Gravina Access Project

Appendix E - Part 1
Essential Fish Habitat Consultation

U.S. Department
of Transportation
Federal Highway Administration

Alaska Division

March 14, 2013

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In Reply Refer To:
ACHP-922(5)/67698

Ms. Linda Shaw
Habitat Biologist
National Marine Fisheries Service
P.O. Box 21668
Juneau, AK 99802

Dear Ms. Shaw:

The Federal Highway Administration (FHWA), in cooperation with the Department of Transportation and Public Facilities (DOT&PF), is preparing a Supplemental Environmental Impact Statement (SEIS) for the Gravina Access Project near Ketchikan, Alaska.

In July 2004, FHWA and DOT&PF issued a Final Environmental Impact Statement (FEIS) for the Gravina Access Project. FHWA issued a Record of Decision (ROD) on September 15, 2004, and identified Alternative F1 as the Selected Alternative. Alternative F1 includes bridges across Tongass Narrows at Pennock Island and a roadway link to the airport on Gravina Island. Following completion of the EIS and permitting, the DOT&PF moved forward with the first phase of implementing Alternative F1: construction of the Gravina Island Highway, which was completed in 2008.

On September 21, 2007, Alaska Governor Sarah Palin directed the DOT&PF to look for a lower cost alternative for access to the airport and Gravina Island. On July 2, 2008, FHWA issued a notice of intent to re-examine alternatives in an SEIS and identify and select a new preferred alternative.

As part of the FEIS process, FHWA and DOT&PF consulted with the National Marine Fisheries Service (NMFS) on Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation Management Act (Magnuson-Stevens Act). In 2004, an EFH Assessment including negotiated conservation recommendations was included with the FEIS. These conservation recommendations were included in the ROD and concluded the EFH consultation process.

The attached report is an addendum to the 2004 EFH Assessment. The EFH Addendum provides updates to baseline conditions where appropriate, descriptions of project alternatives and potential impacts, and other changes from the 2004 EFH Assessment. Conservation measures to avoid and minimize potential project effects are also described.

We would appreciate your comments on the EFH Addendum and any additional recommendations or conservation measures you may have at this time. Note that the FHWA and DOT&PF have not identified a preferred alternative; therefore, the conservation measures in this addendum are general measures to be included in the Draft SEIS that is expected to be released in late spring 2013. The conservation measures will be modified in the Final SEIS to specifically address details of the preferred alternative through further coordination with the agencies during final design.

Please submit your written response via mail to Kris Riesenberg, NEPA, Project Manager, Federal Highway Administration, P.O. Box 21648, Juneau, Alaska 99802 or email at kris.riesenberg@dot.gov . Please feel free to contact me at (907) 586-7413 with any questions.

Sincerely,

Kris Riesenberg

Kris Riesenberg
FHWA NEPA Project Manager

Enclosure:
Gravina Access Project Supplemental Environmental Impact Statement
Essential Fish Habitat Assessment Addendum

Electronically cc w/ enclosure:
Jeanne Hanson, NMFS, Anchorage
John Barnett, DOT&PF, Southeast Project Environmental Coordinator
Jim Lowell, DOT&PF, Special Projects Manager
Mark Dalton, HDR Alaska, Inc.

Gravina Access Project
Supplemental Environmental Impact Statement

Essential Fish Habitat Assessment Addendum

DOT&PF Project No: 67698
Federal Project No: ACHP-0922(5)

Prepared for:

State of Alaska
Department of Transportation
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Prepared by:

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November 2011

Table of Contents

List of Tables

List of Figures

List of Appendices

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1 Background

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), has developed the Gravina Access Project to improve public access between Revillagigedo Island and Gravina Island. This project was one of 17 high priority infrastructure projects in the State of Alaska to be federally funded under the Federal Transportation Equity Act for the 21st Century (TEA-21), enacted in 1998[1].

In July 2004, FHWA and DOT&PF issued a Final Environmental Impact Statement (FEIS) for the Gravina Access Project, identifying a preferred alternative. The preferred alternative was Alternative F1, which included bridges across the East and West channels of Tongass Narrows at Pennock Island and the Gravina Island Highway to connect the bridge crossing with the airport. Alternative F1 was selected in a Record of Decision and, following permitting, the DOT&PF moved forward with the first phase of implementing Alternative F1: construction of the Gravina Island Highway, which was completed in 2008.

On September 21, 2007, due to rapidly escalating costs, Alaska Governor Sarah Palin directed the DOT&PF to look for a lower cost alternative for access to the airport and Gravina Island instead of proceeding further with Alternative F1. On July 2, 2008, FHWA issued a notice of intent to re-examine alternatives in a Supplemental Environmental Impact Statement (SEIS) and identify and select a new preferred alternative.

As part of the FEIS process, FHWA and DOT&PF consulted with the National Marine Fisheries Service on Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation Management Act (Magnuson-Stevens Act). In 2004, an EFH Assessment including negotiated conservation recommendations was included with the FEIS. These conservation recommendations were included in the ROD and concluded the EFH consultation process.

This report is an addendum to the EFH Assessment prepared for the Gravina Access Project in April 2004 (Appendix A). It provides updates to baseline conditions where appropriate, descriptions of project alternatives and potential impacts, and other changes from the 2004 EFH Assessment. Conservation measures to avoid and minimize potential project effects are also described.

2 Proposed Alternatives

2.1 Bridge Alternatives

The FHWA and DOT&PF identified two reasonable bridge alternatives to evaluate in the SEIS: Alternatives C3-4 and F3. The Alternative C3-4 bridge is located near the airport. Alternative F3 includes two bridges crossing at Pennock Island: one bridge crosses over East Channel and one crosses over West Channel (Figure 1).

[1] Public Law 105-178, Subtitle F (High-Priority Projects), Section 1602 (Project Authorizations).

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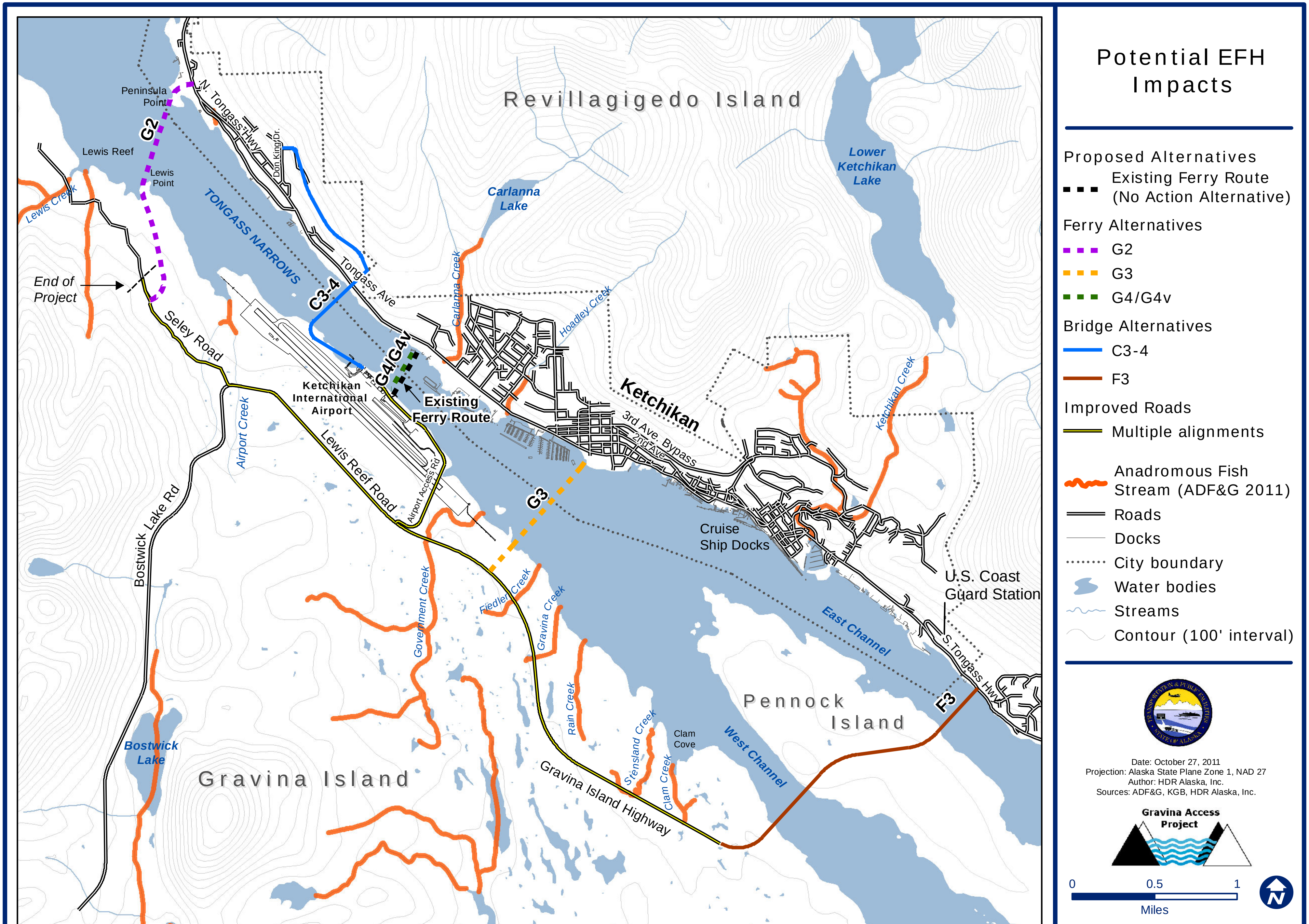

Potential EFH Impacts
Proposed Alternatives
Existing Ferry Route (No Action Alternative)
Ferry Alternatives
G2
G3
G4/G4v
Bridge Alternatives
C3-4
F3
Improved Roads
Multiple alignments
Anadromous Fish Stream (ADF&G 2011)
Roads
Docks
City boundary
Water bodies
Streams
Contour (100' interval)
Date: October 27, 2011
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: ADF&G, KGB, HDR Alaska, Inc.
Gravina Access Project
0
0.5
1
Miles
Revillagigedo Island
Gravina Island
Pennock Island
Ketchikan
Peninsula Point
Lewis Reef
Lewis Point
Lewis Creek
End of Project
TONGASS NARROWS
N. Tongass Hwy
Don King Dr.
Tongass Ave
Carlanna Lake
Carlanna Creek
Hoadley Creek
Lower Ketchikan Lake
Ketchikan Creek
Seley Road
Ketchikan International Airport
Existing Ferry Route
Airport Creek
Lewis Reef Road
Airport Access Rd
Bostwick Lake Rd
3rd Ave. Bypass
2nd Ave
Cruise Ship Docks
U.S. Coast Guard Station
East Channel
S. Tongass Hwy
West Channel
Government Creek
Fiedler Creek
Gravina Creek
Rain Creek
Stensland Creek
Clam Creek
Clam Cove
Gravina Island Highway
Bostwick Lake
G2
C3-4
G4/G4v
G3
F3

Figure 1

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Alternative C3-4 is a new alternative similar to the C3a and C4 alternatives evaluated in the 2004 EFH Assessment. Alternative F3 is nearly identical to the F3 alternative evaluated in the 2004 EFH Assessment with minor modifications to bridge design, dredging quantities, and pier placement in Tongass Narrows. As the Gravina Island Highway was constructed in 2008, upgrades to existing anadromous stream crossings on Gravina Island vary from the 2004 EFH Assessment for each alternative. Alternatives C3a, C3b, C4, D1, and F1, which were other bridge alternatives evaluated in the 2004 EFH Assessment, are not being evaluated as part of the SEIS or this EFH Assessment update.

2.1.1 Alternative C3-4 (Airport Bridge)

This alternative would follow the Bench Road alignment on Revillagigedo Island and would cross over Tongass Avenue and Tongass Narrows, and then turn southward to parallel the northern airport taxiway and airport runway, and ultimately touch down (reach the ground surface) on Gravina Island near the north end of the airport terminal at the existing parking lot.

The Alternative C3-4 bridge across Tongass Narrows would be 48 feet wide and approximately 4,190 feet long. The maximum height of the bridge over the navigational channel would be approximately 280 feet above mean higher high water (MHHW). Alternative C3-4 would require placement of piers in near-shore waters on the eastern side of Tongass Narrows that could affect bull kelp beds. On the western side of Tongass Narrows, the bridge piers would be located in an area that currently supports part of a near-continuous eelgrass bed that is interspersed with beds of kelp and an area of bull kelp. Approximately 42,000 cubic yards of fill would be required in this area .

The following improvements would be made to Gravina Island roadways under Alternative C3-4.

- Reconstruction of the Lewis Reef Road bridge over Airport Creek: 36 feet wide, gravel surface.
- Construction of Seley Road from Lewis Reef Road to Airport Development Land boundary: 36 feet wide, gravel surface.

2.1.2 Alternative F3 (Pennock Island Bridges)

The East Channel bridge would connect directly to South Tongass Highway on Revillagigedo Island. From this terminus, the bridge would cross the East Channel to Pennock Island. From Pennock Island, the West Channel bridge would cross to Gravina Island and connect with the Gravina Island Highway, approximately 3 miles south of the airport. The East Channel bridge would be approximately 1,985 feet long and have a maximum height of approximately 115 feet. The bridge would have a vertical navigational clearance of 60 feet above MHHW. The West Channel bridge would be approximately 2,470 feet long and have a maximum height of approximately 270 feet. The bridge would have a vertical navigational clearance of 200 feet above MHHW.

In order to improve its navigational characteristics for cruise ships transiting the West Channel, the narrowest portion of the channel would be widened. The proposed modifications would widen this portion of the channel to 750 feet. The center 550 feet would have a minimum depth of 40 feet at low tide and the 100 feet of channel on either side would have a minimum depth of 30 feet at low tide. The dredged quantity is approximately 213,000 cubic yards over 15 acres of fractured rock and bedrock that would require blasting before removal by dredge. All material removed would be disposed of at a pre-approved marine location. Channel widening would impact intertidal and subtidal habitat in areas adjacent to Gravina and Pennock Islands (Table 1). The areas of the West Channel to be widened are shown on Figure 2 and associated cross-sections are shown in Figure 3.

The following improvements would be made to Gravina Island roadways under Alternative F3.

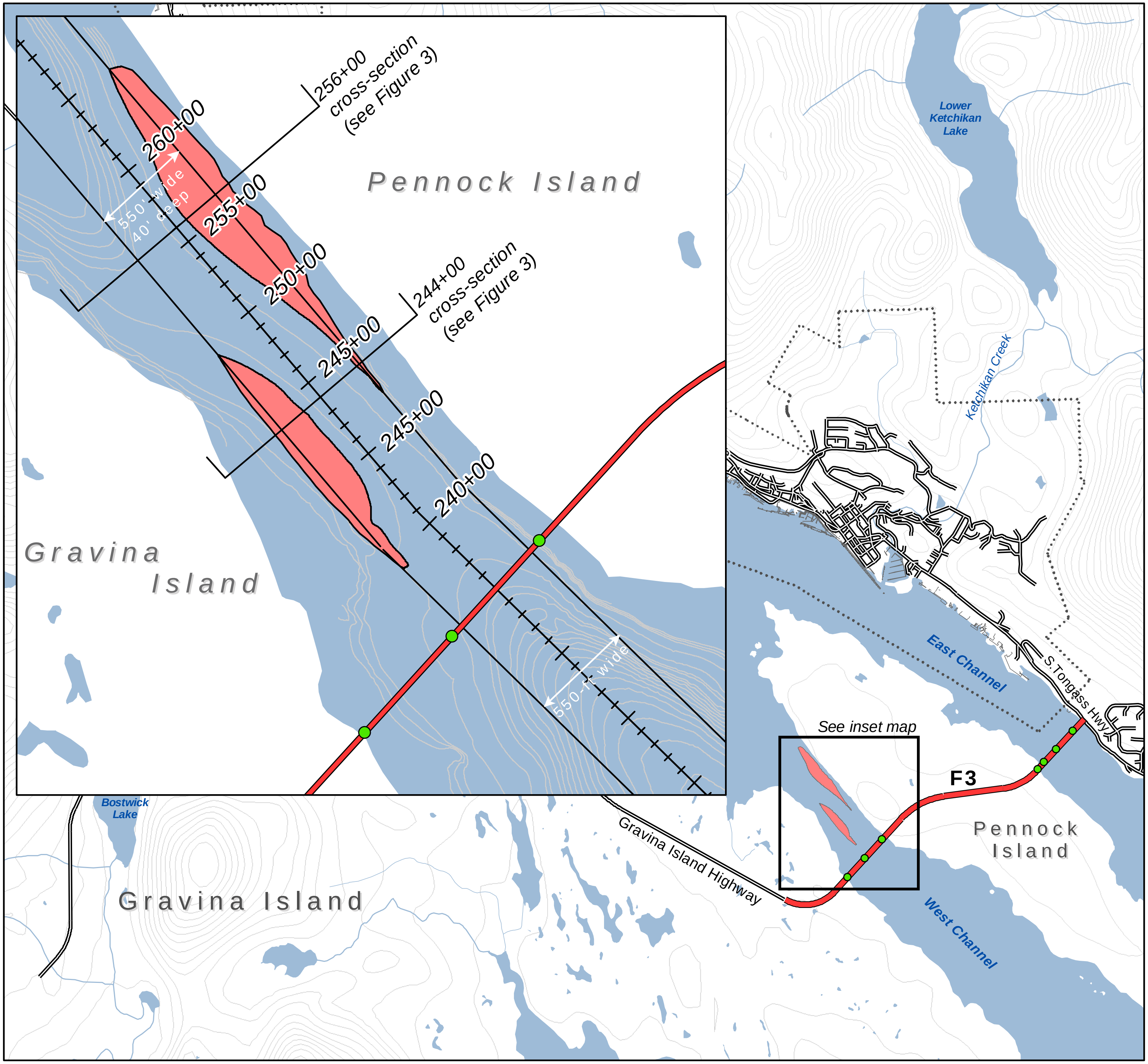
- Widening Gravina Island Highway to 40 feet and paving along its entire length, including lengthening of several culverts.
- Widening Gravina Island Highway bridge over Gravina Creek to 40 feet and paving bridge surface.
- Widening Gravina Island Highway bridge over Government Creek to 40 feet and paving bridge surface.
- Widening Airport Access Road to 40 feet and paving along its entire length.
- Reconstruction of the Airport Access Road/Gravina Island Highway intersection to eliminate the curve and create a straight T-intersection.
- Reconstruction of the Lewis Reef Road bridge over Airport Creek to 36 feet wide with a gravel surface.
- Construction of Seley Road from Lewis Reef Road to Airport Development Land boundary: 36 feet wide, with a gravel surface.

2.2 Ferry Alternatives

Alternatives G2, G3, and G4 would augment the existing airport ferry service with new ferry service between two new ferry terminals (one on either side of Tongass Narrows) using two new ferries. All ferry alternatives include:

- A 60-passenger waiting facility at the existing ferry terminal on Revillagigedo Island.
- A new heavy freight dock on a 2.5-acre site near the airport, just to the south of the existing ferry berth to provide heavy freight access to Gravina Island for highway loads that cannot be accommodated by the shuttle ferry.
- Reconstruction of the existing airport ferry transfer bridges and ramps, if needed to meet current design standards.
- Upgrades and improvements for all sidewalks and wheelchair ramps associated with the airport ferry facilities to meet applicable standards.
- Replacement of the deficient existing ferry layup dock and transfer bridge to support layup and maintenance of the airport shuttle ferry system.

A lower-cost variant of Alternative G4, known as Alternative G4v, is included in the SEIS. Alternative G4v would include all of the above-noted facilities, but would not include new ferry service like Alternatives G2, G3, and G4 (i.e., no additional ferry terminals or ferries).



Alternative F3: West Channel Widening

F3
F3 Pier Locations
Area of proposed dredging
Proposed cruise ship track line
roads
docks
city boundary
water bodies
streams

Date: August 26, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: KGB, HDR Alaska, Inc.

Gravina Access Project

0 0.5 1
Miles

Figure 2

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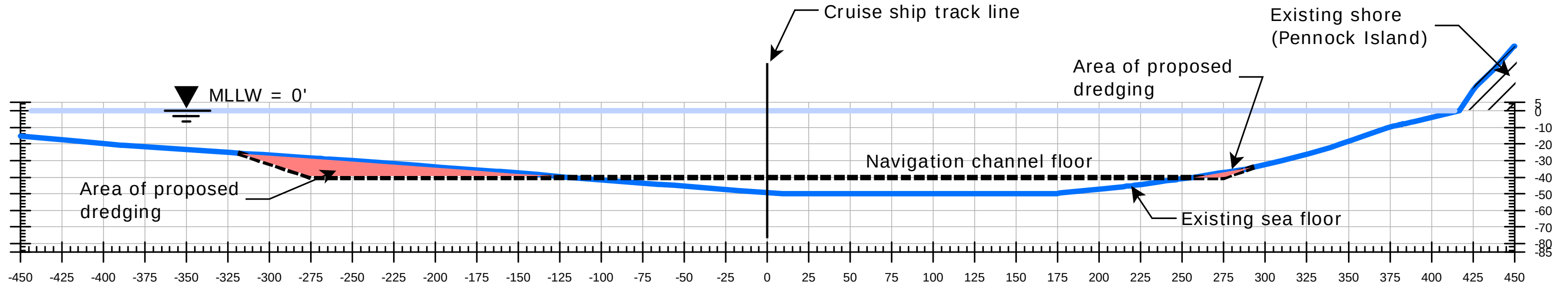
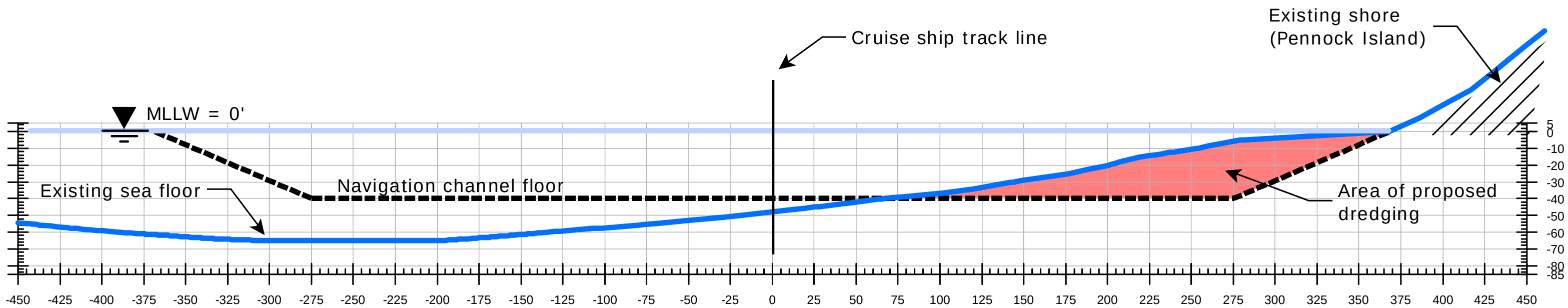
Alternative F3: West Channel Widening Cross-Sections



244+00



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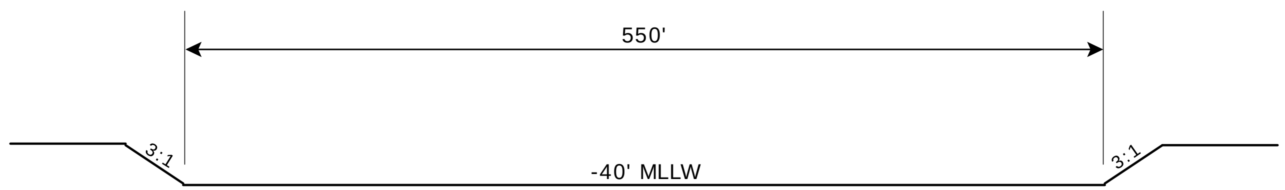

Navigation Channel Floor

* Navigation channel floor configuration is based on a modeled, minimum section which provides adequate draft for 2-way cruise ship traffic.

