

## US 2 - SWAMP CREEK MITIGATION SITE

Montana Department of Transportation Stream Mitigation Monitoring Report

### Project Overview

**Watershed:** Watershed #1 – Kootenai River

**MDT Project:** Libby Creek-South; NH-F 1-1(29)45 F, CN 1027004

**Monitoring Year:** 2024

**Years Monitored:** 10<sup>th</sup> year of monitoring

**Corps Permit Number:** NWO-2012-00146-MTM

**SPA Authorization:** MDT-R1-08-2012

**Monitoring Conducted By:** Confluence Consulting Inc.

**Monitoring Dates:** August 12<sup>th</sup> – 16<sup>th</sup>, 2024

#### **Purpose of the approved project:**

The purpose of the Swamp Creek mitigation project was to provide onsite mitigation to compensate for unavoidable impacts to the Swamp Creek channel associated with the Libby Creek – South road reconstruction project on Highway 2. The project involved relocating 11,260 feet of Swamp Creek channel away from the roadway. The project included five reconstructed channel reaches, which are numbered from downstream to upstream (Table 1).

**Table 1.** Site Location Coordinates

Reach No.	Upstream Coordinates	Downstream Coordinates
1	48.220508, -115.4721273	48.221688, -115.4725672
2	48.217889, -115.4668691	48.219270, -115.4700393
3	48.199532, -115.4505371	48.209107, -115.4584196
5	48.190702, -115.4429910	48.191503, -115.4435604
7	48.181414, -115.4437213	48.188837, -115.4419659

**County:** Lincoln **Nearest Town:** Libby

**Maps Included:** Figure # 3 & Appendix A.

**Mitigation Site Construction Started:** 2013 **Construction Ended:** 2014

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

**Activity:** Noxious weed control management efforts. **Date:** May 1<sup>st</sup>, 2024

**Specific recommendations for additional corrective actions:** Continue noxious weed control management in 2025.

#### **Previous Monitoring Reports and Methods Descriptions:**

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

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

**Monitoring Period:** Minimum of 5 years from construction completion or until concurrence by US Army Corps of Engineers (USACE).

#### **Performance Standards:**

Seven performance standards were established for the Swamp Creek mitigation project, which are assessed independently for each of the five monitoring reaches. Performance standards for riparian buffer, stream bank vegetation, and stream channel restoration success are summarized by monitoring reach in Table 2. All performance criteria were achieved in Reaches 3.2 and 3.3 in 2024. Monitoring data that support conclusions regarding the performance standards and associated 2024 achievement status are provided in the following sections of this report.

**Table 2.** Summary of Performance Standards.

Performance Standards	Success Criteria	Criteria Achieved by Reach (Y/N)									
		1	2	3.1	3.2	3.3	3.4	5	7.1	7.2	
Riparian Buffer Success	Areas within creditable riparian buffer disturbed during construction must have $\geq 50\%$ cover of non-noxious plant species by the end of the monitoring period	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Combined areal cover of riparian and stream bank vegetation communities is at least 70%	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Noxious weeds do not exceed 10% cover within the riparian buffer areas	Y	Y	Y	Y	Y	N*	N*	Y	N	
	Planted trees and shrubs must exhibit 50% survival after 5 years	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Vegetation Along Stream Banks	The majority of the vegetation on the stream banks consists of deep-rooting riparian species with a root stability index values of 6 or greater	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Stream Channel Restoration Success	Bankfull width to depth ratios have value of $\leq 20$	N	Y	N	Y	Y	Y	N	N	N	
	Maximum pool depth based on the Longitudinal Profile has not been reduced by 20% or more.	N	N	N	Y	Y	N	N	Y	Y	

\*These reaches are located on private property. MDT has not been given permission to treat weeds on these parcels.

#### **Additional Reporting Requirements:**

1. **Photographs** of the restored stream channel and adjacent riparian vegetation community will be taken annually from established photo points to monitor the development of the site. Photographs will also be captured at the end of each stream transect to show the stream channel and vegetation communities both upstream and downstream.
2. **Weed Control** will be based upon annual monitoring which will determine the weed species present and infestation sizes within the site. Control measures will be implemented by MDT and its weed contractors to minimize and/or eliminate the intrusion of State Listed Noxious weed species within the stream corridor.

#### **Summary Data**

Data collected at the Swamp Creek mitigation site in 2024 are summarized below. Some monitoring results are presented by individual monitoring reach, but where possible, data were summarized for brevity. The mitigation site was constructed as five separate reaches. However, reaches 3 and 7 were split into sub-reaches for monitoring purposes due to differing construction timelines and for documenting observations made during annual monitoring events. Sub-reach 3.1 was further divided into reaches 3.1a and 3.1b due to significant downcutting observed in the lower end of the reach in 2015.

#### **Riparian Vegetation Inventory**

In 2024, total riparian cover within the 22-foot-wide riparian belt transects was estimated at 87%. Total riparian cover is comprised of 31% woody vegetation, 77% herbaceous vegetation, and 10% cover provided by noxious weed species. Total cover ranged from 70-97% among reaches, with Reaches 3.3 and 3.4 having the highest cover values and Reach 7.2 having the

lowest. Several large areas of bare ground were observed over the last several years within Reach 7.2. However, vegetation began to reestablish within these areas in 2021 and total cover was observed at 70% in 2024 (Table 3).

**Table 3.** Areal riparian vegetation cover estimates for riparian belt transects at the Swamp Creek stream mitigation site in 2015, 2023, and 2024.

