

I-5 – SR 161/SR 18 Triangle Improvements Project Stream (Corrington Streams) Mitigation Site

USACE NWP (23) NWS-2009-181

Northwest Region

2015 MONITORING REPORT

Wetlands Program

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| General Site Information | |
|--|--|
| USACE NWP 23 Number | NWS-2009-181 |
| Mitigation Location | North of South 356 th Street and west of I-5 in Federal Way |
| LLID Number | 1223103472829 |
| Construction Date | 2011-2012 |
| Monitoring Period | 2013-2017 |
| Year of Monitoring | 3 of 5 |
| Type of Restoration¹ | Stream Realignment |

¹See Appendix 2, Table 1 for the Impact and Mitigation Summary (WSDOT 2010).

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Summary of Monitoring Results and Management Activities (2015)

| Performance Standards | 2015 Results ² | Management Activities |
|---|--|--|
| Ensure that all of the proposed wildlife enhancement structures have been placed within the riparian replacement and enhancement areas and that they meet the specific size and location requirements (including brush piles, snags, and bat boxes). | All present and installed according to plan | |
| Density of four native, wetland (facultative and wetter) woody plants/100ft ² in the wetland areas of the created stream channel. | 8.1 plants/100ft ² (CI _{80%} = 6.8-9.4) across the site | |
| Less than 20% cover state-listed Class A noxious weeds and non-native blackberries (<i>Rubus</i> species), purple loosestrife (<i>Lythrum salicaria</i>), Scotch broom (<i>Cytisus scoparius</i>), thistles (<i>Cirsium</i> species), and non-native knotweeds (<i>Reynoutria cuspidatum</i> , <i>R. polystachyum</i> , <i>R. sachalinense</i> , and <i>R. bohemicum</i>) in the created and enhanced wetlands. | 5% across the site | Weed control occurred 8 times in 2015. |
| 90% survival of riparian enhancement plantings. | 8.1 plants/100ft ² (CI _{80%} = 6.8-9.4) across the site | |
| The relocated stream channel is stable, has the presence or indicators of hydrology, in-stream structures are in place and intact, and the channel has no indicators of significant erosion. | Stream dry at time of monitoring; no signs erosion observed | |

Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the Interstate (I) 5 Corrington Streams Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities included vegetation surveys and photo-documentation on July 15, 2015.

¹ Estimated values are presented with their corresponding statistical confidence interval. For example, 8.1 plants/100ft² (CI_{80%} = 6.8-9.4) means we are 80% confident that the true density value is between 6.8 and 9.4 plant/100ft².

What is the I-5 Corrington Streams Mitigation Site?

This stream mitigation site (Figure 1) consists of riparian and riparian buffer areas along a section of realigned Hylebos Creek Tributary 0016A. This site was created to compensate for impacts from the stream realignment due to road improvements along I-5. The created and enhanced riparian and riparian buffer areas are designed to provide mitigation for lost riparian and stream functions including wildlife habitat, biological support, and storm water control.