- - - Navigation channel floor
Existing sea floor
Mean lower low water (MLLW) (elevation = 0')
Area of proposed dredging

Note: Drawings not to scale.

Date: August 26, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: KGB, HDR Alaska, Inc.

Gravina Access Project

Figure 3

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Alternatives G2, G3, and G4 are nearly identical to the ferry alternatives evaluated as part of the 2004 EFH Assessment, with only minor changes to dock design and dredging quantities in Tongass Narrows. Similar to the bridge alternatives, the ferry alternatives would require upgrades to Gravina Island roadways, which is a change from the 2004 EFH Assessment.

2.2.1 Alternative G2 (Peninsula Point to Lewis Point)

Alternative G2 would be a new ferry service for vehicles and passengers between Peninsula Point on Revillagigedo Island and Lewis Point on Gravina Island. Two new ferry vessels and construction of a new ferry terminal on each side of Tongass Narrows would be required for this alternative. Alternative G2 would require the removal of approximately 1,400 cubic yards of material in Tongass Narrows near the proposed Gravina Island terminal (Figure 4). A 0.8-mile long, 40-foot wide paved access road would be constructed on Gravina Island to connect the ferry terminal site to Seley Road. The following improvements would be made to Gravina Island roadways under Alternative G2:

- Construction of Seley Road from the ferry terminal access road to Lewis Reef Road: 40 feet wide, paved surface.
- Construction of Seley Road from ferry terminal access road to Airport Development Land boundary: 36 feet wide, gravel surface.
- Reconstruction of the Lewis Reef Road bridge over Airport Creek: 40 feet wide, paved surface.
- Reconstruction of Lewis Reef Road from Seley Road to Airport Access Road: widened to 40 feet, paved surface.
- Reconstruction of the Airport Access Road/Gravina Island Highway intersection to eliminate the curve and create a straight T-intersection.
- Widening Airport Access Road to 40 feet and paving along its entire length.

2.2.2 Alternative G3 (Downtown to South of Airport)

Alternative G3 would be new ferry service for vehicles and passengers between Ketchikan (near the Plaza Mall at Bar Point) on Revillagigedo Island and a location near Clump Cove on Gravina Island. This alternative would require construction of a new ferry terminal on each side of Tongass Narrows and two new ferry vessels. Dredging (18,600 cubic yards) may be required to provide adequate navigational depth for the ferry terminal on Revillagigedo Island (Figure 4). The existing breakwater could also be widened and extended for use as the ferry terminal pier. A 0.2-mile long, 40-foot wide paved access road would be constructed on Gravina Island to connect the ferry terminal site to the Gravina Island Highway. The following improvements would be made to Gravina Island roadways under Alternative G3:

- Widening Gravina Island Highway to 40 feet and paving it from the ferry access road to the intersection with the Airport Access Road.
- Widening Gravina Island Highway bridge over Government Creek to 40 feet and paving bridge surface.
- Reconstruction of the Airport Access Road/Gravina Island Highway intersection to eliminate the curve and create a straight T-intersection.

- Widening Airport Access Road to 40 feet and paving along its entire length.
- Construction of Seley Road from Lewis Reef Road to Airport Development Land boundary: 36 feet wide, gravel surface.
- Reconstruction of the Lewis Reef Road bridge over Airport Creek: 36 feet wide, paved surface.

2.2.3 Alternative G4 (New Ferry Adjacent to Existing Ferry)

Alternative G4 would be new ferry service for vehicles and passengers with new ferry terminals adjacent to the existing ferry terminals and an adjacent airport ferry route from Charcoal Point on Revillagigedo Island to the airport on Gravina Island. Alternative G4 would require the removal of approximately 15,200 cubic yards of material near both the Revillagigedo Island and Gravina Island terminals (Figure 4). The following improvements would be made to Gravina Island roadways under Alternative G4.

- Reconstruction of the Lewis Reef Road bridge over Airport Creek: 36 feet wide, gravel surface.
- Construction of Seley Road from Lewis Reef Road to Airport Development Land boundary: 36 feet wide, gravel surface.

2.2.4 Alternative G4v (Lower Cost Variant of Alternative G4)

Alternative G4v is a lower cost variant to Alternative G4 to address immediate needs for improved facilities for airport travelers and heavy freight movement. No dredging would occur as a result of this alternative. Improvements under this alternative include a new waiting facility on Revillagigedo Island, shuttle vans, new freight dock, new ferry lay up dock, upgraded ferry transfer bridges, and improved sidewalks. The following improvements would be made to Gravina Island roadways under Alternative G4v.

- Reconstruction of the Lewis Reef Road bridge over Airport Creek: 36 feet wide, gravel surface.
- Construction of Seley Road from Lewis Reef Road to Airport Development Land boundary: 36 feet wide, gravel surface.

3 Affected Essential Fish Habitat

Tongass Narrows is designated as EFH under the Magnuson Stevens Fisheries and Conservation Management Act (MSA) for 11 species of ground fish and 5 species of Pacific salmon. EFH listings are summarized in Tables 1 and 2. For detailed information on each species, refer to Sections 3.3 and 3.5 in the 2004 EFH Assessment (Appendix A). No new listings or changes to EFH species have occurred since the 2004 EFH Assessment (Eagleton 2011; ADF&G 2011; NOAA 2011).

Table 1: Essential Fish Habitat Ground Fish Species in Project Area

Ground Fish Species	Egg	Larvae	Late Juvenile	Adult	Spawning
Pacific Ocean Perch			X	X	
Yelloweye Rockfish			X	X	
Shortraker			X	X	
Rougheye Rockfish			X	X	
Dusky Rockfish			X	X	
Walleye Pollock	X			X	
Sablefish			X	X	
Pacific Cod			X	X	
Arrowtooth Flounder			X	X	
Sculpin spp.			X	X	
Skates spp.			X	X	

Source: NOAA 2011; Eagleton 2011

Table 2: Essential Fish Habitat Salmon Species in Project Area

Salmon Species	Egg and larvae – fresh water	Juvenile – fresh water	Juvenile – estuarine	Juvenile – marine	Adult – marine waters	Spawning – fresh water only
Coho salmon	x	x	x	x	x	x
Chum salmon	x	x	x	x	x	x
Pink salmon	x	x	x	x	x	x
Chinook salmon*				x	x	
Sockeye salmon*				x	x	

* Both species are found only in Tongass Narrows within the project area; however, they do occur as freshwater eggs, larvae and juveniles in other freshwater streams in the Ketchikan area.

Source: Johnson and Blanche 2011; NOAA 2011

In addition to the marine habitat of Tongass Narrows, several fish streams listed as anadromous in ADF&G's *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* are located in the project area . The catalog identifies various waterbodies in Alaska that are important to the spawning, rearing, or migration of anadromous fishes (Johnson and Blanche 2011; ADF&G 2011). Table 3 identifies the anadromous waters in the project area. (Figure 2; Table 3).

Table 3: Anadromous Waters in Project Area

Stream Name	ADF&G No.	EFH Species
Airport Creek	101-47-10450-2002 and 101-47-10450	Coho and pink salmon present
Government Creek	101-47-10400	Coho, chum and pink salmon present
Fiedler Creek	101-47-10380	Coho salmon present
Gravina Creek*	101-47-10350	Coho salmon present
Rain Creek	101-47-10340	Coho salmon present
Stensland Creek	101-47-10320	Coho salmon rearing habitat present
Clam Creek	101-47-10310	Coho salmon present

Source: Johnson and Blanche 2011; ADF&G 2011

*Referred to as Long Lake Creek in Catalog (ADF&G 2011)

3.1 Airport Creek

3.1.1 Species

During fish surveys conducted by HDR in 2004, both coho and pink salmon were observed in Airport Creek downstream of the proposed crossing. According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), coho and pink salmon are present in the lower reaches of Airport Creek below the proposed crossing location..

3.1.2 Habitat

The 2004 EFH assessment documented Airport Creek as anadromous in the upper reaches of the creek. Since then, a fish barrier downstream of the bridge crossing was documented. Because of this barrier, the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011) categorizes Airport Creek as anadromous only on its lower reaches (Figure 1).

No other changes to baseline habitat conditions have occurred since the 2004 EFH Assessment. Section 3.4.2 of the 2004 EFH Assessment provides a description of habitat (Appendix A).

3.2 Government Creek

3.2.1 Species

During fish surveys conducted by HDR in 2004, both coho and pink salmon were observed (HDR 2004). According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), Government Creek provides habitat considered to be EFH for coho, chum, and pink salmon. Chum salmon were not listed as present in Government Creek in the 2004 EFH Assessment.

3.2.2 Habitat

In conjunction with the extension of the runway safety area at Ketchikan International Airport in 2007-08, the DOT&PF and Federal Aviation Administration (FAA) re-routed Government

Creek. As part of the re-route effort, two small creeks, North Tributary and Boulder Creek, were routed into the new Government Creek channel, which increased the available fish habitat (Minnillo 2008). Approximately a half mile of new channel was designed and constructed for Government Creek and a tributary to avoid the need to place the streams in a long culvert. The new channel contains habitat features including large woody debris, large boulders, and multiple riparian vegetation islands. Three side channels were cut into the flood plain bedrock to provide off channel rearing habitat for coho salmon. In addition, a 0.7-acre brackish marsh estuary was constructed at the stream mouth to provide a gradual and natural transition from the new stream into the marine environment of Tongass Narrows (Jensen et al. 2011). Section 3.4.1 of the 2004 EFH Assessment (Appendix A) describes habitat in Government Creek prior to the construction of the new channel and re-routing.

The realignment of the creek channel at the lower end resulted in removal of vegetation and disruption of stream substrate. However, within months of project completion, juvenile salmon were observed using the lower reaches of the new channel (Minnillo 2008). Monitoring is ongoing to assess the effectiveness and longevity of the newly designed habitat features and to provide pre- and post-construction data on eelgrass, clams, salt marsh vegetation, and fish spawning and rearing. The new stream and estuary supports abundant rearing by coho salmon and habitat quality and stream bed benthos appear to be improving (Jensen et al. 2011).

With development of the Gravina Island Highway in 2008, a full span bridge was constructed over Government Creek. The constructed bridge is 143 feet long and 38feet wide. Bridge supports were constructed outside of “bankfull” and the 100-year floodplain. Any gravel or streambed material removed or temporarily impacted during construction was replaced with similar materials. In addition, stream banks were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. No loss of EFH has occurred as a result of the bridge construction.

Fiedler Creek

3.2.3 Species

During fish surveys conducted by HDR in 2004, coho salmon were observed near the proposed crossing (HDR 2004).According to the ADF&G Anadromous Waters Catalog (ADF&G 2011), coho salmon are present in Fiedler Creek.

3.2.4 Habitat

As described in Section 3.4.3 of the 2004 EFH Assessment (Appendix A), the creek is confined to a low flow, low gradient, narrow channel that flows directly into Tongass Narrows. The creek is very narrow, approximately 3 feet wide and less than one foot deep. The creek is ephemeral in some locations with a gravel and cobble substrate with shale throughout the lower reaches becoming a muskeg channel with gravel substrate in the upper reaches. Overhanging riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understudy is present, which likely provides rearing habitat for juvenile salmon (HDR 2004).

With development of the Gravina Island Highway, a culvert was installed at the Fiedler Creek crossing. As permitted and approved, a 133-foot long by 78-inch wide corrugated metal pipe (CMP) was installed. The CMP was installed at a gradient of 2.68 percent, and gravel and streambed material was used in the bottom of the culvert. In addition, stream banks were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. The culvert was designed per DOT&PF agreement with the ADF&G specifically for fish passage: no loss of EFH has occurred as a result of culvert installation.

3.3 Gravina Creek

3.3.1 Species

During fish surveys conducted by HDR in 2004, coho salmon were observed near the proposed crossing (HDR 2004).According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), coho salmon are present in Gravina Creek.

3.3.2 Habitat

With development of the Gravina Island Highway, a full span bridge was constructed over Gravina Creek. The constructed bridge is 63 feet long and 38feet wide. Bridge supports were constructed outside of bankfull and the 100 year floodplain. Any gravel or streambed material removed or temporarily impacted during construction was replaced with similar materials. In addition, stream banks were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. No loss of EFH has occurred as a result of the bridge construction.

As described in Section 3.4.3 of the 2004 EFH Assessment (Appendix A), the creek is confined to a low flow, low gradient, narrow channel that flows directly into Tongass Narrows. The creek is very narrow, ranging from 3 to 5 feet wide or less in most locations. The depths vary from shallow (1 foot) to 2 to 3 feet in some locations. The creek is ephemeral in some locations, depending on rainfall, and overhanging riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understudy is present, which likely provides rearing habitat for juvenile salmon (HDR 2004).

3.4 Rain Creek

3.4.1 Species

During fish surveys conducted by HDR in 2004, cutthroat trout were observed (HDR 2004). According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), coho salmon are present in Rain Creek.. This creek was not included in the 2004 EFH Assessment because it was not cataloged as anadromous in 2004.

3.4.2 Habitat

With development of the Gravina Island Highway, a culvert was constructed at this creek crossing. The culvert was designed per DOT&PF agreement with the ADF&G specifically for fish passage. As approved, a 96 foot long by 66 inch wide CMP was installed. The CMP was installed at a gradient of 1.78 percent, and gravel and streambed material was used in the bottom of the culvert. In addition, stream banks were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. No loss of EFH has occurred as a result of the culvert installation.

Similar to Gravina Creek, this creek is a low-flow and low-gradient system in a narrow channel that flows directly into Tongass Narrows. The creek averages 5 feet wide and 1 foot deep. In some locations the creek is ephemeral dependant on rainfall. Habitat is primarily narrow terraced pools and riffles with small to large gravel substrate with a gradient of 2 percent . Riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understudy is present, which likely provides rearing habitat for juvenile salmon. Undercut banks and large woody debris are present throughout the length of the creek (HDR 2004).

3.5 Stensland Creek

3.5.1 Species

During fish surveys conducted by HDR in 2004, coho and cutthroat trout were observed. (HDR 2004). According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), coho salmon rearing habitat is present in Stensland Creek. This creek was not included in the 2004 EFH Assessment because it was not cataloged as anadromous in 2004.

3.5.2 Habitat

With development of the Gravina Island Highway, a culvert was constructed at this creek crossing. The culvert was designed per DOT&PF agreement with the ADF&G specifically for fish passage. As approved, a 142-foot long by 96-inch wide CMP was installed. The CMP was installed at a gradient of 0.3 percent, and gravel and streambed material was used in the bottom of the culvert. In addition, stream banks and side channels were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. No loss of EFH has occurred as a result of the culvert installation.

Similar to Gravina Creek, Stensland Creek is confined to a low-flow, low-gradient, narrow channel that flows directly into Tongass Narrows. The creek is narrow, averaging 6.5 feet wide and 5 feet deep. The creek is ephemeral in some locations, depending on rainfall. Habitat is a deep, entrenched glide running through muskeg with organics and silt for substrate (HDR 2004). Overhanging riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understudy is present, which likely provides rearing habitat for juvenile salmon.

3.6 Clam Creek

3.6.1 Species

During fish surveys conducted by HDR in 2004, coho and cutthroat trout were observed (HDR 2004). According to the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 2011), coho salmon are present in Clam Creek.. This creek was not included in the 2004 EFH Assessment because it was not cataloged as anadromous in 2004.

3.6.2 Habitat

With development of the Gravina Island Highway, a culvert was constructed at this creek crossing. The culvert was designed per DOT&PF agreement with the ADF&G specifically for fish passage. As approved, a 140 foot long by 108 inch wide CMP was installed. The CMP was installed at a gradient of 0.44 percent, and gravel and streambed material was used in the bottom of the culvert. In addition, stream banks were re-contoured to original conditions and reseeded with native vegetation to minimize erosion. No loss of EFH has occurred as a result of the culvert installation.

Similar to Gravina Creek, Clam Creek is a low-flow and low-gradient system in a narrow channel that flows directly into Tongass Narrows at Clam Cove. Clam Creek consists of a pool and riffle channel with gravel, small cobbles, and bedrock with a gradient of 3 percent (HDR 2004). The creek averages 10 feet wide and less than 1 foot deep. In some locations the creek is ephemeral depending on rainfall. Overhanging riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understory is present, which likely provides rearing habitat for juvenile salmon.

3.7 Marine Nearshore

No changes to baseline conditions have occurred since the 2004 EFH Assessment. Refer to Section 3.4.3 in the 2004 assessment (Appendix A) for a description of marine nearshore habitat.

4 Project Impacts and Conclusions

Construction activities within coastal watersheds and in coastal marine areas will impact EFH. These activities may adversely impact marine resources directly and indirectly through habitat loss and/or modification, loss of prey species in fill and dredging areas, changes in hydrologic patterns, and increased turbidity. Other impacts that may occur as a result of the proposed project include the following: runoff from new roadways, increased human access (e.g., for fishing), and development of shoreline property. Locations of the anadromous fish stream crossings and alternatives are shown in Figure 1. Project impacts as described in the 2004 EFH Assessment remain largely unchanged and are summarized in Table 4. Only impacts that have changed since the 2004 EFH Assessment are described below and are noted in bold text in Table 4.

Alternatives C3a, C3b, C4, D1, and F1 are not evaluated as part of the SEIS or in this EFH Assessment Addendum. Alternative C3-4 is a hybrid of C3a and C4 alternatives evaluated in the 2004 FEIS; thus, impacts generally described for those original bridge options apply to C3-4. Alternative F3 is very similar to the F3 alternative evaluated in the 2004 FEIS and the impacts, likewise, are very similar. Descriptions of ferry alternative impacts described in the 2004 EFH Assessment are applicable to Alternatives G2, G3, and G4 in this addendum. The new ferry alternative, G4v, would have fewer impacts than Alternative G4 because there would be no development associated with new ferry service.

4.1 Tongass Narrows

4.1.1 General Impacts

The general impacts regarding effects from construction activities are described in Section 4.1.1, General Impacts in the 2004 EFH Assessment (Appendix B). Table 4 shows water body crossings, piers, fill and dredging impacts to Tongass Narrows from construction of each alternative.

Table 4: Quantities of fill, dredging, and other EFH impacts[1]

	C3-4	F3	G2	G3	G4	G4v
Anadromous Stream Crossings[2]	**1**	**7**	2	3	2	**2**
Piers in Tongass Narrows	**13**	6	0	0	0	**0**
Shading (acres)	**0**	0.1	**0.2**	**0.2**	0.3	**0.1**
Fill in Tongass Narrows (cubic yards)[3]	**42,000**	0	**21,000**	**18,000**	0	**0**
Dredging in Tongass Narrows (cubic yards / acres)	**0 / 0**	**213,000 / 15**	1,400 / 0.25	**18,600 / 2.2**	**15,200 / 0.4**	**0**
Eelgrass[4] (acres)	**0**	**0.5**	**0**	**0.7**	0	**0**
Kelp[4] (acres)	**0**	**1.8**	**0**	**0.5**	**0.1**	**0**
Saltmarsh[4] (acres)	**0**	0	**1.0**	**2.0**	0	**0**

[1] Numbers in **bold** are updated quantities since the 2004 EFH Assessment.

[2] Indicates the total number of anadromous stream crossings for new construction and improvements to existing roads (not including Tongass Narrows). No permanent loss of EFH would occur because bridge and culvert design would preserve EFH.

[3] For bridge alternatives, fill quantities shown do not include the bridge piers.

[4] Eelgrass, kelp, and saltmarsh are a subset of the fill and dredging quantities provided.

4.1.2 Impacts of Pier Construction and Channel Modification

Channel modification and pier construction impacts are described in Section 4.1.1, Impacts of Pier Construction and Channel Modification in the 2004 EFH Assessment (Appendix A).

Alternative F3 would require modification to West Channel to improve navigation clearances as discussed in the 2004 EFH Assessment and shown on Figures 2 and 3. Channel modification would require the dredging of approximately 213,000 cubic yards of fractured rock and bedrock (Figure 2), which would require the use of explosives. Substantial removal of sediment and rock would require ocean disposal. Dredging in the West Channel would remove approximately 15 acres of subtidal habitat from areas adjacent to Gravina and Pennock Islands (Table 3). This alternative would eliminate approximately 1.8 acres of existing kelp beds including *Nereocystis* and *Laminaria*, and 0.5 acres of eelgrass beds (Figure 5 and Table 3). The area dredged may re-colonize over time but would differ from in terms of species composition and abundance. No dredging will be required for Alternative C3-4.

The ferry alternatives, with the exception of Alternative G4v, would also require minor dredging in Tongass Narrows to produce adequate water depths for ferry docking as described in the 2004 EFH Assessment (Figures 4 and 6). Footprints for the ferry docks have been slightly modified resulting in revised quantities for dredging. Alternative G2 would require the removal of approximately 1,400 cubic yards of material near the proposed south terminal. Alternative G3 would require the removal of approximately 18,600 cubic yards of material near both the proposed north and south terminals. Alternative G4 would require the removal of approximately 15,200 cubic yards of material near the north and south terminals. Dredged debris will be placed onto a barge where it will enter a settling basin and be disposed of on land.

