

Montana Department of Transportation Stream Mitigation Monitoring Report
ASHLEY CREEK MITIGATION SITE

Project Overview

MDT Project Number: NH-MT 5-3(59) FST / UPN # 2038010

Watershed: Watershed #4 - Flathead

Monitoring Year: 2023

Years Monitored: 8th year of monitoring (2013-2015, 2018-2021, & 2023)

Corps Permit Number: NWO-2009-01808-MTM

Monitoring Conducted By: Confluence Consulting Inc.

Monitoring Dates: May 19th, 2023 and August 4, 2023

Purpose of the approved project:

As part of construction of the U.S. Highway 2 South Kalispell Bypass project, the Montana Department of Transportation (MDT) modified a segment of Ashley Creek at the North Bridge crossing. This project was developed to provide compensatory mitigation for stream impacts associated with the U.S. 93 Alternative widening segment of the Kalispell Bypass. Prior to construction, Ashley Creek had been channelized into a V-shaped drainage with steep side slopes (1.5:1). The purpose of this project was to restore Ashley Creek by widening the channel and recontouring the stream banks to have a more gradual slope where possible.

Site Location:

Upstream Coordinates: 48.19216, -114.337387

Downstream Coordinates: 48.19185, -114.335872

County: Flathead **Nearest Town:** Kalispell

Map Included: Figure 1 Site Location map on page #8.

Mitigation Site Construction Started: 2010

Construction Ended: Phase I - 2010; Phase II - 2017

Dates of any recent corrective or maintenance activities (since previous report): In 2022, the eroding banks at the Ashley Creek Mitigation Site were reconstructed and fenced off. The site was not monitored in 2022 as it was under construction during the time of monitoring.

Activity: Bank repair **Date:** August 2022

Specific recommendations for additional corrective actions: While adaptive management was implemented in 2022 to address bank erosion, the streambanks under the US Highway 93 - Kalispell Bypass bridge are still eroding. The bank reconstruction work completed in the winter of 2022 is beginning to deteriorate due to design/construction issues and public usage of the site for access to Ashley Creek. MDT is aware of the issues and is working with the contractor and designers to address the situation.

Previous Monitoring Reports and Methods Descriptions:

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

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

Monitoring Period: 5 years from the original 2010 construction completion or until concurrence by US Army Corps of Engineers (USACE). Due to adaptive management actions in 2022, the Corps. has required additional monitoring.

Table 1. Summary of Performance Standards

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Riparian Buffer Establishment	Areas within creditable riparian buffer disturbed during construction must have 50% or greater aerial cover of non-noxious weed species by the end of the monitoring period.	Y	Riparian areas contain an estimated 62% cover from non-noxious species.
	Montana State-listed noxious weeds do not exceed 10% cover.	Y	Riparian buffer areas contain an estimated 3% noxious weeds cover.
Vegetation Success	Combined aerial cover of riparian and stream bank vegetation communities is at least 70%.	N	Combined aerial cover of riparian and stream bank vegetation communities is an estimated 65%.This percentage includes the area under the expanded bridge
	Planted trees and shrubs must exhibit 50% survival after 5 years.	Y	This goal was met after the 5 year timeline.
Vegetation along Stream Banks	Majority of plants on the stream bank must have root stability indices of at least 6.	N	Greater than 50% of the stream bank was dominated by bare ground, which has a root stability index of 1.
Stream Bank Stability Success	Less than 25% of bank length is unstable and classified as eroding bank.	Y	Total eroding bank length was 201' or 24% of the total bank length in 2023.
Channel Form Success	Stream has stabilized, includes pool and riffles, allows for flood events to occupy the floodplain, and the habitat features such as riparian plant communities have successfully established along stream banks.	N	The stream is considered stable and multiple pool and riffle sequences exist. Re-sloping the banks beneath and immediately upstream of the bridge has increased flood capacity compared to pre-construction conditions; however, floodplain access is compromised by the dimensions of the bridge opening. Riparian vegetation has established beyond the bridge footprint but has not successfully established beneath the bridge due to its expanded width and associated shading.

Performance Standards:

Results from the 2023 monitoring event indicate the Ashley Creek stream mitigation site met four of the six quantitative performance standards established in the original monitoring plan (Table 1). Both performance standards for riparian buffer establishment were met, as the buffer has more than 50% cover of non-noxious plant species and total areal cover of noxious weed species is well below 10%. Due to recent adaptive management actions, the site has yet to meet the performance criteria of at least 70% combined areal cover of riparian and stream bank vegetation communities, and the majority of stream bank plants have a stability index rating of at least six. The site failed to meet these success criteria due to high amounts of bare ground below the US 93 – Kalispell Bypass bridge following recent adaptive management activities. The success criterion for planted woody vegetation survivorship was met in 2019 and was therefore not calculated in 2023. Thus far, the success of bank reconstruction actions undertaken in 2022 is limited to the segment upstream of the bridge. Under the bridge, corrective actions are needed to address bank stability issues. While the corrective actions have yet to fully address bank instability, the site is currently meeting the bank stability criterion, as 24% (201 feet) of the banks within the project reach are eroding (Table 1).

The stream is considered stable and contains multiple pool and riffle sequences. The stream banks were re-sloped to increase flood capacity beneath and immediately upstream of the bridge during high water events as compared to pre-construction conditions, although the length of the bridge and abutment spacing were not intended to provide a fully-functional floodplain or allow Ashley Creek to access a broad floodplain at typical flood events. Riparian vegetation establishment along the banks remains compromised by the shading effects of the expanded bridge. Based on these factors, the site has not met all of the qualitative criteria elements for channel form success.

Summary Data***Riparian Buffer Vegetation Inventory***

Total vegetative cover combined across the riparian and stream bank belt transects was estimated at 65%. This includes 17% cover by woody species and 3% cover by noxious weeds (Table 2). Overall, 62% of the reach exhibited non-noxious vegetation cover (65% total riparian cover minus 3% noxious weed cover).

Total cover and noxious weed cover in 2023 remained consistent with the previous monitoring event which occurred in 2021. Revegetation success along the south bank upstream of the US 93 – Kalispell Bypass bridge was high, with large amounts of grass cover and ubiquitous new willow (*Salix* spp.) growth observed among the plantings installed. Total woody cover increased across the site in association with the willow plantings, and planted willow survival was estimated at over 80% during the August 2023 monitoring event. Despite the revegetation success upstream of the bridge, total cover remained unchanged on average due to the amount of bare ground under the bridge. The bridge, which is approximately 104' wide, covers 50% and 43% of the south/north belt transects, respectively. Despite the installation of soil lifts to stabilize the streambanks below the bridge, vegetation in this area lacks adequate sunlight and precipitation to establish and persist.

Dominant species recorded along the riparian transects were combined with visual observations of vegetation in the surrounding area to develop a vegetation community map (Figure 3, Appendix A). The four community types documented since 2018 were again observed during the 2023 monitoring event, with the addition of a community Type 6. Vegetation communities at the site include: Type 1 (*Phalaris arundinacea*), Type 3 (*Phalaris arundinacea*/*Elymus* spp.), Type 4 (Bare Ground/*Elymus* spp.), Type 5 (*Cornus alba*/*Alnus incana*), and Type 6 (*Salix* spp.). The streambanks below the bridge are dominated by bare ground and are highly disturbed, and area dominated by early successional species including lamb's quarters (*Chenopodium album*), tall hedge-mustard (*Sisymbrium altissimum*), prickly Russian thistle (*Salsola tragus*), and wild rye (*Elymus* spp.).