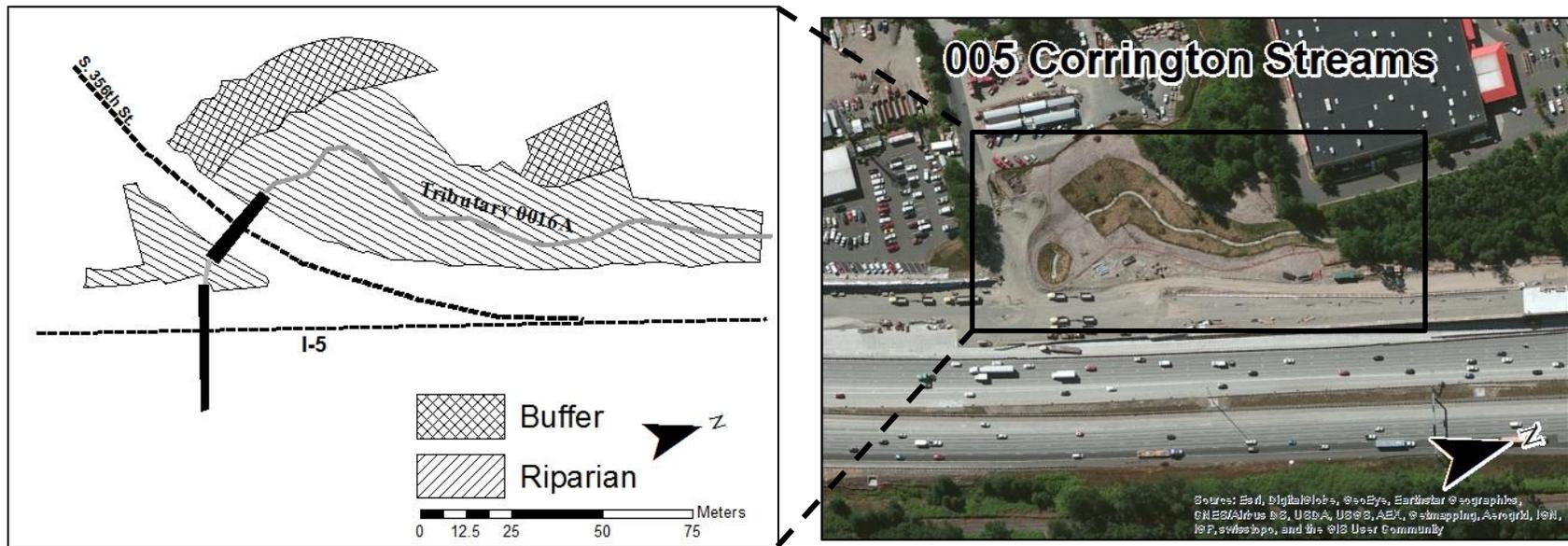


Figure 1 Site Sketch

The I-5 Corrington Streams Mitigation Site contains riparian and riparian buffer areas on the west side of I-5. Appendix 1 includes site directions.

What are the performance standards for this site?

Year 3

Performance Standard 1

Ensure that all of the proposed wildlife enhancement structures have been placed within the riparian replacement and enhancement areas and that they meet the specific size and location requirements. These include brush piles, snags, and bat boxes.

Performance Standard 2

Native, wetland (facultative and wetter) woody species (planted and volunteer) will achieve an average density of at least four plants per 100 square feet in the wetland areas of the created stream channel.

Performance Standard 3

State-listed Class A noxious weeds and non-native blackberries, purple loosestrife, Scotch broom, thistles, and non-native knotweeds will not exceed 20 percent aerial cover in the created and enhanced wetlands.

Performance Standard 4

Survival of 90 percent of riparian enhancement plantings. If dead plantings are replaced, then the performance measure will be met.

Performance Standard 5

The relocated stream channel is stable, has the presence or indicators of hydrology, in-stream structures are in place and intact, and the channel has no indicators of significant erosion.

Appendix 1 shows the as-built planting plan (WSDOT 2010).

How were the performance standards evaluated?

The tables below document the sampling methodology utilized for all of the performance standards (PS) as required by the mitigation plan or permits. For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

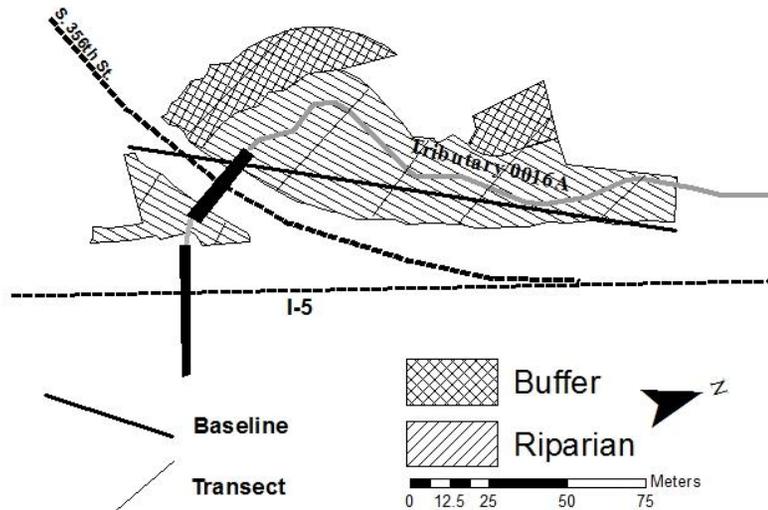


Figure 2 Site Sampling Design (2015)

Placement of Baseline: The baseline was placed parallel to I-5 on the decommissioned road.
Length 130m Transects 1-6

| | PS 1 | PS 2 | PS 3 | PS 4 | PS 5 |
|----------------------|--------------------|----------------------|------------------|----------------------|------------------------------|
| Attribute | Number | Density | Cover | Density | Presence |
| Target pop. | Habitat Structures | Native Woody Species | Invasive Species | Native Woody Species | Stream Hydrology and Erosion |
| Zone | Riparian | Entire Site | Entire Site | Entire Site | Stream Channel |
| Sample method | Total Count | Quadrat | Qualitative | Quadrat | Qualitative |
| SU length | NA | 22m | NA | 22m | NA |
| SU width | NA | 1m | NA | 1m | NA |
| Points per SU | NA | NA | NA | NA | NA |
| Total # of SU | NA | 6 | NA | NA | NA |

How is the site developing?

