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: 2024

Years Monitored: Lower Reach - 6th year of monitoring, Upper Reach 5th 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 12, 2024

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 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 in length. The upper reach is located west of the U.S. Highway 2 corridor and is approximately 899 linear feet in length. Construction was completed on the lower reach prior to the 2019 monitoring event and was assessed for the first time in the summer of 2019. The upper reach was completed in 2020 and assessed for the first time during the summer of 2020.

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: Lower Reach: Summer 2018 **Upper Reach: Summer 2019**

Construction Ended: Lower Reach: Spring 2019 Upper Reach: Spring 2020

Dates of any recent corrective or maintenance activities (since previous report)
Activity: Noxious Weed Treatment **Date:** May 1, 2024

Specific recommendations for additional corrective actions: Continue noxious weed control.

Previous Monitoring Reports and Methods Descriptions:
https://www.mdt.mt.gov/publications/brochures/stream-mitigation.aspx
Monitoring methods are described in the 2019 monitoring report, and additional details for the upper reach are available 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 monitoring site met the performance standard for vegetation success for the first time in 2022. The criteria were met again in 2023 and 2024.

Table 1. Summary of performance standards for the Swamp Creek East Mitigation site.

Parameter	Success Criteria	Status	Site Meeting Success Criteria?
Vegetation Success	Will be achieved when combined areal cover of riparian and streambank vegetation is ≥75%.	The average areal cover along the four riparian transects was 78.9%.	YES

Summary Data

Riparian Vegetation Inventory
The results of four line-point intercept transects indicate total areal vegetation cover in riparian areas was 78.9% in 2024 (Table 2). As compared to results in 2023, the lower reach displayed no change, but bare ground in the upper reach increased by 5.6%. The dominant species recorded in the lower reach were reed canarygrass (*Phalaris arundinacea*), creeping wildrye (*Elymus repens*) and blue wildrye (*Elymus glaucus*). In the upper reach, reed canarygrass, creeping wildrye and intermediate wheatgrass (*Elymus hispidus*) were the dominant species.

A total of 76 species have been observed site-wide since 2019. Of the 76 species identified, 31 are considered hydrophytic based on the 2020 National Wetland Plant List (USACE 2020; Appendix C). Of the species recorded across the site, 58% are native and considered beneficial to the restoration efforts, including willows which were planted within the project reach.

Noxious Weeds
Five Montana state-listed noxious weed species, including Canada thistle (*Cirsium arvense*), ox-eye daisy (*Leucanthemum vulgare*), common tansy (*Tanacetum vulgare*), spotted knapweed (*Centaurea stoebe*), and butter-and-eggs (*Linaria vulgaris*) were observed within the Swamp Creek stream mitigation site in 2024. Canada thistle and common tansy are the most prevalent noxious weed in the upper reach, although the west bank also has infestations of spotted knapweed. Noxious weed cover was estimated at 3% within the lower reach due to an increase in common tansy, mainly on the west bank and in the channel. Total weed cover was approximately 7% in the upper reach, where the most common species were Canada thistle and common tansy. Noxious weed infestations encompassing at least 1 percent of the total cover within each reach were mapped and are shown on Map 1 in 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 along vegetation transects within the Swamp Creek East Mitigation site in 2022-2024.

Reach	Location	Length (ft)	% Cover					
			2022		2023		2024	
			Bare Ground/ Fabric	Vegetation	Bare Ground/ Fabric	Vegetation	Bare Ground/ Fabric	Vegetation
Lower	Transect 1	42	30	70	10	90	10	90
	Transect 2	42	15	85	30	70	30	70
Upper	Transect 3	45	30	70	30	70	40	60
	Transect 4	36	20	80	0	100	0	100
		Weighted Average	**24.0**	**76.0**	**18.4**	**81.6**	**21.1**	**78.9**