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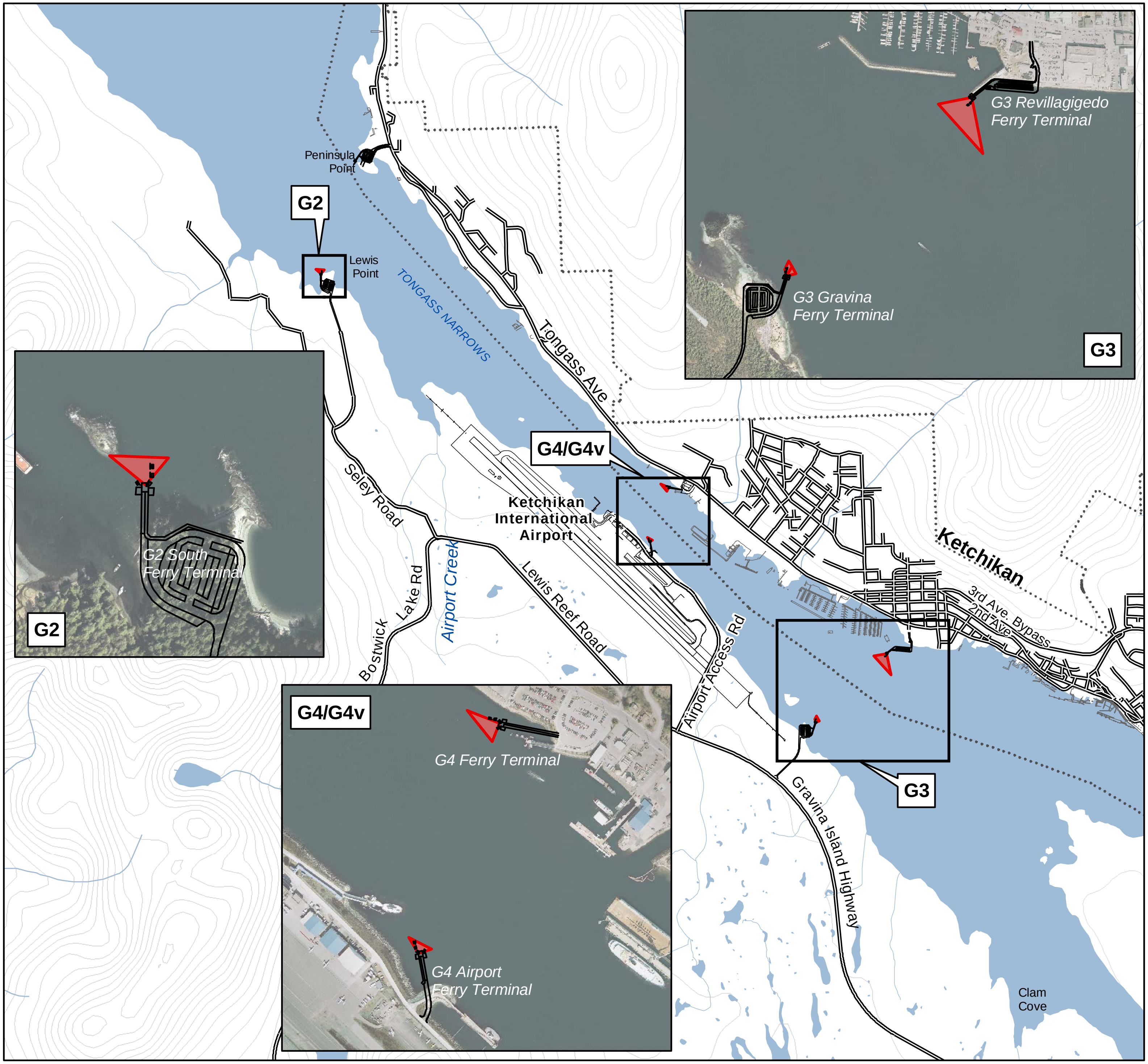

Proposed Dredging for Ferry Alternatives

Proposed Dredging for Ferry Alternatives

roads

city boundary

water bodies

streams

Date: September 1, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: KGB, HDR Alaska, Inc.

Gravina Access Project

0 0.25 0.5
Miles

Figure 4

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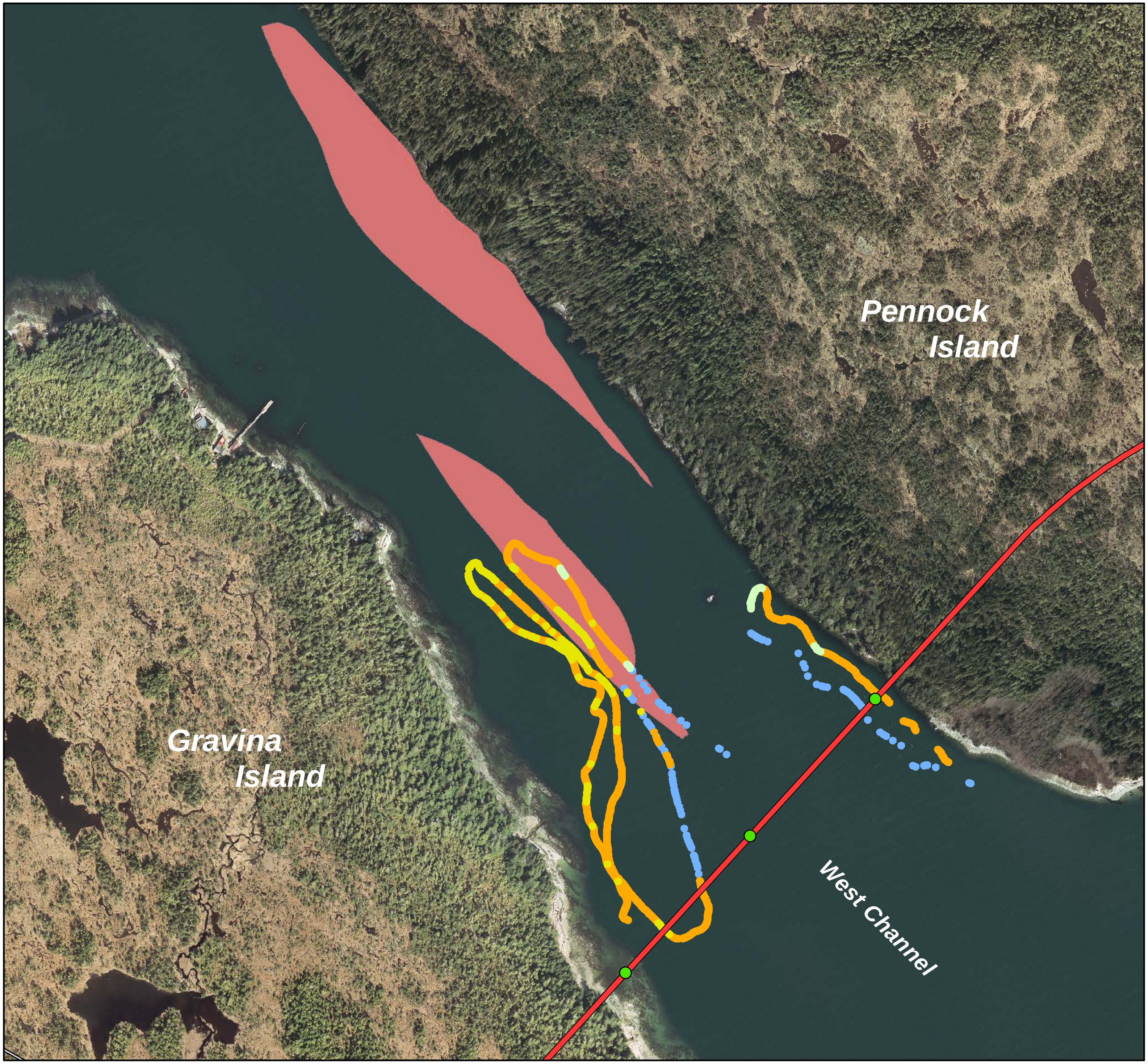

Proposed Dredging Locations for Alternative F3 and Marine Resources

- F3
- F3 Pier Locations
- Area of proposed dredging

Marine resources

- Algae
- Bullkelp
- Cucumber
- Eelgrass
- Laminaria

Date: August 26, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: KGB, HDR Alaska, Inc.

Gravina Access Project

0 250 500 750
Feet

N

Figure 5

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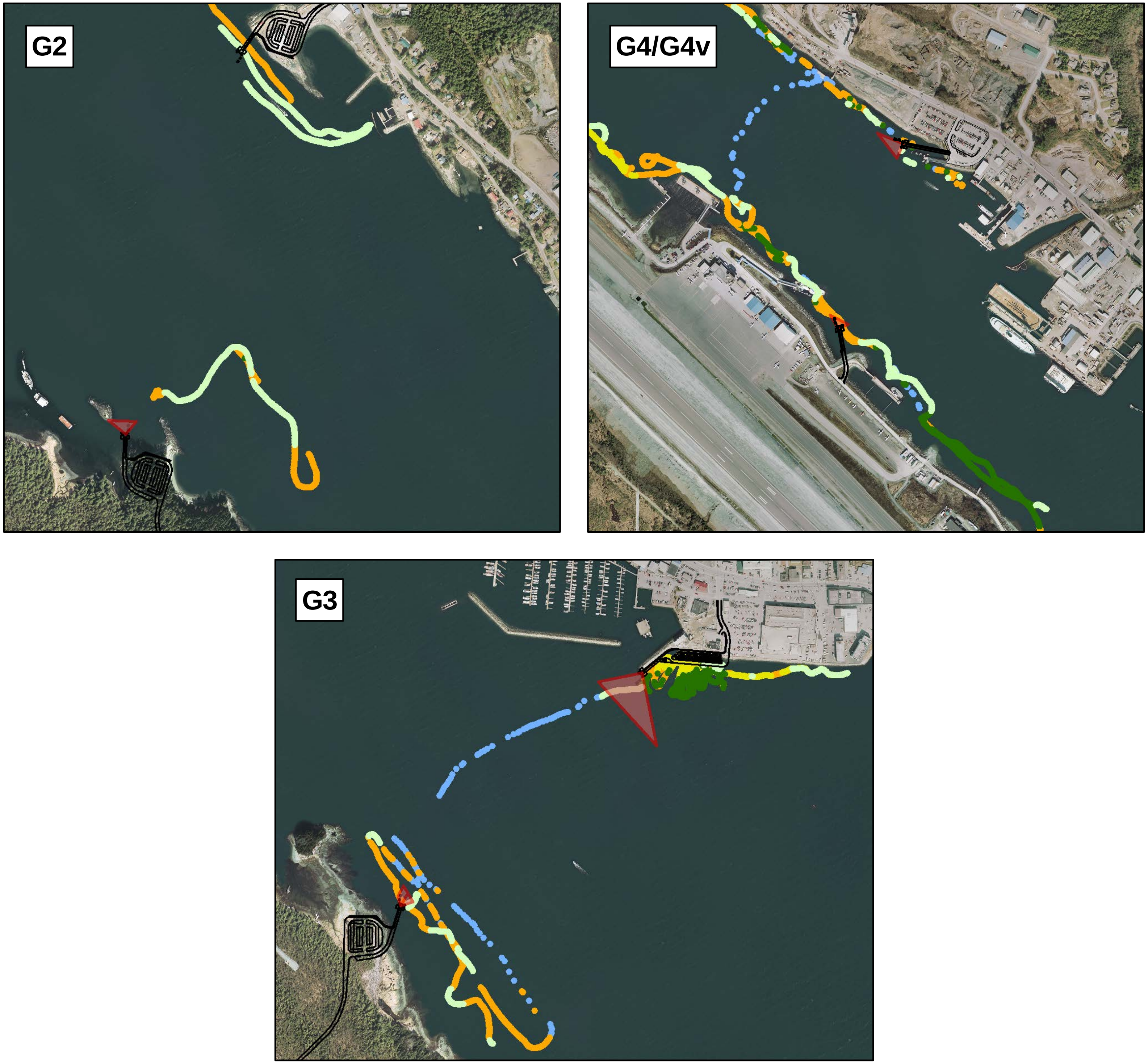

Proposed Dredging Locations for Ferry Alternatives and Marine Resources

Proposed Dredging for Ferry Alternatives

Marine resources

- Algae
- Bullkelp
- Cucumber
- Eelgrass
- Laminaria

Date: August 26, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: KGB, HDR Alaska, Inc.

Gravina Access Project

0 500 1,000
Feet

Figure 6

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4.1.3 Temporary Impacts

Temporary impacts are described in Section 4.1.1, Temporary Impacts in the 2004 EFH Assessment (Appendix A). No changes to temporary impacts are anticipated.

4.1.4 Entrainment

Entrainment is described in Section 4.1.1, Entrainment in the 2004 EFH Assessment (Appendix A). No changes are proposed.

4.1.5 Operational Impacts

Operational impacts are described in Section 4.1.1, Operational Impacts in the 2004 EFH Assessment (Appendix A). No changes to operational impacts are anticipated.

4.2 Government Creek

As described in Section 3.2, Government Creek in the 2004 EFH Assessment (Appendix A), a full span bridge was constructed over Government Creek during the Gravina Island Highway construction. Alternatives G3 and F3 would utilize this stretch of the Gravina Island Highway, requiring additional widening from a 36-foot wide road to 40-foot road, not including the road prism. The bridge over Government Creek would be widened to match the highway but would not require any in-water work. A typical cross section of the proposed bridge is shown on Figure 7. Temporary impacts from sediment and erosion along the banks would be minimized through implementation of Best Management Practices (BMPs). Disturbed areas would be reseeded with native vegetation to minimize erosion following construction. No loss of EFH would occur as a result of bridge widening.

4.3 Airport Creek

The potential impacts to Airport Creek described in Section 4.3 of the 2004 EFH Assessment (Appendix A) remain the same. No changes are proposed.

4.4 Other Anadromous Waterways

Implementation of Alternative F3 would require widening the existing 36-foot wide Gravina Island Highway to 40 feet (not including the road prism). In addition to widening the bridge over Government Creek (described above in Section 4.2), highway widening for Alternative F3 would require widening of the bridges over Gravina Creek and the culverts at Rain Creek, Stensland Creek, and Clam Creek.

The bridge at Gravina Creek would be widened to match the highway but would not require any in-water work. Temporary impacts from sediment and erosion along the banks would be minimized through implementation of BMPs. Disturbed areas would be reseeded with native vegetation to minimize erosion following construction. No loss of EFH would occur as a result of bridge widening.

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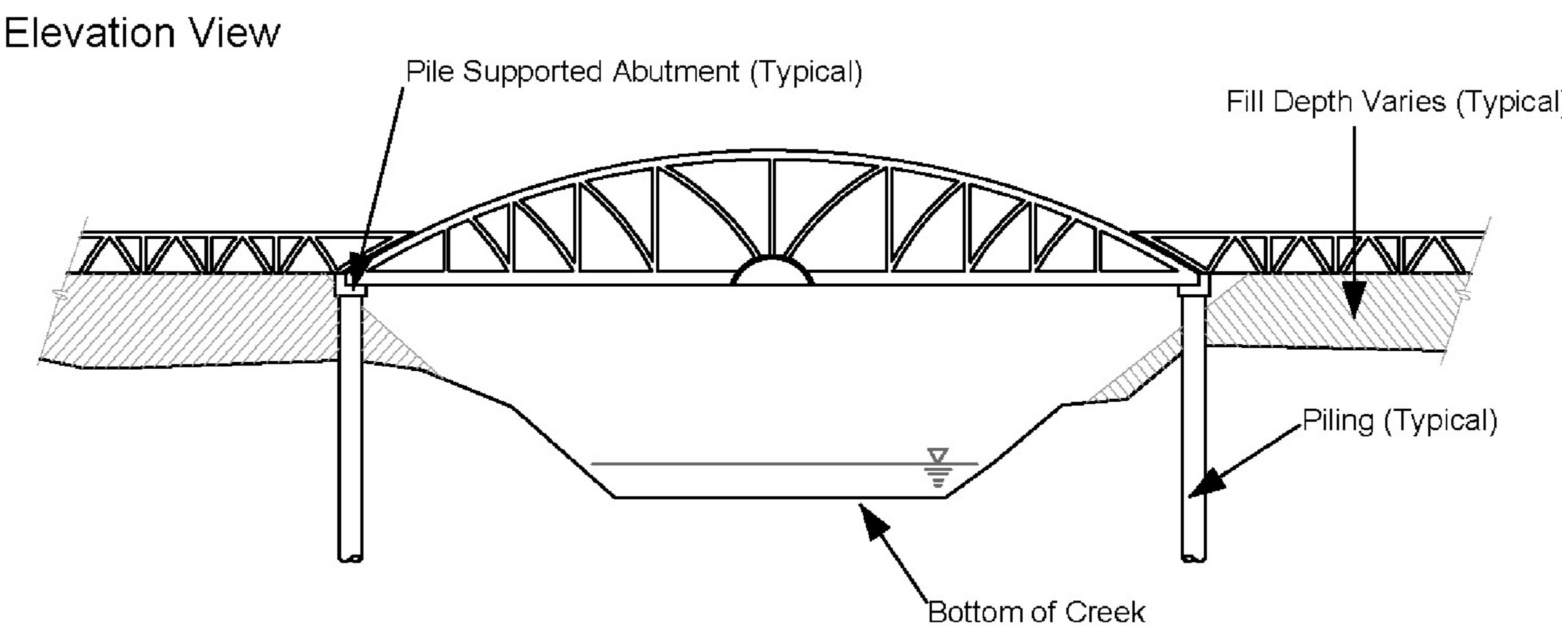
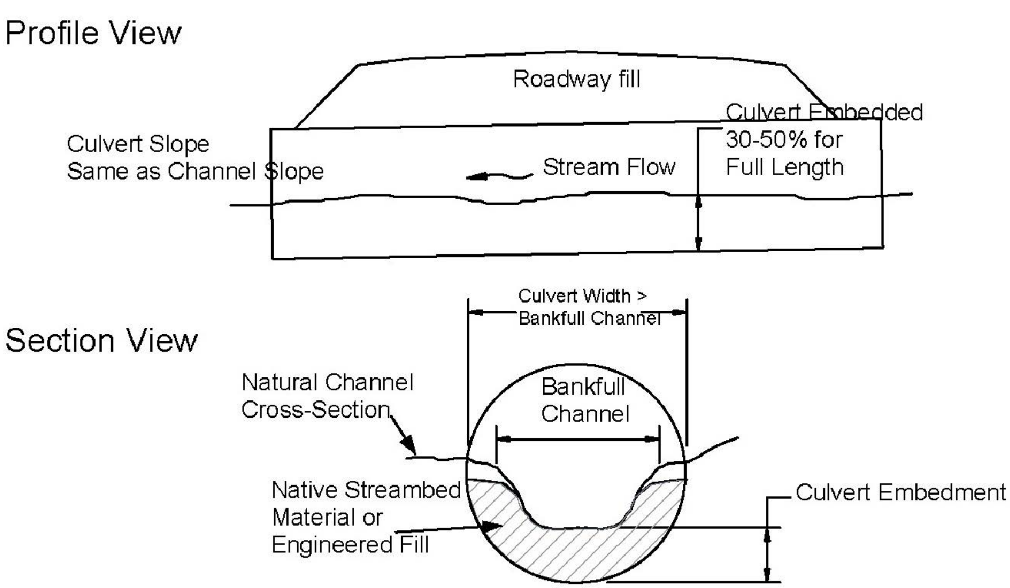
Conceptual Clear Span Bridge



Conceptual Embedded Culvert



Proposed Anadromous Stream Crossings

Note: Drawings not to scale.

Date: September 7, 2010
Projection: Alaska State Plane Zone 1, NAD 27
Author: HDR Alaska, Inc.
Sources: HDR Alaska, Inc.

Gravina Access Project

Figure 7

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The culvert crossings would require extension of the existing culverts and would require in-water work. Any impacts to EFH would be temporary and related to the installation of the culverts. Temporary impacts could include an increase in turbidity levels or a temporary diversion of the creeks to allow installation of the culverts. BMPs would be employed to minimize temporary impacts during construction. There would be no permanent loss of EFH resulting from the culvert crossings, because the required culvert design features noted above would preserve EFH. Gravel and streambed material would be used in the bottom of the culverts. In addition, stream banks would be re-contoured to original conditions and reseeded with native vegetation to minimize erosion. Typical cross sections for the bridge and culverts are shown on Figure 7.

4.5 Cumulative Effects

Cumulative Effects described in Section 4.5 of the 2004 EFH Assessment (Appendix A) remain the same. No changes are proposed.

5 Conservation Measures

The following conservation measures will be incorporated to avoid, minimize, and mitigate impacts to EFH. These are general measures that will be modified to specifically address details of the preferred alternative through further coordination with the agencies during final design.

- At all stream crossings (both culverts and bridge crossings), stream banks will be re-contoured to approximate original conditions and re-seeded with native vegetation to minimize erosion. BMPs, developed in accordance with EPA's "Storm Water Management for Construction Activities: Developing Pollution and Prevention Plans and Best Management Practices," EPA Document 832 R-92-005 (EPA 1992), will be employed to minimize the introduction of sediment and siltation of ponds and streams during adjacent fill placement and during culvert placement.
- For all project-related crossings of fish-bearing waters that incorporate bridges or culverts, the Applicant shall design, construct, and maintain the conveyance structures in accordance with the National Marine Fisheries Service 2008 publication, "Anadromous Salmonid Passage Facility Design" [National Marine Fisheries Service. 2008. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service, Northwest Region, Portland, Oregon] or equivalent and reasonable requirements.
- In-water work in Tongass Narrows will be restricted, as follows. General use of boats and barges could occur year round for general survey and work on bridge structures above water. Except for blasting, dredging, and pile driving, other work in marine waters could occur July 1-February 28. As further described below, blasting, dredging, and pile driving could occur only November 1-February 28, with the possible exception of mid-channel locations, based on further consultation with the Alaska Department of Fish and Game , NMFS, U.S. Army Corps of Engineers (COE), and U.S. Fish and Wildlife Service (USFWS).
- The following conservation recommendations will be followed with respect to pile driving in Tongass Narrows: A vibratory hammer will be used to drive steel piles instead of an impact hammer. Piles should be driven during low tide when in intertidal and subtidal areas.

- All construction in and around anadromous fish streams will take place when stream disturbances would have the least impact on anadromous fish species. The recommended time period for in-stream construction work in the Ketchikan area is June 15 through August 7 (Minnillo 2011). In-stream construction activities should completely avoid the period from August 8 through June 14. For the Ketchikan area, salmon fry generally emerge in the spring from April 15 to May 15, and the adults move into the streams by August 1 and remain through October 31 (Doherty 2003). However, timing of fry emergence and adult spawning depend on the species of fish present in each stream. For example, steelhead spawn in the spring and eggs are generally present in the stream until the middle of July. Construction work that occurs above the ordinary high water area of the stream and does not include in-stream construction may be conducted throughout the year (Minnillo 2004). In-water work areas, except for stream crossings by construction equipment, will be isolated from flowing waters of all anadromous fish streams.
- Any necessary in-water blasting will be performed such that ground vibration (particle velocity) does not exceed 2.0 inches per second and peak water overpressure (instantaneous pressure change) does not exceed 2.7 pounds per square inch. The project will employ monitoring devices to ensure adherence to these standards. If blasting amounts are minor, and if agreed by the agencies, monitoring may not be undertaken.
- The contractor will be required to prepare a blasting plan prior to any blasting activities. The blasting plan will be submitted to NMFS for review of both EFH and marine mammal impacts. A fish, marine mammal and invertebrate monitoring program will be required for any proposed blasting activities. A pre-blasting survey will be required to ensure that no fish schools are in the vicinity of the blasting area. If fish schools are detected, blasting will be delayed until they leave. A biologist will check the area and record any kills that are within 100 feet up current and 300 feet down current of the blast area after blasting is completed. Monitoring of the dredge materials may be incorporated into the blasting monitoring plan as a method for documenting organisms injured or killed in the blasting. Measures such as covering the rock to be blasted with sand may be used to dampen the blast impact. In-water blasting shall avoid the entire months of March through June to avoid juvenile salmonids and the period from June through October 31 to avoid adult salmon. All project-related activities will conform to the pertinent provisions of the Marine Mammal Protection Act and the Endangered Species Act.
- Dredged debris will be placed onto a barge where it will enter a settling basin and be disposed of on land. Only under Alternative F3, which could require substantial removal of sediment and rock, will ocean disposal be necessary. These operations for Alternative F3 will be consistent with the regulations of Clean Water Act, Section 404(b)(1) (disposal of dredged materials into waters of the U.S.) and Marine Protection, Research, and Sanctuaries Act, Sections 102 and 103. Monitoring of the dredged materials may be incorporated into the blasting monitoring plan as a method for documenting organisms injured or killed in the blasting. Dredging activities will avoid the entire months of March through October.
- All fueling and servicing operations will be conducted at least 100 feet away from all streams and water bodies, and fuel storage will be at least 100 feet away from all wetlands and water bodies.

