



Juneau Access Improvements Project Draft Supplemental Environmental Impact Statement

2014 Update to Appendix R Bald Eagle Technical Report

Prepared for:

**Alaska Department of Transportation
& Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999**

**State Project Number: 71100
Federal Project Number: STP-000S(131)**

Prepared by:

**HDR, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503**

May 2014

This page intentionally left blank.

Table of Contents

1. Introduction.....	1
1.1 Project Description.....	2
1.1.1 Alternative 1 – No Action.....	2
1.1.2 Alternative 1B – Enhanced Service with Existing AMHS Assets.....	2
1.1.3 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway.....	3
1.1.4 Alternative 3 – West Lynn Canal Highway.....	3
1.1.5 Alternatives 4A through 4D – Marine Alternatives.....	4
2. Regulatory Update.....	6
3. Studies and Coordination.....	9
4. Affected Environment.....	11
5. Environmental Consequences.....	12
5.1 Alternative 1B – Enhanced Service with Existing AMHS Assets.....	12
5.2 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway.....	12
5.3 Alternative 3 – West Lynn Canal Highway.....	13
5.4 Alternatives 4B and 4D – FVF Service/ Conventional Monohull Service from Berners Bay.....	14
6. Mitigation Measures.....	15
7. References.....	16

Tables

Table 2-1: Recommended Distance to Maintain from Active Bald Eagle Nests for Permitted Activities*.....	8
Table 3-1: Active Bald Eagle Nests and Nest Productivity, 2003–2012.....	10
Table 5-1: Number of Bald Eagle Nests within the Study Area and Distance to Work Limits of Proposed Alignments.....	13

Attachments

- Attachment A: Updated Tables
- Attachment B: Updated Figures

Acronyms and Abbreviations

ACF	Alaska Class Ferry
AMHS	Alaska Marine Highway System
BGEPA	Bald and Golden Eagle Protection Act
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FVF	Fast Vehicle Ferry
JAI	Juneau Access Improvements
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NHS	National Highway System
ROD	Record of Decision
SEIS	Supplementary Environmental Impact Statement
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1. Introduction

This report is an update to the September 2004 *Bald Eagle Technical Report*, which was prepared by the Alaska Department of Transportation and Public Facilities (DOT&PF) as Appendix R of the 2005 Juneau Access Improvements (JAI) Project Supplemental Draft Environmental Impact Statement (EIS). The 2004 *Bald Eagle Technical Report* analyzed the potential impacts of Alternatives 2, 2A, 2B, 2C, 3, 4B, and 4D on bald eagles (*Haliaeetus leucocephalus*) in Lynn Canal.

The 2004 *Bald Eagle Technical Report* described bald eagle nest survey data from 2003 and potential impacts from the Supplemental Draft EIS alternatives. The survey identified bald eagle nests located within 0.5 mile of the proposed cut and fill limits of each alternative. Results of the nests surveys concluded that Alternatives 2 and 2C would have the greatest impacts on bald eagle nest sites. For both of these alternatives, 57 out of 100 nests (57 percent) could not be reasonably avoided by more than 330 feet. Alternative 2A would encroach within 330 feet of 54 out of 82 nests (66 percent). Alternative 2B would encroach within 330 feet of 45 out of 84 nests (54 percent). For the West Lynn Canal Highway route, Alternative 3, 25 out of 45 nests (56 percent) could not be reasonably avoided by more than 330 feet. The Alaska Marine Highway System (AMHS) improvement alternatives, Alternatives 4A and 4C, would have substantially less impact on eagle nest sites than Alternatives 2 or 3. Alternatives 4B and 4D would require the construction of a highway to Sawmill Cove but this section of highway would not encroach within 330 feet of any bald eagle nests.

During its development of the JAI Project Final EIS, DOT&PF responded to comments on the Supplemental Draft EIS, incorporated new data and further analysis for some resources, and incorporated additional mitigation measures to reduce impacts to wildlife and habitat. The DOT&PF also made some changes to Alternative 2B and removed Alternatives 2, 2A, and 2C from the range of reasonable alternatives. Many of these changes prompted DOT&PF to update supporting technical reports with addenda, including *Addendum to Appendix R- Bald Eagle Technical Report*, which were compiled in Appendix W of the 2006 Final EIS.

Seven years have passed since the 2006 Final EIS and Record of Decision (ROD) were published. The Federal Highway Administration (FHWA) and DOT&PF need to update Technical Reports as part of the JAI Project 2014 Draft Supplemental Environmental Impact Statement (SEIS). Updates are needed to reflect changes in regulations, new information related to the potentially affected environment or conditions, updated analysis, evaluation of the newly added Alternative 1B, changes in the design or alignment for Alternatives 2B and 3, and the widening of the recently constructed Glacier Highway Extension between Echo Cove and Sawmill Creek that is common to Alternatives 2B, 3, 4B, and 4D. Three key components that affected changes to the design and alignment of Alternative 2B and 3 since the 2006 ROD are: changes in 2006 during the US Army Corps of Engineers (USACE) permitting process to minimize impacts to wetlands and reduce the extent of rock side cast areas, changes in 2009 based on advanced geotechnical survey information, and changes in 2012 in response to updated bald eagle nest survey data.

This 2014 update describes new regulations, new eagle nest data, and updated project conditions since the 2004 *Bald Eagle Technical Report* was issued and replaces the 2006 *Addendum to Appendix R – Bald Eagle Technical Report*. Much of the 2004 report remains valid. This 2014 update provides:

- Updated eagle nest survey data collected from 2004 through 2012.
- Updated life history information on bald eagles in the project area.
- New regulations regarding bald eagle take and disturbance permits.
- Evaluation of the new Alternative 1B, and alignment/design revisions to Alternatives 2B, 3, 4B, and 4D that could have impacts to bald eagle nests.

1.1 Project Description

As required by the National Environmental Policy Act (NEPA), this technical report considers the following reasonable alternatives.

1.1.1 Alternative 1 – No Action

The No Action Alternative (Alternative 1) includes a continuation of mainline ferry service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs). The AMHS would continue to be the National Highway System (NHS) route from Juneau to Haines and Skagway, and no new roads or ferry terminals would be built. In addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. This alternative is based on the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner is on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal.

1.1.2 Alternative 1B – Enhanced Service with Existing AMHS Assets

Alternative 1B includes all of the components of Alternative 1, No Action, but focuses on enhancing service using existing AMHS assets without major initial capital expenditures. Similar to Alternative 1, Alternative 1B includes a continuation of mainline ferry service in Lynn Canal; the AMHS would continue to be the NHS route from Juneau to Haines and Skagway; no new roads or ferry terminals would be built; and in addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. Service to other communities would remain the same as with the No Action Alternative. Alternative 1B keeps the *M/V Malaspina* in service after the second Day Boat ACF is brought

online to provide additional capacity in Lynn Canal. Enhanced services included as part of Alternative 1B are a 20 percent reduction in fares for trips in Lynn Canal and extended hours of operations for the reservation call center.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, the *M/V Malaspina* would make one round trip per day seven days per week on a Skagway-Auke Bay-Skagway route, while one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner would be on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week.

1.1.3 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

Alternative 2B would construct the East Lynn Canal Highway (50.8 miles, including 47.9 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove around Berners Bay to a new ferry terminal 2 miles north of the Katzehin River. Ferry service would connect Katzehin to Haines and Skagway. In addition, this alternative includes modifications to the Skagway Ferry Terminal to include a new end berth and construction of a new conventional monohull ferry to operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 2B would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer months, one Day Boat ACF would make eight round trips per day between Haines and Katzehin, a second Day Boat ACF would make six round trips per day between Skagway and Katzehin, and the Haines-Skagway shuttle ferry would make two trips per day. During the winter, one Day Boat ACF would make six round trips per day between Haines and Katzehin, and a second Day Boat ACF would make four round trips per day between Skagway and Katzehin. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzehin and transfer ferries.

1.1.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 would upgrade/extend the Glacier Highway (5.2 miles, including 2.3 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay. New ferry terminals would be constructed at Sawmill Cove in Berners Bay and at William Henry Bay on the west shore of Lynn Canal, and the Skagway Ferry Terminal would be modified to include a new end berth. A new 38.9-mile highway would be constructed from the William Henry Bay Ferry Terminal to Haines with a bridge across the Chilkat River/Inlet connecting into Mud Bay Road. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 3 would come on-line: two Day Boat ACFs,

improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer, two Day Boat ACFs would make six round-trips per day between Sawmill Cove and William Henry Bay (total of 12 trips each direction), and the Haines-Skagway shuttle ferry would make six round-trips per day. During the winter, one Day Boat ACF would make four round-trips per day between Sawmill Cove and William Henry Bay, and the Haines-Skagway shuttle ferry would make four round-trips per day.

1.1.5 Alternatives 4A through 4D – Marine Alternatives

All four marine alternatives would include continued mainline ferry service in Lynn Canal with a minimum of two trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. Each marine alternative includes a new conventional monohull shuttle that would make two round trips per day between Haines and Skagway six days a week in the summer and a minimum of three round trips per week between Haines and Skagway in the winter. The AMHS would continue to be the NHS route from Juneau to Haines and Skagway. These alternatives assume the following improvements will have been made independent of the JAI Project before the alternative comes on-line: improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include new double bow berths.

1.1.5.1 Alternative 4A – Fast Vehicle Ferry Service from Auke Bay

Alternative 4A would construct two new fast vehicle ferries (FVFs). No new roads would be built for this alternative, and the Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. The FVFs would make two round trips between Auke Bay and Haines and two round trips between Auke Bay and Skagway per day in the summer. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.2 Alternative 4B – Fast Vehicle Ferry Service from Berners Bay

Similar to Alternative 4A, Alternative 4B would construct two new FVFs. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. In the summer, the FVFs would make two round trips between Sawmill Cove and Haines and two round trips between Sawmill Cove and Skagway per day. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.3 Alternative 4C – Conventional Monohull Service from Auke Bay

Alternative 4C would use Day Boat ACFs to provide additional ferry service in Lynn Canal. No new roads would be built for this alternative. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. In the summer, one Day Boat ACF would make one round trip per day between Auke Bay and Haines, and one Day Boat ACF would make one round trip per day between Auke Bay and Skagway. During the winter, one Day Boat ACF would alternate between a round trip to Haines one day and a round trip to Skagway the next day.

1.1.5.4 Alternative 4D – Conventional Monohull Service from Berners Bay

Alternative 4D would use Day Boat ACFs to provide additional ferry service in Lynn Canal. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. This alternative includes construction of a new conventional monohull ferry that would operate between Haines and Skagway. In the summer, the Day Boat ACFs would make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. During the winter, a Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and to Skagway the next day.

2. Regulatory Update

The following updates Sections 3.6 and 3.7 of the 2004 *Bald Eagle Technical Report*. Bald and golden eagles (*Aquila chrysaetos*) in Alaska are protected by the Bald and Golden Eagle Protection Act (BGEPA)¹ and the Migratory Bird Treaty Act (MBTA). Golden eagles do not nest in the study area and therefore are not discussed further in this report.

Until their delisting in June 2007, bald eagles were on the endangered species list in the continental United States. In connection with the delisting, the USFWS announced a final rule on two new permit regulations that would allow for the disturbance and take of eagles and eagle nests under the BGEPA (USFWS, 2009). The final rule was published in the Federal Register on September 11, 2009, and would allow take or disturbance associated with development projects or other activities that may impact eagles or their nests (50 CFR part 13 and 50 CFR part 22).

A new Federal regulation (50 CFR 22.26) provides for the issuance of permits to take bald eagles and golden eagles where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance; however, permits may authorize non-purposeful take that may result in mortality. These permits are typically referred to as Disturbance Permits.

Another new Federal regulation (50 CFR 22.27) establishes authority to issue permits for removing eagle nests where 1) necessary to alleviate a safety emergency to people or eagles; 2) necessary to ensure public health and safety; 3) the nest prevents the use of a human-engineered structure; or 4) the activity or mitigation for the activity will provide a net benefit to eagles. These permits are typically referred to as Take Permits.

The USFWS developed the National Bald Eagle Management Guidelines, dated May 2007, to ensure that construction activities are consistent with the BGEPA and the MBTA (USFWS, 2007). The 2009 eagle permit regulations are consistent with the National Bald Eagle Management Guidelines. The guidelines are based on three general recommendations to avoid disturbance to nesting bald eagles:

1. Keeping a distance between the activity and the nest (distance buffers).
2. Maintaining forested (or natural) areas between the activity and nest trees (landscape buffers).
3. Avoiding certain activities during the breeding season (timing buffers).

Depending on the nature and magnitude of impact on bald eagles that could result from each activity, the visibility of the activity from the nest, and the degree to which similar activities are already occurring near the nest, the USFWS has developed the activity-specific guidelines and buffers described in Table 2-1. The bald eagle nesting season in southeast Alaska is March 1 to

¹ The BGEPA prohibits anyone from “taking” bald eagles, their eggs, nest, or any part of the birds. It defines “taking” as “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” “Disturb” means: “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

August 30. All nests should be considered active March 1 to May 31 because eagle pairs select nests and perform courtship activities during this period. From June 1 through August 30, nests without an incubating adult or chicks present may be considered inactive (USFWS, 2009).

For activities that entail permanent landscape alterations that may result in bald eagle disturbance, the buffers described in Table 2-1 apply to both active and inactive bald eagle nests. Disturbance becomes an issue with regard to alternate/inactive nests if eagles return for breeding purposes and react to land use changes that occurred while the nest was inactive. The recommended buffers for avoiding disturbance around the nest site may no longer be warranted if a nest has not been active during the preceding five breeding seasons. However, the nest itself remains protected by other provisions of the BGEPA, and may not be destroyed (USFWS, 2007).

Depending on the selected alternative for the JAI Project, the DOT&PF would need to apply for eagle permits for nests within 660 feet of the cut and fill limits and for active nests within 0.5 miles of blasting activities. As a requirement of the permit program, the applicant must consult with the USFWS prior to construction and, if required, update aerial bald eagle nest surveys to determine the current status of the nests (i.e., which nests are still active and whether there are any additional nests in the project area that may be affected by construction activities). An additional requirement of the permit program is post- construction monitoring. Depending on the magnitude of the anticipated disturbance, USFWS may require the applicant to provide post-construction monitoring to determine whether the nest sites, communal roosts, or important foraging areas continue to be used by eagles for up to 3 years following completion of the permitted activity (USFWS, 2009). The DOT&PF would coordinate with USFWS to determine if post-construction monitoring would be required as a condition of the JAI Project eagle permit.

