a flood, pollutants could enter the system from the surrounding roadways.
Functional score = sum of ratings for indicators/total possible score = 3/6	0.5	
C. Erosion Control and Shoreline Stabilization	N/A	None of the wetlands in this functional class borders a waterbody; thus this function was not assessed.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	N/A	
2. Soils are not predominantly sandy or silty, and are not ice rich.	N/A	
3. Historical aerial photography (if available) indicates stable shoreline features.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
D. Organic Matter Production and Export		Wetlands in this class have >30% cover of vegetation with deciduous shrubs, but are not likely to receive flood waters regularly; thus this function was scored at 0.
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	0	
2. At least 10% of wetland is seasonally flooded (N/A for waters).	0	
3. Surface water outflow occurs regularly throughout the growing season.	0	
Functional score = sum of ratings for indicators/total possible score = 0/3	0	

NWI Code(s): PEM1B, PSS1/EM1B, PSS1B [Seasonally Saturated Emergent and Shrub Scrub]
HGM: Slope

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	1	Breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	No surface water was observed during the field survey.
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	1	Wetlands in this class consist of a forb/shrub understory with a low or tall deciduous shrub stratum.
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
F. Fish Habitat Suitability		This function is not assessed for terrestrial wetland types that are not immediately adjacent to a fish-bearing waterbody.
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	N/A	
2. Fish are present.	N/A	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	N/A	
4. Suitable spawning areas are present.	N/A	
5. Juvenile rest areas present.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

NWI Code(s): PFO2B, PFO4B [Seasonally Saturated Needle-leaved Forest]
HGM: Slope

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	1	Wetlands in this functional class have open canopies of needle-leaved trees (*Picea mariana* and *Larix laricina*), in some cases with dense tall deciduous shrub understory.
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	0	All wetlands in this functional class are classified as HGM slope.
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	0	No signs of storage or fluctuating surface water levels were observed during the field survey.
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	1	The area is within an active floodplain with evidence of impounded waters throughout. No channelized features were observed; the wetlands were seasonally saturated. Evidence of permafrost was observed in the PFO4B wetlands.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	N/A	
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.	0	No surface water was observed during the field survey.
2. Low to tall woody vegetation present (N/A if assessing waters).	1	Woody vegetation is present.
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	No surface water was observed during the field survey.
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	0	No sediment deposits were observed during the field survey.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	1	The organic layer is more than 8 inches in depth.
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The wetlands are completely surrounded by urban development; in the unlikely event of a flood, pollutants could enter the system from the surrounding roadways.
Functional score = sum of ratings for indicators/total possible score = 3/6	0.5	
C. Erosion Control and Shoreline Stabilization	N/A	None of the wetlands in this class borders a waterbody; thus this function was not assessed.
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	N/A	
2. Soils are not predominantly sandy or silty, and are not ice rich.	N/A	
3. Historical aerial photography (if available) indicates stable shoreline features.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	0	
2. At least 10% of wetland is seasonally flooded (N/A for waters).	1	Wetlands may receive floodwaters due to impoundment of water at TLRA access roads.
3. Surface water outflow occurs regularly throughout the growing season.	1	Floodwaters are likely to recede periodically through the growing season.
Functional score = sum of ratings for indicators/total possible score = 2/3	0.66	

NWI Code(s): PFO2B, PFO4B [Seasonally Saturated Needle-leaved Forest]
HGM: Slope

Function and Indicators	Rating	Project Rationale
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	1	Breeding birds were present during the June 2020 field survey.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	No surface water was observed during the field survey.
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	1	Wetlands in this class consist of an open canopy of needle-leaved trees with an understory of deciduous shrubs.
Functional score = sum of ratings for indicators/total possible score = 2/4	0.5	
F. Fish Habitat Suitability		This function is not assessed for terrestrial wetland types that are not immediately adjacent to a fish-bearing waterbody.
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	N/A	
2. Fish are present.	N/A	
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	N/A	
4. Suitable spawning areas are present.	N/A	
5. Juvenile rest areas present.	N/A	
Functional score = sum of ratings for indicators/total possible score (not applicable)	N/A	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non-motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

ADDENDUM TO THE WETLAND AND STREAM DELINEATION FOR THE TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT, FAIRBANKS, ALASKA, 2020: AK FNSB TANANA(1)

DRAFT

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave
Anchorage, Alaska 99503

and

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th Street
Vancouver, Washington 98661

Prepared by:

ABR, Inc.—Environmental Research & Services
P.O. Box 240268
Anchorage, AK 99518

December 2020

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

A wetland field survey, wetland delineation, and functional assessment were prepared to support wetland permitting and NEPA documentation for the Tanana River Recreation Access Improvements Project in October 2020 (ABR 2020a). The project design has evolved since the original report was finalized and this addendum documents the changes in study area boundaries and the new wetland types and wetland functional classes found within the revised study area boundaries.

PROJECT LOCATION

The project area is located immediately south of the city of Fairbanks within the Fairbanks North Star Borough (Figure 1). The coordinates for the center point of the main portion of the project are: 64.800963, -147.741609° and the legal land description is: Sections 21-22, and 27-28, Township 1South, Range 1West, Fairbanks Meridian, Alaska.

STUDY AREA

The revised wetland delineation study area is as described in ABR (2020a), but it has been expanded from 23.0 to 31.1 acres. The additional acreage encompasses expansions of the project footprint for the motorized boat launch at the Tanana River and the non-motorized boat launch on Cushman Lake as well as an expansion of the swim beach on Cushman Lake (Figure 1). The majority of the expansion area is composed of upland fill, but the expansion of the swim beach and non-motorized boat launch boundaries now includes seasonally flooded and unvegetated fringe wetlands and open lake water on Cushman Lake. Revisions to the design of the proposed extension of South Lathrop Street involved shifting the road alignment slightly to the west near the intersection with Northlake Lane. Similarly, the road alignment for Northlake Lane was also shifted and curved slightly to the north. Both of these alterations were done to minimize fill in high-value wetlands (see ABR 2020b).

METHODS

WETLAND CLASSIFICATION AND MAPPING

As noted above, the wetland mapping study area was expanded and now includes new wetland and waters types not previously mapped or described. Mapping followed the methods detailed in ABR (2020a). No additional field data were collected to support the mapping prepared for this addendum.

WETLAND FUNCTIONAL ASSESSMENT

The new wetlands and waters types mapped were evaluated for wetland functions using the same methodology described in ABR (2020a). The new functional assessment worksheets are presented in Appendix A.

RESULTS AND DISCUSSION

WETLAND CLASSIFICATION AND MAPPING

WETLANDS

No new wetland types were identified during the mapping for the revised study area. One additional wetland polygon was mapped as Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub (PEM1/SS1F, polygon W-33, Figure 2). Polygon W-33 encompasses 0.07 acres or 0.2% of the study area (Table 1). A total of 6 existing wetland polygons increased slightly in size where the new study area boundaries expanded slightly; these are W-18 (0.18 acres or 0.6% of the study area), W-30 (0.21 acres, 0.7%), W-21 (0.05 acres, 0.2%), W-9, 0.42 acres, 1.4%), W-23 (0.24 acres, 0.8%) and W-26 (0.16 acres, 0.5%).

STREAMS AND WATERS OF THE U.S.

Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom (L2UB2H) and Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore (L2US2C) were new waters types mapped in polygons W-37, W-34, W-36, and W-38 (Figure 2, Table 1). Both waters are unvegetated with a sandy unconsolidated substrate composed of sand deposited to form the swim beach and the non-motorized boat launch. L2UB2H is the portion of constructed beach determined to be permanently flooded and L2US2C is subject to seasonal lake level fluctuations and slight wave action.

The Stream-2 polygon classified as Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom (R2UBH) increased slightly in size in the new mapping to 0.15 acres or 0.5% of the study area (Table 1). The R2UBH polygon is an extention of the lower perennial active slough connecting Cushman Lake to the Tanana River.

UPLANDS

In the new mapping, total uplands increased from 16.70 acres (72.6% of the study area) to 23.66 acres (76.2% of the study area; Table 1). The majority of the additional acreage was categorized as upland fill within the two boat launch parking lots and the swim beach (Figure 2).

WETLAND FUNCTIONAL ASSESSMENT

The two new waters types included in the revised study area were combined into one new wetland functional class (Appendix A). L2UB2H and L2US2C make up the Lacustrine Sandy Shoreline wetland functional class, which is considered to occupy the lacustrine fringe surrounding Cushman Lake. The overall Functional Capacity Index (FCI) score for Lacustrine Sandy Shoreline is 0.49, which is low to moderate functioning across all evaluated functional indicators (Table 2).

The water level of Cushman lake appears to fluctuate based on assessments of historical imagery and field observations, which indicates the potential for moderately high functional value (0.75) in flood-flow regulation or storage for the Lacustrine Sandy Shoreline wetland functional class (Table 2). Sediment nutrient and toxicant removal also rated moderate-high (0.75) because still water is present, which would allow for settlement and because the proximity to urban development increases the likelihood that pollutants are entering the system during floods (Table 2; Appendix A). There were no changes to the functional assessment scores for the remaining wetlands and waters within the new study area boundaries. Descriptions and functional assessment worksheets for those types can be found in ABR (2020a).

PROPOSED JURISDICTIONAL STATUS

The previous assessment established Cushman Lake as a jurisdictional lake on the basis that it immediately abuts the active channel of the Tanana River (a traditional navigable water). The new waters types (mapped in polygons W-36 and W-37, Figure 2) described in this addendum are part of Cushman Lake and are thus considered jurisdictional. Similarly, the L2EM2H wetland mapped at polygon W-38 and the PEM1/SS1F wetland mapped at W-33 both directly abut Cushman Lake and are considered jurisdictional. The remaining increases in mapped acreages were extensions of previously mapped and numbered polygons and the jurisdictional determination for those types discussed in ABR (2020a) still applies. Table 3 provides updated acreages and jurisdictional categories for all mapped wetlands in the new study area.

LITERATURE CITED

ABR, Inc.—Environmental Research & Services (ABR). 2020a. Wetland and stream delineation for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB Tanana(1). Final report prepared for PND Engineers, Inc., and Federal Highway Administration, Western Federal Lands Highway Division. 24 pp. + Appendices.

ABR, Inc.—Environmental Research & Services (ABR). 2020b. Addendum to the wetland impacts and mitigation report for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB Tanana(1). Final report prepared for PND Engineers, Inc., and Federal Highway Administration, Western Federal Lands Highway Division. 15 pp.

Table 1. Acreages of wetlands, waters, and uplands types in numbered, mapped polygons in the Tanana River Recreation Access Improvements study area, Fairbanks, Alaska, 2020.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	% of Study Area
Waters		**Total**	**0.93**	**3.00**
L2UB2H	Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom	W-37	0.32	1.04
L2US2C	Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore	W-34	0.20	0.65
		W-36	0.15	0.49
L2EM2H	Lacustrine Permanently Flooded Littoral Nonpersistent Emergent Marsh	W-20	0.01	0.02
		W-38	0.03	0.11
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	W-10	0.01	0.02
		W-28	0.04	0.13
		W-8	0.01	0.03
R2UBH	Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	Stream-2	0.15	0.48
R4USC	Riverine Seasonally Flooded Intermittent Unconsolidated Shore	Stream-1	0.01	0.04
Wetlands		**Total**	**6.45**	**20.78**
PEM1F	Palustrine Semipermanently Flooded Persistent Emergent	W-13	0.99	3.18
		W-18	0.18	0.58
		W-31	0.18	0.57
		W-6	0.13	0.41
PSS1F	Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	W-11	0.37	1.18
		W-12	0.04	0.14
		W-25	0.08	0.26
		W-27	0.16	0.50
		W-30	0.21	0.69
PEM1/SS1F	Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	W-17	0.16	0.50
		W-19	0.02	0.08
		W-33	0.07	0.23

Table 1. Continued.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	% of Study Area
Wetlands (cont.)				
PSS1E	Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	W-14	0.12	0.39
		W-16	0.24	0.76
		W-21	0.05	0.16
		W-3	0.35	1.14
		W-4	0.04	0.12
PEM1B	Palustrine Seasonally Saturated Persistent Emergent	W-1	0.07	0.24
		W-2	0.09	0.28
PSS1/EM1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	W-5	1.71	5.50
PSS1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	W-7	0.05	0.16
PFO2B	Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	W-32	0.02	0.07
		W-9	0.42	1.36
PFO4B	Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	W-23	0.24	0.77
		W-26	0.16	0.50
PFO1C	Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	W-22	0.11	0.34
		W-24	0.21	0.67
Uplands		**Total**	**23.66**	**76.22**
U	Uplands		7.82	25.20
Ur	Uplands (urban)		0.86	2.78
Us	Uplands (fill)		14.97	48.23
Grand Total			31.05	100.00

[a] National Wetland Inventory (NWI) annotation based on FGDC (2013) classification system.
[b] All values rounded to the nearest 0.01 acre.

Table 2. Wetland function (Functional Capacity Index) scores for wetlands and waters functional classes within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020.

Wetland Functional Class	Flood Flow Regulation	Sediment/ Nutrient/ Toxicant Removal	Erosion Control & Shoreline Stabil.	Organic Matter Production and Export	Avian and Mammal Habitat Suitability	Fish Habitat Suitability	Education/ Science/ Rec/ Subsist Use	Overall FCI score
Waters								
Lower Perennial Stream R2UBH	0.25	1.00	0.33	1.00	0.33	0.80	1.00	0.67
Intermittent Stream R4USC	0.25	0.75	0.00	0.50	0.00	0.00	1.00	0.36
Lacustrine Lentic Waters L2EM2H	0.75	1.00	0.00	1.00	0.33	1.00	1.00	0.73
Lacustrine Sandy Shoreline L2UB2H, L2US2C	0.75	0.75	0	0.5	0	0.4	1.00	0.49
Palustrine Lentic Waters PUBH	0.50	0.50	N/A	0.00	0.00	0.20	1.00	0.37
Wetlands								
Semipermanently Flooded Wetlands PEM1F, PEM1/SS1F, PSS1F	0.75	0.66	N/A	1.00	0.75	N/A	1.00	0.83
Seasonally Flooded Wetlands PSS1E, PFO1C	0.75	0.66	N/A	1.00	0.50	N/A	1.00	0.78
Seasonally Saturated Emergent and Shrub Scrub PEM1B, PSS1/EM1B, PSS1B	0.50	0.50	N/A	0.00	0.50	N/A	1.00	0.50
Seasonally Saturated Needle-leaved Forest PFO2B, PFO4B	0.50	0.50	N/A	0.66	0.50	N/A	1.00	0.63

Table 3. Connectivity characteristics and proposed jurisdictional classification for each mapped wetland within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020.

Wetland Name	NWI Code	Area (acres)	Jurisdictional Class	Characteristics
Stream-1	R4USC	0.01	(a)(2) tributaries	Constructed ditch contributing intermittent flow from upstream wetlands to Cushman lake, to STREAM-2, to the Tanana River
Stream-2	R2UBH	0.15	(a)(2) tributaries	Active riparian slough with perennial flow connecting directly to the Tanana River
W-1	PEM1B	0.07	non-jurisdictional (wetlands)	Drainage feature within a fallow field with no direct surface water connection to a navigable water
W-2	PEM1B	0.09	non-jurisdictional (wetlands)	Drainage feature within a fallow field with no direct surface water connection to a navigable water
W-3	PSS1E	0.35	non-jurisdictional (wetlands)	Impounded wetlands with no direct surface water connection to a navigable water
W-4	PSS1E	0.04	non-jurisdictional (wetlands)	Impounded wetlands with no direct surface water connection to a navigable water
W-5	PSS1/EM1B	1.71	(a)(4) adjacent wetlands	Wetland abuts Cushman Lake, connected directly to the Tanana River through STREAM-2
W-6	PEM1F	0.13	(a)(4) adjacent wetlands	Wetland abuts W-5
W-7	PSS1B	0.05	(a)(4) adjacent wetlands	Wetland abuts W-21
W-8	PUBH	0.01	non-jurisdictional (wetlands)	Constructed ditch within surrounding uplands, flooding likely to be solely from precipitation
W-9	PFO2B	0.42	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-10	PUBH	0.01	non-jurisdictional (waters)	Depression possibly from prior gravel mining operations, flooding likely to be solely from precipitation
W-11	PSS1F	0.37	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-12	PSS1F	0.04	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-13	PEM1F	0.99	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River

Table 3. Continued.

Wetland Name	NWI Code	Area (acres)	Jurisdictional Class	Characteristics
W-14	PSS1E	0.12	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-16	PSS1E	0.24	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-17	PEM1/SS1F	0.16	(a)(4) adjacent wetlands	Wetland directly abuts Cushman Lake
W-18	PEM1F	0.18	(a)(4) adjacent wetlands	Wetland directly abuts Cushman Lake
W-19	PEM1/SS1F	0.02	(a)(4) adjacent wetlands	Wetland directly abuts Cushman Lake
W-20	L2EM2H	0.01	(a)(3) lakes and ponds	Wetland directly abuts Cushman Lake
W-21	PSS1E	0.05	(a)(4) adjacent wetlands	Wetland connects to Cushman Lake via STREAM-1
W-22	PFO1C	0.11	non-jurisdictional (wetlands)	Impounded wetlands with no surface water connection
W-23	PFO4B	0.24	non-jurisdictional (wetlands)	Impounded wetlands with no surface water connection
W-24	PFO1C	0.21	non-jurisdictional (wetlands)	Impounded wetlands with no surface water connection
W-25	PSS1F	0.08	(a)(4) adjacent wetlands	Wetland directly abuts STREAM-2
W-26	PFO4B	0.16	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-27	PSS1F	0.16	(a)(4) adjacent wetlands	Wetland drains to Cushman Lake through STREAM-1
W-28	PUBH	0.04	non-jurisdictional (waters)	Flooded depression, possibly from prior gravel mining, surrounded by uplands, no surface water inlets or outlets observed during field survey
W-30	PSS1F	0.21	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-31	PEM1F	0.18	(a)(4) adjacent wetlands	Wetland directly abuts the Tanana River
W-32	PFO2B	0.02	(a)(4) adjacent wetlands	Wetland is part of the undisturbed riverine wetland complex directly abutting the Tanana River
W-33	PEM1/SS1F	0.07	(a)(4) adjacent wetlands	Wetland directly abuts Cushman Lake
W-34	L2US2C	0.20	(a)(3) lakes and ponds	Wetland directly abuts Cushman Lake
W-36	L2US2C	0.15	(a)(3) lakes and ponds	Wetland directly abuts Cushman Lake
W-37	L2UB2H	0.32	(a)(3) lakes and ponds	Wetland directly abuts Cushman Lake
W-38	L2EM2H	0.03	(a)(3) lakes and ponds	Wetland directly abuts Cushman Lake

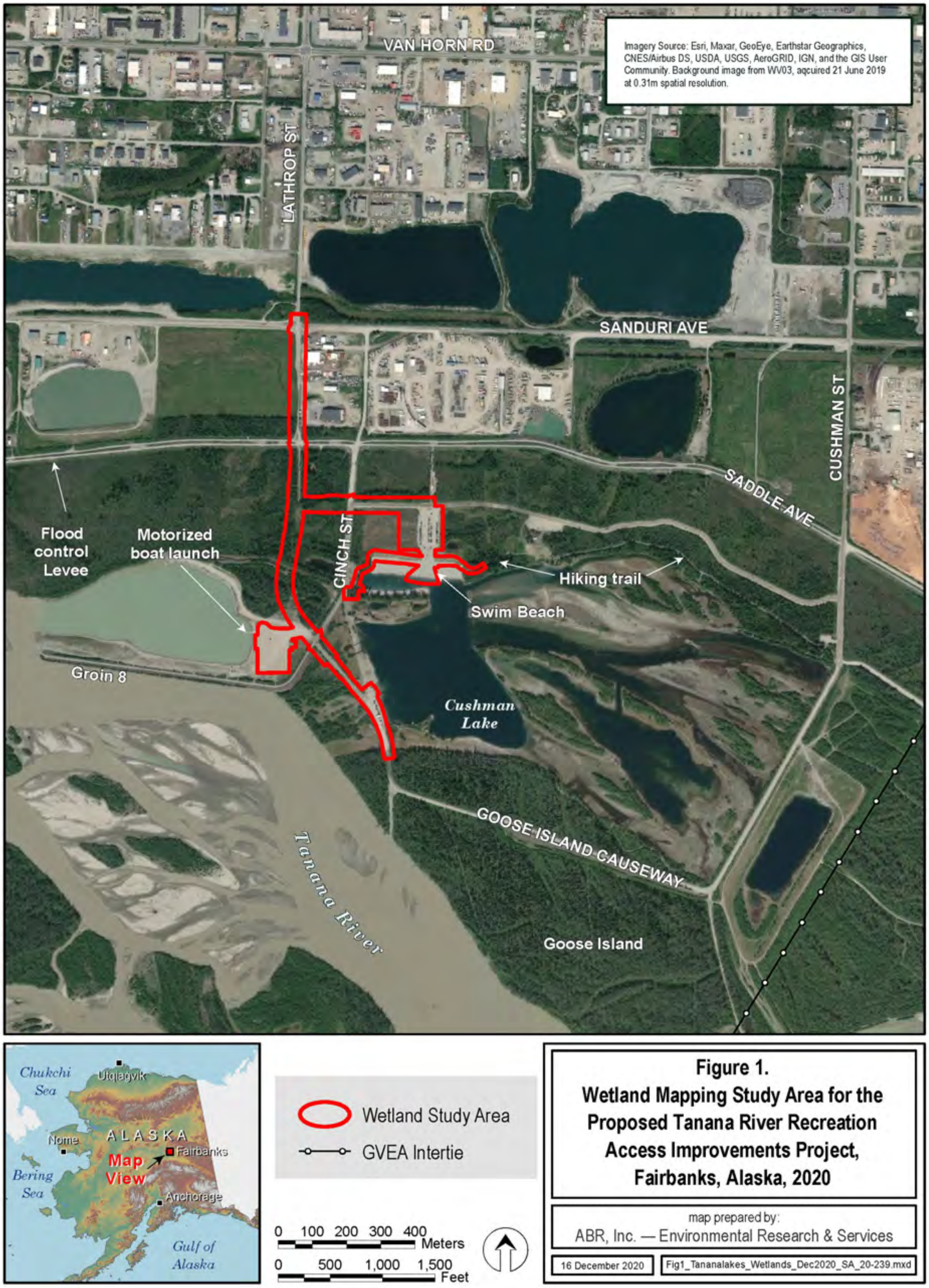


Figure 1.
Wetland Mapping Study Area for the Proposed Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020

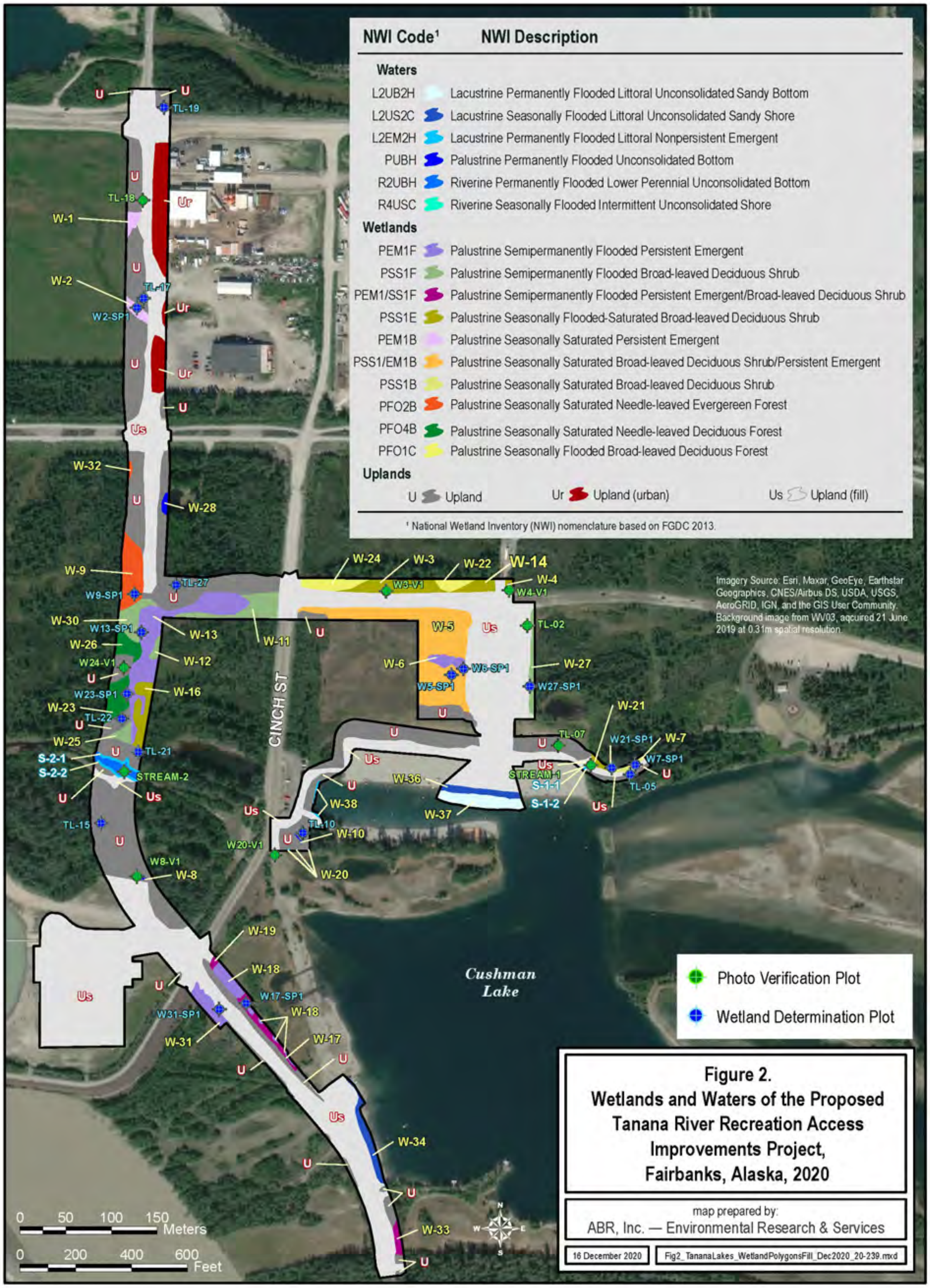


Figure 2.
Wetlands and Waters of the Proposed Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020

Appendix A. Wetland Functional Assessment Data Form.

NWI Code(s): L2UB2H and L2US2C [Lacustrine Sandy Shoreline]
HGM: Lacustrine Fringe

Function and Indicators	Rating	Project Rationale
A. Flood Flow Regulation (Storage)		
1. Dense vegetation or tussocks, low to tall woody vegetation present (N/A if assessing waters).	N/A	
2. Wetland or water is a depressional HGM class or has depressional features capable of storage.	1	The waterbody is a lacustrine fringe surrounding a depressional lake (Cushman Lake).
3. Wetland or water shows signs of storage (i.e. fluctuating water levels, algal mats, and/or lodged debris).	1	This shoreline is a constructed feature involving the placement of sandy fill material within the lacustrine fringe. Based on aerial photography and field observations the water levels in the lake appear to fluctuate
4. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	0	Channelized outflow was observed on the west side of the lake.
5. Waterbody is a lake (>20 acres) (N/A if assessing wetlands).	1	The waterbody is a lacustrine fringe surrounding a lake >20 acres in size.
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	
B. Sediment, Nutrient (N and P), Toxicant Removal		
1. Slow-moving or still water is present.		Still water is present (Cushman Lake).
2. Low to tall woody vegetation present (N/A if assessing waters).	N/A	
3. At least moderate interspersion of vegetation and water is present. Surface water patches should account for >10% areal coverage (N/A if assessing waters).	0	This is an unvegetated constructed water feature
4. Sediment deposits are present, providing evidence of deposition during natural flood events.	1	Assume significant fluctuation in water levels by comparison to historical imagery.
5. Thick surface organic horizon and/or abundant fine organic litter is present (N/A if assessing waters).	N/A	
6. Sediment, nutrients, or toxicants (from agriculture, roadways, or development) appear to be or are likely to be entering the wetland.	1	The study area is completely surrounded by urban development; waterbody is likely to contain pollutants from surrounding access roads and groins.
Functional score = sum of ratings for indicators/total possible score = 3/4	0.75	

NWI Code(s): L2UB2H and L2US2C [Lacustrine Sandy Shoreline]
HGM: Lacustrine Fringe

Function and Indicators	Rating	Project Rationale
C. Erosion Control and Shoreline Stabilization		
1. Wetland has dense, energy absorbing vegetation bordering the watercourse and no evidence of erosion.	0	Vegetation is primarily rooted aquatic plants, with little lacustrine shoreline vegetation development
2. Soils are not predominantly sandy or silty, and are not ice rich.	0	The soil profiles were dominated by riverine sands and silts.
3. Historical aerial photography (if available) indicates stable shoreline features.	0	Comparison with historical imagery indicates changing water levels.
Functional score = sum of ratings for indicators/total possible score= 0/3	0	
D. Organic Matter Production and Export		
1. Wetland has at least 30%, or water has at least 10%, cover herbaceous vegetation. Woody plants are predominantly deciduous.	0	Water feature is unvegetated
2. At least 10% of wetland is seasonally flooded (N/A for waters).	N/A	
3. Surface water outflow occurs regularly throughout the growing season.	1	Active outflow was occurring through a culvert on the east side of Cushman Lake at the time of the field survey.
Functional score = sum of ratings for indicators/total possible score = 1/2	0.5	
E. Avian and Mammal Habitat Suitability		
1. Wetland or water is undisturbed by human habitation or development.	0	The study area is completely surrounded by urban development.
2. Birds and/or mammals recorded using habitat.	0	Although non-breeding waterbirds are known to use Cushman Lake, the sandy substrate in this functional class is unlikely to provide suitable habitat for foraging by dabbling or diving species.
3. Interspersion of vegetation and water is at least moderate (surface water patches accounting for 5–10% areal cover, or continuous cover of surface water with a well-developed emergent component).	0	
4. Wetland has 2 or more vegetation strata with at least 30% total cover each (N/A for waters).	N/A	
Functional score = sum of ratings for indicators/total possible score = 0/3	0	

NWI Code(s): L2UB2H and L2US2C [Lacustrine Sandy Shoreline]
HGM: Lacustrine Fringe

Function and Indicators	Rating	Project Rationale
F. Fish Habitat Suitability		
1. Water has sufficient size and depth of open water so as not to freeze completely during winter (N/A for wetlands).	1	Assume Cushman lake is deep enough to allow overwintering.
2. Fish are present.	1	Cushman Lake is assumed to support fish based on its close proximity to the Tanana River.
3. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	0	
4. Suitable spawning areas are present.	0	Sandy bottom may provide limited spawning habitat but the swim beach is highly disturbed
5. Juvenile rest areas present.	0	
Functional score = sum of ratings for indicators/total possible score 2/5	0.4	
G. Educational, Scientific, Recreational, or Subsistence Use		
1. Site has documented scientific or educational use.	1	The Tanana Lakes Recreation area has multiple recreational and educational uses. This site has a nature trail, swim beach, non motorized watercraft rentals, and motorized boat launch
2. Wetland or water is in public ownership.	1	The study area is managed by the Fairbanks North Star Borough.
3. Accessible trails are available.	1	See indicator 1 above.
4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	1	The area provides some hunting opportunities as well as a motorized boat launch for access to hunting and fishing locations along the Tanana River.
Functional score = sum of ratings for indicators/total possible score = 4/4	1	

WETLAND IMPACTS AND MITIGATION REPORT FOR THE TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT, FAIRBANKS, ALASKA, 2020: AK FNSB TANANA(1)

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave
Anchorage, Alaska 99503

On behalf of:

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th St
Vancouver, Washington 98661

Prepared by:

ABR, Inc.—Environmental Research & Services
P.O. Box 80410
Fairbanks, Alaska 99708-0410

and

P.O. Box 240268
Anchorage, Alaska 99524

October 2020

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

The Tanana River Recreation Access Improvements Project is managed by the Federal Highway Administration, Western Federal Lands Highway Division (WFLHD). The project is intended to improve access to the Tanana Lakes Recreation Area (TLRA), which is managed by Fairbanks North Star Borough (FNSB). PND Engineers Inc. (PND) is the engineering and environmental contractor to WFLHD for the project and ABR, Inc.—Environmental Research & Services (ABR) is the subcontractor providing wetland information, National Environmental Policy Act (NEPA), and permitting support for the project.

This impacts and mitigation report is based on data in the draft wetland and stream delineation survey report for the project (ABR 2020a), the scientific literature, and the proposed improvement plans for the project. This report summarizes the impacts to wetlands that are likely to occur from gravel fill for construction and from subsequent use of the proposed infrastructure. In addition, the report outlines potential wetland mitigation measures mitigation measures that could be used to offset the loss of wetlands from gravel fill. This information is provided to support subsequent consultation, permitting efforts, and preparation of the NEPA document for the project.

STUDY AREA

The TLRA is located on the south (river) side of the Tanana Flood Control levee in south Fairbanks. A small portion of the project study area north of the levee is outside of the TLRA boundary. The recreation area has been established around Cushman Lake, which was formed by the impounded waters of an active slough of the Tanana River (Figure 1). The Goose Island Causeway (a groin extension of South Cushman Street) and Groin 8 (an extension of Cinch Street) were constructed to create the freshwater Cushman Lake, which is suitable for recreation activities and habitat conservation. Groin 8 also protects the motorized boat launch area at the Tanana River. Following the master plan for the area (FNSB 2007), the TLRA was developed after 2012 to include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch on the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake.