Monitoring Reach	Length (ft)	Year Built	Total % Riparian Cover			% Woody Cover			% Noxious Weed Cover			% Cover Non-noxious species		
			2015	2023	2024	2015	2023	2024	2015	2023	2024	2015	2023	2024
1	282	2013	70	76	76	5	14	14	10	3	4	60	73	72
2	556	2013	80	87	88	20	33	33	12	3	4	68	84	84
3.1a	458	2013	90	86	87	40	31	31	18	3	4	72	83	83
3.1b	796	2013	90	87	87	40	39	39	17	4	5	73	83	82
3.2	639	2014	55	75	75	3	15	15	4	7	8	51	68	67
3.3	447	2013	95	97	97	9	30	30	4	5	6	91	92	91
3.4	1,530	2013	95	97	97	35	40	40	30	15	17	65	82	80
5	338	2013	75	82	83	20	25	25	10	27	30	65	55	53
7.1	1,606	2013	98	94	94	35	38	38	18	7	8	80	87	86
7.2	1,065	2014	60	70	70	10	15	15	20	10	11	40	60	59
<b>Total</b>	<b>7,717</b>	<b>Area Weighted Cover</b>	<b>84</b>	<b>87</b>	<b>87</b>	<b>25</b>	<b>31</b>	<b>31</b>	<b>18</b>	<b>9</b>	<b>10</b>	<b>66</b>	<b>78</b>	<b>77</b>

Dominant species recorded along the riparian belt transects were combined with visual observations to develop a vegetation community map for each of the five restored channel segments. Twenty-two vegetation community types were identified and mapped in 2024 (Maps 9-12, Appendix A). In addition to the percent cover classes and vegetation community classifications, a comprehensive list of all vegetation species observed along each of the reconstructed channel segments is included in Appendix C.

#### **Stream Bank Vegetation Composition**

Total percent vegetation cover within the three-foot-wide stream bank vegetation transects was 85% or greater for all monitoring reaches (Table 4). The area-weighted total cover for the stream bank buffer portion of the riparian transect across the entire project area was 93%. A comprehensive list of species observed along the streambank transects and their associated cover classes is included in Appendix D.

**Table 4.** Areal vegetation cover estimates for stream bank buffers at the Swamp Creek stream mitigation site in 2015 and 2022-2024.

Monitoring Reach	Transect Length (ft)	Total % Vegetated Cover			
		2015	2022	2023	2024
1	282	95	92	93	93
2	556	95	95	95	95
3.1a	458	100	91	92	92
3.1b	796	90	83	84	85

3.2	639	50	83	85	86
3.3	447	100	97	98	98
3.4	1,530	100	97	97	97
5	338	80	91	92	92
7.1	1,606	100	95	95	95
7.2	1,065	95	92	93	94
<b>Total</b>	<b>7,717</b>	<b>93</b>	<b>92</b>	<b>93</b>	<b>93</b>

Vegetation community types, identified by one or more dominant species in the community, were assigned to each reach. Multiple community types were observed along the banks in Reaches 1, 3.3, and 5, while only one community type was observed along the banks of the remaining reaches (Maps 9 – 17, Appendix B). Stability ratings were assigned based upon the dominant plant species for each community type, and were used to assess whether the stream bank vegetation is likely to resist erosive forces. The stability ratings range from one to ten, with higher scores assigned to communities that are more capable of resisting erosion and lower scores assigned to communities that are less capable of resisting erosion due to their root density and growth pattern (Winward 2000; Pick et al. 2004). All streambank vegetation communities observed in 2024 have stability ratings of 8 or higher and provide beneficial bank-stabilizing properties (Table 5).

**Table 5.** Dominant streambank community types and community type stability ratings, by reach, for the Swamp Creek stream mitigation site.

Reach	Dominant Stream Bank Community Type(s)	Community Type Stability Rating
1	<i>Phalaris arundinacea / Alnus incana</i>	9
	<i>Phalaris arundinacea / Equisetum arvense</i>	9
	<i>Phalaris arundinacea / Agrostis stolonifera</i>	9
2	<i>Phalaris arundinacea / Alnus incana</i>	9
3.1	<i>Phalaris arundinacea / Alnus incana</i>	9
3.2	<i>Phalaris arundinacea / Alnus incana</i>	9
3.3	<i>Phalaris arundinacea / Alnus incana</i>	9
	<i>Alnus incana / Equisetum arvense</i>	8
3.4	<i>Phalaris arundinacea / Alnus incana</i>	9
5	<i>Phalaris arundinacea</i>	9
	<i>Phalaris arundinacea / Alnus incana</i>	9
7.1	<i>Phalaris arundinacea / Alnus incana</i>	9
7.2	<i>Phalaris arundinacea / Alnus incana</i>	9

### Combined Cover

Combined areal cover for both the riparian and streambank transects (area weighted) ranged from 73% to 97%. All monitoring transects met the combined areal cover performance criterion in 2024 (Table 6).

**Table 6.** Combined total cover for riparian and stream bank transects (25 feet wide).

Monitoring Reach	Combined Riparian and Streambank Cover (%)
1	78
2	89
3.1a	88
3.1b	87
3.2	76
3.3	97
3.4	97
5	84
7.1	94
7.2	73

#### **Noxious Weed Inventory**

Six State-listed noxious weeds, including one Priority 2A and five Priority 2B species were identified within the Swamp Creek mitigation site in 2024 (Appendix E). Total percent noxious weed cover within each reach ranged from 4% to 30%, with a site-wide estimate of 10% total cover (Table 3). In 2024, minimal changes in noxious weed cover (i.e., plus or minus 1-2%) were observed along most reaches, with a 3% increase observed in Reach 5. However, all reaches except Reaches 3.4, 5, and 7.2 exhibited noxious weed cover below the performance success threshold of  $\leq 10\%$  noxious weed cover. Reach 7.2 is narrowly missing this threshold with noxious weed cover at 11%. Reaches 3.4 and 5, which are on private property, exhibited the highest noxious weed cover at 17% and 30% respectively.

