



# Appendix D. Endangered Species Act Technical Memorandum



# Memo

Date: Tuesday, January 08, 2019

Project: I-5 Rose Quarter Improvement Project

To: Brian Bauman (HDR)

From: Kevin Halsey, EcoMetrix Solutions Group, LLC

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Subject: **Final ESA Technical Memo**

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## 1. Introduction

### 1.1. Purpose of Memo

This technical memo summarizes the assessment of the Endangered Species Act (ESA) considerations associated with in-water work that could be required for the I-5 Rose Quarter Improvement Project (Project). The assessment focusses on the following considerations relevant to in-water work activities and potential impacts to listed anadromous fish species:

- The potential for in-water activities to affect listed fish species and critical habitat
- The need for best management practices (BMPs) or conservation measures to reduce or offset potential impacts to ESA-listed fish
- The likelihood that the proposed activities and impacts would be covered by the Federal Highway Administration's (FHWA) Federal-Aid Highway Program (FAHP) Programmatic Biological Opinion (PBO).<sup>1</sup>

### 1.2. Focus Area

The assessment focus area is located within the Project Area, along the Eastbank Esplanade. The site is bounded on the west by the Willamette River and the flyover off-ramp bridge (southbound Interstate 5 [I-5] to eastbound Interstate 84 [I-84]) and bounded on the east by railroad right-of-way and elevated I-5. The site is divided by concrete trail and is naturally vegetated on either side of the path. The trail is heavily used by foot and bicycle traffic. The naturalized area on the river side of the trail is heavily impacted by foot traffic, and there is evidence of use by homeless campers.

### 1.3. Description of Proposed Activity

The proposed in-water work is associated with the widening of the southbound I-5 to eastbound I-84 exit ramp and improvements to the I-5 viaduct near the Morrison exit ramp at the south end

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<sup>1</sup> NMFS (National Marine Fisheries Service). 2012. *Endangered Species Act Programmatic Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Response for the Federal-Aid Highway Program in the State of Oregon*. Salem, Oregon. November 28.

of the Project Area. This work would widen I-5 and the ramp with approximately 10-15 new columns to support the new structure (see Figure 1). The new columns would be slightly to the west (toward the Willamette River) in-line with existing columns, which would necessitate in-water work at these locations. A temporary work bridge would be required during construction. The column work is anticipated to be done within cofferdams. Sheet piles would be driven into the river bed, enclosing an area large enough for pilings and a footing and/or drilled shafts. The temporary work bridge is expected to be constructed with pilings and short structural spans (50 to 60 feet in length). The pilings and structure would be removed when the permanent structure is complete. The anticipated fish protection mitigation measures for the installing the temporary work bridge include the use of bubble curtains to reduce underwater noise resulting from percussive piling and potentially using vibratory piling. The Project would also conform to in-water work windows that restrict the timing of construction activities.

## 2. Focus Area Existing Conditions

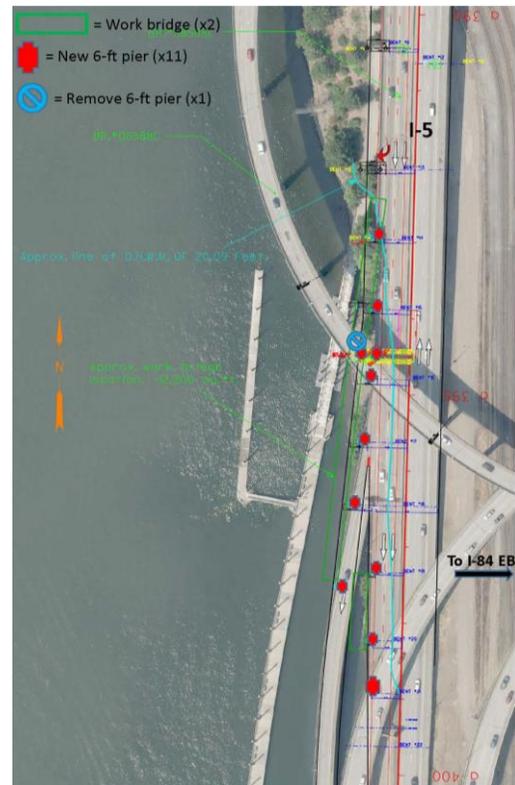
The existing conditions within the focus area include a mix of natural, landscaped, and developed impervious surfaces. The habitat can be divided into four categories: river, shoreline (including ordinary high water [OHW]), river bank, and the upland riparian area (including landscaping, trail, etc.).

### 2.1. River

The site includes a portion of open water along the Willamette River. The river is subject to tidal influences. Scour lines on bridge piers suggest river levels rise 4 to 5 feet above the elevation witnessed during the field visit performed for this assessment, due to tidal influences and high flow events. Evidence of active sloughing (exposed banks, debris, etc.) along the shoreline indicates that some bank erosion is occurring and that substrates beneath the water are similar to material along the shoreline (i.e., gravel, cobble, and some small boulders).