In addition to the USFWS regulations, the City and Borough of Juneau (CBJ) Land Use Code states that development is prohibited within 330 feet of an eagle nest on public land within the CBJ. The DOT&PF would need a variance from the CBJ for the JAI Project if the selected alternative requires construction within 330 feet of a bald eagle nest.

**Table 2-1: Recommended Distance to Maintain from Active Bald Eagle Nests
for Permitted Activities***

Permitted Activity	Specific Considerations	Nest Site Visible	Nest Site Not Visible	Timing of Restriction
Linear construction (roads, utilities, trails)	No existing similar activity within 1 mile	660 feet; landscape buffers recommended	330 feet	Clearing, external construction, and landscaping within 660 feet should be done outside breeding season
	Existing similar activity closer than 1 mile	660 feet, or as close as existing tolerated activity of similar scope	330 feet, or as close as existing tolerated activity of similar scope within 660 feet	Clearing, external construction, and landscaping within 660 feet should be done outside breeding season
Helicopter or aircraft	Except for biologist trained in survey techniques	1,000 feet	1,000 feet	During breeding season except where eagles have demonstrated tolerance to such activities
Blasting or other loud intermittent noises		0.5 mile	0.5 mile	Applies to active nests during breeding season except where eagles have demonstrated tolerance to such activities

Source: USFWS, 2007.

*Note: Depending on the selected alternative, the DOT&PF would apply for eagle permits for nests within 660 feet of the cut and fill limits and 0.5 miles of blasting activities.

3. Studies and Coordination

The following updates Section 2.0 of the 2004 *Bald Eagle Technical Report* with additional bald eagle nest survey information since 2003. The DOT&PF began coordination with the USFWS, Raptor Management Division, during the reconnaissance phase of the JAI Project in 1994. The USFWS conducted annual nest surveys along the East Lynn Canal route from 1997 through 2008 and again in 2012 with funding and administrative support from DOT&PF. Results of the 1997–2003 USFWS surveys are described in the *Bald Eagle Nesting and Productivity at Lynn Canal, Southeast Alaska, 1997–2003* (USFWS, 2003) and in the 2004 *Bald Eagle Technical Report*. The following paragraphs describe surveys conducted subsequent to those documented in the 2004 *Bald Eagle Technical Report*.

In the summer of 2004, USFWS conducted a bald eagle survey on the east and west sides of Lynn Canal (USFWS, 2005). Ninety-two nest sites were surveyed on the east side of Lynn Canal, of which 35 were considered active and 17 were considered successful nests (49 percent of active nests were successful). On the west side of Lynn Canal, 50 nest sites were surveyed, of which 26 were considered active and 16 were considered successful nests (62 percent of active nests were successful). This survey revealed 5 new nests on the west side of Lynn Canal, all outside the 330-foot buffer area of Alternative 3. One of the nests detected within the 330-foot buffer area during the 2003 survey was not detected. Three nests were within 125 feet of the centerline of the Alternative 3 alignment (Table 3-1).

In summer of 2005, USFWS conducted a bald eagle survey along the east side of Lynn Canal. Ninety-eight nests were surveyed during this time, of which 45 were considered active and 22 were considered successful nests (49 percent of active nests were successful). The survey identified 8 new nests within the project area. Three were outside the 330-foot buffer area for Alternative 2B, including 1 north of the alignment in Taiya Inlet. Five were within 125 feet of the centerline of the Alternative 2B alignment (USFWS, 2005). None of the nests are within the 330-foot buffer for Alternatives 4B and 4D (Table 3-1).

The USFWS conducted aerial surveys along the East Lynn Canal in July 2006, 2007, and 2008 to document new nests along the Alternative 2B corridor. The 2006 survey identified 11 new nests, the 2007 survey identified 6 new nests, and the 2008 survey identified 4 new nests (Table 3-1). No surveys were conducted from 2009 through 2011. The USFWS and DOT&PF conducted an aerial survey in April 2012 to obtain updated bald eagle nest information for the analysis of alternatives for the JAI Project Draft SEIS. The April 2012 survey was flown on both sides of Lynn Canal and documented 60 new nests along East Lynn Canal and 21 new nests along West Lynn Canal (Figures 1 through 13 in Attachment B; Table 3-1). An additional aerial survey was conducted in July 2012 to document nest success.

The locations of all eagle nests found during the 2003 through 2012 USFWS surveys are shown in Figures 2 through 13. Locations of nests prior to 2003 are documented in the 2004 *Bald Eagle Technical Report*. Figures 2 through 8 include detailed vicinity maps for Alternative 2B, the East Lynn Canal highway route, and Figures 9 through 13 include detailed vicinity maps for Alternative 3, the West Lynn Canal route. These figures also show the proposed highway

alignments for ferry Alternatives 4B and 4D and indicate the approximate distances of the nests from the cut and fill limits (herein referred to as work limits) of the proposed highway.

Table 3-1: Active Bald Eagle Nests and Nest Productivity, 2003–2012

East Lynn Canal								
	2003	2004	2005	2006	2007	2008	2012	Mean
Nest sites surveyed	94	92	98	95	102	111	124	102.3
Number of new nests	NA	NA	NA	11	6	4	60	20.3
Active nests	37	35	45	46	46	42	48	42.7
(No. nests and percent)	39%	38%	46%	48%	45%	38%	39%	42%
Successful nests	20	17	22	23	15	16	22	19.3
(No. nests and percent)	21%	19%	22%	24%	15%	14%	18%	19%
Active nests successful	54%	49%	49%	50%	33%	38%	46%	45%
Young/active nest	0.78	0.60	0.64	0.65	0.48	0.48	0.63	0.60
Young/successful nests	1.40	1.24	1.32	1.30	1.47	1.25	1.36	1.33
West Lynn Canal								
	2003	2004	2005¹	2006¹	2007¹	2008¹	2012	Mean
Nest sites surveyed	53	50	---	---	---	---	40	47.7
Number of new nests	NA	NA	---	---	---	---	21	21.0
Active nests	22	26	---	---	---	---	18	22.0
(No. nests and percent)	42%	52%	---	---	---	---	45%	46%
Successful nests	10	16	---	---	---	---	3	9.7
(No. nests and percent)	19%	32%	---	---	---	---	8%	19%
Active nests successful	45%	62%	---	---	---	---	17%	41%
Young/active nest	0.64	0.69	---	---	---	---	0.22	0.52
Young/successful nests	1.40	1.13	---	---	---	---	1.33	1.29

NA = not applicable

¹No surveys completed during the year indicated.

Sources: USFWS 2003; JAI Project Draft SEIS Appendix R; JAI Project Final EIS Appendix W; USFWS 2009; Steve Lewis USFWS, personal communication, November 12, 2012.

Note: Nests located over 0.5 mile from the work limits are not included.

4. Affected Environment

This section updates the bald eagle life history presented in Section 3.1 of the 2004 *Bald Eagle Technical Report* based on recent literature pertaining to bald eagles in southeast Alaska. Bald eagles are abundant in Southeast Alaska, with a population estimated at approximately 13,000 adults, which is probably at or near the historic carrying capacity (Hodges, 2011).

During the summer months, nesting pairs disperse to nest sites along the coast. Their nesting habitat is primarily old-growth trees near salt water. Most nest trees are located within 600 feet of the shoreline (Suring, 2008). Some nests are occupied more frequently than others, and the productivity of each nest varies greatly. Only 25 to 55 percent of available nests are occupied during any given year. Bald eagles are most susceptible to disturbance during the nesting season (March through August in Southeast Alaska). Bald eagles subjected to disturbance during the breeding season may seek new, more remote nest sites or may abandon nests (Fraser and Anthony, 2008). Studies have shown that bald eagle pairs may react to human activities very differently. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pairs (USFWS, 2009).

In winter, bald eagles tend to congregate in areas where food resources are plentiful and where they can seek shelter from strong winds and storms. Thousands of bald eagles winter in the Chilkat Bald Eagle Preserve because of the abundance of a late chum salmon (*Onchorhynchus keta*) run (Boeker, 2008). Fish are the most important prey for bald eagles in Southeast Alaska and often comprise 80–90 percent of their diet (Lincer et al., 1979). Eagles also prey on waterfowl, small mammals, sea urchins, clams, crabs, and carrion. In the winter months, ducks and geese may represent up to 20 percent of a bald eagle's diet (Isleib, 2008).

Bald eagles are considered a Management Indicator Species (MIS) by the Tongass National Forest because of their dependence on coastal areas for foraging and nesting. MIS are species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation to assess the effects of management activities on their populations and the populations of other species with similar habitat needs that they may represent (Goldstein et al., 2009).

5. Environmental Consequences

This section updates the direct effects analysis for potential impacts to bald eagles as described in Sections 4.4, 4.6, and 4.8 of the 2004 *Bald Eagle Technical Report*. The direct effects that were identified in the 2004 report generally remain the same. This 2014 update focuses on impacts to eagles from the proximity of construction activities to eagle nests based on the new survey data, new regulations regarding bald eagle take and disturbance permits and changes to the alignment of Alternatives 2B and 3, and additional widening of the Glacier Highway Extension highway component of Alternatives 4B and 4D. It also includes an analysis of impacts to bald eagles from the new Alternative 1B.

There are 268 bald eagle nests located within the JAI study area (see Figures 1–13, and Tables B-1 and B-2 in Attachment A). For this 2014 update, Tables B-1 and B-2 from Attachment B of the 2004 *Bald Eagle Technical Report* have been updated to provide the distance from the work limits of the highway alignments to nests that fall within 0.5 mile of the work limits.

5.1 Alternative 1B – Enhanced Service with Existing AMHS Assets

Alternative 1B would enhance ferry service in Lynn Canal with existing AMHS assets, and would not result in the construction of any new highways or ferry terminals. No bald eagle nests have been documented near any of the existing ferry terminals. Therefore, there are no effects to bald eagles identified for this alternative.

5.2 Alternative 2B – East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

As noted in the introduction of this report, minor alignment and design changes have been incorporated into Alternative 2B since the 2006 ROD as a result of Clean Water Act Section 404 permitting minimization measures, geotechnical investigations, and 2012 eagle nest surveys. A total of 136 bald eagle nests are located less than 0.5 mile from the work limits of the East Lynn Canal Highway alternative. Figures 2 through 8 show the proposed highway alignment for Alternative 2B and indicate the approximate distances of the eagle nests from the work limits of the highway. Construction activity would occur within 660 feet of 99 of those nests (73 percent of nests within 0.5 mile of the work limits). Sixty-three of the 99 nests are located within 330 feet of the project work limits. The alignment has been shifted to avoid nests that were less than 30 feet from the work limits where possible. In some cases, steep slopes and avoiding intertidal and wetland fill prevented shifting the alignment farther away from eagle nest locations.

Table 5-1 identifies the number of nests located within the study area for Alternative 2B and Table B-1 includes all nests on East Lynn Canal and the distances from work limits of the alignment to each nest within 0.5 mile. DOT&PF would need a Disturbance Permit to construct in proximity to nests that are within 660 feet of the highway construction work limits. A variance from the CBJ to allow development within 330 feet of a bald eagle nest on public land within the CBJ would be obtained before construction activities begin. A variance was granted for three nests along Alternative 2B in 2006, but the variance expired in 2008.

Table 5-1: Number of Bald Eagle Nests within the Study Area and Distance to Work Limits of Proposed Alignments

Distance from Highway / Ferry Work Limits	Alternative 2B	Alternative 3	Alternative 4B	Alternative 4D
>0.5 mile	169	220	238	238
661–2,640 ft (0.5 mile)	37	15	23	23
Total nests <660 ft	99	48	7	7
331–660 ft	36	18	5	5
101–330 ft	27	23	2	2
61–100 ft	11	4	0	0
31–60 ft	18	3	0	0
0–30 ft	7	0	0	0
Total Nests	305	283	268	268

During operation of the East Lynn Canal Highway, maintenance blasting by helicopter along avalanche prone areas of the highway would be conducted during the nest selection period in late April, as needed, to protect the highway and travelers from late spring avalanches. Bald eagle nests located in or near the avalanche prone areas may be impacted by intermittent helicopter operations and blasting noise. Charges would be dropped into avalanche trigger zones generally located well above timberline, relatively far from eagle nests along the shoreline. Response to such disturbances may include flushing from the nest, or abandoning the nest (Steidl and Anthony, 2000). Maintenance blasting along avalanche prone areas of Alternative 2B could occur within 0.5 mile of up to 46 nests in the most severe snow circumstances, but in a typical spring only a fraction of that total might be affected. DOT&PF would coordinate with USFWS to determine if a Disturbance Permit is necessary for annual maintenance blasting in avalanche areas.

5.3 Alternative 3 – West Lynn Canal Highway

As noted in the introduction of this report, minor alignment and design changes have been incorporated into Alternative 3 since the 2004 *Bald Eagle Technical Report* to avoid bald eagle nests. A total of 63 bald eagle nests are located within 0.5 mile of the work limits of Alternative 3 (shown in Figures 2, 3, and 9 through 13). This total includes 16 nests on the east side of Lynn Canal between Echo Cove and Sawmill Cove. A total of 48 nests (76 percent of nests within 0.5 mile of the work limits) are located within 660 feet of the work limits. Thirty of the 48 nests are located less than 330 feet from the project work limits. Table 5-1 identifies the number of nests located within the study area for Alternative 3 and Table B-2 includes all nests on West Lynn Canal and the distances from the work limits of the alignment to each nest. DOT&PF would need a Disturbance Permit for all nests located within 660 feet of the alignment work limits. A variance request from the CBJ to allow development within 330 feet of a bald eagle nest on public land within the CBJ must be obtained before construction would occur.