Locations of all weed infestations that encompassed at least 1% of the transect area are shown on Maps 9 – 17 in Appendix B with the cover class of each infestation noted. Noxious weed infestations identified in trace amounts (<1% of inventory area) were noted and used to calculate total percent noxious weed cover but were not mapped. This includes all observations of orange hawkweed (*Hieracium aurantiacum*) and St. Johnswort (*Hypericum perforatum*), which were only observed in isolated, trace occurrences. MDT's weed management program is limited to treatments within MDT's Right-of-Way, but some stream reaches (i.e. 3.4 & 5) extend outside MDT's Right-of-Way.

#### **Woody Plant Survival**

Due to the length of time since construction and the inability to distinguish planted versus volunteer vegetation, a quantitative assessment of woody planting survival rates was discontinued in 2023. In 2024, the percent cover provided by woody vegetation was estimated along a 25-foot-wide combined streambank and riparian transect. The new transect combines the 3-foot-wide stream bank transect with the 22-foot-wide riparian belt transect. Estimates were calculated based on aerial images of each monitoring reach in conjunction with the total area of each combined transect. Aerial images of Swamp Creek were taken by the MDT airplane on June 25, 2024.

Estimates of woody cover along the transects ranged from 37-81%. Reach 3.2 demonstrates the lowest percent woody cover, while Reach 7.1 demonstrates the highest (Table 7). Estimates of woody cover along the transects are higher than those along the riparian transect, as many of the shrub plantings were placed immediately along the streambanks during construction in

2013. Consistent with the community types mapped at each reach, speckled alder (*Alnus incana*) was the dominant woody species observed. The speckled alder plants have established particularly well along the reconstructed channel segment, and many have grown over 15 feet tall over the last ten years.

Channel reconstruction disturbed a relatively narrow corridor and many of the adjacent shrubs and trees remained undisturbed, allowing the seed source for woody vegetation recruitment to remain relatively intact. As a result, many volunteer woody species have established in the disturbance corridor, including Woods' rose (*Rosa woodsii*), Douglas-fir (*Pseudotsuga menziesii*), common snowberry (*Symphoricarpos albus*), narrow-leaf cottonwood (*Populus angustifolia*), balsam poplar (*Populus balsamifera*), and multiple willow species (*Salix* spp.). A total of 18,800 trees and shrubs were prescribed for installation in the revegetation plan.

**Table 7.** Aerial estimates of woody cover in 2024.

Reach	% Woody Cover
1	47
2	73
3.1	65
3.2	37
3.3	74
3.4	62
5	64
7.1	81
7.2	39

#### **Bank Erosion Inventory**

Approximately 0.4% of the total stream bank length within the Swamp Creek mitigation area was classified as eroding in 2024, representing a decrease by 2.2% since 2023. Locations of all eroding banks are shown on Maps 1-8 in Appendix A. Bank erosion was noted in four of the nine monitoring reaches (Table 8). No eroding banks were observed in Reaches 1, 2, 3.3, 7.1, or 7.2. All remaining reaches exhibited eroding banks, the majority of which were observed and documented during previous monitoring events. During the 2024 inventory, many of the eroding banks were removed from the inventory list, while other, larger, actively eroding banks were still classified as eroding and retained in the inventory. Causes of all observed bank erosion is associated with natural processes of lateral bank migration over time and corrective action is not recommended. Below is a bank erosion summary by sub-reach.

No eroding banks were observed in Reaches 1 and 2 in 2024. During the 2023 inventory, many of the banks previously classified as eroding were removed from the inventory as they had sufficiently revegetated and stabilized. 2023 eroding bank locations were reevaluated in 2024 and have continued to vegetate and stabilize.

In Reach 3, approximately 2.3% of the total bank length was classified as eroding in 2024 (Table 8). This is a decrease by over 10% as compared to 2023 when 14.5% of the banks within this reach were classified as eroding. Many of the eroding banks from 2023 have become well vegetated, are low in height, and are developing inset benches.

Reach 3.1 exhibited ten eroding banks in 2023, however eight of those banks were removed from the inventory in 2024. Photos 1 and 2 below depict typical eroding banks within reach 3.1 that were either retained for the 2024 inventory or removed.



*Photo 1. Photo of eroding bank within reach 3.1 (STA 32+50) that was retained in the 2024 inventory.*



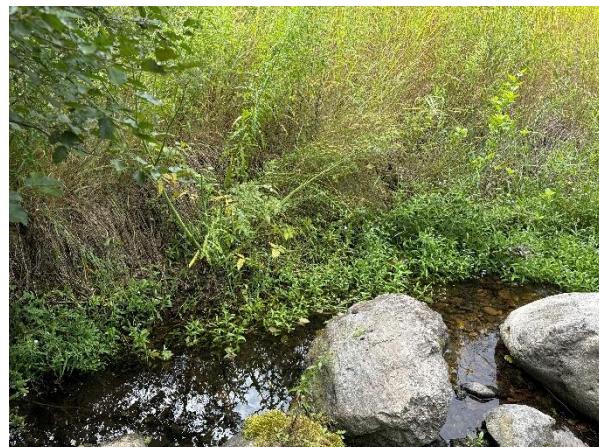
*Photo 2. Photo of eroding bank within reach 3.1 (STA 43+75) that was removed from the 2024 inventory.*

The eroding banks within Reach 3.1 that were removed from the inventory in 2024 exhibited low bank height, inset bench development, and mature vegetation along the banks. Undercut banks are often a natural characteristic of mature, well-vegetated streams; therefore, locations exhibiting undercuts that are not actively sloughing into the channel were removed from the 2024 eroding bank inventory.

Reach 3.2 contained four eroding banks in 2023, however three of those banks were removed from the inventory in 2024. The single eroding bank that was retained is due to bare ground and active bank material loss from erosion. The three banks that were removed from Reach 3.2 exhibited dense vegetation, stability at the toe, and appeared in a natural condition. Photos 3 and 4 below depict the single remaining eroding bank and an example of an eroding bank that was removed from the erosion inventory in 2024.