- All necessary permits and agency approvals will be obtained prior to construction, and any permit stipulations will be incorporated into the contract specifications.
- Perimeter staking will be required on the outside of the disturbance area prior to construction to ensure that there is no additional impact from construction activities.
- Silt fences will be used adjacent to EFH stream channels, just beyond the estimated toe of fill.
- Gravel and streambed material will be used in the bottoms of fish-passage culverts.
- Riprap will be placed at specific locations along the stream bank as necessary to maintain stream bank integrity. Placement of riprap at anadromous fish streams should include the use of bioengineering techniques to improve habitat value of the riprap, by incorporation of willow stakes or other locally available vegetation.

In addition to the conservation measures listed above, more specific requirements may result during the permitting and final design process for the preferred alternative, should a build alternative be selected. By design, the permit stipulations will protect the known fish resources in the project area and will protect EFH areas.

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Appendix A
2004 EFH Assessment

Gravina Access Project
Essential Fish Habitat Assessment

Agreement No: 36893013
DOT&PF Project No: 67698
Federal Project No: ACHP-0922(5)

Prepared for:

State of Alaska
Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, AK 99801

Prepared by:

HDR Alaska, Inc.
712 West 12th St.
Juneau, AK 99801

April 2004

Table of Contents

List of Tables

1.0 Project Description

1.1 Location

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), is preparing an Environmental Impact Statement to assess alternatives to improve transportation access between Revillagigedo Island and Gravina Island. The two islands are separated by Tongass Narrows, a 13-mile-long waterway that varies in width from ¼ mile to 1 mile. Pennock Island lies within the Narrows and divides the southern portion into East Channel and West Channel. Access between the two islands is currently provided via ferry service. The Gravina Access Project area is located in the Ketchikan Gateway Borough (Borough) in southeast Alaska, about 680 miles north of Seattle, Washington, and 235 miles south of Juneau, Alaska. Most of the Borough's 14,000 residents live on Revillagigedo Island (on the eastern side of Tongass Narrows), whose major cities are Ketchikan and Saxman.

1.2 Proposed Action and Impact Summary

This project is one of 17 high-priority infrastructure projects in the State of Alaska to be federally funded under the Federal Transportation Equity Act for the 21st Century (TEA-21), enacted in 1998. The Act authorizes approximately $20 million for construction of a bridge joining Gravina Island to the community of Ketchikan on Revillagigedo Island.

The proposed project would consist of constructing a bridge (or two bridges, one each over East and West Channels) or ferry terminals, along with associated roadways. The project would require fill or bridge piers or dock pilings in Tongass Narrows regardless of whether a ferry or bridge alternative is selected. The roads associated with the bridges or ferry terminal would require bridge crossings over anadromous fish streams. Figure 1 shows the anadromous fish streams in the project area and the project alternatives being evaluated. In addition to any crossing of Tongass Narrows, all build alternatives would require a bridge crossing at two channels of Airport Creek, and Alternatives G3, F1, and F3 would require a bridge crossing at Government Creek. Alternatives F1 and F3 also would require a bridge crossing at an unnamed creek south of Government Creek, and a culvert crossing in a second unnamed anadromous fish stream (Figure 2). These crossings would avoid permanent loss of EFH by use of clear-span bridges or use of culverts designed per DOT&PF agreement with the Alaska Department of Fish and Game (ADF&G) specifically for fish passage

Alternative F3 also includes widening to improve navigational clearances in West Channel. This modification of West Channel would require blasting and dredging along a 2,000-foot-long segment of the channel. Approximately 59,000 cubic yards of surficial sediment would be removed without blasting. Below that material, approximately 125,000 cubic yards of fractured rock and bedrock would require blasting before removal by dredge. All material removed would be disposed of at a pre-approved marine location. Channel widening would impact intertidal and subtidal habitat in areas adjacent to Gravina and Pennock Islands (Table 1). The associated cross-sections are shown in Figure 3, and the areas of the West Channel to be widened are shown on Figure 4. To remove the rock by blasting, holes would be drilled into the rock at 10-foot intervals as deep as needed to pack the explosives to direct the force of the blast into the rock.

The ferry alternatives (G2, G3, and G4) would also require dredging in Tongass Narrows to produce adequate water depths for ferry docking (Figure 5). Alternative G2 would require the removal of approximately 1,400 cubic yards of material near the proposed south terminal. Alternative G3 would require the removal of approximately 15,200 cubic yards of material near both the proposed north and south terminals. Alternative G4 would require the removal of approximately 18,600 cubic yards of material near the north and south terminals. All bridge and ferry alternatives would likely require pile driving using a vibratory hammer to advance the steel pile through the existing sediment to rock.

Essential Fish Habitat (EFH) is defined in Section 2. Table 1 shows the acreage of EFH affected for each alternative, based on preliminary engineering design. This report assesses potential impacts to EFH by project alternatives and recommends conservation measures to avoid, minimize, or offset impacts to EFH.

TABLE 1: POTENTIAL IMPACTS ON ESSENTIAL FISH HABITAT

		Bridge Alternatives[1]						*Ferry Alternatives*[2]		
Type of EFH	*No-Action*	*C3(a)*	*C3(b)*	*C4*	*D1*	*F1*	*F3*[3]	*G2*	*G3*	*G4*
Marine EFH (approximate acreage)										
Dredging[3]	0	0	0	0	0	0	16.0	0.20	2.14	1.22
Shading[4]	0	0	0.3	0	0	0	0.1	0.5	1.6	0.3
Filling	0	6.1	6.5	6.7	4.1	0	0	0	0	0
Pier Area[5]	0	0.13	0.21	0.13	0.18	0.16	0.16	0*	0*	0*
Marine Total[6]	**0**	**6.3**	**7.1**	**6.9**	**4.3**	**0.2**	**16.2**	**0.7**	**3.8**	**1.6**
the following three lines indicate subsets of the marine total shown above										
Eelgrass	0	0.02	0.00	0.04	0.00	0.02	0.03	0.08	0.29	0.00
Kelp	0	2.79	2.99	2.75	1.64	0.02	3.01	0.29	1.36	1.01
Saltmarsh	0	0	0	0	0	0	0	0.1	1.70	0
Freshwater EFH (number of crossings)										
Stream Crossings[7]	**0**	**2**	**2**	**2**	**2**	**5**	**5**	**2**	**3**	**2**

[1] **Bridge Alternatives**:

Alternative C3(a) = 200' Bridge between Signal Road and South of Airport Terminal
Alternative C3(b) = 120' Bridge between Signal Road and Airport Terminal
Alternative C4 = 200' Bridge Between Tongass Avenue (North of Cambria Drive) and South of Airport Terminal
Alternative D1 =120' Bridge Between Tongass Avenue (near Existing Ferry) and Airport Terminal
Alternative F1= Bridges (200' East and 120' West) Between Tongass Avenue and Airport, via Pennock Island
Alternative F3 = Bridges (60' East and 200' West) Between Tongass Avenue and Airport, via Pennock Island

[2] **Ferry Alternatives**:

Alternative G2 = Ferry Between Peninsula Point and Lewis Point
Alternative G3 = Ferry Between Downtown and South of Airport
Alternative G4 =Ferry Between New Terminals Adjacent to Existing Ferry Terminals

[3] Assumes channel modification would be required for F3. Areas shown as dredged would not permanently be lost as EFH.

[4] Area that is covered by over-water structures fewer than 30 feet above MHHW, both for ferry docks and the low portions of bridge alternatives. Ferry loading transfer bridge assumed to be 24'x140'; floating barge 24'x60'; apron 24'x24'.

[5] Bridge alternatives include piers 30'x30'. Ferry alternatives include small-diameter pilings, but these are not calculated. The impact of ferry pilings is included under the shaded area (two lines above).

[6] Marine Total is the total of the first four lines of the table. Impacts include loss of habitat and change in habitat function. Eelgrass, kelp, and saltmarsh impacts are a subset of this total. Total is rounded up to the next tenth acre.

[7] Number of anadromous fish streams shaded by bridge or covered with culvert. No permanent loss of EFH is anticipated at these locations.

2.0 Background Information

2.1 Magnuson-Stevens Fishery and Conservation Management Act

The Magnuson-Stevens Fishery and Conservation and Management Act (MSFCMA) defines EFH as:

> *"…waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity…. For the purpose of interpreting the definition of essential fish habitat, 'waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes sediment, hard bottom, structures underlying the waters, and associated biological communities; 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and 'spawning, breeding, feeding, or growth to maturity' covers a species' full life cycle."*
>
> *-50 CFR 600.10*

The MSFCMA directs federal agencies to consult with the National Marine Fisheries Service (NMFS aka NOAA Fisheries) when any of their activities may have an adverse effect on EFH. According to Section 600.810 of Subpart J of the MSFCMA, an adverse effect is "any impact which reduces quality and/or quantity of EFH." This section also notes that "adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, or reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions."

2.2 DOT&PF and NMFS Agreement of EFH Consultations

In accordance with a November 3, 1999 DOT&PF and NMFS (now referred to as NOAA Fisheries) agreement on EFH consultations (Appendix A) for projects involving an EIS, DOT&PF, on behalf of the FHWA, has determined that this project may cause permanent and temporary adverse effects on EFH. Placement of bridges for stream crossings may cause temporary adverse effects on EFH. Dredging, blasting, and pile driving would also cause permanent loss or alteration of EFH.

3.0 Affected Essential Fish Habitat

Tongass Narrows is designated as EFH under the MSFCMA for 11 species of ground fish and 5 species of Pacific salmon. Most are primarily late juveniles and adults, and may use the Narrows as a migratory corridor to other rearing areas in nearby bays and intertidal areas. In addition to the marine habitat of Tongass Narrows, anadromous fish streams documented by the Alaska Department of Fish and Game (ADF&G) in the Anadromous Waters Catalog (ADF&G 1998) are designated as EFH in the project area. These include Government Creek, Airport Creek (main stem and its tributary), and two unnamed streams (Figure 2). These waterways are defined as anadromous fish streams, which are those streams necessary for salmon spawning, breeding, feeding, or growth to maturity (NMFS 1998).

3.1 Species

The following paragraph and Table 2 present EFH data obtained from NOAA Fisheries through telephone conversations, response letters, and the NOAA Fisheries EFH web site. A response letter received in October 1999 (and confirmed in 2003) indicated these 16 species as having EFH within Tongass Narrows (see Appendix B for copy of letter). All 16 species may be found within the current project area that includes Tongass Narrows and several anadromous streams. Table 2 shows the life stages of each species as they are found within the project area.

Consultation with the NOAA Fisheries established that there is EFH for the following fish species in the project area: arrowtooth flounder (*Atheresthes stomias*), dusky rockfish (*Sebastes ciliatus*), Pacific cod (*Gadus macrocephalus*), Pacific ocean perch (*Sebastes alutus*), shortraker rockfish (*Sebastes borealis*), rougheye rockfish (*Sebastes aleutianus*), sablefish (*Anoplopoma fimbria*), sculpins (*Cottidae* spp.), skates *(Raja* spp.), walleye pollock (*Theragra calcogramma*), yelloweye rockfish (*Sebastes ruberrimus*), and all five Alaskan salmon species (*Oncorhynchus* spp.). Tongass Narrows supports habitat for all five Alaskan salmon species, which are likely to occupy the Narrows at various times of the year for feeding and migration. The anadromous fish streams in the project footprint contain three species of salmon: pink, coho and chum salmon (NMFS 1999).

Many of the species with EFH in the project area are of high commercial value and support the local and state economy through commercial and sport fisheries. Ketchikan's commercial fishing industry generates more than $90 million annually and provides more than 1,500 full-time jobs (USKH 2000).

TABLE 2: ESSENTIAL FISH HABITAT SPECIES IN PROJECT AREA

Ground Fish Species	**Egg**	**Larvae**	**Late Juvenile**	**Adult**	**Spawning**
Pacific Ocean Perch			X	X	
Yelloweye Rockfish			X	X	
Shortraker			X	X	
Rougheye Rockfish			X	X	
Dusky Rockfish			X	X	
Walleye Pollock	X			X	
Sablefish			X	X	
Pacific Cod			X	X	
Arrowtooth Flounder			X	X	
Sculpin spp.			X	X	
Skates spp.			X	X	

Salmon Species	Egg and larvae – fresh water	Juvenile – fresh water	Juvenile – estuarine	Juvenile – marine	Adult – marine waters	Spawning – fresh water only
Coho salmon	x	x	x	x	x	x
Chum salmon	x	x	x	x	x	x
Pink salmon	x	x	x	x	x	x
Chinook salmon*				x	x	
Sockeye salmon*				x	x	

* Both species are found only in Tongass Narrows within the project area; however, they do occur as freshwater eggs, larvae and juveniles in other freshwater streams in the Ketchikan area.

3.2 General Habitat Description of Tongass Narrows

Tongass Narrows is generally characterized by strong tidal currents and by steep bedrock or coarse gravel-cobble-boulder shoreline. Lower intertidal and shallow subtidal areas are often sandy or mixed gravel, sand, and shell, with varied amounts of silt. At other areas, however, such as at rocky points and along the northwestern shore of Pennock Island, bedrock slopes steeply to subtidal depths. Subtidal habitats, like those in the intertidal zone, are a mix of bedrock outcrops or ledges, boulder-cobble slopes and, where lower slopes permit, sandy gravel bottoms, often mixed with significant amounts of shell debris.

Several small natural coves and areas protected by constructed breakwaters provide wave and current protection for marine habitats with sand or gravel bottoms. Extensive areas of riprap bank protection and filling occur along the northeastern shoreline of the City of Ketchikan. Construction of numerous buildings on pilings over the intertidal and shallow subtidal zone has significantly modified the shorelines in these areas. Human-induced shoreline protection activities have similarly modified about a mile of the shoreline of Gravina Island in the vicinity of the airport and airport ferry terminal.

Prey Species. In areas where natural coarse gravel-cobble-boulder, sand, mud, or mixed-fine shorelines occur, lower beaches contain diverse microhabitats providing prey for ground fish and salmonid species. Fieldwork completed in the intertidal zone in January and July 2000 (HDR 2001) identified 136 plant and 151 animal taxa. Ground fish prey includes a variety of epibenthic crustaceans, especially amphipods and several crab and shrimp species, as well as infaunal clams, gastropods, and polychaete worms. Diets of young salmonids include a variety of smaller crustaceans (harpacticoids, mysids, cumaceans), larval fish, and terrestrial insects. Diets of subadult and adult salmon vary among species, but generally, are dominated by forage fish (herring, smelt, sand lance) and larger pelagic and planktonic invertebrates. Huge schools of herring, smelt, capelin, and Pacific sand lance collectively provide the food base for salmon. Pacific herring spawn during the spring in eelgrass or rockweed beds at the north end of Gravina Island (Walker, 2000). The shorelines of Tongass Narrows provide rearing habitat for juvenile salmonids migrating out of area streams during the spring. Low gradient gravel and sand beaches produce an abundance of epibenthic zooplankton that provide a key prey base for juvenile pink, chum, and chinook salmon (Groot and Margolis, 1991) At low tides, extensive eelgrass beds along the narrows also produce large numbers of prey items and provide refuge for juvenile salmonids against predation by birds and larger fish.

3.3 Ground Fish Species Descriptions

Specific descriptions of the non-salmonid species, some of which may be found within Tongass Narrows, and their life stages are included below. References to habitat locations indicate the following depth associations: inner (1-50 meters), middle (50-100 meters), and outer (100-200 meters) shelf regions, and upper (200-1,000 meters) and lower (>1,000 meters) slopes and basin (>3,000 meters) (NMFS 1999). No specific surveys have been identified that document the use of project area waters by these species. However, unconsolidated bottom areas of silt, sand, and gravelly sand along the slopes of Tongass Narrows are expected to support a variety of ground fish. Rockfish are more likely to use boulder, ledge, and bedrock outcrops within the Narrows.

- <u>Arrowtooth Flounder</u>
  Arrowtooth flounder spawn during December-February at depths of 100-360 meters (DiCosimo 2001). Pelagic (open seas) eggs and larvae inhabit all areas of the continental shelf, though predominantly inhabiting only the inner and middle shelf regions. Juveniles and adults are demersal (bottom dwelling) in gravel and muddy sand. Juveniles typically inhabit shallow areas until they are about 10 centimeters long. During winter, the flounder migrate to shelf margins and upper continental slopes to avoid cold temperatures (NPFMC 1998b). This species is a likely inhabitant of Tongass Narrows.

- <u>Dusky Rockfish</u>
  Dusky rockfish adults are found along the outer shelf, upper slope, and nearshore waters of southeast Alaska, typically in areas with rocky shores at depths less than 50 meters. Juveniles inhabit inner and middle slopes. This species may be found in Tongass Narrows. Preferred

substrate for both adults and juveniles is gravel, cobble, or boulder. Juvenile dusky rockfish have been captured in nearshore eelgrass and kelp beds. Adults are semi-demersal/semi-pelagic (NPFMC 1998b).

- Pacific Cod
  Pacific cod are demersal and concentrate on the shelf edge and upper slope (100-200 meters) in the winter and spring where they overwinter and spawn from January through April and move to shallower waters (<100 meters) in the summer (DiCosimo 2001). This species is a likely inhabitant of Tongass Narrows. They prefer mud, sandy mud, muddy sand, or sand in deep waters (Morrow 1980). Pacific cod eggs are found on the inner and middle continental shelf. Pacific cod larvae are epipelagic (zone where photosynthesis can occur) in the upper 45 meters of the ocean. Juveniles can be found in water 60-150 meters deep (NPFMC 1998b). Juvenile Pacific cod have been captured in nearshore eelgrass and kelp beds (NOAA Fisheries 2003).

- Pacific Ocean Perch
  Adult Pacific Ocean perch (POP) are found along outer shelf and upper slope. They migrate into deeper water during fall and winter to spawn, and then move to shallower depths to feed during spring and summer. Juveniles are found in the inner, middle, and outer shelves, and upper slope. Larval stages are found in the same areas as juveniles plus in the lower slope and basin. As a result of this life history pattern, it is unlikely that significant numbers of POP occur in Tongass Narrows. Preferred habitat for adults includes gravel, pebble, and cobble. Juveniles generally prefer the same habitats as adults, but will also use areas with boulders (DiCosimo 2001).

- Shortraker and Rougheye Rockfish
  Adults inhabit waters of the outer continental shelf and continental slope (DiCosimo 2001). Juveniles are found in the middle and outer shelves. As a result of this life history pattern, it is unlikely that significant numbers of these species occur in Tongass Narrows. Adults use habitats where mud, clay, silt, sand, gravel, pebble, cobble, boulder, and bedrock are present. The softer substrates (sand or mud) generally have the highest adult densities; hard substrates (bedrock, cobble or pebble) usually have the lowest densities. Habitats with steep slopes and frequent boulders are used more than habitats with gradual slopes and few boulders. Juveniles may occupy shallower habitats than adults (NPFMC 1998b).

- Sablefish
  Adults and late juveniles inhabit the deeper waters of the continental shelf, the slope, and the deep-water coastal fjords. Most adults are typically found in depths of 366–914 meters. As a result of this life history pattern, it is probable that sablefish occur in Tongass Narrows. Adult and late juvenile sablefish are pelagic and may be found in waters over any substrate (NPFMC 1998b). Spawning occurs in pelagic waters at a depth of 300–500 meters in the spring (McFarlane 1997).

- Sculpin spp
  Sculpins are bottom-dwelling fish that live in tide pools or in shallow or deep marine waters, and occasionally can be found in freshwater. Adults and late juveniles can be found in the middle shelf regions. Sculpins are known to use a wide range of habitats, including intertidal pools and all shelf habitats, e.g., mud, sand, gravel, etc. (NPFMC 1998b). Several species of sculpin have been seen in intertidal and subtidal surveys in Tongass Narrows.

- Skates spp
  Juvenile and adult skates can be found in the middle shelf regions. Skates are known to use a broad range of substrate types (mud, sand, gravel, and rock) and can typically be found in the lower portion of the water column (NPFMC 1998b). It is probable that skates occasionally inhabit the deeper waters of Tongass Narrows.

- Walleye Pollock
  Both adults and eggs are found in the outer shelf regions. Walleye pollock and their eggs are pelagic; therefore, they may be sighted in waters over any substrate. All life stages of walleye pollock are known to use the Tongass Narrows as habitat. Pollock larvae are pelagic and inhabit the middle and outer continental shelf. Juvenile pollock inhabit the inner, middle, and outer continental shelf and oceanographic features like basins, fronts, and upwellings. Adults are semi-demersal (near the ocean surface to 200 meters). Adults congregate where food is concentrated in middle and outer continental shelf areas (NPFMC 1998b).

- Yelloweye Rockfish
  Adults and juveniles are both found in the middle and outer shelves and upper slope. Habitat for both consists of bays, estuaries, and island passes. This species is a likely inhabitant of Tongass Narrows. Both life stages are demersal, and are often found in areas with rock, coral, and cobble. High concentrations of rockfish are found in areas with high relief containing refuge spaces such as overhangs, crevices, and caves (NPFMC 1998b).

3.4 Anadromous Fish Waterways Habitat Descriptions

3.4.1 Government Creek

Species
According to the ADF&G Anadromous Waters Catalog (ADF&G 1998), Government Creek (ADF&G No. 101-47-10400) provides habitat considered to be EFH for coho, chum, and pink salmon. The mouth of Government Creek provides spawning habitat for all three salmon species, and the headwaters provide rearing habitat for juveniles.