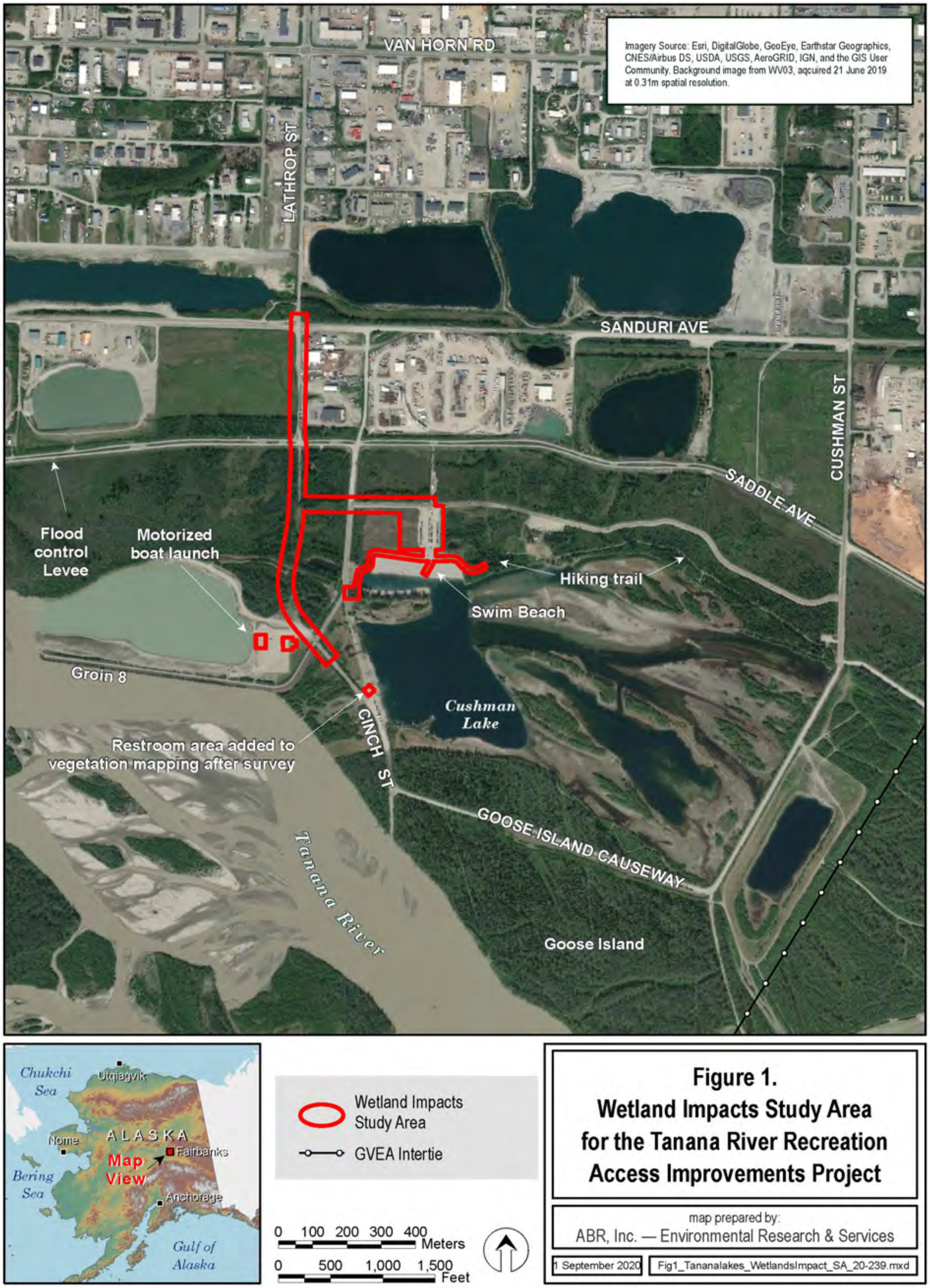


Figure 1.
Wetland Impacts Study Area for the Tanana River Recreation Access Improvements Project

map prepared by:
ABR, Inc. — Environmental Research & Services

1 September 2020 | Fig1_Tananalakes_WetlandsImpact_SA_20-239.mxd

The entire TLRA area is located within the active floodplain of the large, braided Tanana River, but the hydrology has been substantially altered by the construction of the levee system and the creation of Cushman Lake. Surface water levels in the area are driven by water levels in the Tanana River and rainfall, but frequent flood events typical of undisturbed floodplains are moderated in the TLRA by the groins. Waters in the area have been formed by the impoundment of active sloughs of the Tanana River, the filling of gravel excavation depressions, and there is one flowing slough crossing the study area north of the motorized boat launch area. Overall, the terrain is characterized by flat, riverine-influenced lowlands, with small variations in elevation along the edges of abandoned river channels and depressions. North of the levee along South Lathrop Street, the study area is composed of a fallow field and an industrial park. According to the 2007 TLRA Master Plan, historically the area was composed of over 80% jurisdictional wetlands prior to any facility development (FNSB 2007). Surficial deposits are composed of alluvial sands and silts, with shallow organic layers developing in wetland areas. The geomorphology of the area consists of fluvial landscape features. As is much of Interior Alaska, the TLRA is located in a discontinuous permafrost zone.

The wetland survey and impacts study area was defined in the FHWA Statement of Work as specific buffer zones surrounding areas of proposed infrastructure improvements. This included a buffer of 75 feet of either side of the proposed road centerlines, a buffer of 25 feet on either side of the proposed trail centerlines, a buffer of 25 feet around the proposed parking areas, and a buffer of 50 feet around the proposed restroom locations (Figure 1). In total, the wetland study area encompasses approximately 23 acres. However, because the project footprint was finalized after the wetland field survey and mapping work was completed, small portions of the footprint (0.55 acre total, see Results and Discussion below) were not included in the study area; these areas were examined during the preparation of this report on the same satellite imagery used to map wetlands. The study area includes a proposed extension of South Lathrop Street to access the motorized boat launch on the Tanana River, a spur road from South Lathrop Street to the east to access the existing swim beach, and proposed improvements to the motorized boat launch facilities, the non-motorized boat launch facilities on the southwest side of Cushman Lake, and the facilities at the swim beach on the north side of Cushman Lake. With the exception of a short section of South Lathrop Street north of the Tanana Flood Control levee, the majority of the study area is on the Tanana River side of the levee, on both the east and west sides of Groin 8.

METHODS

WETLAND IMPACTS

Impacts to wetlands in the study area were evaluated in ArcGIS by overlaying the expected cut and fill boundaries (the footprint) of the proposed project improvements on the mapped National Wetland Inventory (NWI) wetland types occurring in the area. The cut and fill boundaries were provided by PND and the wetland mapping was prepared by ABR. The two layers were intersected, using an ArcGIS analytical operation, to calculate the total acreage of each wetland type that would be lost to cut and fill during construction. The acreage of each wetland type within the wetland mapping area, but outside the project footprint, was calculated to assess the additional acreage that could be altered during construction, operation, and maintenance of the proposed infrastructure.

WETLAND AVOIDANCE AND MINIMIZATION

The acreage and locations of the wetland and waters types in the study area were assessed after the proposed project footprint was overlaid on the mapping of wetlands to determine if any modifications of the infrastructure plans could be made to avoid and/or minimize impacts to wetlands. In this process, the functional values of the wetland and waters types were also taken into account so as to identify design modifications that could made to reduce impacts on the higher functioning wetlands in the study area.

WETLAND MITIGATION

On-site mitigation options within the TLRA that could be used to offset the loss and alteration of wetlands from construction, operation, and maintenance of the proposed project infrastructure were evaluated by ABR staff while in the field conducting the wetland survey in July 2020. This site visit provided key information on the current status of wetlands in the study area and generated ideas on how wetland functions in the area could be maintained and/or improved by various local mitigation measures. Information on suitable wetland mitigation banks that could be used to offset wetland impacts from the proposed project was assessed after the field survey. A search for active mitigation banks in Interior Alaska (within the same region of the state as the project) was made using the U.S. Army Corps of Engineers (USACE) Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) website, and by contacting ablestaff at the Salcha-Delta Soil & Water Conservation District (Salcha-Delta SWCD), which maintains wetland banks in the region. Only those banks that are currently known to have wetland credits available were evaluated.

RESULTS AND DISCUSSION

WETLANDS AFFECTED

The mapping of wetlands for the proposed project (ABR 2020a) indicates that 14 NWI wetland and waters types occur in the study area (Table 1, Figure 2). This includes 4 waters and 10 wetland types. The waters cover only small portions of the study area and include both lotic (active sloughs) and lentic (impounded) waters. Wetlands include 3 semipermanently flooded wetland types, 1 semipermanently flooded/saturated type, 1 seasonally flooded type, and 5 saturated types. These wetlands include open sedge marshes, grass- and forb-dominated meadows, shrub wetlands dominated by willows (*Salix* species), and forested wetlands dominated by needleleaf (coniferous) trees and mixed needleleaf and broadleaf deciduous trees. Upland portions of the study area support both needleleaf and mixed needleleaf-broadleaf forests. Areas of gravel fill in the study area are extensive and were classified as Upland (fill).

For the assessment of wetland functions, the 14 NWI wetland and waters types that occur in the study area were aggregated into a smaller set of 8 wetland functional classes that share the same wetland functions (ABR 2020a). The seven wetland functions assessed were the capacity for flood flow regulation (water storage); sediment, nutrient, and toxicant removal; erosion control and shoreline stabilization; organic matter production and export; avian/mammal habitat suitability; fish habitat suitability; and educational, scientific, recreational, or subsistence use. The wetland functional classes (and the NWI wetland classes within) in the study area ranged from low to high functioning depending on the functional class and the wetland function assessed (Table 2). For waters, across all functions, the Lacustrine Lentic Waters class (the shoreline of Cushman Lake) had the highest average functional score (0.73). The Lower Perennial Stream class ranked slightly lower (0.67), and the other two waters in the study area

Table 1. Acreages of wetlands and waters by wetland type and name, and acreages of uplands within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, AK.

NWI Code[a]	NWI Description[a]	Wetland Name	Acres[b]	Percent of Study Area
Waters		**Total**	**0.22**	**0.96**
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	Subtotal	0.07	0.30
		W-10	0.01	0.04
		W-28	0.04	0.17
		W-8	0.01	0.04
R2UBH	Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	Stream-2	0.14	0.61
R4USC	Riverine Seasonally Flooded Intermittent Unconsolidated Shore	Stream-1	0.01	0.04
L2EM2H	Lacustrine Permanently Flooded Littoral Nonpersistent	W-20	0.01	0.04
Wetlands		**Total**	**6.09**	**26.47**
PEM1F	Palustrine Semipermanently Flooded Persistent Emergent	Subtotal	1.43	6.21
		W-13	0.99	4.30
		W-18	0.14	0.61
		W-31	0.18	0.78
		W-6	0.13	0.56
PEM1/SS1F	Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	Subtotal	0.07	0.30
		W-17	0.04	0.17
		W-19	0.02	0.09
PSS1F	Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	Subtotal	0.85	3.69
		W-11	0.37	1.61
		W-12	0.04	0.17
		W-25	0.08	0.35
		W-27	0.16	0.70
		W-30	0.20	0.87
PSS1E	Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	Subtotal	0.78	3.39
		W-14	0.12	0.52
		W-16	0.24	1.04
		W-21	0.03	0.13
		W-3	0.35	1.52
		W-4	0.04	0.17
PEM1B	Palustrine Seasonally Saturated Persistent Emergent	Subtotal	0.16	0.70
		W-1	0.07	0.30
		W-2	0.09	0.39

Table 1. Continued.

NWI Code[a]	NWI Description[a]	Wetland Name	Acres[b]	Percent of Study Area
Wetlands				
PSS1/EM1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	W-5	1.71	7.43
PSS1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	W-7	0.05	0.22
PFO2B	Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	Subtotal	0.40	1.74
		W-9	0.21	0.91
		W-32	0.02	0.09
PFO4B	Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	Subtotal	0.34	1.48
		W-23	0.21	0.88
		W26	0.13	0.60
PFO1C	Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	Subtotal	0.32	1.39
		W-22	0.11	0.48
		W-24	0.21	0.91
Uplands		**Total**	**16.70**	**72.58**
U	Uplands	n/a	6.38	27.73
Ur	Uplands (urban)	n/a	0.86	3.74
Us	Uplands (fill)	n/a	9.46	41.11

[a] National Wetland Inventory (NWI) annotation based on the FGDC (2013) classification system.
[b] All values rounded to the nearest 0.01 acre.

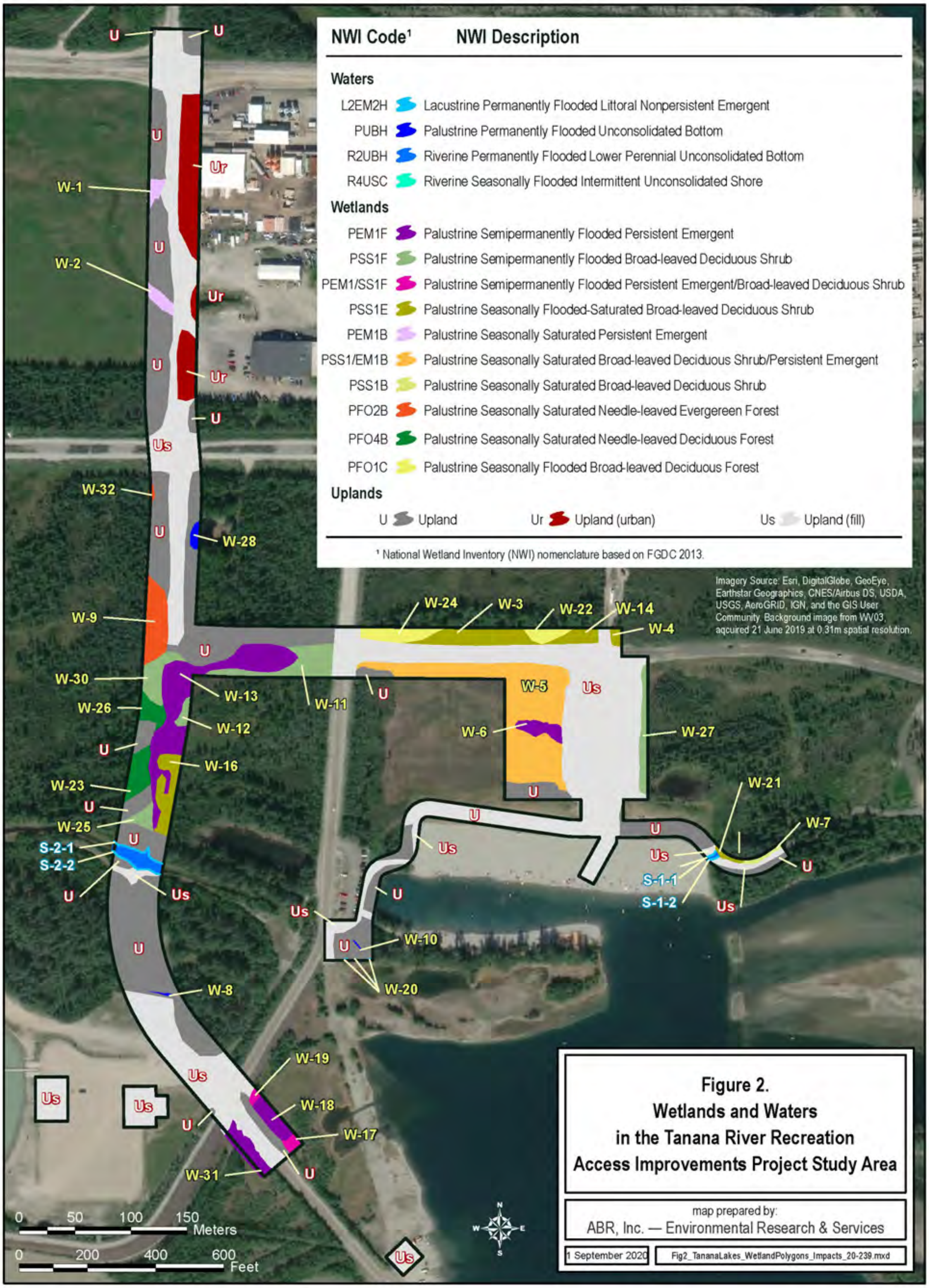


Figure 2.
Wetlands and Waters
in the Tanana River Recreation
Access Improvements Project Study Area

Table 2. Wetland function (functional capacity index) scores for wetlands and waters functional classes within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, AK.

Wetland Functional Class and Included NWI Types	Flood Flow Regulation	Sediment/ Nutrient/ Toxicant Removal	Erosion Control & Shoreline Stabilization	Organic Matter Production and Export	Avian and Mammal Habitat Suitability	Fish Habitat Suitability	Education/ Science/ Rec/ Subsist Use	Average Functional Score[a]
Waters								
Lower Perennial Stream R2UBH	0.25	1.00	0.33	1.00	0.33	0.80	1.00	0.67
Intermittent Stream R4USC	0.25	0.75	0.00	0.50	0.00	0.00	1.00	0.36
Lacustrine Lentic Waters L2EM2H	0.75	1.00	0.00	1.00	0.33	1.00	1.00	0.73
Palustrine Lentic Waters PUBH	0.50	0.50	N/A	0.00	0.00	0.20	1.00	0.37
Wetlands								
Semipermanently Flooded Wetlands PEM1F, PEM1/SS1F, PSS1F	0.75	0.66	N/A	1.00	0.75	N/A	1.00	0.83
Seasonally Flooded Wetlands PSS1E, PFO1C	0.75	0.66	N/A	1.00	0.50	N/A	1.00	0.78
Seasonally Saturated Emergent and Shrub Scrub PEM1B, PSS1/EM1B, PSS1B	0.50	0.50	N/A	0.00	0.50	N/A	1.00	0.50
Seasonally Saturated Needle-leaved Forest PFO2B, PFO4B	0.50	0.50	N/A	0.66	0.50	N/A	1.00	0.63

[a] Averages calculated by omitting N/A (null) values.

had low average functional scores (0.36 or 0.37). For wetlands, across all functions, the semipermanently flooded open marsh and meadow wetlands (the Semipermently Flooded Wetland class) had the highest average functional score (0.83). Seasonally flooded shrub and forest wetlands were ranked slightly lower (0.78). Those two functional classes were ranked higher functioning than the seasonally saturated emergent, shrub, and forested wetlands (average functional scores of 0.50 to 0.63).

IMPACTS TO WETLANDS

Impacts on wetlands in the study area as a result of the proposed project improvements will generally fall into several broad categories including (1) direct loss of wetlands from cut and fill work during construction; (2) direct alteration of wetlands in areas adjacent to the new infrastructure from construction activities; and (3) indirect alteration of wetlands adjacent to the new infrastructure from operation and maintenance activities.

Direct loss of wetlands will occur in the study area as a result of cut and fill construction within the project footprint for the new proposed access road to the swim beach and the motorized boat launch, the construction of new trails and parking lots, and upgrades to the swim beach berm. In total, 2.33 acres of wetlands and waters within the project footprint will be lost; this includes 10 wetland and 3 waters types (Table 3, Figure 3). The Palustrine Semipermanently Flooded Persistent Emergent (PEM1F) wetland type is the single most extensive of the wetlands and waters in the footprint, encompassing 0.81 acre or 7.7% of the footprint area. This type was also observed to be used by several breeding bird species of conservation concern during the avian census conducted in June 2020 (see Potential Design Modifications below). The other two semipermanently flooded wetland types combined cover only 0.35 acre or 3.3% of the project footprint; these include Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub (PSS1F) and Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub (PEM1/SS1F). The one seasonally flooded wetland type, Palustrine Seasonally Flooded Broad-leaved Deciduous Forest (PFO1C), occupies 0.03 acre or 0.3% of the project footprint. A single seasonally flooded/saturated wetland type, Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub (PSS1E), also encompasses 0.03 acre or 0.3% of the project footprint. The remaining set of five wetland types in the project footprint are all seasonally saturated types, which combined occupy 1.0 acre or 9.5% of the project footprint. These five

Table 3. Acres of wetland and waters types within the project footprint and disturbance buffers for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska.

NWI Code and Description	Footprint Acres	% of Project Footprint[a]	Additional Acres Disturbed[b]
Waters			
PUBH, Palustrine Permanently Flooded Unconsolidated Bottom	0.01	0.10	0.06
R2UBH, Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	0.10	0.91	0.04
R4USC, Riverine Seasonally Flooded Intermittent Unconsolidated Shore	0.01	0.06	<0.01
L2EM2H, Lacustrine Permanently Flooded Littoral Nonpersistent	0.00	0.00	0.01
Wetlands			
PEM1F, Palustrine Semipermanently Flooded Persistent Emergent	0.81	7.70	0.62
PEM1/SS1F, Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	0.01	0.14	0.05
PSS1F, Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	0.33	3.17	0.55
PSS1E, Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	0.04	0.34	0.47
PEM1B, Palustrine Seasonally Saturated Persistent Emergent	0.04	0.42	0.12
PSS1/EM1B, Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	0.66	6.29	1.05
PSS1B, Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	<0.01	<0.01	0.05
PFO2B, Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	0.23	2.16	0.41
PFO4B, Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	0.06	0.58	0.28
PFO1C, Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	0.03	0.28	0.29
(outside of mapped area)	0.55	5.21	0.00
Totals	2.88	27.37	3.98

[a] Represents only the acreage of wetlands in the footprint; uplands are not included so the total is less than 100%.
[b] Acreage within the various wetland mapping buffers (see Study Area section above) that could be disturbed during construction and use of the new infrastructure.

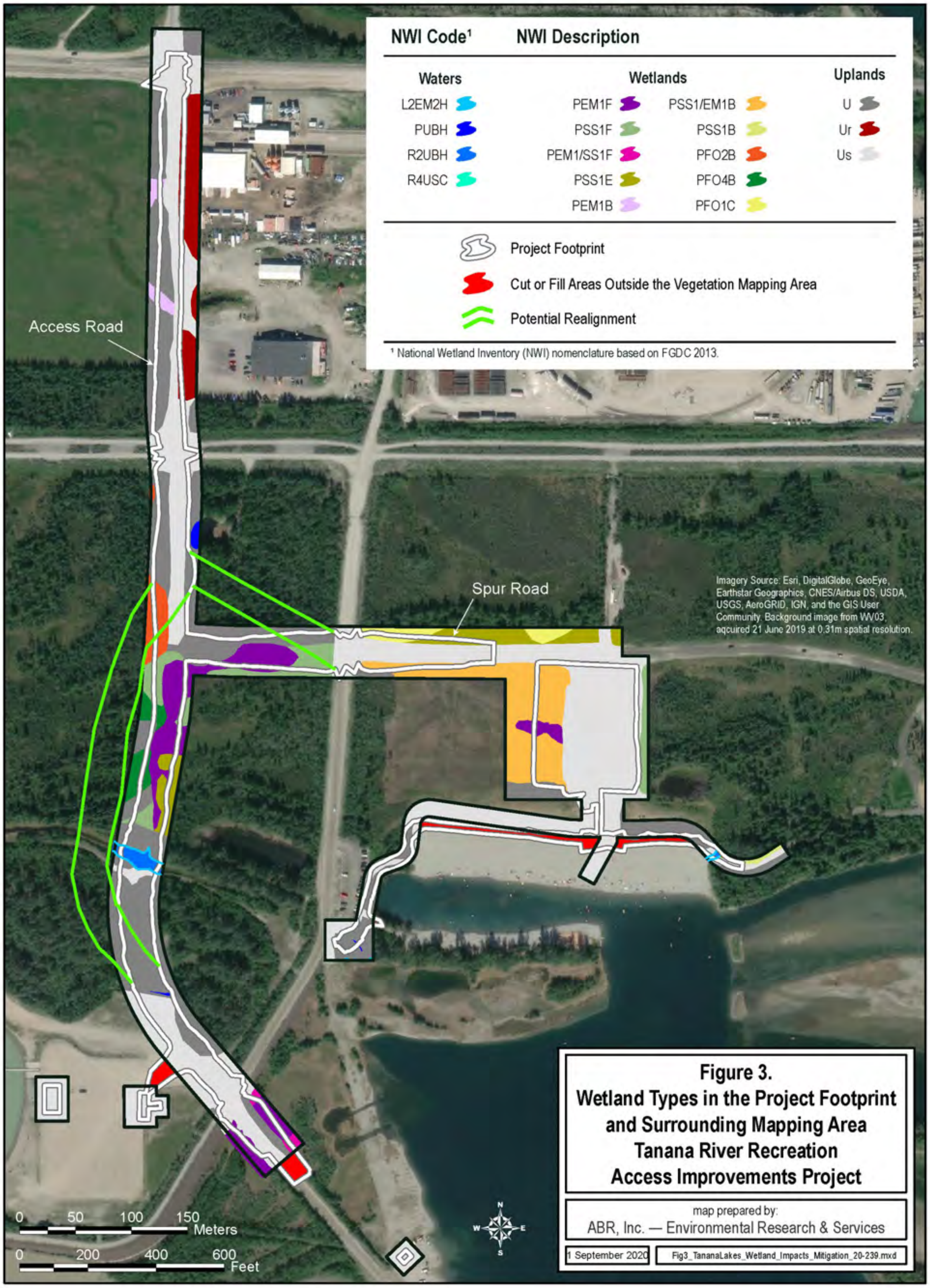


Figure 3. Wetland Types in the Project Footprint and Surrounding Mapping Area Tanana River Recreation Access Improvements Project

Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub (PSS1B), and Palustrine Seasonally Saturated Needle-leaved Deciduous Forest (PFO2B), and Palustrine Seasonally Saturated Needle-leaved Evergreen Forest (PFO4B).

Of the four waters types mapped in the study area, one does not occur in the project footprint; this type, Lacustrine Permanently Flooded Littoral Nonpersistent (L2EM2H), occurs only outside the footprint along the eastern shore of Cushman Lake (Figure 3). The three waters types that do occur in the project footprint are not extensive and combined occupy only 0.11 acre or 1.1% of the project footprint (Table 3, Figure 3). The waters types include Palustrine Permanently Flooded Unconsolidated Bottom (PUBH), Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom (R2UBH), and Riverine Seasonally Flooded Intermittent Unconsolidated Shore (R4USC).

The project footprint was finalized after the wetland field survey and mapping work was completed, and some portions of the footprint occur outside the area mapped for wetlands. These unmapped areas combined represent 0.55 acre or 5.2% of the project footprint (Table 3, Figure 3). Inspection of the aerial photography, however, indicates that the majority of these areas are composed of gravel fill and would be classified as Uplands (fill).

Direct alteration of wetlands in the mapping area outside of and adjacent to the project footprint will occur due to disturbance from construction activities. The use and staging of machinery outside of the project footprint during construction will damage wetland vegetation and could potentially compress wetland soils as well. Indirect alteration of wetlands in those areas is likely to occur from use of the new infrastructure. During operation and maintenance of the infrastructure, especially the new access road, fugitive dust deposition will occur and may contribute to the alteration of vegetation in wetlands. In studies along the Dalton Highway in northern Alaska, fugitive dust accumulations were documented to impact vegetation up to 328 feet from the road edge (Walker and Everett 1987; Myers-Smith et al. 2006). Fugitive dust deposition in the study area likely will not be as extensive as along the Dalton Highway (where truck traffic is more common) and can be minimized by keeping the speed limits low. Additional alteration to wetland vegetation may occur in areas outside of the project footprint from impounded drainages, drifted snow that can alter hydrologic patterns, and from snow plowing and snow dumping activities that can delay plant phenology during spring and contribute additional road gravel, fines, and contaminants to adjacent wetlands.

A total of 3.98 acres of wetlands, including the same 10 wetland types present in the project footprint, occur in the mapping area outside the project footprint (Table 3, Figure 3). The same 3 waters types as in the footprint also occur in the mapping area outside the footprint, along with a fourth waters type, Lacustrine Permanently Flooded Littoral Nonpersistent (L2EM2H), that occurs outside the footprint along the eastern shore of Cushman Lake (Figure 3). The wetland and waters types occurring outside the footprint are likely to be altered from the operation and maintenance activities described above that will be associated with the new infrastructure. Similar proportions of wetland and waters types occur in the mapping area outside the project footprint as occur in the footprint. However, the most common wetland type in the footprint, Palustrine Semipermanently Flooded Persistent Emergent (PEM1F), is less extensive outside the footprint (Table 3, Figure 3).

DRAINAGE CONSIDERATIONS

The inclusion of culverts with adequate flow capacity at the two drainages in the study area (Stream-1 and Stream-2; Figure 2) that provide surface water connections for wetlands in the TLRA to the navigable Tanana River will be necessary to maintain existing wetland functions or to avoid degradation of existing habitats due to impounded waters. A culvert at Stream-1 would be installed as part of the proposed trail that is to be compliant with the Americans with Disabilities Act (ADA), and a culvert at Stream-2 would be installed as part of the construction of the proposed new access road. Additional culvert(s) should be considered along the proposed access road as it will bisect a number of wetland types, especially in the area just north of Stream-2; Figure 2). Culverts to drain impounded areas north of the swim beach parking lot could also be considered to reduce further habitat degradation. These culvert(s) should be installed at the lowest point(s) along the road to convey any possible water that would otherwise be impounded and to help maintain existing wetland hydrology in the TLRA.

POTENTIAL DESIGN MODIFICATIONS

To avoid and minimize fill in the highest functioning wetlands in the study area, we are recommending small changes to the proposed access road alignment (Figure 3). These changes would result in reductions in fill in the aggregate wetland functional class (Semipermanently Flooded Wetlands), which is composed of three high-functioning NWI wetland types (Table 2). The design modifications involve re-routing the north-south portion of the access road slightly to the west of the current alignment, constructing the intersection with the spur road to the swim beach farther to the north, and aligning the spur road in a southeasterly direction towards the swim beach. These changes would avoid the need for fill in many Semipermanently Flooded Wetlands in the study area, and would avoid fill completely in PEM1F wetlands (Fresh Sedge Marsh), which comprises the largest area to be filled of the 13 wetland and waters types that occur in the project footprint (Table 3). The single PEM1F wetland in the road corridor portion of study area (see W-13 on Figure 2) was being used during the biological resources survey in June 2020 by two breeding shorebird species (Solitary Sandpiper [*Tringa solitaria*] and Lesser Yellowlegs [*T. flavipes*]), and one breeding landbird species (Blackpoll Warbler [*Setophaga striata*]) that are considered to be of conservation concern, as well as other breeding bird species (ABR 2020b). This is indicative of the high wildlife habitat support function this wetland type provides in that particular area. The PEM1F wetland type also scored high for the other four wetland functions assessed (Table 2). These road realignments likely will also reduce the overall acreage of fill in wetlands because the realigned spur road to the swim beach would be constructed largely in upland white spruce (*Picea glauca*) and paper birch (*Betula neoalaskana*) forest. During the permitting process, these design modifications to avoid fill in high-value wetlands should be well received by federal and state management agencies.

However, there will be cost and design ramifications from implementing these modifications to the proposed access road. For the alternate extension of South Lathrop Street (the longer alignment running north-south depicted in Figure 3), the roadway length would be increased from 2,500 to 2,770 feet, which represents an approximately 10% increase in length and an increase in cost of approximately $100,000. The alternate alignment would be moved away from portions of PEM1F wetlands that have already been impacted by off-road vehicle tracks, though wetland function is still classified high for those wetlands (Table 2). This design change would also result in the following negative impacts to the roadway design:

- The TLRA entrance station would have to be placed on a curve in the roadway.
- The alternate road design would likely include compound or back-to-back curves.

- Northlake Lane (the east-west running spur road depicted in Figure 3) would either have to be extended to connect with South Lathrop Street (impacting some of the avoided wetlands) or re-aligned; in both cases Northlake Lane would connect on or immediately before/after a curve.

For the alternate Northlake Lane route, the roadway would be extended from 960 to 1,110 feet, representing an increase of about 5% in length and $10,175 in cost. This cost is unavoidable if South Lathrop Street is shifted to the west as depicted in Figure 3. The design change to Northlake Land would also result in the following negative impacts to the roadway design:

- The intersection with South Lathrop Street would be placed at the base of the ramp to the levee roadway (Saddle Avenue).
- The design change would also require (1) a shift of the entrance station onto the ramp down from the levee, (2) a raising of the roadway grade to level out the section for the entrance station, (3) moving the entrance station south of the Northlake Lane intersection, or (4) eliminating the entrance station completely.

WETLAND MITIGATION OPTIONS

The preliminary project design footprint provided for this report would result in direct impacts to 2.3 acres of wetlands (Table 3). The affected wetlands range from low to high functioning (Table 2). All the wetlands occur within the floodplain of the Tanana River and are connected by surface water, and almost certainly by groundwater as well, to the Tanana River.

The design modifications recommended above for the proposed access road will help to avoid and minimize impacts on the highest functioning wetlands in the TLRA, but additional compensatory mitigation for wetland impacts may be requested during the permitting process. Assuming that mitigation will be required for the project, the available options for mitigating the unavoidable wetland impacts are outlined below. Mitigation is not always required, however, and is project dependent. Decisions regarding compensatory mitigation are usually made early in the permitting process in consultation with a USACE project manager. The USACE project manager assigned to evaluate the Section 404, Clean Water Act (CWA) permit application for the project will have the final authority in determining whether mitigation will be required.

The Alaska District Compensatory Mitigation Thought Process (USACE 2018) is a working document prepared to assist in determining whether mitigation will be required for a project, and to assess whether the proposed mitigation in the wetland permit application is sufficient to offset the proposed impacts. Mitigation is likely to be required for the Tanana River Recreation Access Improvements Project because it meets three of the criteria outlined in USACE (2018), including (1) the project impacts more than 1/10 of an acre of wetlands, (2) fill may be placed within 500 feet of fish bearing waters, and (3) the project is federally funded. Once all measures have been taken to avoid and minimize impacts (see above), compensatory mitigation may be calculated using the current USACE debit/credit calculator (USACE 2016) in conjunction with a suitable functional assessment method such as the one used in this report. Applicants may choose permittee-responsible mitigation in the form of restoration or rehabilitation of a previously disturbed wetland with similar functions within the project watershed, or preservation of a similar set of wetland types within the same region. Other options include the purchase of credits from an existing local mitigation bank or an in-lieu-fee (ILF) option in which monetary mitigation costs are calculated and payed to the USACE.

For the proposed project, there are at least three possible permittee-responsible mitigation options as described below.

1. The removal of the extensive infestation of the invasive tree *Prunus padus* (European bird cherry) in the TLRA will help to restore natural riverine wetland function in the area. During the wetland field survey in July 2020, it was recognized that the infestation of *P. padus* was substantially greater than the relatively few plants recorded in the area a decade ago by Heidemann (2010). *P. padus* proliferates easily in Alaska and is especially problematic in riparian areas where it can outcompete and displace native shrub species such as willows and alders (*Alnus* species). Over time, in high density infestations the species may alter riverine wetland functions through reductions in terrestrial invertebrate biomass on the foliage of *P. padus* compared to native species (Roon 2011).

2. As noted under Drainage Considerations above, including culverts in the proposed access road will help to (a) maintain hydrology in existing and higher value wetlands that are adjacent to those in the road corridor, and (b) reduce the prevalence of

impounded waters in non-wetland habitats in the study area, which may, over time, alter those non-wetland habitats. The well documented trend of increasing precipitation, and especially rainfall in the snow-free months, in Interior Alaska will maintain high groundwater levels in the TLRA because of connectivity with high water in the Tanana River. This, along with increased direct precipitation, is likely contributing to impounded waters in otherwise non-wetland habitats (ABR 2020a).

3. Consider paving the access road to substantially reduce the prevalence of fugitive dust impacts on adjacent wetland habitats.

Regarding the possible purchase of wetland credits, there is currently a single wetland mitigation bank with available credits in the Interior Alaska region. The Salcha-Delta SWCD maintains the Chena Greenbelt Bank in Fairbanks, which currently has 13.41 wetland credits available for purchase; as of August 2020, a rate of $15,000 per credit would be charged (Jeff Durham, Salcha-Delta SWCD, pers. comm.). Two additional wetland banks in Interior Alaska maintained by the Salcha-Delta SWCD also may have credits available in the future. This includes the Tanana Watershed Umbrella Stream & Wetland Mitigation Bank – Jarvis Block F, which is located south of Fairbanks, and the Huntsbury Bank near the Fort Wainwright Small Arms Complex in Fairbanks.

Because of the uncertainty surrounding the actual debit:credit ratio that would be determined during the permitting process for any wetland bank transaction for the proposed project, a cost estimate for the purchase of wetland credits is speculative at this time. However, assuming a minimum debit:credit ratio of 1:1 for the preservation of wetlands as indicated in USACE (2018), and using the current rate of $15,000 per credit in the Chena Greenbelt Bank, the estimated minimum cost to purchase wetland credits to compensate for the 2.3 acres of wetlands lost in the project footprint would be $34,500. Note that the specific debit:credit ratio used will be determined by the USACE project manager assigned to process the Section 404, CWA permit application for any particular project.

The ILF option has not been commonly used recently in Alaska, but if it is recommended, The Conservation Fund can work with project applicants to develop an appropriate ILF transaction.

LITERATURE CITED

ABR, Inc.—Environmental Research & Services (ABR). 2020a. Wetland and stream delineation report for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Draft report prepared for PND, Engineers, Inc., Anchorage, AK, and Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 26 pp. + appendices.

ABR. 2020b. Biological resources survey report for the proposed Tanana River Recreation Access Improvementsn Project: AK FNSB TANANA(1). Draft report prepared for PND, Engineers, Inc., Anchorage, AK, and Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 32 pp.

Fairbanks Northstar Borough (FNSB) 2007. Tanana Lakes Recreation Area Master Plan. Prepared by the FNSB Department of Parks and Recreation and USKH Inc., Fairbanks, AK. 36 pp.

Federal Geographic Data Committee (FGDC). 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Heidemann, M. 2010. Invasive plant management recommendations for the Tanana Lakes Recreation Area. Prepared for the Fairbanks Northstar Borough Department of Parks and Recreation. 20 pp. + appendices.