*Photo 3. Photo of eroding bank within reach 3.2 (STA 26+25) that was retained in the 2024 inventory.*



*Photo 4. Photo of eroding bank within reach 3.2 (STA 29+00) that was removed from the 2024 inventory.*

No eroding banks were observed in Reach 3.3 in either 2023 or 2024 (Table 8). This reach has remained stable for several years.

Reach 3.4 exhibited five eroding banks in 2023, however four of those banks were removed from the inventory in 2024. Photos 5 and 6 below depict typical eroding banks within reach 3.4 that were either retained for the 2024 inventory or removed.



*Photo 5. Photo of eroding bank within reach 3.4 (STA 13+50) that was retained in the 2024 inventory.*



*Photo 6. Photo of eroding bank within reach 3.4 (STA 12+00) that was removed from the 2024 inventory.*

The banks in Reach 3.4 that were removed from the inventory exhibited low bank height, a prevalence of woody root material, and a high percentage of established vegetation. The banks that were removed also exhibit natural, undercut characteristics, these conditions justify their removal from the eroding bank inventory.

Reach 5 exhibited one eroding bank in 2023 which was retained during the 2024 inventory. Photo 7 below was captured during the 2024 inventory depicting its current condition.



*Photo 7. Photo of eroding bank within reach 5 (STA 1+75) that was retained during the 2024 inventory.*

The single eroding bank in Reach 5 was retained due to the degree of exposed soil and lack of stabilizing vegetation. While this bank was retained during the 2024 inventory, the bank erosion is natural and has signs of wildlife using this area as a ramp to access and cross Swamp Creek. These conditions are considered natural, and no corrective action is recommended.

Reach 7.1 contained two eroding banks in 2023; however, both of those banks were removed following the 2024 inventory. Photos 8 and 9 below depict the conditions of the two banks in 2024.



*Photo 8. Photo of eroding bank within reach 7.1 (STA 32+00) that was removed from the 2024 inventory.*



*Photo 9. Photo of eroding bank within reach 7.1 (STA 14+25) that was removed from the 2024 inventory.*

These banks were removed from the inventory due to low bank height and establishment of mature woody vegetation. While the eroding bank at STA 14+25 does have an unvegetated toe, the presence of large woody root masses appears to be stabilizing the bank. Both locations exhibit natural and stable conditions justifying their removal from the erosion inventory.

No eroding banks were observed in Reach 7.2 in either 2023 or 2024 (Table 8). This reach continues to remain stable.

**Table 8.** Eroding banks observed throughout the Swamp Creek stream mitigation project area in 2024.

Reach	Eroding Bank Length (ft)	Total Bank Length (ft)	% Eroding Banks	Suspected Causes of Erosion
1	0	950	0.0	No erosion observed in Reach 1
2	0	1,970	0.0	No erosion observed in Reach 2
3.1	33	3,850	0.9	Many of the eroding banks from the 2023 monitoring year have become well vegetated and developed inset benches and were not recorded as actively eroding. Two eroding banks were still considered to be actively eroding and are located immediately upstream and downstream of the headcut from 2014. The eroding banks had varying bank heights between 3.4 and 4 feet, were sparse in vegetation, but were approaching an angle of repose. Bank angle and vegetation appear to be trending towards a stable direction, however continued monitoring is recommended.
3.2	11	1400	0.8	Many of the eroding banks from the 2023 monitoring year have become well vegetated and are stabilizing. Only 1 eroding bank was recorded as actively eroding with a vertical bank height of 3.1 feet and a total length of 11 feet. The bank is still too steep to fully vegetate and is failing at its toe from undercutting.
3.3	0	900	0.0	No erosion observed in Reach 3.3
3.4	20	3,250	0.6	Bank erosion in Reach 3.4 was limited to one actively eroding bank downstream of the stabilized headcut from 2019. The observed eroding bank had a vertical wall and was failing at its toe. Evidence of fine sediment deposition at the toe of the slope was observed.
5	9	750	1.2	Bank erosion was limited to a single outside meander bend. The recorded bank erosion appeared to be at a more stable slope, but was sparsely vegetated and actively contributing sediment to the system.
7.1	0	5300	0.0	No erosion observed in Reach 7.1
7.2	0	2400	0.0	No erosion observed in Reach 7.2
<b>Total</b>	<b>73</b>	<b>20,770</b>	<b>0.4</b>	

## **Channel Form**

### Longitudinal Profiles

In 2024, longitudinal profiles of all the channel thalwegs closely mirrored those surveyed in 2023, indicating that the bed elevations in all reaches have largely remained consistent over the last year with minor vertical adjustments indicative of a channel that is naturally forming over time. No major vertical shifts in the channel bed elevation were observed in any of the monitoring reaches and previous stabilization efforts have been successful in preventing further incision of the channel bed. Head cut migration and bed aggradation in Reach 3.1 has remained stable since 2023 and the stabilized head cut in Reach 3.4 continues to hold grade.

The lack of substantial aggradation or degradation within any of the monitoring reaches indicates sediment is largely being efficiently transported through the entirety of the Swamp Creek monitoring area. The small variations in bed elevations as compared to previous years is expected as a channel matures and natural scour and depositional processes occur.

Although the bed elevation has remained consistent in the vicinity of the armored head cut in Reach 3.4, the rock weir installed to prevent further incision is continuing to show signs of deterioration as noted in 2023. The channel has not continued to incise and the head cut has not migrated further upstream; therefore no immediate action is warranted. Continued deterioration of the stabilization treatment may result in future maintenance needs.

