

Montana Department of Transportation Stream Mitigation Monitoring Report
US 2 - SWAMP CREEK EAST MITIGATION SITE

Project Overview

Watershed: Watershed #1 - Kootenai

MDT Project: NH-1(35)49F; Control No. 1027000

Monitoring Year: 2021

Years Monitored: 3rd year of monitoring

Corps Permit Number: NWO-2012-00146-MTM

Stream Protection Act Authorization: SPA# MDT-R1-04-2018

Monitoring Conducted By: Confluence Consulting Inc.

Monitoring Dates: August 17, 2021

Purpose of the approved project:

As part of the U.S. Highway 2 – Swamp Creek East road reconstruction project, the Montana Department of Transportation (MDT) modified two reaches of Swamp Creek to allow for highway widening and roadway improvements. MDT mitigated for these impacts on-site by reconstructing 1,069 feet of Swamp Creek adjacent to U.S. Highway 2. The project was broken up into “upper” and “lower” reaches. The lower reach is located east of the U.S. Highway 2 corridor and is approximately 170 linear feet. The upper reach is located west of the U.S. Highway 2 corridor and is approximately 899 linear feet. Construction was completed on the lower reach prior to the 2019 monitoring event and was assessed in 2019. The upper reach was completed in 2020 and assessed for the first time during the 2020 monitoring event.

Site Location:

Upper Reach Upstream Coordinates: 48.1341951, -115.432838

Upper Reach Downstream Coordinates: 48.135767, -115.4337009

Lower Reach Upstream Coordinates: 48.135914, -115.4335097

Lower Reach Downstream Coordinates: 48.137279, -115.4341232

County: Lincoln **Nearest Town:** Libby

Map Included: Figure 1 on page # 4.

Mitigation Site Construction Started: Summer 2018 **Construction Ended:** Spring of 2020

Dates of any recent corrective or maintenance activities (since previous report):

Activity: None **Date:** NA

Specific recommendations for additional corrective actions: Weed control should be undertaken for riparian areas within each reach that grass has established.

Previous Monitoring Reports and Methods Descriptions:

<https://www.mdt.mt.gov/publications/brochures/stream-mitigation.shtml>

Monitoring methods are described in the 2019 monitoring report, and additional details for the upper reach were provided in the 2020 monitoring report.

Monitoring Period: Minimum of 3 years from construction completion or until concurrence by US Army Corps of Engineers (USACE).

Requirements (from approved mitigation plan, banking instrument, or DA permit conditions)
Performance Standards:

The lower reach met the single quantitative success criterion in 2021 while the upper reach did not.

Table 1. Summary of performance standards

Performance Standard	Success Criteria	Criteria Achieved?	Discussion
Vegetation Success	Areal cover of riparian and streambank vegetation is $\geq 75\%$	Yes	The lower reach exhibits an average of 85% areal vegetation cover, which meets the 75% cover requirement for the 3 rd consecutive year.
		No	The upper reach exhibits an average of 63% areal vegetation cover. This reach has been monitored for two years and is progressing toward the 75% cover requirement.

Summary Data

Riparian Vegetation Inventory

In 2021, the total areal vegetation cover was 85% for the lower reach and 63% for the upper reach (Table 2). Vegetative cover increased by 8% and 15% since 2020 for the lower and upper reaches respectively. The vegetation transects in both reaches were dominated by two non-native invasive species – creeping wild rye (*Elymus repens*) and reed canary grass (*Phalaris arundinacea*), though the transects in the upper had higher amounts of bare ground.

Fifty-one plant species were observed site-wide, 21 of which are considered hydrophytic based on the 2018 National Wetland Plant List (USACE 2018; Appendix C). The number of plant species observed increased by 16 since 2020. Half of the plant species observed were native and considered beneficial to the restoration efforts within the project area.