Myers-Smith I. H., B. K., Arnesenm, R. M. Thompson, and F. S. Chapin III. 2006. Cumulative impacts on Alaskan arctic tundra of a quarter century of road dust. Ecoscience 13: 503–510.

Roon, D. A. 2011. Ecological effects of invasive European bird cherry (*Prunus padus*) on salmonid food webs in Anchorage, Alaska streams. M.Sc. Thesis. University of Alaska Fairbanks.

U.S. Army Corps of Engineers (USACE). 2016. Methodology for assessing functional gains and losses for permittee responsible compensatory mitigation and calculating compensatory mitigation credits and debits for third party mitigation providers in the Alaska District.

Prepared by the USACE in consultation with the Alaska Statewide Interagency Review Team. 12 pp.

USACE. 2018. Alaska District Compensatory Mitigation Thought Process. [Online] https://www.poa.usace.army.mil/Portals/34/docs/regulatory/2018MitigationThoughtProcess.pdf.

Walker, D. A., and K. R. Everett. 1987. Road dust and its environmental impact on Alaskan taiga and tundra. Arctic and Alpine Research 19: 479–489.

ADDENDUM TO THE WETLAND IMPACTS AND MITIGATION REPORT FOR THE TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT, FAIRBANKS, ALASKA, 2020: AK FNSB TANANA(1)

DRAFT

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave
Anchorage, Alaska 99503

On behalf of:

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th St
Vancouver, Washington 98661

Prepared by:
ABR, Inc.—Environmental Research & Services
P.O. Box 80410
Fairbanks, Alaska 99708-0410

and

P.O. Box 240268
Anchorage, Alaska 99524

December 2020

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

A wetland impacts and mitigation report was prepared to support wetland permitting and NEPA documentation for the Tanana River Recreation Access Improvements Project in October 2020 (ABR 2020a). The design of the proposed improvements and study area for wetland impacts have evolved since the original report was finalized and this addendum updates the assessment of wetland impacts within the revised study area boundaries. To minimize fill in wetlands, slight alterations in the proposed road alignments have been made. The wetland mitigation options presented in the October 2020 report remain unchanged.

STUDY AREA

The revised study area for wetland impacts is as described in ABR (2020a), but it has been expanded from 23.0 to 31.1 acres. The additional acreage encompasses expansions of the project footprint for the motorized boat launch at the Tanana River and the non-motorized boat launch on Cushman Lake as well as an expansion of the swim beach on Cushman Lake (Figure 1). The majority of the expansion area is composed of upland fill, but the expansion of the swim beach and non-motorized boat launch boundaries now includes seasonally flooded and unvegetated fringe wetlands and open lake water on Cushman Lake. Revisions to the design of the proposed extension of South Lathrop Street involved shifting the road alignment slightly to the west near the intersection with Northlake Lane. Similarly, the road alignment for Northlake Lane was also shifted and curved slightly to the north. Both of these alterations were done to minimize fill in high-value wetlands (see Results and Discussion below).

METHODS

The methods used to assess impacts to wetlands in the study area have not been changed and are as described in ABR (2020a). As noted above, the wetland mitigation options also have not changed and the project design procedures used to avoid and minimize fill in wetlands are the same as those presented in the October 2020 report.

RESULTS AND DISCUSSION

WETLANDS AFFECTED

The revised mapping of wetlands for the proposed project (ABR 2020b) indicates that 16 NWI wetland and waters types occur in the study area (Table 1, Figure 2). This includes 10 wetland and 6 waters types. The waters cover only small portions of the study area and include both lotic (active sloughs) and lentic (impounded) waters. Wetlands include 3 semipermanently flooded wetland types, 1 semipermanently flooded/saturated type, 1 seasonally flooded type, and 5 saturated types. These wetlands include open sedge marshes, grass- and forb-dominated meadows, shrub wetlands dominated by willows (*Salix* species), and forested wetlands dominated by needleleaf (coniferous) trees and mixed needleleaf and broadleaf deciduous trees. Upland portions of the study area support both needleleaf and mixed needleleaf-broadleaf forests. Areas of gravel fill in the study area are extensive and were classified as Upland (fill).

For the assessment of wetland functions, the 16 NWI wetland and waters types that occur in the study area were aggregated into a smaller set of 9 wetland functional classes that share the same wetland functions (ABR 2020b). The seven wetland functions assessed were the capacity for flood flow regulation (water storage); sediment, nutrient, and toxicant removal; erosion control and shoreline stabilization; organic matter production and export; avian/mammal habitat suitability; fish habitat suitability; and educational, scientific, recreational, or subsistence use. The wetland functional classes (and the NWI wetland classes within) in the study area ranged from low to high functioning depending on the functional class and the wetland function assessed (Table 2). For waters, across all functions, the Lacustrine Lentic Waters class (the shoreline of Cushman Lake) had the highest average functional score (0.73). The Lower Perennial Stream class ranked slightly lower (0.67), and the other three waters in the study area had moderate to low average functional scores (0.49, 0.37, and 0.36). For wetlands, across all functions, the semipermanently flooded open marsh and meadow wetlands (the Semipermently Flooded Wetland class) had the highest average functional score (0.83). Seasonally flooded shrub and forest wetlands were ranked slightly lower (0.78). Those two functional classes were ranked higher functioning than the seasonally saturated emergent, shrub, and forested wetlands (average functional scores of 0.50 to 0.63).

IMPACTS TO WETLANDS

Impacts on wetlands in the study area as a result of the proposed project improvements will generally fall into several broad categories including (1) direct loss of wetlands from cut and fill work during construction; (2) direct alteration of wetlands in areas adjacent to the new infrastructure from construction activities; and (3) indirect alteration of wetlands adjacent to the new infrastructure from operation and maintenance activities.

Direct loss of wetlands will occur in the study area as a result of cut and fill construction within the project footprint for the new proposed access road to the motorized and non-motorized boat launches, the spur road to the swim beach, the construction of new trails and parking lots, and upgrades to the swim beach berm. In total, 2.33 acres of wetlands and waters within the project footprint will be lost; this includes 9 wetland and 5 waters types (Table 3, Figure 3). The Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent (PSS1/EM1B) wetland type is the single most extensive of the wetlands and waters in the footprint, encompassing 0.69 acre or 4.2% of the footprint area. The other three seasonally saturated wetland types combined cover 0.61 acre or 3.7% of the project footprint; these include Palustrine Seasonally Saturated Needle-leaved Deciduous Forest (PFO2B, 0.29 acre), Palustrine Seasonally Saturated Needle-leaved Evergreen Forest (PFO4B, 0.27 acre), and Palustrine Seasonally Saturated Persistent Emergent (PEM1B, 0.05 acre). Three semipermanently flooded wetland types are also relatively common in the project footprint and combined cover 0.73 acre or 4.4% of the project footprint; these include Palustrine Semipermanently Flooded Persistent Emergent (PEM1F, 0.34 acre), Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub (PSS1F, 0.33 acre), and Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub (PEM1/SS1F, 0.06 acre). The one seasonally flooded wetland type, Palustrine Seasonally Flooded Broad-leaved Deciduous Forest (PFO1C), occupies 0.05 acre or 0.3% of the project footprint. A single seasonally flooded/saturated wetland type, Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub (PSS1E), encompasses 0.06 acre or 0.4% of the project footprint.

Of the six waters types mapped in the study area, two do not occur within the project footprint. One of these types, Lacustrine Permanently Flooded Littoral Nonpersistent (L2EM2H), occurs only outside the footprint along the eastern shore of Cushman Lake (Figure

3). The other type, Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom (L2UB2H), represents the waters of Cushman Lake at the end of the middle portion of the swim beach that will be made wheel-chair accessible and compliant with the Americans with Disabilities Act (ADA; Figure 3).

The four waters types that do occur in the project footprint are not extensive and combined occupy only 0.19 acre or 1.1% of the project footprint (Table 3, Figure 3). The waters types include Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore (L2US2C), Palustrine Permanently Flooded Unconsolidated Bottom (PUBH), Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom (R2UBH), and Riverine Seasonally Flooded Intermittent Unconsolidated Shore (R4USC).

Direct alteration of wetlands in the mapping area outside of and adjacent to the project footprint will occur due to disturbance from construction activities. The use and staging of machinery outside of the project footprint during construction will damage wetland vegetation and could potentially compress wetland soils as well. Indirect alteration of wetlands in those areas is likely to occur from use of the new infrastructure. During operation and maintenance of the infrastructure, especially the new access roads, fugitive dust deposition will occur and may contribute to the alteration of vegetation in wetlands. In studies along the Dalton Highway in northern Alaska, fugitive dust accumulations were documented to impact vegetation up to 328 feet from the road edge (Walker and Everett 1987; Myers-Smith et al. 2006). Fugitive dust deposition in the study area likely will not be as extensive as along the Dalton Highway (where truck traffic is more common) and can be minimized by keeping the speed limits low. Additional alteration to wetland vegetation may occur in areas outside of the project footprint from impounded drainages, drifted snow that can alter hydrologic patterns, and from snow plowing and snow dumping activities that can delay plant phenology during spring and contribute additional road gravel, fines, and contaminants to adjacent wetlands.

A total of 5.05 acres of wetlands, including the same nine wetland types present in the project footprint, occur in the mapping area outside the project footprint (Table 3, Figure 3). The same four waters types that are present in the footprint also occur in the mapping area outside the footprint. As noted above, there are two waters types, Lacustrine Permanently Flooded Littoral Nonpersistent (L2EM2H) and Lacustrine Permanently Flooded Littoral Unconsolidated Sandy

Bottom (L2UB2H) that occur only outside the project footprint (Table 3, Figure 3). The wetland and waters types occurring outside of and adjacent to the footprint are likely to be altered from the construction, operation, and maintenance activities described above that will be associated with the new infrastructure. Roughly similar proportions of wetland and waters types occur in the mapping area outside the project footprint as occur inside the footprint. However, two wetland types, Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub (PSS1E) and the high-functioning Palustrine Semipermanently Flooded Persistent Emergent (PEM1F), are notably more extensive outside the footprint (Table 3, Figure 3). Similarly, one waters type, Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore (L2US2C), is also notably more common outside the project footprint.

DRAINAGE CONSIDERATIONS

The drainage considerations discussed in ABR (2020a) to help maintain existing wetland hydrology in the Tanana River floodplain areas surrounding the proposed project do not need to be changed as a result of the revisions to the project improvement plans.

DESIGN MODIFICATIONS

To minimize fill in the highest functioning wetlands in the study area, the alignment for the South Lathrop Street extension has been shifted slightly to the west, and the alignment for the extension of Northlake Lane has been shifted and curved slightly to the north (Figure 3). This will result in reductions in fill in the aggregate wetland functional class (Semipermanently Flooded Wetlands), which is composed of three high-functioning NWI wetland types (Table 2). These design modifications will reduce the fill in high-functioning PEM1F wetlands by more than 50%, from 0.81 acre as noted in ABR (2020a) to 0.34 acre (Table 3). Previously, in the October 2020 report, PEM1F wetlands represented the greatest wetland area to be filled of the 13 wetland and waters types that occurred in the project footprint at that time. Overall, because of the current design modifications, fill in wetlands has been reduced in the project footprint from 2.88 acres as noted in ABR (2020a) to 2.33 acres (Table 3).

WETLAND MITIGATION OPTIONS

The wetland mitigation options discussed in ABR (2020a) are still applicable to the revised design plans for the project improvements. One of those mitigation options was to pave the proposed access roads to reduce the prevalence of fugitive dust impacts on adjacent wetland habitats. As part of the revised design plans for the project, the extension of South Lathrop Street will be paved and this will help reduce fugitive dust. However, the extension of Northlake Lane will not be paved, so there will be fugitive dust effects from the use of that access road to the swim beach.

LITERATURE CITED

ABR, Inc.—Environmental Research & Services (ABR). 2020a. Wetland impacts and mitigation report for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Draft report prepared for PND, Engineers, Inc., Anchorage, AK, and Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 20 pp.

ABR, Inc.—Environmental Research & Services (ABR). 2020b. Addendum to the wetland and stream delineation for the Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020: AK FNSB TANANA(1). Draft report prepared for PND, Engineers, Inc., Anchorage, AK, and Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 14 pp. + appendix.

Myers-Smith I. H., B. K., Arnesenm, R. M. Thompson, and F. S. Chapin III. 2006. Cumulative impacts on Alaskan arctic tundra of a quarter century of road dust. Ecoscience 13: 503–510.

Walker, D. A., and K. R. Everett. 1987. Road dust and its environmental impact on Alaskan taiga and tundra. Arctic and Alpine Research 19: 479–489.

Table 1. Acreages of wetlands, waters, and uplands types in numbered, mapped polygons in the Tanana Lakes Recreation Access Improvements study area, Fairbanks, Alaska, 2020.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	% of Study Area
Waters		**Total**	**0.93**	**3.00**
L2UB2H	Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom	W-37	0.32	1.04
L2US2C	Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore	W-34	0.20	0.65
		W-36	0.15	0.49
L2EM2H	Lacustrine Permanently Flooded Littoral Nonpersistent Emergent Marsh	W-20	0.01	0.02
		W-38	0.03	0.11
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	W-10	0.01	0.02
		W-28	0.04	0.13
		W-8	0.01	0.03
R2UBH	Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	Stream-2	0.15	0.48
R4USC	Riverine Seasonally Flooded Intermittent Unconsolidated Shore	Stream-1	0.01	0.04
Wetlands		**Total**	**6.45**	**20.78**
PEM1F	Palustrine Semipermanently Flooded Persistent Emergent	W-13	0.99	3.18
		W-18	0.18	0.58
		W-31	0.18	0.57
		W-6	0.13	0.41
PSS1F	Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	W-11	0.37	1.18
		W-12	0.04	0.14
		W-25	0.08	0.26
		W-27	0.16	0.50
		W-30	0.21	0.69
PEM1/SS1F	Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	W-17	0.16	0.50
		W-19	0.02	0.08
		W-33	0.07	0.23

Table 1. Continued.

NWI_Code[a]	NWI Description[a]	Wetland Name	Acres[b]	% of Study Area
Wetlands (cont.)				
PSS1E	Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	W-14	0.12	0.39
		W-16	0.24	0.76
		W-21	0.05	0.16
		W-3	0.35	1.14
		W-4	0.04	0.12
PEM1B	Palustrine Seasonally Saturated Persistent Emergent	W-1	0.07	0.24
		W-2	0.09	0.28
PSS1/EM1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	W-5	1.71	5.50
PSS1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	W-7	0.05	0.16
PFO2B	Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	W-32	0.02	0.07
		W-9	0.42	1.36
PFO4B	Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	W-23	0.24	0.77
		W-26	0.16	0.50
PFO1C	Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	W-22	0.11	0.34
		W-24	0.21	0.67
Uplands		**Total**	**23.66**	**76.22**
U	Uplands		7.82	25.20
Ur	Uplands (urban)		0.86	2.78
Us	Uplands (fill)		14.97	48.23
Grand Total			31.05	100.00

[a] National Wetland Inventory (NWI) annotation based on FGDC (2013) classification system.
[b] All values rounded to the nearest 0.01 acre.

Table 2. Wetland function (Functional Capacity Index) scores for wetlands and waters functional classes within the mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020.

Wetland Functional Class	Flood Flow Regulation	Sediment/ Nutrient/ Toxicant Removal	Erosion Control & Shoreline Stabil.	Organic Matter Production and Export	Avian and Mammal Habitat Suitability	Fish Habitat Suitability	Education/ Science/ Rec/ Subsist Use	Overall FCI score
Waters								
Lower Perennial Stream R2UBH	0.25	1.00	0.33	1.00	0.33	0.80	1.00	0.67
Intermittent Stream R4USC	0.25	0.75	0.00	0.50	0.00	0.00	1.00	0.36
Lacustrine Lentic Waters L2EM2H	0.75	1.00	0.00	1.00	0.33	1.00	1.00	0.73
Lacustrine Sandy Shoreline L2UB2H, L2US2C	0.75	0.75	0	0.5	0	0.4	1.00	0.49
Palustrine Lentic Waters PUBH	0.50	0.50	N/A	0.00	0.00	0.20	1.00	0.37
Wetlands								
Semipermanently Flooded Wetlands PEM1F, PEM1/SS1F, PSS1F	0.75	0.66	N/A	1.00	0.75	N/A	1.00	0.83
Seasonally Flooded Wetlands PSS1E, PFO1C	0.75	0.66	N/A	1.00	0.50	N/A	1.00	0.78
Seasonally Saturated Emergent and Shrub Scrub PEM1B, PSS1/EM1B, PSS1B	0.50	0.50	N/A	0.00	0.50	N/A	1.00	0.50
Seasonally Saturated Needle-leaved Forest PFO2B, PFO4B	0.50	0.50	N/A	0.66	0.50	N/A	1.00	0.63

Table 3. Acres of wetland and waters types within the project footprint and disturbance buffers for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska, 2020.

NWI Code and Description	Footprint Acres	% of Project Footprint[a]	Additional Acres Mapped[b]
Waters			
L2UB2H, Lacustrine Permanently Flooded Littoral Unconsolidated Sandy Bottom	0	0	0.32
L2US2C, Lacustrine Seasonally Flooded Littoral Unconsolidated Sandy Shore	0.09	0.52	0.27
L2EM2H, Lacustrine Permanently Flooded Littoral Nonpersistent Emergent Marsh	0	0	0.04
PUBH, Palustrine Permanently Flooded Unconsolidated Bottom	0.01	0.05	0.05
R2UBH, Riverine Permanently Flooded Lower Perennial Unconsolidated Bottom	0.08	0.50	0.07
R4USC, Riverine Seasonally Flooded Intermittent Unconsolidated Shore	0.01	0.04	0.01
Wetlands			
PEM1F, Palustrine Semipermanently Flooded Persistent Emergent	0.34	2.08	1.12
PSS1F, Palustrine Semipermanently Flooded Broad-leaved Deciduous Shrub	0.33	2.00	0.53
PEM1/SS1F, Palustrine Semipermanently Flooded Persistent Emergent/Broad-leaved Deciduous Shrub	0.06	0.34	0.19
PSS1E, Palustrine Seasonally Flooded-Saturated Broad-leaved Deciduous Shrub	0.06	0.39	0.73
PEM1B, Palustrine Seasonally Saturated Persistent Emergent	0.05	0.32	0.11
PSS1B, Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub	0	0	0.05
PSS1/EM1B, Palustrine Seasonally Saturated Broad-leaved Deciduous Shrub/Persistent Emergent	0.69	4.17	1.02
PFO2B, Palustrine Seasonally Saturated Needle-leaved Deciduous Forest	0.29	1.78	0.15
PFO4B, Palustrine Seasonally Saturated Needle-leaved Evergreen Forest	0.27	1.63	0.13
PFO1C, Palustrine Seasonally Flooded Broad-leaved Deciduous Forest	0.05	0.31	0.26
Total	2.33	14.13	5.05

[a] Represents only the acreage of wetlands in the footprint; uplands are not included so the total is less than 100%.
[b] Acreage within the wetland mapping area that could be disturbed during construction and use of the new infrastructure.

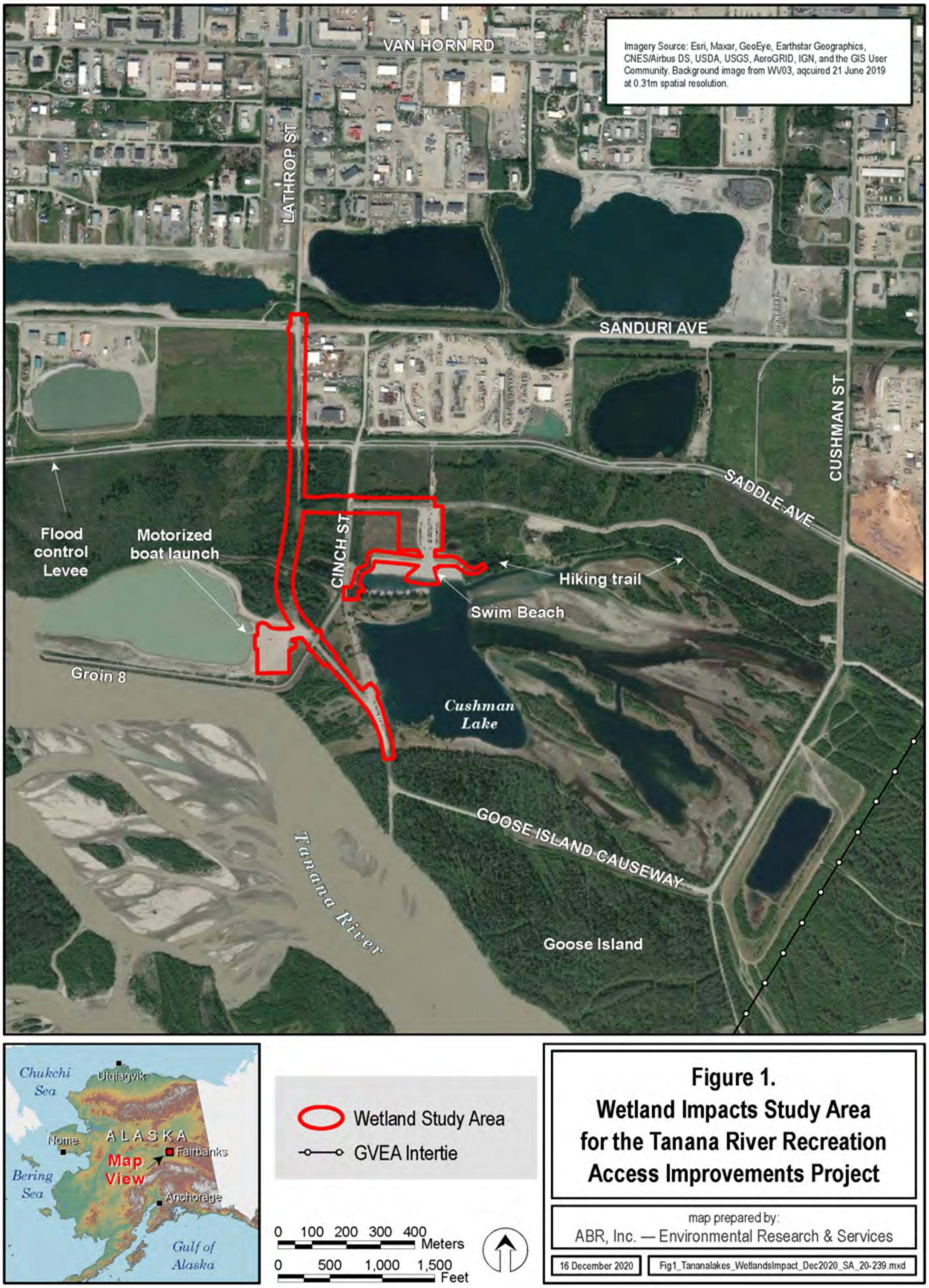


Figure 1.
Wetland Impacts Study Area for the Tanana River Recreation Access Improvements Project

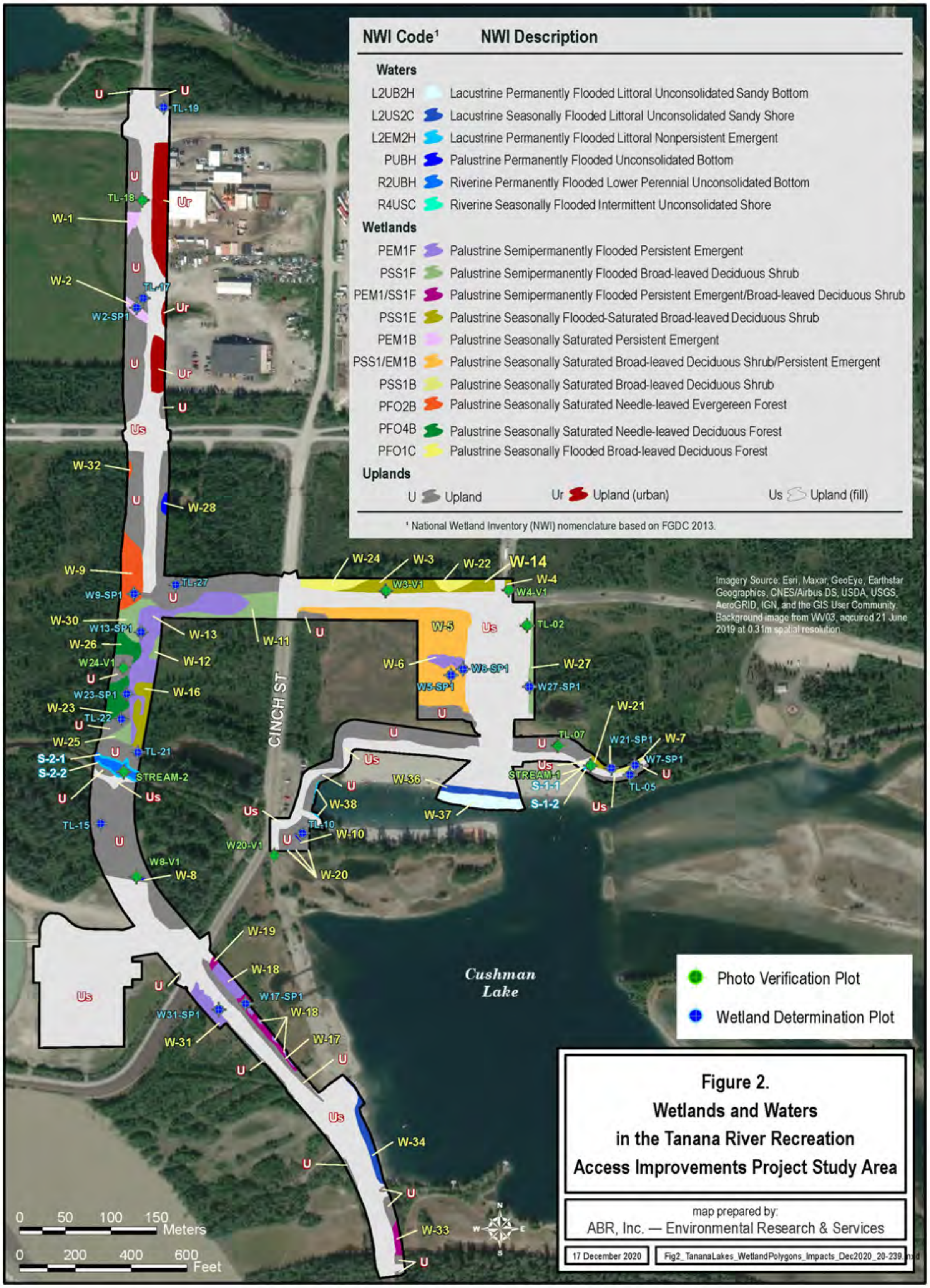


Figure 2.
Wetlands and Waters in the Tanana River Recreation Access Improvements Project Study Area

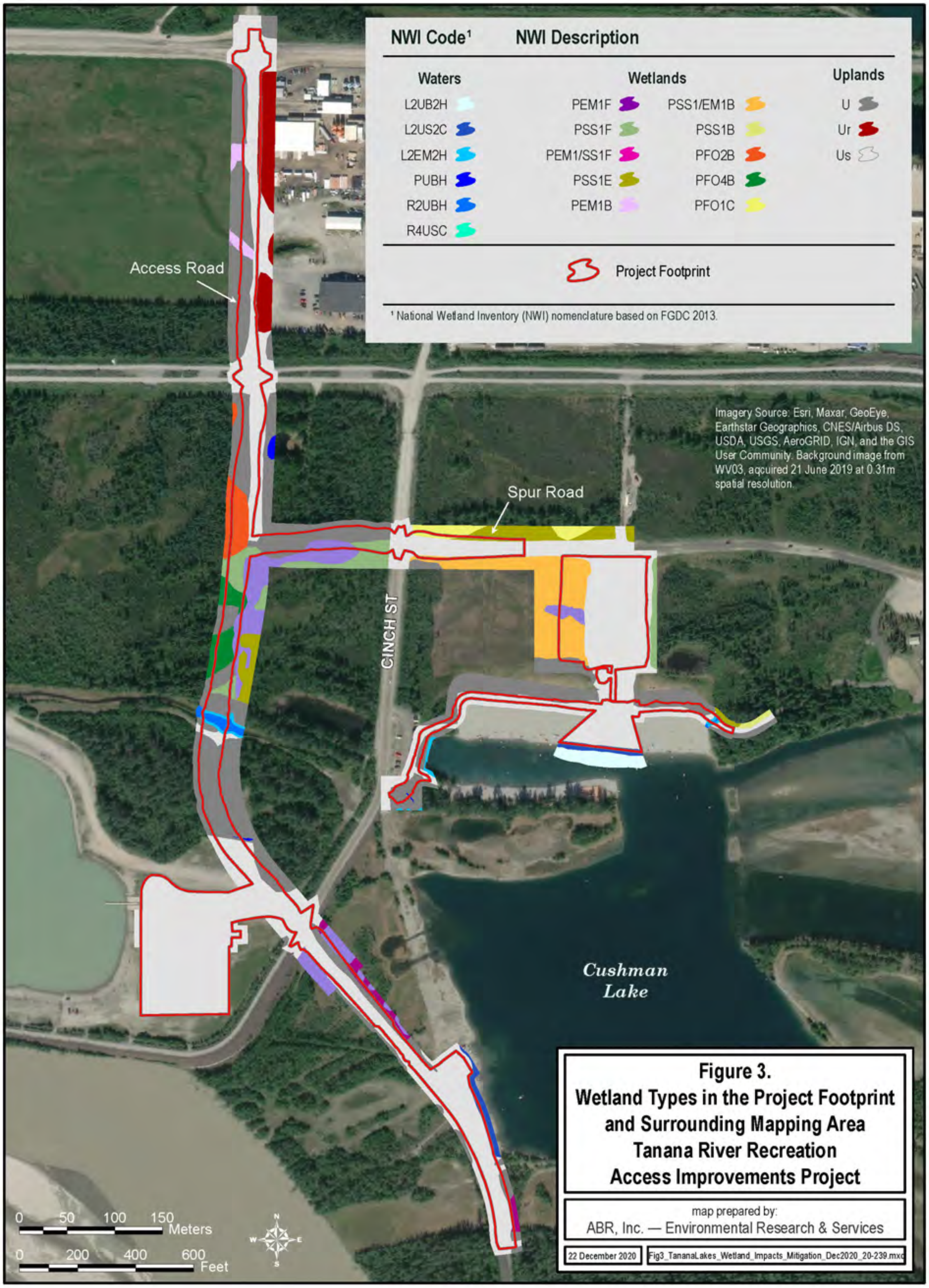


**Figure 3.
Wetland Types in the Project Footprint and Surrounding Mapping Area
Tanana River Recreation
Access Improvements Project**

Appendix C – Biological Resources Study Reports and ESA Species Report

BIOLOGICAL RESOURCES SURVEY REPORT FOR THE PROPOSED TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT: AK FNSB TANANA(1)

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave.
Anchorage, Alaska 99503

On behalf of:

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th Str.
Vancouver, Washington 98661

Prepared by:
ABR, Inc.—Environmental Research & Services
P.O. Box 80410
Fairbanks, Alaska 99708-0410

and

P.O. Box 240268
Anchorage, Alaska 99524

September 2020

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

In the proposed Tanana River Recreation Access Improvements Project, the Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFLHD) is planning to construct a new access road, and improve and expand the hiking trails and user facilities at the Tanana Lakes Recreation Area (TLRA) in Fairbanks, Alaska. PND Engineers Inc. (PND) is the engineering and environmental contractor to WFLHD for the project. ABR, Inc.—Environmental Research & Services (ABR) was subcontracted to provide environmental support, in this case a review and summary of existing data on biological resources that apply to the TLRA, along with site-specific field surveys to collect current data on botanical and wildlife resources in the study area.

A field survey to support the mapping of vegetation in the TLRA study area (see Study Area below) was conducted in July 2020 and included surveys for non-native and invasive plant species as well as an assessment of the possible occurrence of rare plant species. To support permitting of the project and to ensure that WFLHD remains in compliance with the Bald and Golden Eagle Protection Act (BGEPA), a survey for Bald Eagle[1] (*Haliaeetus leucocephalus*) nests in the study area was conducted in early June 2020. A separate survey for breeding birds was also conducted in early June 2020 to determine the occurrence and abundance of breeding birds and species of conservation concern. Data on the occurrence of mammals in the study area were derived from existing information and professional judgement as field surveys for mammals were beyond the scope of the study.

STUDY AREA

The TLRA is located on the south (river) side of the Tanana Flood Control levee in south Fairbanks. The recreation area has been established around Cushman Lake, which was formed by the impounded waters of an active slough of the Tanana River (Figure 1). The Goose Island

[1] Following the formal nomenclature for the common names of recognized by the American Ornithologist’s Union in the Check-list of North American Birds (Chesser et al. 2019), the common names of bird species are capitalized throughout this report.

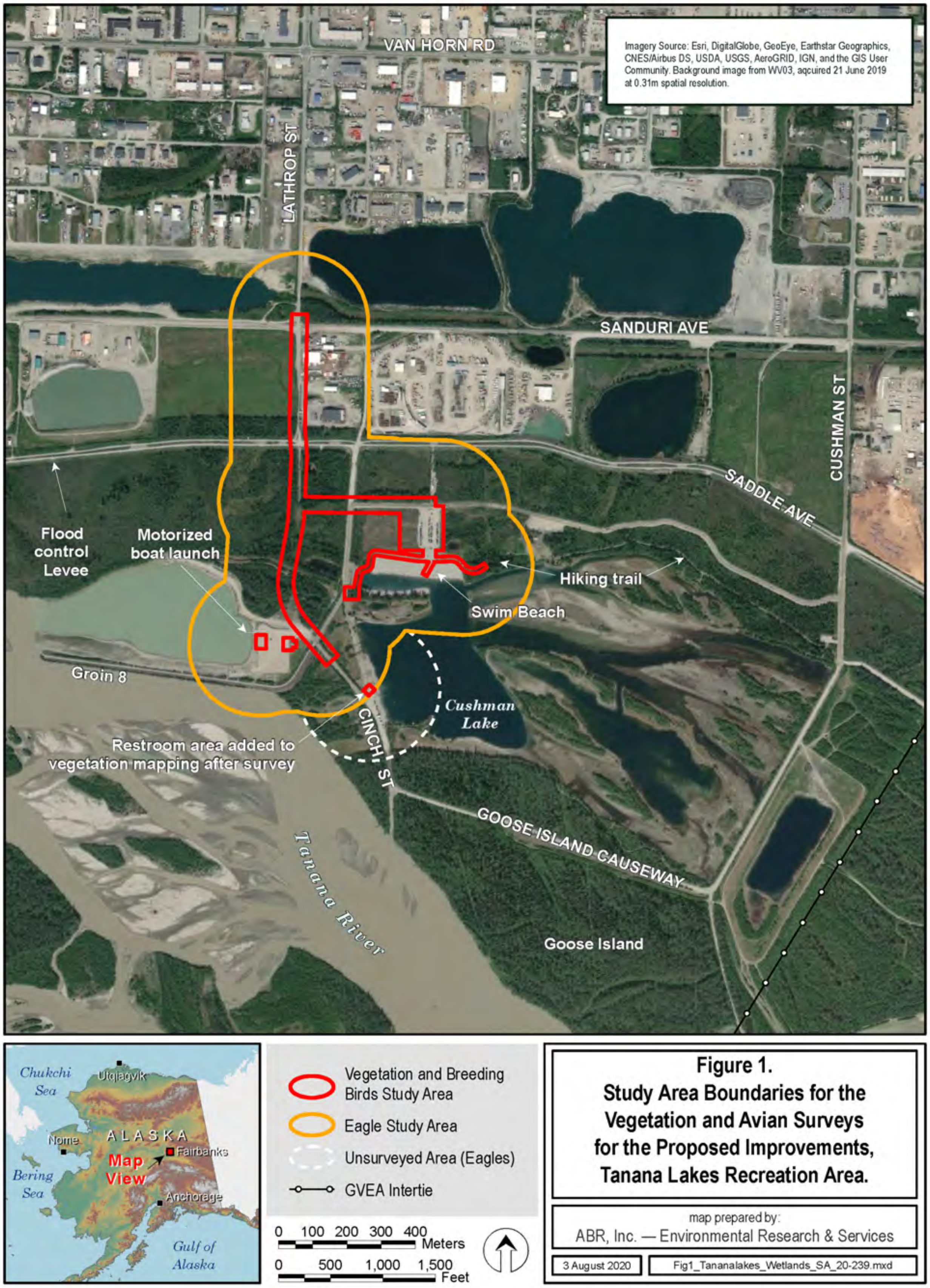


Figure 1. Study Area Boundaries for the Vegetation and Avian Surveys for the Proposed Improvements, Tanana Lakes Recreation Area.