### Perpendicular Transects – Channel Geometry and Pool Depths

Results of the cross-sectional transect surveys within each monitoring reach are summarized in Table 9 and the following narrative. Plots depicting the channel dimensions at each transect in 2015 and 2024 are included in Appendix G. The exception is for transects 21.5, 21.7, 22.3, 22.5 and 22.7 in Reaches 3.2 and 3.3, which were established in 2018 and therefore only depict survey results from 2018 and 2024. Transect plots depict vertical or lateral channel adjustment between the monitoring years that are shown and allow for comparison to performance metrics including width/depth ratios and pool depth.

For Reach 1 the average width to depth ratio for the two surveyed riffle transects was 27.1 feet, and therefore Reach 1 did not meet the performance criterion in 2024 for width depth ratio. Neither of the pools in Reach 1 were within the 20% of design depth criteria; therefore, Reach 1 did not meet performance criterion for pool depth. Cross sectional transects within Reach 1 depict bed aggradation at both T1 and T3 (pool transects), with T1 also exhibiting substantial narrowing as the inside point bar has developed. Both riffle transects have largely maintained their max depth, however T2 has experienced substantial narrowing while T4 has experienced minimal channel narrowing. In general, channel narrowing and bed aggradation increased in the lower half of Reach 1 (Appendix G).

In Reach 2, the average width to depth ratio for the three surveyed riffle transects was 15.6 feet; therefore, Reach 2 met performance criterion for width depth ratio. None of the three pool depths in Reach 2 were within 20% of the design depth. Cross sectional transects within Reach 2 indicate bed downcutting at the top of the reach, lateral channel movement in the middle of the reach, and minimal sedimentation and maintained channel geometry at the bottom of the reach. Transects 9, 10, 13 and 14 indicate little lateral movement since 2015, but Transects 11 and 12 indicate the channel has become wider on the south bank and overall.

For Reach 3.1, the average width to depth ratio for the four surveyed riffle transects was 24.7 feet; therefore, Reach 3.1 did not meet the performance criterion for width depth ratio. The pool located in Reach 3.1a was not within the 20% of design depth criteria, while both of the pools located in reach 3.1b met the design depth criteria. Cross-sectional transects within Reach 3.1a show transects T15 and T16 becoming narrower and shallower, while upstream transects in Reach 3.1b exhibit greater lateral movement, pool depth and downcutting since 2015. The

transects within Reach 3.1 are indicative of natural channel response to the headcutting that occurred in 2017. Upstream transects like T21 and T19 depict downcutting in response to the steepened grade, while transects T20, T18, and T17 show lateral movement and channel realignment to increase total length. Transects 15 and 16 at the bottom of the reach subsequently narrow and aggrade due to upstream erosion. T18 had a width to depth ratio greater than double that specified by the performance criteria (Table 8). This transect is located in the center of the area that downcut in 2015, where the channel exhibited significant lateral migration (Appendix A).

In Reach 3.2, the average width to depth ratio for the two surveyed riffle transects was 9.1 feet; therefore, this reach met the performance criterion for width depth ratio., the average bankfull width was 13.3 feet and the calculated mean depth was 1.5 feet. The single pool surveyed in Reach 3.2 was within the 20% of design depth criteria. Cross sectional transects indicate channel dimensions in Reach 3.2 have changed somewhat over the years, but to a far lesser extent than in Reach 3.1. The original monitoring plan only established one transect within Reach 3.2 (T22), and following the changes observed in reach 3.1, two transects were added within the reach in 2018 (T21.5 and T21.7). Since 2018 and 2015 respectively, the bankfull channel has become approximately 2-4 feet wider at T21.5, T21.7, T22. A failed rock weir exists between T21.5 and T22, and the channel widening observed at these three transects may be a consequence of the structure's failure.

In Reach 3.3, the average width to depth ratio for the surveyed riffle transects was 16.8 feet; therefore, the reach met the performance criterion for width depth ratio. The riffle transects had an average bankfull width of 10.1 feet and the calculated mean depth was 0.6 feet. Depth for both of the pools located in reach 3.3 were within the 20% of design depth criteria. Transects 22.5 and 22.7 have generally maintained their geometry; however, both gained approximately 0.5 feet of depth since 2018. Transect 22.3 indicates mid-channel bar development since 2018; max depth and bankfull width have stayed relatively constant with minimal lateral shift towards the west bank. Sedimentation and bed aggradation at T22.3 could be a result of sedimentation within the culvert immediately downstream.

For Reach 3.4, the average width to depth ratio for the two surveyed riffle transects was 14.6 feet; therefore, the reach met the performance criterion for width depth ratio. Depth in two of the three pools in Reach 3.4 were within 20% of the design depth, As with several other reaches, the changes observed within Reach 3.4 transects were variable. Transects 23 and 25 depict the least lateral and vertical channel movement and have remained nearly identical to 2015 survey data. Transects 24 and 26 show lateral movement and general channel widening. Transect 24 (immediately below the headcut) exhibits downcutting, likely a response to the headcut that was stabilized in 2019. Transect 27 at the top of the reach depicts bed aggradation in the 1 foot range and lateral movement towards the east bank.

In Reach 5, the average width to depth ratio for the two surveyed riffle transects was 28.4 feet; therefore, the reach did not meet the performance criterion for width depth ratio. This criteria was not met solely due to the measured width to depth ratio at Transect 28 (Table 9). Neither of the two pools in Reach 5 exhibited depth within the 20% of the design criteria. Three of the four surveyed transects in Reach 5 have become narrower and shallower in comparison to 2015 data; T28 and T29 also depict gravel bar development on inside bends. The pool at Transect 31 shows channel widening and approximately 10' of lateral movement towards the west bank. The lateral movement was confirmed by channel centerline surveys (Appendix A).