During operation of the West Lynn Canal Highway, maintenance blasting along avalanche prone areas of the highway would be conducted during the nest selection period in late April, as needed, to protect the highway and travelers from late spring avalanches. Bald eagle nests located in or near the avalanche prone areas may be impacted by blasting noise as described above for Alternative 2B. Maintenance blasting along avalanche prone areas of Alternative 3 would occur within 0.5 mile of up to approximately 23 nests. DOT&PF would coordinate with USFWS to determine if a Disturbance Permit is necessary for annual maintenance blasting in avalanche areas.

5.4 Alternatives 4B and 4D – FVF Service/ Conventional Monohull Service from Berners Bay

These alternatives include highway widening and construction along East Lynn Canal to Sawmill Cove and FVF or conventional monohull service from Berners Bay to Haines and Skagway. A total of 23 bald eagle nests are documented within 0.5 mile of the ferry route and new proposed ferry terminal. Only two nests are located within 660 feet of the work limits for the highway portion of these alternatives (Table 5-1). These two nests are located along the existing Glacier Highway between Echo Cove and Cascade Point and are generally accustomed to daily activity. Construction activities affecting these nests would require a Disturbance Permit. A variance request from the CBJ to allow development within 330 feet of a bald eagle nest on public land within the CBJ would be obtained before construction would occur.

During operation of the Glacier Highway extension to Sawmill Cove, maintenance blasting by helicopter along avalanche-prone areas of the highway would be conducted during the nest selection period in late April, as needed, to protect the highway and travelers from late spring avalanches. Bald eagle nests located in or near the avalanche-prone areas may be impacted by intermittent helicopter operations and blasting noise. Charges would be dropped into avalanche trigger zones generally located well above timberline, relatively far from eagle nests along the shoreline. Response to such disturbances may include flushing from the nest, or abandoning the nest (Steidl and Anthony, 2000). Maintenance blasting along avalanche-prone areas of Alternatives 4B and 4D could occur within 0.5 mile of up to 2 nests in the most severe snow circumstances, but in a typical spring fewer might be affected. DOT&PF would coordinate with USFWS to determine if a Disturbance Permit is necessary for annual maintenance blasting in avalanche areas.

6. Mitigation Measures

The National Bald Eagle Management Guidelines (USFWS, 2007) recommend construction activities outside of the bald eagle breeding season (March 1 to August 30; see Table 2-1); however, due to weather constraints (i.e., frozen ground or heavy snow cover) in the winter months in the project area, it is not practicable to limit construction to that period. If Alternative 2B, 3, 4B, or 4D were selected, DOT&PF would apply for permits to disturb nests within 660 feet of the work limits of the alignment and for nests within 0.5 mile of maintenance blasting activities. For those nests affected by blasting activities (<0.5 mile) or within 660 feet of the work limits, a Disturbance Permit is anticipated. DOT&PF does not anticipate the need for any Take Permits for the project at this time. DOT&PF would conduct on-the-ground nest surveys before construction to confirm the location of trees with eagle nests. For 5 years following construction, DOT&PF would fund USFWS aerial surveys to assess the potential impacts from the JAI Project on the Lynn Canal bald eagle population.

A variance request to allow development within 330 feet of a bald eagle nest on public land in the CBJ would be obtained from the CBJ before construction would occur. Any applicable conditions from the variance would be incorporated into the mitigation measures.

7. References

- Alaska Department of Transportation and Public Facilities (DOT&PF). 2004. *Appendix R, Bald Eagle Technical Report for the Juneau Access Improvements Supplemental Draft Environmental Impact Statement*. Juneau, Alaska, October 2004. Available online at http://dot.alaska.gov/sereg/projects/juneau_access/assets/SDEIS_JAN05/Appendix_R.pdf
- . 2005. *Juneau Access Project: Supplemental Draft Environmental Impact Statement*. Juneau, Alaska. Available online at http://dot.alaska.gov/sereg/projects/juneau_access/documents.shtml.
- . 2006. *Juneau Access Project: Final Environmental Impact Statement*. Juneau, Alaska. Available online at http://dot.alaska.gov/sereg/projects/juneau_access/documents.shtml.
- Boeker, E. L. 2008. “Eagles on the Chilkat: Winter Ecology.” In: *Bald Eagles in Alaska* (Wright, B. A., and P. F. Schempf, eds.), pp. 134–137.
- Fraser, J. D., and R. G. Anthony. 2008. “Human Disturbance and Bald Eagles.” In: *Bald Eagles in Alaska* (Wright, B. A., and P. F. Schempf, eds.), pp. 304–314.
- Goldstein, Michael, D. Martin, and M. C. Stensvold. 2009. *2009 Forest Service Alaska Region Sensitive Species List Assessment and Proposed Revisions to the 2002 List*.
- Hodges, J. I. 2011. “Bald eagle population surveys of the North Pacific Ocean, 1967–2010.” *Northwestern Naturalist* 92:7–12.
- Isleib, M. E. “Pete.” 2008. “Avian Resources for Southeast Alaska: A Brief Review and Their Importance to Eagles.” In: *Bald Eagles in Alaska* (Weight, B. A., and P. F. Schempf, eds.), pp. 68–71.
- Lincer, J. L., W. Clark, and M. N. France, Jr. 1978. “Working Bibliography of the Bald Eagle Breeding Population in Southeast Alaska.” *Journal of Wildlife Management* 43:219–221.
- Steidl, R. J., and R.G. Anthony. 2000. Experimental Effects of Human Activity on Breeding Bald Eagles. *Ecological Applications* 10(1), pp. 258–268.
- Suring, L. H. 2008. “Habitat Relationships of Bald Eagles in Alaska.” In: *Bald Eagles in Alaska* (Wright, B. A., and P. F. Schempf, eds.), pp. 106–116.
- U. S. Fish and Wildlife Service (USFWS). 2003. *Bald Eagle Nesting and Productivity at Lynn Canal, Southeast Alaska, 1997–2003*.
- . 2005. Lynn Canal Bald Eagle Survey data collected by Mike Jacobson for 2004 and 2005. Personal communication. August 18, 2005.
- . 2007. *National Bald Eagle Management Guidelines*. May 2007.
- . 2009. “Eagle permits; take necessary to protect interests in particular localities; final rule.” *Federal Register* 74:46836–46879.

Attachment A

Updated Tables

This section includes updated versions of the following tables that were presented in the 2004 *Bald Eagle Technical Report*.

Table B-1 Bald Eagle Nest Locations East Lynn Canal

Table B-2 Bald Eagle Nest Locations West Lynn Canal

This page intentionally left blank.

Table B-1. Bald Eagle Nest Locations East Lynn Canal

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL085 (FWS#4)	110+00	382	657 LT	628	N/A
EGL121 (FWS#90)	160+33	357	405 LT	382	N/A
EGL166 (FWS#99)	174+00	2122	509 LT	486	N/A
EGL154 (FWS#93)	184+81	Surveyed post FEIS	397 LT	362	N/A
EGL153 (FWS#94)	200+50	593	548 LT	507	N/A
EGL152 (EGL139)	234+08	Surveyed post FEIS	2,102 LT	2,039	N/A
EGL082 (FWS#30B)	255+67	1,361	1,386 LT	1,315	N/A
EGL165	261+91	Surveyed post FEIS	2,032 LT	1,980	N/A
EGL302	279+43	Surveyed post FEIS	1,868 LT	1,758	N/A
EGL081 (FWS#30A)	279+89	2,194	1,781 LT	1,669	N/A
EGL080 (FWS#30)	285+40	1,384	1,207 LT	1,174	N/A
EGL301	288+74	Surveyed post FEIS	1,574 LT	1,557	N/A
EGL176 (FWS#100)	297+66	Surveyed post FEIS	1,681 LT	1,656	N/A
EGL299	326+09	Surveyed post FEIS	616 LT	502	N/A
EGL300	325+04	Surveyed post FEIS	1,184 LT	1,080	N/A
EGL079 (FWS#31)	346+05	333	385 LT	304	Downhill alignment would fill onto beach. Alignment constrained by steep uphill slope
EGL078 (FWS#32)	366+23	1,609	1,646 LT	1,596	N/A
EGL077 (FWS#32A)	378+24	1,637	1,907 LT	1,833	N/A
EGL298	394+87	Surveyed post FEIS	1,983 LT	1,948	N/A
EGL120 (FWS#8)	407+40	686	466 LT	388	N/A
EGL164	440+64	Surveyed post FEIS	498 LT	382	N/A
EGL076 (FWS#2)	453+96	44	495 LT	421	N/A
EGL119 (FWS#4A)	466+08	157	706 LT	626	N/A

Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL074 (FWS#4)	477+26	104	413 LT	370	N/A
EGL294	521+59	Surveyed post FEIS	76 LT	23	New nest - downhill alignment would fill into herring spawning area. Uphill alignment constrained by high cliffs
EGL163	557+74	Surveyed post FEIS	177 RT	151	New nest - alignment is downhill of nest due to extremely steep uphill terrain. Alignment constrained by herring spawning area.
EGL292	561+38	Surveyed post FEIS	62 RT	32	New nest - alignment is downhill of nest due to extremely steep uphill terrain. Alignment constrained by herring spawning area.
EGL181	299+23	Surveyed post FEIS	2,306 LT	2,246	N/A
EGL162	601+28	Surveyed post FEIS	1,349 RT	1,286	N/A
EGL118 (FWS#13A)	635+21	N/A	2,988 RT	N/A	N/A
EGL161	699+34	Surveyed post FEIS	1,738 RT	1,683	N/A
EGL160	699+89	Surveyed post FEIS	1,499 RT	1,444	N/A
EGL180	703+82	Surveyed post FEIS	385 RT	331	N/A
EGL287	706+00	Surveyed post FEIS	736 RT	702	N/A
EGL175 (FWS#35)	714+89	Surveyed post FEIS	514 RT	483	N/A
EGL174 (FWS#36)	723+41	Surveyed post FEIS	186 LT	152	Alignment location driven by need to avoid wetlands, other eagle nests and the need to minimize the impacts at the beaver slough crossing
EGL290	729+56	Surveyed post FEIS	733 LT	717	N/A
EGL117	747+42	N/A	4,684 RT	N/A	N/A
EGL138 (FWS#85A)	763+75	N/A	436 LT	323	Nest downhill from alignment along lace river
EGL073 (FWS#?)	773+00	>330	1,033 LT	954	N/A
EGL116 (FWS#7)	804+37	775	1,614 LT	1,547	N/A
EGL072 (FWS#69)	826+06	1211	1,406 LT	1,366	N/A

*Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report*

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet)¹	Offset from work limits (feet)²	Comments for primary zone encroachments³
EGL151	834+20	Surveyed post FEIS	2,016 LT	1,979	N/A
EGL284	837+32	Surveyed post FEIS	1,998 LT	1,965	N/A
EGL071 (FWS#102A)	861+27	685	745 LT	713	N/A
EGL070 (FWS#102)	866+42	N/A	1,851 LT	1,808	N/A
EGL281	867+68	Surveyed post FEIS	4,111 LT	N/A	N/A
EGL069 (FWS#4)	867+79	N/A	4,157 LT	N/A	N/A
EGL279	868+11	Surveyed post FEIS	3,412 LT	N/A	N/A
EGL068 (FWS#46D)	868+66	N/A	3,156 LT	N/A	N/A
EGL067 (FWS#46E)	868+77	N/A	3,190 LT	N/A	N/A
EGL270	870+53	Surveyed post FEIS	9,769 LT	N/A	N/A
EGL271	870+61	Surveyed post FEIS	9,552 LT	N/A	N/A
EGL062 (FWS#59)	870+63	N/A	12,093 LT	N/A	N/A
EGL066 (FWS#46C)	870+91	1706	1,606 LT	1,548	N/A
EGL273	872+59	Surveyed post FEIS	4,539 LT	N/A	N/A
EGL065 (FWS#46B)	873+07	1315	1,279 LT	1,211	N/A
EGL064 (FWS#46)	873+32	831	799 LT	729	N/A
EGL274	876+58	Surveyed post FEIS	2,465 LT	2,428	N/A
EGL063 (FWS#46A)	886+49	517	604 LT	567	N/A
EGL272	949+02	Surveyed post FEIS	6,167 LT	N/A	N/A
EGL266	951+87	Surveyed post FEIS	16,363 LT	N/A	N/A
EGL265	951+90	Surveyed post FEIS	17,558 LT	N/A	N/A
EGL264	951+98	Surveyed post FEIS	19,951 LT	N/A	N/A
EGL263	952+02	Surveyed post FEIS	19,154 LT	N/A	N/A
EGL267	952+04	Surveyed post FEIS	14,641 LT	N/A	N/A
EGL262	953+16	Surveyed post FEIS	14,108 LT	N/A	N/A
EGL261	953+41	Surveyed post FEIS	12,878 LT	N/A	N/A

Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL061 (FWS#88A)	954+09	Surveyed post FEIS	12,226 LT	N/A	N/A
EGL259	954+68	Surveyed post FEIS	10,300 LT	N/A	N/A
EGL258	956+04	Surveyed post FEIS	8,893 LT	N/A	N/A
EGL060 (FWS#62A)	971+32	N/A	5,565 LT	N/A	N/A
EGL059 (FWS#62)	982+17	N/A	5,419 LT	N/A	N/A
EGL058 (FWS#63)	1021+60	N/A	3,225 LT	N/A	N/A
EGL254	1023+22	Surveyed post FEIS	3,155 LT	N/A	N/A
EGL057 (FWS#99)	1035+70	2122	1,638 LT	1,600	N/A
EGL253	1039+46	Surveyed post FEIS	1,738 LT	1,702	N/A
EGL056 (FWS#97A)	1047+75	962	648 LT	601	N/A
EGL251	1073+11	Surveyed post FEIS	1,081 LT	1,056	N/A
EGL055 (FWS#97)	1083+90	729	1,063 LT	1,022	N/A
EGL054 (FWS#89)	1112+75	910	892 LT	849	N/A
EGL053 (FWS#64)	1128+93	439	455 LT	418	N/A
EGL247	1135+46	Surveyed post FEIS	480 LT	443	N/A
EGL248	1143+23	Surveyed post FEIS	484 LT	453	N/A
EGL052 (FWS#65)	1148+47	417	434 LT	393	N/A
EGL246	1162+17	Surveyed post FEIS	471 LT	447	N/A
EGL050 (FWS#95)	1183+75	707	528 LT	463	N/A
EGL244	1184+18	Surveyed post FEIS	656 LT	595	N/A
EGL245	1184+93	Surveyed post FEIS	522 LT	476	N/A
EGL049 (FWS#94)	1195+81	593	540 LT	509	N/A
EGL243	1214+06	Surveyed post FEIS	467 LT	438	N/A
EGL241	1252+69	Surveyed post FEIS	734 LT	707	N/A
EGL242	1253+60	Surveyed post FEIS	646 LT	615	N/A
EGL048 (FWS#27)	1253+71	709	743 LT	712	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL047 (FWS#83)	1282+06	498	523 LT	490	N/A
EGL240	1283+60	Surveyed post FEIS	609 LT	577	N/A
EGL115 (FWS#57)	1375+42	82	182 LT	154	Offset increased. The nest buffer encompasses the beach and an uphill bench at the base of steep terrain. The beach alignment would have had cuts into the cliff face below the nest tree, so the alignment was set on the east edge of the bench uphill from the nest.
EGL159	1408+66	Surveyed post FEIS	196 RT	158	The nest buffer encompasses the beach and an uphill bench at the base of steep terrain. The beach alignment would have had cuts into the cliff face below the nest tree, so the alignment was set on the east edge of the bench uphill from the nest.
EGL114 (FWS#82)	1411+60	113	142 RT	113	This nest is on the base of a rock knob overlooking a beach area. Alignments on either side of the tree would enter the buffer. The beach alignment was chosen for its smaller footprint (fill vs. Rock cuts) and to avoid encroachment into nest FWS#81 buffer.
EGL113 (FWS#81)	1430+83	355	389 RT	361	N/A
EGL170 (FWS#118)	1469+47	Surveyed post FEIS	85 RT	49	New nest - alignment downhill of nest due to very steep slopes on the uphill side. The alignment is constrained on the downhill side by the high tide line.
EGL111 (FWS#81A)	1477+40	296	276 RT	247	Nest sets at the bottom of very steep terrain, with relatively gradual slope down to the beach. Alignment on the outer edge of buffer on the beach.
EGL112 (FWS#81B)	1478+46	366	361 RT	333	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL236	1520+72	Surveyed post FEIS	62 RT	30	New nest - alignment downhill of nest due to very steep slopes on the uphill side. The alignment is constrained on the downhill side by the high tide line.
EGL109 (FWS#79A)	1545+84	110	231 LT	119	Nest on narrow bench a short distance from waterside cliffs and deep water to the west and steep terrain to the east. The alignment loops uphill to the base of a cliff in the steepest part of the slope to minimize encroachment.
EGL108 (FWS#79)	1548+70	133	179 LT	53	Close to nest FWS#79, it is on a narrow bench a short distance from waterside cliffs and deep water to the west and steep terrain to the east. The alignment loops uphill to the base of a cliff in the steepest part of the slope to minimize encroachment.
EGL234	1552+39	Surveyed post FEIS	130 LT	94	New nest - grouped with EGL108 and EGL109. The alignment loops uphill to the base of a cliff in the steepest part of the slope to minimize encroachment.
EGL233	1573+31	Surveyed post FEIS	62 RT	30	New nest – grouped with EGL107. The alignment loops uphill to the base of a cliff in the steepest part of the slope to minimize encroachment.
EGL107 (FWS#78)	1575+35	109	148 RT	106	Nest located on very steep hillside 160 feet from beach. Alignment spotted on bench near beach.
EGL232	1577+82	Surveyed post FEIS	136 RT	104	New nest - grouped with EGL107. The alignment loops uphill to the base of a cliff in the steepest part of the slope to minimize encroachment.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL106 (FWS#32)	1609+30	291	285 LT	156	Nest located at top of beach cliff into deep water. Alignment set as far as possible to the east at the base of very steep slope.
EGL105 (FWS#77)	1649+67	71	106 LT	71	Nest positioned midway between beach and base of very steep slope. Alignment set at the base of the steep slope.
EGL229	1667+54	Surveyed post FEIS	81 RT	54	New nest - nest located at the base of a very steep slope. The alignment is positioned downhill of the nest as far as possible while avoiding beach fills.
EGL103 (FWS#84)	1692+01	88	114 LT	27	Nest is located on a bench above beach cliffs. The alignment is positioned uphill as far as possible at the base of very steep terrain.
EGL101 (FWS#93A)	1709+51	217	87 RT	56	Nest is under cliffs in very rugged terrain. Alignment is positioned downhill of nest and above beach cliffs to avoid deep water fills and to minimize encroachments at nests EGL102 and EGL149 ahead on line.
EGL102 (FWS#93)	1713+00	76	127 LT	31	Nest is in the middle of a 100 foot wide bench between beach cliffs and very difficult uphill terrain. The alignment is located uphill as far as possible to minimize encroachment into the buffer while minimizing encroachment into the EGL101 buffer.
EGL149	1713+93	Surveyed post FEIS	132 LT	58	Nest is next to EGL102 - the alignment is located uphill as far as possible to minimize encroachment into the buffer while minimizing encroachment into the EGL101 buffer.
EGL227	1721+64	Surveyed post FEIS	226 RT	196	New nest - nest is located on steep talus slope. Alignment is positioned downhill on the beach at the toe of the talus.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL100 (FWS#76)	1757+97	152	59 RT	29	Nest located high on steep talus slope. The alignment is positioned between the nest and the beach cliffs.
EGL099 (FWS#75)	1767+23	93	169 LT	82	Nest is at the top of beach cliff above deep water. East buffer is in very steep terrain. Alignment is at the base of the steep terrain.
EGL178	1789+42	Surveyed post FEIS	685 RT	655	N/A
EGL177	1789+61	Surveyed post FEIS	549 RT	519	N/A
EGL124 (FWS#?)	1803+01	91	103 RT	75	Nest is on steep terrain under cliffs. Alignment is on bench just above beach cliffs to allow it to be positioned above EGL125.
EGL125 (FWS#?)	1812+49	135	162 LT	132	Nest on top of beach cliff, forcing alignment uphill to the base of steep talus slope.
EGL215	1829+41	Surveyed post FEIS	504 RT	475	N/A
EGL098 (FWS#74)	1839+16	76	102 RT	73	Nest is just above the beach cliff and below very steep terrain. Beach fill alignment is the minimum impact alignment.
EGL095 (FWS#38C)	1857+72	53	116 LT	34	Nest is just above the beach on a talus slope. To avoid beach fill, alignment loops above nest on a fill across the gradual talus slope.
EGL096 (FWS#38B)	1868+40	94	205 LT	150	Nest is the top of a low beach cliff and at the toe of a gradual talus slope. The alignment continues from EGL095 and crosses this slope above the nest on a slight bench.
EGL213	1885+22	Surveyed post FEIS	72 RT	44	New nest - nest located at the base of a steep slope. The alignment drops off a bench and runs below the nest, but off of the shoreline.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL146	1887+72	Surveyed post FEIS	101 RT	68	New nest - nest located at the base of a steep slope. The alignment drops off a bench and runs below the nest, but off of the shoreline.
EGL212	1912+51	Surveyed post FEIS	64 RT	35	New nest - nest located on bench at base of steep mega-talus slope. Alignment runs below the nest and above the high tide line.
EGL211	1952+05	Surveyed post FEIS	68 RT	37	New nest - nest located near the base of very steep terrain. The alignment angles below this nest and above the three nests ahead on line.
EGL158	1953+79	Surveyed post FEIS	127 LT	99	New nest - on steep slope 108 feet from high tide line. Alignment runs above nest to avoid deep water fills and to get above nests EGL094 and EGL209. Constrained by very steep uphill slope
EGL094 (FWS#41)	1957+91	33	245 LT	155	Nest on steep talus slope close to beach. Alignment runs uphill to avoid deep water fills. Constrained by very steep uphill slope
EGL209	1961+14	Surveyed post FEIS	145 LT	57	New nest - nest on steep talus slope. Alignment uphill of nest. I constrained by downhill by preceding nests and uphill by very steep terrain.
EGL034 (FWS#36)	2000+05	190	349 LT	219	Nest off beach on steep terrain. Alignment towards uphill limits of buffer at base of cliffs.
EGL033 (FWS#35A)	2013+66	99	139 LT	58	Alignment set at base of steep terrain on uphill side of nest. Downhill alignment precluded by beach cliffs and beach location of nest FWS#35.
EGL032 (FWS#35)	2024+26	229	303 LT	253	Nest on bench above beach cliffs. Alignment moved uphill to base of steep terrain near outer limits of buffer.
EGL206	2026+37	Surveyed post FEIS	507 LT	455	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL157 (FWS#607)	2097+95	65	65 LT	30	New nest? May be project nest 607 in Table B-1. Nest located on a bench near the bottom of a very steep talus slope. Below the nest are steep beach cliffs. The alignment runs uphill of the nest on a fill against the talus. The alignment is constrained to very steep terrain and the talus both back on line, and ahead on line.
EGL031 (FWS#39)	2123+96	56	94 RT	52	Nest located on steep hillside. Very steep terrain back on line prevented moving alignment for an uphill encroachment. Beach alignment is the minimum impact alignment.
EGL156	2210+74	Surveyed post FEIS	395 LT	363	N/A
EGL145	2216+17	Surveyed post FEIS	117 LT	61	Nest is located on a bench above beach cliffs and deep water fills. The alignment runs above the nest, and is constrained by steep talus slopes back on line, and high bedrock cliffs ahead on line.
EGL029 (FWS#32)	2232+84	54	124 LT	32	Nest is located on a bench above beach cliffs and deep water fills. The alignment is pinned the base of high cliffs on the uphill side of the nest.
EGL028 (FWS#31)	2268+99	76	270 LT	240	Nest on bench above initial beach cliff. Alignment set on top of next cliff and at the base of steep terrain.
EGL027 (FWS#30)	2288+34	97	207 LT	164	Nest is located on steep talus slope. In order to avoid deep water fills, the alignment crosses the talus slope above the nest and at the toe of very steep slopes.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL026 (FWS#29)	2290+95	86	190 LT	96	Nest is located on steep talus slope. In order to avoid deep water fills, the alignment crosses the talus slope above the nest and at the toe of very steep slopes.
EGL143	2337+23	Surveyed post FEIS	152 LT	117	Nest located on steep talus slopes just above beach. The alignment avoids deep water fills by crossing above the nest. The alignment is constrained by very steep slopes and cliffs ahead on line.
EGL127 (FWS#?)	2359+35	93	317 LT	283	Alignment determined by downhill sea lion haulout and uphill cliffs.
EGL142	2374+36	Surveyed post FEIS	324 LT	280	Nest is located on a very steep slope above the beach cliffs. The alignment is uphill of the nest due to the need to skirt around the sea lion haulout at grand. It is constrained by steep cliffs at the nest location.
EGL025 (FWS#27B)	2401+73	74	548 LT	487	N/A
EGL024 (FWS#27A)	2450+89	75	132 LT	47	Nest on steep hillside below cliffs. Alignment constrained to location by steep terrain before and after the nest and deep-water beach fills.
EGL204	2501+58	Surveyed post FEIS	71 RT	389	New nest - located on steep slope back from beach. Alignment is downhill from nest where it is constrained by beach cliffs and very steep terrain back on line.
EGL023 (FWS#25)	2550+96	94	104 RT	76	Nest on bench below very high cliffs. Alignment runs below nest into beach fills which constrain the alignment from further increases in offset.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
EGL202	2565+53	Surveyed post FEIS	86 LT	38	New nest - nest located near the beach, which prevents running the alignment on the downhill side of the nest. The alignment is on the uphill side of the nest, and is constrained by steep slopes and nest EGL093.
EGL093 (FWS#24)	2567+30	44	100 RT	61	Nest on very steep slope below cliffs, pushed the alignment onto the beach. Deep water constrains the alignment from increasing the offset from the nest.
EGL021 (FWS#44A)	2602+87	139	184 LT	146	Nest located on a wide bench above the beach cliff. The alignment is pinned below a cliff preceding the nest and has to drop quickly past the nest to get below a massive vertical face. A downhill alignment would encroach on the buffer and have back slopes daylighting near the base of the tree.
EGL168 (FWS#66)	2611+47	Surveyed post FEIS	63 RT	31	Nest at the foot of a very steep slope. The alignment set to the west, where it is constrained by intertidal wetlands.
EGL020 (FWS#44)	2623+80	270	248 RT	207	Nest is on a relatively gradual slope. The alignment is on the beach at the base of the slope. The alignment is constrained by intertidal wetlands.
EGL018 (FWS#43B)	2646+78	N/A	3,377 RT	N/A	N/A
EGL019 (FWS#43)	2647+84	2602	2,730 RT	N/A	N/A
EGL199	2652+45	Surveyed post FEIS	4,295 RT	N/A	N/A
EGL017	2663+11	N/A	6,022 RT	N/A	N/A
EGL167 (FWS#64)	2688+76	Surveyed post FEIS	6,634 RT	N/A	N/A
EGL016 (FWS#42)	2707+04	771	720 RT	675	N/A

*Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report*

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet)¹	Offset from work limits (feet)²	Comments for primary zone encroachments³
EGL015 (FWS#23B)	2727+95	340	642 RT	314	Nest high on steep slope. Alignment follows base of slope and is constrained by wetlands ahead on line.
EGL196	2739+95	Surveyed post FEIS	82 LT	21	N/A
EGL014 (FWS#23A)	2766+24	197	234 RT	176	The nest is on the east edge of a wide bench that abuts very tough terrain. Alignment is on the flats of the Katzehin delta in outer limits of the buffer.
EGL092 (FWS#22)	2271+00	391	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL013 (FWS#15B)	2271+00	118	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL012 (FWS#15A)	2271+00	345	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL193	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL091 (FWS#6)	2271+00	79	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL191	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL010 (FWS#14)	2271+00	59	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL190	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL009 (FWS#16A)	2271+00	219	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL141	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL188	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL008 (FWS#16)	2271+00	30	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL186	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL090 (FWS#13A)	2271+00	104	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL184	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL006 (FWS#13)	2271+00	119	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL005 (FWS#12A)	2271+00	65	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL183	2271+00	Surveyed post FEIS	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal
EGL004 (FWS#11)	2271+00	272	N/A	N/A	Approx. Distance beyond Katzehin ferry terminal

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-1 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ²	Comments for primary zone encroachments ³
---	---------	--	--	---	---

¹ Offset from Centerline of alignment based on current Draft SEIS Alignment (RT = right; LT = left)

² Offset from edge of work limits based on current Draft SEIS Alignment

³ Nests that are 330 feet or less from the work limits are considered within the primary zone.