Four Montana state-listed noxious weed species, including Canada thistle (*Cirsium arvense*), ox-eye daisy (*Leucanthemum vulgare*), common tansy (*Tanacetum vulgare*), and spotted knapweed (*Centaurea stoebe*) were observed in 2021. Canada thistle and common tansy were the most prevalent noxious weed, with oxeye daisy and spotted knapweed only occurring in trace amounts. Noxious weed infestations encompassing at least 1% of the area within each reach were mapped and displayed on Map 1 (Appendix A). Noxious weed infestations identified in trace amounts (<1% of inventory area within each reach) were noted but not mapped.

Table 2. Percent cover of vegetation transects within the Lower and Upper Reaches of Swamp Creek East in 2020 and 2021.

Reach	Location	Length (ft)	% Cover			
			2020		2021	
			Bare Ground/ Fabric	Vegetation	Bare Ground/ Fabric	Vegetation
Lower	Transect 1	42	18	82	5	95
	Transect 2	42	27	73	25	75
	Total	84	23	77	15	85
Upper	Transect 3	45	59	41	50	50
	Transect 4	36	46	55	25	75
	Total	76	52	48	38	63

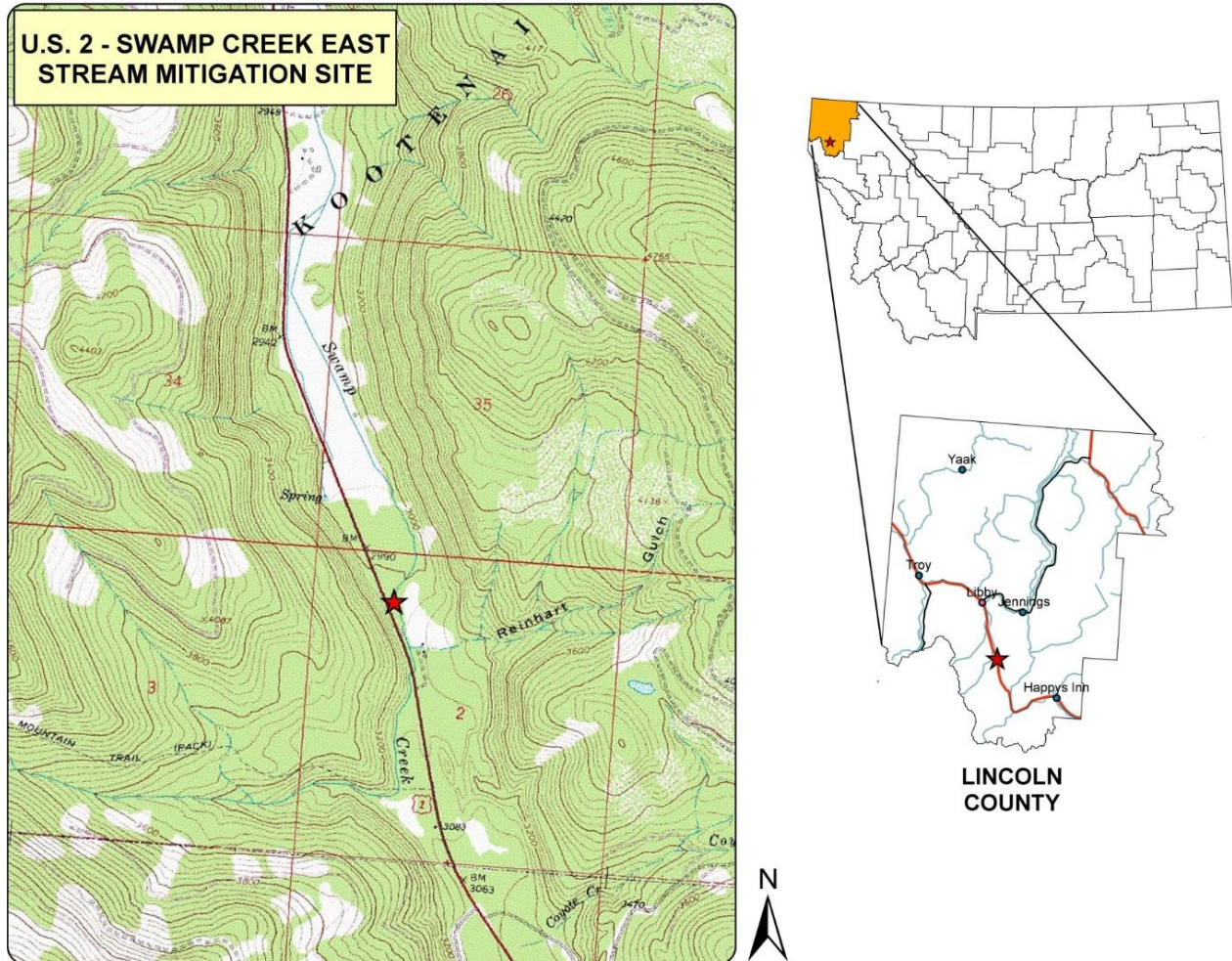
Conclusions