For Reach 7.1, the average width to depth ratio for the five surveyed riffle transects was 20.3 feet; therefore the reach did not meet the performance criterion for width depth ratio. The riffle at Transect 34 had a width to depth ratio of 39.1 which likely skewed the data as all the other riffle width to depth ratios were well under the threshold value of 20. All of the pools in Reach 7.1 showed depths within the 20% of the design depth. Cross sectional transects indicate channel geometry has largely remained stable within the downstream extent of Reach 7.2 with the

exception of riffle transects 36 and 40 showing downcutting in the 1-1.5-foot range; T36 also clearly shows approximately 5 feet of lateral channel movement towards the east bank. The downcutting observed in T40 occurs within a uniquely straight section of the reach where the channel profile grade steepens, and downcutting would be expected as a response to the increase in gradient and reduced sinuosity (Appendix A & G).

For Reach 7.2, the average width to depth ratio for the two surveyed riffle transects was 23.5 feet; therefore, the reach did not meet the performance criterion width depth ratio. The pool depth in Reach 7.2 was within 20% of the design depth. Cross sectional transects depict very little change in channel dimensions since 2015 (Appendix G). Despite the lack of change in channel dimensions, both riffle transects had a width-to-depth ratio greater than 20. Given this information the channel was potentially constructed wider than specified by the design; therefore, these transects may not achieve the width to depth criterion unless channel narrowing or deepening occurs. Depth of the single pool surveyed in Reach 7.2 met the performance criterion for the pool depth standard, indicating scour is maintaining habitat complexity.

**Table 9.** Surveyed bankfull widths, depths, and cross-sectional areas at all monitoring transects, with calculated width to depth ratios, in 2024. Width to Depth ratio Values in Red are >20.

Monitoring Reach	Transect	Type	Surveyed Bankfull Width (ft)	Surveyed Maximum Depth (ft)	Area (ft <sup>2</sup> )	Mean Depth (ft)	W/D Ratio
1	1	Pool	8.5	2.4	10.3	1.2	7.1
	2	Riffle	14.5	1.1	7.8	0.5	29
	3	Pool	25.3	1.5	25.9	1.0	25.3
	4	Riffle	22.7	1.7	19.6	0.9	25.2
	Average Pools		16.9	2.0	18.1	1.1	16.2
	Average Riffles		18.6	1.4	13.7	0.7	27.1
	Average Transects		17.7	1.7	15.9	0.9	21.7
2	9	Pool	22.9	1.4	20.8	0.9	25.5
	10	Riffle	20.0	2.0	24.6	1.2	16.6
	11	Riffle	22.9	2.1	35.2	1.5	15.2
	12	Pool	20.3	2.0	24.9	1.2	16.9
	13	Riffle	18.0	1.6	21.5	1.2	15.0
	14	Pool	15.1	3.1	29.6	2.0	7.6
	Average Pools		18.5	2.3	26.3	1.5	13.7
	Average Riffles		20.3	1.9	27.1	1.3	15.6
Average All Transects			19.9	2.0	26.1	1.3	16.1
3.1	15	Riffle	7.6	0.1	2.4	0.3	25.4
	16	Pool	8.3	1.0	5.3	0.6	13.9
	17	Pool	28.5	2.9	47.0	1.7	16.7
	18	Riffle	21.6	1.0	8.1	0.4	53.9
	19	Riffle	29.2	4.0	65.0	2.2	13.3
	20	Pool	19.6	3.5	44.4	2.3	8.5
	21	Riffle	10.8	2.2	19.6	1.8	6.0
	Average Pools		18.8	2.5	32.2	1.5	13.0
Average Riffles			17.3	1.8	23.8	1.2	24.7
Average All Transects			17.9	2.1	27.4	1.3	19.7
3.2	21.5	Riffle	10.8	1.6	11.6	1.1	9.8
	21.7	Pool	20.8	3.6	49.7	2.4	8.7
	22	Riffle	15.8	2.6	30.3	1.9	8.3
	Average Pools		20.8	3.6	49.7	2.4	8.7
	Average Riffles		13.3	2.1	20.9	1.5	9.1
	Average All Transects		15.8	2.6	30.5	1.8	8.9
	22.3	Pool	17.8	3.1	23.9	1.3	13.7
	22.5	Riffle	10.1	1.5	5.7	0.6	16.8
3.3	22.7	Pool	16.4	3.4	30.0	1.8	9.1
	Average Pools		26.0	4.8	38.9	2.2	11.4
	Average Riffles		10.1	1.5	5.7	0.6	16.8
	Average All Transects		14.8	2.7	19.9	1.2	13.2
	23	Riffle	11.2	2.2	18.3	1.6	7.0
	24	Pool	16.2	3.9	38.3	2.4	6.7
	25	Riffle	26.6	1.8	31.8	1.2	22.2
	26	Pool	19.1	3.2	37.6	2.0	9.5
3.4	27	Pool	14.8	2.4	19.7	1.3	11.4
	Average Pools		37.3	3.2	31.9	1.9	9.2
	Average Riffles		24.5	2.0	25.0	1.4	14.6
	Average All Transects		17.6	2.7	29.1	1.7	11.4
	28	Riffle	19.4	1.1	9.2	0.5	38.8
	29	Pool	12.3	1.5	9.8	0.8	15.4
	30	Riffle	21.6	1.7	25.6	1.2	18.0
	31	Pool	16.2	2.2	26.9	1.7	9.5
5	Average Pools		20.4	2.6	23.3	1.7	12.5
	Average Riffles		30.2	1.9	22.0	1.1	28.4
	Average All Transects		17.4	1.6	17.9	1.1	20.4
	32	Riffle	12.8	1.1	10.6	0.8	16.0
	33	Pool	11.7	1.5	11.8	1.0	11.7
	34	Riffle	19.6	0.9	9.2	0.5	39.1
	35	Pool	9.9	2.0	12.6	1.3	7.6
	36	Riffle	11.1	1.2	8.8	0.8	13.9
7.1	37	Pool	20.4	2.3	27.3	1.3	15.7
	38	Pool	15.0	1.3	12.1	0.8	18.7
	39	Riffle	15.5	1.0	9.8	0.6	25.8
	40	Riffle	9.4	1.9	13.2	1.4	6.7
	Average Pools		14.2	1.8	15.9	1.1	13.4
	Average Riffles		13.7	1.2	10.3	0.8	20.3
	Average All Transects		13.9	1.5	12.8	0.9	17.2
7.2	41	Riffle	18.8	1.4	15.1	0.8	23.5
	42	Pool	20.5	2.0	21.8	1.1	18.7
	43	Riffle	14.1	0.8	9.1	0.6	23.4
	Average Pools		20.5	2.0	21.8	1.1	18.7
	Average Riffles		25.8	1.8	19.7	1.1	23.5
	Average All Transects		17.8	1.4	15.4	0.8	21.9