⁴ Offset from edge of work limits was not calculated for nests greater than 0.5 mile.

Table B-2. Bald Eagle Nest Locations West Lynn Canal

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL301 (FWS#73)	4025+24	Surveyed post FEIS	2,292	2,270	Nest is southeast of the project start point
EGL360 (FWS#8)	4061+67	164	193 RT	164	Alignment on bench uphill from nest to get around rock knob ahead on line. Beach alignment would have encroached on buffer and increased the impacts to FWS#9.
EGL361 (FWS#9)	4102+24	155	188 RT	102	Nest on east edge of bench overlooking beach. Beach alignment would have had cut daylighting near base of tree. Alignment at base of mountain uphill from tree.
EGL362 (FWS#57)	4155+54	139	314 RT	247	Buffer encroachments on beach and uphill alignments. Chose lesser impact on uphill bench at base of hill.
EGL305 (FWS#6)	4182+99	93	183 RT	128	Nest overlooking beach at the end of a ridge. Beach alignment would most likely be a "take". Chose an uphill thru-cut.
EGL306 (FWS#7)	4214+20	101	182 RT	167	Nest overlooking beach on the south-facing slope of ridge that extends to the beach. Beach alignment would have had cut daylighting near base of tree. Moved alignment uphill as far a possible into a thru- cut.
EGL307 (FWS#68)	4225+61	85	123 RT	84	Nest overlooking beach on the north facing slope of ridge that extends to the beach. Beach alignment would have had cut daylighting near base of tree. Alignment exits thru-cut from FWS#7 and runs along the back edge a bench uphill from the nest.
EGL363 (FWS#43)	4263+49	381	414 LT	389	N/A
EGL378	4266+47	Surveyed post FEIS	372 RT	434	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL308 (FWS#43A)	4290+57	81	161 RT	61	Nest on top of cliff overlooking Endicott R. Uphill alignment at base of mountain gives greatest offset from nest and best approach for Endicott R. Bridge.
EGL309 (FWS#43B)	4312+05	N/A	4,617 LT	N/A	N/A
EGL310 (FWS#43C)	4326+50	N/A	4,669 LT	N/A	N/A
EGL364 (FWS#9)	4363+27	177	213 RT	172	Nest at base of cliff and on beach. This is a karst area. Alignment set at base of mountain as far as possible uphill from nest and karst.
EGL365 (FWS#10)	4396+69	348	423 RT	391	N/A
EGL313 (FWS#70)	4449+53	116	166 LT	127	Nest on steep rock bluff. The alignment goes in between EGL313 and EGL379. Only alignment alternative was on the beach.
EGL379	4454+58	Surveyed post FEIS	106 RT	247	Nest is on top of beach cliff. Uphill alignment avoided undercutting nest incurred on beach alignment
EGL314 (FWS#14A)	4508+70	54	155 RT	54	Nest on wide bench in karst area. About equal encroachment on alignment uphill and downhill from nest. Chose uphill alignment at base of mountain to stay out of high vulnerability karst.
EGL381	4547+60	Surveyed post FEIS	771 RT	759	N/A
EGL317 (FWS#91B)	4585+00	97	143 LT	98	This nest is on a bench between the beach and a steep bluff in a high vulnerability karst area. The alignment moved onto the beach below the nest as the low impact and karst avoidance option.

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL366 (FWS#91)	4586+33	150	191 LT	150	This nest is on a bench between the beach and a steep bluff in a high vulnerability karst area. The alignment moved onto the beach below the nest as the low impact and karst avoidance option.
EGL315 (FWS#91A)	4595+80	140	160 LT	128	Beach alignment, below nest, driven by nests FWS#91 and FWS#91B.
EGL318 (FWS#71)	4614+07	68	209 RT	100	Nest on top of cliff overlooking the beach and the base of a very steep bluff. Encroachment either way. Beach alignment cut slope would have daylighted close to nest tree. Chose to set alignment at base of bluff uphill of the nest. This set the alignment to avoid encroachment into nest FWS#72 buffer and high vulnerability karst ahead on line.
EGL319 (FWS#72)	4634+51	606	641 RT	605	N/A
EGL320 (FWS#17)	4669+58	339	374 RT	342	N/A
EGL385	4672+96	Surveyed post FEIS	333 RT	274	Nest on top of steep beach cliff. A few hundred feet away from the nest is a knob requiring a cut. Uphill alignment proved to be the minimum impact option to avoid the need for excessive material removal.
EGL321 (FWS#73)	4687+71	377	414 RT	386	N/A
EGL322 (FWS#18)	4715+09	589	615 RT	522	N/A
EGL323 (FWS#18A)	4768+16	N/A	4,202 RT	N/A	N/A
EGL324 (FWS#22A)	4792+98	N/A	4,213 RT	N/A	N/A
EGL389	4852+67	Surveyed post FEIS	1,173 RT	1191	N/A
EGL326 (FWS#1A)	4863+80	438	462 RT	436	N/A
EGL390	4929+28	Surveyed post FEIS	523 RT	535	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL327 (FWS#17)	4941+37	338	373 RT	338	N/A
EGL367 (FWS#18A)	4981+25	593	632 RT	601	N/A
EGL328 (FWS#18)	4981+42	N/A	769 RT	728	N/A
EGL369 (FWS#19)	5011+78	313	341 RT	314	Nest located on wide bench between beach and base of mountain. Choose minimum impact alignment at base of mountain uphill from nest.
EGL392	5017+07	Surveyed post FEIS	459 RT	488	N/A
EGL393	5042+55	Surveyed post FEIS	255 RT	174	Nest located on wide bench above beach. High beach cliffs ahead on line forced alignment above nest. The road alignment goes in between EGL393 and EGL330 in order to equally avoid each nest.
EGL330 (FWS#10A)	5054+29	123	152 LT	121	Nest buffer encompasses the beach and steep uphill terrain. Buffer encroachment about the same uphill and downhill. Choose downhill alignment for the easier terrain and smaller footprint.
EGL331 (FWS#20A)	5075+08	284	328 RT	278	Nest located on top of cliff above beach. Minimum impact alignment set on uphill bench at base of mountain.
EGL370 (FWS#20)	5086+53	145	192 RT	144	Nest located on top of cliff above beach. Minimum impact alignment set on uphill bench at base of mountain.
EGL332 (FWS#20)	5088+96	N/A	274 RT	230	N/A
EGL333 (FWS#21)	5145+58	1242	1,269 RT	1241	N/A
EGL334 (FWS#7)	5172+71	240	277 RT	245	Nest located on top of cliff above beach. Minimum impact alignment set on uphill bench at base of mountain.
EGL371 (FWS#20)	5212+53	226	258 RT	224	Nest located at the base of cliff and on the beach. Set the alignment at back edge of uphill bench at the. Base of the mountain.

*Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report*

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet)¹	Offset from work limits (feet)^{2,3,4}	Comments for primary zone encroachments³
EGL396 (FWS#19)	5219+59	48	144 LT	106	Nest located on top high cliffs approximately 450 feet from the beach. Alignment located between the base of the high cliffs and the beach cliffs.
EGL397	5332+77	Surveyed post FEIS	457 RT	449	N/A
EGL372 (FWS#4)	5361+70	358	392 RT	357	N/A
EGL335 (FWS#23)	5384+93	680	715 RT	664	N/A
EGL398	5390+43	Surveyed post FEIS	913 RT	917	N/A
EGL399	5533+03	Surveyed post FEIS	243 RT	243	Nest located in wetland flats approximately 1800 feet from beach. Alignment is located west of nest and is constrained by the need to avoid wetland impacts. This alignment had been previously shifted to avoid wetlands.
EGL336 (FWS#24)	5587+33	2,583	2,615 RT	2,583	N/A
EGL401	5618+70	Surveyed post FEIS	2,558 RT	2,533	N/A
EGL337 (FWS#25A)	5624+39	2196	2,220 RT	2,194	N/A
EGL338 (FWS#6)	5669+65	219	273 RT	222	Nest located at the base of cliff and on the beach. Set the alignment at back edge of uphill bench at the base of a steep cliff.
EGL402	5675+53	Surveyed post FEIS	115 RT	421	Nest is located on the top of beach cliffs. The alignment is located west of the nest at the base of steep terrain to avoid beach alignment cutslope impacts to nest tree and tideland fills.
EGL339 (FWS#17)	5700+43	260	310 RT	260	Nest located at the base of cliff and on the beach. Set the alignment at back edge of uphill bench at the base of the mountain.
EGL340 (FWS#17A)	5733+63	1,008	1,036 RT	977	N/A

Juneau Access Improvements Project Draft SEIS
2014 Update to Appendix R – Bald Eagle Technical Report

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL403	5745+37	Surveyed post FEIS	70 LT	52	Nest located on bench above beach cliffs. To avoid steep terrain and fill impacts to the nest, the alignment was shifted downhill to the top of the beach cliffs.
EGL404	5816+69	Surveyed post FEIS	369 RT	334	N/A
EGL341 (FWS#8A)	5893+29	1,404	1,512 RT	1,490	N/A
EGL342 (FWS#8)	5902+20	1,041	1,081 RT	1,039	N/A
EGL406	5939+69	Surveyed post FEIS	79 RT	51	Nest located on top of beach cliff. The alignment was moved uphill to avoid beach alignment, tideland fills and cut slope impacts to nest tree.
EGL348 (FWS#12A)	5962+38	N/A	16,891 LT	N/A	N/A
EGL410	5962+49	N/A	16,514 LT	N/A	N/A
EGL347 (FWS#12)	5962+53	N/A	14,625 LT	N/A	N/A
EGL345 (FWS#27)	5965+14	N/A	4,144 LT	N/A	N/A
EGL346 (FWS#11A)	5966+40	N/A	12,686 LT	N/A	N/A
EGL408	5966+52	Surveyed post FEIS	10,766 LT	N/A	N/A
EGL407	5966+89	Surveyed post FEIS	4,875 LT	N/A	N/A
EGL343 (FWS#28)	5968+86	2399	1,380 LT	1349	N/A
EGL344 (FWS#15)	5969+15	1345	2,434 LT	2402	N/A
EGL411	5978+55	Surveyed post FEIS	20,277 LT	N/A	N/A
EGL355 (FWS#?)	6030+39	N/A	436 RT	421	N/A
EGL373 (FWS#29)	603044'	368	421 RT	406	N/A
EGL349 (FWS#31A)	6057+33	N/A	23,188 LT	N/A	N/A
EGL350 (FWS#31)	6063+50	N/A	20,606 LT	N/A	N/A
EGL351 (FWS#32)	6065+46	N/A	20,195 LT	N/A	N/A
EGL352 (FWS#30A)	6076+73	N/A	11,525 LT	N/A	N/A
EGL353 (FWS#30B)	6078+60	N/A	10,717 LT	N/A	N/A

Nest number (DOT&PF No. and USFWS No.)	Station	Original Table B-2 offset from work limits (feet)	Offset from construction centerline (feet) ¹	Offset from work limits (feet) ^{2,3,4}	Comments for primary zone encroachments ³
EGL354 (FWS#30)	6078+60	N/A	8,527 LT	N/A	N/A

¹ Offset from centerline of alignment based on current Draft SEIS Alignment (RT = right; LT = left)

² Offset from edge of work limits based on current Draft SEIS Alignment

³ Nests that are 330 feet or less from the work limits are considered within the primary zone.

⁴ Offset from edge of work limits was not calculated for nests greater than 0.5 mile.

This page intentionally left blank.

Attachment B

Updated Figures

This section provides the following updated versions of Figures 1 to 8 that were originally presented in the 2004 *Bald Eagle Technical Report*.

- Figure 1 Bald Eagle Nest Locations and Figure Index
- Figure 2 Bald Eagle Nests Echo Cove Vicinity East Lynn Canal
- Figure 3 Bald Eagle Nests Berners Bay Vicinity East Lynn Canal
- Figure 4 Bald Eagle Nests Sherman Rock Vicinity East Lynn Canal
- Figure 5 Bald Eagle Nests Eldred Rock Vicinity East Lynn Canal
- Figure 6 Bald Eagle Nests Yeldagalga Creek East Lynn Canal
- Figure 7 Bald Eagle Nests Katzehin River East Lynn Canal
- Figure 8 Bald Eagle Nests Taiya Inlet East Lynn Canal
- Figure 9 Bald Eagle Nests William Henry Bay West Lynn Canal
- Figure 10 Bald Eagle Nests Endicott River West Lynn Canal
- Figure 11 Bald Eagle Nests Sullivan Island West Lynn Canal
- Figure 12 Bald Eagle Nests Chilkat Inlet West Lynn Canal
- Figure 13 Bald Eagle Nests Chilkat Inlet – Haines

This page intentionally left blank.