Habitat
In the project area, Government Creek enters Tongass Narrows through a shallow gravel-cobble-bottomed stream channel in a small V-shaped embayment. The stream channel bottom is covered with a dense growth of filamentous brown alga (*Pilayella littoralis).* Lower stream banks support dense rockweed; in muddy pockets adjacent to the stream, softshell clams (*Mya arenaria*) are abundant. Finer sediments at higher elevations (e.g., > +13 ft MLLW) have a well-developed saltmarsh grouping. Dominant plants in the lower saltmarsh are *Carex* sp., *Glaux* sp., and *Plantago* sp.; higher elevations have *Potentilla* sp., *Deschampsia* sp., and *Juncus* sp. Higher areas with coarse sand and gravel, especially to the south toward East Clump Island, support patches of *Salicornia virginica* and a backshore grouping mixed with salt-tolerant grasses and herbs (HDR 2001).

3.4.2 Airport Creek

Species
According to the ADF&G Anadromous Waters Catalog (ADF&G 1998), Airport Creek (ADF&G No. 101-47-10450-2002 and No. 101-47-10450) provides spawning habitat for coho and pink salmon.

Habitat
In the project area, Airport Creek flows directly into a productive estuary of Tongass Narrows. Airport Creek consists of two channels that merge into one near the estuary. The upper intertidal area around the creek mouth consists of a relatively flat bench dominated at lower elevations by *Salicornia* and *Puccinellia*. At somewhat higher elevations, taller species such as the sedge *Carex*, velvet grass (*Holcus lanata)*, and tufted hairgrass (*Deschampsia dominate)*. Gravelly areas adjacent to the stream channel support patches of *Honkenya peploides*, and higher-elevation sand and gravel have a dense growth of dune grass.

The outer reaches of this estuary support eelgrass beds that provide habitat and food for juvenile salmon. Airport Creek consists of a shallow gravel-cobble-bottomed stream channel with small cascades. Areas farther upslope are characterized with a boulder-cobble bottom and steep banks. The riparian vegetation surrounding the creek consists of Sitka spruce (*Picea sitchensis)* and cedar-hemlock (*Chamaecyparis* sp. and *Tsuga* sp.) forest with an open shrubby understory (HDR 2001).

3.4.3 Other Anadromous Fish Waterways

Species
According to the ADF&G Anadromous Waters Catalog (ADF&G 1998), two unnamed creeks (ADF&G No. 101-47-10380 and No. 101-47-10350) provide spawning habitat for coho salmon in the project area.

Habitat
The two unnamed creeks are known spawning habitat for coho salmon (*Oncorhynchus kisutch*). Both creeks are confined to a low flow, low gradient, narrow channel that flows directly into Tongass Narrows. The creeks are very narrow, ranging from 3 to 5 feet wide or less in most locations. The depths of the creeks vary from shallow (1 foot) to 2 to 3 feet in some locations. Both can be ephemeral in some locations, depending on rainfall. The creeks have overhanging riparian vegetation consisting of Sitka spruce and cedar-hemlock forest with a shrubby understudy, which likely provide rearing habitat for juvenile salmon (HDR 2001).

Marine Nearshore
The shorelines of Tongass Narrows provide rearing habitat for juvenile salmonids migrating out of area streams during the spring. Low gradient gravel sand beaches produce an abundance of epibenthic zooplankton that provide a key prey base for juvenile pink, chum, and chinook salmon (Groot and Margolis 1991). At low tides, extensive eelgrass beds along the narrows also produce large numbers of prey items and provide refuge for juvenile salmonids against predation by birds and larger fish. As they grow, young salmon tend to move offshore into deeper waters while remaining in the upper portion of the water column. These fish feed on larger planktonic and pelagic prey including larval fish and smaller forage fish.

3.5 Salmonid Species Descriptions

- <u>Coho Salmon</u>
  The NOAA Fisheries EFH web site (NMFS 2002) shows that coho salmon (*O. kisutch*) have EFH in all ADF&G anadromous streams that are crossed by the project and in Tongass Narrows. Coho salmon enter spawning streams from July to November, usually during periods of high runoff. The eggs hatch early in the spring, where the embryos remain in the gravel using the egg yolk until they emerge in May or June. Juvenile coho spend one to three winters in streams and may spend up to five winters in lakes before migrating to the sea as smolt (ADF&G 2002). Coastal streams, lakes, estuaries, and tributaries to large rivers all provide coho rearing habitat.

Coho juveniles may also use brackish-water estuarine areas in summer and migrate upstream to fresh water to overwinter. They spend about 16 months at sea before returning to coastal areas and entering fresh water to spawn (NPFMC 1998).

- <u>Chum Salmon</u>
  The NOAA Fisheries EFH web site (NMFS 2002) shows that chum salmon (*O. keta*) have EFH in Government Creek and Tongass Narrows. Chum salmon return to spawn as 2- to 7-year olds. Chum salmon fry, like pink salmon, do not overwinter in the streams but migrate out of the streams directly to the sea shortly after emergence (ADF&G 2002). This outmigration occurs between February and June, but most fry leave the streams during April and May. Chum salmon tend to linger and forage in the intertidal areas at the head of bays. Estuaries are important for chum salmon rearing during spring and summer. Chum salmon spawn between June and November in gravel in streams, side-channel sloughs, and intertidal portions of streams when the tide is below the spawning grounds (NPFMC 1998).

- <u>Pink Salmon</u>
  The NOAA Fisheries EFH web site (NMFS 2002) shows that pink salmon (*O. gorbuscha*) have EFH in Government Creek, Airport Creek, and Tongass Narrows. Pink salmon are distinguished from other Pacific salmon by having a fixed two-year life span. Because of the life span, pink salmon spawning in a particular river system in odd and even years are reproductively isolated from each other and have developed into genetically different lines (NPFMC 1998). Adult pink salmon enter spawning streams between late June and mid-October. They spawn within a few miles of the coast, and spawning within the intertidal zone or the mouth of streams is very common. Shallow riffles where flowing water breaks over coarse gravel or cobble-size rock and the downstream ends of pools are favored spawning areas. The eggs hatch in early to mid-winter and the fry swim up out of the gravel and migrate downstream into salt water by late winter or spring (ADF&G 2002).

- <u>Chinook Salmon</u>
  The NOAA Fisheries EFH web site (NMFS 2002) shows that chinook salmon (*O. tshawytscha*) have EFH in Tongass Narrows, but not in any of the creeks or streams in the project area. Adult chinook salmon are found over a broad geographic range, encompassing different ecotypes and very diverse habitats in Southeast Alaska. Chinook salmon generally spawn from mid-June to mid-August in waters ranging from a few centimeters deep to several meters deep. Eggs hatch in the late winter or early spring and juveniles typically remain in fresh water for at least one year before migrating to the ocean in the springtime (ADF&G 2002). Chinook salmon spend one to six years at sea before they return to freshwater streams to spawn (NPFMC 1998). Adults return to spawning streams from July through September (Morrow 1980).

- <u>Sockeye Salmon</u>
  The NOAA Fisheries EFH web site (NMFS 2002) shows that sockeye salmon (*O. nerka)* have EFH in Tongass Narrows, but not in any of the creeks or streams in the project area. Sockeye salmon exhibit a greater variety of life history patterns than other Pacific salmon, and are known to use lake-rearing habitats in the juvenile stages (NPFMC 1998). Sockeye salmon generally spawn in late summer and autumn. They use a wide variety of spawning habitats such as rivers, streams, and upwelling areas along lake beaches. Eggs hatch during the winter and the young salmon move into the rearing areas. In systems with lakes, juveniles usually spend one to three years in fresh water before migrating to the ocean in the spring as smolts. However, in systems without lakes, many juveniles migrate to the ocean soon after emerging from the gravel (ADF&G 2002).

4.0 Project Impacts and Conclusions

4.1 Project Impacts

Construction activities within coastal watersheds and in coastal marine areas will impact EFH. These activities may adversely impact marine resources directly and indirectly through habitat loss and/or modification. Other impacts that may occur as a result of the proposed project include the following: runoff from roadways, increased human access (e.g., for fishing), and cumulative development of shoreline property. Locations and descriptions of the anadromous fish stream crossings, by alternative, are shown in Figure 1. Individual waterway impacts by the proposed project alternatives are described below.

4.1.1 Tongass Narrows

<u>General Impacts</u>

All project alternatives would require placement of either bridge pier footings or pilings for ferry facilities in shallower waters (e.g., shallower than -50 feet MLLW) near the shoreline of Tongass Narrows. Table 3 shows the required number of piers, water body crossings, amount of roadway fill for Tongass Narrows, and dredging quantity for each alternative. Given the small area that would be required for bridge piers and ferry terminal pilings, the permanent effects on EFH are minor. Pilings for bridge piers and ferry terminal will be placed as drilled shafts into Tongass Narrows using a reverse rotary drill.

All alternatives may require pile driving to penetrate any existing sediment in the area and enable the pile to bear on or within rock. Geophysical surveys suggests that this soil sediment may be as much as 20 feet thick. In these locations, a vibratory hammer would be used to advance the steel pile (probably 18 to 30-inches in diameter) through the existing sediment until it reached bedrock and then drilling would be employed to penetrate the rock and/or install the piling or rock anchors in the rock formation.

The reverse rotary drill for bridge pier foundations will advance large diameter drilled shafts into the rock bottom by grinding or coring about 10 or 12 feet diameter holes through the rock at the bottom of the channel at each pier location. Four to six shafts may be drilled to support each pier. Each shaft takes approximately one week to complete. Shaft drilling will be conducted by first installing a large diameter steel casing through the water and seating it into the bottom material. It is not known at this point whether the casing will be dewatered or whether the water will be left in the casing (most likely the latter, especially where the deeper water is present). The shaft will then be drilled through the casing to depths on the order of 50 to 100 feet into soil and rock, and then completed by lowering a reinforced steel cage into the shaft hole and filling the hole and casing to above the water line with concrete. These 4 to 6 shafts will then be cast into a single pier cap for supporting the above water portion of the pier and bridge structure.

All shaft and pile construction methods will entail barge-mounted equipment to have the least impact on marine epifauna. The barge-mounted reverse rotary drill uses wet construction technology to draw the rock drill cuttings as slurry up through the middle of the drill shaft onto the barge where it enters a settling basin and is disposed of according to normal dredge disposal regulations. Refer to Table 3 for impacts to EFH by alternative for bridge or pier construction.

No site-specific surveys of fish likely to be present in the vicinity of drilling or pile driving are available. However, fish types that will likely be present include demersal (e.g., flatfish, cottids, rockfish, gadids) and pelagic (salmonids, clupeids, embiotocids, greenling) species. Of these, fish with closed swim bladders (physoclistous species – e.g., rockfish, gadids) are known to be most vulnerable to sharp changes in acoustic energy (e.g., from blasting), while those with open swim bladders (physostomous species – e.g., salmonids) are less affected; fish lacking a swim bladder (e.g., cottids, flatfish) are the least susceptible.

Using reverse rotary drilling and a vibratory hammer will have less impact on fish than use of an impact hammer to drive piles, which is known to have significant adverse effects on fish. The small amount of pile driving that may be necessary would be in sediment, and conservation measures would reduce the harmful vibratory impacts of pile driving by using a vibratory hammer instead of an impact hammer, and by driving near-shore piles at low tide only. Peak sound pressures generated by rotary drilling would be comparable to or less than that generated by clamshell dredging, and well below levels known to be harmful to fish and marine life. Sound frequencies associated with drilling would be generally higher pitched and sound pressure levels would be steadier than would clamshell dredging. As a result, there likely would be less disruption of fish and mammal movement and feeding patterns than would occur during dredging.

There would be some permanent loss of eelgrass beds from placement of fill in Tongass Narrows in Alternatives C3a, C3b, C4, and D1. Placement of fill would result in a direct loss of EFH in Tongass Narrows and could modify current patterns and water circulation slightly by changing the direction or velocity of water flow, or changing the dimensions of a water body. These changes to the water dynamics could result in increased deposition of suspended particulates, or increased bed scour, either of which could reduce the area of habitats available for spawning, breeding, feeding, or growth to maturity of fish for which EFH has been designated (NMFS 1998). Piers and the bridge structures could eliminate or slow the growth of eelgrass beds by shading, which indirectly would negatively impact EFH.

Ferry alternatives could result in substantial scour of the bottom of the channel in areas under and near the loading ramps. Propeller scour caused by power reversal during docking would eliminate existing unconsolidated surficial sediments and associated biota over a small area (assumed 0.1 acres for each ferry docking area) shoreward of the berth.

Table 3 shows water body crossings, piers, and roadway fill impacts to Tongass Narrows from bridge or pier construction, and dredging quantities.

TABLE 3: QUANTITIES OF FILL, DREDGING, AND OTHER EFH IMPACTS

	C3(a)	*C3(b)*	*C4*	*D1*	*F1*	*F3*	*G2*	*G3*	*G4*
EFH/Total Number of Water Body Crossings[1]	2/8	2/8	2/8	2/8	5/14	5/14	2/8	3/10	2/8
Piers in Tongass Narrows (Number)	5	7	5	6	6	6	0	0	0
Fill in Tongass Narrows (Cubic Yards, Thousands)[2]	280	140	280	295	0	0	0	0	0
Dredging Quantities (Cubic Yards)	0	0	0	0	0	184,000[3]	1,400	15,200	18,600

[1] Indicates the total number of stream crossings (not including Tongass Narrows) and the number of these crossing that are of anadromous fish streams (such streams are EFH). No permanent loss of EFH would occur because bridge and culvert design would preserve EFH.

[2] For bridge alternatives, fill quantities shown do not include the bridge piers themselves.

[3] Of this total, approx. 125,000 cy of solid and fractured rock would be loosened by blasting and removed by clamshell dredge. For the balance, surficial sediments would be removed by dredge without blasting.

Impacts of Pier Construction and Channel Modification

In-water blasting might be necessary for all alternatives to prepare the foundations for in-water piers or pilings for bridge and ferry alternatives. If blasting were required to prepare the foundations for piers or pilings, the conservation measures for blasting in Chapter 5.0 would be implemented. In addition, if blasting is required, it will be performed such that ground vibration (particle velocity) does not exceed 2.0 inches per second and peak water overpressure (instantaneous pressure change) does not exceed 2.7 pounds per square inch. The project will employ monitoring devices to ensure adherence to these standards. Currently only Alternative F3 has the potential to require substantial blasting. However, dredging for the ferry alternatives may require a small amount of blasting. If blasting is necessary for the ferry alternatives, it would last 2-3 days and would have localized impacts that would be of minimal significance in relation to the large areas of similar habitats available in Tongass Narrows. The types of charges that would be used for blasting would be common explosives used in underwater blasting. The amount of explosives needed to generate 1 ton of rock would be approximately 1 pound of explosive. The amount of in-water blasting that may be required has not been determined for any of the alternatives. The depth of detonation, weight of the charge, and detonation velocity are not known at this time. This information will be determined during the final design phase and will be addressed in project permitting. Shock waves from blasting can be expected to travel, and to be sensed by marine organisms up to a few miles, depending on the topography of the area. In addition, underwater blasting can be expected to cause heavy mortalities of fish within 100 meters, with lesser numbers of fish killed with greater distance. The confined nature and rocky shorelines of the West Channel may focus, rather than dissipate acoustic energy, extending the area of impact up and down the channel (Houghton and Munday 1987).

Research conducted by the U.S. Army Corps of Engineers indicates that the lethality of an explosive is directly related to its detonation velocity. Detonation velocity is the speed with which a blasting agent ignites. The more rapid the detonation velocity is, the more abrupt the resultant hydraulic pressure gradient will be, and the more difficulty fish have adjusting to the pressure changes. Investigations have demonstrated that the swim bladder is the most frequently damaged organ. Laboratory tests have demonstrated that small negative pressures can injure fish swim bladders, and negative pressures of only one atmosphere (101.4 kPa) can kill marine fish. This is well below the pressure of most underwater explosions (Keevin et al.1997).

The distance from the blast at which lethal effects occur depends upon several variables including: the typical size (weight) of the fish species likely to be in the area, the depth of the fish, the depth of detonation of the charge, and the weight of the charge. Lethal ranges will be increased if the water is shallow (less than fives times either the detonation depth or target depth, whichever is greater) or where the bottom is rocky (Keevin et al. 1997).

No site-specific studies have been conducted to describe fish populations potentially at risk at locations that would require blasting to provide necessary navigational depths. Nonetheless, the general nature of fish that may be present at each site can be deduced from the nature of the habitats present. Rocky habitats in Tongass Narrows likely support rockfish, which, because of their large swim bladders, would be expected to be highly susceptible to sound pressures generated by blasting, while cottids would be less susceptible. Adjacent soft bottom areas likely support flatfish species and skates that would be somewhat less vulnerable to blast effects because they lack swim bladders, and gadids that are known to be very susceptible. A number of other species may be present in the water column, depending on the time of year. These could include salmonids, forage fish, and some gadids, all of which would be very susceptible to blast effects (Houghton and Munday 1987).

Alternative F3 would require modification to West Channel to improve navigation clearances (see Figure 3). This alternative would widen the channel and modify the localized nearshore tidal flow regime slightly, but would not affect overall flow though West Channel. Altered hydrology in the channel would not significantly impact benthic assemblages or productivity outside of the area directly modified. Channel modification would require the removal of approximately 59,000 cubic yards of surficial sediment, which would be removed by dredging (not blasting), and 125,000 cubic yards of fractured rock and bedrock, which would require blasting to be removed (See Figure 3). The channel widening would consist of a combination of drilling, blasting, and dredging activities. The duration of these activities would be 1 to 3 months. Channel modification work would occur up to seven days a week with almost continuous disturbance from dredging and intermittent disturbance from blasting. Blasting, and dredging in the West Channel would remove approximately 16 acres of subtidal habitat from areas adjacent to Gravina and Pennock Islands (Table 1). This action would eliminate approximately 3 acres of existing kelp beds including *Nereocystis* and *Laminaria*, 0.03 acres of eelgrass beds, and would affect 0.75 acres of sea cucumber (*Parastichopus californica*) habitat in the immediate area (Figure 6 and Table 1).

Construction disturbance (blasting and dredging) will reduce the primary and secondary productivity of the West Channel during construction and for 1 to 2 years following channel expansion. During this time, forage resources for benthic feeders may be substantially reduced. This will reduce the flux of plant matter, smaller organisms, and the prey available for larger organisms on either end of the channel, where those animals were dependent for prey on plants or algae produced in the impacted area. This effect will be short term and likely would be immeasurable since few organisms would be dependent solely on prey produced in the impacted area.

The ferry alternatives would also require minor dredging in Tongass Narrows to produce adequate water depths for ferry docking (Figure 5). Use of a clamshell dredge is the most likely method of dredging for the ferry alternatives and F3 (See Temporary Impacts Section for discussion of clamshell dredges and possibility of entrainment). Alternative G2 would require the removal of approximately 1,400 cubic yards of material near the proposed south terminal (approximately 0.2 acres; Table 1). Alternative G3 would require the removal of approximately 15,200 cubic yards of material near both the proposed north and south terminals (approximately 2.14 acres total; Table 1). Alternative G4 would require the removal of approximately 15,200 cubic yards of material near the north and south terminals (1.22 acres; Table 1).

Where blasting is required for Alternative F3, and possibly for other alternatives, a barge mounted percussion drill would be used to drill holes for the explosive. The explosive would be set into the holes and detonated, and a clam bucket would be used to remove the debris. The debris would be placed onto the barge where it would enter a settling basin and be disposed of according to normal dredge disposal regulations. Disposal of dredged and blasted material would follow the Environmental Protection Agency's (EPA) Guidelines for disposing of dredged and blasted material (40 CFR Parts 220-238) (Ocean Dumping) and would be consistent with the regulations of Clean Water Act (CWA) Section 404(b)(1) [disposal of dredged materials into waters of the U.S.] and Marine Protection, Research, and Sanctuaries Act (MPRSA) Section 103. The disposal would be an "open water" ocean disposal and would require the use of locations be pre-approved by the EPA (MPRSA Section 102). Deepwater disposal of sediment removed from the West Channel would eliminate existing benthos in the disposal area. However, recolonization of disposal areas is expected to be rapid. The recurring use of a common disposal area by this and other projects would focus the impacts of this and the other projects in a localized area. Use of a deepwater disposal site would avoid impacting more productive shallow water areas.

Eelgrass is typically found to –20 feet MLLW in Southeast Alaska, and kelp to –60 feet MLLW (NOAA Fisheries 2003). It is unlikely that these communities would fully reestablish in the deeper depths that would result from the channel widening. Newly exposed soil and rock surfaces would be recolonized over a period of several years. Newly exposed rock at depths from the lower intertidal zone to about –20 feet MLLW would be recolonized by epibenthic biota similar to that seen at low tide levels on the existing west shore including red algae, kelp, and a variety of other small species. Subtidal rock will be colonized by a wide variety of invertebrates such as coral (*Balanophyllia elegans*), erect bryozoans (*Dendrobenia lichenoides*), scallop (*Chalmys hasata*), gastropods (*Scabrotrophon maltzani* and *Trichotropus cancellata*), white limpet (*Acmaea mitra*), sea peach (*Halocynthia auranthium*), and several other hydroids and bryozoans. A variety of red algae are expected to form an understory and large *Laminaria* species are expected to form an overstory. Bull kelp will recolonize at depths down to about –20 to –25 feet MLLW (HDR 2001). Red algae will form the deepest zone and may extend to –50 feet MLLW. Pockets of newly exposed sediment, and sediment that accumulates in rock crevices will be colonized by an infauna composed of a variety of polychaetes, crustaceans, bivalves, echinoderms, and other taxa (Jon Houghton, Pentec, pers. communication to Sirena Brownlee, HDR 2003). Because of the loss of some shallow water habitats, especially on the southwest side of the channel, overall productivity in the area would be less than current productivity in the existing shallower areas. The West Channel dredging accounts for the relatively higher area of impact shown for Alternative F3 in Table 1..

<u>Temporary Impacts</u>

Underwater drilling, pile driving for ferry terminals, and blasting activities would generate noise and vibration in the area. In addition, fine silts would be suspended in the water column by these activities. Turbidity plumes would be quickly carried downstream by the strong tidal current. The distance the turbidity plume moves from the point of origin would be dependent upon tides, currents, nature of the substrate, and other factors. Because of the strong tidal currents in the channel, intermittent generation of waterborne sediments, especially when released into deeper waters offshore, will be quickly dissipated with minimal effect on biota. While specific sampling of sediments that would require dredging has not been conducted, underwater video and side scan sonar surveys in the areas of proposed dredging indicate that sediments to be dredged would range from silts and silty sand to coarse gravel and sand. The dredging activities for F3 would occur at depths of water such that no intertidal or estuarine areas would be directly affected. Any adult or juvenile fish using the West Channel during this stage of construction could be adversely affected by the blasting and dredging, by direct mortality, damage from sound pressures released into the water, or entrainment in dredging equipment.

Vibration and noise from dredging operations may displace or otherwise harass both salmon and ground fish species in the Narrows. However, the areas being dredged are small relative to the cross section of the Narrows. Other construction impacts would be temporary, minimized, and mitigated by measures specified in Section 5.0. It is expected that construction activities in Tongass Narrows would last for approximately two to three years. During this time, work barges would be moving about, and anchoring in Tongass Narrows.

