October 28, 2014

Grays Harbor County, Utilities & Development Division
100 West Broadway, Suite 31
Montesano, WA 98563-3614

Attention: Kevin Varness

Subject: Aquatic Species and Habitat Inventory
Wishkah Road Floodwall

Dear Mr. Varness:

AMEC is currently under contract with Grays Harbor County (GHC) to provide engineering and permitting support for a proposed flood wall that would protect Wishkah Road and several residences from flooding of the Wishkah River. The comprehensive Scope of Work (AMEC November 14, 2013) outlines the design process, which includes property acquisition and data acquisition, permitting, and 30/60/90/100 percent design phases. As part of the data acquisition phase, an Aquatic Species and Habitat Inventory (Task 2.1 in the original scope) was conducted. The objective of the Aquatic Species and Habitat Inventory was to document the type and condition of existing habitats in the project area and floodplain east of the project area, and to determine if fish utilize habitat provided by the small tributary stream and ditches west of Wishkah Road. This information will support permitting and be used to evaluate potential mitigation opportunities if mitigation is deemed necessary later in the permitting process.

On April 28, 2014, AMEC field biologists conducted a reconnaissance level pedestrian survey of the areas east and west of Wishkah Road, investigating stream and off-channel aquatic habitat features, as well as culverts that may impede fish migration. These features were sketched on a base map and annotated (Figure 1).

On April 29 and 30, 2014, a fish survey was performed to document fish use of these habitats. In addition to simple visual observations of fish, a variety of capture methods were used depending on site-specific conditions. Methods included: baited minnow traps, backpack electrofishing, and a small seine net. Based on observations of flow direction and connectivity, the study area was divided nominally into discrete sampling sites (Figure 1). The results of the fish survey at each sampling site are fully described in Table 1.

In summary, despite the poor quality of habitat in the roadside ditches and channelized tributary streams, fish were found in all except two sampling sites (BAR-N and HOF-N1). At these sites, it was difficult to determine whether poor water quality, barriers to migration, or the absence of suitable habitat was the reason for not finding fish. Juvenile coho were found anywhere that a tide-gate did not block their access, and in some cases were also found up-stream of tide-gates. Three-spine stickleback were virtually ubiquitous, which is not surprising considering their tolerance for higher water temperatures, lower dissolved oxygen concentrations, and higher densities of aquatic macrophytes – conditions typical of a roadside ditch. At one site along Wishkah Road (HOF-N2), we captured one Olympic mudminnow, which is considered a sensitive species by the State of Washington.

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Table 1. Summary of Fish Data

Site	Description	Method	Results	Habitat observations
BAR-S	Ditch along south side of Baretich Road. Connected to Wishkah River via unregulated ~32 in dia. corrugated metal culvert.	Visual observation Baited minnow traps (3) Electrofishing	Yes 1 three-spine stickleback 1 coho salmon (70 mm) 2 coho salmon (58, 60 mm) 3 three-spine stickleback	BAR-S-1: WW: 3.8; BFW: 14.5; BFD: 2.9 Reed canary grass, slough sedge, Japanese knotweed, algae Embedded gravel substrate Incised clay banks BAR-S-2: Most of the flow draining into culvert comes from a small stream originating in the wetland to the south. Willow thicket at mouth. BAR-S-3: WW: 3.2; BFW: 9.0; BFD: 2.3 Reed canary grass, slough sedge, water parsley, small fruited bulrush. Soft, muddy substrate w/ organic matter Stagnant water
BAR-N	Ditch along north side of Baretich Road. Drains to BAR-S via tide-gated ~22 in dia. corrugated metal culvert.	Visual observation Electrofishing	No None	BAR-N-1 WW: 5.4; BFW: 8.8; BFD: 1.9 Reed canary grass, cattail, skunk cabbage, small fruited bulrush, duckweed Muddy substrate w/ organics Low flow, choked w/ aquatic vegetation Water trickling in from behind houses (North)