Vegetation cover was high in both the upper and lower reaches in 2021, given how recently the project was constructed. The vegetation observed in both reaches was dominated by early successional non-native annual and perennial species, which generally provide stability over bare ground and cover for small animals. Plant species diversity increased over the last two years and habitat diversity and structure is expected to increase as coverage of some species expands. Total plant cover is expected to increase within both reaches during the next few years, which will likely allow the site to meet the established success criterion.

While there were no success criteria for channel form stability or functionality, the rock weirs and culverts on the site were all in good condition and functioning as designed during the 2021 monitoring visit.

Maps, Plans, Photos:

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A

Photos: See Appendix B

Comprehensive Plant List: See Appendix C

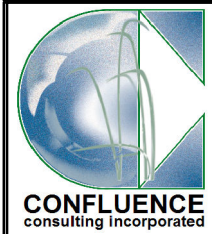
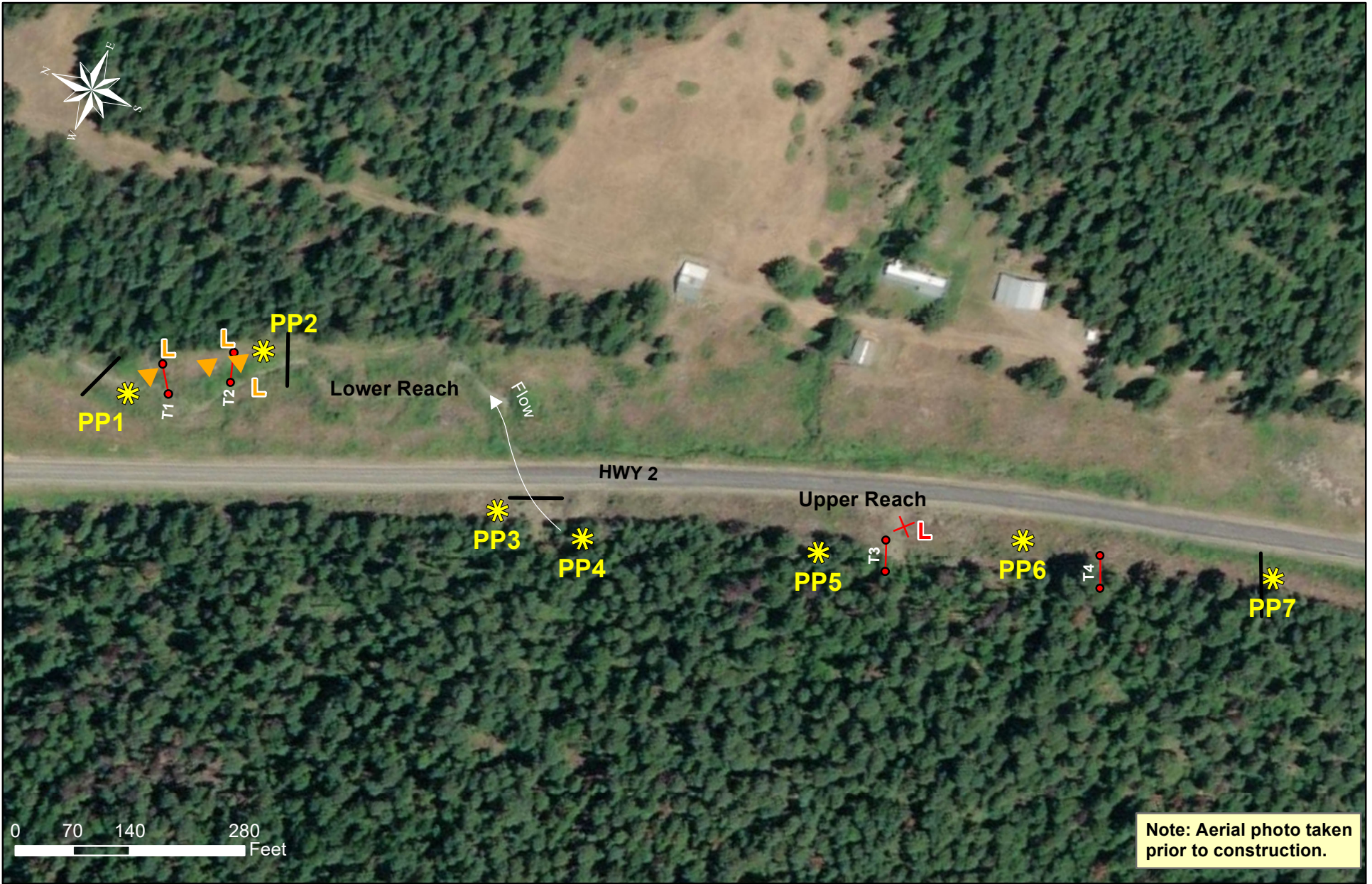
Plans: See Appendix D of 2019 Monitoring Report