The flyover bridge (southbound I-5 to eastbound I-84) extends over the river on the west side of the site, with piers in the water to support the current structure (Figure 2). In this area, there is a large concrete stormwater pipe that extends out into the flow of the river. The concrete pipe and piers may affect shading, flow patterns, and scour and deposition patterns differently upstream and downstream of the structures.

**Figure 1 – Proposed In-Water Work Areas**



The focus area and its corresponding river reach provide habitat for multiple resident species of plants, mammals, insects, etc. The focus area also overlaps with five National Marine Fisheries Service (NMFS) listed species and designated critical habitats. Although there has been degradation of the habitat within this reach, and more importantly, within the Project Area, the reach is still particularly important habitat for migration (all life-stages), and juvenile rearing for multiple listed anadromous species of fish including Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), and steelhead salmon (*O. mykiss*). These species and native resident fish species use the waters within the site and at various times throughout the year. Presence and density vary due to life history patterns and site conditions (e.g., water temperature).

## 2.2. Shoreline

The shoreline area is affected by tidal influence and seasonal flows. It consists of both natural and human-made material. The area surrounding the northern-most outfall shows the most recent evidence of active bank erosion. Exposed materials indicate most of the natural material along the bank is gravel and cobble. However, riprap has been placed in areas of active or potential erosion. Vegetation within the shoreline consists of mostly large trees. There are several shrubs, but little herbaceous vegetation is present in the understory.

## 2.3. River Bank

The river bank includes the slopes in the area between the shoreline and the trail and a strip above the trail. Most of the natural vegetation between the trail and the shoreline consists of native trees with a shrub understory. There are trails throughout this area, and much of the understory is compacted with little or no herbaceous vegetation. There is a small bioswale adjacent to the Esplanade. The area around the swale is mostly grasses and shrubs, which are dense in areas where water is retained the longest.

## 2.4. Riparian Area

A trail bisects the site, near the top of the river bank. The trail is concrete and about 16 feet wide, with curbs on either side. There is a narrow strip of densely planted shrubs and trees between the trail and the railroad right of way. The ground surface in this landscaped area is covered with bark mulch. The Project would have no effect on riparian vegetation.

**Figure 2 – View of Project Area Looking South**



### 3. Potential Impacts

#### 3.1. Fish Habitat

The Project Area is heavily modified and currently lacks habitat features such as floodplain connectivity, natural cover, submerged or overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, or undercut banks that would support freshwater rearing for listed anadromous species. Likewise, other than the channel being free of obstructions, there is limited habitat support within the Project Area for migration. In-water work is unlikely to permanently impact existing shoreline or river bank habitat structure. However, increased piers would potentially cause some in-stream effects due to short-term, in-water work activities and long-term changes in flow patterns, shading, and sediment movement and deposition. These potential effects are discussed further below. Due to the timing of juvenile rearing and juvenile and adult migration, there is a year-round potential for listed fish to be present.

#### 3.2. Indirect and Direct Effects

There are five primary concerns for directly or indirectly impacting listed fish that are present during Project activities:

1. *Increased Turbidity* – Because the river bed consists primarily of fine silts and sands that are easily resuspended by in-water activity, there is a potential for increased turbidity that could negatively affect fish in the vicinity of the disturbance.
2. *Hydroacoustic Impacts* – Pile driving activities could create the potential for hydroacoustic impacts to fish. The potential presence of juveniles within the Project Area increases the likelihood of impacts. Juveniles are more likely to experience hydroacoustic effects than adults because they are more likely to be in nearshore areas where Project activities are likely to occur.
3. *Contamination* – There is a potential for the release of contaminants into the water from equipment or materials used in the construction process.
4. *Fish Handling* – To reduce or avoid the impacts identified above, the proposed design has incorporated a coffer-dam structure to isolate pier construction activities. However, as the coffer dam is de-watered, there may need to be fish capture and removal, which could potentially impact listed fish species.
5. *Presence of Piers* – The long-term increase in piers in this location could have impacts due to changes in flow patterns, shading, and sediment movement and deposition. Impacts from sediment movement and deposition would be an issue if this were spawning habitat but is not anticipated to be a significant concern within this Project Area. There is, however, a potential Project effect due to the change in habitat structure, which could potentially favor piscivorous predators. Although native and exotic piscivorous fish species have been found to use pilings and piers in the lower Willamette River, studies suggest that there is only limited predation of juvenile salmon in the lower

Willamette from these piscivorous species.<sup>2</sup> Nonetheless, there is a desire to limit new piers in the lower Willamette to reduce the amount of habitat favored by exotic species.<sup>3</sup> The number of new piers the Project would add is still uncertain given the current stage of design; however, the Project could increase the number of new piers below OHW by as much as 50 percent.

While any of these impact pathways could potentially lead to an outcome that adversely affects a listed species, any adverse effects would either be avoided or adequately minimized by complying with FAHP programmatic standards.