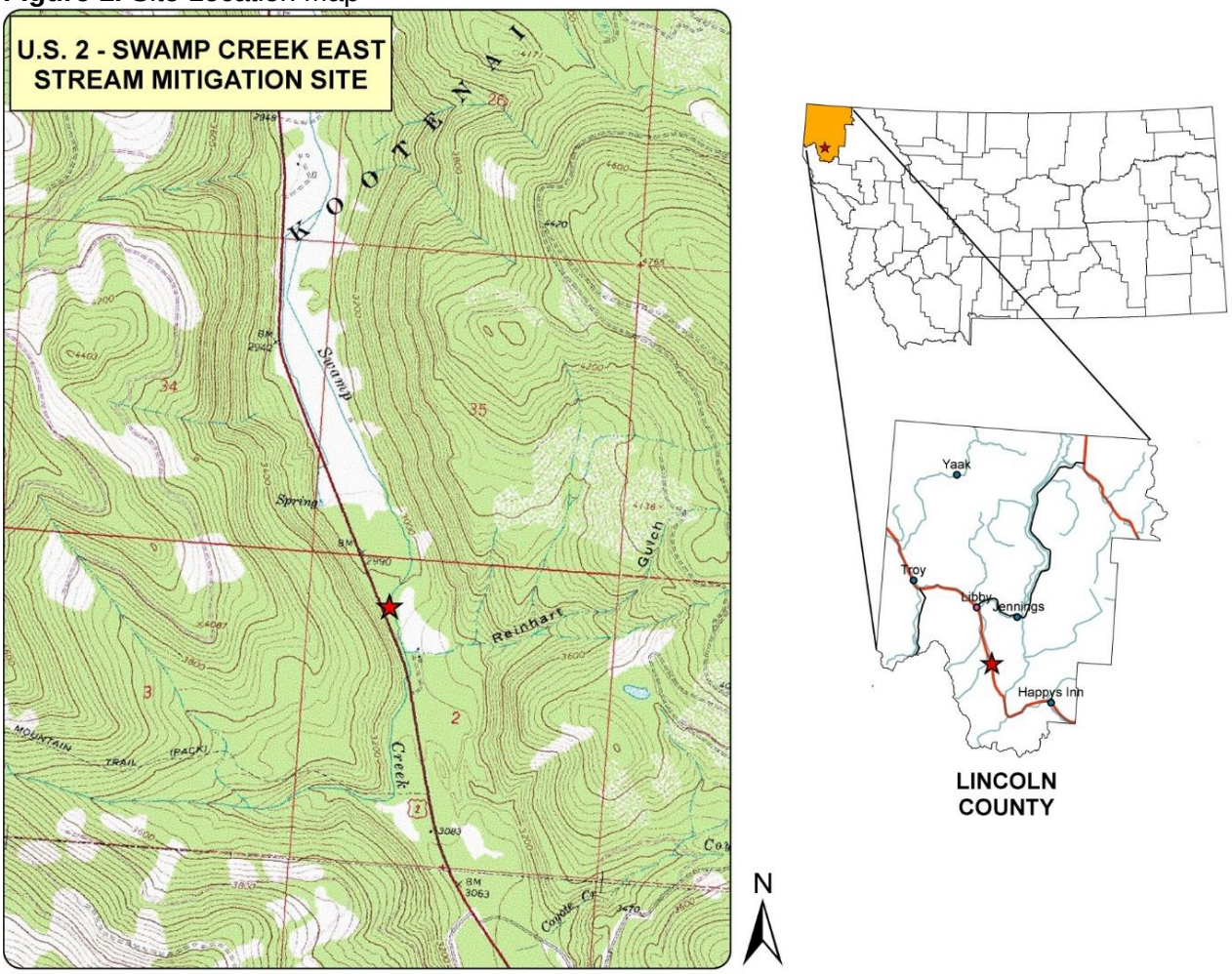
Conclusions

A weighted average across the four vegetation transects indicates that total vegetative cover was 78.9 percent in 2024, which meets the vegetative success criterion. This criterion has now been met for three consecutive years and a general upward trend in total cover has been observed throughout the monitoring period (Table 2). A small decrease in total cover in the upper reach was observed in 2024 but is not concerning and provides evidence that vegetation at the site is still maturing. In general, vegetation is transitioning from a community dominated by non-native species including many annual forbs, to one dominated by native and introduced perennial grass species. This transition will eventually provide greater soil stability and increased cover for birds and small mammals. As indicated by the overall vegetative trend, plant diversity has continued to increase over the monitoring period. Habitat diversity and structure is expected to increase as perennial cover expands, willows mature, and more volunteers establish.

While there are no specific success criteria outlined in the monitoring plan for channel form, stability, or function, visual inspections of the rock weirs and culverts indicate all are currently in good condition and functioning as designed. No instability issues or maintenance concerns have been noted during any of the six monitoring events.