https://www.mdt.mt.gov/other/webdata/external/planning/STREAM-MITIGATION/2019_REPORTS/2019-FINAL-Swamp-Creek-East.PDF

APPENDIX A

PROJECT AREA MAPS

MDT Stream Mitigation Monitoring
Swamp Creek East
Lincoln County, Montana



Legend

- Approximate Channel Reach Breaks
- Vegetation Transects
- Photo Points

- Cirsium arvense*
- Tanacetum vulgare*

- Noxious Weed Cover Classes
- T = Trace (<1% cover)
 - L = Low (1-5% cover)
 - M = Moderate (6-25% cover)
 - H = High (26-100% cover)

Note: Aerial photo taken prior to construction.

Swamp Creek East 2021 - Upper and Lower Reaches Monitoring Features

Map 1

Date: 2/14/2022

SwampEast_monitor2021.mxd

APPENDIX B

PROJECT AREA PHOTOGRAPHS

MDT Stream Mitigation Monitoring
Swamp Creek East
Lincoln County, Montana

Monitoring Photo Log

SITE NAME: Swamp Creek East
MONITORING YEAR: 2021



2019



2021

Photo Point 1: Looking south (upstream) from the bottom of the lower reach.



2019



2021

Photo Point 2: Looking north (downstream) from the top of the lower reach.



2019



2021

Photo Point 3: Looking south (upstream) from the bottom of upper reach during (2019) and after construction (2021).



2020



2021

Photo Point 4: Looking north (downstream) at the downstream end of the upper reach.



2020



2021

Photo Point 5.1: Looking south (upstream) from below the culvert located mid-way up the upper reach.



2020



2021

Photo Point 5.2: Looking east at the culvert located mid-way up the upper reach.

SITE NAME: Swamp Creek East
MONITORING YEAR: 2021



2020



2021

Photo Point 5.3: Looking north (downstream) from the culvert located mid-way up the upper reach.