Since 2013, 92 plant species have been identified within the project area, and plant diversity has increased by 36 species since the initial monitoring event. Prickly Russian thistle (*Salsola tragus*), an introduced species, was identified at Ashley Creek for the first time in 2023 (Table C-1, Appendix C). Forty-two of the 91 species (46%) observed in 2023 were hydrophytic based on the 2020 National Wetland Plant List (USACE, 2020).

Table 2. Aerial cover estimates (weighted average) for vegetation at the Ashley Creek Mitigation Site in 2013, 2021, and 2023 within the streambank and riparian transects combined.

Belt Transect	Length (ft)	Total % Riparian Cover			% Bare Ground			% Woody Cover			% Noxious Weed Cover		
		2013	2021	2023	2013	2021	2023	2013	2021	2023	2013	2021	2023
South bank	208	92	65	64	8	35	32	23	14	20	12	4	4
North bank	243	84	65	65	16	35	35	30	14	14	10	3	3
Total	451	88	65	65	12	35	34	26	14	17	11	3	3

Stream Bank Vegetation

Bare ground accounted for greater than 50% cover along the stream-bank vegetation transects, which extend both upstream and downstream of the overpass (Figure 2, Appendix A). Reed canary grass comprised between 21% and 50% cover along the north bank and between 11 and 20% along the south bank (Table D-1, Appendix D). Low vegetation cover is partially due to active bank erosion and limited sunlight beneath the bridge overpass. As the majority of the stream banks were bare, the dominant stream bank community type was considered “barren”, and the site was assigned a corresponding root stability index value of 1 (Winward 2000).

Woody Plant Survival

Woody plantings, including serviceberry (*Amelancier alnifolia*), choke cherry (*Prunus virginiana*), Woods’ rose (*Rosa woodsii*), common snowberry (*Symphoricarpos albus*), narrow-leaf willow (*Salix exigua*), gray willow (*Salix bebbiana*), Drummond’s willow (*Salix drummondiana*), speckled alder (*Alnus incana*), and red osier dogwood (*Cornus alba*) were observed within the project area in 2023. The success criteria for woody vegetation requires greater than 50% survival after a 5-year monitoring period. This criterion was met in the fifth year of monitoring (2019) and was therefore not quantitatively assessed in 2023.

Noxious Weed Inventory

Four Montana-Listed noxious weed species were identified during the 2023 monitoring event. Noxious weed infestations of a low cover class (1 to 5 percent) or higher were mapped and are displayed on Figure 3 (Appendix A). Noxious weed infestations identified in isolated and trace amounts (<1%) were noted but not mapped. Seven infestations of two Priority 2B noxious weeds were mapped within the riparian corridor at the Ashley Creek site (MDA 2019). These infestations included six occurrences of common tansy (*Tanacetum vulgare*) and one occurrence of field bindweed (*Convolvulus arvensis*). A low cover class was assigned to each mapped weed infestation within the project area. An estimated 3% of the project area has been colonized by noxious weeds, with common tansy as the most prevalent. In 2023, this includes Canada thistle (*Cirsium arvense*), and spotted knapweed (*Centaurea stoebe*).

Bank Erosion Inventory

The Ashley Creek Stream Mitigation Site has a history of stream bank erosion. Confluence reported bank erosion during several previous monitoring events (see previous monitoring reports), and MDT took corrective actions to address the eroding banks in 2022. The following section provides an updated bank erosion inventory and describes where new erosion is occurring and where previous erosion has been addressed. Photos of each eroding bank are included in Appendix B of this report, while Figure 2 in Appendix A provides the locations of each eroding bank. Descriptions of bank erosion observed during previous monitoring events can be found online at: <https://www.mdt.mt.gov/publications/brochures/stream-mitigation.aspx>

For the purposes of this report an "eroding bank" is defined as any bank greater than two feet in length that is more than 50% bare mineral soil and has no roots, surface vegetation, or other stabilizing structure (e.g. rock, woody debris) to inhibit erosion.

Total eroding bank length within the Ashley Creek stream mitigation project area decreased from 266 feet in 2021 to 201 feet in 2023. This decrease is due to corrective actions that were taken in 2022 to stabilize eroding banks. The length of erosion on the south bank is now 96 feet and was only documented underneath the US 93 – Kalispell Bypass bridge in 2023, where in previous years bank erosion had also been noted on the south bank above the bridge. The eroding south bank that was previously documented upstream of the bridge (EBR1) was stabilized in 2022 by reducing the slope angle, and installing erosion control fabric, soil lifts, and willow cuttings. All of these corrective actions had effectively stabilized this bank segment in 2023. Approximately 105 feet of the north bank were eroding during the 2023 monitoring event, which is consistent with 2020 and 2021. Despite the efforts made to repair the eroding banks under the bridge in 2022, both the north and south banks are sparsely vegetated and have large sections that are slumping (Additional photos 3-6 and 8-10, Appendix B).

One factor potentially contributing to the upper north bank erosion could be that the thalweg appears to have shifted toward the north bank since the 2021 monitoring event (Figure 2, Appendix A). This shift has not caused erosion along the toe of the north bank to date. The clay lens at toe of both streambanks, noted in previous monitoring reports, is still present and likely still protecting the lower portions of the stream banks from lateral erosion.

Annual cross-section surveys show slumping on the upper north bank at Transect 4. While this bank still has enough plant cover to prevent excessive erosion, it should be monitored in future years to ensure this remains true. Since much of the stream has been fenced off, it appears that people are now accessing the creek in locations that are not fenced, such as in the vicinity of Transect 4 along the south bank, thus causing impacts to the streambanks in locations not observed before.

Channel Form

Annual surveys of the Ashley Creek longitudinal profile indicate the channel form is generally stable and that pool and riffle features are being maintained over time (Appendix E). The mitigation reach supports three pools, each of which are separated by a distinct riffle. These pool-riffle sequences provide adequate slow water habitat for fish and faster-moving shallow water habitat for insect production. However, in 2023, all three of the pools were 1-2 feet shallower than in 2021 or 2020. Continued monitoring will determine if the current pool depth is maintained or if pool depths increase again in the future.

The four cross-sectional transects monitored annually reflect some of the changes that occurred within the project reach since the 2022 streambank reconstruction. The Transect 1 cross-section, which is located above the area impacted by the 2022 bank reconstruction activities, indicates that the bankfull channel dimensions have been maintained over time. The bank profiles at Transects 2 and 3 were modified during the 2022 bank repair, and the cross-sectional profiles show how the south bank were re-sloped. Both banks at Transect 2 were reconstructed to a reduced slope, as was the south bank at Transect 3. The north bank at Transect 3 was built to a steeper slope than it was prior to reconstruction. As mentioned in the bank erosion section, the south bank of Transect 4 also appears to have slumped since the 2021 monitoring event.