Table 1. Summary of Fish Data

Site	Description	Method	Results	Habitat observations
FRO-S	Ditch along south side of Frosty Way. Drains to FRO-N via tide-gated ~22 in dia. corrugated metal culvert.	Visual observation Baited minnow traps (3) Electrofishing	Yes, one juvenile salmonid retreated into culvert None 2 three-spine stickleback Tadpoles (multiple)	FRO-S-1 WW: 5.7; BFW: 10.0; BFD: 1.3 Slough sedge, reed canary grass, duckweed, marsh plantain, filamentous algae Soft, muddy substrate FRO-S-2 WW: 6.2; BFW: 8.5; BFD: 1.9 Low flow, choked w/ aquatic vegetation Soft muddy substrate
FRO-N	Ditch along north side of Frosty Way. Connected to Wishkah River via unregulated culvert.	Visual observation Baited minnow traps (3) Electrofishing Seine	Yes, several dozen juvenile salmonids in scour pool below tide gate and 100 ft west. 2 three-spine stickleback 2 coho salmon (100, 122 mm) 1 sculpin (60 mm) None captured 3 three-spine stickleback	FRO-N-1 WW: 2.5; BFW: 9.4; BFD: 2.4 Reed canary grass, slough sedge Embedded gravel substrate Incised, mud banks FRO-N-2 WW: 4.3; BFW: 6.5; BFD: 1.9 Gravel and organic substrate
HOF-S1	Ditch along Wishkah Road, first segment south of Hoffman Road. Drains to FRO-N???	Visual observation	Yes, three-spine stickleback	HOF-S-1 WW: 4.3; BFW: 8.8; BFD: 1.4 Cattail, juncus, reed canary grass, blackberry, duckweed Stagnant water Soft, silty substrate, reddish nr south end

Table 1. Summary of Fish Data

Site	Description	Method	Results	Habitat observations
HOF-N1	Ditch along Wishkah Road, first segment north of Hoffman Road. Drains to HOF-N2 via unregulated corrugated HDPE culvert.	Visual observation	No	HOF-N-1 WW: 4.8; BFW: 7.6; BFD: 1.5 Juncus, small fruited bulrush, reed canary grass Choked w/ aquatic vegetation; not feasible to trap or electrofish.
HOF-N2	Ditch along Wishkah Road, second segment north of Hoffman Road. Drains to HOF-N3 via unregulated corrugated HDPE culvert.	Visual observation Baited minnow traps (2)	Yes, three-spine stickleback 5 three-spine stickleback 3 coho salmon (56, 100, 120 mm) 1 Olympic mudminnow (79 mm) 1 speckled dace (60 mm) 1 sculpin (98 mm)	HOF-N-2 WW: 6.1; BFW: 9.1; BFD: 1.5 Reed canary grass, duckweed Soft silty substrate Deeper in the middle section where a small stream comes in from wetland to the west
HOF-N3	Ditch along Wishkah Road, third segment north of Hoffman Road. Drains to HOF-N4 via unregulated corrugated HDPE culvert.	Visual observation Baited minnow traps (1)	Yes. 2 coho salmon (115, 120 mm) 1 rough skinned newt	HOF-N-3 WW: 8.8; BFW: 11.8; BFD: 3.2 Reed canary grass, cattail, duckweed, filamentous algae Choked w/ aquatic vegetation Deeper pool near culvert on south end

Table 1. Summary of Fish Data

Site	Description	Method	Results	Habitat observations
HOF-N4	Ditch along Wishkah Road, fourth segment north of Hoffman Road. Connected to Wishkah River tidal channel via unregulated corrugated metal culvert. May also connect via tide-gated culvert???	Visual observation Baited minnow traps (1)	Yes. 3 three-spine stickleback 2 sculpin	HOF-N-4 WW: 5.2; BFW: 9.1; BFD: 2.0 Duckweed, reed canary grass, cattail, slough sedge
WTC	Incised tidal channel along east side of Wishkah Road. Connects culverts to mainstem Wishkah River	Visual observation Baited minnow traps (4)	Yes, juvenile salmonids. 1 coho salmon (115 mm) 1 sculpin	Highly incised channel with muddy banks and bed.
WISH	Along bank of mainstem Wishkah River	Visual observation	Yes, several dozen juvenile salmonids, approximately 60 mm TL.	Mud bank Fish were holding in a small eddy, <12 inches deep, formed by a small piece of embedded wood debris

WW = wetted width (ft)
BFW = bankfull width (ft)
BFD = water depth at bankfull stage (ft)

Map Date: May 30, 2014

Aerial Photo: 2013 NAIP

200 0 200 Feet

N W E S

- Existing Tidegates
- Existing Roadfill Toe
- Existing Edge of Pavement
- Existing Centerlines
- Existing Culverts and Pipes
- Watercourses (from LiDAR/Survey)
- 5ft Contours from LiDAR (Ft NAVD)
- Delineated Wetland Boundary
- Parcels
- Existing Structures
- Existing Septic

Kersh-Wishkah Flood Wall

Figure 1

Existing Features

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