Causeway (a groin extension of South Cushman Street) and Groin 8 (an extension of Cinch Street) were constructed to create the freshwater Cushman Lake, which is suitable for recreation activities and habitat conservation. Groin 8 also protects the motorized boat launch area. The area was cleaned up and developed after 2012 to include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch that connects with the active channel of the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake (FNSB 2007).

The TLRA biological resources study area was defined in the Statement of Work as the footprints of the proposed infrastructure areas and specific buffer zones, which include a buffer of 75 feet of either side of the proposed road centerlines, a buffer of 25 feet on either side of the proposed trail centerlines, a buffer of 25 feet around the proposed parking areas, and a buffer of 50 feet around the proposed restroom locations (Figure 1). In total, the biological resources study area encompasses approximately 23 acres. The study area includes the areas for the proposed extension of South Lathrop Street and additional road improvements and expansions to access the TLRA, as well as the areas of proposed improvements to the motorized boat launch facilities on the Tanana River, the non-motorized boat launch facilities on the southwest side of Cushman Lake, and the facilities at the main swim beach on the north side of Cushman Lake. With the exception of a short section of South Lathrop Street north of the Tanana Flood Control levee, the majority of the study area is on the Tanana River side of the levee, and occurs on both the east and west sides of Groin 8.

The entire TLRA area is located within the active floodplain of the Tanana River but the hydrology has been substantially altered by the construction of the levee system and the creation of Cushman Lake. Surface water levels in the area are driven by water levels in the Tanana River and rainfall, but frequent flood events typical of undisturbed floodplains are moderated in the TLRA by the groins. Waters in the area have been formed by the impoundment of active sloughs of the Tanana River, the filling of gravel excavation depressions, and there is one flowing slough crossing the study area north of the motorized boat launch area. Overall, the terrain is characterized by flat, riverine-influenced lowlands, with small variations in elevation along the edges of abandoned river channels and depressions. North of the levee along South Lathrop Street, the study area is composed of a fallow field and an industrial park. According to the 2007 TLRA Master Plan, historically the area was composed of over 80% jurisdictional wetlands prior to any clean-up activities or facility development (FNSB 2007). Surficial deposits are composed of alluvial sands and silts, with shallow organic layers developing in wetland areas. The geomorphology of the area consists of fluvial landscape features. As is much of Interior Alaska, the TLRA is located in a discontinuous permafrost zone.

Much of the TLRA study area has been cleared and is composed of barren gravel fill (see Vegetation and Other Land Cover Types in Results and Discussion below). The vegetated portions of the study area support open broadleaf forests, open mixed white spruce (*Picea glauca*) and paper birch (*Betula neoalaskana*) forest stands, open black spruce (*P. mariana*) and tamarack (*Larix laricina*) forests, low and tall willow (*Salix* spp.) scrub, tall alder (*Alnus incana*) scrub, moist forb and bluejoint grass (*Calamagrostis canadensis*) meadows, and aquatic sedge marshes.

METHODS

BOTANICAL RESOURCES

VEGETATION MAPPING

Field surveys to collect ground-reference information for the mapping of vegetation in the TLRA study area were conducted on 8 and 9 July 2020 by a team of two ABR biologists (Wendy Davis and Julie Parrett). The vegetation field work was conducted concurrently with the wetland surveys, the results of which will be presented in a separate report. The field work involved sampling wetland determination plots and/or map-verification plots (see below) in the various aerial image-signatures within the TLRA study area to collect ground-reference information to support the mapping of vegetation and wetland types. One small (0.14 acres), isolated site in the study area, the non-motorized boat launch area on the southwest side of Cushman Lake, was not surveyed because this area was added to the study area after the survey was completed. The data collected at the wetland determination plots included plant cover estimates, a determination of the applicable vegetation and wetland type, data on soils and hydrology to facilitate final wetland classifications, and documentary photos of each plot. At each wetland determination plot sampled in the field, all vascular species were recorded, and percent cover for each species was estimated to facilitate the determination of vegetation types. The vegetation type at each plot was assigned to the Level IV vegetation classes of the Alaska Vegetation Classification (Viereck et al. 1992). Additional data were collected at map-verification plots in which a subset of the data collected at wetland determination plots was recorded. Map-verification plots were used to rapidly collect additional data to facilitate the mapping effort for aerial image-signatures that had been previously documented with a full wetland determination plot. Data collected at map-verification plots included cover estimates for the dominant plant species, a determination of the vegetation type, and documentary plot photos. All data except for plot photos were recorded using an Android tablet loaded with an ABR-developed HTML application created specifically for vegetation and wetland surveys in Alaska. Plot photos were recorded on an Android cellular phone using an ABR-developed application that records the plot name and geographic coordinates for each photo.

After the field surveys, vegetation type boundaries were interpreted visually from aerial image-signatures and were digitized on-screen using ArcGIS software. The imagery used was the best data layer provided through ESRI; the imagery was acquired on 21 June 2019 and was of suitable high-resolution for identifying and digitizing the boundaries of vegetation and land cover types. During the mapping process, each map polygon was assigned a Level IV vegetation class following Viereck et al. (1992). The Level IV vegetation types include information on vegetation structure and dominant plant species.

NON-NATIVE PLANT SURVEY

Existing information on non-native plant species in the TLRA study area was requested from the Alaska Center for Conservation Science (ACCS), which maintains the Alaska Exotic Plants Information Clearinghouse (AKEPIC), a database of non-native plant species records in Alaska (ACCS 2020a). The database provides location information on non-native plant collections, an invasiveness ranking score for each species, and extent of the infestation for each field record. AKEPIC data were requested for the TLRA study area and adjacent areas; this included the study area in the floodplain south of the levee and areas immediately surrounding the study area, and for the portion of the study area extending north of the levee along South Lathrop Street to the railroad crossing and the intersection with Sanduri Street.

In addition to the compilation of existing records of non-native plant species, the occurrence of non-native and potentially invasive plant species was documented in the TLRA study area during the course of the vegetation and wetland field surveys described above. Comprehensive plant species lists were compiled at each full wetland determination plot, and additional information was collected at map-verification plots where significant non-native plant infestations were found.

RARE PLANT SPECIES

Rare plant species information for the TLRA study area and adjacent areas, as described above for the non-native plant survey, was requested from ACCS, which also maintains a database of rare plant records in Alaska (ACCS 2020b). In addition to the TLRA study area and immediately adjacent areas, a request for rare plant records within a 100-km radius surrounding TLRA was made to provide additional information on species that have some possibility of occurring in the study area. Full plant species lists for the study area were compiled from the wetland determination and map-verification plot survey data collected in July 2020 and were compared with the ACCS lists to determine if any rare or sensitive species were found in the area. Specific surveys targeted at locating potential populations of rare plants were beyond the scope of this study, as those surveys would require intensive searches focused on suitable habitats for target species.

WILDLIFE RESOURCES

BACKGROUND INFORMATION AND REGULATORY COMPLIANCE

A review of applicable literature, regulations, and existing data was conducted to provide information about the occurrence and status of wildlife (birds and mammals) and threatened or endangered species in the TLRA study area and to supplement the information gathered in the summer 2020 field surveys. Wildlife field surveys were limited to birds during the breeding season. Additional sources of recorded bird observations in the TLRA were used to compile information on those bird species that only occur in the TLRA outside the breeding season (especially during migration). No mammal-focused fieldwork was conducted for this study. All information on the occurrence of mammals in the TLRA study was based on existing literature and collection records; this information was modified specifically for the study area based on professional judgment and knowledge of the habitats present in the area.

BALD EAGLE SURVEY

To support project permitting and to ensure compliance with the BGEPA, one-day ground-based Bald Eagle nest survey was conducted in the TLRA study area in June 2020. Active Bald Eagle nests and unoccupied or alternate nest structures within a breeding territory are protected under the BGEPA. Active nests are further protected with a buffer from activities that may disturb nesting birds. Bald Eagles have been known to nest in or near the TLRA, though not within the area proposed for improvements.

ABR ornithologist Kristen Rozell conducted a Bald Eagle survey on 2 June 2020. All potential nesting trees within the footprint of the proposed project improvements and a 660-ft buffer surrounding it (Figure 1) were surveyed for eagle nests. This buffer zone size was chosen to correspond to the 660-ft area of no-disturbance required around active eagle nests under the BGEPA. The non-motorized boat launch area on the southwest side of Cushman Lake and the 660-ft buffer surrounding it (Figure 1) was not surveyed for nesting eagles because this area was added to the study area after the survey was completed. Vantage points along existing roads, trails, and especially levees were used to view tall trees suitable for eagle and other raptor nests. All candidate nest trees were scanned using 10×42 binoculars for the presence of stick nests, nesting platforms, and nesting raptors. Navigation in the study area was accomplished using a moving-map application (ESRI Collector for ArcGIS) on an Android tablet computer on which the project footprint and 660-foot survey buffer zone were overlaid on geographically referenced, high-resolution aerial imagery for the study area.

BREEDING BIRD CENSUS

A one-day census of breeding birds was conducted in June 2020 to determine which bird species (primarily landbirds and shorebirds) use the study area and could be most affected by habitat loss or alteration. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) and activities that can harm nesting birds (i.e., land-clearing or construction) must typically be scheduled outside the breeding period (see Regulatory Compliance in Results and Discussion below).

ABR ornithologist Kristen Rozell conducted the breeding bird census on 9 June 2020. Because the TLRA study area is so small and to avoid double-counting of birds, a modified breeding bird census technique was used instead of point-count surveys, such as the U.S. Geological Survey's (USGS's) Alaska Landbird Monitoring System (ALMS) or the Breeding Bird Survey (BBS), which are intended for large study areas and require surveying a predetermined set of points spaced at regular intervals (250 m apart in forested habitats and 500 m in open or shrub habitats). The breeding bird census area included the footprints of the proposed project improvements and the specific buffer zones surrounding them as described above in the Study Area section for the TLRA study area (Figure 1). The census of the proposed road corridor began at the northwestern end of the proposed road improvement area (the intersection of South Lathrop Street, the Alaska Railroad crossing, and Sanduri Avenue) and continued south along the western side of the study area. A small, isolated segment of the study area at the motorized boat launch parking lot at the Tanana River was surveyed for birds prior to continuing again northward along the eastern side of the study area to the industrial area north of the levee. The non-motorized boat launch area on the southwest side of Cushman Lake was not surveyed as this area was added to the study area after the survey was completed. The census of the swim beach, parking area, and surrounding terrain was conducted by following the northern boundary of the study area buffer from west to east and continuing within the buffer zone in a clockwise direction. Except for two small patches of mixed forest, these areas and the adjacent buffer zone are very open, which made it easy to observe all birds in the area.

All bird species seen and/or heard during the census were recorded using an Android tablet loaded with an ABR-developed HTML application created specifically for bird surveys in Alaska. Data collected included the species, number of individuals, sex (when possible), behavior, habitat used (when possible), and whether the birds were observed inside or outside of (adjacent) to the study area boundary. Birds that were observed flying over the study area (in transit) and not using available habitats were recorded separately. Weather and observation conditions during the survey were also recorded.

RESULTS AND DISCUSSION

BOTANICAL RESOURCES

VEGETATION AND OTHER LAND COVER TYPES

In general, the TLRA study area consists of a combination of disturbed and reseeded herbaceous vegetation types, barren gravel fill, undisturbed forest stands, and shrub and marsh types typical of an active riverine floodplain. Broadleaf and mixed broadleaf-needleleaf forests dominate areas of raised and well-drained topography, shrubs and needleleaf forests occur in low-lying, more poorly drained areas that may be underlain by permafrost, and depressions in the area tend to develop into open water types or marsh wetlands. Despite much of the area being located between two flood control groins, there is still evidence of periodic flooding, especially in the western portion of the study area west of Groin 8. Alterations to surface water hydrology from impounded water south of the levee are evident in the eastern portion of the study area (east of Groin 8) surrounding the swim beach and parking lot. Based on the lack of transition in the plant communities in those areas to ones dominated by hydrophytic species, the impoundment flooding is likely to be recent.

In the study area, 13 vegetation and non-vegetated land cover types were identified and mapped (Table 1, Figure 2). The most commonly occurring land cover type is barren gravel fill, which accounts for 41% of the study area. Barren gravel fill includes the existing access road, parking lots, and the swim beach. Some portions of filled areas have been reseeded resulting in partially vegetated surfaces. These areas are characterized by sparse cover of seeded grasses and colonizing weed species (see Non-native Plant Species below) and account for an additional 2% of the study area. Open water was mapped in less than 1% of the study area and includes a small outlet draining a shrub wetland on the east side of the swim beach, an active slough draining Cushman Lake to the Tanana River, and two small isolated and inundated depressions.

The most common vegetation type in the study area is Open Low Willow, encompassing 11% of the study area. Open Low Willow is dominated by a variety of typical low-growing, floodplain willow species, including *Salix glauca*, *S. niphoclada*, and *S. pulchra*. These species are recolonizing previously cleared sites, especially in the immediate area surrounding the main parking lot at the swim beach. The tall shrub classes dominated by alder include Open Tall Alder

Table 1. Vegetation and land cover types, and acreages for each mapped in the Tanana Lakes Recreation Area biological resources study area, Fairbanks, Alaska, 2020.

Vegetation/Land Cover Type	ABR Vegetation/Land Cover Code	Level IV Vegetation Code [a]	Acres	% of Study Area
Barren	bbg	N/A[b]	9.49	41.22
Partially Vegetated	bpv	N/A[b]	0.45	1.95
Open Balsam Poplar	fbop	I.B.2.C	0.94	4.10
Open Spruce-Paper Birch	fmosb	I.C.2.A	1.82	7.91
Open Spruce-Balsam Poplar	fmosp	I.C.2.D	0.16	0.70
Open Black Spruce	fnobs	I.A.2.F	0.93	4.04
Open Black Spruce-Tamarack	fnobt	I.A.2.H	0.40	1.73
Seral Herbs	hfds	II.B.1.A	1.25	5.45
Moist Forb Meadow	hfm	III.B.2	1.13	4.91
Bluejoint-Herb	hgmbh	III.A.2.B	0.09	0.38
Fresh Sedge Marsh	hgwfs	III.A.3.D	1.43	6.21
Open Low Willow	slow	II.C.2.G	2.47	10.74
Open Tall Alder	stoa	II.B.2.B	0.19	0.82
Open Tall Shrub Swamp	stoss	II.B.2.F	0.76	3.30
Open Tall Willow	stow	II.B.2.A	1.34	5.82
Water	w	N/A[b]	0.17	0.73
Totals			23.02	100

[a] Viereck et al. (1992)
[b] No Level IV vegetation codes exist for unvegetated land cover types.

and Open Tall Shrub Swamp. These two types combined cover 4% of the study area. Another tall shrub class, Open Tall Willow, is variably dominated by *Salix alaxensis, S. bebbiana, S. interior,* and *S. lasiandra*, and encompasses 6% of the study area. These tall shrub types occur most commonly in the least disturbed portions of the study area, along the edges of riparian areas or bordering marsh wetlands. Forest classes in the study area include Open Balsam Poplar (*Populus balsamifera*), Open Spruce-Paper Birch, Open Spruce-Balsam Poplar, Open Black Spruce, and Open Black Spruce-Tamarack. Combined, these forest types account for 19% of the study area. Forest stands occupy the uncleared and undisturbed portions of the study area, with the broadleaf and mixed broadleaf-needleleaf types typically occurring on raised abandoned banks and needleleaf forest types dominant in the low-lying, less well-drained areas.

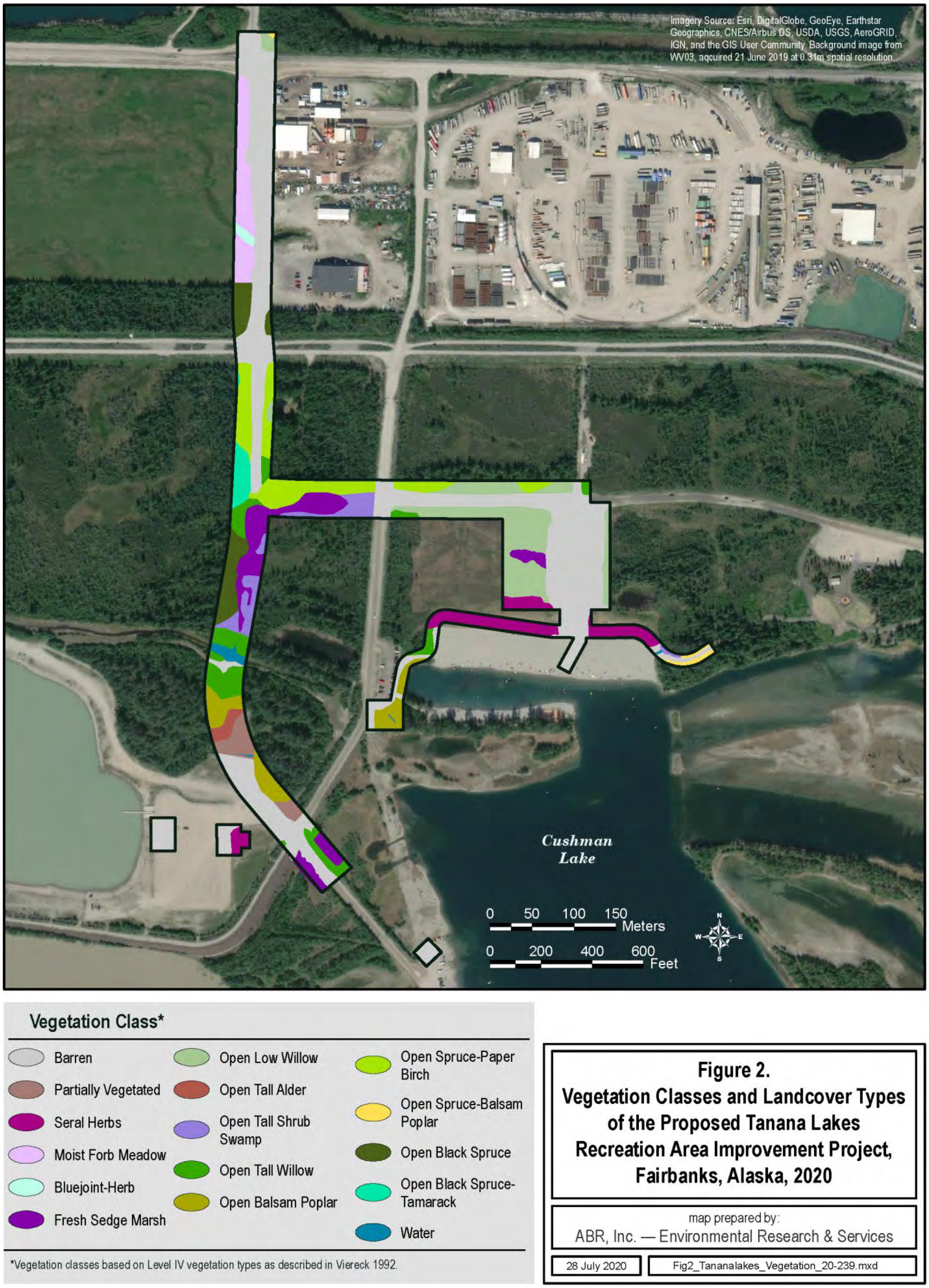


Figure 2.
Vegetation Classes and Landcover Types of the Proposed Tanana Lakes Recreation Area Improvement Project, Fairbanks, Alaska, 2020

map prepared by:
ABR, Inc. — Environmental Research & Services

28 July 2020 | Fig2_Tananalakes_Vegetation_20-239.mxd

Fresh Sedge Marsh encompasses 6% of the study area and is primarily located in the undisturbed area proposed for the new road alignment (the southward extension of South Lathrop Street). The Fresh Sedge Marsh type was flooded at the time of sampling and supported obligate wetland sedges and grasses with co-dominant and obligate wetland forb species. Moist herbaceous vegetation types in the study area include Moist Forb Meadow and Bluejoint-Herb Meadow. The single well-drained and dry herbaceous type is Seral Herbs, which is dominated by early successional forbs. These three herbaceous types together encompass 11% of the study area and occur exclusively on disturbed and often reseeded surfaces, including the fallow field adjacent to South Lathrop Street and the vegetated berm adjacent to the swim beach.

NON-NATIVE PLANT SPECIES

In the AKEPIC database maintained by ACCS, there are 65 records of nine invasive species found within the boundaries of the TLRA and the southern end of South Lathrop Street. During the field survey in July 2020, we recorded 13 non-native plant species in various locations throughout the study area (Table 2). The majority of the occurrences were concentrated around the swim beach parking lot and berm and the fallow field along the western edge of South Lathrop Street. Four of the recorded species—White Sweetclover (*Melilotus albus*), European Bird Cherry (*Prunus padus*), Field Sow-Thistle (*Sonchus arvensis*), and Bird Vetch (*Viccia cracca*)—have invasiveness ranking scores greater than 70, which indicates a weed with the potential to spread and affect communities of native plant species (Table 2; ACCS 2020a). As noted in Table 2, all four species already have established populations in the study area and should be considered a risk for spread into undisturbed areas (e.g., with the construction of the proposed new access road).

During the July 2020 survey, we recorded all nine species that are found in the AKEPIC database for the TLRA study area except for *Elodea* sp. (Waterweed). *Elodea* is known to occur in both lotic and lentic waters in the Chena River basin (Plant Materials Center 2017) and is likely to be of concern for spreading within the TLRA study area. An Invasive Species Management Plan (Heidemann 2010) was prepared for the TLRA prior to clean-up and development of the recreation area after 2012. In that plan, seven high-priority invasive plant species were noted to occur at the site and it was expected that best management practices would

Table 2. Non-native plant species recorded within the Tanana Lakes Recreation Area biological resources study area, Fairbanks, Alaska, 2020.

Species	Common Name	Invasiveness Ranking	Notes
Crepis tectorum	Narrowleaf Hawksbeard	56	Recorded on the edges of gravel fill at the main swim beach parking lot. A few individual plants growing along with larger populations of White Sweetclover. Likely to occur in similar situations throughout the study area.
Melilotus albus	White Sweetclover	81	Recorded at the edge of the main parking lot, on the vegetated berm adjacent to the beach and in the fallow field along S. Lathrop Street. Infestations range from a few individual plants to dense stands. Occurs throughout the study area on similar, well-drained gravel fill substrates.
Plantago major	Great Plantain	44	Recorded occurrences on the berm adjacent to the swim beach and in the fallow field along S. Lathrop Street. Usually individual plants with low overall cover within the established plant community. Likely to occur throughout the study area on well drained, vegetated gravel fill surfaces.
Poa pratensis	Kentucky Blue Grass	52	Recorded occurrence as isolated tussocks on the vegetated berm adjacent to the swim beach. Most likely introduced via application of seed mixes and may occur on similar vegetated gravel fill surfaces throughout the study area.
Potentilla recta	Sulphur Cinqefoil	not available	Recorded as an individual plant on the vegetated berm adjacent to the swim beach.
Prunus padus	European Bird Cherry	74	Recorded on either side of the hiking trail running east from the swim beach and along the active channel draining from Cushman Lake. Infestations range from individuals within a shrub canopy to the dominant tall shrub species. Likely to occur throughout the study area particularly bordering lotic or lentic waters.

Table 2. Continued.

Species	Common Name	Invasiveness Ranking	Notes
Rorippa austriaca	Creeping Fieldcress	not available	Recorded as individual plants within the fallow field along S. Lathrop. Potentially limited to abandoned agricultural areas.
Senecio viscosus	Sticky Ragwort	not available	Recorded as individual plants within the fallow field along S. Lathrop. Potentially limited to abandoned agricultural areas.
Sonchus arvensis	Field Sow-Thistle	73	Recorded as a dominant forb species within the fallow field along S. Lathrop. Potential to occur on vegetated, disturbed surfaces throughout the study area.
Taraxacum officinale	Common Dandelion	58	Recorded as a few individual plants on the vegetated berm adjacent to the swim beach. Likely to occur on similar surfaces throughout the study area.
Trifolium hybridum	Alsike Clover	57	Recorded as well established populations in the fallow field on S. Lathrop. Likely to occur in similar substrates throughout the study area.
Viccia cracca	Bird Vetch	73	Recorded in fallow field on S. Lathrop, roadside edges, on the vegetated berm adjacent to the swim beach and gravel edges of the main parking lot. Some populations are dense stands with no other co-dominant species. Has the potential to spread widely throughout the study area on newly disturbed surfaces.

be needed to control the spread of those highly invasive species. In July 2020, we recorded five of the seven species noted in Heidemann (2010); Yellow Toadflax (*Linaria vulgaris*) and Quackgrass (*Elymus repens*) were not observed in 2020 but are likely to be present in the study area.

RARE PLANT SPECIES

In this discussion of rare plants, we are assessing only those species that have state rarity listings of S1 (critically imperiled or endangered), S2 (imperiled), S1/S2, S3 (rare or uncommon) or S2/S3 (ACCS 2019). Species with state listings of S4 (apparently secure) or S3/S4 were not included. None of these rare and uncommon species that are tracked by ACCS are listed federally or by the State of Alaska as endangered, threatened, or candidate species. In the request for rare plant information from the ACCS rare plant database, no documented records of any rare vascular plant species (those with listings of S3 or rarer) in the TLRA study area were found. Similarly, during the field surveys in July 2020 to support the mapping of vegetation and wetlands in the area, we did not find any rare vascular plants. In the search for rare plants within a 100-km radius of the study area, a set of 28 species for which suitable habitat exists in the TLRA were identified (Table 3). Although suitable habitat for these species occurs in the study area, to date none of these species have been recorded there.

WILDLIFE RESOURCES

BACKGROUND INFORMATION

In Fairbanks, the TLRA is well known as a hotspot for migratory birds during spring and fall, and an active and experienced community of local birders regularly visit the TLRA and record their sightings in eBird (an online bird observation program created by Cornell Lab of Ornithology). Using this database of observations (eBird 2020), we prepared a list of all bird species that have been reported at TLRA, excluding rare and vagrant species that, because of their very low numbers in the area, are unlikely to be affected by the proposed improvements in the recreation area. This modified list includes 131 bird species composed of 34 waterbirds (waterfowl, loons, grebes, and cranes), 7 seabirds (gulls, terns, and jaegers), 20 shorebirds, 14 raptors (eagles, hawks, falcons, and owls), and 56 landbirds (mostly passerines; Table 4).

Table 3. Rare vascular plant taxa collected within a 100-km radius of the Tanana Lakes Recreation Area biological resources study area, Fairbanks, Alaska.[a] None of these species were found in the study area.

Family	Taxon	State Rank[b]	Federal Listings
Amaranthaceae	*Corispermum ochotense*	S3	
Apiaceae	*Cicuta bulbifera*	S3	
Apocynaceae	*Apocynum androsaemifolium*	S3	
Asteraceae	*Artemisia tanacetifolia*	S3	BLM Watchlist
Asteraceae	*Bidens tripartita*	S1	
Brassicaceae	*Rorippa curvisiliqua*	S1S2	
Cyperaceae	*Carex atratiformis*	S3	
Cyperaceae	*Carex bebbii*	S1S2	
Cyperaceae	*Carex deflexa var. deflexa*	S2S3	BLM Watchlist
Cyperaceae	*Carex deweyana* var. *deweyana*	S2S3	
Cyperaceae	*Carex interior*	S3	
Fabaceae	*Astragalus williamsii*	S3	
Gentianaceae	*Gentianopsis barbata* ssp. *barbata*	S3Q	BLM Watchlist
Hydrocharitaceae	*Najas flexilis*	S3	
Juncaceae	*Juncus tenuis*	S2	BLM Watchlist
Ophioglossaceae	*Botrychium alaskense*	S3	BLM Watchlist
Ophioglossaceae	*Botrychium yaaxudakeit*	S2	USFS Sensitive
Poaceae	*Agrostis clavata*	S1S2	
Poaceae	*Glyceria striata*	S3	
Poaceae	*Poa porsildii*	S2S3	BLM Sensitive
Poaceae	*Poa secunda* ssp. *secunda*	S2	
Poaceae	*Trisetum sibiricum* ssp. *litorale*	S3	
Polypodiaceae	*Polypodium sibiricum*	S3	
Potamogetonaceae	*Potamogeton obtusifolius*	S3	
Rosaceae	*Rosa woodsii* ssp. *woodsii*	S2S3	BLM Watchlist
Salicaceae	*Salix athabascensis*	S2	
Salicaceae	*Salix candida*	S3	
Salicaceae	*Salix planifolia*	S2	BLM Watchlist

[a] Data from the Rare Plant Portal database maintained by the Alaska Center for Conservation Science (ACCS 2020b).
[b] S1 = critically imperiled or endangered in the state, S2 = imperiled, and S3 = rare or uncommon. Q = taxonomic distinctiveness is questionable.

Table 4. Bird species recorded in and mammal species likely to occur in the Tanana Lakes Recreation Area, Fairbanks, Alaska.[a]

Species Group/Common Name	Scientific Name	Abundance[c]	Conservation Status[b] USFWS BCC	ADFG At-risk
BIRDS				
Waterbirds				
Snow Goose	*Anser caerulescens*	C		
Greater White-fronted Goose	*Anser albifrons*	C		
Cackling Goose	*Branta hutchinsii*	U		
Canada Goose	*Branta canadensis*	C		
Trumpeter Swan	*Cygnus buccinator*	C		
Tundra Swan	*Cygnus columbianus*	C		
Blue-winged Teal	*Anas discors*	C		
Northern Shoveler	*Spatula clypeata*	C		
Gadwall	*Mareca strepera*	C		
Eurasian Wigeon	*Mareca penelope*	U		
American Wigeon	*Mareca americana*	C		
Mallard	*Anas platyrhynchos*	C		
Northern Pintail	*Anas acuta*	C		
Green-winged Teal	*Anas crecca*	C		
Canvasback	*Aythya valisineria*	C		
Redhead	*Aythya americana*	U		
Ring-necked Duck	*Aythya collaris*	C		
Greater Scaup	*Aythya marila*	C		
Lesser Scaup	*Aythya affinis*	C		
Surf Scoter	*Melanitta perspicillata*	C		
White-winged Scoter	*Melanitta deglandi*	C		
Black Scoter	*Melanitta americana*	U		X
Long-tailed Duck	*Clangula hyemalis*	U		
Bufflehead	*Bucephala albeola*	C		
Common Goldeneye	*Bucephala clangula*	C		
Barrow's Goldeneye	*Bucephala islandica*	C		
Common Merganser	*Mergus merganser*	C		
Red-breasted Merganser	*Mergus serrator*	U		
Horned Grebe	*Podiceps auritus*	C	X	
Red-necked Grebe	*Podiceps grisegena*	C		
Sandhill Crane	*Antigone canadensis*	C		
Red-throated Loon	*Gavia stellata*	U		X
Pacific Loon	*Gavia pacifica*	U		
Common Loon	*Gavia immer*	C		
Seabirds				
Long-tailed Jaeger	*Stercorarius longicaudus*	U		
Bonaparte's Gull	*Chroicocephalus philadelphia*	C		

Table 4. Continued.

Species Group/Common Name[b]	Scientific Name	Abundance[c]	Conservation Status[b] USFWS BCC	ADFG At-risk
Mew Gull	*Larus canus*	C		
Herring Gull	*Larus argentatus*	C		X
Glaucous-winged Gull	*Larus glaucescens*	U		
Glaucous Gull	*Larus hyperboreus*	U		
Arctic Tern	*Sterna paradisaea*	C		
Shorebirds				
Black-bellied Plover	*Pluvialis squatarola*	U		
American Golden-Plover	*Pluvialis dominica*	U		X
Killdeer	*Charadrius vociferus*	C		X
Semipalmated Plover	*Charadrius semipalmatus*	C		
Whimbrel	*Numenius phaeopus*	C	X	X
Hudsonian Godwit	*Limosa haemastica*	C		X
Stilt Sandpiper	*Calidris himantopus*	U		
Dunlin	*Calidris alpina*	U		X
Baird's Sandpiper	*Calidris bairdii*	U		
Least Sandpiper	*Calidris minutilla*	C		
Pectoral Sandpiper	*Calidris melanotos*	C		X
Semipalmated Sandpiper	*Calidris pusilla*	C		X
Western Sandpiper	*Calidris mauri*	U		X
Long-billed Dowitcher	*Limnodromus scolopaceus*	C		
Wilson's Snipe	*Gallinago delicata*	C		
Spotted Sandpiper	*Actitis macularius*	C		X
Solitary Sandpiper	*Tringa solitaria*	C	X	X
Lesser Yellowlegs	*Tringa flavipes*	C		X
Greater Yellowlegs	*Tringa melanoleuca*	U		
Red-necked Phalarope	*Phalaropus lobatus*	U		
Raptors				
Osprey	*Pandion haliaetus*	C		
Golden Eagle	*Aquila chrysaetos*	U		X
Northern Harrier	*Circus hudsonius*	C		X
Sharp-shinned Hawk	*Accipiter striatus*	C		
Northern Goshawk	*Accipiter gentilis*	C		
Bald Eagle	*Haliaeetus leucocephalus*	C		
Red-tailed Hawk	*Buteo jamaicensis*	C		X
Rough-legged Hawk	*Buteo lagopus*	U		
Great Horned Owl	*Bubo virginianus*	C		
Short-eared Owl	*Asio flammeus*	U		X
Boreal Owl	*Aegolius funereus*	U		X
American Kestrel	*Falco sparverius*	C		X
Merlin	*Falco columbarius*	C		
Peregrine Falcon	*Falco peregrinus*	C	X	

Table 4. Continued.