While the channel geometry below the bankfull elevation remained similar to the pre-construction geometry at all four monitoring transects, the channel has become approximately one foot shallower at Transects 1 and 2 (pool transects) since 2021. The average bankfull depth in riffles was 2.8 feet, as it has been in years past. The average bankfull pool depth was 7.3 feet, approximately one foot shallower than in 2021. The average bankfull width was 26.1 feet at riffle transects (T3 & T4), which is approximately 1.5 feet wider than in 2021. The increase in average bankfull width at riffle transects is entirely due to the expansion of the bankfull channel on the south bank at T2. The average bankfull width at pools was 34.8 feet which is similar to that of previous years (Table 3).

Table 3. Maximum bankfull depths and bankfull widths at cross-section transects 2013-2015, 2020, 2021, and 2023.

Transect	Type	Maximum Depth (ft)						Bankfull Width (ft)					
		2013	2014	2015	2020	2021	2023	2013	2014	2015	2020	2021	2023
1	Pool	**	9.9	10.1	9.0	9.0	8.0	43.8	43.6	45.1	42.9	43.3	42.4
2	Pool	**	8.2	7.9	7.3	7.5	6.5	29.0	30.8	31.0	26.9	27.2	27.2
3	Riffle	2.6	2.8	2.8	2.9	2.9	3.0	26.3	26.3	27.0	25.0	23.6	25.9
4	Riffle	3	2.7	2.6	2.4	2.7	2.5	30.0	29.5	28.5	27.5	25.8	26.3
Average Riffles		2.8	2.8	2.7	2.7	2.8	2.8	28.2	27.9	27.8	26.3	24.7	26.1
Average Pools		N/A	9.1	9.0	8.2	8.2	7.3	36.4	37.2	38.1	34.9	35.3	34.8

** Maximum pool depths not surveyed in 2013

Ashley Creek’s access to its floodplain within the mitigation reach is limited to the south bank upstream of the US 93-Kalispell bypass bridge. The remainder of the reach is constricted by steeply sloped banks that extend above the floodplain elevation. During high water events, Ashley Creek does not have access to a floodplain throughout this confined reach and therefore exerts erosive forces directly on the streambanks. High velocity flows coming in direct contact with poorly vegetated, unstable, eroding banks will likely result in continued erosion under the bridge during high flow events. Though reconstruction of the south bank upstream of the bridge did provide a small amount of increased floodwater storage capacity, the majority of the reach is channelized and will convey floodwater quickly

Conclusions

In 2023, the Ashley Creek mitigation site met four of the six quantitative performance standards. The site met or exceeded the criteria for non-noxious vegetative cover, noxious weed cover, planted woody vegetation survival in the riparian buffer, and streambank stability. However, the combined aerial cover of riparian and stream bank vegetation failed to meet the 70% cover threshold due to high amounts of bare ground, and the stream bank vegetation community failed to meet the required root stability index threshold of 6.

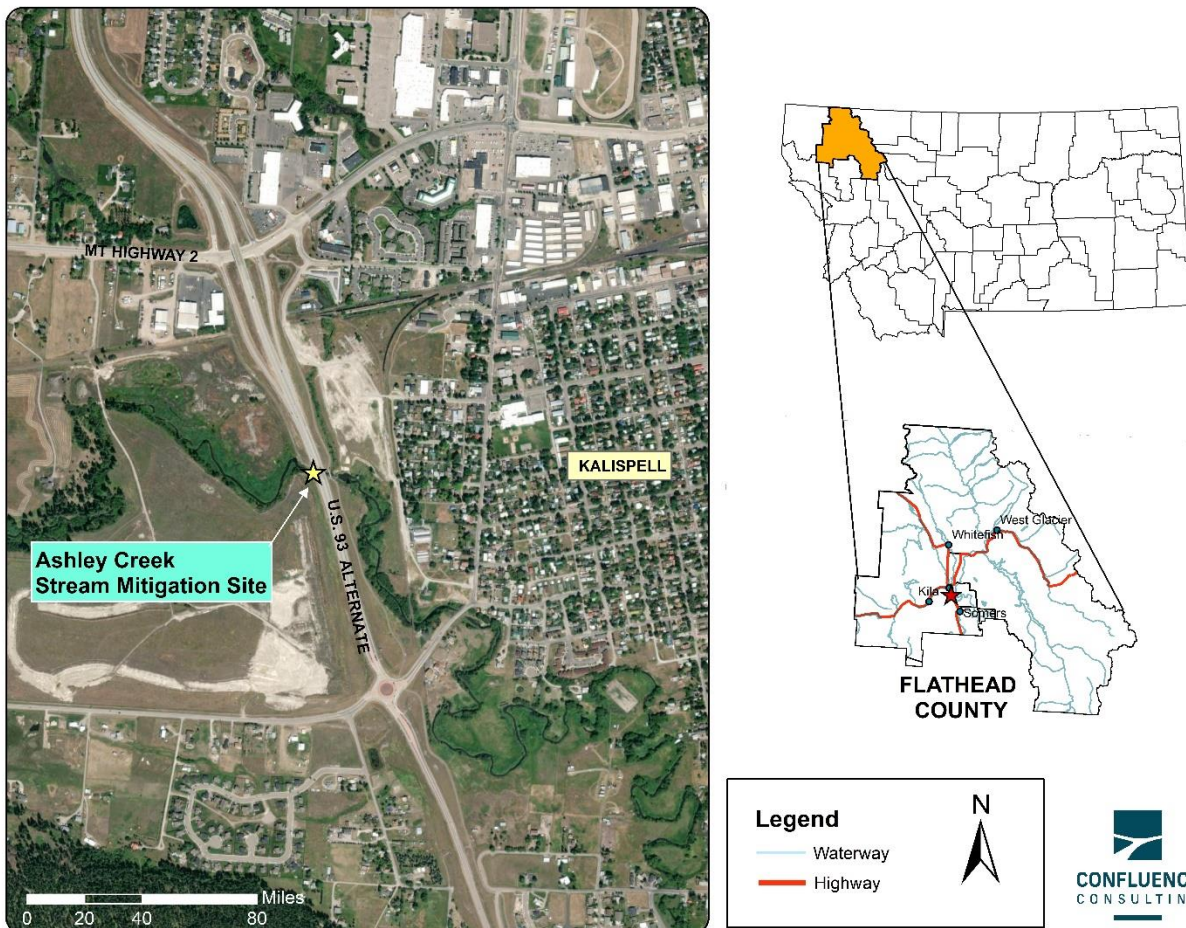
The Ashley Creek mitigation site failed to meet the qualitative performance criterion for channel form success. The channel form has been largely maintained and exhibits multiple pool and riffle features, but the site exhibits limited floodplain accessibility beneath and immediately upstream of the bridge. Poor riparian vegetation establishment under the US 93 – Kalispell Bypass bridge also limits channel function.

All performance standard failures at the Ashley Creek mitigation site are associated with the US 93 – Kalispell Bypass bridge and the condition of the streambanks underneath the bridge. The 100-foot-wide bridge covers 48% (220 of 460 feet) of the riparian transects. The bridge affects vegetation growth and establishment by intercepting direct sunlight and precipitation. Very little vegetation has established under the bridge since the bridge was expanded to accommodate 5 lanes of traffic. MDT has attempted to address bank instability and vegetation establishment, in areas where previous monitoring results are problematic. Vegetative

establishment and bank stability have improved where sunlight is available, yet remains an issue where the bridge footprint precludes successful plant growth.