**Table 10.** Pool depths surveyed at monitoring transects within the Swamp Creek mitigation project area in 2024.

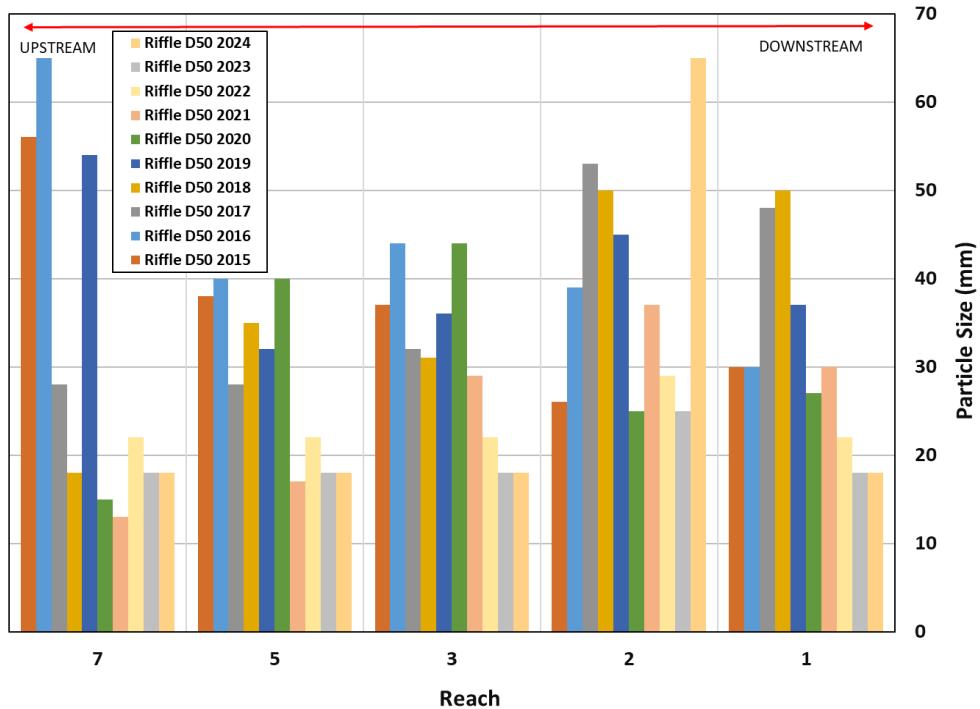
Monitoring Reach	Transect	Type	Pool Design Depth (ft)	Depth required to Meet Success Criteria (ft)	Surveyed Maximum Depth (ft)	Meeting Criteria?
1	1	Pool	3.3	2.6	2.4	NO
	3	Pool	3.3	2.6	1.5	NO
2	9	Pool	3.9	3.1	1.4	NO
	12	Pool	3.9	3.1	2.0	NO
	14	Pool	3.9	3.1	3.1	NO
3.1	16	Pool	3.9	3.1	1.0	NO
	17	Pool	2.1	1.7	2.9	YES
	20	Pool	2.1	1.7	3.5	YES
3.2	21.7	Pool	3.0	2.4	3.6	YES
3.3	22.3	Pool	3.0	2.4	3.1	YES
	22.7	Pool	3.0	2.4	3.4	YES
3.4	24	Pool	3.9	3.1	3.9	YES
	26	Pool	3.9	3.1	3.2	YES
	27	Pool	3.9	3.1	2.4	NO
5	29	Pool	3.0	2.4	1.5	NO
	31	Pool	3.0	2.4	2.2	NO
7.1	33	Pool	1.6	1.3	1.5	YES
	35	Pool	1.6	1.3	2.0	YES
	37	Pool	1.6	1.3	2.3	YES
	38	Pool	1.6	1.3	1.3	YES
7.2	42	Pool	1.8	1.4	2.0	YES

#### **Stream Bed Substrate Composition**

Wolman pebble count data collected in Swamp Creek in 2024 are presented in the cumulative distribution curves in Appendix F. Continued monitoring of bed material composition indicates the mean substrate size (D50) found in both pools and riffles is coarse gravel ranging from 13-27 mm. D50 values in riffles were identical to the material sizes sampled in 2023 for all reaches except for Reach 2. D50 values for pools were approximately 4mm smaller at all sampled locations, which is indicative of continued bed fining in pools as previously noted in 2023.