Species Group/Common Name[b]	Scientific Name	Abundance[c]	Conservation Status[b]	
			USFWS BCC	ADFG At-risk
Landbirds				
Ruffed Grouse	*Bonasa umbellus*	C		
Spruce Grouse	*Falcipennis canadensis*	U		
Sharp-tailed Grouse	*Tympanuchus phasianellus*	U		
Rock Pigeon	*Columba livia*	U		
Belted Kingfisher	*Megaceryle alcyon*	U		X
American Three-toed	*Picoides dorsalis*	C		
Black-backed Woodpecker	*Picoides arcticus*	U		
Downy Woodpecker	*Dryobates pubescens*	C		
Hairy Woodpecker	*Dryobates villosus*	C		
Northern Flicker	*Colaptes auratus*	C		X
Olive-sided Flycatcher	*Contopus cooperi*	U		X
Western Wood-Pewee	*Contopus sordidulus*	U		X
Alder Flycatcher	*Empidonax alnorum*	C		X
Hammond's Flycatcher	*Empidonax hammondii*	C		
Say's Phoebe	*Sayornis saya*	U		
Northern Shrike	*Lanius borealis*	C		
Canada Jay	*Perisoreus canadensis*	C		
Black-billed Magpie	*Pica hudsonia*	C		
Common Raven	*Corvus corax*	C		
Bank Swallow	*Riparia riparia*	C		X
Tree Swallow	*Tachycineta bicolor*	C		X
Violet-green Swallow	*Tachycineta thalassina*	C		
Cliff Swallow	*Petrochelidon pyrrhonota*	C		
Black-capped Chickadee	*Poecile atricapillus*	C		
Boreal Chickadee	*Poecile hudsonicus*	C		X
Brown Creeper	*Certhia americana*	U		
Golden-crowned Kinglet	*Regulus satrapa*	U		X
Ruby-crowned Kinglet	*Regulus calendula*	C		
Swainson's Thrush	*Catharus ustulatus*	C		X
Hermit Thrush	*Catharus guttatus*	C		
American Robin	*Turdus migratorius*	C		
Varied Thrush	*Ixoreus naevius*	U		X
Bohemian Waxwing	*Bombycilla garrulus*	C		
American Pipit	*Anthus rubescens*	C		X
Pine Grosbeak	*Pinicola enucleator*	C		
Common Redpoll	*Acanthis flammea*	C		X
Hoary Redpoll	*Acanthis hornemanni*	C		
White-winged Crossbill	*Loxia leucoptera*	C		
Pine Siskin	*Spinus pinus*	U		X
Lapland Longspur	*Calcarius lapponicus*	U		
Fox Sparrow	*Passerella iliaca*	C		X
American Tree Sparrow	*Spizelloides arborea*	C		X
Dark-eyed Junco	*Junco hyemalis*	C		

Table 4. Continued.

Species Group/Common Name[b]	Scientific Name	Abundance[c]	Conservation Status[b] USFWS BCC	Conservation Status[b] ADFG At-risk
White-crowned Sparrow	*Zonotrichia leucophrys*	C		X
Golden-crowned Sparrow	*Zonotrichia atricapilla*	U		
Savannah Sparrow	*Passerculus sandwichensis*	C		X
Lincoln's Sparrow	*Melospiza lincolnii*	C		
Red-Winged Blackbird	*Agelaius phoeniceus*	U		X
Rusty Blackbird	*Euphagus carolinus*	C	X	X
Northern Waterthrush	*Parkesia noveboracensis*	C		
Orange-crowned Warbler	*Leiothlypis celata*	C		
Yellow Warbler	*Setophaga petechia*	C		X
Blackpoll Warbler	*Setophaga striata*	C		X
Yellow-rumped Warbler	*Setophaga coronata*	C		
Townsend's Warbler	*Setophaga townsendi*	C		
Wilson's Warbler	*Cardellina pusilla*	C		
MAMMALS				
Red Squirrel	*Tamiasciurus hudsonicus*	C		
Northern Flying Squirrel	*Glaucomys sabrinus*	C		
Woodchuck	*Marmota monax*	U		
Beaver	*Castor canadensis*	C		
Meadow Jumping Mouse	*Zapus hudsonius*	U		
Brown Lemming	*Lemmus trimucronatus*	U		
Tundra Vole, Root Vole	*Microtus oeconomus*	C		
Meadow Vole	*Microtus pennsylvanicus*	C		
Taiga Vole, Yellow-cheeked Vole	*Microtus xanthognathus*	U		
Northern Red-Backed Vole	*Myodes rutilus*	C		
Muskrat	*Ondatra zibethicus*	C		
Northern Bog Lemming	*Synaptomys borealis*	U		
Porcupine	*Erethizon dorsatum*	C		
Snowshoe Hare	*Lepus americanus*	C		
Common Shrew, Cinereus	*Sorex cinereus*	C		
American Pygmy Shrew	*Sorex hoyi*	U		
Dusky Shrew	*Sorex monticola*	C		
Western Water Shrew	*Sorex navigator*	U		
Tundra Shrew	*Sorex tundrensis*	U		
Holarctic Least Shrew	*Sorex minutissimus*	U		
Little Brown Bat	*Myotis lucifugus*	C		
Lynx	*Lynx canadensis*	C		
Coyote	*Canis latrans*	C		
Wolf	*Canis lupus*	U		
Red Fox	*Vulpes vulpes*	C		
Black Bear	*Ursus americanus*	C		
Brown Bear	*Ursus arctos*	U		
River Otter	*Lontra canadensis*	U		

Table 4. Continued.

Species Group/Common Name[b]	Scientific Name	Abundance[c]	Conservation Status[b]	
			USFWS BCC	ADFG At-risk
Wolverine	*Gulo gulo*	U		
Marten	*Martes americana*	C		
Ermine, Short-Tailed Weasel	*Mustela erminea*	C		
Least Weasel	*Mustela nivalis*	U		
Mink	*Neovison vison*	U		
Moose	*Alces americanus*	C		

[a] Bird species list compiled using data from eBird (2020). Mammal species list compiled using MacDonald and Cook (2009) and UAMN (2020), and modified for the Tanana Lakes Recreation Area based on the habitats available .
[b] Bird species of Conservation Concern (BCC) listed by USFWS (2008) and At-risk bird species listed by ADFG (2015).
[c] C = common; U = uncommon in the Tanana Lakes Recreation Area; does not account for seasonality.

Many of the species listed in eBird occur outside the breeding season and would not have been present when we conducted surveys in June 2020.

A list of mammals expected to occur in the study area was compiled from MacDonald and Cook (2009) and the University of Alaska Museum of the North mammal checklist for Alaska (UAMN 2020). This list was then modified for the TLRA by ABR senior mammologist, Brian Lawhead, based on his extensive field experience (over 30 years) studying mammals in Interior Alaska and specific knowledge of the habitats available in the TLRA study area. The list of mammals that are likely to occur in the study area includes 34 species composed of 13 species of small mammals (mice, voles, lemmings, and shrews), 2 squirrel species, 1 bat species, 15 furbearer species, and 3 species of large mammals (Table 4).

FIELD SURVEY RESULTS

Over the course of the two avian surveys conducted during the breeding season in early June 2020, 34 bird species were recorded in the TLRA study area; this included 3 waterbird, 2 gull, 4 shorebird, 2 raptor, and 23 landbird species (Table 5). Eighteen of these species were seen on both surveys. No mammals were observed in the study area during either avian survey.

Table 5. Number of birds recorded inside and outside the biological resources study area, and flyovers recorded during the breeding bird survey on 9 June 2020, Tanana Lakes Recreation Area, Fairbanks, Alaska. Species observed incidentally during the Bald Eagle survey on 2 June 2020 are denoted with an x.

Species group/ Common name	Number of Birds: Road Corridor In	Road Corridor Out	Remainder of Study Area[a] In	Remainder of Study Area[a] Out	Flyover[b]	Bald Eagle Survey
Waterbirds						
Canada Goose	0	1	0	0	1	x
Northern Shoveler	0	0	0	0	8	
Mallard	0	0	0	0	0	x
Seabirds						
Mew Gull	1	0	4	0	2	x
Herring Gull	0	0	0	0	0	x
Shorebirds						
Wilson's Snipe	1	0	0	0	0	
Spotted Sandpiper	2	0	0	0	0	
Solitary Sandpiper	1	0	0	0	0	
Lesser Yellowlegs	1	0	0	0	0	x
Raptors						
Osprey	0	0	0	0	0	x
Northern Harrier	0	0	0	0	0	x
Landbirds						
Hairy Woodpecker	0	0	0	0	0	x
Northern Flicker	1	0	0	0	0	x
Alder Flycatcher	1	2	1	1	0	x
Black-billed Magpie	0	0	0	0	0	x
Common Raven	0	0	1	0	1	x
Tree Swallow	1	0	0	0	0	x
Black-capped Chickadee	0	0	1	0	0	
Boreal Chickadee	1	0	0	0	0	
Swainson's Thrush	8	3	0	0	0	x
Hermit Thrush	1	0	0	0	0	
American Robin	2	1	0	1	1	x
Common Redpoll	0	0	0	0	3	x
White-winged Crossbill	0	0	0	0	2	
Dark-eyed Junco	0	1	1	1	0	x
White-crowned Sparrow	6	3	0	1	0	x
Savannah Sparrow	3	1	0	0	0	x
Lincoln's Sparrow	3	4	0	1	0	x
Orange-crowned Warbler	7	0	0	0	0	x
Yellow Warbler	5	0	1	3	0	x
Blackpoll Warbler	4	0	0	1	0	x
Yellow-rumped Warbler	5	3	0	2	0	x

Table 5. Continued.

Species group/ Common name	Number of Birds: Road Corridor In	Out	Remainder of Study Area[a] In	Out	Flyover[b]	Bald Eagle Survey
Townsend's Warbler	0	0	0	0	0	x
Wilson's Warbler	0	0	0	0	0	x
Total	54	19	9	11	22	26
% of all birds observed	49	17	8	10	20	–

[a] This includes birds observed in the swim beach area, the associated existing and proposed parking lots, and hiking trails.
[b] Flyovers are birds that pass over the study area and are not using habitats in the study area.

Bald Eagle Survey

The Bald Eagle survey was conducted from 0930–1430 on 2 June 2020. Weather during the survey was fair and included scattered drizzle in the afternoon and moderate temperatures in the mid-60s °F, conditions that were suitable for the detection of bird species.

No Bald Eagles were seen in the survey area, and no eagle nest platforms were located. Few balsam poplar trees in the study area are large enough to support an eagle nest. The nearest known Bald Eagle nest, which was active in 2004, is located well outside (1.3 km to the southeast) from the nearest outer boundary of the survey area for Bald Eagles (Figure 3; ABR unpublished data). It is not known whether this nest is still actively being used. No other raptor nests were found during the survey, but an Osprey (*Pandion haliaetus*) was observed flying across Cushman Lake adjacent to the swim beach and may be one of a pair that regularly nests on the barber pole along the Golden Valley Electric Association (GVEA) Northern Intertie transmission line, which is located approximately 1.5 km from the study area boundary. In addition, a Northern Harrier (*Circus hudsonius*) was observed hunting in the field at the northwestern corner of the study area. Although no Bald Eagles were observed, 26 other bird species were recorded during the survey (Table 5).

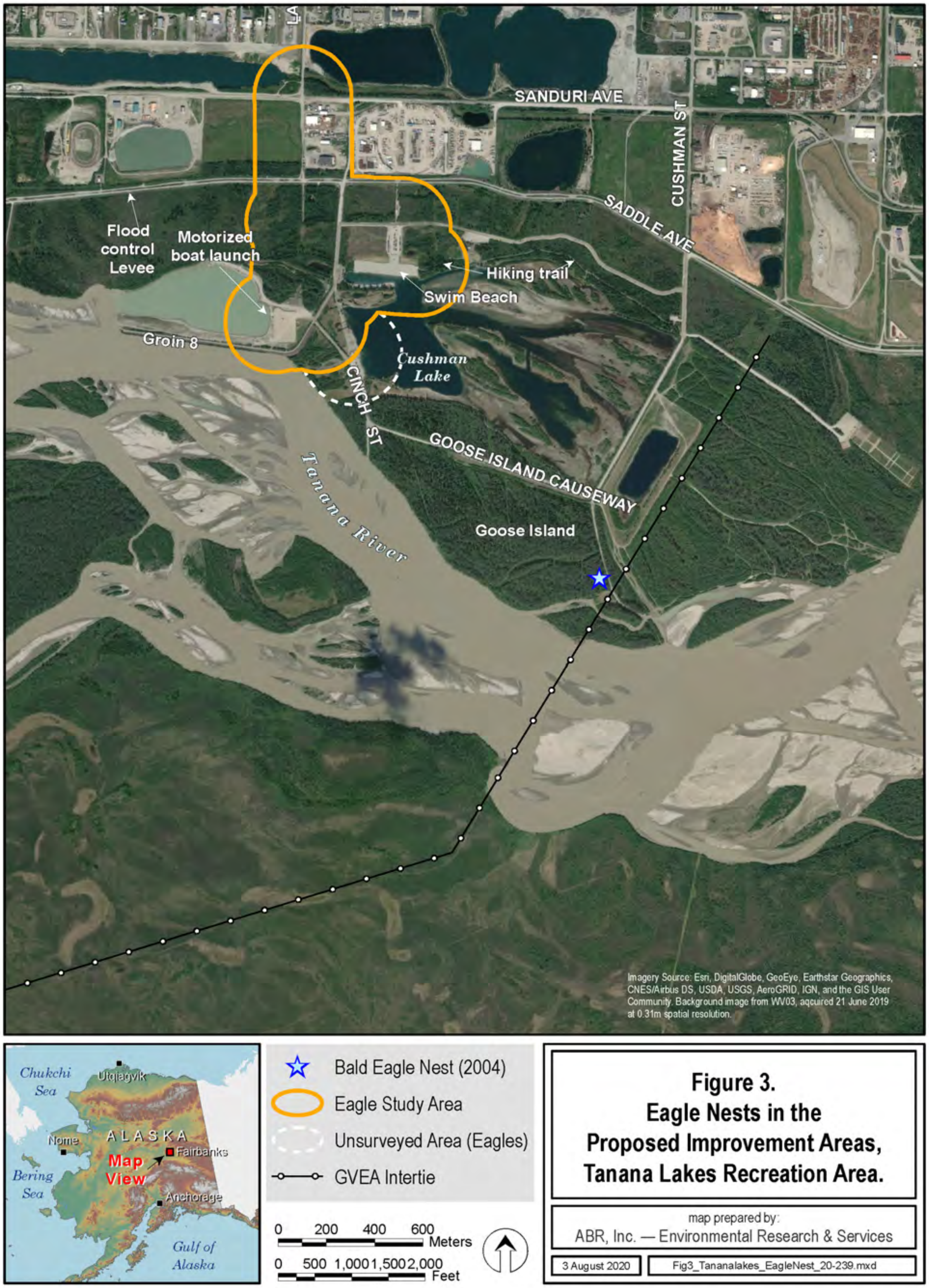


Figure 3. Eagle Nests in the Proposed Improvement Areas, Tanana Lakes Recreation Area.

Breeding Bird Census

The breeding bird census was conducted from 0400–1000 on 9 June 2020. Weather was in the low to mid-60s °F and mostly cloudy. There was no wind or precipitation during the survey, which provided ideal conditions for the detection of singing and calling birds.

Twenty-six bird species and 111 total birds were recorded during the one-day survey period, most of which were landbird species. Nearly 53% of all birds recorded (n = 59) were observed using habitats in the study area; 27% of all birds (n = 30) were located outside the study area and were typically identified at a distance by song; and another 20% (n = 22) were birds flying over the study area (Table 5).

One Boreal Chickadee (*Poecile hudsonicus*) was observed near the intersection of the proposed north-south road and the east-west swim beach access road with food and may have been feeding nestlings or fledglings. A pair of White-Crowned Sparrows (*Zonotrichia leucophrys*) was observed just north of the swim beach parking lot exhibiting aggressive behaviors consistent with nest defense. Both behavioral observations indicate that the survey date was appropriate to observe both resident and migrant breeding landbird species.

Forty-nine percent of all birds observed consisting of 19 species and 54 individual birds were recorded within the boundary of the proposed road corridor and buffer (Table 5). Species-habitat relationships in this portion of the study area were similar to those observed in a study of the Badger Watershed near Fairbanks (Martin et. al 1995), a site with comparable habitats also located near the Tanana River. Areas of low and tall alder and willow at the northern end of the road corridor and in patches throughout the study area, supported landbird species such as Yellow Warbler (*Setophaga petechia),* Orange-crowned Warbler (*Leiothypis celata*), and Alder Flycatcher (*Empidonax alnorum*). The northern end of the road corridor north of the levee is dominated by Moist Forb Meadow to the west and an unvegetated industrial site to the east, separated by a small dirt road. In these habitats, ground-nesting species such as Dark-eyed Junco (*Junco hyemalis*), Savannah Sparrow (*Passerculus sandwichensis*), and White-crowned Sparrow, and ground-foraging American Robins (*Turdus migratorius*) were observed. The Northern Harrier observed during the Bald Eagle survey was also hunting in this meadow. Several American Robins and Tree Swallows (*Tachycineta bicolor*) were observed on or near the road and within the industrial area. The forest habitats in the middle of the road corridor and extending to the east supported three bird species groups that composed ~ 94% of all observations within forest types in the road corridor. Warblers, thrushes, and sparrows comprised 44%, 29%, and 21%, respectively, of all observations in forests along the road corridor. Forest-dwelling Swainson's Thrush (*Catharus ustulatus*) was the most abundant species recorded in the road corridor (n = 8), and the forest-edge species, Orange-crowned Warbler, was the second most abundant bird recorded (n = 7; Table 5).

Though small in size, the Fresh Sedge Marsh extending south from the end of a dirt trail in the road corridor, and east towards the swim beach parking lot (nearly bound by a gravel road; Figure 2), was rich with bird species that were not observed elsewhere in the study area. This wetland and adjacent forest was being used by three of the four shorebird species recorded in the full study area. These shorebirds included Wilson's Snipe (*Gallinago delicata*), Solitary Sandpiper (*Tringa solitaria*), and Lesser Yellowlegs (*Tringa flavipes*). Solitary Sandpiper is listed as species of conservation concern by the U.S. Fish and Wildlife Service (USFWS 2008) and an at-risk by the Alaska Department of Fish and Game (ADFG 2015), and Lesser Yellowlegs is considered an at-risk species (Table 4), in both cases because of documented declines in their populations (Handel and Sauer 2017). Two male Blackpoll Warblers (*Setophaga striata*), considered an at-risk species (ADFG; Table 4), were also observed singing in the area of the Fresh Sedge Marsh. In the barrens near the motorized boat launch at the Tanana River, the only species observed (besides flyover species) were two Spotted Sandpipers (*Actitis macularius*).

Only 8% of all bird observations and six species were made in those portions of the study area surrounding the swim beach, parking lot, and associated trails (Table 5). The remaining 47% of observations included species recorded outside the TLRA study area boundaries and flyovers (Table 5). The low number and diversity of birds in the area of the swim beach parking lot and associated trails is undoubtedly due to the general lack of vegetation in these areas. Dark-eyed Junco, Alder Flycatcher, Yellow Warbler, and Black-capped Chickadee (*Poecile atricapillus*) were recorded within a small forest stand with adjacent tall shrubs (near a small parking area southwest of the swim beach; Figure 2). Only a Common Raven (*Corvus corax*) was observed in the parking lot and swim beach area, and several Mew Gulls (*Larus canus*) were observed in the swim beach area.

REGULATORY COMPLIANCE

As noted above, approximately 131 species of birds and 34 species of mammals are likely to occur in the TLRA on an annual basis (Table 4). Compliance with the Endangered Species Act (ESA; 16 USC. 1531) should be straightforward because no federally-protected threatened, endangered, or candidate species are likely to occur in the study area, and no critical habitat for federally-protected species exists within the study area. Because of this, no Section 7 consultation with the USFWS will be necessary. The TLRA is well outside the range of the four threatened species that occur in terrestrial habitats on the mainland of Alaska: Spectacled Eider (*Somateria fischeri*), Steller's Eider (*Polysticta stelleri*), polar bear (*Ursus maritimus*), and wood bison (*Bison bison athabascae*; ADFG 2020). The remaining threatened, endangered, and candidate species in Alaska either occur on the Aleutian Islands (i.e., the Aleutian shield fern [*Polystichum aleuticum*]), or are found exclusively in marine habitats (ADFG 2020).

Of the eight bird species that occur in the TLRA study area and are listed as species of conservation concern (USFWS 2008), seven are common, and one, Olive-sided Flycatcher (*Contopus cooperi*), is considered uncommon. In addition, 42 bird species are listed by the ADFG as at-risk species because of noted population declines or known threats during the breeding or non-breeding seasons. This includes 2 waterbird, 1 seabird, 11 shorebird, 6 raptor, and 22 landbird species (Table 4). Twenty-seven of these species are considered to be relatively common in abundance in the TLRA study area, if only seasonally (Table 4). No species of mammals likely to occur in the TLRA are listed by federal or state agencies.

The TLRA is within the range of Bald and Golden Eagles, both of which are protected by the BGEPA (50 CFR 22). Golden Eagles are very unlikely to occur in the study area due to the lack of suitable cliffs for nesting and open tundra habitats for foraging. While Golden Eagles are known to regularly nest in trees in other parts of their range (Kochert et al. 2020), there exist very few records of tree nests in Alaska (Ritchie and Curatolo 1982). The closest known Golden Eagle tree nests to the TLRA study area were found during raptor surveys in the Healy, Alaska area (Roseneau and Springer 1991), which is over 100 miles south of Fairbanks. All three nests in that study were located in the upper reaches of white spruce trees that were 30–50 m tall. Bald Eagles are likely to occur in the study area due to the presence of known nest sites in the region along the Tanana River (Figure 3) and suitable foraging habitats; however, no nesting structures were found in the study area during the surveys in summer 2020. In the event that a Bald Eagle nest is found in or very close to the study area, timing of construction activity in the vicinity could be adjusted to avoid disturbing the nest during the eagle breeding season, which is defined by the USFWS as April–July in Interior Alaska (USFWS 2020). This will facilitate project compliance with the BEGPA.

Of of the 131 bird species recorded in the TLRA, all except Rock Pigeon *Columba livia*) are protected under the Migratory Bird Treaty Act (MBTA; 16 USC 703). Because songbird, shorebird, and waterfowl nests are difficult to locate (and thus avoid), compliance with the MBTA typically requires that vegetation clearing and construction activities be performed outside the breeding bird season for Interior Alaska, defined by the USFWS (2017) as 1 May–15 July for all forest, shrub, and open habitats. In practice, this is easily accomplished by conducting vegetation clearing and construction activities in early spring before the bird breeding season and/or in late summer and fall after young of the year have fledged.

LITERATURE CITED

Alaska Center for Conservation Science (ACCS). 2019. Alaska Rare Vascular Plant Guide. Available at: <https://accscatalog.uaa.alaska.edu/dataset/alaska-rare-vascular-plant-field-guide>. Accessed 20 July 2020.

Alaska Center for Conservation Science (ACCS). 2020a. AKEPIC data portal. Available at: <https://aknhp.uaa.alaska.edu/apps/akepic/>. Accessed 20 July 2020.

Alaska Center for Conservation Science (ACCS). 2020b. Rare plant data portal. Available at: <https://aknhp.uaa.alaska.edu/apps/rareplants/#>. Accessed 20 July 2020.

Alaska Department of Fish and Game (ADFG). 2015. Alaska wildlife action plan. Juneau, AK. 228 pp.

Alaska Department of Fish & Game (ADFG). 2020. Federal special status species [website]. Available at: <https://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.fedendangered/>. Accessed 20 July 2020

Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., D. F. Stotz, and K. Winker. 2019. Check-list of North American Birds [website]. American Ornithological Society. Available at: <http://checklist.aou.org/taxa>. Accessed 5 August 2020.

eBird. 2020. Hotspot map Tanana Lakes Recreation Area [website]. Available at: <https://ebird.org/hotspot/L526888>. Accessed 20 July 2020.

Fairbanks Northstar Borough (FNSB) 2007. Tanana Lakes Recreation Area Master Plan. Prepared by the FNSB Department of Parks and Recreation and USKH Inc. Fairbanks, AK. 36 pp.

Handel, C.M., J. R. Sauer. 2017. Combined analysis of roadside and off-road breeding bird survey data to assess population change in Alaska, The Condor 119: 557–575.

Heidemann, M. 2010. Invasive Plant Management Recommendations for the Tanana Lakes Recreation Area. Prepared for the Fairbanks Northstar Borough, Fairbanks, AK, 36 pp.

Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2020. Golden Eagle (*Aquila chrysaetos*), version 1.0. In S. M. Billerman, ed. Birds of the World. Cornell Lab of Ornithology, Ithaca, NY. Available at: <https://doi.org/10.2173/bow.goleag.01>. Accessed 6 August, 2020.

MacDonald, S. O., and J. A. Cook. 2009. Recent mammals of Alaska. University of Alaska Press, Fairbanks, AK. 387 pp.

Martin, P.D., R.E. Spangler, and L.K. Bright. 1995. Bird use of habitats in the badger watershed near Fairbanks, AK. U.S. Fish and Wildlife Service, Technical report NAES-TR-95-1.

Plant Materials Center. 2017. Interior Alaska Elodea eradication project: environmental assessment. Alaska Department of Natural Resources, Department of Agriculture. Palmer AK. 71 pp.

Ritchie, R. J., and J. A. Curatolo. 1982. Notes on Golden Eagle productivity and nest site characteristics, Porcupine River, Alaska, 1979-1982. Raptor Research 16: 123–128.

Roseneau, D. G., and A. M. Springer. 1991. Raptor surveys in the vicinity of the Healy Clean Coal Project near Healy, Alaska, May 30-31 and July 21-22, 1991. Unpublished report for Stone & Webster Engineering Corporation, Englewood, CO, by Biosystems Alaska, Fairbanks, AK. 50 pp.

University of Alaska Museum of the North (UAMN). 2020. Mammals of Alaska [website]. Available at: <https://www.uaf.edu/museum/collections/mammal/current-mammal-species-of/>. Accessed 20 July 2020.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of conservation concern 2008. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Movements, Arlington, VA. 85 pp.

USFWS. 2017. Timing recommendations for land disturbance and vegetation clearing: planning ahead to protect nesting birds. Prepared by U.S. Fish and Wildlife Service, Region 7. Anchorage, AK. 2 pp.

USFWS. 2020. Bald Eagle nesting & sensitivity to human activity [website]. Available at: <https://www.fws.gov/alaska/pages/migratory-birds/eagles-other-raptors/bald-eagle-nesting-sensitivity-human-activity>. Accessed 24 July 2020.

Viereck, L.A., Dyrness, C.T., Batten, A.R., Wenzlick, K.J. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-286.

BIOLOGICAL RESOURCES IMPACTS REPORT FOR THE TANANA RIVER RECREATION ACCESS IMPROVEMENTS PROJECT: AK FNSB TANANA(1)

Prepared for:

PND Engineers Inc.
1506 W. 36th Ave
Anchorage, Alaska 99503

On behalf of:

Federal Highway Administration
Western Federal Lands Highway Division
610 E. 5th St
Vancouver, Washington 98661

Prepared by:
ABR, Inc.—Environmental Research & Services
P.O. Box 80410
Fairbanks, Alaska 99708-0410

and

P.O. Box 240268
Anchorage, Alaska 99524

September 2020

TABLE OF CONTENTS

TABLES

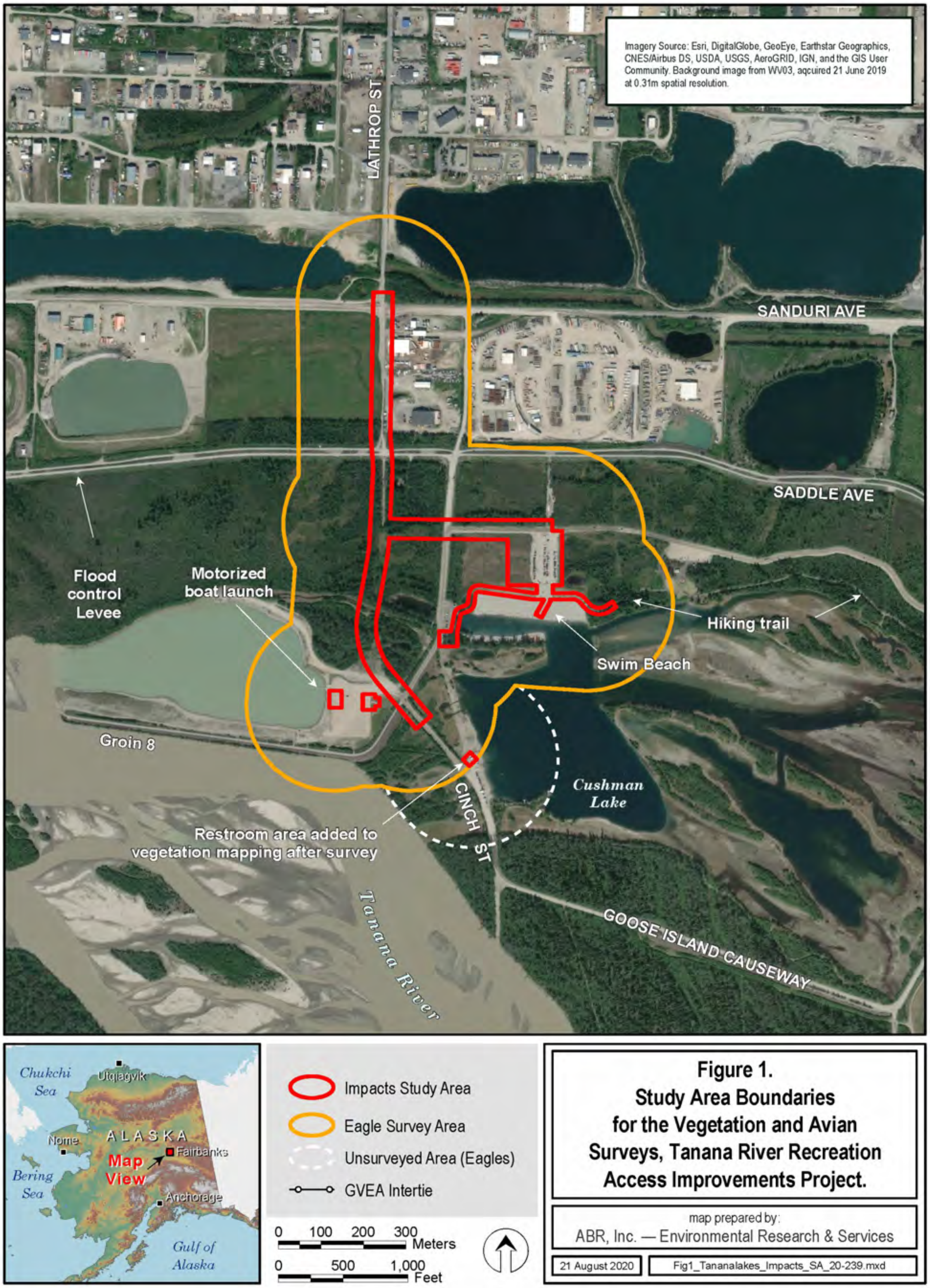
FIGURES

INTRODUCTION

The Tanana River Recreation Access Improvements Project is managed by the Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFLHD). The project is intended to construct a new access road, and improve and expand the hiking trails and user facilities at the Tanana Lakes Recreation Area (TLRA) in Fairbanks, Alaska, which is managed by Fairbanks North Star Borough (FNSB). PND Engineers Inc. (PND) is the engineering and environmental contractor to WFLHD and ABR, Inc.—Environmental Research & Services (ABR) was subcontracted to provide environmental support for the project. This impacts report is based on data in the draft biological resources survey report for the project (ABR 2020) and the proposed improvement plans for the project area, which lies primarily within the TLRA (see Study Area below). This report summarizes the impacts to botanical and wildlife resources that are likely to occur from construction and use of the proposed improvements. Following the specifications in the FHWA Statement of Work for the project, this report summarizes the likely impacts on botanical and wildlife resources and provides impact and assessment suggestions that may be used in subsequent consultation, permitting, and NEPA documents. The formal assessment of impacts will be conducted separately in the Environmental Assessment for the proposed project.

STUDY AREA

The TLRA is located on the south (river) side of the Tanana Flood Control levee in south Fairbanks. The portion of the study area north of the levee is outside of the TLRA boundary. The recreation area has been established around Cushman Lake, which was formed by the impounded waters of an active slough of the Tanana River (Figure 1). The Goose Island Causeway (a groin extension of South Cushman Street) and Groin 8 (an extension of Cinch Street) were constructed to create the freshwater Cushman Lake, which is suitable for recreation activities and habitat conservation. Groin 8 also protects the motorized boat launch area at the Tanana River. Following the master plan for the area (FNSB 2007), the TLRA was developed after 2012 to include a swimming beach on Cushman Lake, hiking trails, the motorized boat launch on the Tanana River, and the non-motorized boat launch on the shore of Cushman Lake.



Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Background image from WV03, aqcuired 21 June 2019 at 0.31m spatial resolution.
LATHROP ST
SANDURI AVE
SADDLE AVE
Flood control Levee
Motorized boat launch
Hiking trail
Swim Beach
Groin 8
Cushman Lake
CINCH ST
Restroom area added to vegetation mapping after survey
Tanana River
GOOSE ISLAND CAUSEWAY
Chukchi Sea
Utqiagvik
Nome
ALASKA
Map View
Fairbanks
Bering Sea
Anchorage
Gulf of Alaska
Impacts Study Area
Eagle Survey Area
Unsurveyed Area (Eagles)
GVEA Intertie
0 100 200 300 Meters
0 500 1,000 Feet
Figure 1.
Study Area Boundaries for the Vegetation and Avian Surveys, Tanana River Recreation Access Improvements Project.
map prepared by:
ABR, Inc. — Environmental Research & Services
21 August 2020
Fig1_Tananalakes_Impacts_SA_20-239.mxd

The biological resources study area for the project was defined in the FHWA Statement of Work as specific buffer zones surrounding areas of proposed infrastructure improvements. This included a buffer of 75 feet of either side of the proposed road centerlines, a buffer of 25 feet on either side of the proposed trail centerlines, a buffer of 25 feet around the proposed parking areas, and a buffer of 50 feet around the proposed restroom locations (Figure 1). In total, the biological resources study area encompasses approximately 23 acres. However, because the project footprint was finalized after the biological resources field survey and mapping work was completed, small portions of the footprint (0.6 acres total, see Results and Discussion below) were not included in the study area. The study area includes a proposed extension of South Lathrop Street to access the motorized boat launch on the Tanana River, a spur road from South Lathrop Street to the east to access the existing swim beach, and proposed improvements to the motorized boat launch facilities, the non-motorized boat launch facilities on the southwest side of Cushman Lake, and the facilities at the swim beach on the north side of Cushman Lake. With the exception of a short section of South Lathrop Street north of the Tanana Flood Control levee, the majority of the study area is on the Tanana River side of the levee, on both the east and west sides of Groin 8. Additional details on the study area can be found in ABR (2020).

METHODS

BOTANICAL RESOURCES

VEGETATION AND LAND COVER

Impacts to vegetation in the study area were evaluated in ArcGIS by overlaying the expected cut and fill boundaries (the footprint) of the proposed project improvements on the mapped vegetation and land cover types in the area. The cut and fill boundaries were provided by PND and the vegetation and land cover mapping was prepared by ABR. The two layers were intersected, using an ArcGIS analytical operation, to calculate the total acreage of each vegetation and land cover type that would be lost to cut and fill during construction. The acreage of each vegetation and land cover type within the vegetation and land cover mapping area, but outside the project footprint, was calculated to assess the additional acreage that could be altered during construction, operation, and maintenance of the proposed infrastructure.

NON-NATIVE AND RARE PLANTS

The potential for the spread of non-native vascular plants in the study area was discussed based on the current, known occurrences of non-native and especially invasive plant species in the study area. The potential for impacts on rare vascular plant taxa was discussed using documented records for rare plant taxa in a broad region surrounding the study area and specific survey results in the study area (ABR 2020).

WILDLIFE RESOURCES

BIRDS AND MAMMALS

Lists of the bird species known to occur and the mammal species likely to occur in the study area were prepared by ABR biologists prior to the field surveys. Field surveys for eagle nests and breeding birds were conducted in the study area in June 2020 . These data in association with the proposed project improvement plans were used to discuss the potential impacts to birds and mammals that could be expected from development of the proposed project.

RESULTS AND DISCUSSION

BOTANICAL RESOURCES

IMPACTS TO VEGETATION AND LAND COVER

Impacts on vegetation and land cover in the study area as a result of the proposed project improvements will generally fall into several broad categories including (1) direct loss of vegetation and land cover classes from cut and fill work during construction; (2) direct alteration of vegetation and land cover classes in areas adjacent to the new infrastructure from construction activities; and (3) indirect alteration of vegetation and land cover classes adjacent to the new infrastructure from operation and maintenance activities.