Maps, Plans, Photos:

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A (Figure 2 – Monitoring Features, Figure 3 – Noxious Weeds and Vegetation Communities).

Photos: See Appendix B (Monitoring Photo and Survey Photo Logs).

Comprehensive Plant List: See Appendix C (Table C-1).

Stream Bank Vegetation Composition: See Appendix D (Table D-1).

Perpendicular Transect and Longitudinal Profile Plots: See Appendix E.

Plans: See Appendix E of the 2013 Monitoring Report.

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

References

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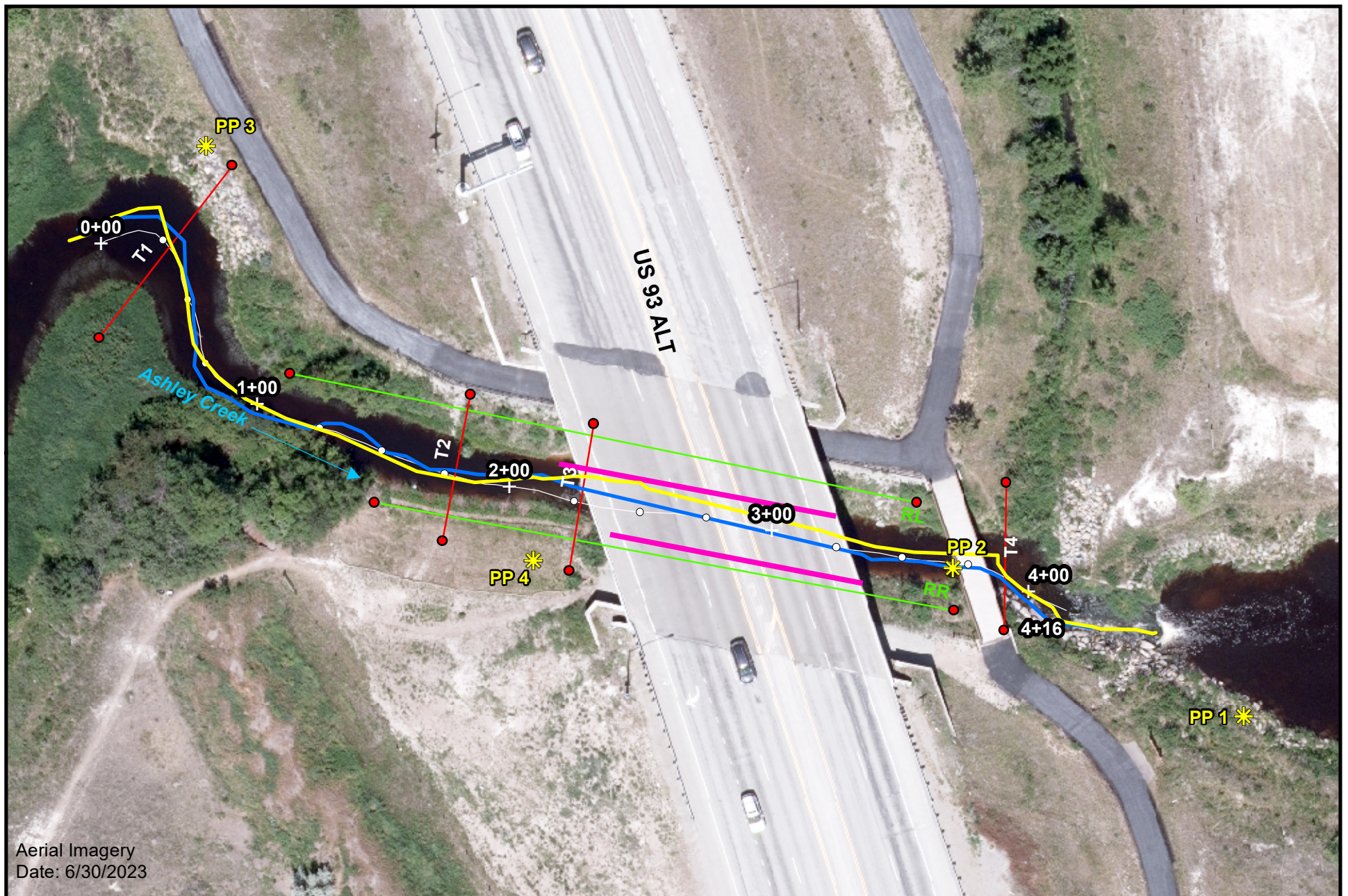
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APPENDIX A