Placement of culverts in fish-bearing streams could temporarily impact anadromous fish by directly eliminating eggs incubating in the streambed, or by creating highly turbid water. Deposition of material downstream on incubating eggs could destroy them, and turbid water could interfere particularly with juvenile salmon. Therefore, any kind of in-stream work would be undertaken during work windows determined by permit to avoid critical times in the salmon life cycle.

Entrainment

It is generally accepted that clamshell dredges do not have the potential to entrain pelagic fish such as salmonids. Clamshell dredges have a lower incidence of entrainment than hopper and pipeline dredges, and if the dredging were conducted immediately following the blasting, it is likely that there would not be any live organisms in the debris (Miller 2003). Specifically, the clamshell bucket descends to the substrate in an open position. The force generated by the descent drives the jaws of the bucket into the substrate, which "bites" the sediment upon retrieval. During the descent, the bucket cannot trap or contain a mobile organism because it is totally open. Based on the operation of the clamshell dredge bucket, it is concluded that, if used for the proposed project, it would not entrain juvenile, subadult, or adult salmonids, or forage fish, although some entrainment of demersal fish and epibenthic invertebrates (e.g., crab) may occur.

Operational Impacts

Propeller scour during docking of ferries under the three ferry alternatives would eliminate existing unconsolidated surficial sediments down to about – 20 feet MLLW over an area of approximately 0.2 acres for each ferry alternative (assumes 0.1 acre per terminal).

Bridges or ferry ramps would partially shade littoral areas, reducing primary productivity and possibly limiting the distribution of some algae, while extending the distribution of other taxa. In addition, the presence of over-water structures (bridges, causeways, and ferry docks) might partially shade portions of the adjacent beach and subtidal bottom areas. The area under a dock or causeway would likely receive full-time shade, whereas the area under elevated bridge sections would not, because the shadow cast by structures high above the water would move across the water as the sun traverses the sky. Because the upper limits of many intertidal species, including eelgrass, are set by the degree of desiccation experienced, and because shading would reduce desiccation, shading by project structures may allow some species to extend their range upslope.

However, since lower limits of vegetative growth are set by light level, net loss of eelgrass or kelp productivity could result from the project if deeper portions of beds are shaded. If this occurs, eelgrass habitat area would be incrementally reduced reducing the area of refuge for migrating juvenile salmon, other small fish, and Dungeness crab. Reduced eelgrass productivity would decrease the eelgrass blade area available to support epiphytic crustaceans, which are an important food source for juvenile salmon.

Pilings and piers necessary to support bridges or nearshore components of the alternatives could alter the nearshore migration pathways of smaller juvenile salmonids (e.g., pink and chum salmon) or other marine species in Tongass Narrows. Impacts could be reduced by locating nearshore components in a manner that leaves a nearshore migration corridor (e.g., down to at least -5 feet MLLW, near the extreme low-water line) clear of obstruction. Deeper piers or pilings would allow free passage of marine species migrating along shorelines and would develop an epifauna typical of natural deeper hard-bottom areas.

In addition to shading, over-water structures that create areas of darkened water can impede or delay long-shore migrations of juvenile salmonids. Studies in Washington State have shown that schools of juvenile chinook and chum salmon pause in their migration when encountering an over-water structure that creates a darkened area of water, such as a marginal wharf or wide pier (Pentec 1997). There is little expectation that an elevated bridge would create light conditions that would impede salmon migrations in the Tongass Narrows, although the low elevation causeways along the northeast edge of the airport under the northern bridge alternatives (C3a, C3b, C4) could cause fish to alter their migration corridors.

Runoff from new roads, if not collected and treated, would create temporary, localized increases in water turbidity of drainage pathways and in the Tongass Narrows. In addition, some contaminants such as oil and metals from vehicle brake dust are also likely to reach the drainage pathways and Tongass Narrows. In the climate of Ketchikan, frequent rainfall would limit accumulation of these materials on roadways. Thus, it is unlikely that these materials would run off the bridge or roadways in concentrations that would create conditions harmful to biota; again, the high circulation rates in Tongass Narrows would quickly dilute and dissipate any releases. In addition, road design is expected to include vegetated swales and other means of intercepting and filtering road runoff before discharge to streams.

A hydrocarbon/fuel/petrochemical spill could occur during project operation from a tank truck accident that spills gasoline or diesel from the bridge into the marine environment. In general, fish are less vulnerable to effects of oil spills than are most other types of marine organisms. They are mobile, can usually avoid adverse conditions, and rapidly metabolize hydrocarbons (Craddock 1977; Patton 1977). However, if hydrocarbons persisted in sediment, recent work has shown high sensitivities of fish to levels of sediment hydrocarbon concentrations in the parts per million or even parts per billion range (Horness et al. 1998). Other work has shown a very high sensitivity of salmon eggs to residual hydrocarbons from the *Exxon Valdez* spill (Bue et al 1998). Salmon use of Government Creek is noted previously, and pink, coho, and chum salmon are known to spawn in the small creek (Airport Creek) entering Lewis Cove. If a portion of this spawning occurs in tidal areas, a spill could affect egg survival in either of these estuaries. Smolt outmigration from these and other streams in the area occurs from early April through late June. Fry would probably not be vulnerable to acute effects unless a few fish became isolated in a small embayment that received heavy oiling (Brannon et al. 1995).

4.2 Government Creek

All project alternatives include features near Government Creek. Alternatives F1, F3, and G3 would use a clear-span bridge crossing at Government Creek (Figure 8). No loss of EFH would occur by the placement of a bridge over the creek. The steep side would have an abutment at the top. The gradual side may have a pier located on the slope; however, this would be above the high water area of the creek itself. A temporary impact to EFH from in-water construction activities would result in an increase in turbidity. Impacts to EFH would be minimized through implementation of Best Management Practices (BMPs), such as use of silt curtains, booms, or bales to intercept and filter runoff. Disturbed areas would be revegetated to stabilize soils quickly and minimize further runoff.

4.3 Airport Creek

All project alternatives would cross Airport Creek. All alternatives would require two clear span bridge crossings, one over each channel of Airport Creek (Figure 8). No loss of EFH would occur by the placement of bridges over the creek. No fill would be required in Airport Creek because a clear span bridge would be used and bridge abutments would be above stream floodplains. A temporary impact to EFH from in-water construction activities would be an increase in turbidity, which may reduce water quality, displace fish, or possibly inhibit the food production of plants and other food sources for fish. Impacts to EFH would be minimized through implementation of BMPs to intercept turbid runoff, as described above, and by timing construction outside of critical periods for anadromous fish.

4.4 Other Anadromous Waterways

Alternatives F1 and F3 would require a bridge crossing at an unnamed anadromous fish stream and a culvert crossing at another unnamed anadromous fish streams southeast of Government Creek. In accordance with the memorandum of agreement between DOT&PF and ADF&G, the culvert crossing would be designed to a Tier 1 stream simulation design level and would maintain natural stream conditions such as flow, substrate, and existing fish passage efficiency (see Figure 8). Any impacts to EFH would be temporary and be related to the installation of the culvert(s). This could include such things as a temporary increase in turbidity levels or a temporary diversion of the creeks to allow installation of the culverts. There would be no permanent loss of EFH resulting from the culvert crossing, because the required culvert design features noted above would preserve EFH. The bridge crossing would not require fill because a clear span bridge would be used and bridge abutments would be placed above the stream floodplains. The bridge crossing would not create a loss of EFH. Impacts to EFH would be minimized through implementation of BMPs.

4.5 Cumulative Effects

Cumulative effects are defined as “those effects of future State or private activities, not involving Federal activities, which are reasonably certain to occur within the area of the Federal action subject to consultation” (50 CFR 402.02).

The Gravina Access Project alternatives, when considered with past, present, and other future actions, would have a cumulative effect on EFH. Existing development, coupled with future actions (improvements to the airport, the Gravina Island timber sale, the road north of the airport, and widely dispersed residential and commercial development) would further impact fish species and habitat in Tongass Narrows as a result of direct disturbance during construction, long-term use of the lands, and the improved access to and increased human activity in the Tongass Narrows. Roadways, and clearing and filling for residential, commercial, and resource (timber) development, would lead to the diversion of small streams into culverts, channelization of flows, and increased runoff intensity that could alter natural stream dynamics. This would potentially affect EFH associated with tributaries to Vallenar Bay and Bostwick Inlet, and important marine habitat at Vallenar Bay and Bostwick Inlet.

Pollutant sources associated with foreseeable development include untreated runoff from bridges, ferry emissions, roadway runoff, runoff and pollutant spills associated with industrial (including timber) and commercial development, runoff and pollutants produced by residential development, erosion resulting from land clearing and altered stream hydrology, and increased human activity on currently inaccessible lands.

5.0 Conservation Measures

Construction of this project will require a Title 16 Permit through the Alaska Department of Natural Resources, a determination of consistency with the Coastal Management Plan, and a U.S. Army Corps of Engineers Permit for fill in wetlands and waters of the United States. Coordination with NOAA Fisheries has been ongoing during the planning of this project. The following conservation measures will be incorporated to avoid, minimize, and mitigate impacts to EFH. Based on informal consultation with NMFS, it was determined that timing windows will be subject to modification when we can provide specific design details of the selected alternative (Miller 2004). These are general measures that will be modified to specifically address details of the preferred alternative through further coordination with the agencies during design.

- At all stream crossings (both culverts and bridge crossings), stream banks would be re-contoured to approximate original conditions and re-seeded with native vegetation to minimize erosion.

- BMPs, developed in accordance with EPA's "Storm Water Management for Construction Activities: Developing Pollution and Prevention Plans and Best Management Practices," EPA Document 832 R-92-005 (EPA 1992), will be employed to minimize the introduction of sediment and siltation of ponds and streams during adjacent fill placement and during culvert placement.

- All anadromous fish stream crossings would be designed to minimize impacts on stream function and to provide passage to both anadromous and resident fish. All road structures crossing anadromous fish habitat channels would be designed to provide passage for juvenile and adult salmon per Alaska Statutes Title 41 (DNR cataloged anadromous streams) standards.

- In-water work in Tongass Narrows would be restricted, as follows. General use of boats and barges could occur year round for general survey and work on bridge structures above water. Except for blasting, dredging, and pile driving, other work in marine waters could occur July 1-February 28. As further described below, blasting, dredging, and pile driving could occur only November 1-February 28, with the possible exception of mid-channel locations, based on further consultation with the Alaska Department of Natural Resources (DNR), NOAA Fisheries, U.S. Army Corps of Engineers (COE), and U.S. Fish and Wildlife Service (USFWS).

- The following conservation recommendations will be followed with respect to pile driving in Tongass Narrows: A vibratory hammer would be used to drive steel piles instead of an impact hammer. Piles should be driven during low tide when in intertidal and subtidal areas.

- All construction in and around anadromous fish streams will take place when stream disturbances would have the least impact on anadromous fish species. The recommended time period for in-stream construction work in the Ketchikan area is June 15 through August 7 (Minnillo 2004). In-stream construction activities should completely avoid the period from August 8 through June 14. For the Ketchikan area, salmon fry generally emerge in the spring from April 15 to May 15, and the adults move into the streams by August 1 and remain through October 31 (Doherty 2003). However, timing of fry emergence and adult spawning depend on the species of fish present in each stream. For example, steelhead spawn in the spring and eggs are generally present in the stream until the middle of July. Fish surveys will be conducted in the summer of 2004 for all streams that will be affected by the project. If additional species are found to be present in the project streams, the existing timing window for in-stream construction (June 15 to August 7) may be modified to protect additional species. Construction work that occurs above the ordinary high water area of the stream and does not include in-stream construction may be conducted throughout the year (Minnillo 2004). In-water work areas, except for stream crossings by construction equipment, will be isolated from flowing waters of all anadromous fish streams.

- Any necessary in-water blasting will be performed such that ground vibration (particle velocity) does not exceed 2.0 inches per second and peak water overpressure (instantaneous pressure change) does not exceed 2.7 pounds per square inch. The project will employ monitoring devices to ensure adherence to these standards. If blasting amounts are minor, and if agreed by the agencies, monitoring may not be undertaken.

- The contractor will be required to prepare a blasting plan prior to any blasting activities. The blasting plan will need be submitted for review by NOAA Fisheries for both EFH and marine mammal impacts. A fish and invertebrate monitoring program will be required for any proposed blasting activities. A pre-blasting survey will be required to ensure that no fish schools are in the vicinity of the blasting area. If fish schools are detected, blasting will be delayed until they leave. A biologist will check the area and record any kills that are within 100 feet up current and 300 feet down current of the blast area after blasting is completed. Monitoring of the dredge materials may be incorporated into the blasting monitoring plan as a method for documenting organisms injured or killed in the blasting. Measures such as covering the rock to be blasted with sand may be used to dampen blast impact. In-water blasting shall avoid the entire months of March through June to avoid juvenile salmonids and the period from June through October 31 to avoid adult salmon. All project-related activities would conform to the pertinent provisions of the Marine Mammal Protection Act and the Endangered Species Act.

- Dredged debris would be placed onto a barge where it would enter a settling basin and be disposed of on land. Only under Alternative F3, which could require substantial removal of sediment and rock, would ocean disposal be necessary. These operations for Alternative F3 would be consistent with the regulations of Clean Water Act, Section 404(b)(1) (disposal of dredged materials into waters of the U.S.) and Marine Protection, Research, and Sanctuaries Act, Sections 102 and 103. Monitoring of the dredged materials may be incorporated into the blasting monitoring plan as a method for documenting organisms injured or killed in the blasting. Dredging activities will avoid the entire months of March through October.

- All fueling and servicing operations will be conducted at least 100 feet away from all streams and water bodies, and fuel storage will be at least 100 feet away from all wetlands and water bodies.

- All necessary permits and agency approvals will be obtained prior to construction, and any permit stipulations will be incorporated into the contract specifications.

- Perimeter staking will be required on the outside of the disturbance area prior to construction to ensure that there is no additional impact from construction activities.

- Silt fences will be used adjacent to EFH stream channels, just beyond the estimated toe of fill.

- Gravel and streambed material will be used in the bottoms of fish-passage culverts.

- Riprap will be placed at specific locations along the stream bank as necessary to maintain stream bank integrity. Placement of riprap at anadromous fish streams should include the use of bioengineering techniques to improve habitat value of the riprap, by incorporation of willow stakes or other locally available vegetation.

In addition to the conservation measures listed above, more specific requirements may result from the permit process for the preferred alternative, should a build alternative be selected. By design, the permit stipulations will protect the known fish resources in the project area and will protect EFH areas.

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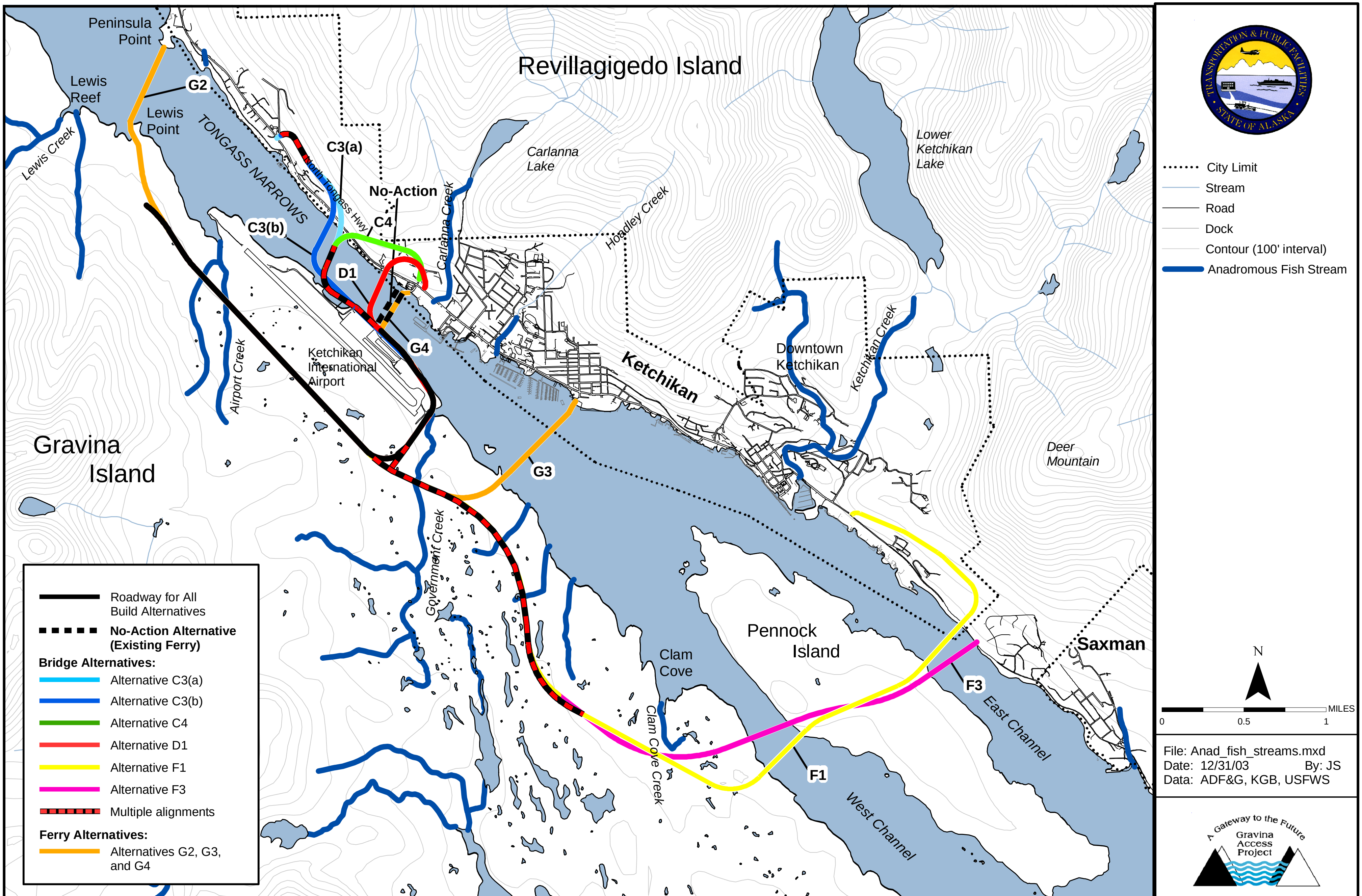

December 2003
Gravina Access Project

Figure 1
Potential EFH Impacts

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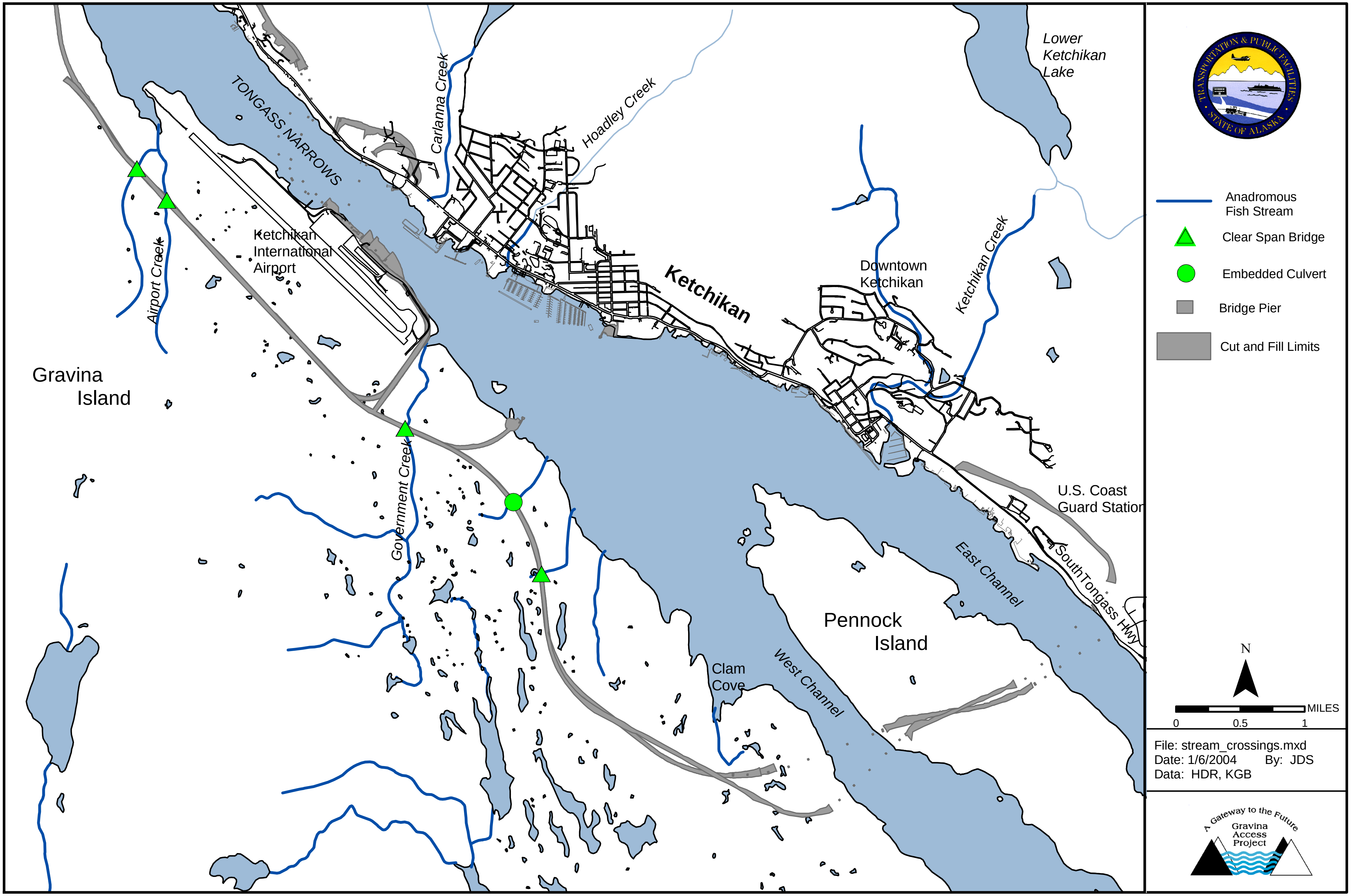