Maps, Plans, Photos:

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A

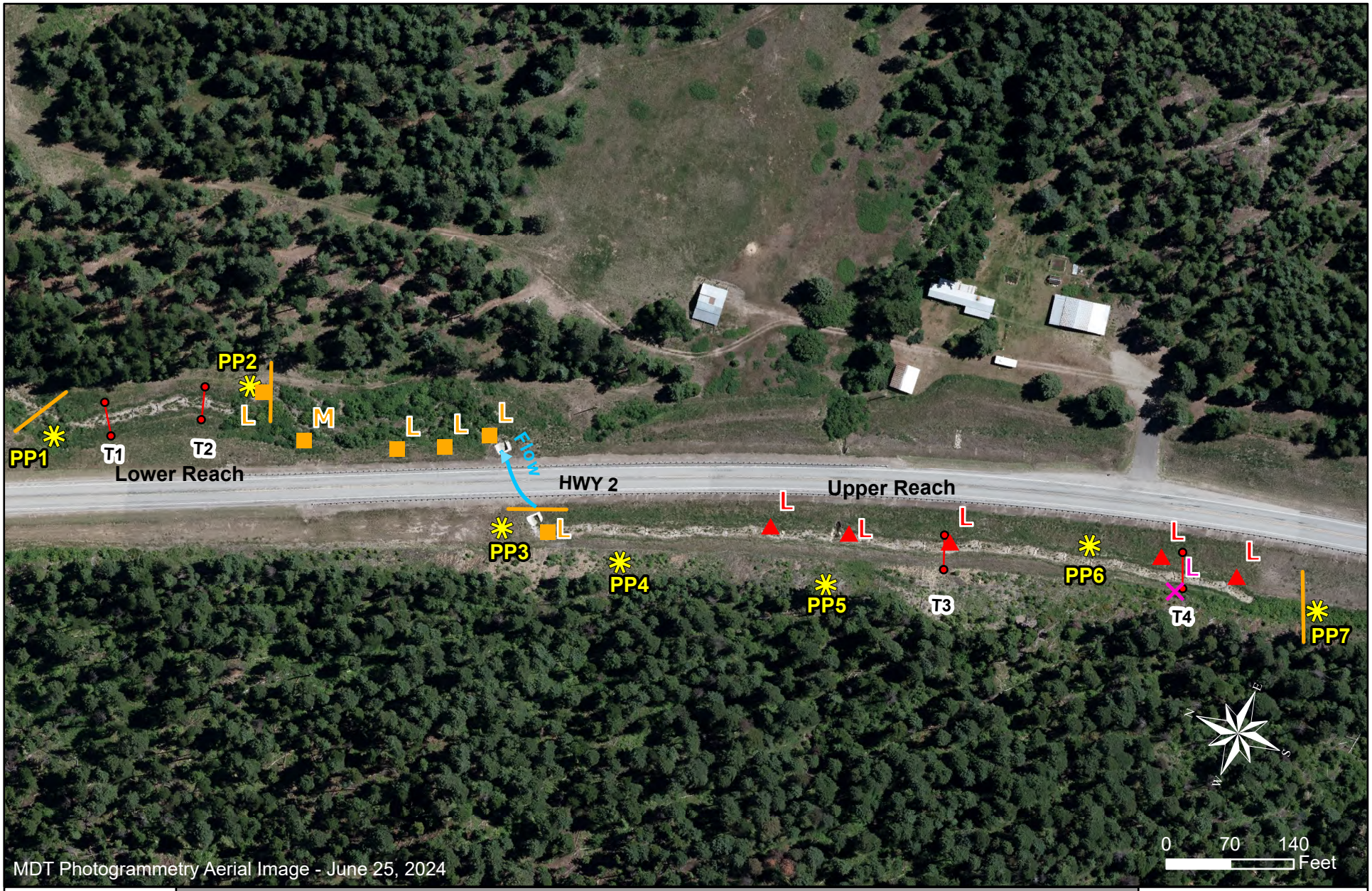
Photos: See Appendix B

Comprehensive Plant List: See Appendix C

Plans: See Appendix D of 2019 Monitoring Report
https://www.mdt.mt.gov/publications/brochures/stream-mitigation.aspx

APPENDIX A
PROJECT AREA MAPS

MDT Stream Mitigation Monitoring
Swamp Creek East
Lincoln County, Montana



CONFLUENCE CONSULTING

Legend

- Approximate Channel Reach Breaks
- Vegetation Transects
- Photo Points

Noxious Weeds

- Centaurea stoebe
- Cirsium arvense
- Tanacetum vulgare

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

Swamp Creek East 2024 - Upper and Lower Reaches Monitoring Features

Map 1

Map Date: 11/2/2024

SwampEast_monitor_2024.mxd

APPENDIX B
PROJECT AREA PHOTOGRAPHS

MDT Stream Mitigation Monitoring
Swamp Creek East
Lincoln County, Montana

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

MONITORING PHOTO LOG

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

CONFLUENCE CONSULTING

2019

2024

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

2019

2024

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

2019

2024

Photo Point 3: Looking south (upstream) from the bottom of upper reach during (2019) and after construction (2024).