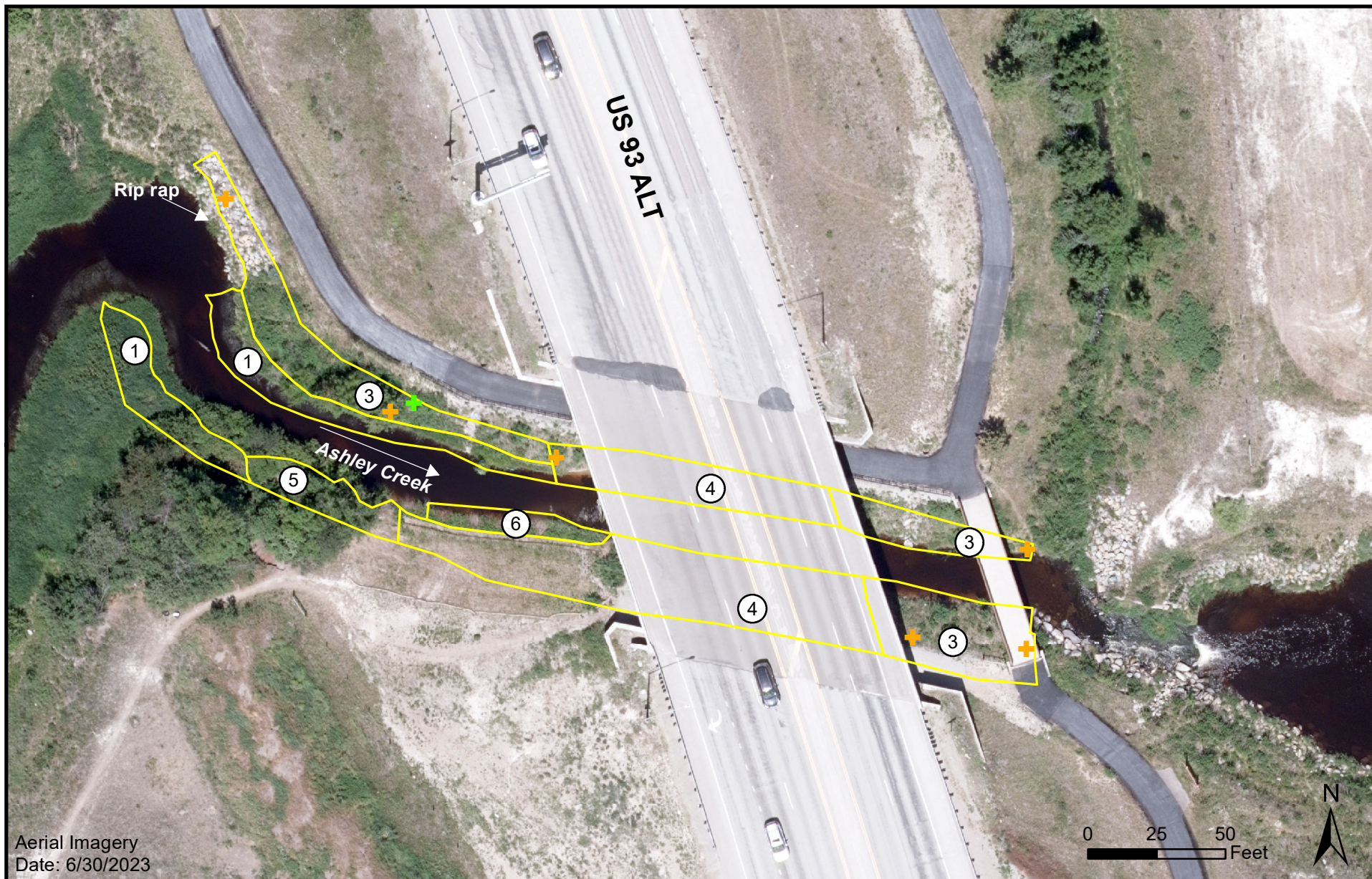
PROJECT AREA MAPS

MDT Streams Mitigation Monitoring
Ashley Creek
Flathead County, Montana



Aerial Imagery
Date: 6/30/2023





Legend

Vegetation Community Boundary

Noxious Weeds

- + Convolvulus arvensis
- + Tanacetum vulgare

Vegetation Community

- ① Phalaris Community
- ③ Phalaris/Elymus Community
- ④ Bare Ground/Elymus Community
- ⑤ Cornus/Alnus Community
- ⑥ Salix Community

Ashley Creek - 2023 Noxious Weeds and Vegetation Communities

Figure 3

Date: 10/25/2023

Ashley_monitor2023.mxd

APPENDIX B

PROJECT AREA PHOTOGRAPHS

MDT Streams Mitigation Monitoring
Ashley Creek
Flathead County, Montana

MONITORING PHOTO LOG

SITE NAME: Ashley Creek
MONITORING YEARS: 2013 and 2023



2013



2023

Photo Point 1: View of grade control structure downstream of project area. **Compass:** 315° (Northwest)



2013



2023

Photo Point 2: View looking upstream from pedestrian bridge. **Compass:** 315° (Northwest)



2013



2023

Photo 3.1: View looking south at upstream end of project site. **Compass:** 180° (South)

MONITORING PHOTO LOG

SITE NAME: Ashley Creek

MONITORING YEARS: 2013 and 2023



2013



2023

Photo 3.2: View looking at upstream end of project site. **Compass:** 225° (Southwest)



2013



2023

Photo 4.1: View looking downstream from south bank. **Compass** 90° (East)



2013



2023

Photo 4.2: View of channel looking upstream from south bank. **Compass** 315° (Northwest)

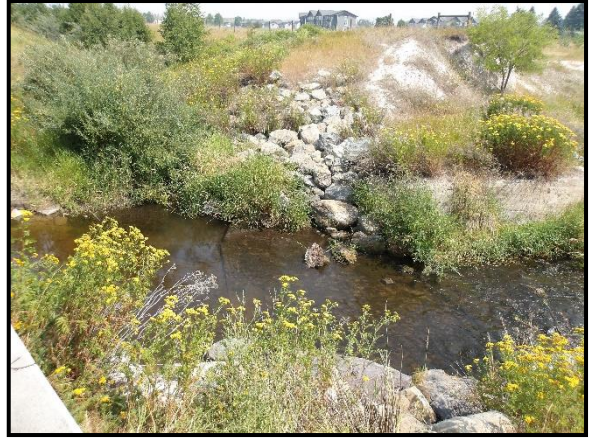
MONITORING PHOTO LOG

SITE NAME: Ashley Creek

MONITORING YEARS: 2013 and 2023



2013



2023

Additional Photo 1: View of Ashley/Spring Creek confluence.



2013 (before)



2023 (after)

Additional Photo 2: South bank upstream of the US 93-Kalispell Bypass Bridge before and after the 2022 bank repair.



2018



2023

Additional Photo 3: Upstream end of eroding south bank under the US 93-Kalispell Bypass bridge.

MONITORING PHOTO LOG

SITE NAME: Ashley Creek

MONITORING YEARS: 2013 and 2023



2013



2023

Additional Photo 4: Downstream end of the eroding south bank under the US 93-Kalispell Bypass Bridge. The area denoted with the arrow is slumping and the soil lifts are pulling away from the bank.



2014



2023

Additional Photo 5: Stabilized culvert outlet on the upstream end of the project area. This culvert may have been jeopardized by fence post placement, which appears to be washing out. See additional Photo 7.



2013



2023

Additional Photo 6: Eroding left bank under the US 93 – Kalispell Bypass bridge. The area denoted with the arrow is slumping and the soil lifts are pulling away from the bank.

MONITORING PHOTO LOG

SITE NAME: Ashley Creek

MONITORING YEARS: 2013 and 2023



May 2023

Additional Photo 7: Looking at the culvert shown in additional photo 5 from above. The area around the fence post footers is eroding.



August 2023

Additional Photo 8: Close-up of the downstream end of the south bank repair showing cracks and slumping.



May 2023

Additional Photo 9: Close-up of the middle of the south bank repair showing cracks and soil lift slumping.



May 2023

Additional Photo 10: Close-up of the middle of the north bank repair showing cracks and soil lift slumping.



May 2023

Additional Photo 11: Repaired south bank upstream of the bridge.



August 2023

APPENDIX C

2013 – 2023 COMPREHENSIVE PLANT SPECIES LIST

MDT Streams Mitigation Monitoring
Ashley Creek
Flathead County, Montana

Table C-1. Comprehensive list of plant species observed at the Ashley Creek Stream Mitigation Site from 2013 through 2015, 2018 through 2021, and 2023.

Scientific Name	Common Name	WMVC Indicator Status*
<i>Agropyron</i> sp.	Wheatgrass	N/A
<i>Agrostis gigantea</i>	Black Bent	FAC
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus pratensis</i>	Field Meadow-Foxtail	FAC
<i>Amelanchier alnifolia</i>	Saskatoon Service-Berry	FACU
<i>Artemisia absinthium</i>	Absinthium	UPL
<i>Artemisia biennis</i>	Biennial Wormwood	FACW
<i>Asperugo procumbens</i>	German-Madwort	UPL
<i>Avena fatua</i>	Wild Oats	UPL
<i>Bassia scoparia</i>	Mexican-Fireweed	FAC
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Betula pumila</i>	Bog Birch	OBL
<i>Bromus carinatus</i>	California Brome	UPL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus tectorum</i>	Cheatgrass	UPL
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Chenopodium album</i>	Lamb's-Quarters	FACU
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Clematis ligusticifolia</i>	Deciduous Traveler's Joy	FAC
<i>Convolvulus arvensis</i>	Field Bindweed	UPL
<i>Cornus alba</i>	Red Osier	FACW
<i>Cynoglossum officinale</i>	Gypsy-Flower	FACU
<i>Descurainia sophia</i>	Herb Sophia	UPL
<i>Elodea canadensis</i>	Canadian Waterweed	OBL
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC
<i>Elymus hispidus</i>	Intermediate Wheatgrass	UPL
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Panicked Willowherb	UPL
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW
<i>Equisetum arvense</i>	Field Horsetail	FAC
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW
<i>Festuca idahoensis</i>	Bluebunch Fescue	FACU
<i>Galium aparine</i>	Sticky-Willy	FACU
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Helianthus maximiliani</i>	Maximilian Sunflower	UPL
<i>Helianthus nuttallii</i>	Nuttall's Sunflower	FACW