Direct loss of vegetation and land cover will occur in the study area as a result of cut and fill construction within the project footprint for the new proposed access road to the swim beach and the motorized boat launch, the construction of new trails and parking lots, and upgrades to the swim beach berm. In total, 12.6 acres of vegetation and land cover within the project footprint will be lost, which includes 15 vegetation and land cover types (Table 1). The Barren type

Table 1. Acres of vegetation and land cover types within the project footprint and mapping area for planned improvements, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska.

Vegetation/Land Cover Type	Footprint Acres	% of Footprint	Additional Acres Altered[a]
Barren	5.65	44.76	3.84
Partially Vegetated	0.27	2.16	0.18
Open Balsam Poplar	0.46	3.64	0.48
Open Spruce-Paper Birch	0.97	7.72	0.85
Open Spruce-Balsam Poplar	0.00	0.00	0.16
Open Black Spruce	0.41	3.24	0.52
Open Black Spruce-Tamarack	0.21	1.66	0.19
Seral Herbs	0.14	1.10	1.11
Moist Forb Meadow	0.56	4.47	0.57
Bluejoint-Herb	0.06	0.45	0.03
Fresh Sedge Marsh	0.96	7.57	0.47
Open Low Willow	0.84	6.62	1.63
Open Tall Alder	0.13	1.06	0.06
Open Tall Shrub Swamp	0.40	3.18	0.36
Open Tall Willow	0.81	6.41	0.53
Water	0.13	1.03	0.04
(outside of mapped area)	0.62	4.93	0.00
Totals	12.62	100.00	11.02

[a] Acreage within the vegetation and land cover mapping area, but outside the project footprint (see Study Area section above), that could be altered during construction, operation, and maintenance of the new infrastructure.

(barren gravel fill) is the most common single land cover class, covering 5.7 acres or 44.8% of the footprint area. The Partially Vegetated vegetation type covers 0.3 acre or 2.2% of the footprint area and represents areas that were previously cleared and are now regenerating with seeded grasses and colonizing weed species,. A set of 12 undisturbed vegetation types including forest stands, dwarf tree woodlands, open marshes, meadows, and early successional herbaceous classes cover between <0.1 and 1.0 acre each (0.4–7.7% of the footprint area). These 12 types combined encompass 6.0 acres or 47.1% of the footprint area. These vegetated areas will be used to a much greater degree by wildlife than cleared and partially vegetated areas (see Wildlife Resources below). Open water represents 0.1 acre or 1.0% of the project footprint. The project footprint was finalized after the biological resources field survey and mapping work was completed, and some portions of the footprint occur outside the area mapped for vegetation and land cover. These unmapped areas combined represent 0.6 acre or 4.9% of the project footprint (Figure 2). Inspection of the aerial photography indicates that the majority of these areas area would be classified as Barren.

Direct alteration of vegetation in the mapping area outside of and adjacent to the project footprint will occur due to disturbance from construction activities, and indirect alteration of vegetation in those areas is likely to occur from use of the new infrastructure. The use and staging of machinery outside of the project footprint during construction will damage the vegetation present. During operation and maintenance of the infrastructure, especially the new access road, fugitive dust deposition will occur and may contribute to the alteration of vegetation. In studies along the Dalton Highway in northern Alaska, fugitive dust accumulations were documented to impact vegetation up to 328 feet from the road edge (Walker and Everett 1987; Myers-Smith et al. 2006). Fugitive dust deposition in the study area likely will not be as extensive as along the Dalton Highway where truck traffic is more common, and can be minimized by keeping the speed limits low. Additional vegetation alteration may occur in areas outside of the project footprint from impounded drainages, drifted snow that can alter hydrologic patterns, and from snow plowing and snow dumping activities that can delay plant phenology during spring and contribute additional road gravel, fines, and contaminants to adjacent vegetation. A total of 11.0 acres, including the same 15 vegetation and land cover types present in the project footprint, occur in the mapping area outside the project footprint (Table 1, Figure 2). The vegetation types in this area are likely to be altered from operation and maintenance activities associated with the new infrastructure. As in the project footprint, the Barren type is the most common single land cover class in these areas, covering 3.8 acres or 34.8% of the area. The Partially Vegetated class covers 0.2 acres or 1.6% of the area. Combined, the 12 undisturbed natural vegetated types cover 7.0 acres or 63.2% of the mapped area outside the project footprint. Open water covers <0.1 acre or 0.4% of the area. One forest type, Open Spruce-Balsam Poplar, covering 0.2 acres or 1.5% of the mapped area outside the project footprint, does not occur in the project footprint.

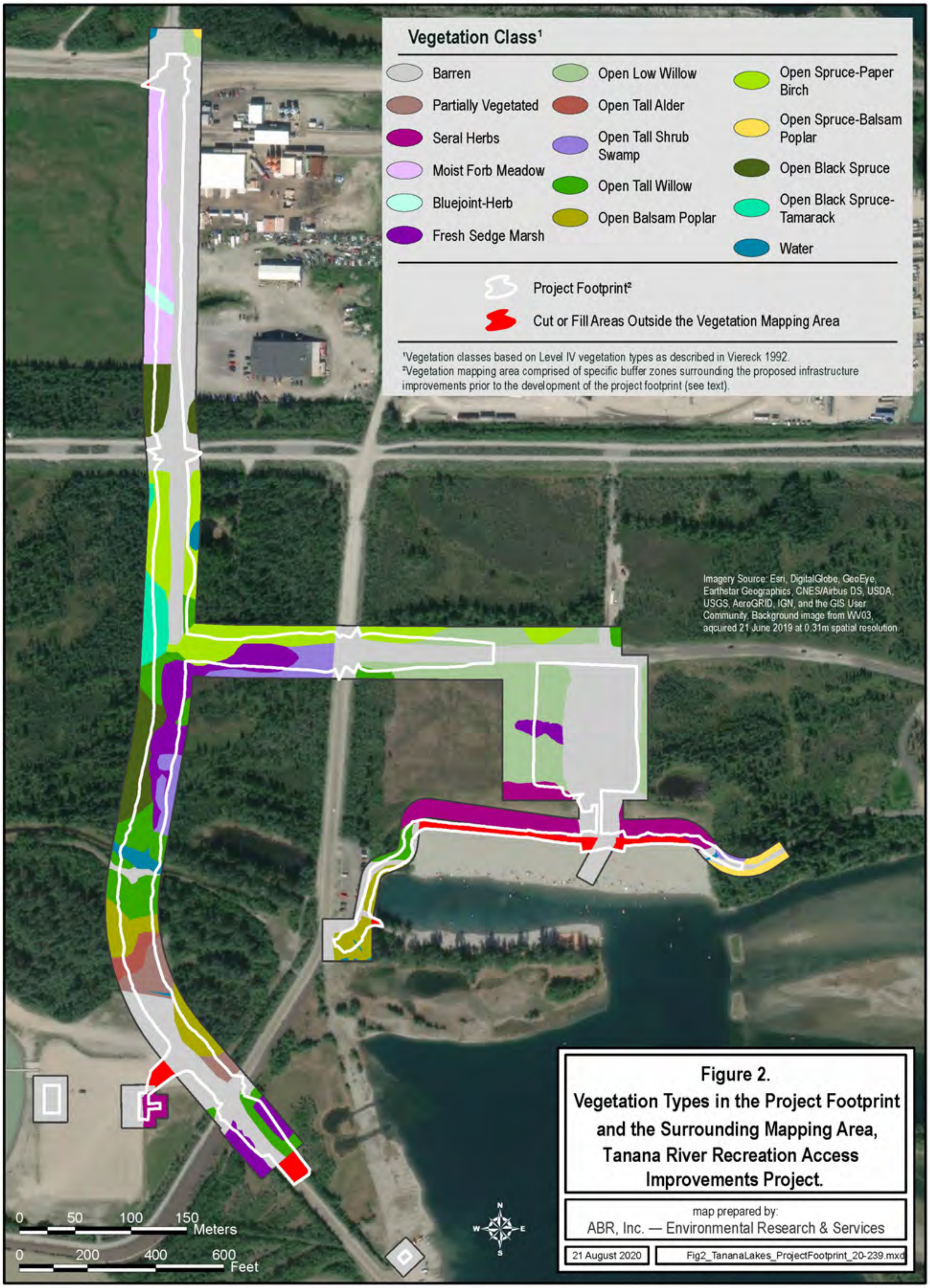


Figure 2.
Vegetation Types in the Project Footprint and the Surrounding Mapping Area, Tanana River Recreation Access Improvements Project.

POTENTIAL FOR SPREAD OF NON-NATIVE PLANT SPECIES

During the field survey in July 2020, ABR biologists recorded 13 non-native plant species in various locations throughout the study area. The majority were concentrated around the swim beach parking lot and berm and the fallow field along the western edge of South Lathrop Street. Four of the recorded species: white sweetclover (*Melilotus albus*), European bird cherry (*Prunus padus*), field sow-thistle (*Sonchus arvensis*), and bird vetch (*Viccia cracca*) have invasiveness ranking scores greater than 70, which indicates a weed with the potential to spread and affect communities of native plant species (ACCS 2020a). All four species have established populations in the study area and should be considered a risk for further spread into undisturbed areas (e.g., with the construction of the proposed new access road).

During the July 2020 survey, we did not record *Elodea* (Waterweed). *Elodea* (various species) is known to occur in both lotic and lentic waters in the Chena River basin (Plant Materials Center 2017) and, if not already present, should be of concern for spreading into waters within the TLRA. *Elodea* spreads primarily through the dispersal of vegetative propagules (roots and shoots) that can be present on recreational equipment such as boats, waders, boots, and fishing gear that have been used in infested waters.

IMPACTS TO RARE PLANT SPECIES

Only those species with state rarity listings of S1 (critically imperiled or endangered), S2 (imperiled), S1/S2, S3 (rare or uncommon) or S2/S3 (ACCS 2019) were evaluated for possible impacts. Species with state listings of S4 (apparently secure) or S3/S4 were not included. None of the rare and uncommon species tracked by ACCS are listed federally or by the State of Alaska as endangered, threatened, or candidate species.

There are no known occurrences of rare vascular plant taxa (those with listings of S3 or rarer) in the study area (ABR 2020). Similarly, although 28 taxa considered to be rare in Alaska by ACCS (2020b) have been recorded within a 100-km radius of the study area and suitable habitat also exists for these taxa in the study area, none have been found there. For these reasons, impacts to rare vascular plant taxa are not expected from the proposed improvements to the TLRA.

WILDLIFE RESOURCES

IMPACTS TO BIRDS

While we did not analyze impacts of the proposed improvements in the study area on bird use of the area, we can discuss the types of impacts that are likely to occur. Impacts will generally fall into several broad categories including (1) direct loss of habitat and habitat alteration from construction; (2) indirect loss of habitat from displacement of breeding and non-breeding birds; (3) changes in activity patterns and energetic impacts resulting from anthropogenic disturbance; (4) direct mortality from human activity including collisions with vehicles or structures and mortality from contaminants; and (5) indirect mortality from the attraction of predators to the area.

Habitat loss and alteration will occur in the study area as a result of the construction of the new proposed access road to the swim beach and the motorized boat launch. This will include direct habitat loss from cut and fill for the new road and habitat alteration from vegetation damage and fugitive dust in areas adjacent to the road due to construction impacts and use of the new road. Portions of the new access road will be built in relatively undisturbed forest, wetland, and meadow habitats in which the greatest number of breeding bird species (19 of 26 species observed in the study area) were recorded during the field surveys in June 2020. As noted below in the Regulatory Compliance section, the take (disturbance and mortality) of breeding birds protected under the Migratory Bird Treaty Act (MBTA) can be avoided by conducting all vegetation clearing activities outside of the bird nesting season in Interior Alaska, which has been defined by the U.S. Fish and Wildlife Service (USFWS) as 1 May–15 July (USFWS 2017). Similarly, there should be no concerns for project compliance with the Bald and Golden Eagle Protection Act (BGEPA) because no Bald or Golden Eagle nests were found in June 2020 in the study area that included a 660-ft eagle survey buffer. The closest known eagle nest to the study area occurs roughly 1.3 km outside the 660-ft eagle survey buffer (Figure 3). This nest was active in 2004 (unpublished ABR data from the Golden Valley Electric Association Northern Intertie project [Shook et al. 2009]) and is currently of unknown status.

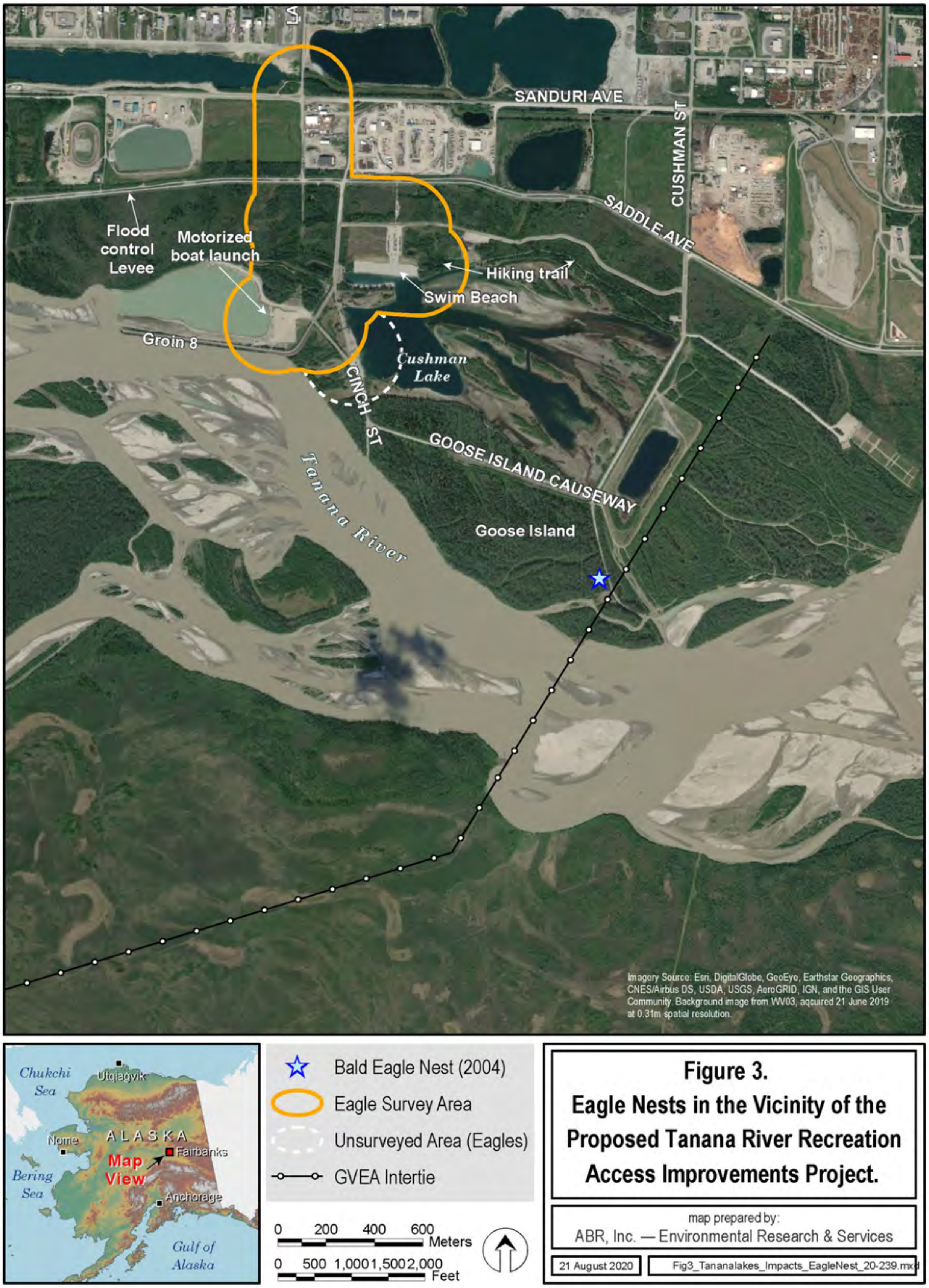


Figure 3. Eagle Nests in the Vicinity of the Proposed Tanana River Recreation Access Improvements Project.

map prepared by:
ABR, Inc. — Environmental Research & Services

21 August 2020 | Fig3_Tananalakes_Impacts_EagleNest_20-239.mxd

After construction of the new access road, the group of 19 breeding bird species and 54 individual birds that are assumed to have portions of their breeding territories in the road corridor area (ABR 2020) are likely to be displaced. This includes 14 passerine species, 4 shorebird species, and 1 gull species (Table 2). Eight of the 14 passerine species are considered to be of conservation concern and are listed as at-risk species by the State of Alaska (ADFG 2015). This includes Alder Flycatcher (*Empidonax alnorum*), Tree Swallow (*Tachycineta bicolor*), Boreal Chickadee (*Poecile hudsonicus*), Swainson's Thrush (*Catharus ustulatus*), White-crowned Sparrow (*Zonotrichia leucophrys*), Savannah Sparrow (*Passerculus sandwichensis*), Yellow Warbler (*Setophaga petechia*), and Blackpoll Warbler (*Setophaga striata*; Table 2). Three of the four shorebird species—Spotted Sandpiper (*Actitis macularius*), Solitary Sandpiper (*Tringa solitaria*), and Lesser Yellowlegs (*T. flavipes*)—are considered to be at-risk species by ADFG (2015). Solitary Sandpiper is also listed as a species of conservation concern by the USFWS (2008).

After displacement from construction of the new access road, these birds may need to find alternative breeding habitat nearby. The likelihood that they will find suitable, alternative breeding habitat nearby in the floodplain of the Tanana River is unknown, but the numbers of birds involved (54) is relatively small. In contrast, the effects of displacement of migrant birds that currently use habitats in the road corridor will be of much less magnitude than for breeding birds because migrant birds are not philopatric to breeding territories and they can move, often in flocks, to a variety of nearby habitats in which to forage.

The effects of the proposed improvements on breeding birds in all portions of the study area outside of the new proposed road corridor will be of much less magnitude because the majority of these areas have been previously cleared and/or filled for the construction of existing infrastructure. Because of this, these areas were found to be used by many fewer breeding bird species (6) and only 9 individual birds (Table 2). Similarly, because of the general lack of vegetation and habitat diversity, these areas outside of the proposed road corridor will also be used by fewer numbers of migrant bird species.

Table 2. Breeding bird species recorded in the proposed access road corridor and in the remainder of the biological resources study area, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska.

Species Group/ Common Name	Scientific Name	No. in Road Corridor[a]	No. in Remainder of Study Area[a]	Conservation Status[b]	
				USFWS BCC	ADFG At-risk
Seabird					
Mew Gull	*Larus canus*	1	4		
Shorebirds					
Wilson's Snipe	*Gallinago delicata*	1	0		
Spotted Sandpiper	*Actitis macularius*	2	0		X
Solitary Sandpiper	*Tringa solitaria*	1	0	X	X
Lesser Yellowlegs	*Tringa flavipes*	1	0		X
Landbirds					
Northern Flicker	*Colaptes auratus*	1	0		
Alder Flycatcher	*Empidonax alnorum*	1	1		X
Common Raven	*Corvus corax*	0	1		
Tree Swallow	*Tachycineta bicolor*	1	0		X
Black-capped Chickadee	*Poecile atricapillus*	0	1		
Boreal Chickadee	*Poecile hudsonicus*	1	0		X
Swainson's Thrush	*Catharus ustulatus*	8	0		X
Hermit Thrush	*Catharus guttatus*	1	0		
American Robin	*Turdus migratorius*	2	0		
Dark-eyed Junco	*Junco hyemalis*	0	1		
White-crowned Sparrow	*Zonotrichia leucophrys*	6	0		X
Savannah Sparrow	*Passerculus sandwichensis*	3	0		X
Lincoln's Sparrow	*Melospiza lincolnii*	3	0		
Orange-crowned Warbler	*Leiothlypis celata*	7	0		
Yellow Warbler	*Setophaga petechia*	5	1		X
Blackpoll Warbler	*Setophaga striata*	4	0		X
Yellow-rumped Warbler	*Setophaga coronata*	5	0		
Total		54	9		

[a] Birds recorded during the breeding bird census conducted on 9 June 2020 (ABR 2020).
[b] Bird species of Conservation Concern (BCC) listed by USFWS (2008) and At-risk bird species listed by ADFG (2015).

Changes in bird activity patterns and energetic impacts from disturbance will be most pronounced in those vegetated areas adjacent to the new proposed access road, where construction disturbance and disturbance from vehicles using the new road will occur. Disturbance effects will include increased noise and altered light levels. These auditory and visual disturbances could disrupt bird activity patterns and energetics. New and larger parking lots could also increase vehicular disturbance to birds. Increased visitor traffic along the new access road and upgraded trails could further disturb breeding and foraging birds.

Direct mortality from collisions with vehicles and new infrastructure, and mortality from contaminants are potential concerns for all bird species. These impacts are likely to be uncommon but the magnitude (mortality) will be high. Choices in lighting in particular will determine how great an impact built structures in the study area will have on bird collisions. The USFWS and other organizations have issued standards and recommendations for reducing bird collision hazards with infrastructure, which can decrease the likelihood of avian collisions if implemented (USFWS 2016). Increases in vehicle collisions may result from increases in the number of personal vehicles in the TLRA. As more surfaces in the area such as parking lots, roads, and trails are hardened, the application of de-icing solutions might become more frequent. Snow dumps in parking lots may result in release of road salts into nearby waterways, affecting invertebrates, fish, and bird species. Additionally, landbirds are known to consume road salt directly and may die as a result (Mineau and Brownlee 2005).

The proposed improvements could indirectly result in higher bird mortality due to the increased presence of predators in the area. This could result in higher levels of predation of birds and their nests. Species such as Common Ravens, Bald Eagles, gulls, bears, foxes, and coyotes are well known to be predators on birds, especially bird nests and young broods. These impacts, however, may not be increased substantially above existing conditions in the study area because each of these predatory species is already expected to be common in the area (ABR 2020). In addition to natural predators, higher numbers of off-leash dogs from increased human use of the recreation area could result in higher levels of predation on birds.

IMPACTS TO MAMMALS

This section discusses the types of impacts to be expected on mammals in the study area as a result of the proposed project improvements. Impacts will generally fall into several broad categories including (1) direct loss of habitat and habitat alteration from construction; (2) indirect loss of habitat from displacement or disruption of movements; (3) changes in the abundance or availability of food or other important resources; (4) changes in activity patterns with associated energetic impacts caused by disturbance; and (5) direct mortality from human activity including hunting, vehicle collisions, or defense of life or property.

Up to 34 species of mammals are likely to occur in the study area during some portion of the year (ABR 2020). Of these, 19 species are expected to be common in the area (Table 3), and because of their abundance they are more likely than uncommon species to be affected by the proposed improvements. Impacts on mammals will vary according to the mammal species in question but the direct loss of habitat and habitat alteration from construction, and the indirect loss of habitat from displacement, especially in the new access road corridor area where native forest, wetland, and meadow habitats occur, will almost certainly be the most substantial impacts on all mammal species. From a regional perspective, given the relatively limited extent of the naturally vegetated areas to be affected (6.0 acres in the footprint and 7.0 acres potentially disturbed outside of the footprint; Table 1), the numbers of individual mammals to be affected may be low. This is especially likely for large mammals such as moose (*Alces americanus*) and black bears (*Ursus americanus*), and wide-ranging furbearers such as red fox (*Vulpes vulpes*) and coyote (*Canis latrans*) that have large home range sizes. For other mammal species with smaller home ranges and small mammals in particular (because they can occur at high densities in some years), the numbers of individual mammals to be affected will be greater.

Changes in the abundance or availability of food from vegetation clearing and disturbance is likely to affect mammals to a lesser degree than habitat loss as sufficient forage will almost certainly be available in nearby vegetated areas. For example, moose that preferentially forage on willow shrubs (*Salix* spp.) in open forests and forest edges, especially during the winter months, likely will be able to find sufficient willow stands elsewhere in riparian areas in the Tanana River floodplain.

Table 3. Mammal species expected to occur commonly in the biological resources study area, Tanana River Recreation Access Improvements Project, Fairbanks, Alaska.

Common Name	Scientific Name
Red Squirrel	*Tamiasciurus hudsonicus*
Northern Flying Squirrel	*Glaucomys sabrinus*
Beaver	*Castor canadensis*
Tundra Vole, Root Vole	*Microtus oeconomus*
Meadow Vole	*Microtus pennsylvanicus*
Northern Red-Backed Vole	*Myodes rutilus*
Muskrat	*Ondatra zibethicus*
Porcupine	*Erethizon dorsatum*
Snowshoe Hare	*Lepus americanus*
Common Shrew, Cinereus Shrew	*Sorex cinereus*
Dusky Shrew	*Sorex monticola*
Little Brown Bat	*Myotis lucifugus*
Lynx	*Lynx canadensis*
Coyote	*Canis latrans*
Red Fox	*Vulpes vulpes*
Black Bear	*Ursus americanus*
Marten	*Martes americana*
Ermine, Short-Tailed Weasel	*Mustela erminea*
Moose	*Alces americanus*

Changes in activity patterns with associated energetic impacts induced by disturbance from human activities may represent a minor impact to mammals because in the study area mammals such as bears, for example, are not heavily dependent on a single food source such as spawning salmon, which often occur in distinct locations along streams. There is also evidence that in some cases brown bears may be able to maintain adequate food intake despite changes in their behavior because of human activities (Rode et al. 2006). Some mammals are also well known to alter their patterns of diurnal and nocturnal foraging behaviors to avoid interactions with humans during daylight hours.

The direct mortality of mammals from illegal hunting and defense of life or property actions is a concern only for large mammals and furbearers, whereas collisions with vehicles could occur for all mammal species. Collisions with vehicles are likely to be uncommon if road speed limits are set low, allowing mammals sufficient time to cross the new access road. Overall, these mortality impacts are likely to be uncommon but the magnitude (mortality) will be high.

REGULATORY COMPLIANCE

Approximately 131 species of birds and 34 species of mammals are likely to occur in the study area on an annual basis. Compliance with the Endangered Species Act (ESA; 16 USC. 1531) will be straightforward for the project because no federally-protected threatened, endangered, or candidate species are likely to occur in the study area, and no critical habitat for federally-protected species exists within the study area. Because of this, no Section 7 consultation with the USFWS will be necessary. The study area is well outside the range of the four threatened species that occur in terrestrial habitats on the mainland of Alaska: Spectacled Eider (*Somateria fischeri*), Steller's Eider (*Polysticta stelleri*), polar bear (*Ursus maritimus*), and wood bison (*Bison bison athabascae*; ADFG 2020). The remaining threatened, endangered, and candidate species in Alaska either occur on the Aleutian Islands (i.e., the Aleutian shield fern [*Polystichum aleuticum*]), or are found exclusively in marine habitats (ADFG 2020).

The study area is within the range of Bald and Golden Eagles, both of which are protected by the BGEPA (50 CFR 22). Golden Eagles are very unlikely to occur in the study area due to the lack of suitable cliffs for nesting and open tundra habitats for foraging. The closest known Golden Eagle tree nests to the study area were found during raptor surveys in the Healy, Alaska area (Roseneau and Springer 1991), which is over 100 miles south of Fairbanks. Bald Eagles are likely to occur in the study area due to the presence of known nest sites in the region along the Tanana River (Figure 3) and suitable foraging habitats; however, no nesting structures were found in the study area during the surveys in summer 2020 (ABR 2020). In the event that a Bald Eagle nest is found in or very close to the study area, timing of construction activity in the vicinity could be adjusted to avoid disturbing the nest during the eagle breeding season, which is defined by the USFWS as April–July in Interior Alaska (USFWS 2020). This will facilitate project compliance with the BEGPA.

Of the 131 bird species recorded in the study area (ABR 2020), all except Rock Pigeon (*Columba livia*) are protected under the Migratory Bird Treaty Act (MBTA; 16 USC 703). Because songbird, shorebird, and waterfowl nests are difficult to locate (and thus avoid), compliance with the MBTA typically requires that vegetation clearing and construction activities be performed outside the breeding bird season for Interior Alaska, defined by the USFWS (2017) as 1 May–15 July for all forest, shrub, and open habitats. In practice, this is easily accomplished by conducting vegetation clearing and construction activities in early spring before the bird breeding season and/or in late summer and fall after young of the year have fledged.

LITERATURE CITED

ABR, Inc.—Environmental Research & Services (ABR). 2020. Biological Resources Survey Report for the Proposed Tanana River Recreation Access Improvements Project: AK FNSB TANANA(1). Final report prepared for PND, Engineers, Inc., Anchorage, AK, and Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 30 pp.

Alaska Center for Conservation Science (ACCS). 2019. Alaska Rare Vascular Plant Guide. Available at: <https://accscatalog.uaa.alaska.edu/dataset/alaska-rare-vascular-plant-field-guide>. Accessed 20 July 2020.

Alaska Center for Conservation Science (ACCS). 2020a. AKEPIC data portal. Available at: <https://aknhp.uaa.alaska.edu/apps/akepic/>. Accessed 20 July 2020.

Alaska Center for Conservation Science (ACCS). 2020b. Rare plant data portal. Available at: <https://aknhp.uaa.alaska.edu/apps/rareplants/#>. Accessed 20 July 2020.

Alaska Department of Fish and Game (ADFG). 2015. Alaska wildlife action plan. Juneau, AK. 228 pp.

Alaska Department of Fish & Game (ADFG). 2020. Federal special status species [website]. Available at: <https://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.fedendangered/>. Accessed 20 July 2020

Fairbanks Northstar Borough (FNSB) 2007. Tanana Lakes Recreation Area Master Plan. Prepared by the FNSB Department of Parks and Recreation and USKH Inc. Fairbanks, AK. 36 pp.

Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2020. Golden Eagle (*Aquila chrysaetos*), version 1.0. In S. M. Billerman, ed. Birds of the World. Cornell Lab of

Ornithology, Ithaca, NY. Available at: <https://doi.org/10.2173/bow.goleag.01>. Accessed 6 August, 2020.

Mineau, P., and L. J. Brownlee. 2005. Road salts and birds: an assessment of the risk with particular emphasis on winter finch mortality. Wildlife Society Bulletin 33: 835–841.

Myers-Smith I. H., B. K., Arnesenm, R. M. Thompson, and F. S. Chapin III. 2006. Cumulative impacts on Alaskan arctic tundra of a quarter century of road dust. Ecoscience 13: 503–510.

Plant Materials Center. 2017. Interior Alaska Elodea eradication project: environmental assessment. Alaska Department of Natural Resources, Department of Agriculture. Palmer AK. 71 pp.

PND Engineers, Inc. (PND). 2019. Scoping Report: Tanana Lakes Recreation Area, Fairbanks North Star Borough, Alaska, AK FNSB TANANA(1), Tanana River Recreation Access Improvements. Prepared for Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, WA. 59 pp.

Ritchie, R. J., and J. A. Curatolo. 1982. Notes on Golden Eagle productivity and nest site characteristics, Porcupine River, Alaska, 1979-1982. Raptor Research 16: 123–128.

Rode, K. D., S. D. Farley, and C. T. Robbins. 2006. Behavioral responses of brown bears mediate nutritional effects of experimentally introduced tourism. Biological Conservation 133: 70–80.

Roseneau, D. G., and A. M. Springer. 1991. Raptor surveys in the vicinity of the Healy Clean Coal Project near Healy, Alaska, May 30-31 and July 21-22, 1991. Unpublished report for Stone & Webster Engineering Corporation, Englewood, CO, by Biosystems Alaska, Fairbanks, AK. 50 pp.

Shook, J. E., R. H. Day, J. P. Parrett, A. K. Prichard, and R. J. Ritchie. 2009. Monitoring interactions of birds with the Northern Intertie powerline, Interior Alaska, 2004–2006. Report prepared for Golden Valley Electric Association, Inc., Fairbanks, AK, by ABR, Inc.—Environmental Research & Services, Fairbanks, AK. 83 pp.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of conservation concern 2008. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Movements, Arlington, VA. 85 pp.

USFWS. 2016. Reducing bird collisions with buildings and building glass: best practices. Unpublished report by Division of Migratory Bird Management, Falls Church, VA. 17 pp.

USFWS. 2017. Timing recommendations for land disturbance and vegetation clearing: planning ahead to protect nesting birds. Prepared by U.S. Fish and Wildlife Service, Region 7. Anchorage, AK. 2 pp.

USFWS. 2020. Bald Eagle nesting & sensitivity to human activity [website]. Available at: <https://www.fws.gov/alaska/pages/migratory-birds/eagles-other-raptors/bald-eagle-nesting-sensitivity-human-activity>. Accessed 24 July 2020.

Walker, D. A., and K. R. Everett. 1987. Road dust and its environmental impact on Alaskan taiga and tundra. Arctic and Alpine Research 19: 479–489.

IPaC **U.S. Fish & Wildlife Service**

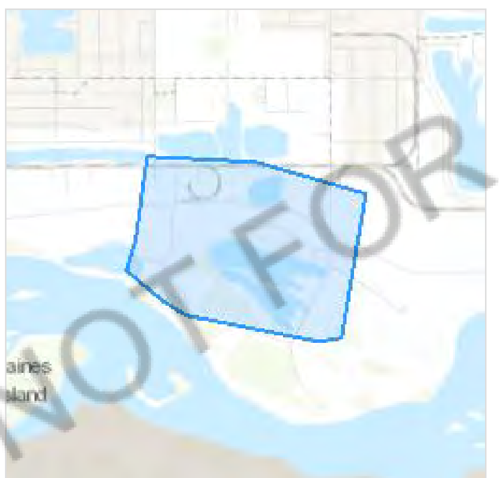
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Fairbanks North Star County, Alaska



Local office

Fairbanks Fish And Wildlife Conservation Office

(907) 456-0203
(907) 456-0208

MAILING ADDRESS
101 12th Avenue
Room 110
Fairbanks, AK 99701-6237

PHYSICAL ADDRESS

101 12th Avenue, Room 110
Fairbanks, AK 99701-6237

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS

ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

American Golden-plover *Pluvialis dominica*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 20 to Aug 15

Bald Eagle *Haliaeetus leucocephalus*
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626
Breeds Feb 1 to Sep 30

Golden Eagle *Aquila chrysaetos*
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680
Breeds Jan 1 to Aug 31

Hudsonian Godwit *Limosa haemastica*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 15 to Jul 31

Lesser Yellowlegs *Tringa flavipes*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679
Breeds May 1 to Aug 15

Olive-sided Flycatcher *Contopus cooperi*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914
Breeds May 20 to Aug 31

Rusty Blackbird *Euphagus carolinus*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Jul 20

Semipalmated Sandpiper *Calidris pusilla*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds elsewhere

Whimbrel *Numenius phaeopus*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483
Breeds May 10 to Aug 20

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

SPECIES

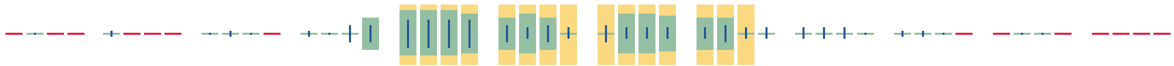
American Golden-plover
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

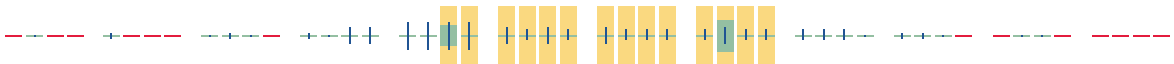
Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Hudsonian Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

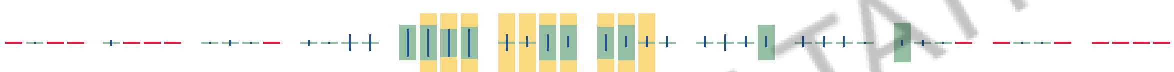
Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



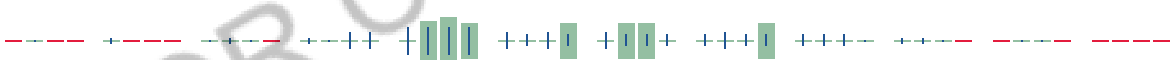
Olive-sided Flycatcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



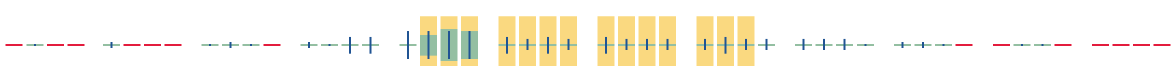
Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Whimbrel
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1B
- PEM1Cx
- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1B
- PSS1/3B
- PSS1/USA
- PSS/EM1B
- PSS4/1B
- PSS/EM1C

FRESHWATER POND

- PUBHx
- PUBH

LAKE

- L1UBH
- L1UBHx

RIVERINE

- R2UBG
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix D – Air Quality Conformity Meeting Summary

U.S. Department of Transportation
Federal Highway Administration

Memorandum

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661-3801

INTERAGENCY CONSULTATION
TANANA RIVER RECREATION IMPROVEMENTS
AIR QUALITY CONFORMITY

March 3, 2021 • 10:00 – 11:00 a.m. • TEAMS Web Conference

MEETING NOTES

Attendees	**Organization**
Adeyemi Alimi	ADEC
Cynthia Heil	ADEC
Randi Bailey	Alaska DOT&PF
Adam Moser	Alaska DOT&PF
Karl Pepple	EPA Region 10
Jackson Fox	FAST Planning
Stephen Morrow	FHWA
Brandon Stokes	FHWA
Jennifer Chariarse	FHWA
Leigh Oesterling	FHWA
George Noel	FHWA
Melissa Goldstein	FHWA
Paul Kendall	PND Engineering, Inc. (consultant)
Anna Kopitov	PND Engineering, Inc. (consultant)

Summary
Stephen Morrow led the meeting with introductions and a summary of the Tanana River Recreation (TRRA) Improvements Project. He presented a project figure showing the proposed road extensions and other project elements. He also stated the purpose of the meeting was to discuss the project-level Air Quality Conformity of the TRRA Improvements Project. Karl Pepple asked if the project was part of the latest Regional Conformity Analysis. Jackson Fox confirmed the project north of the levee was part of Fairbanks Metropolitan Area Transportation System (FMATS) and is within the Transportation Improvement Plan TIP/metropolitan planning area boundary and received a conformity determination. However, it is not clear if the project was included in sufficient detail. The area south of the levee is within a *donut area* outside of the metropolitan planning area boundary (just south of the Tanana Levee). Both the TRRA Improvements project and Tanana Lake Recreation Area are inside the PM 2.5 nonattainment area.