Juneau Access Improvements

Figure 1

Bald Eagle Nest Locations and Figure Index

Bald Eagle Nests By Year

- 2012 ○ 2005
- 2008 ○ 2003
- 2007 ○ Reported gone
- 2006

Alternative 2B

East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

■ New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

■ New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

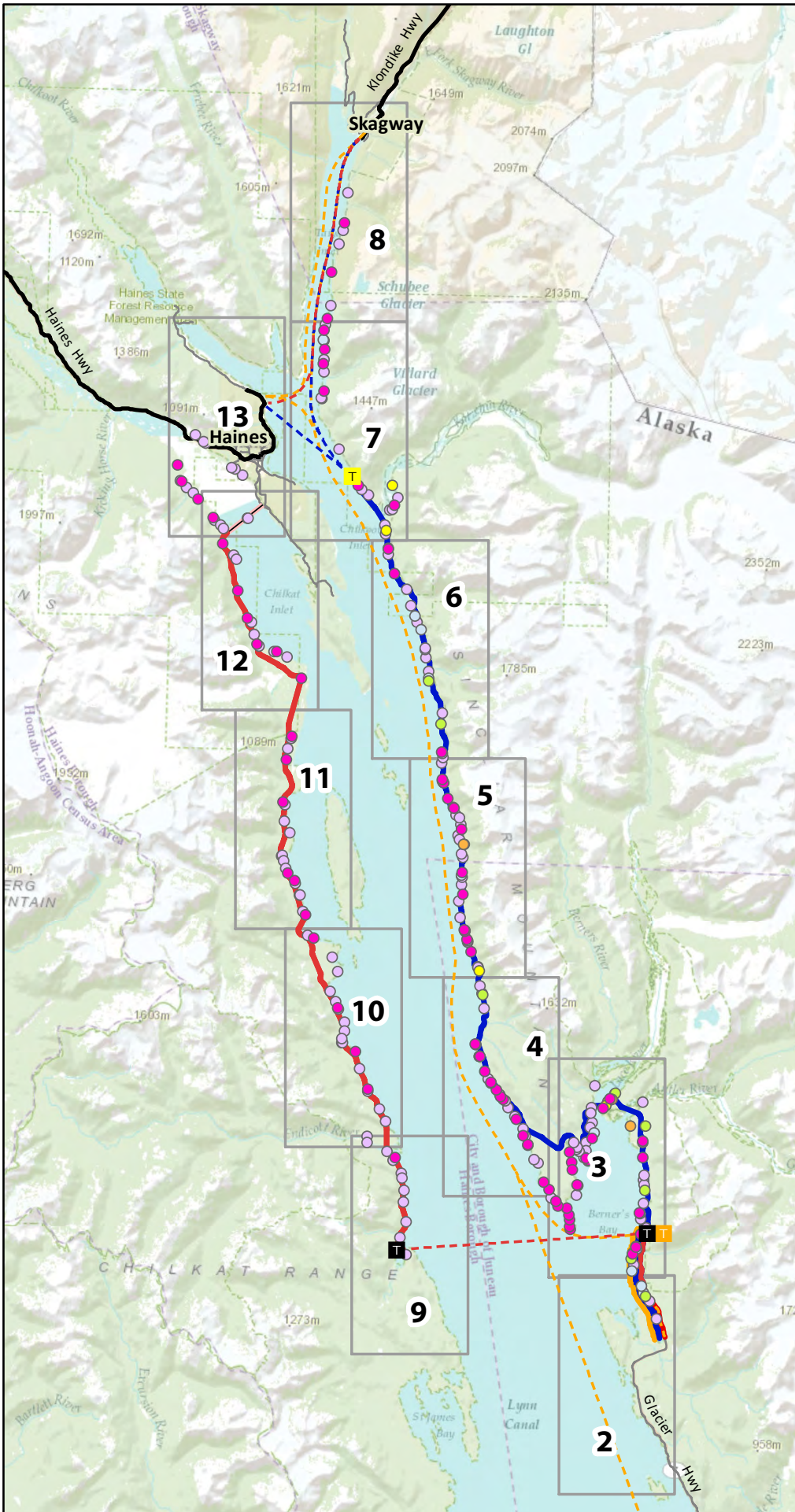
Alternatives 4B and 4D

Marine Alternatives

■ New Ferry Terminal

— New Highway

- - - Ferry Shuttle or Dayboat



3/18/2013

Sources: AK DOT&PF, USFWS

0 2 4 8 Miles





Juneau Access Improvements

Figure 2

Bald Eagle Nests
Echo Cove Vicinity East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

- T** New ferry terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

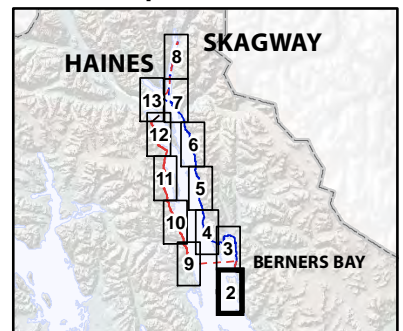
- T** New Ferry Terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternatives 4B and 4D

Marine Alternatives

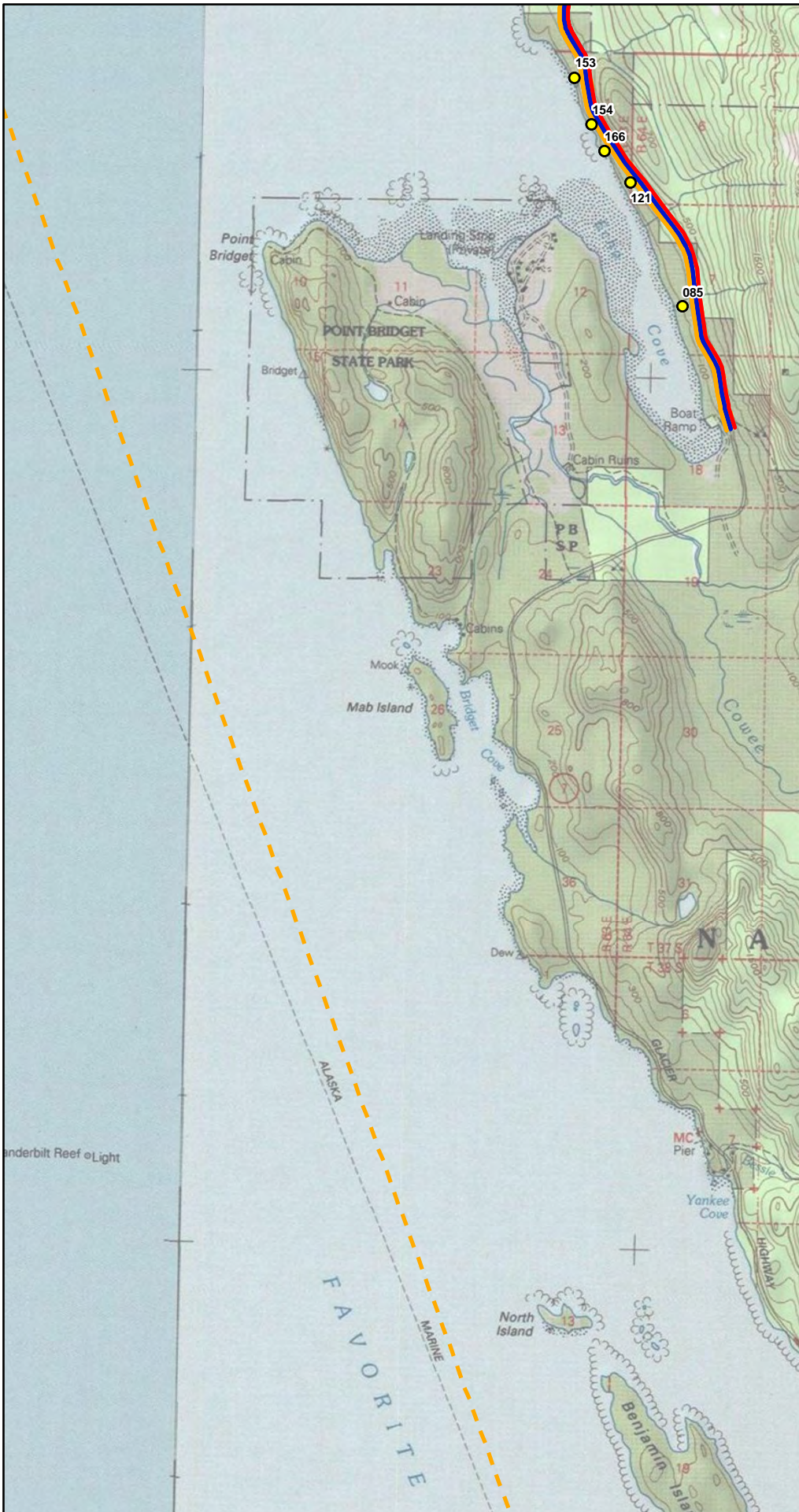
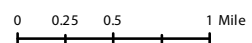
- T** New Ferry Terminal
- New Highway
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 3

Bald Eagle Nests
Berners Bay Vicinity East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

- T** New ferry terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

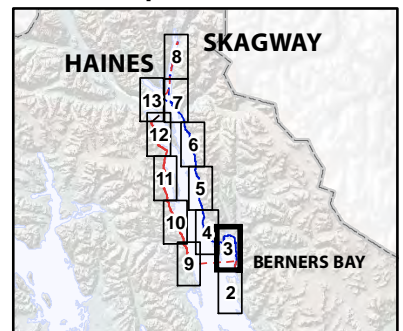
- T** New Ferry Terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternatives 4B and 4D

Marine Alternatives

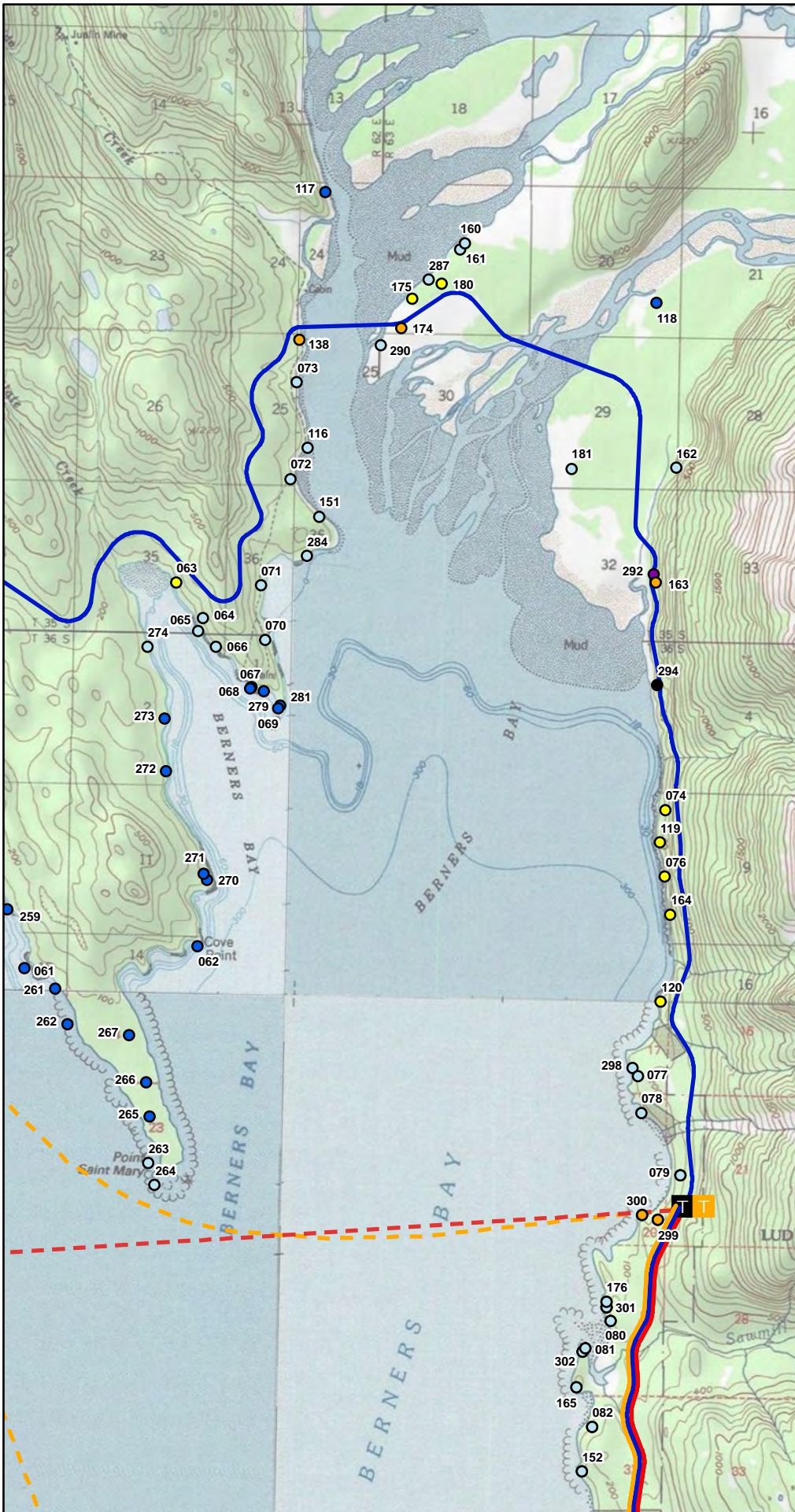
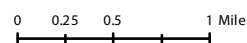
- T** New Ferry Terminal
- New Highway
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 5

Bald Eagle Nests
Eldred Rock Vicinity East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

- T** New ferry terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

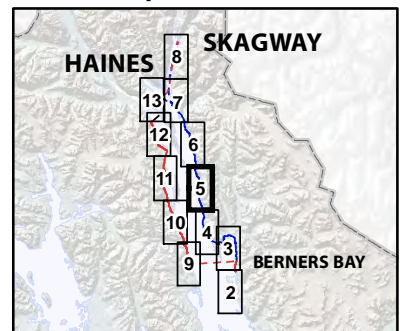
- T** New Ferry Terminal
- New Highway
- New Bridge
- - - Ferry Shuttle