December 2003
Gravina Access Project

Figure 2
Types of Crossings at Anadromous Fish Streams

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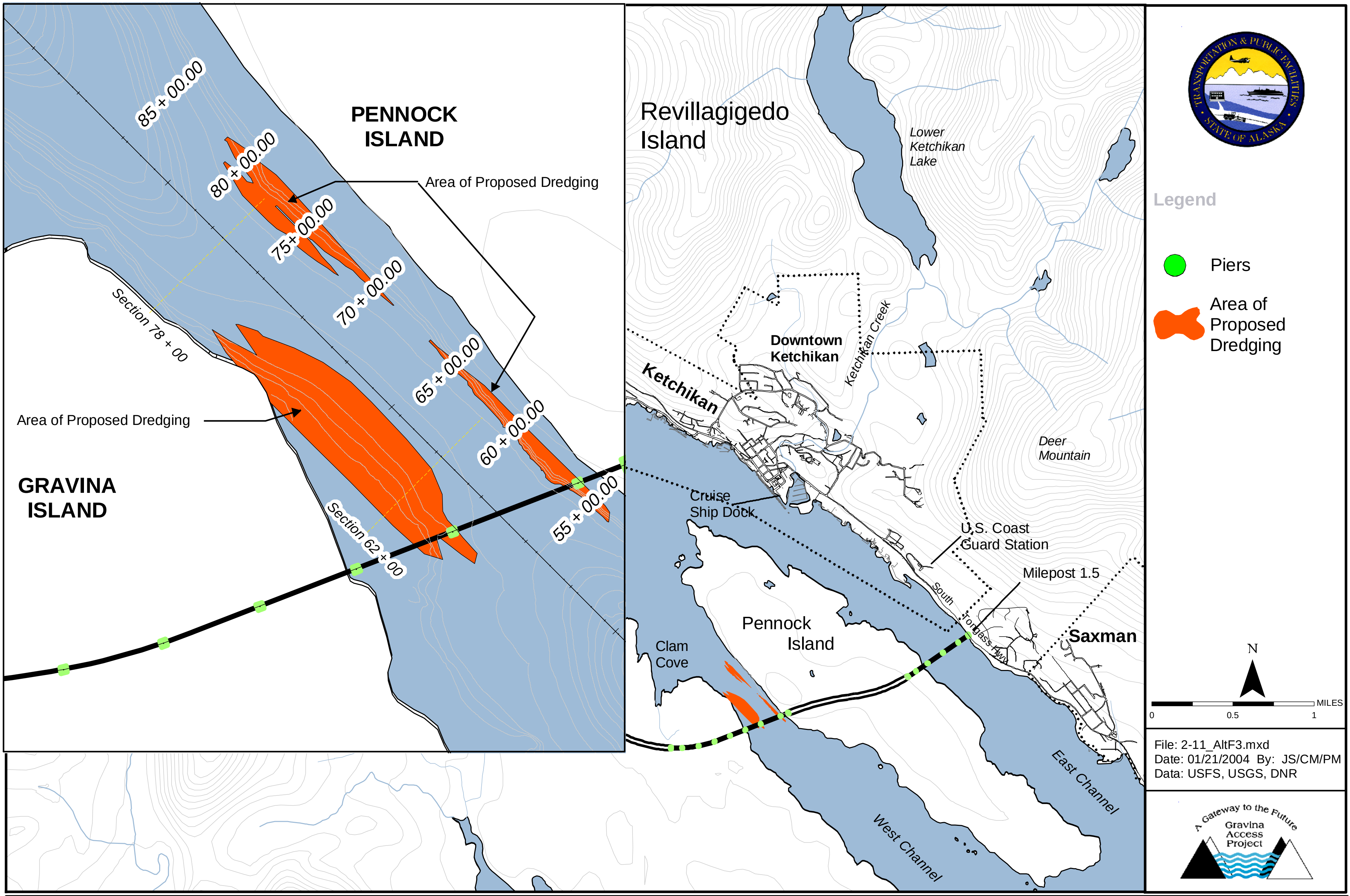
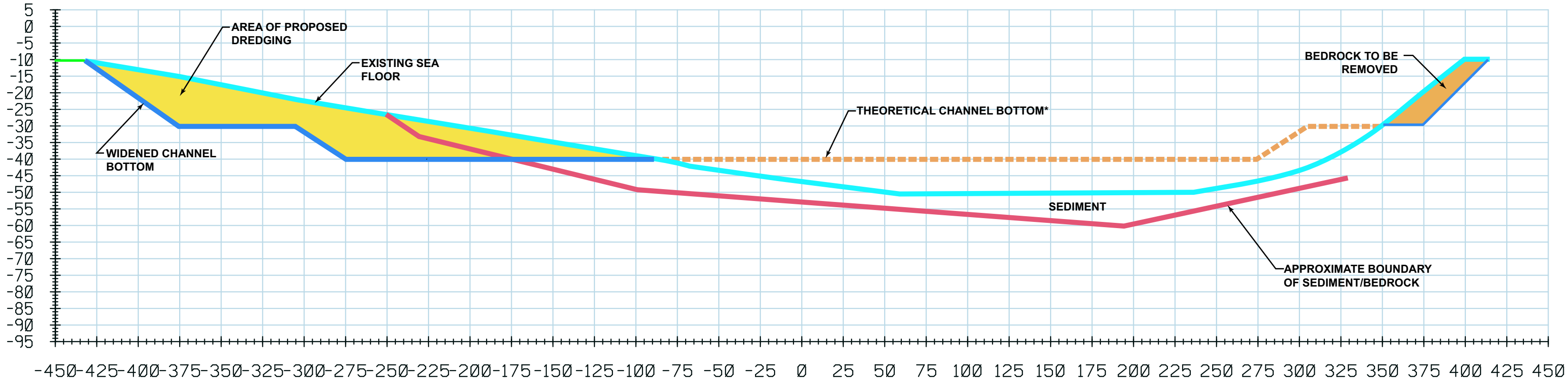
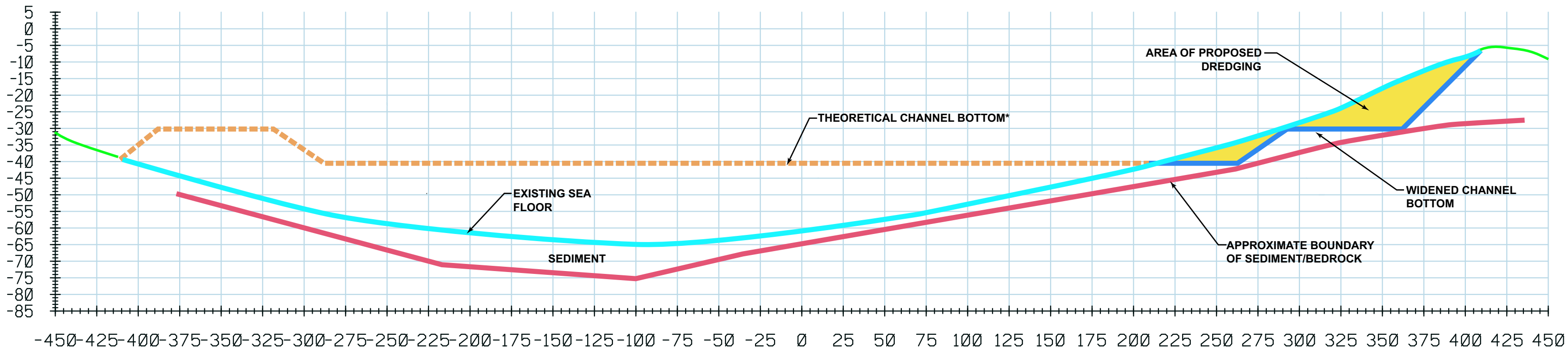


Gravina Access Project
Environmental Impact Statement

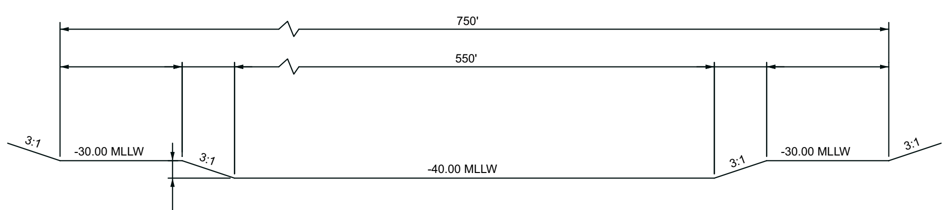
Figure 3
Alternative F3, West Channel Widening



62+00



78+00



THEORETICAL CHANNEL BOTTOM

NOT TO SCALE

*Theoretical channel bottom configuration is based on a modeled, minimum section which provides adequate draft for 2-way cruise ship traffic.

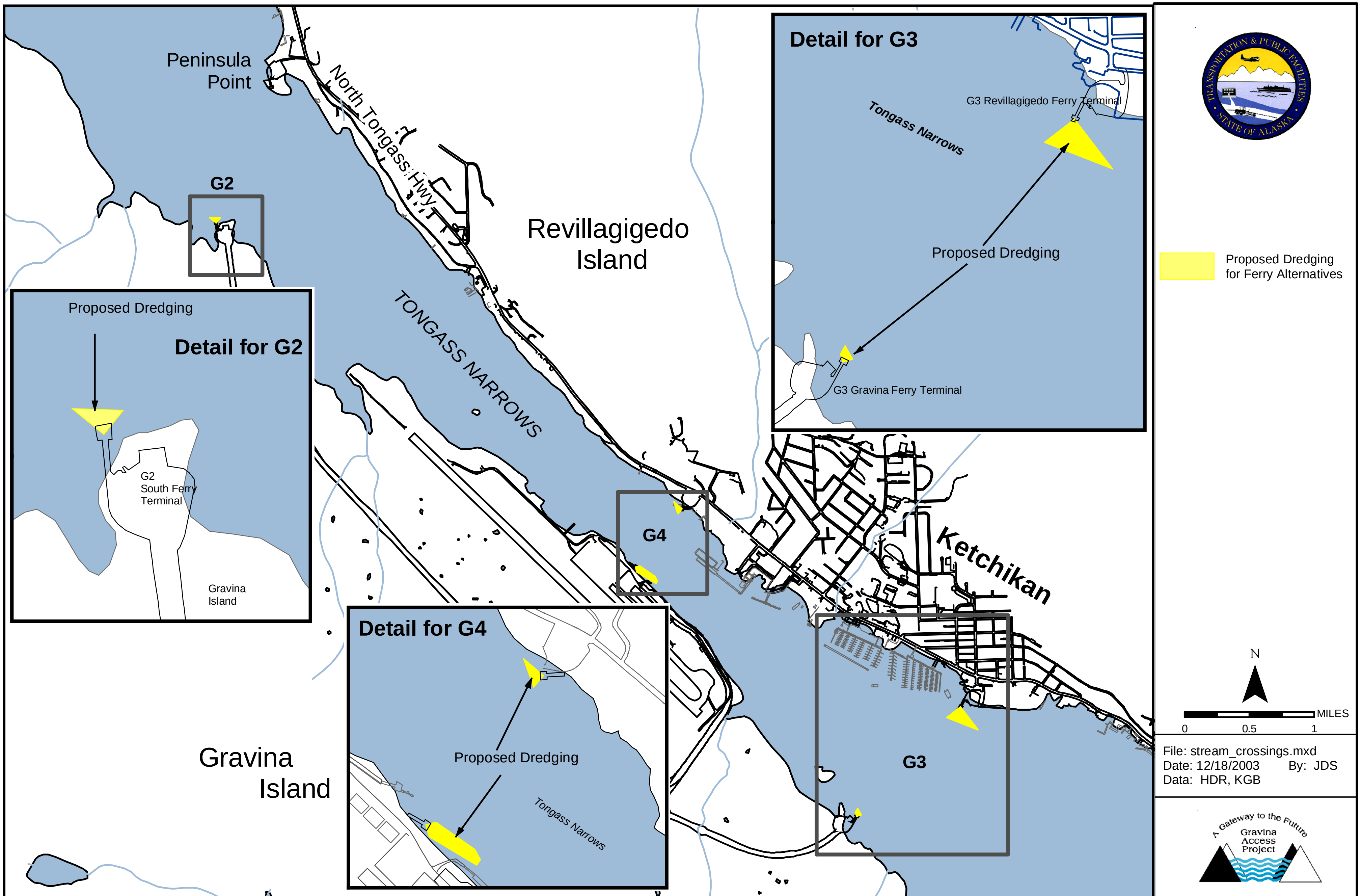
- Theoretical Channel Bottom
- Existing Sea Floor
- Approximate Boundary of Sediment/Bedrock
- Widened Channel Bottom
- Bedrock To Be Removed
- Area of Proposed Dredging

File: Figure 2.16 F3 Widening Cross Sections 1 20 04.ai
Date: 1/20/04 By: SEA/SD
Data: HDR

A Gateway to the Future
Gravina Access Project

Gravina Access Project
Environmental Impact Statement

Figure 4
Alternative F3, West Channel Widening Cross Sections



December 2003
Gravina Access Project

Figure 5
Proposed Dredging for Ferry Alternatives

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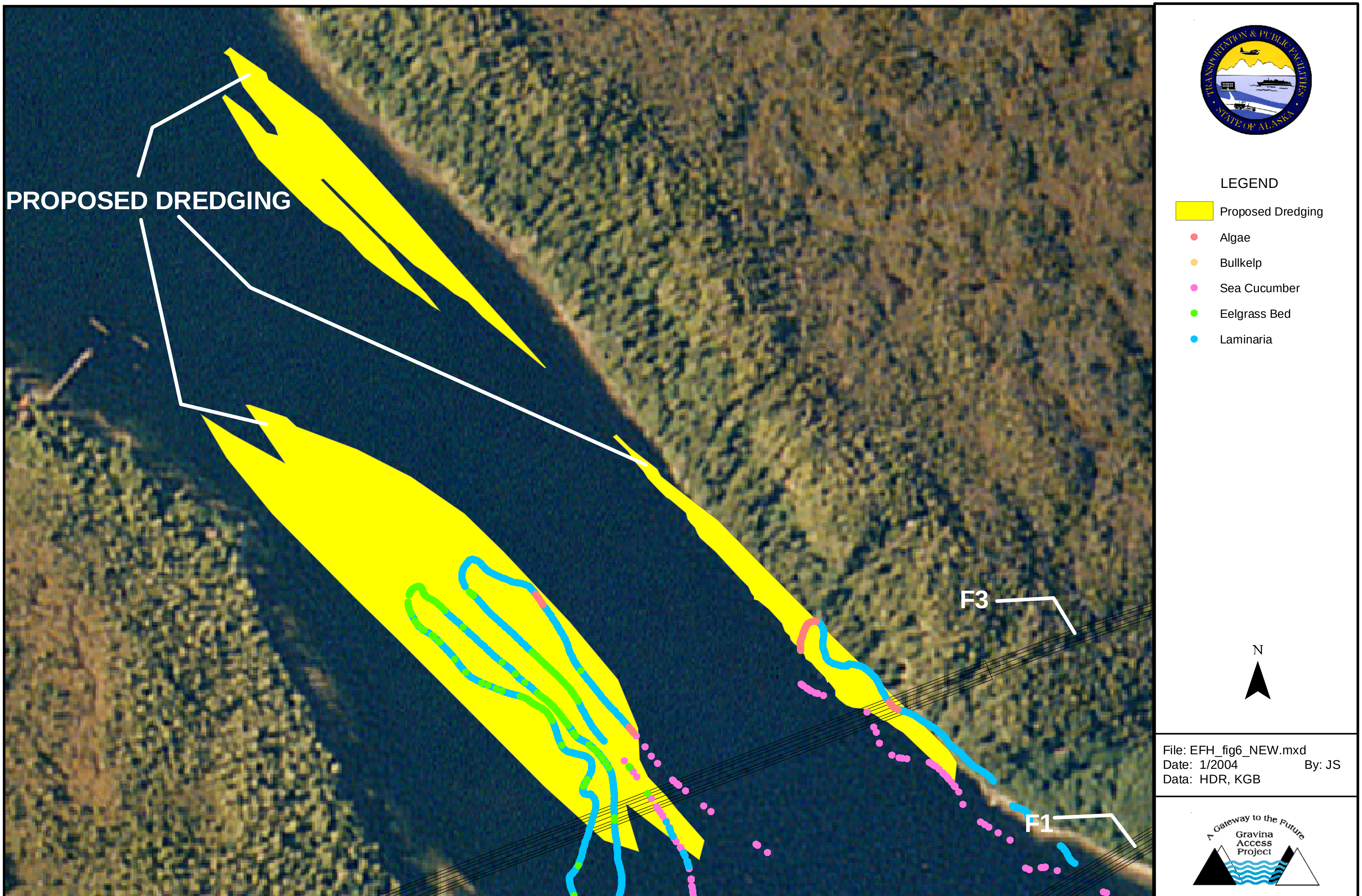

Gravina Access Project

Figure 6
Proposed Dredging locations for F3 and Marine Resources

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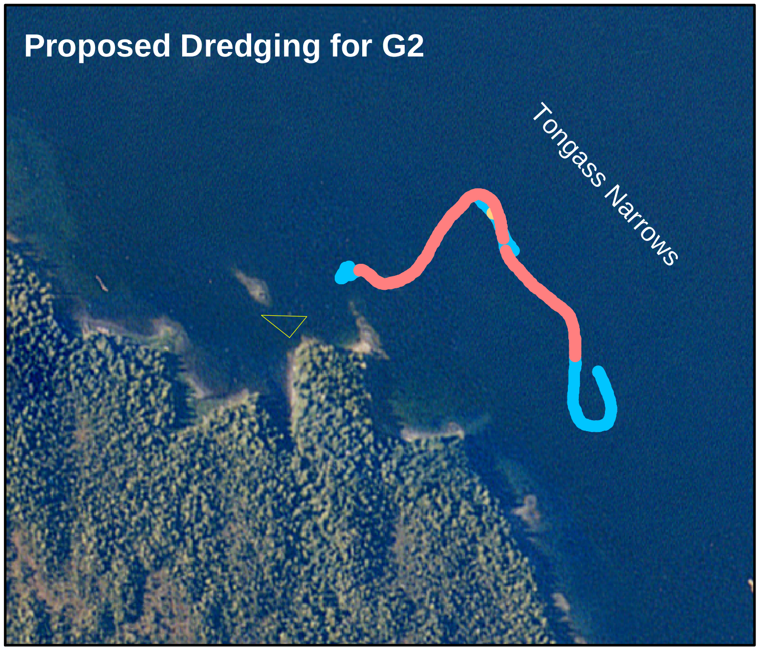

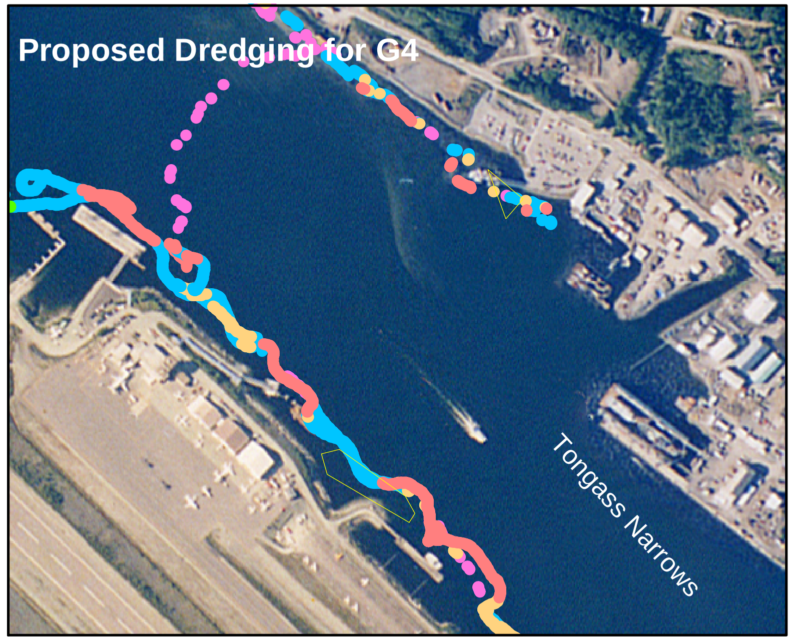

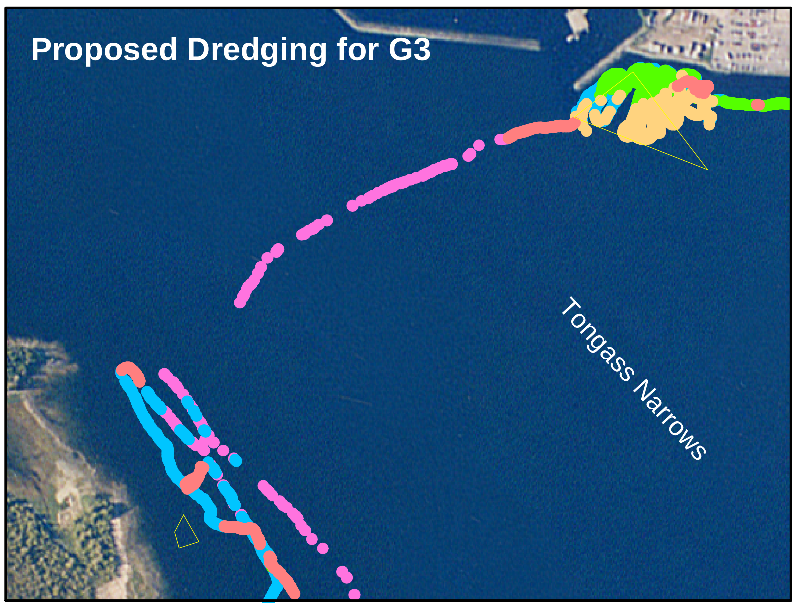

- Algae
- Bullkelp
- Sea Cucumber
- Eelgrass Bed
- Laminaria
- Proposed Dredging

N

500 250 0 Feet

File: sirena-impacts.mxd
Date: 12/18/2003 By: JDS
Data: HDR, KGB

A Gateway to the Future
Gravina Access Project

December 2003
Gravina Access Project

Figure 7
Proposed Dredging for Ferry Alternatives and Marine Resources

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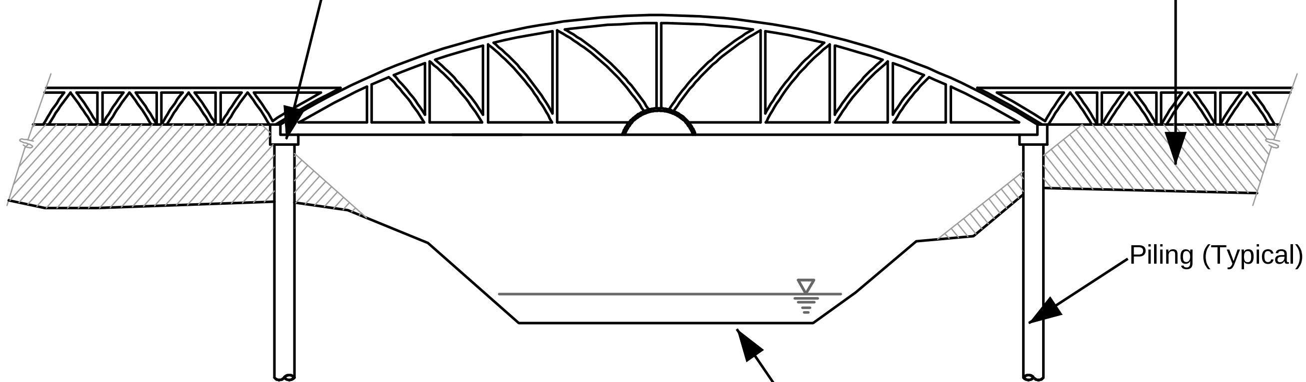
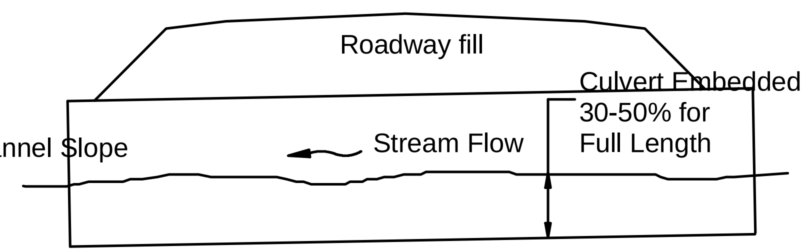
Conceptual Clear Span Bridge

Elevation View

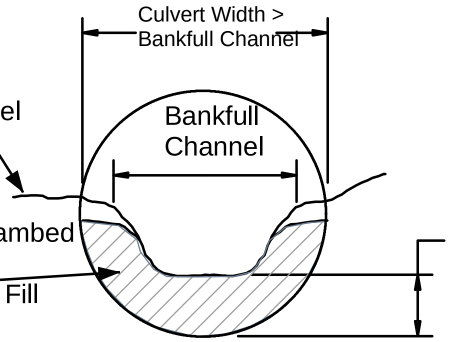


Conceptual Embedded Culvert

Profile View



Section View



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APPENDIX A

ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES AND NATIONAL MARINE FISHERIES SERVICE ESSENTIAL FISH HABITAT: ALASKA AGREEMENT FOR EAs AND EISs

Consultation with National Marine Fisheries Service (NMFS) on Essential Fish Habitat (EFH).