Leigh Oesterling asked if Cinch Street would be closed. Paul Kendall stated that Cinch Street would be gated at the levee/Cinch Street with additional gates installed at Cinch Street and Northlake Lane and at a pedestrian trail. This would limit Cinch Street to pedestrian access.

Adeyemi Alimi asked if the project was in a CO Maintenance area? Jackson Fox confirmed that it was not within a CO Maintenance area.

Mr. Fox also explained that the South Lathrop Street extension was included in the FMATS 2045 Metropolitan Transportation Plan (MTP) Air Quality Conformity Analysis and Transportation Improvement Plan (TIP); however, he was unsure of whether the analysis included the specific project information in the model. He confirmed that headbolt plug-ins were not part of the conformity analysis, as these were a later addition. Mr. Morrow noted that the headbolt plug-ins would result in net benefit to PM 2.5 and Mr. Fox added that plug-ins are not a conformity concern. Mr. Morrow added that paving South Lathrop Street Extension and Northlake Lane would reduce fugitive dust conditions generated by the existing gravel roads. Mr. Fox agreed that pavement would reduce dust conditions and benefit both PM 10 and PM 2.5 conditions.

Ms. Oesterling noted that it is likely that the question of regional emissions analysis would not need to be reopened as long as the Transportation Improvement Plan (TIP) analysis included the project information. Ms. Oesterling added that the next steps of the interagency conference would be to determine if the TRRA Improvements project is part of a conforming plan or TIP, and then whether the project is a local air quality concern to the interagency group. Ms. Oesterling noted, in her assessment, that the project was not of air quality concern.

Mr. Pepple asked if the project area was a recreation area. Mr. Morrow responded affirmatively and added that the TLRA provides year-round recreation (e.g., ice fishing, boating, swimming, ice skating), provides access to the Tanana River via Tanana Lake motorized boat launch, and public access to federal lands of Fort Wainwright for recreation purposes (e.g., hunting, food gathering [berries]). Mr. Adam Moser also inquired if the project was a standalone project or if the DOT has an associated project. Brandon Stokes and Mr. Fox clarified that the FHWA is delivering the project (design and construction management), but DOT is providing design for overhead powerlines and plugins.

There was consensus among the agencies that the project did not pose a local air quality concern. Mr. Fox stated the project was in the TIP, and the project was not of air quality concern. Mr. Pepple stated that as long as it was confirmed the project was part of the TIP there is no need to update the regional emissions analysis. Mr. Pepple also concurred that the project was not of air quality concern. Mr. Alimi stated that as long as it was confirmed the project was part of the TIP there is no need to update the regional emissions analysis., Mr. Alimi concurred the project was not of local air quality concern. Mr. Morrow restated for confirmation the agency comments that there were no local air quality concerns and that additional project-level modeling would not be required.

Ms. Oesterling summarized the requirements for a project-level conformity determination, including documenting that interagency consultation was completed (pending feedback from Mr. Fox).

Mr. Alimi requested that NEPA mitigation measures controlling dust during construction be included. FHWA agreed and requested specific language if available. Mr. Alimi agreed to provide example language, if needed. Mr. Pepple and Mr. Morrow agreed that dust control should be included as best management practices (BMPs) and addressed in the environmental assessment. Mr. Morrow also informed the conference that the environmental assessment is scheduled for release in late April with a 30-day public comment period.

Next steps:

i. Is the project part of a conforming plan/TIP? Yes, but Mr. Fox to confirm. **Confirmation** –Mr. Fox confirmed March 9, 2021 the Lathrop Street Extension project (south of the levee) was included in the Regional Conformity Analysis for Fairbanks Metropolitan Area Transportation System Metropolitan Transportation Plan.
ii. Is the project of local air quality concern? No.
iii. FHWA to prepare a formal conformity determination that would be included in the environmental assessment. Ms. Oesterling offered to provide example.
iv. FHWA will provide a summary of the meeting to be distributed to attendees for comments/edits. A final summary of meeting notes will be included in the environmental assessment.

There were no further comments or questions. Mr. Morrow stated the FHWA would draft meeting notes and email attendees for edits. He thanked everyone for their time and attendance and ended the meeting at 11:00 a.m.

Appendix E – Section 4(f) Net Benefit Programmatic Evaluation

Appendix F – Tribal Coordination Letters

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable William Miller, President
Village of Dot Lake
P.O. Box 70494,
Fairbanks, AK 99701-0494

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear President Miller,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Village of Dot Lake regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Village of Dot Lake. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Village of Dot Lake believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Monday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:27:30 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

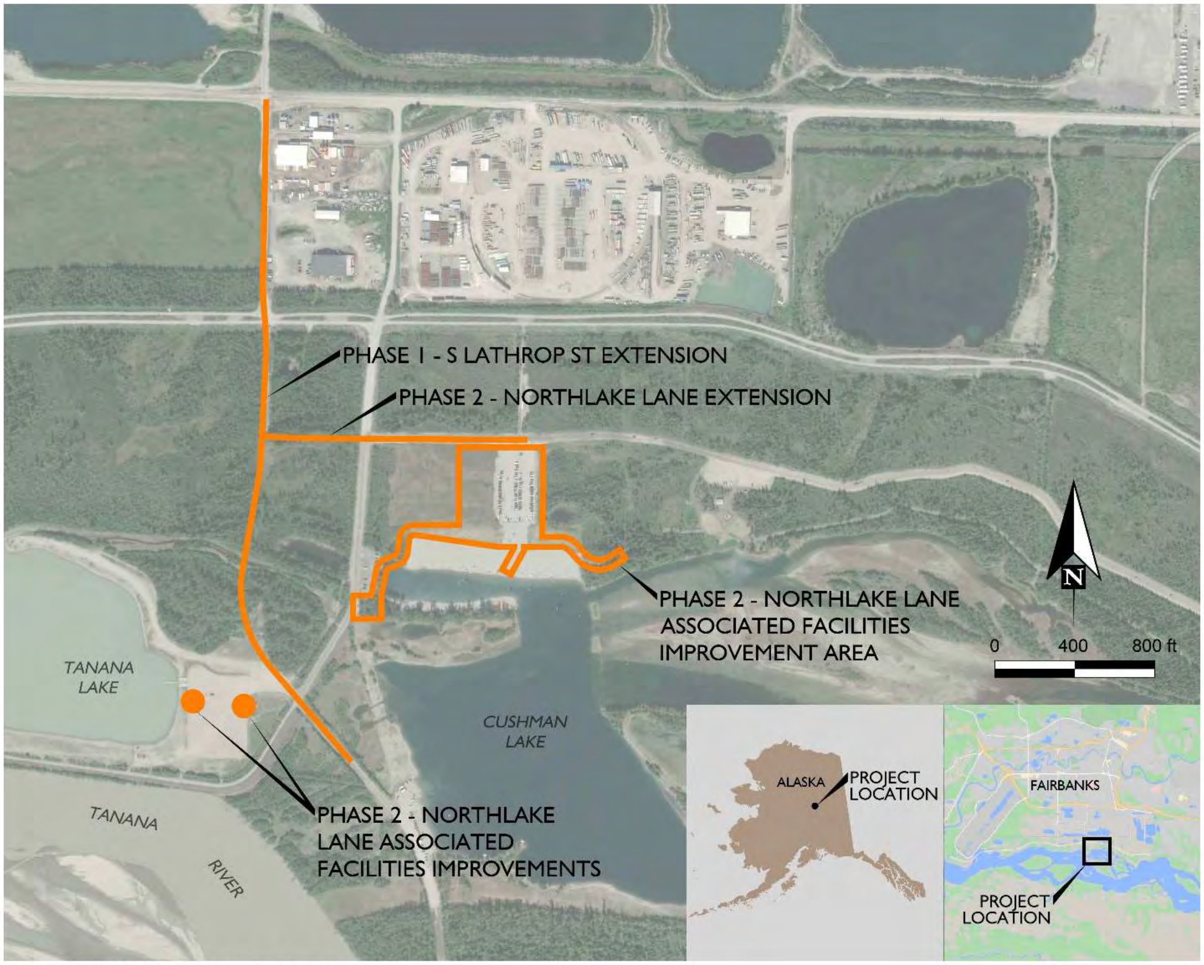


Figure 1 Project Vicinity Map

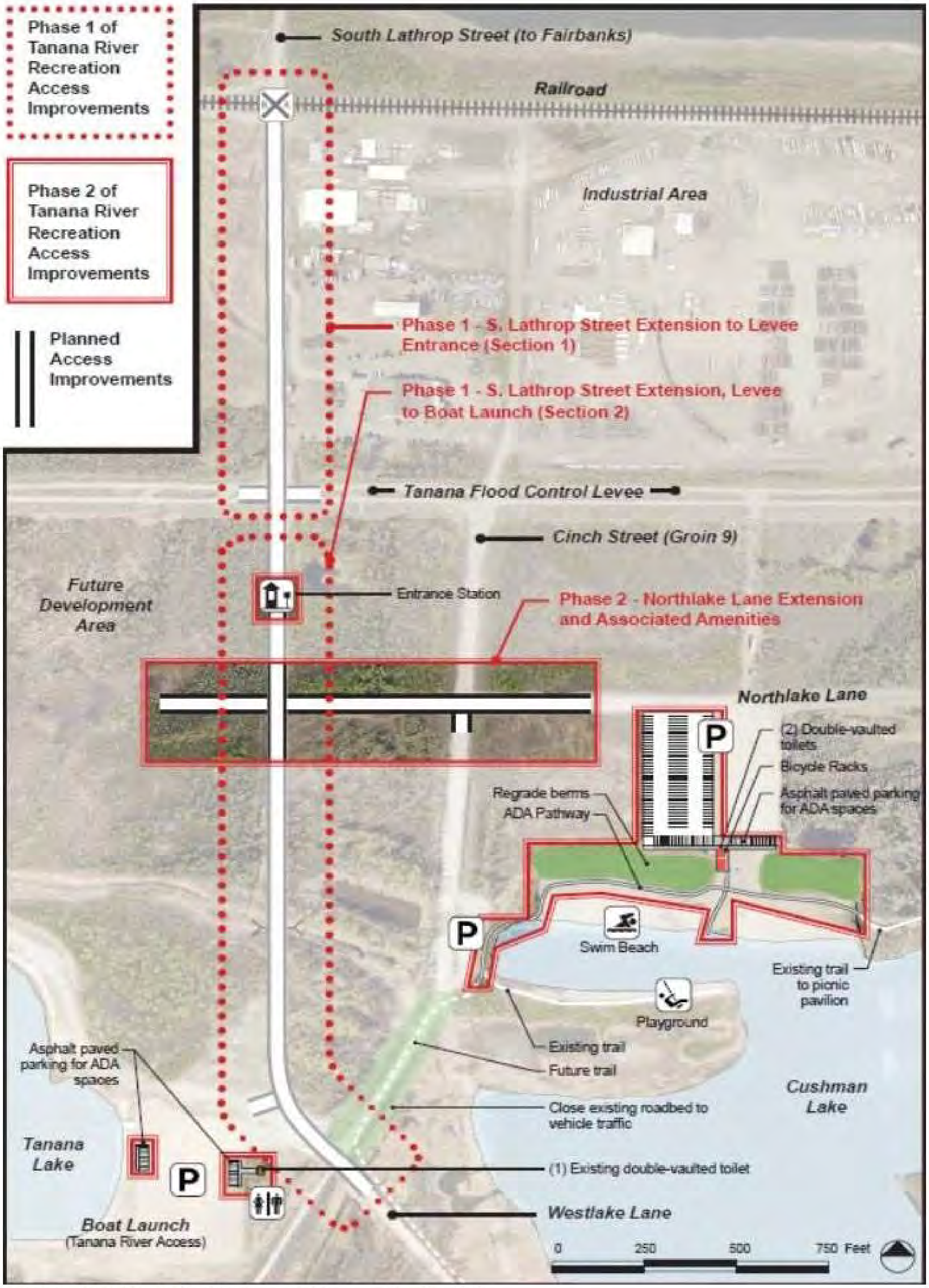


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Arma Ulvi, First Chief
Native Village of Eagle
P.O. Box 19
Eagle, AK 99738

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear Chief Ulvi,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Native Village of Eagle regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Native Village of Eagle. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Native Village of Eagle believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Friday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:25:31 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

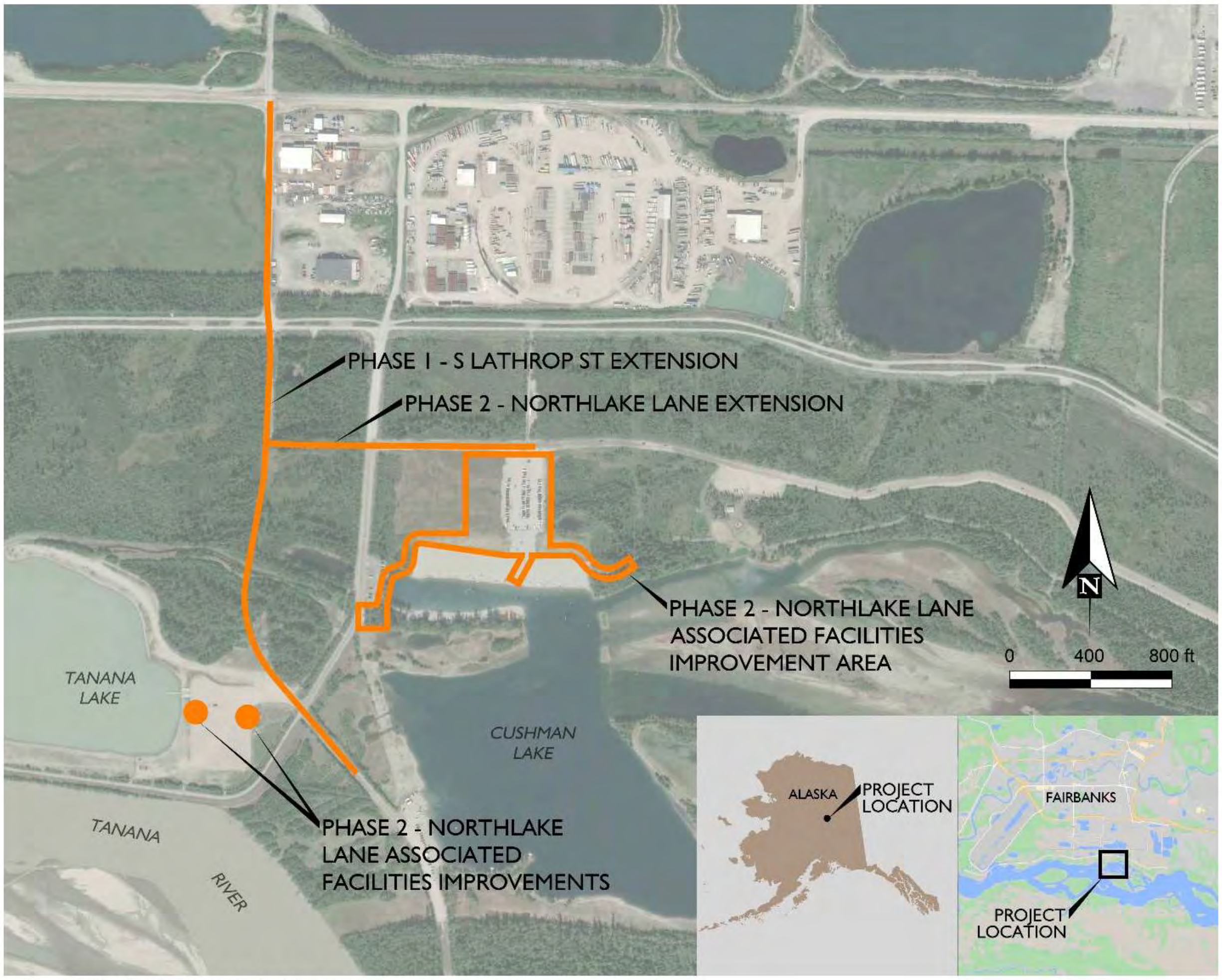


Figure 1 Project Vicinity Map

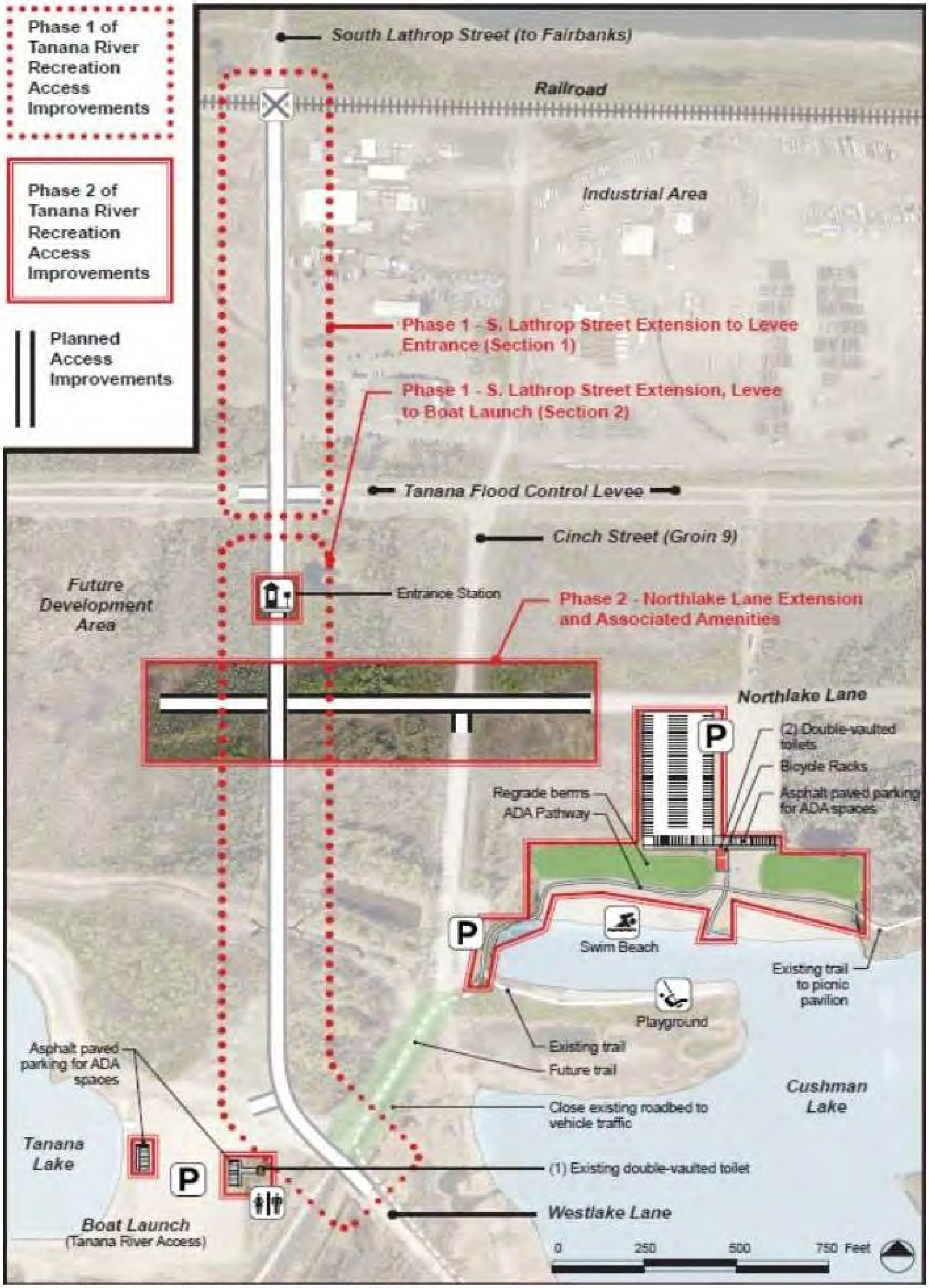


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Gary Healy, President
Healy Lake Village
PO Box 60302
Fairbanks, AK 60302

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear President Healy,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Healy Lake Village regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Healy Lake Village. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Healy Lake Village believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Friday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:24:40 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Evelynn Combs, Acting Tribal Administrator
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

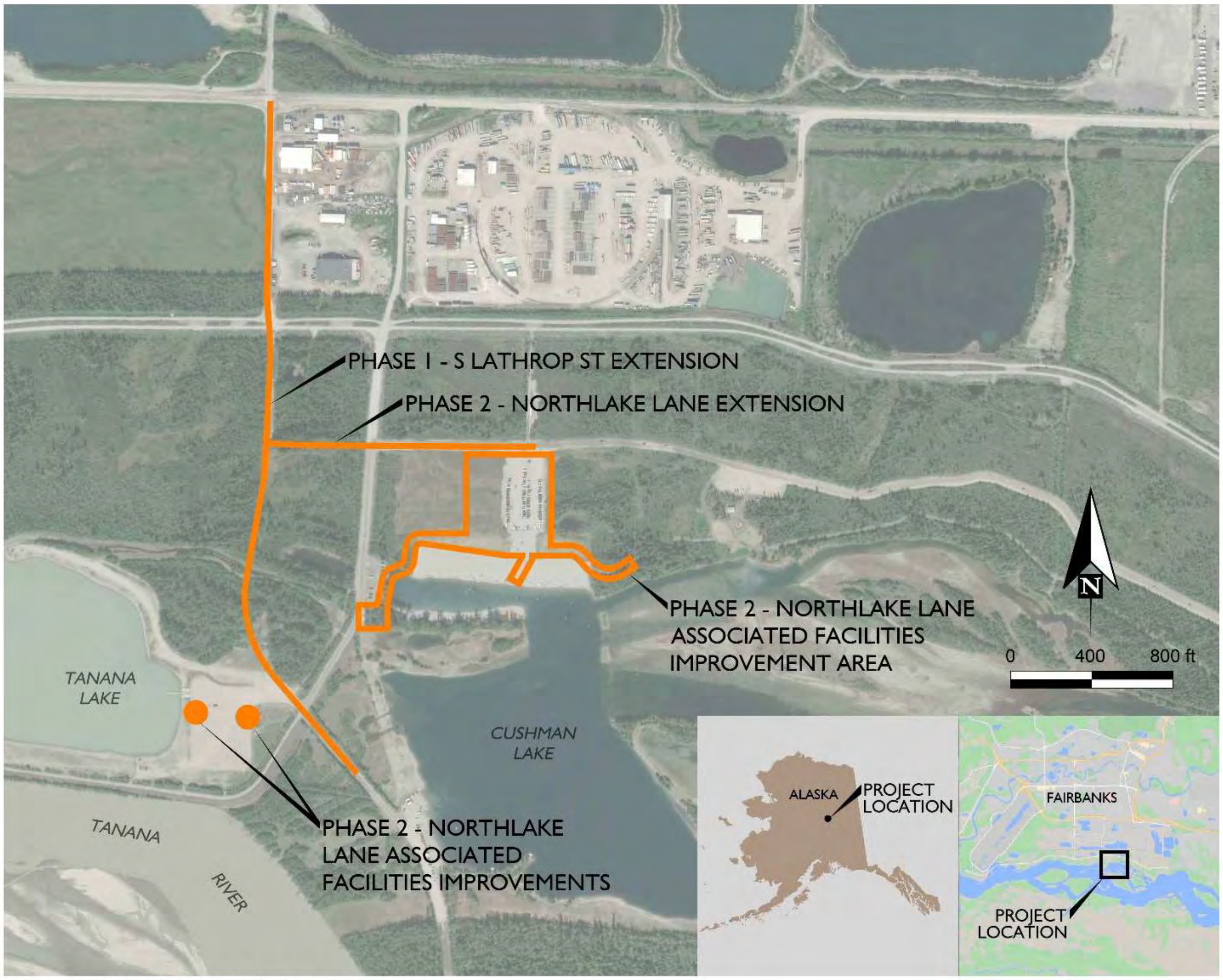


Figure 1 Project Vicinity Map

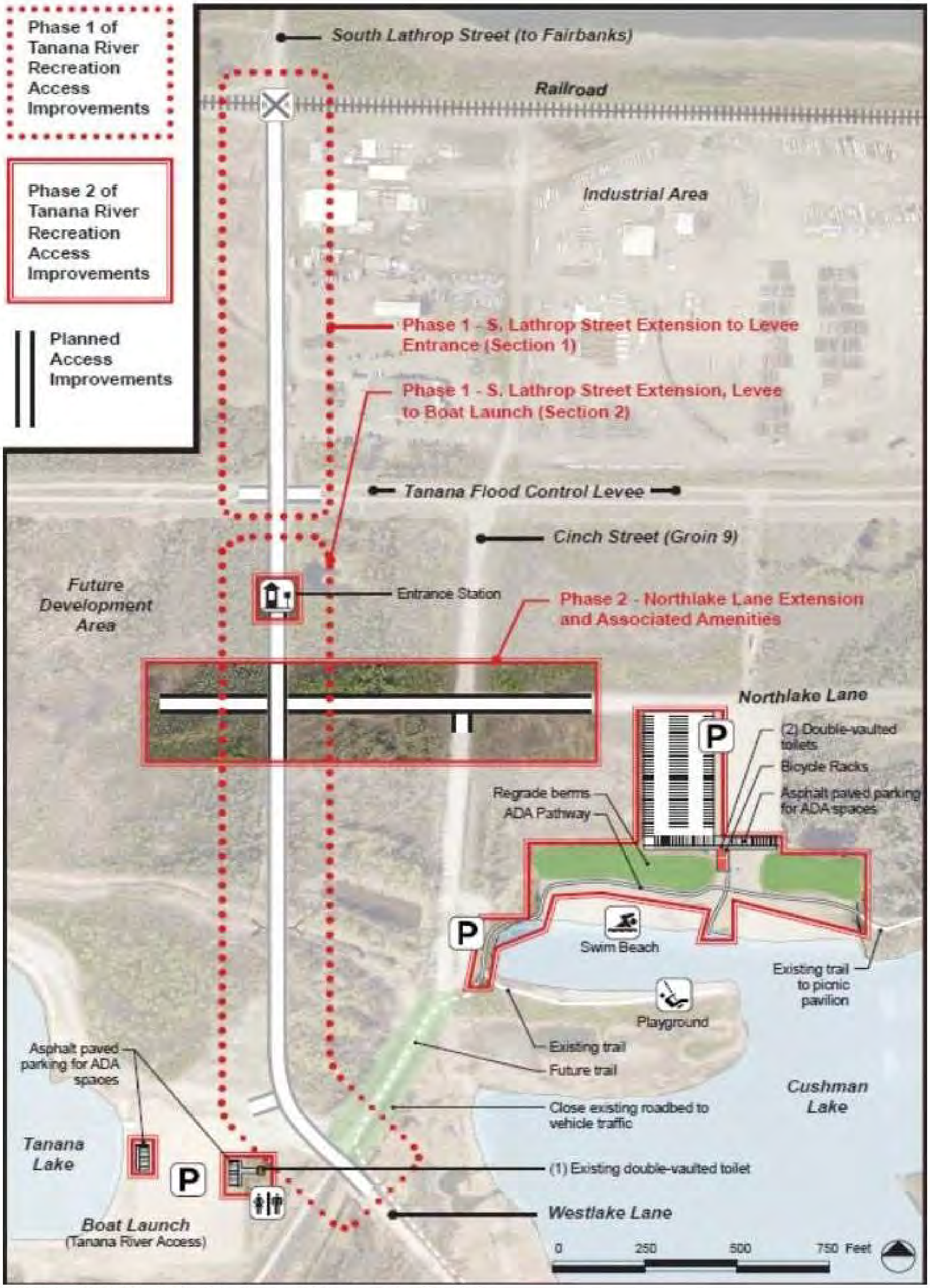


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
Federal Highway Administration

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Emmanuel Baker, First Chief
Mentasta Traditional Council
P.O. Box 6019
Mentasta Lake, AK 99780-6019

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear Chief Baker,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Mentasta Traditional Council regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Mentasta Traditional Council. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Mentasta Traditional Council believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Friday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:25:06 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

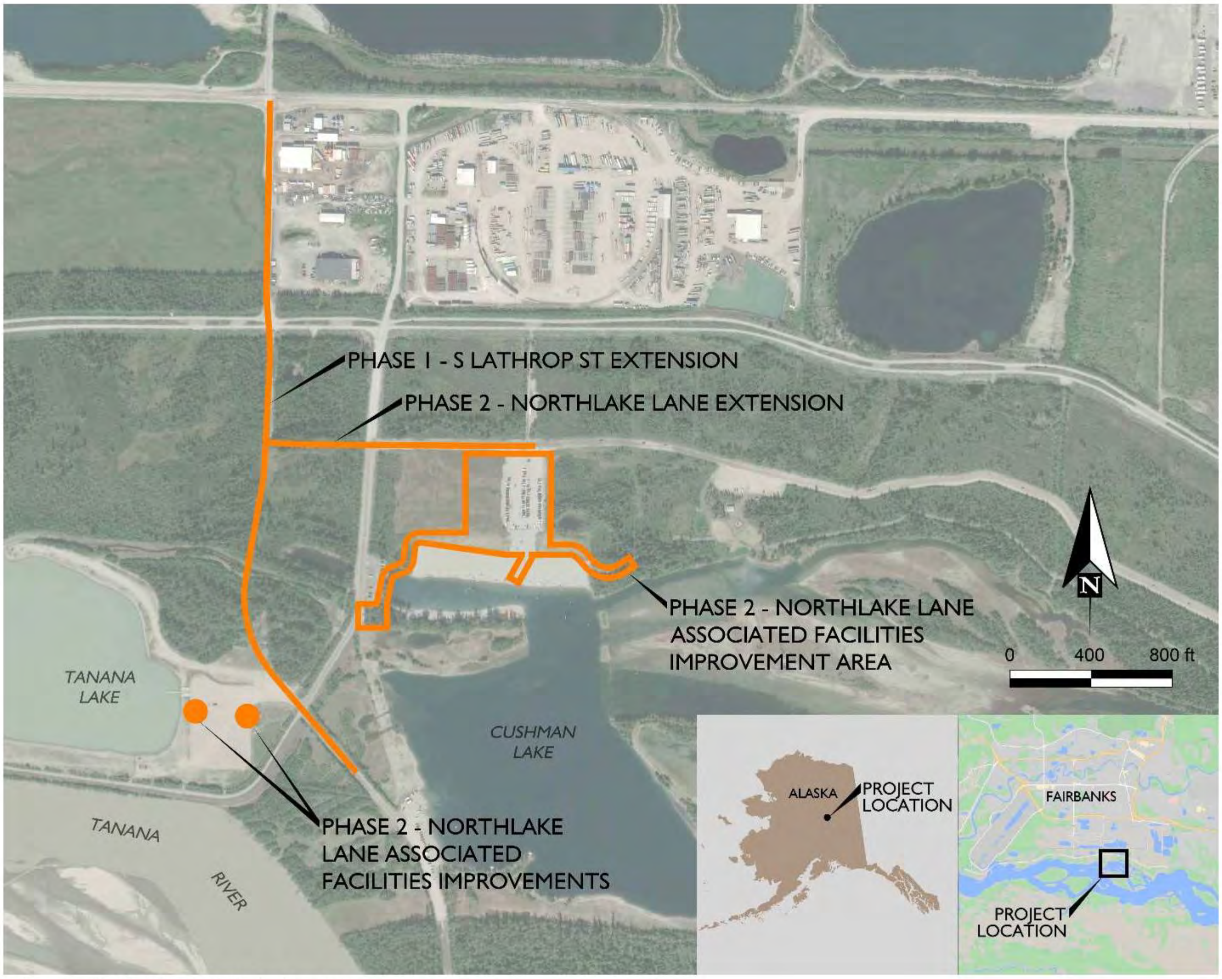


Figure 1 Project Vicinity Map

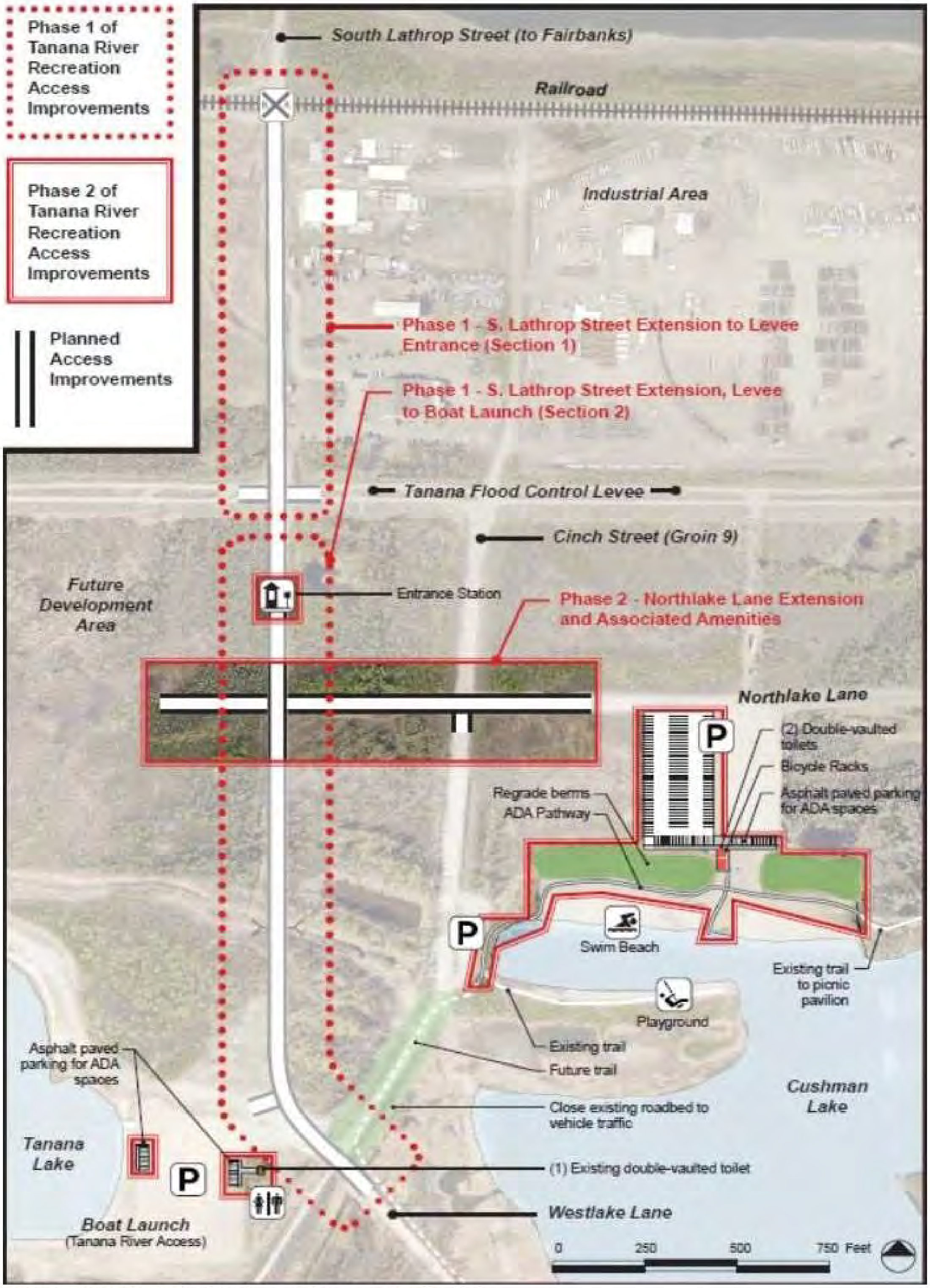


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Gerald Albert, President
Northway Village
P.O. Box 516
Northway, AK 99764