Scientific Name	Common Name	WMVC Indicator Status*
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Lepidium perfoliatum</i>	Clasping Pepperwort	FACU
<i>Lupinus argenteus</i>	Silvery Lupine	UPL
<i>Lupinus lepidus</i>	Stemless-dwarf Lupine	UPL
<i>Lupinus</i> sp.	Lupine	N/A
<i>Malva neglecta</i>	Dwarf Cheeseweed	UPL
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Medicago sativa</i>	Alfalfa	UPL
<i>Melilotus albus</i>	White Sweetclover	UPL
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Onopordum acanthium</i>	Scotch Thistle	UPL
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Peritoma serrulata</i>	Rocky Mountain Beeplant	FACU
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Plantago major</i>	Great Plantain	FAC
<i>Poa palustris</i>	Fowl Blue Grass	FAC
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC
<i>Populus angustifolia</i>	Narrow-Leaf Cottonwood	FACW
<i>Populus balsamifera</i>	Balsam Poplar	FAC
<i>Potamogeton richardsonii</i>	Red-Head Pondweed	OBL
<i>Potentilla anserina</i>	Silverweed	OBL
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rumex acetosa</i>	Garden Sorrel	FAC
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix drummondiana</i>	Drummond's Willow	FACW
<i>Salix exigua</i>	Narrow-Leaf Willow	FACW
<i>Salix lasiandra</i>	Pacific Willow	FACW
<i>Salsola tragus</i>	Prickly Russian Thistle	FACU
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<i>Silene latifolia</i>	Bladder Campion	UPL
<i>Silene repens</i>	Creeping Catchfly	UPL
<i>Silene vulgaris</i>	Maiden's-tears	UPL
<i>Sinapis arvensis</i>	Corn Mustard	UPL
<i>Sisymbrium altissimum</i>	Tall Hedge-Mustard	FACU
<i>Solanum dulcamara</i>	Climbing Nightshade	FAC
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Sonchus arvensis</i>	Field Sow-Thistle	FACU
<i>Symphoricarpos albus</i>	Common Snowberry	FACU
<i>Symphoricarpos occidentalis</i>	Western Snowberry	FAC

Scientific Name	Common Name	WMVC Indicator Status*
<i>Symphyotrichum ascendens</i>	Western American-Aster	FACU
<i>Symphyotrichum laeve</i>	Smooth Blue American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Thlaspi arvense</i>	Field Pennycress	UPL
<i>Tragopogon dubius</i>	Meadow Goat's-Beard	UPL
<i>Trifolium repens</i>	White Clover	FAC
<i>Urtica dioica</i>	Stinging Nettle	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>Vicia americana</i>	American Purple Vetch	FAC

* 2020 National Wetland Plant List; Western Mountains, Valleys, and Coast Region (WMVC) (USACE 2020)

New species identified in 2023 are **bolded**

Species identified to genus level have been assigned an indicator status of N/A

APPENDIX D

2023 STREAM BANK VEGETATION COMPOSITION

MDT Streams Mitigation Monitoring
Ashley Creek
Flathead County, Montana

Streambank Species	South Bank	North Bank Cover Class	South Bank	South Bank Cover Class	WMVC Indicator Status*
<i>Agrostis stolonifera</i>	X	1	X	1	FAC
<i>Alnus incana</i>	X	0	X	0	FACW
<i>Artemisia absinthium</i>	X	1	X	0	UPL
<i>Bromus inermis</i>	X	1	X	1	UPL
<i>Carex stipata</i>	X	0	-	-	OBL
<i>Centaurea stoebe</i>	X	0	-	-	UPL
<i>Chenopodium album</i>	X	0	X	1	FACU
<i>Cirsium arvense</i>	X	1	X	1	FAC
<i>Cornus alba</i>	-	-	X	1	FACW
<i>Cynoglossum officinale</i>	X	0	-	-	FACU
<i>Elymus repens</i>	X	1	X	2	FAC
<i>Equisetum arvense</i>	X	0	X	1	FAC
<i>Galium aparine</i>	X	0	-	-	FACU
<i>Glyceria grandis</i>	X	0	-	-	OBL
<i>Helianthus maximiliani</i>	X	0	-	-	UPL
<i>Lactuca serriola</i>	X	1	-	-	FACU
<i>Medicago lupulina</i>	X	0	-	-	FACU
<i>Melilotus officinalis</i>	X	0	X	0	FACU
<i>Peritoma serrulata</i>	X	0	X	0	FACU
<i>Phalaris arundinacea</i> **	X	4	X	3	FACW
<i>Poa pratensis</i>	X	0	X	0	FAC
<i>Rosa woodsii</i>	X	0	-	-	FACU
<i>Salix bebbiana</i>	X	0	-	-	FACW
<i>Salix drummondiana</i>	X	0	X	2	FACW
<i>Salix exigua</i>	-	-	X	1	FACW
<i>Salix lasiandra</i>	-	-	X	1	FACW
<i>Scirpus microcarpus</i>	X	1	-	-	OBL
<i>Sisymbrium altissimum</i>	-	-	X	1	FACU
<i>Sonchus arvensis</i>	X	1			FACU
<i>Symphoricarpos albus</i>	X	0	X	0	FACU
<i>Symphyotrichum campestre</i>	X	0	-	-	UPL
<i>Symphyotrichum foliaceum</i>	X	0	-	-	FACU
<i>Tanacetum vulgare</i>	X	1	X	0	FACU
<i>Taraxacum officinale</i>	X	0	-	-	FACU
<i>Thlaspi arvense</i>	X	0	X	0	UPL
<i>Typha latifolia</i>	X	0	-	-	OBL

*2020 National Wetland Plant List; *Western Mountains, Valleys, and Coasts* (WMVC) (USACE, 2020)