Alternatives 4B and 4D

Marine Alternatives

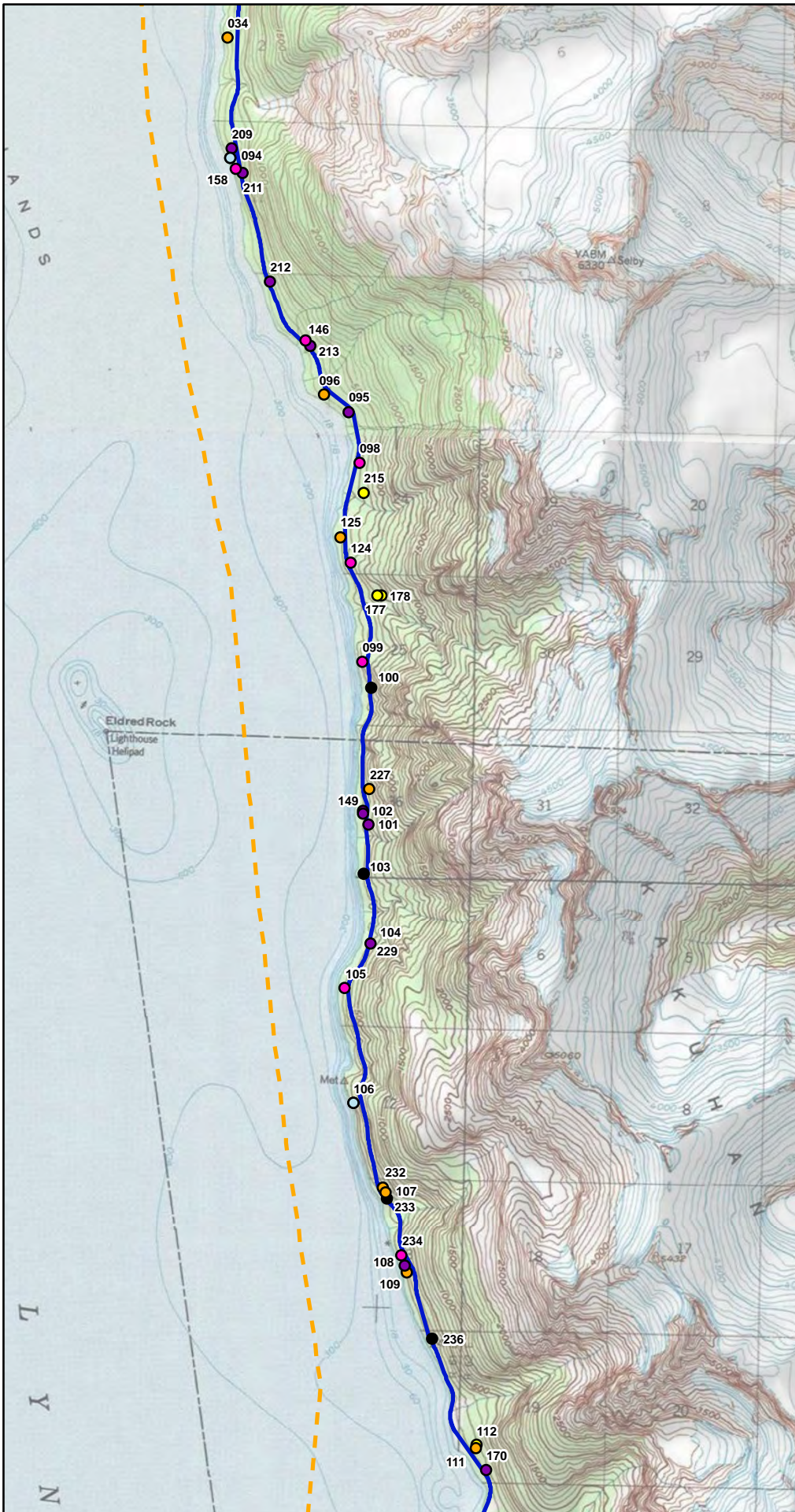
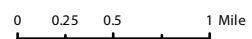
- T** New Ferry Terminal
- New Highway
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 6

Bald Eagle Nests
Yeldagalga Creek East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

- T** New ferry terminal
- New Highway
- New Bridge
- Ferry Shuttle

Alternative 3

West Lynn Canal Highway

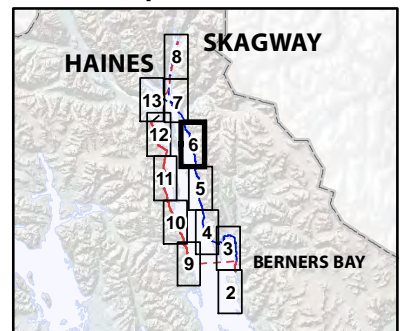
- T** New Ferry Terminal
- New Highway
- New Bridge
- Ferry Shuttle

Alternatives 4B and 4D

Marine Alternatives

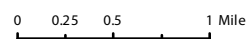
- T** New Ferry Terminal
- New Highway
- Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 7

Bald Eagle Nests
Katzehin River East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

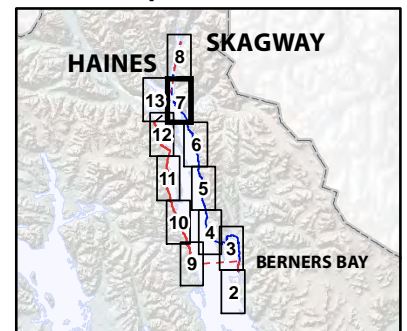
Marine Alternatives

T New Ferry Terminal

— New Highway

- - - Ferry Shuttle or Dayboat

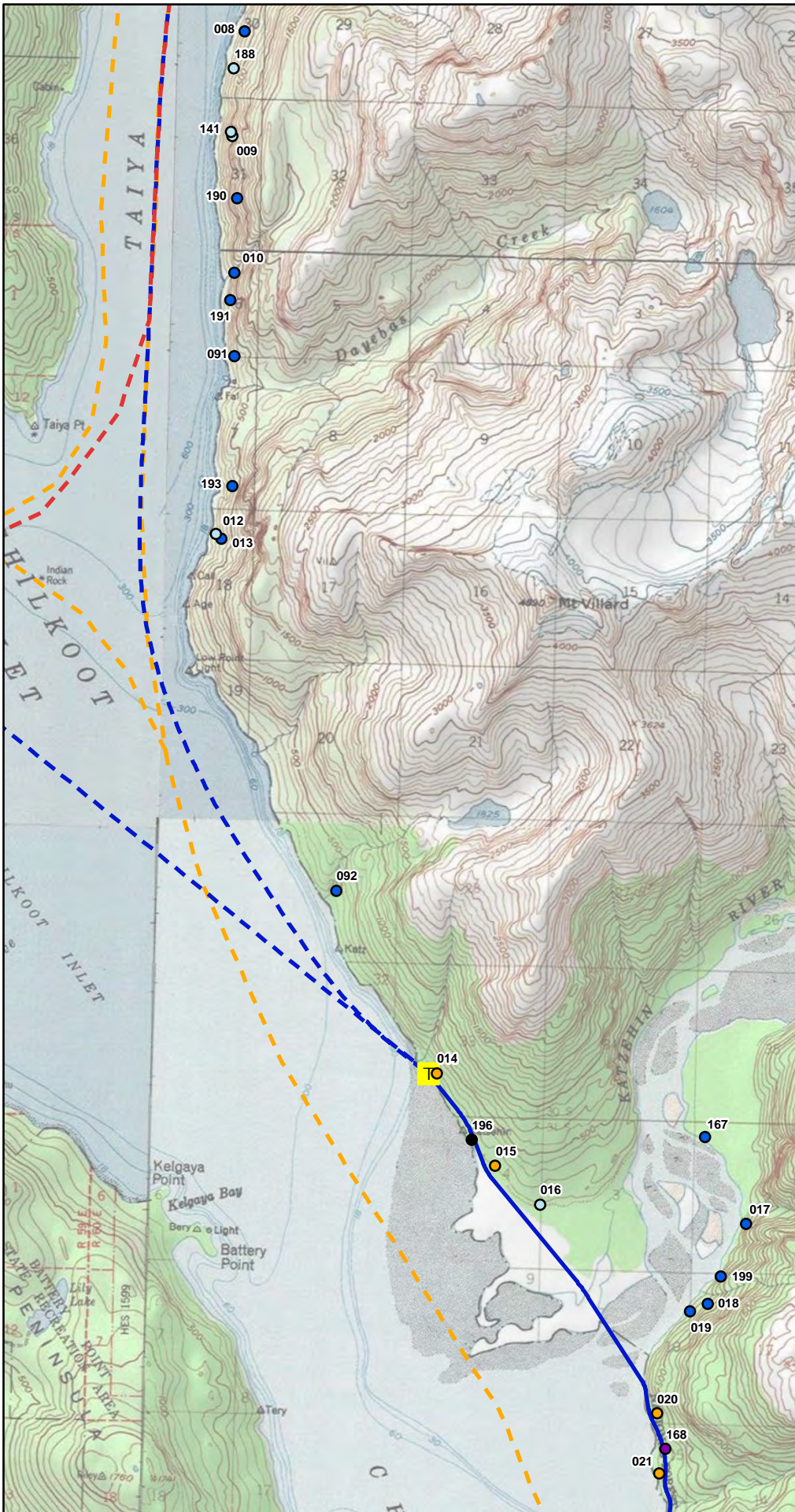
Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)

0 0.25 0.5 1 Mile





Juneau Access Improvements

Figure 8

Bald Eagle Nests
Taiya Inlet East Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

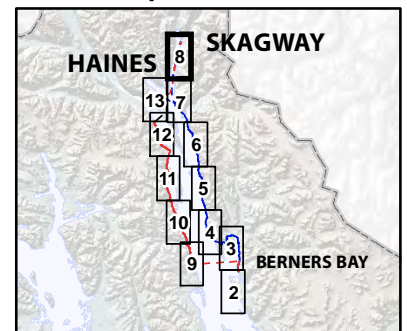
Marine Alternatives

T New Ferry Terminal

— New Highway

- - - Ferry Shuttle or Dayboat

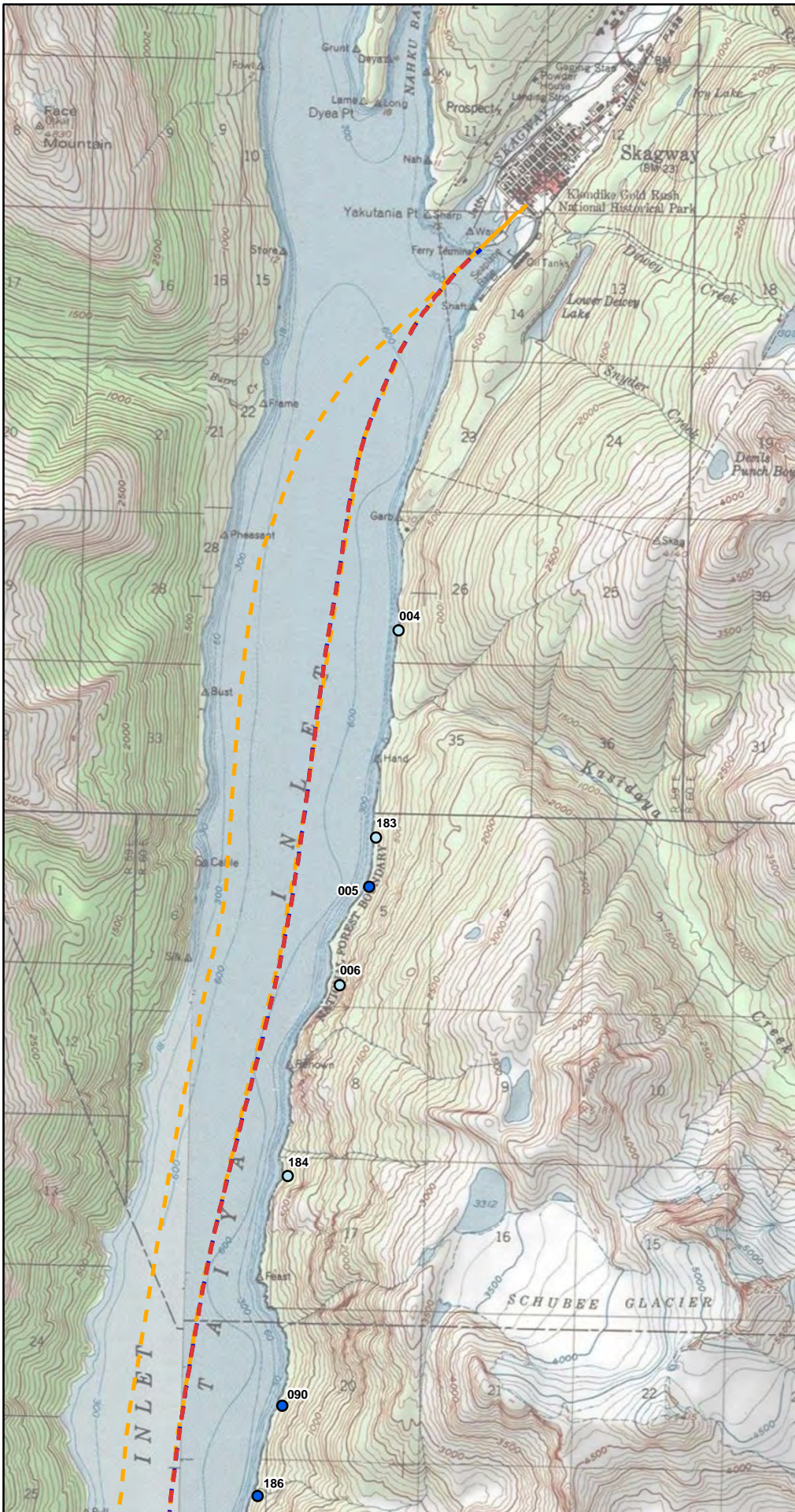
Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)

0 0.25 0.5 1 Mile





Juneau Access Improvements

Figure 9

Bald Eagle Nests
William Henry Bay West Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