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear President Albert,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Northway Village regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Northway Village. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Northway Village believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Monday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:26:42 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

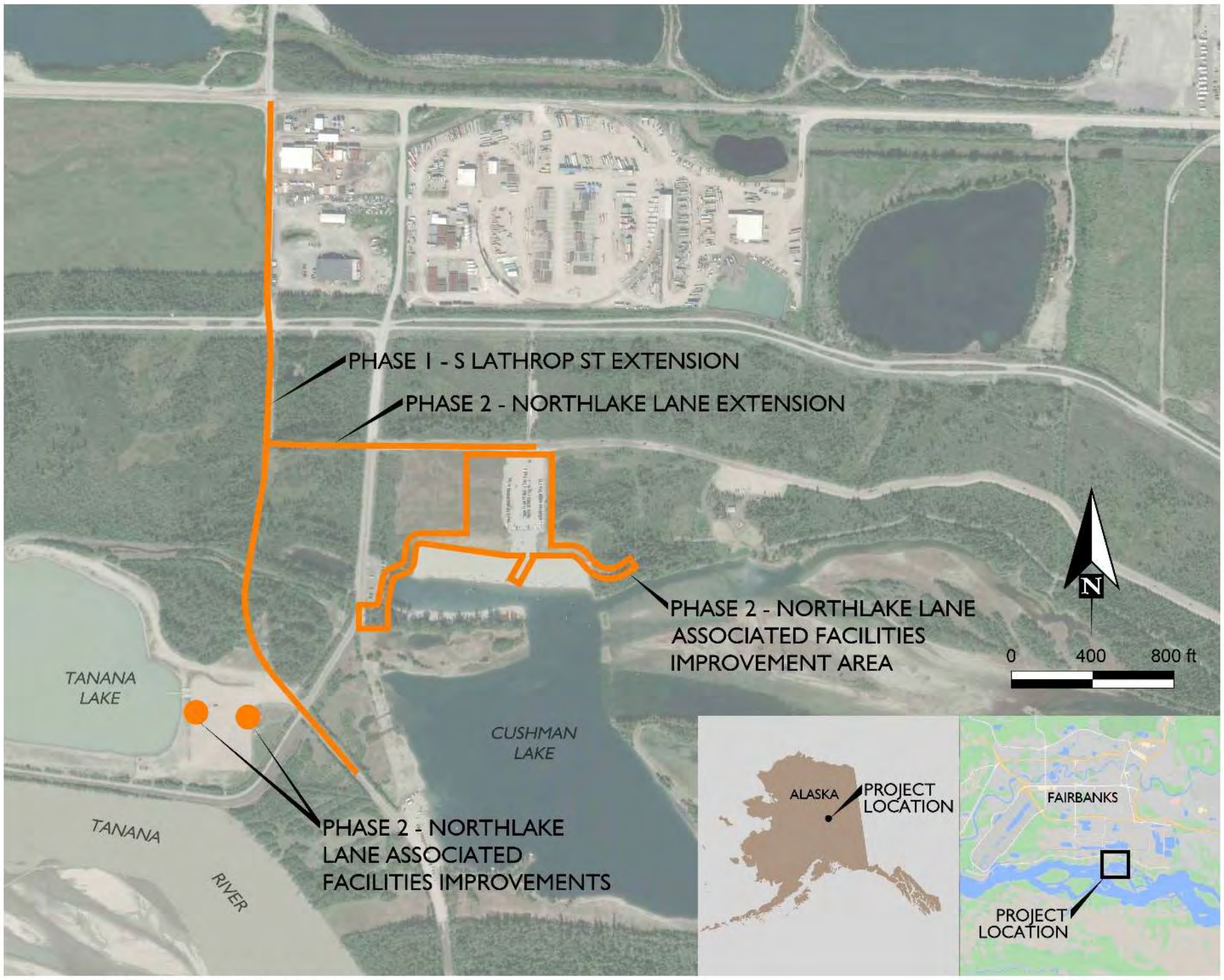


Figure 1 Project Vicinity Map

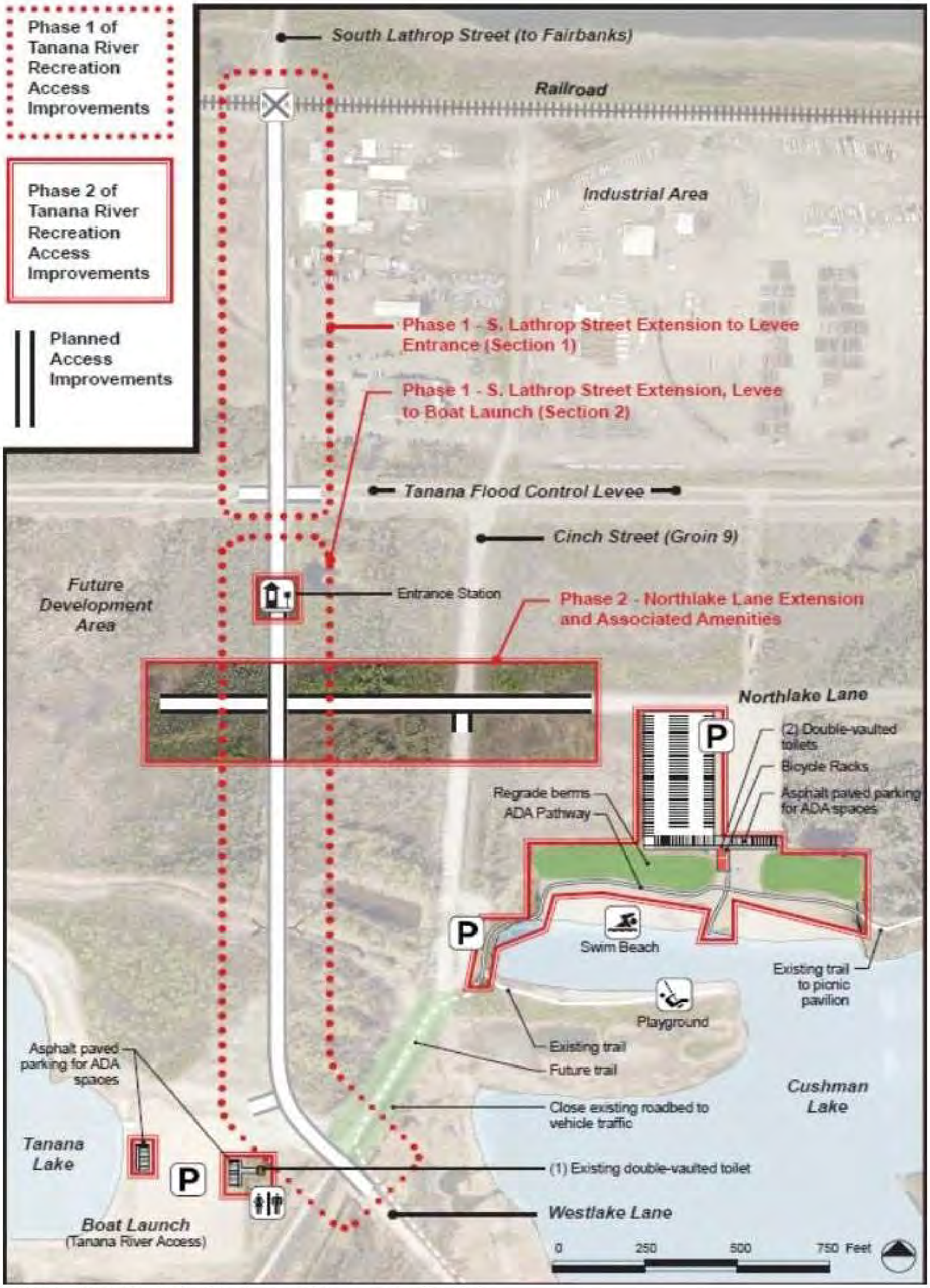


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Victor Joseph, Chairman
Tanana Chiefs Conference (TCC)
P.O. Box 70494,
Fairbanks, AK 99701-0494

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear Chairman Joseph,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Tanana Chiefs Conference (TCC) regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Tanana Chiefs Conference (TCC). We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Tanana Chiefs Conference (TCC) believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Monday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:27:03 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

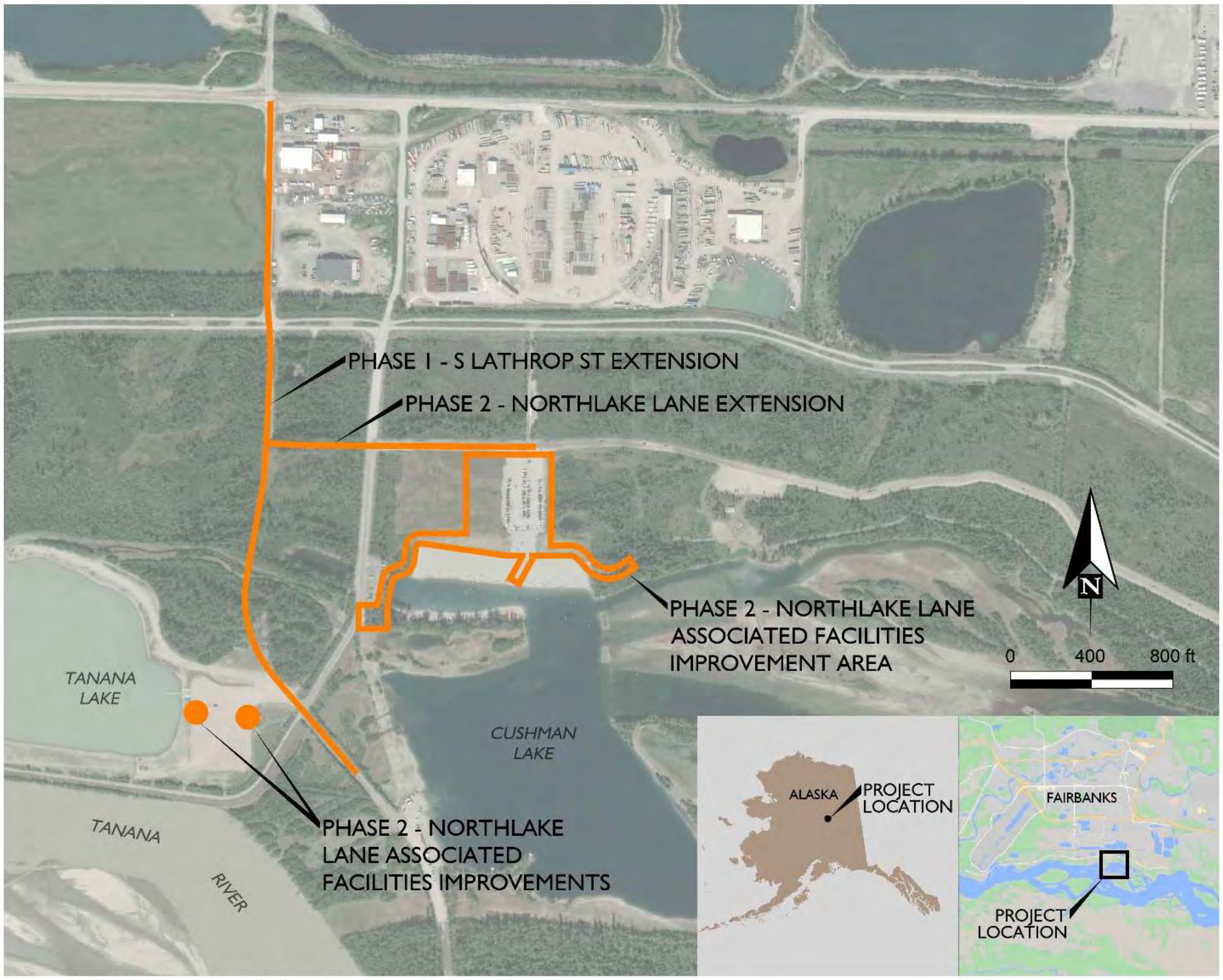


Figure 1 Project Vicinity Map

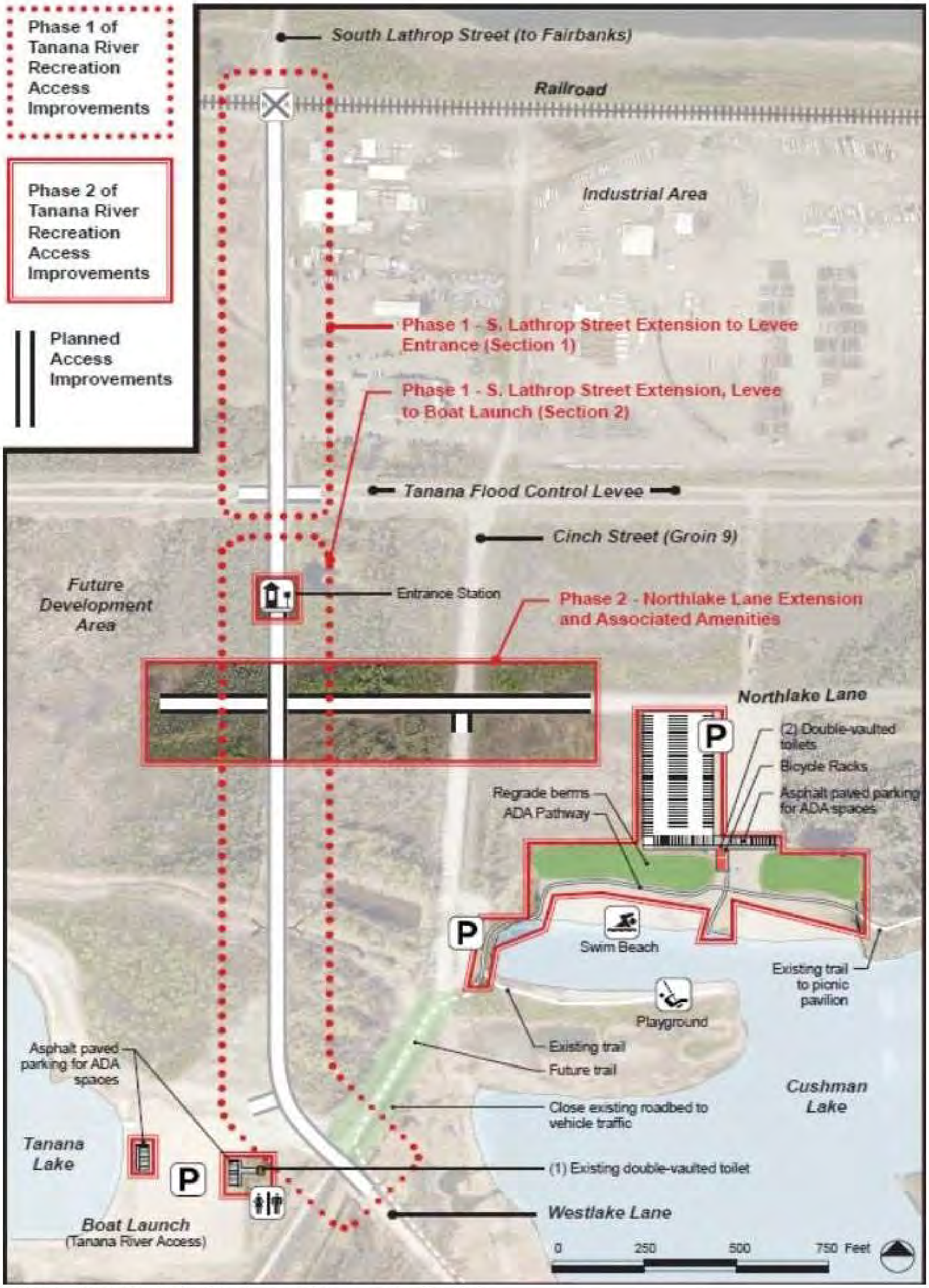


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
**Federal Highway
Administration**

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Herbert F. Demit, President
Native Village of Tanacross
P.O. Box 76009
Tanacross, AK 99776

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear President Demit,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Native Village of Tanacross regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Native Village of Tanacross. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Native Village of Tanacross believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Monday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:25:53 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

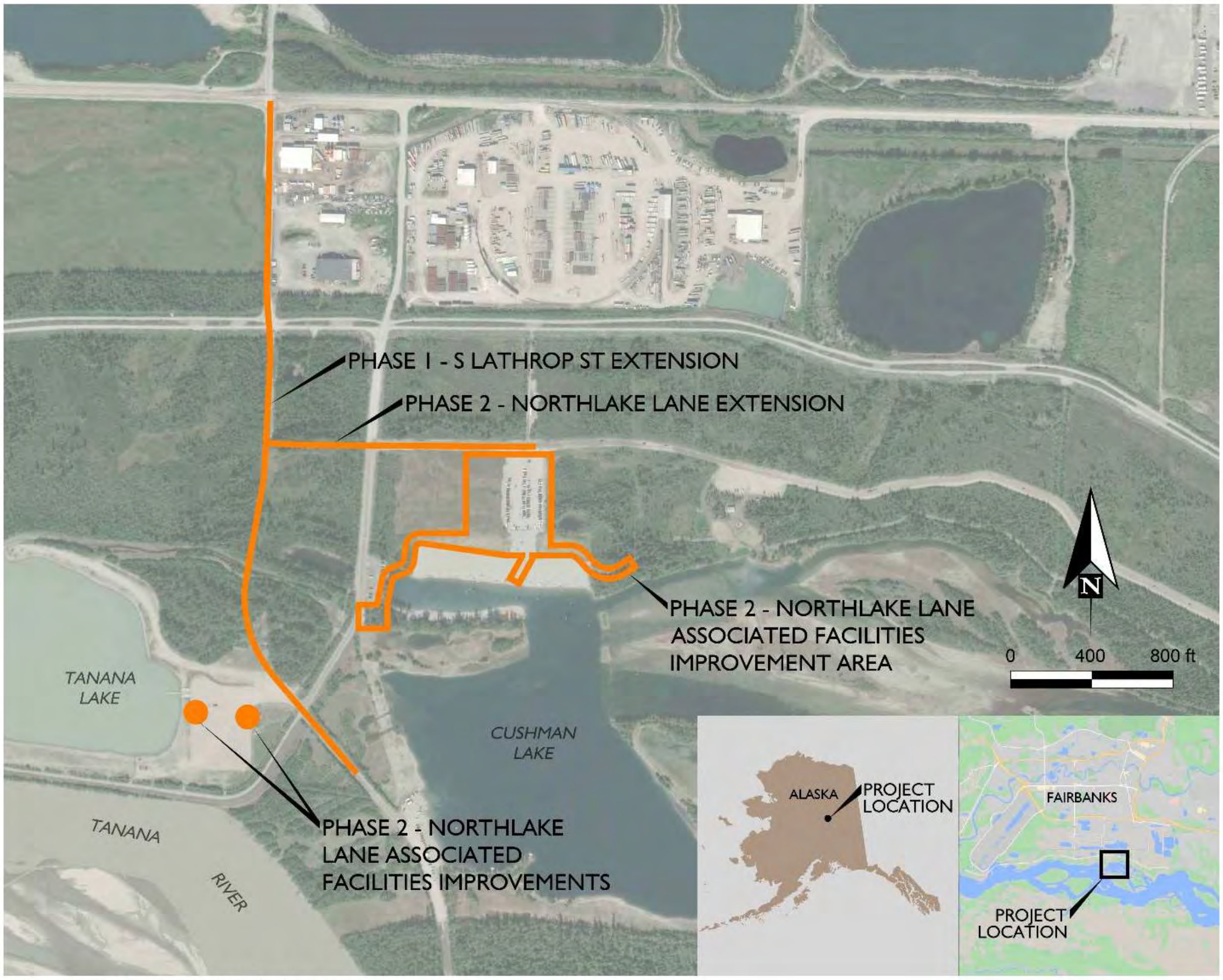


Figure 1 Project Vicinity Map

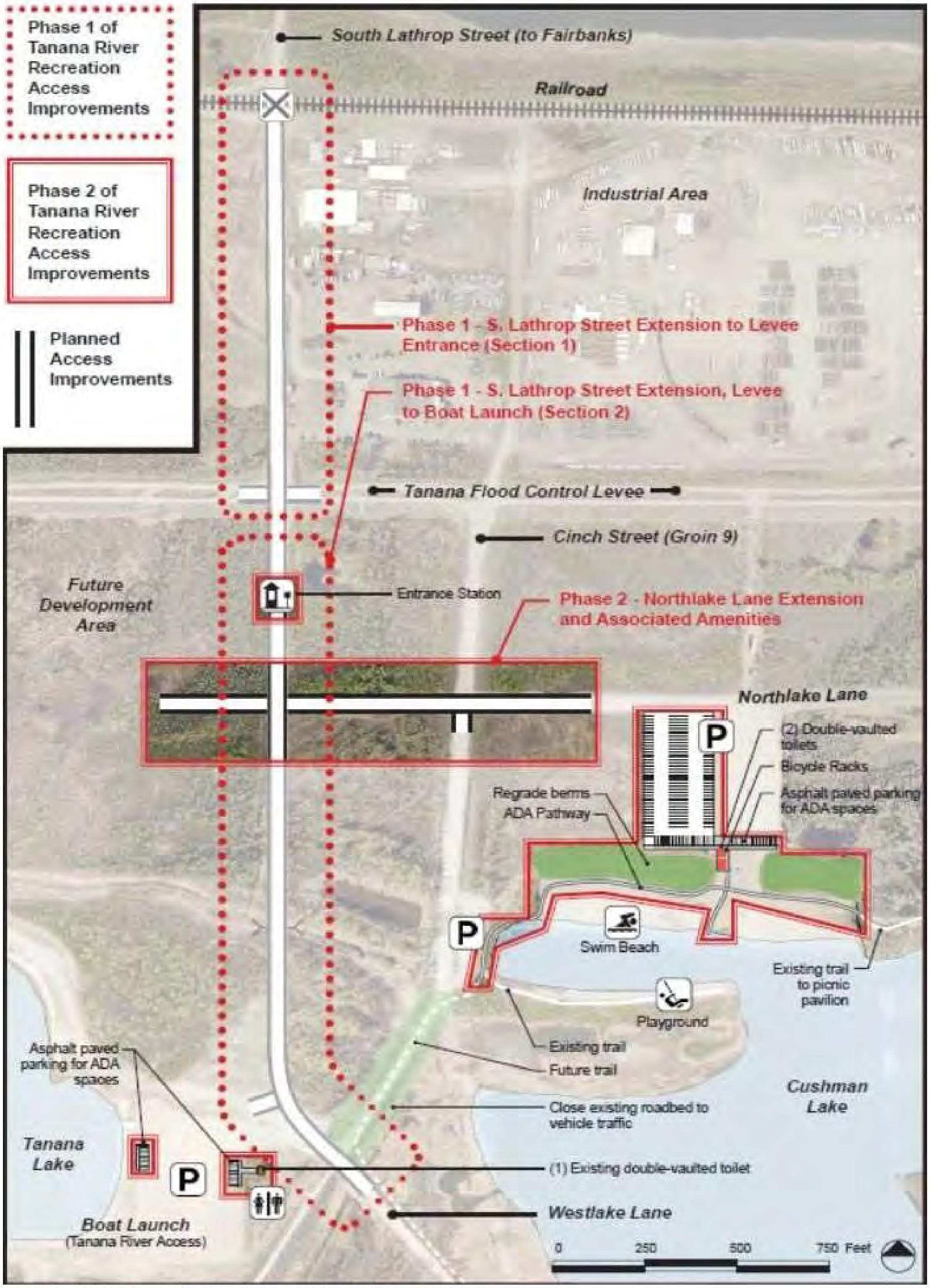


Figure 2 TRRA Preliminary Project Footprint

U.S. Department
of Transportation
Federal Highway Administration

Western Federal Lands Highway Division
610 E. Fifth Street
Vancouver, WA 98661
Phone 360-619-7700
Fax 360-619-7846

October 7, 2020

The Honorable Michael Sam, President
Native Village of Tetlin
P.O. Box 797
Tok, AK 99780

RE: AK FNSB TANANA(1) Tanana River Recreation Access (TRRA) Improvements Project

Dear President Sam,

The Federal Highway Administration (FHWA), Western Federal Lands Highway Division (WFL), in partnership with Fairbanks North Star Borough (FNSB) and the Department of the Army, Fort Wainwright is seeking comments and/or participation from the Native Village of Tetlin regarding the TRRA project located in Fairbanks North Star Borough, Alaska (see attached vicinity map and preliminary area of potential effect map). The proposed project is in the early planning phases of the National Environmental Policy Act process.

This letter is requesting government-to-government consultation with the Native Village of Tetlin. We would gladly discuss the project in further detail, should you have interest. You may contact us by mail, phone or email. Our contact information is included at the end of this letter.

For the purpose of complying with Section 106 of the National Historic Preservation Act (Section 106), FHWA requests notification if the Native Village of Tetlin believe cultural resources that the Tribe attaches religious and cultural significance to may be affected by the proposed project.

The purpose of the proposed project, as currently defined, is to improve access to the TRRA and to federally-managed lands along the Tanana River. Please review the enclosed maps (Figure 1 Project Vicinity and Figure 2 Preliminary Area of Potential Effect) and contact FHWA with any questions or concerns by Monday, 6 November 2020 or at your earliest convenience.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities, please contact me or Stephen Morrow, Environmental Specialist at (360) 619-7811 or email at Stephen.morrow@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

BETHANY RENEE SIGEL

Digitally signed by BETHANY RENEE SIGEL
Date: 2020.10.07 12:26:17 -06'00'

Renee Sigel, Acting WFL Division Director

Enclosures:
Figure 1 Project Vicinity Map
Figure 2 Preliminary Area of Potential Effect Map

Cc:
Brandon Stokes, WFL Project Manager
Steven Morrow, WFL Environmental Specialist
Mike Schurke, WFL Archaeologist

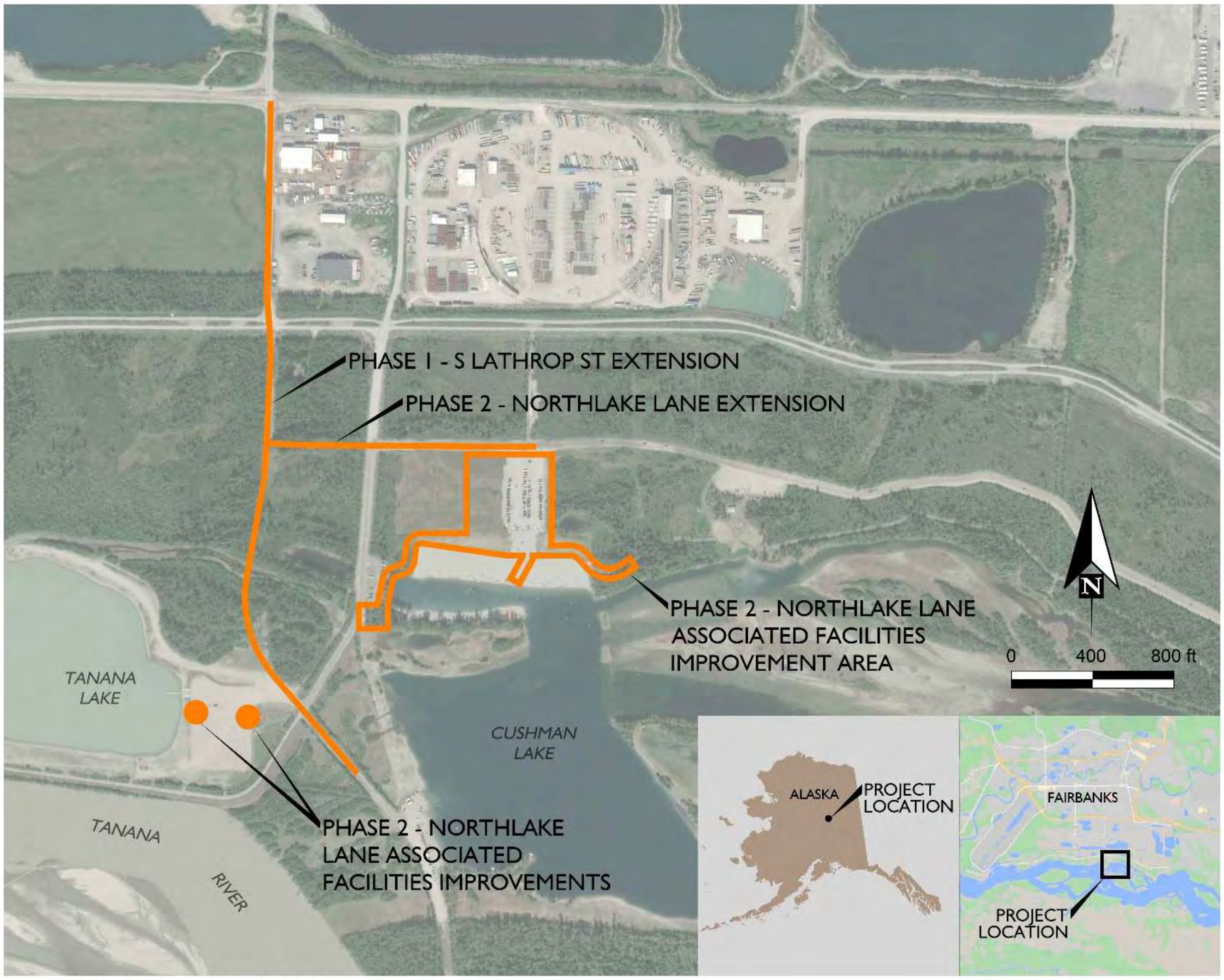


Figure 1 Project Vicinity Map

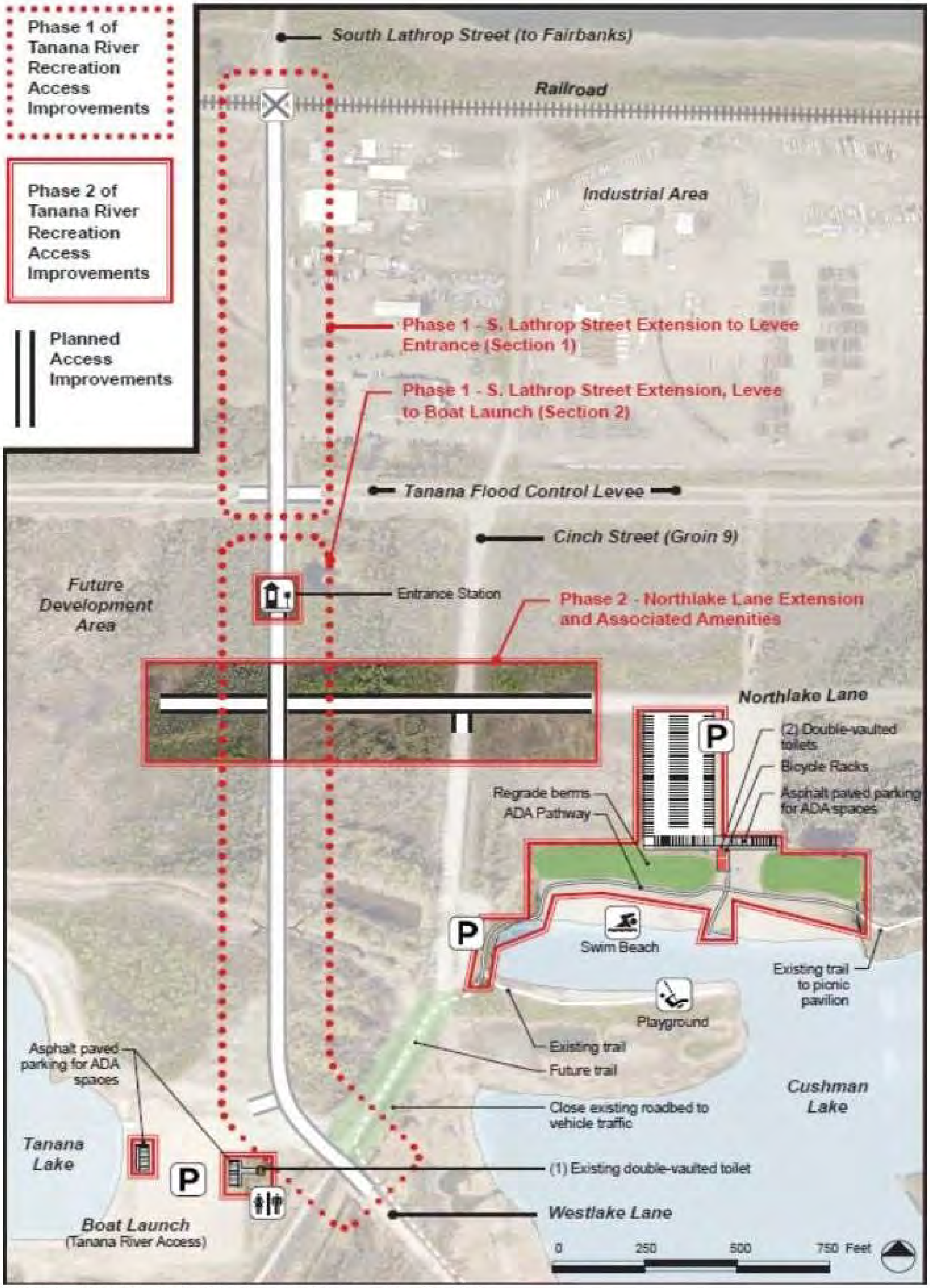


Figure 2 TRRA Preliminary Project Footprint