1. Alaska Department of Transportation & Public Facilities (DOT&PF), in accord with 50 CFR 600.920(c) will be the designated representative of the Federal Highway Administration (FHWA) in the consultation process. The FHWA remains ultimately responsible for compliance.

2. The consultation process for projects requiring an environmental assessment or an environmental impact statement will be accomplished under the existing NEPA/404 merger Agreement process.

3. As part of the initial scoping letter to NOAA Fisheries, DOT&PF will identify possible EFH resources and will request additional information as appropriate.

4. DOT&PF, in concert with FHWA, will determine if the project may adversely effect EFH.

5. DOT&PF will notify NOAA Fisheries that a project may adversely effect EFH and will initiate discussion on possible conservation measures.

6. An EFH assessment will be incorporated in the NEPA document as part of the fish and wildlife section of the environmental consequences, and will be titled or co-titled as such.

7. DOT&PF will provide NOAA Fisheries the draft EA or pre-DEIS including the draft EFH assessment for their review and comment. NOAA Fisheries will respond as appropriate including, preliminary EFH conservation recommendations. If NOAA Fisheries believes that the proposed action may result in substantial adverse effects on EFH, or that additional analysis is needed to accurately assess the effects of the proposed action, NOAA Fisheries will request that FHWA initiate expanded consultation.

8. DOT&PF will revise, amend the EFH assessment as appropriate based on comments and necessary additional coordination with NOAA Fisheries.

9. Transmittal of the approved EA or DEIS to NOAA Fisheries will be considered "Submittal of the EFH Assessment" under 50 CFR 600.920(h)(3).

   The EFH assessment, as outlined in 600.920(g), must contain the following: 1) a description of the proposed action; 2) an analysis of individual and cumulative effects of the action on EFH, the managed species, and associated species such as major prey species, including affected life history stages; 3) the agency's views regarding effects on EFH; and 4) a discussion of proposed mitigation, if applicable. Additional information which may be appropriate to include in the EFH assessment is listed in 50 CFR 600.920(g)(3).

10. NOAA Fisheries will respond, in writing, as to whether it concurs with the findings of the EFH assessment as part of their formal comments on the document. If applicable, final EFH conservation recommendations may be included.

11. If necessary, additional coordination to resolve concurrence issues will be initiated. As applicable, DOT&PF will respond, in writing, within 30 days with respect to conservation recommendations.

    The response must include a description of measures proposed for avoiding, mitigating, or offsetting the impacts of the project on EFH, as required by 50 CFR 600.920(j). If the response is inconsistent with NOAA Fisheries Conservation Recommendations the reasons for not following the recommendations must be explained, including the scientific justification for any disagreements with NOAA Fisheries over the anticipated effects of the project or measures needed to avoid, minimize, mitigate or offset such effects.

12. The FONSI or FEIS will address NOAA Fisheries response to the transmittal.

The steps outlined above address the abbreviated consultation procedures described in 50 CFR 600.920(h). If at any point in the process it is determined that the project would result in substantial adverse effects to EFH or that additional information/analysis is needed, expanded consultation procedures will be implemented. A party may request expanded consultation at any point in the process. The parties will determine how best to implement expanded consultation based on the specifics of the project. It is recognized that additional information may be required, that a site visit will be necessary and that conservation recommendations will need to be addressed. However, to the extent practical, existing NEPA/404 Agreement procedures will be utilized to fulfill the requirements of expanded consultation.

In order to provide a reference to the sequence of activities outlined in this document to the NEPA/404 Agreement, the concurrence points are identified. Concurrence on purpose & need would be requested concurrent with or just after item 3. Concurrence on range of alternatives (preferred alternative for EAs) would be requested before or concurrent with item 5. Request for concurrence in the preferred alternative would occur before or concurrent with item 11.

Dispute Resolution

If an FHWA decision is inconsistent with NOAA Fisheries EFH Conservation Recommendations, 50 CFR 600.920(j)(2) allows the NOAA Assistant Administrator for Fisheries to request a meeting with the head of the FHWA to discuss the proposed action and opportunities for resolving any disagreements. NOAA Fisheries will endeavor to resolve any such issues at the field level wherever possible, typically in a meeting between the NOAA Fisheries Regional Administrator and The FHWA Division Administrator.

APPENDIX B

LETTERS FROM NATIONAL MARINE FISHERIES SERVICE REGARDING ESSENTIAL FISH HABITAT

UNITED STATES DEPARTMENT OF COMMERCI
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

October 13, 1999

ALASKA DOT
SOUTHEAST REG
OCT 8 1999
PRECONSTRUCTION/DESIGN

Al Steininger, P.E.
Project Manager
State of Alaska
Department of Transportation
and Public Facilities
Design and Engineering Services Division
Southeast Region - Design
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Gravina Access Project - Agency Scoping Comments

Dear Mr. Steininger:

Thank you for soliciting scoping comments on the referenced project. The purpose of the project is to provide better access between the Ketchikan airport and the city of Ketchikan. Alternatives were discussed at the September 27 scoping meeting held in Juneau and include enhanced ferry service, an underground tunnel, and a bridge, the location of which will be considered at a number of locations. The National Marine Fisheries Service (NMFS) has the responsibility to comment on impacts to living marine resources under our jurisdiction including anadromous fish, marine fish and invertebrates and marine mammals. Accordingly, we would favor those project alternatives and designs that minimize direct, indirect and cumulative impacts to anadromous fish streams, wetlands, intertidal areas, submerged aquatic vegetation, marine habitats, and the relevant species using them.

Mark Dalton of HDR consulting has met separately with Steve Brockmann of the U.S. Fish and Wildlife Service and Jack Gustafson of the Alaska Department of Fish and Game, and provided us with a summary of resource issues provided at that meeting. Of the issues listed, the NMFS is also concerned with numbers 1, 3, 4, 5, 6, 9, 10, 11, 12, 13, 16, 17, 19, 20, and 24. Rather than re-state these issues, we are providing additional comment as follows.

Of the issues listed above, numbers 4,5 and 6 address the presence of marine mammals in Tongass Narrows and suggest that additional studies may be necessary. We concur with this recommendation, as any in-water work that generates underwater noise will need to be evaluated for its potential to disturb marine mammals that may be present (as well as migrating juvenile salmonids and spawning herring). Enclosed is a draft copy of a report for the marine mammal observation program implemented aboard some of the ferries of the Alaska Marine Highway System. Sightings collected through this program show humpback whale, killer whale and Pacific white-sided dolphin sightings in the northern area of Tongass Narrows, and/or the confluence of Tongass Narrows, Clarence Strait and Behm Canal. The humpback whale and Steller sea lion are listed as endangered and threatened species, respectively. Depending on the magnitude of impact to these species, it may be necessary to satisfy consultation requirements of the Endangered Species Act with the responsible Federal agency, the Federal Highway Administration.

The environmental impact statement (EIS) for the project will need to address the essential fish habitat (EFH) requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The EIS should include an assessment of the impacts of the proposed action on EFH in a chapter or section titled "Essential Fish Habitat". The EFH assessment should include 1) a description of the proposed action; 2) an analysis of individual and cumulative effects of the action on EFH, the managed species, and associated species such as major prey species, including affected life history stages; 3) the responsible Federal agency's views regarding the effects of the action on EFH; and 4) a discussion of any proposed mitigation, if applicable.

Upon receipt of the EFH assessment, NMFS will provide back to the Federal agency or their representative, any EFH conservation recommendations, as appropriate, if we believe the project would adversely affect EFH. In order to develop these conservation recommendations, whenever possible, at least 60 days notice prior to a final decision on an action, or 90 days if the action would result in a substantial adverse impact to EFH. Upon receipt of NMFS conservation recommendations, the Federal agency is required to respond in writing to NMFS within 30 days.

EFH Assessment Information:

To assist you in developing an EFH assessment, we have identified EFH in the general vicinity of the current ferry between the airport and the city of Ketchikan. This list would need to be verified for specific project sites, but is likely to be similar, if not identical. Specific information on habitat for salmon should be obtained from the Alaska Department of Fish and Game and U.S. Fish and Wildlife Service in Ketchikan. EFH for all five species of Pacific salmon (chinook, coho, chum sockeye, pink) is present in the project area.

Following are habitat characteristics for the non-salmonid species of EFH. References to habitat locations indicate the following depth associations; inner (1-50 meters) and middle (50-100 meters)and outer (100-200 meters) shelf regions and upper (200-1000m) and lower (>1000m) slopes and basin (>3000m).

<u>Pacific Ocean Perch Adults and Late Juveniles:</u>

Adults found in outer shelf and upper slope. Juveniles found in inner, middle, and outer shelves, and upper slope. Larval stages found in same as juveniles plus lower slope and basin. Adult substrates are gravel, pebble, and cobble, juvenile substrates are the same as adults plus boulders.

<u>Yelloweye Rockfish Adults and Late Juveniles:</u>

Adults and juveniles are both found in the middle and outer shelves and upper slope. Habitat for both is bays, estuaries, and island passes. Both life stages are demersal. Found in substrate areas of rock, coral and cobble. High concentrations are found associated with high relief containing refuge spaces such as overhangs, crevices and caves. Feeding areas are those containing fish, shrimp and crab.

<u>Shortraker and Rougheye Rockfish Adults and late Juveniles:</u>

Adults occur in outer shelf and upper slope, in depths from 25 to 875 m and are semi-demersal. Juveniles are found in the middle and outer shelves. Adults found over all substrates including mud, clay, silt, sand, gravel, pebble, cobble, boulder and bedrock. However, from submersible observations, soft substrates of sand or mud usually had the highest densities; whereas hard substrates of bedrock, cobble or pebble usually had the lowest adult densities. Habitats with steep slopes and frequent boulders were used at a higher rate than habitats with gradual slopes and few boulders. It is suspected that juveniles occupy shallower habitats than adults.

<u>Dusky Rockfish Adults and Late Juveniles:</u>

Adults found in outer shelf, upper slope and nearshore waters of Southeast Alaska along rocky shores at depths less than 50m. Juveniles found in inner (1-50m) and middle (50-100m) slopes. Substrates for adults and juveniles is gravel, cobble, boulder. Juvenile dusky rockfish have also been captured in nearshore eelgrass and kelp beds. Adults are semi-demersal/semi-pelagic.

Walleye Pollock Adults and Eggs:

Both adults and eggs occur in outer shelf. Walleye pollock and their eggs are pelagic, therefore they may occur in waters over any substrate.

Sablefish Adults and Late Juveniles:

Adults and late juveniles occur in the upper and lower slopes. Adult and late juvenile sablefish are pelagic and may occur in waters over any substrate.

Pacific Cod Adults and Late Juveniles:

Occur in both inner and middle shelf regions. Both life stages are demersal. Adults occur from the shoreline to 500m, juveniles from 60-150m. Preferred substrate is soft sediment, from mud and clay to sand.

Arrowtooth Flounder Adults and Late Juveniles:

Occur in both inner and middle shelf regions. Both life stages are demersal. Juveniles inhabit shallow areas until about 10 cm in length. Widespread distribution mainly on middle and out portions of shelf. Wintertime migration to shelf margin and upper continental slope to avoid cold temperatures.

Sculpin spp. Adults and Late Juveniles:

Occur in both inner and middle shelf regions. Both life stages are demersal. Broad range of habitats from intertidal pools, and all shelf substrates (mud, sand, gravel, etc.).

Skates spp. Adults and Late Juveniles:

Occur in middle shelf regions. Both life stages are demersal. Broad range of substrate types (mud, sand, gravel, and rock) and the lower portion of the water column.

Thank you for the opportunity to comment. We look forward to continued coordination for this project. If you have any further concerns or questions please contact Linda Shaw at (907) 586-7510.

Sincerely,

P. Michael Payne
Assistant Regional
Administrator
for Habitat Conservation

cc: EPA Anchorage (Mark Jen)
ADEC, AADGC, ADNR, Juneau
ADF&G, USFWS, Ketchikan

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

DESIGN & ENGINEERING SERVICES DIVISION
SOUTHEAST REGION - DESIGN

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE: (907) 465-4428
TEXT: (907) 465-4647
FAX: (907) 465-4414

February 21, 2003

Linda Shaw
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Re: Draft Essential Fish Habitat Assessment
Gravina Access Project #67698 / ACHP-0922(5)

Dear Ms. Shaw:

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration, is preparing a Draft Environmental Impact Statement (DEIS) to assess impacts of the proposed Gravina Access Project located in Ketchikan. DOT&PF has hired HDR Alaska, Inc., to complete the EIS studies. Planning has been underway since 1999 with preliminary engineering and public and agency scoping. A draft EIS is anticipated in Spring 2003.

The proposed project corridor is located between Gravina Island and Revillagigedo Island in the Ketchikan Gateway Borough. The two islands are separated by Tongass Narrows, a 13-mile-long waterway that varies in width from approximately ¼ to 1 mile. As shown on Figure 1 of the attached draft Essential Fish Habitat (EFH) assessment, six bridge alternatives and three ferry alternatives are reasonable alternatives evaluated in the DEIS.

In accordance with the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act, we present an EFH assessment with the following information: (1) a description of the proposed action, (2) an analysis of the effects on EFH, (3) the effects of the action on EFH, and (4) proposed mitigation.

We have determined that all of the project alternatives may adversely affect EFH, as established by the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act and the Department of Commerce's EFH consultation regulations. We request your review of the enclosed draft EFH Assessment. I would appreciate your comments on the draft assessment and any recommendations and/or proposed conservation measures you may have at this time.

Based on your comments and recommendations, we will revise the draft assessment and include it in the Draft EIS for your official review per the January 7, 2000 agreement between FHWA and NMFS.

If you have any questions regarding this request, please do not hesitate to contact me at 907/465-4498 or our Consultant Project Manager, Mark Dalton, at 907/274-2000.

Sincerely,

Reuben Yost

Reuben Yost
Regional Environmental Coordinator

Copies:

Roger Healy, ADOT&PF
Mark Dalton, HDR
Tim Haugh, FHWA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 14, 2003

Mr. Reuben Yost
Regional Environmental Coordinator
Alaska Department of Transportation
and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Draft Essential Fish Habitat (EFH) Assessment,
Gravina Access Project, #67698/ACHP-0922(5)

Dear Mr. Yost:

The National Marine Fisheries Service (NMFS) has reviewed the referenced Draft EFH assessment. NMFS offers both general and specific revisions for your consideration.

General Comments:

Page 1, Section 1.0, B., second paragraph, last sentence, and Page 13, Section D.:

This sentence states that "Alternatives F1 and F3 would require placing culverts in an unnamed anadromous fish stream that would cause loss of EFH." Section D. reiterates this point. The EFH assessment and DEIS should include, as an alternative for analysis, the use of bridges for these alternatives. Bridges usually eliminate or significantly minimize adverse effects to EFH.

Page 10, Section 4.0, A., first paragraph, fourth and fifth sentences:

These sentences state that "There would be some permanent loss of eelgrass beds from placement of fill in Tongass Narrows. Pier footings and the bridge structures could slow the growth of eelgrass beds by shading, which indirectly would negatively impact EFH."

The EFH assessment should document how much eelgrass would be impacted and where it is located. Figure 1 should map the location of the eelgrass beds, as well as other sensitive habitats, including kelp beds and wetlands. A sentence should be added to this section that mentions the loss of interspersed eelgrass and kelp in the next section "Impacts of Pier Construction and Modification." Acreage of impacts by habitat type of eelgrass, kelp and wetlands should be included in Table 1-1, which currently provides only "freshwater" and "marine" impacts.

Page 11, Section 4.0, A., third paragraph:

This paragraph outlines plans for channel widening that would deepen a 2,000 foot long by 550-750 foot wide area from -10 to -40 mean lower low water (MLLW). According to this section "This action would eliminate interspersed eelgrass and kelp beds located in this area. Newly exposed soil and rock surfaces would be re-colonized over a period of years. Ultimate benthic assemblages are expected to resemble those now found in similar substrates and depths. Because of the loss of some shallow water habitats, especially on the southwest side of the channel, overall productivity in the area would be less than current productivity in the existing shallower areas."

This discussion should indicate how much eelgrass and kelp would be eliminated, and where it is located (preferably on a map). It is unlikely that these communities would re-establish in the deeper depths that would result. Eelgrass is typically found to -20 feet MLLW in southeast Alaska, and kelp to -60 feet MLLW. This should be clearly stated, and the document should provide a more specific description of the benthic communities referred to as replacing those eelgrass and kelp communities. NMFS may be able to assist with a dive survey to document the benthic habitat in this area. United States Fish and Wildlife Service staff have also expressed interest in a possible dive survey for this project (Mr. Ed Grossman, personal communication, March 11, 2003).

Page 14, fifth bullet:

The blasting plan will need to be reviewed by NMFS for both EFH and marine mammal impacts.

Page 15, fourth bullet:

Placement of riprap along stream banks to maintain stream bank integrity should include the use of bioengineering techniques to improve habitat value of the riprap, by incorporation of willow stakes, or other locally available vegetation.

Specific Comments:

Page 3, section 3.0, penultimate sentence:

Add boldface type to sentence as follows.

"These include Government Creek, Airport Creek **and its tributary**, and two unnamed streams (Figure 1)."

Page 4, section 3.0, A., third sentence:

Replace "dusty rockfish" with "dusky rockfish".

Page 4, section 3.0, A., fourth sentence:

Replace "shore tracker" with "shortraker rockfish".

Page 4, section 3.0, A., eight sentence:

Replace "species; they", with " species, which".

Page 5, section 3.0, C., fifth sentence:

Remove the word "and" from "lower (>1000 meters) and slopes and basen (>3000 meters) (NMFS 1999)."

Page 5, section 3.0, C., "Arrowtooth Flounder" paragraph, fourth sentence:

Remove "s" from word "desmersal" to spell as "demersal".

Page 5, section 3.0, C. "Dusty (sic) Rockfish" paragraph, title and first sentence:

Replace "Dusty rockfish" with "Dusky Rockfish".

Page 6, section 3.0, C. "Pacfic Cod":

Add the sentence "Juvenile Pacific cod have been captured in nearshore eelgrass and kelp beds."

Page 6, section 3.0, C. "Shore tracker (sic) and Rougheye Rockfish":

Replace "Shore tracker" with "Shortraker"

Thank you for the opportunity to review the draft EFH assessment. Please direct any questions you may have regarding these comments to Linda Shaw at (907) 586-7510.

Sincerely,

Jonathan M. Kurland
Assistant Regional Administrator
for Habitat Conservation

cc: EPA, Juneau
ADEC, AADGC, ADNR, ADF&G, USFWS, Juneau
ADF&G, Ketchikan

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 21, 2013

Kris Riesenberg
NEPA Project Manager
Federal Highway Administration
P.O. Box 21648
Juneau, Alaska 99802

Re: Gravina Access Project Supplemental Environmental Impact Statement Essential Fish Habitat Assessment Addendum

Dear Ms. Riesenberg:

The National Marine Fisheries Service (NMFS) reviewed the Gravina Access Project Supplement Environmental Impact Statement (SEIS) Essential Fish Habitat (EFH) Assessment Addendum prepared in cooperation by the Federal Highway Administration (FHWA) and Alaska Department of Transportation and Public Facilities (ADOT&PF). The report is an addendum to the 2004 EFH Assessment and provides updates to baseline conditions, descriptions of project alternatives and potential impacts, and conservation measures to avoid and minimize potential project effects. You requested comments on the Gravina Access Project SEIS EFH Assessment Addendum and any additional recommendations and conservation measures pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act which requires federal agencies to consult with the NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH. You noted that the FHWA has not identified a preferred alternative, therefore the conservation measures in the addendum are general measures to be included in the SEIS that is expected to be released in late spring 2013.

The EFH Assessment Addendum describes two bridge alternatives (C3-4, the Airport Bridge and F3, the Pennock Island Bridge) and four ferry alternatives (G2, G3, G4 and G4v). The various alternatives also include widening of the Gravina Island Highway and Bridge, construction of Seley Road and reconstruction of Lewis Reef Road and the Airport Access Road. Fourteen conservation recommendations are provided that include best management practices at stream crossings, in-water work windows, best management practices for pile driving and blasting, and the development of a blasting plan, including monitoring, to be submitted to NMFS for review. Assurance is given that more specific requirements may result during the permitting and final design process for the preferred alternative, should a build alternative be selected.

Table four on page nineteen of the EFH Assessment Addendum identifies water body crossings, piers, fill and dredging impacts to Tongass Narrows from construction of each alternative. Alternative G4v is the least damaging alternative to the aquatic environment. The remaining alternatives would cause unavoidable and permanent impacts to the aquatic environment to varying degrees. Alternatives C3-4, G2, and G3 require the most fill in Tongass Narrows. Alternatives F3, G3, and G4 require the most dredging in Tongass Narrows. Alternatives F3 and G3 have the greatest loss of eelgrass begs (0.5 and 0.7 acres respectively) and of kelp beds (1.8 and 0.5 acres respectively). Alternatives G2 and G3 both have losses of saltmarsh (1.0 and 2.0 acres respectively).

EFH Conservation Recommendations

NMFS recommends that the FHWA select alternative G4v which is the least damaging alternative to the aquatic environment.

If another alternative is chosen NMFS recommends that ADOT&PF convene an interagency mitigation team to determine how to compensate for these unavoidable losses.

If you have any questions regarding our comments for this project, please contact Linda Shaw at (907) 586-7510 or by email at Linda.Shaw@noaa.gov.

Sincerely,

Robert D Mecum

for James W. Balsiger, Ph.D.
Administrator, Alaska Region

cc: John Barnett, ADOT