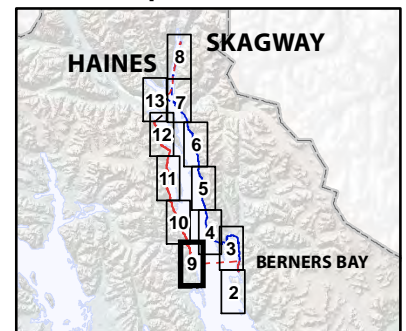
Marine Alternatives

T New Ferry Terminal

— New Highway

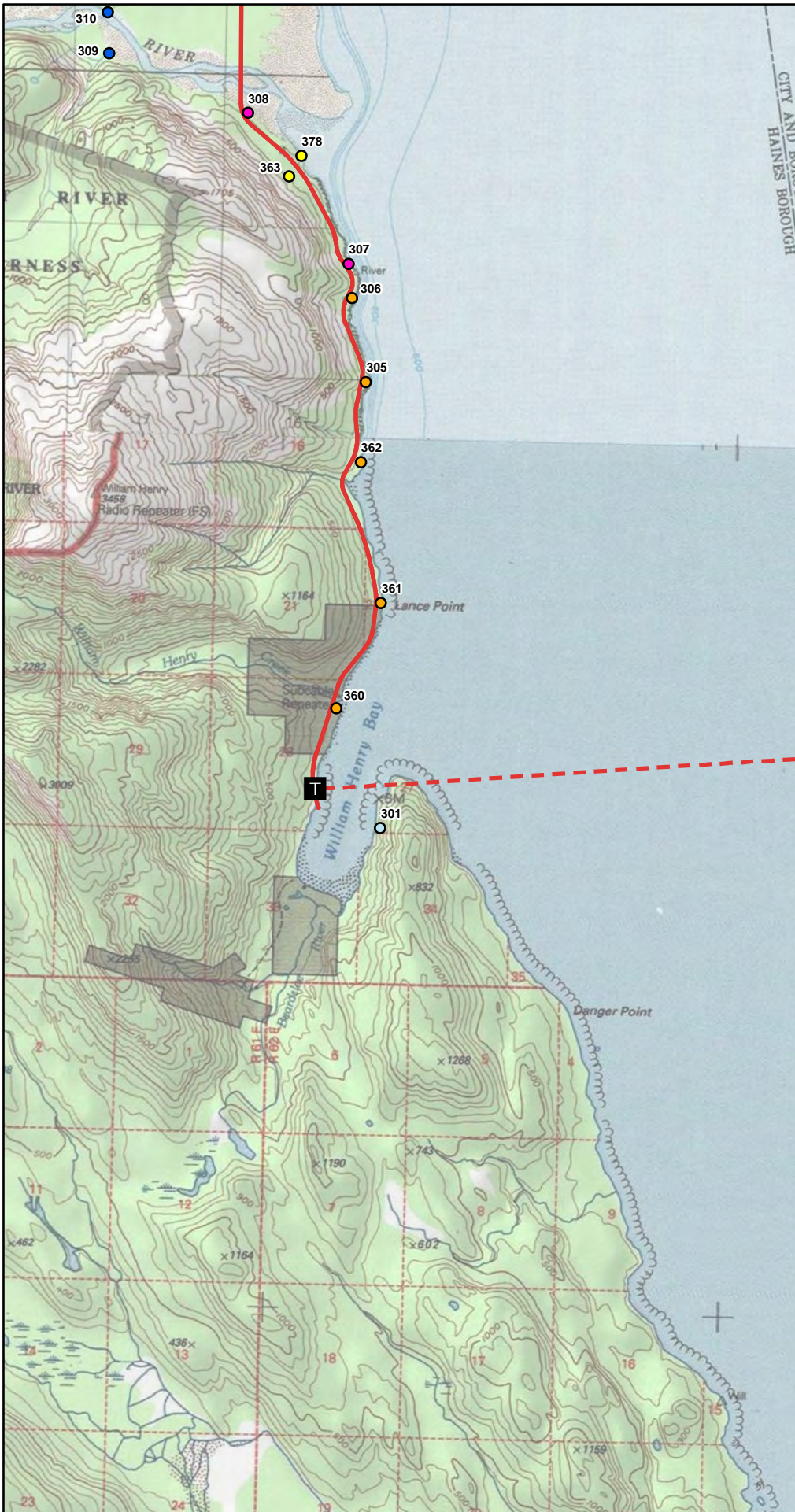
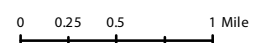
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 10

Bald Eagle Nests
Endicott River West Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

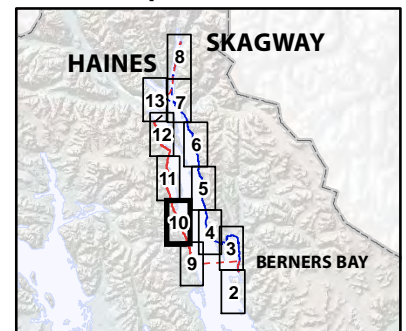
Marine Alternatives

T New Ferry Terminal

— New Highway

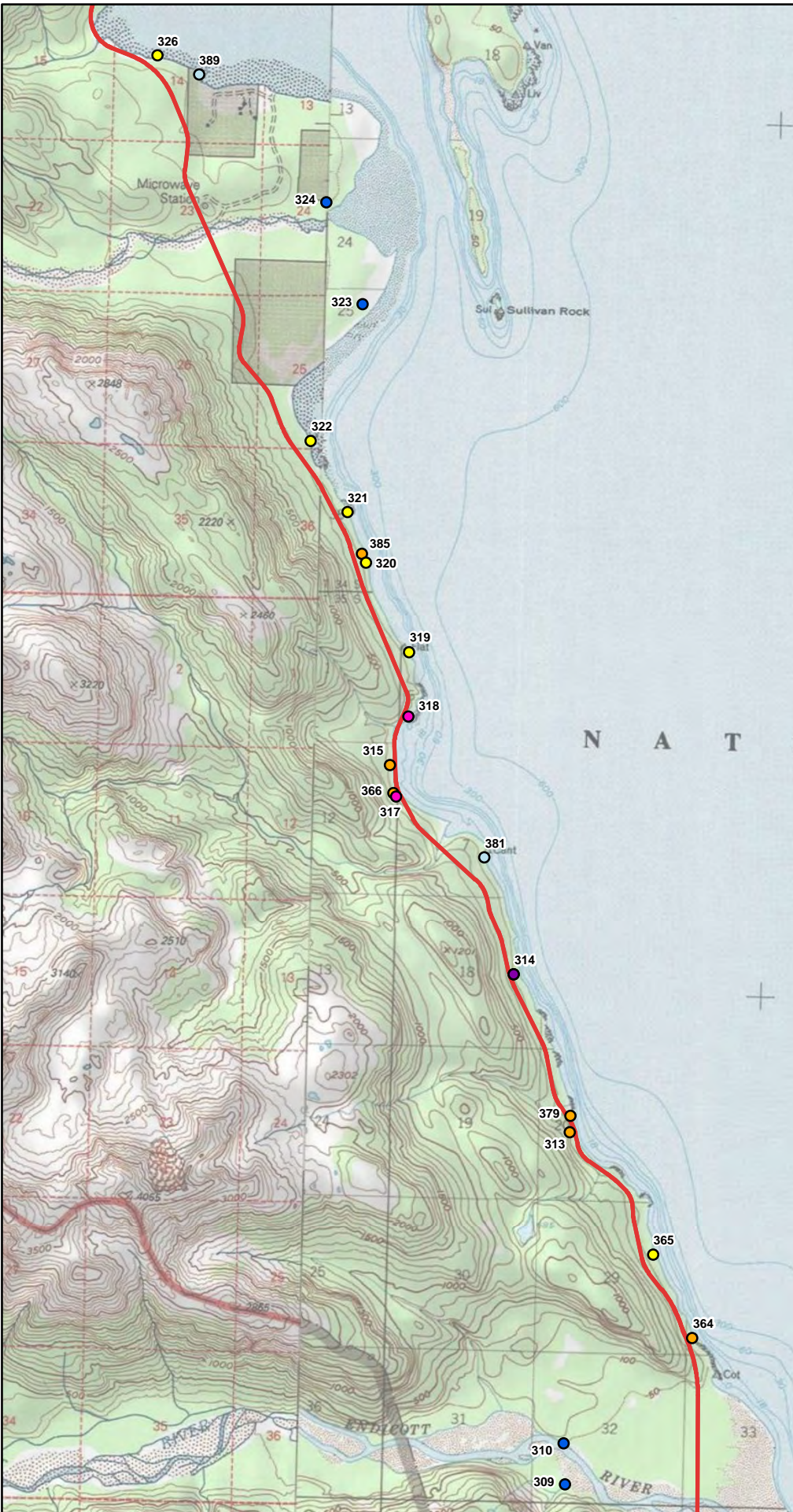
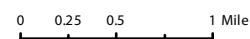
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 11

Bald Eagle Nests
Sullivan Island West Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

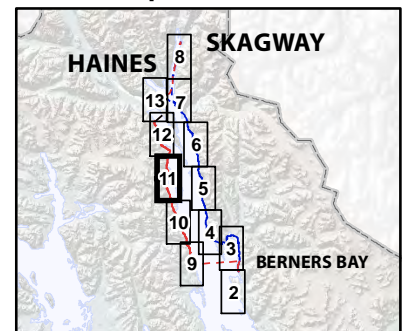
Marine Alternatives

T New Ferry Terminal

— New Highway

- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)

0 0.25 0.5 1 Mile





Juneau Access Improvements

Figure 12

Bald Eagle Nests
Chilkat Inlet West Lynn Canal

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

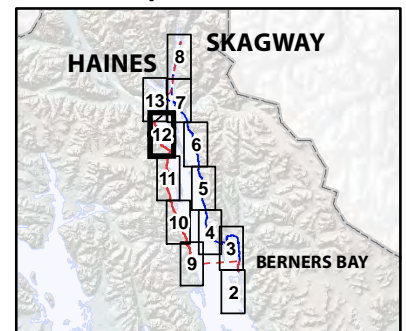
Marine Alternatives

T New Ferry Terminal

— New Highway

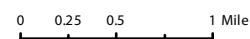
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)





Juneau Access Improvements

Figure 13

Bald Eagle Nests
Chilkat Inlet - Haines

Bald Eagle Nests*

Buffer distance from construction zone

- < 30 ft
- 31 ft ≥ 60 ft
- 61 ft ≥ 100 ft
- 101 ft ≥ 330 ft
- 331 ft ≥ 660 ft
- 660 ft ≥ 2,640 ft (0.5 mile)
- > 0.5 Mile

Alternative 2B

East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway

T New ferry terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternative 3

West Lynn Canal Highway

T New Ferry Terminal

— New Highway

— New Bridge

- - - Ferry Shuttle

Alternatives 4B and 4D

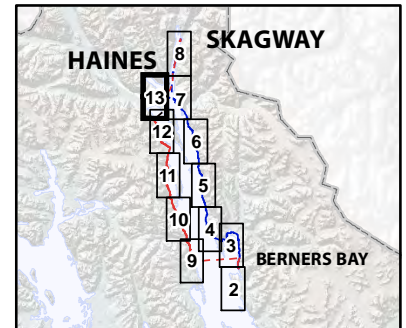
Marine Alternatives

T New Ferry Terminal

— New Highway

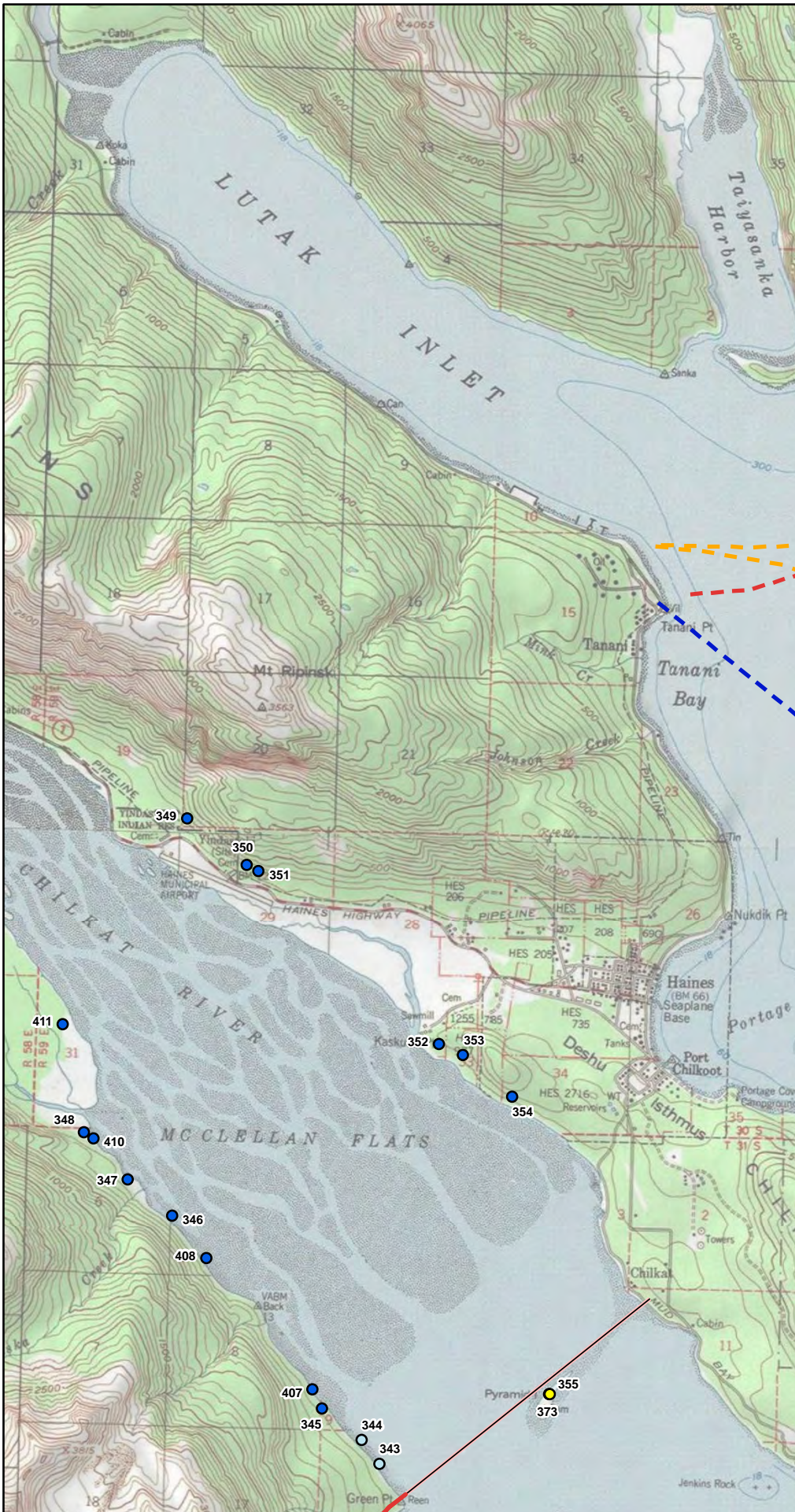
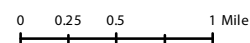
- - - Ferry Shuttle or Dayboat

Locator Map



3/18/2013

Sources: AK DOT&PF
*Buffers (USFWS 2007)



This page intentionally left blank.