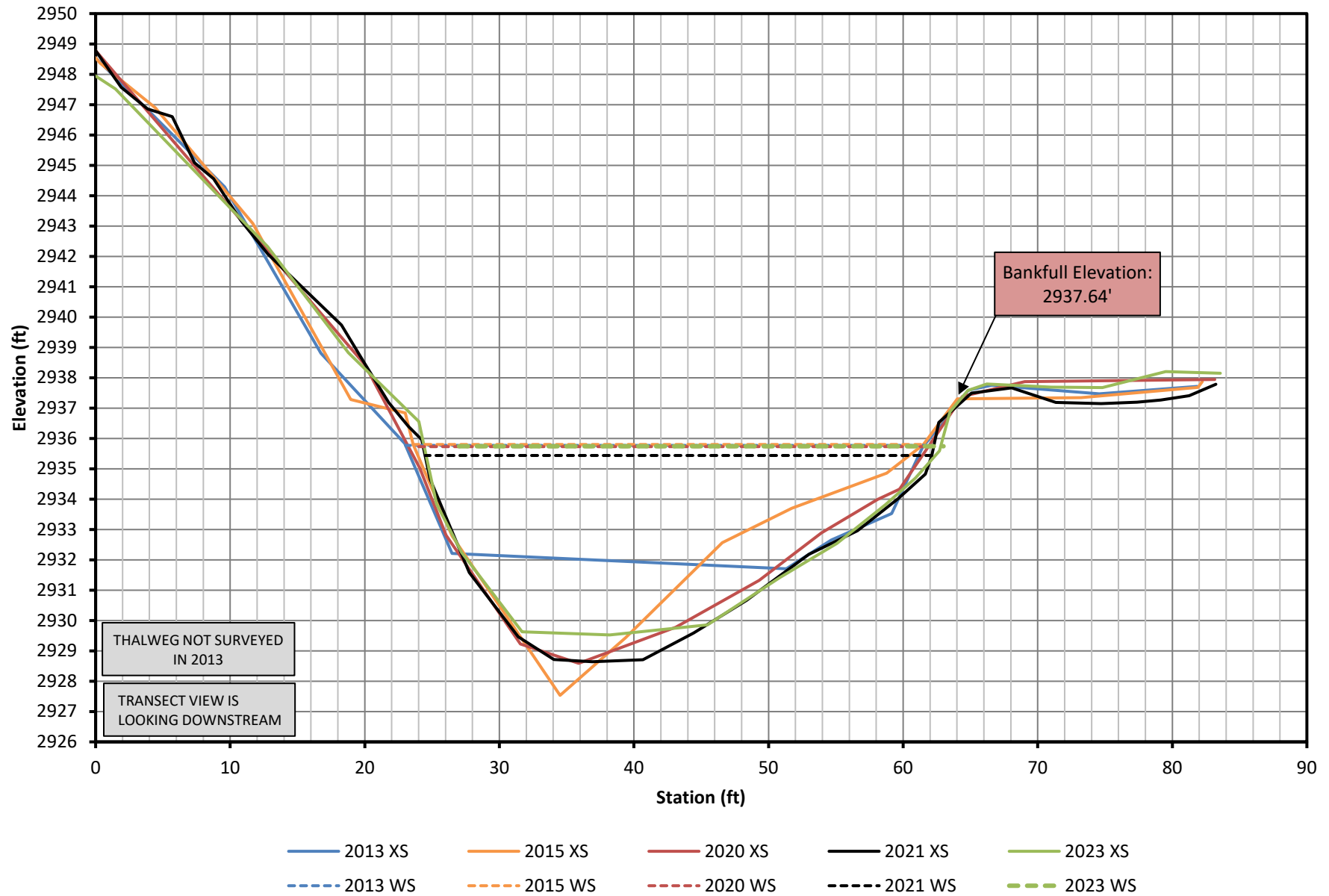
** Dominant species observed along Ashley Creek stream banks