#### 4. Recommended Conservation Measures

Given the proposed in-water activities identified above, the following conservation measures/BMPs would be needed to ensure the Project is authorized pursuant to the ESA. The ODOT standard specifications address many of the potential impact mechanisms described above. Likewise, the FAHP PBO incorporates a number of standard specifications, including ODOT Standard Specifications sections 00280, 00290, 01030, and 01040, into the PBO. The Boilerplate Special Provisions also provide additional measures that would be necessary to address potential impacts to listed fish species. The following special provisions are expected to be necessary to adequately protect listed species in and around the site:

- **SP00245 (2018 Specifications: 12-01-17)**

*Temporary Water Management:* This special provision is required by the FAHP PBO whenever there is “substantial excavation, backfilling, embankment construction, or similar work below OHW where adult or juvenile fish are reasonably certain to be present”.<sup>4</sup> The intent of this special provision is to ensure that fish are properly removed from the isolated construction area, and that once removed, fish would be isolated from the activity and there is no “visible release of pollutants or sediment into the water”.<sup>5</sup> If this special provision is deemed necessary, then SP00290.34c would likely also be necessary, which basically requires work area isolation.

- **SP00290.30(a) (2018 Specifications: 08-01-18)**

*Environmental Protection:* This special provision relates to water quality and ensuring no releases into the water that would compromise water quality, including turbidity (SP00290.3(a)(8)).

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<sup>2</sup> Friesen, Thomas A. 2004. *Biology, Behavior, and Resources of Resident and Anadromous Fish in the Lower Willamette River*. Oregon Department of Fish and Wildlife. (stating: “[c]urrently, densities of all large predator fishes are low, and their effects on juvenile salmonids are likely negligible.”); and Friesen, Thomas, John Vile, Alena Pribyl. 2007. *Outmigration of Juvenile Chinook Salmon in the Lower Willamette River, Oregon*. Willamette River Chinook Salmon Outmigration Northwest Science. 81. 10.3955/0029-344X-81.3.173. (stating: “predation on juvenile salmonids by resident fish in the Willamette River appears to be minimal”).

<sup>3</sup> Id.

<sup>4</sup> NMFS, *Programmatic Biological Opinion*

<sup>5</sup> Id.

- **SP00290.34(a and b) (2018 Specifications: 08-01-18)**

*Environmental Protection:* These special provision sections restrict certain activities such as water jetting and release of petroleum products and restrict timing of project activities to the in-water work window designated for the river reach. For the Project Area, the in-water work window is July 1 through October 31. Although the in-water work period includes a winter window from December 1 to January 31, the FAHP PBO specifically disallows activities during that period.

- **SP00290.34(c)(7) (2018 Specifications: 08-01-18)**

*Environmental Protection:* This special provision addresses potential hydro-acoustic impacts. The special provision prescribes the materials that can be used in pilings and the way they can be installed. The provision requires sound attenuation measures that could include work area isolation or bubble curtains. Many of the specifics associated with this provision can be changed “as needed based on site conditions and alternatives as negotiated/approved by the NMFS”.<sup>6</sup>

- **SP00290.34(c)(10) (2018 Specifications: 08-01-18)**

*Environmental Protection:* This special provision addresses activities associated with piling removal. This provision suggests that pile removal should be done with a vibratory hammer if feasible.

In addition to the existing standard specifications and special provisions discussed above, there are requirements within the FAHP PBO that would also need to be addressed if the Project is going to seek ESA authorization through that mechanism. The following are the relevant requirements associated with the in-water work (there are additional requirements for staging, stormwater management, etc. that are not addressed here):

- Removal of unnecessary human-made features from habitat areas. This is an enhancement that is expected and should occur if possible.
- Site restoration. The relevant language in the PBO states: “Site restoration is required for all temporary disturbances in regulated habitats, typically with the goal of returning the habitat to pre-construction conditions, although designs for site restoration should incorporate enhancements whenever possible.”

## 5. Conclusion

This memo documents considerations associated with authorizing in-water work in the Project Area and evaluates the potential for significant impacts from those proposed in-water activities. Based on that evaluation and the two following factors, we do not believe the Project would result in significant impacts:

1. The Project Area is urban and the river bank areas, shoreline areas, and nearshore river areas currently lack floodplain connectivity, natural cover, submerged or overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, or undercut

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<sup>6</sup> NMFS, *Programmatic Biological Opinion*

banks that would support freshwater rearing for listed anadromous species. However, the river bank area is well vegetated with shrubs and trees, which should be replaced if impacted, which is consistent with the FAHP programmatic standards that the Project is anticipated to follow. This is expected to address any need for offsets from activities that could have negative effects to existing vegetative structure.

2. There is the potential for direct impacts to listed fish from in-water activities, including potentially increasing the presence of in-water piers by as much as a 50 percent, which as described above, could have a negative cumulative effect to the system. However, any adverse effects would be avoided or adequately minimized by complying with FAHP programmatic standards. Whereas there is the potential for direct impacts to listed fish from in-water activities, those impacts should be largely avoidable with the application of ODOT's Standard Specifications and the use of appropriate Boilerplate Special Provisions.

Accordingly, unless there is a limitation or design constraint that precludes use of these specifications, and assuming these specifications are incorporated into the Project delivery, the proposed in-water work should be allowed in the Project Area, and use of the FAHP PBO is unlikely to be limited by anticipated Project impacts.