This site is developing according to plan with high native woody species cover and a limited presence of invasive species. No water was present in the stream channel at the time of monitoring in July, however drift deposits were observed. The stream banks are well vegetated with no signs of erosion. Violet-green swallows and Northern flickers were observed, and all habitat structures are in place and intact.

Results for Performance Standard 1

(Wildlife enhancement structures in place and intact):

All habitat features are present and installed according to plan. (Photo 1)

Results for Performance Standard 2

(Density of four native, woody plants per 100ft² in the wetland areas of the created stream channel):

Density of native, woody plant species across the site is estimated at 8.1 plants per 100 square feet (CI_{80%}= 6.8-9.4). This value exceeds the performance standard target. Dominant species include redosier dogwood (*Cornus alba*), Nootka rose (*Rosa nutkana*), western red cedar (*Thuja plicata*), salmonberry (*Rubus spectabilis*), and Pacific ninebark (*Physocarpus capitatus*). (Photo 2)



Photo 1
Habitat structure (July 2015)



Photo 2
Density of native woody species in the riparian areas (July 2015)

Results for Performance Standard 3

(Less than 20% cover state-listed Class A noxious weeds and non-native blackberries, purple loosestrife, Scotch broom, thistles, and non-native knotweeds in the created and enhanced wetlands):

Cover of state-listed Class A noxious weeds, non-native blackberries, purple loosestrife, Scotch broom, thistles and non-native knotweeds is qualitatively estimated at less than five percent across the site. This value is below the performance standard threshold. Species observed include Himalayan blackberry (*Rubus armeniacus*), Canada thistle (*Cirsium arvense*), Scotch broom, and reed canarygrass (*Phalaris arundinacea*).

Results for Performance Standard 4

(90% survival riparian enhancement plantings):

Survival in the riparian enhancement planting areas is high, with many volunteers. Qualitatively, there is estimated twice as many woody plants as what was planted. Density of native woody plants across the site is estimated at 8.1 plants per 100 square feet (CI_{80%}= 6.8-9.4). Dominant species include black cottonwood (*Populus balsamifera*) and redosier dogwood. (Photo 3)

Results for Performance Standard 5

(Stable stream channel with hydrology, in-stream structures, and no signs of erosion):

The stream was dry at the time of monitoring, although drift deposits were observed. In-stream structures are present and intact, and no signs of erosion were observed. (Photo 4)



Photo 3
Survival in the riparian enhancement area (July 2015)



Photo 4
Dry stream channel (July 2015)

What is planned for this site?

Routine weed control and repair to the damaged fence is planned for 2016.

Appendix 2 – Data Table

Table 1. Impact and Mitigation Summary (Table 4 in WSDOT 2010)

| Activity | Impact | Mitigation |
|---------------------------|--|--|
| Stream Channel and Buffer | <ul style="list-style-type: none"> • 185 ft. culvert extension • 495 ft. channel fill • 65 ft. new culvert • 4.54 acres riparian buffer loss | <ul style="list-style-type: none"> • Stormwater control and treatment retrofit for 34.10 acres of improved surfaces • 2.45 acres buffer enhancement and creation • 515 ft. of new channel • 250 ft. of culvert removal and channel restoration |
| Fish Passage | <ul style="list-style-type: none"> • Retain existing fish passage barriers | <ul style="list-style-type: none"> • 1.08 acres riparian buffer enhancement • 412 lf./0.19 acre off-channel stream habitat |

Literature Cited

1. [USACE] US Army Corps of Engineers. 2011. Department of the Army Nationwide Permit 23 NWS-2009-181.
2. [WSDOT] Washington State Department of Transportation. 2010. Draft Stream Mitigation Plan I-5 – SR 161/SR 18 Triangle Improvement Project. Seattle (WA): Washington State Department of Transportation, Northwest Region.
3. [WSDOT] Washington State Department of Transportation. 2010. I-5 – SR 161/SR 18 Triangle Improvement Project As-built Planting Plan.
4. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>