APPENDIX E

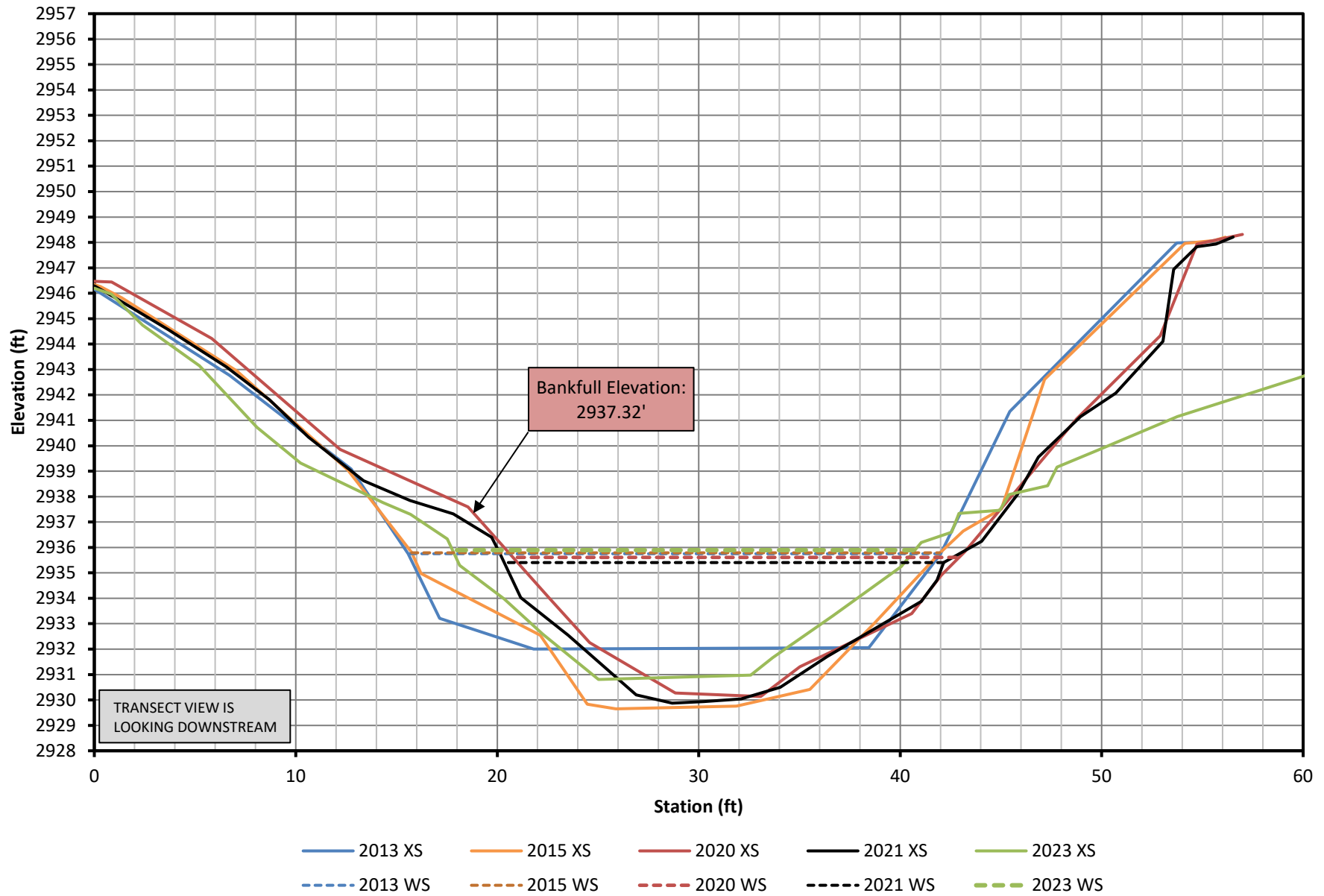
LONGITUDINAL PROFILE AND PERPENDICULAR TRANSECT PLOTS

MDT Streams Mitigation Monitoring
Ashley Creek
Flathead County, Montana

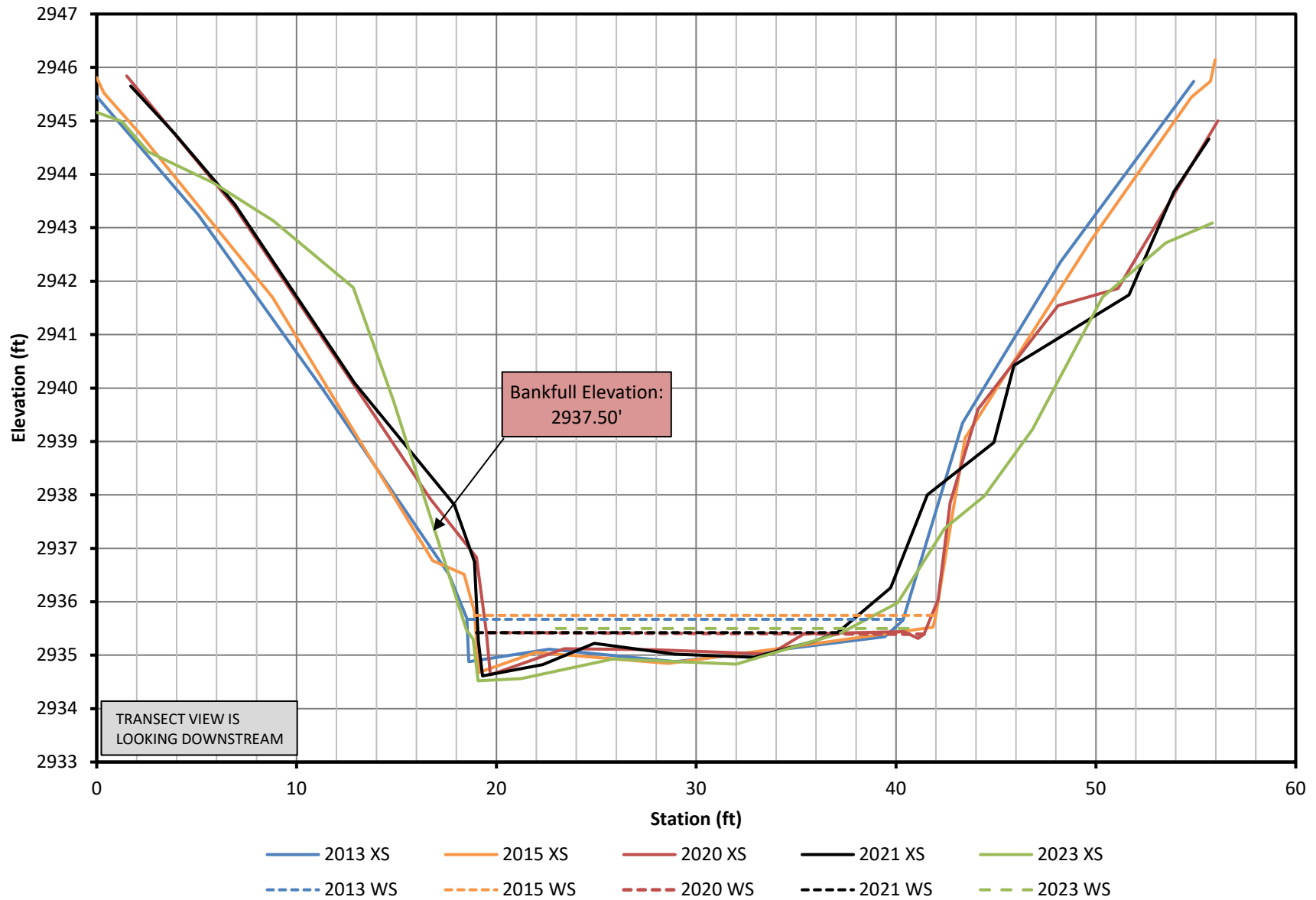
Ashley Creek Transect #1 - Pool



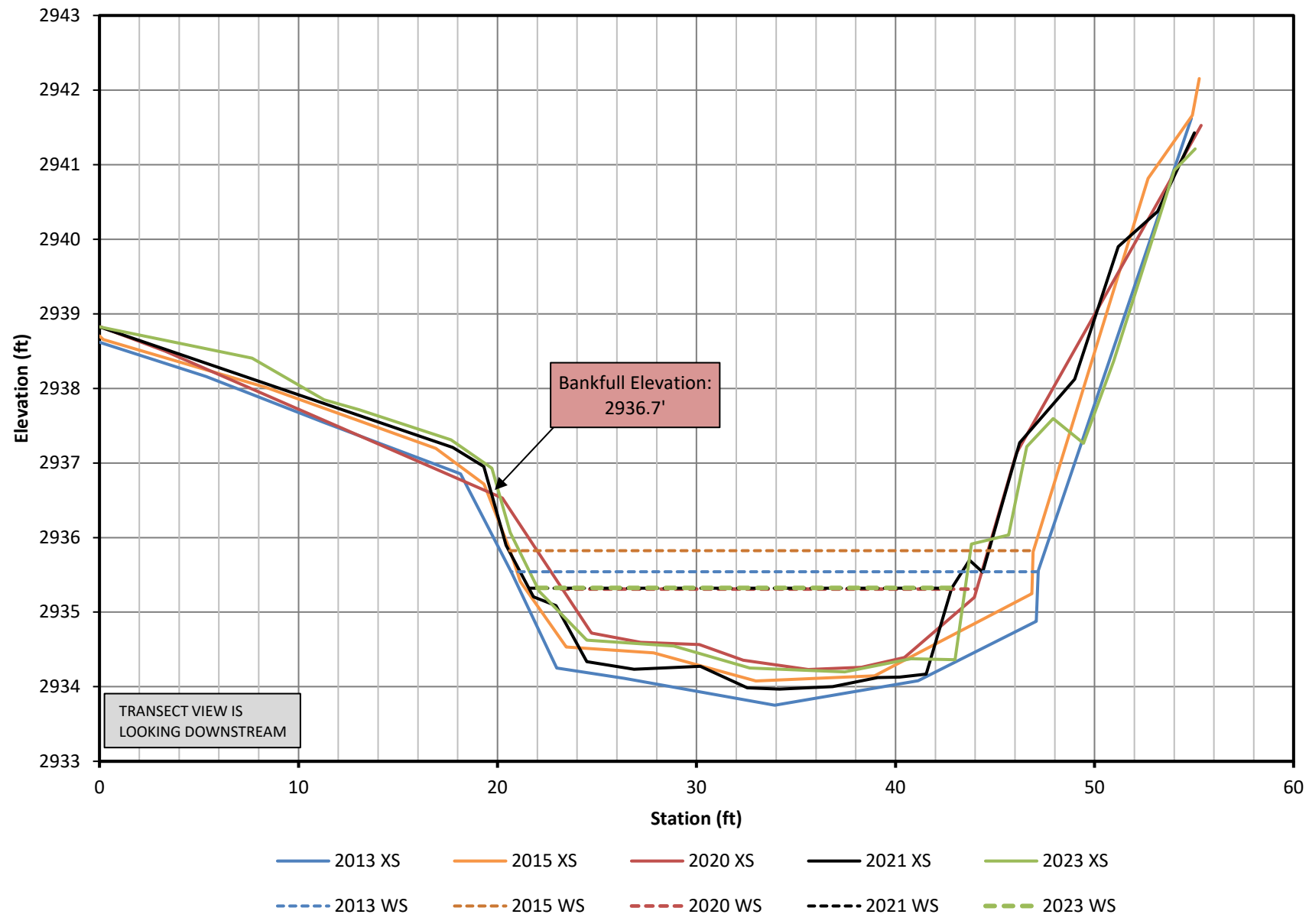
Ashley Creek Transect #2 - Pool



Ashley Creek Transect #3 - Riffle



Ashley Creek Transect #4 - Riffle



Ashley Creek Longitudinal Profiles