2020



2021

Photo Point 5.4: Looking south (upstream) above the culvert located mid-way up the upper reach.



2020



2021

Photo Point 6.1: Looking southwest (upstream) at the upper end of the upper reach.

SITE NAME: Swamp Creek East
MONITORING YEAR: 2021



2020



2021

Photo Point 6.2: Looking west from the upper end of the upper reach.



2020



2021

Photo Point 6.3: Looking northwest (upstream) from the upper end of the upper reach.



2020



2021

Photo Point 7: Looking north (downstream) from the top of the upper reach.



2019



2021

Additional Photo 1: View looking west across Vegetation Transect #1.



2019



2021

Additional Photo 2: View looking east across Vegetation Transect #1



2021



2021

Additional Photo 3: View looking west across Vegetation Transect #2.

SITE NAME: Swamp Creek East

MONITORING YEAR: 2021



2019



2021

Additional Photo 4: View looking east across Vegetation Transect #2.



2020



2021

Additional Photo 5: View looking west across vegetation transect #3.



2020



2021

Additional Photo 6: View looking east across vegetation transect #3.

SITE NAME: Swamp Creek East

MONITORING YEAR: 2021



2020



2021

Additional Photo 7: View looking west across vegetation transect #4.



2020



2021

Additional Photo 8: View looking east across vegetation transect #4.

APPENDIX C
2019 – 2021 COMPREHENSIVE PLANT SPECIES LIST

MDT Stream Mitigation Monitoring
Swamp Creek East
Lincoln County, Montana

Table C-1. Comprehensive list of plant species observed at the Swamp Creek East Stream Mitigation Site from 2019 through 2021.

Scientific Name	Common Name	WMVC Indicator Status*
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC
<i>Amelanchier alnifolia</i>	Saskatoon Service-Berry	FACU
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Bromus diandrus</i>	Ripgut Brome	UPL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Bromus squarrosus</i>	Corn Brome	UPL
<i>Bromus tectorum</i>	Cheatgrass	UPL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Cerastium fontanum</i>	Common Mouse-Ear Chickweed	FACU
<i>Chenopodium album</i>	Lamb's-Quarters	FACU
<i>Chenopodium capitatum</i>	Strawberry Goosefoot	UPL
<i>Cirsium arvense</i>	Canada Thistle	FAC
<i>Cornus alba</i>	Red Osier	FACW
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU
<i>Elymus repens</i>	Creeping Wild Rye	UPL
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Willowherb	FAC
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW
<i>Fragaria virginiana</i>	Virginia Strawberry	FACU
<i>Heuchera parviflora</i>	Littleleaf Alumroot	UPL
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Madia glomerata</i>	Mountain Tarplant	FACU
<i>Maianthemum racemosum</i>	Feathery False Solomon's-Seal	FAC
<i>Medicago lupulina</i>	Black Medic	FACU
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Plantago major</i>	Great Plantain	FAC
<i>Poa palustris</i>	Fowl Blue Grass	FAC
<i>Populus balsamifera</i>	Balsam Poplar	FAC

Scientific Name	Common Name	WMVC Indicator Status*
<i>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Salix exigua</i>	Narrow-leaf Willow	FACW
<i>Salix lasiandra</i>	Pacific Willow	FACW
<i>Sisymbrium altissimum</i>	Tall Hedge-Mustard	FACU
<i>Sonchus arvensis</i>	Field Sow-Thistle	FACU
<i>Spiraea betulifolia</i>	Shiny-Leaf Meadowsweet	FACU
<i>Symphoricarpos albus</i>	Common Snowberry	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Thlaspi arvense</i>	Field Pennycress	UPL
<i>Trifolium pratense</i>	Red Clover	FACU
<i>Trifolium repens</i>	White Clover	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>xTriticale</i>	Triticale	UPL

*2018 National Wetland Plant List; Western Mountains, Valleys, and Coast Region (USACE 2018)
New species identified in 2021 are **bolded**