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2020

2024

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

2020

2024

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

2020

2024

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

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2020

2024

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

2020

2024

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

2020

2024

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

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2020

2024

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

2020

2024

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

2020

2024

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

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2019

2024

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

2019

2024

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

2019

2024

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

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2019

2024

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

2020

2024

Additional Photo 5: View looking west across Vegetation Transect #3.

2020

2024

Additional Photo 6: View looking east across Vegetation Transect #3.

SITE NAME: Swamp Creek East
MONITORING YEAR: 2024

2020

2024

Additional Photo 7: View looking west across Vegetation Transect #4.

2020

2024

Additional Photo 8: View looking east across Vegetation Transect #4.

APPENDIX C
2019 – 2024 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 2024.

Scientific Name	Common Name	WMVC Indicator Status*
Achillea millefolium	Common Yarrow	FACU
Agrostis stolonifera	Spreading Bent	FAC
Alnus incana	Speckled Alder	FACW
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Amelanchier alnifolia	Saskatoon Service-Berry	FACU
Anaphalis margaritacea	Pearly-Everlasting	FACU
Beckmannia syzigachne	American Slough Grass	OBL
Berteroa incana	Hoary False-alyssum	UPL
Bromus diandrus	Ripgut Brome	UPL
Bromus inermus	Smooth Brome	UPL
Bromus japonicus	Japanese Brome	UPL
Bromus squarrosus	Corn Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Capsella bursa-pastoris	Shepherd's-Purse	FACU
Carex aurea	Golden-Fruit Sedge	FACW
Carex bebbii	Bebb's Sedge	OBL
Carex interior	Inland Sedge	OBL
Carex pachystachya	Thick-Head Sedge	FAC
Centaurea stoebe	Spotted Knapweed	UPL
Cerastium fontanum	Common Mouse-Ear Chickweed	FACU
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium capitatum	Strawberry Goosefoot	UPL
Cirsium arvense	Canada Thistle	FAC
Cornus alba	Red Osier	FACW
Deschampsia caespitosa	Tufted Hair Grass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus glaucus	Blue Wildrye	FACU
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	UPL
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium brachycarpum	Willowherb	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Fragaria virginiana	Virginia Strawberry	FACU
Heuchera parviflora	Littleleaf Alumroot	UPL

Scientific Name	Common Name	WMVC Indicator Status*
Hieracium umbellatum	Narrowleaf Hawkweed	UPL
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus nodosus	Knotted Rush	OBL
Juncus tenuis	Lesser Poverty Rush	FAC
Lactuca serriola	Prickly Lettuce	FACU
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Linaria vulgaris	Butter-and-eggs	UPL
Madia glomerata	Mountain Tarplant	FACU
Maianthemum racemosum	Feathery False Solomon's-Seal	FAC
Medicago lupulina	Black Medic	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Phacelia hastata	Silverleaf Phacelia	UPL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FACU
Plantago major	Great Plantain	FAC
Poa palustris	Fowl Blue Grass	FAC
Populus balsamifera	Balsam Poplar	FAC
Potentilla norvegica	Norwegian Cinquefoil	FAC
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Rorippa sp.	Yellowcress	UPL
Rubus parviflorus	Western Thimble-Berry	FACU
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	Willow Dock	FACW
Salix exigua	Narrow-leaf Willow	FACW
Salix lasiandra	Pacific Willow	FACW
Silene sp.	Catchflies	N/A
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FACU
Spiraea betulifolia	Shiny-Leaf Meadowsweet	FACU
Symphoricarpos albus	Common Snowberry	FACU
Symphyotrichum campestre	Western Meadow Aster	UPL

Scientific Name	Common Name	WMVC Indicator Status*
Symphyotrichum foliaceum	Alpine Leafy-Head Aster	FACU
Tanacetum vulgare	Common Tansy	FACU
Thlaspi arvense	Field Pennycress	UPL
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Verbascum thapsus	Great Mullein	FACU
Veronica americana	American-Brookelime	OBL
xTriticale	Triticale	UPL

*2020 National Wetland Plant List; Western Mountains, Valleys, and Coast Region (USACE 2020)
New species identified in 2024 are **bolded.**