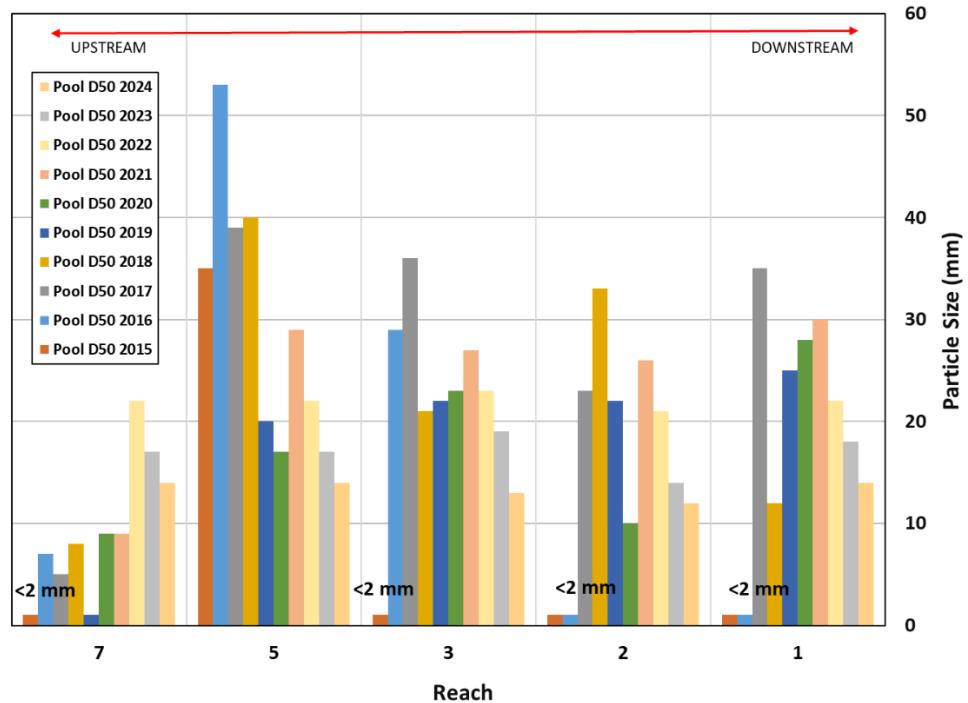
While pebble count data indicates spawning sized gravels are present within each of the monitoring reaches, and median particle sizes values in riffles and pools consists of coarse gravels, Reaches 1, 2 and 3 exhibit fine bed materials <2mm in excess of 20%. The abundance of fine-grained particles may somewhat compromise successful spawning by salmonids.

### Riffle D50 Particle Sizes, Swamp Creek



**Figure 1.** Mean particle sizes in one riffle sampled within each reconstructed reach within the Swamp Creek mitigation area.

### Pool D50 Particle Sizes, Swamp Creek



**Figure 2.** Mean particle sizes in one pool sampled within each reconstructed reach within the Swamp Creek mitigation area.

## **Conclusions**

In 2024, much of the Swamp Creek mitigation site met the performance standards outlined in the monitoring plan. Two of the nine monitoring sub-reaches met all performance standards (Reaches 3.2 and 3.3). All reaches met the performance criteria for total percent cover from non-noxious species within the riparian buffer, combined areal cover, planted shrub and tree survival, and stream bank vegetation root stability index values. Reaches 3.4, 5, and 7.2 did not achieve the success criteria for noxious weed cover. The width to depth ratio performance criteria was met in reaches 2, 3.2, 3.3 and 3.4. Pool depth criteria were met in Reaches 3.2, 3.3, 7.1 and 7.2.

Total vegetation cover and cover from woody species continued to trend in a positive direction for both the riparian and stream bank transects. Noxious weed cover remains an issue in some reaches. Many of the previously noted eroding streambanks have healed, become more stable, and were removed following the 2024 inventory. The longitudinal profiles and cross sectional transects indicate that Swamp Creek has continued to stabilize both vertically and laterally following the stabilization of head cuts in 2019, and that the channel is maturing.

### ***Reach 1 Conclusions***

Reach 1 met all the success criteria for vegetation but did not meet the stream channel restoration success criteria. Reach 1 is well vegetated with cover from both herbaceous and woody species gradually increasing, and low noxious weed cover. Cross sectional transect survey data indicates that this reach may be accumulating streambed substrate as was noted in 2023, which is likely contributing to the stream channel criteria failures. Changes observed in channel geometry and stream bed elevations in Reach 1 are considered natural and non-problematic. No infrastructure is being threatened and no hazards are associated with allowing these natural processes to continue.

### ***Reach 2 Conclusions***

Reach 2 met all the success criteria for vegetation and only failed to meet the performance criterion for pool depth. Redistribution of sediment within the reach has reduced pool depth at two of the three pool monitoring transects even though decreased pool depth does not appear to be problematic throughout the entire reach. The planform of this reach is also quite straight, which may limit the development and maintenance of scour pools.

### ***Reach 3 Conclusions***

Reach 3.1 met all established performance criteria except for bankfull width and pool depth. The reach is continuing to recover from the extensive downcutting observed in 2015, as there is less evidence of recent migration and eroding bank are becoming more vegetated and stabilizing. In 2024, the cross sectional transects indicate that the channel had been vertically and laterally adjusting following the headcut stabilization and that the downstream extent of the reach is becoming narrower as sediment deposits from upstream erosion accumulate. Moreover, eight of the ten eroding banks from 2023 were removed in 2024 due to the degree of vegetative establishment and stabilization observed. Previous monitoring reports also noted a potential threat to the frontage road posed by eroding banks in this reach, but given the recent increase in bank stability, the threat seems minimal. Habitat complexity and heterogeneity are continuing to develop and improve within reach.

The 2023 monitoring event was the fifth consecutive year that Reaches 3.2 and 3.3 achieved all success criteria. No bank erosion or vertical adjustments have been noted in Reach 3.3 during any of the recent monitoring visits and Reach 3.2 had three of the four eroding banks removed during the 2024 inventory.

Reach 3.4 met all performance standard criteria except pool depth and noxious weed cover. Redistribution of sediment within the reach has reduced pool depths at monitoring transects

even though the longitudinal profile indicates pool depths in other locations is adequate. Reach 3.4 exhibited 17% noxious weed cover, which is 7% above performance criterion threshold. Multiple infestations of Canada thistle and spotted knapweed have been observed for several years along much of the riparian corridor and stream banks. Several of these infestations are located on private land and are not being controlled.

#### ***Reach 5 Conclusions***

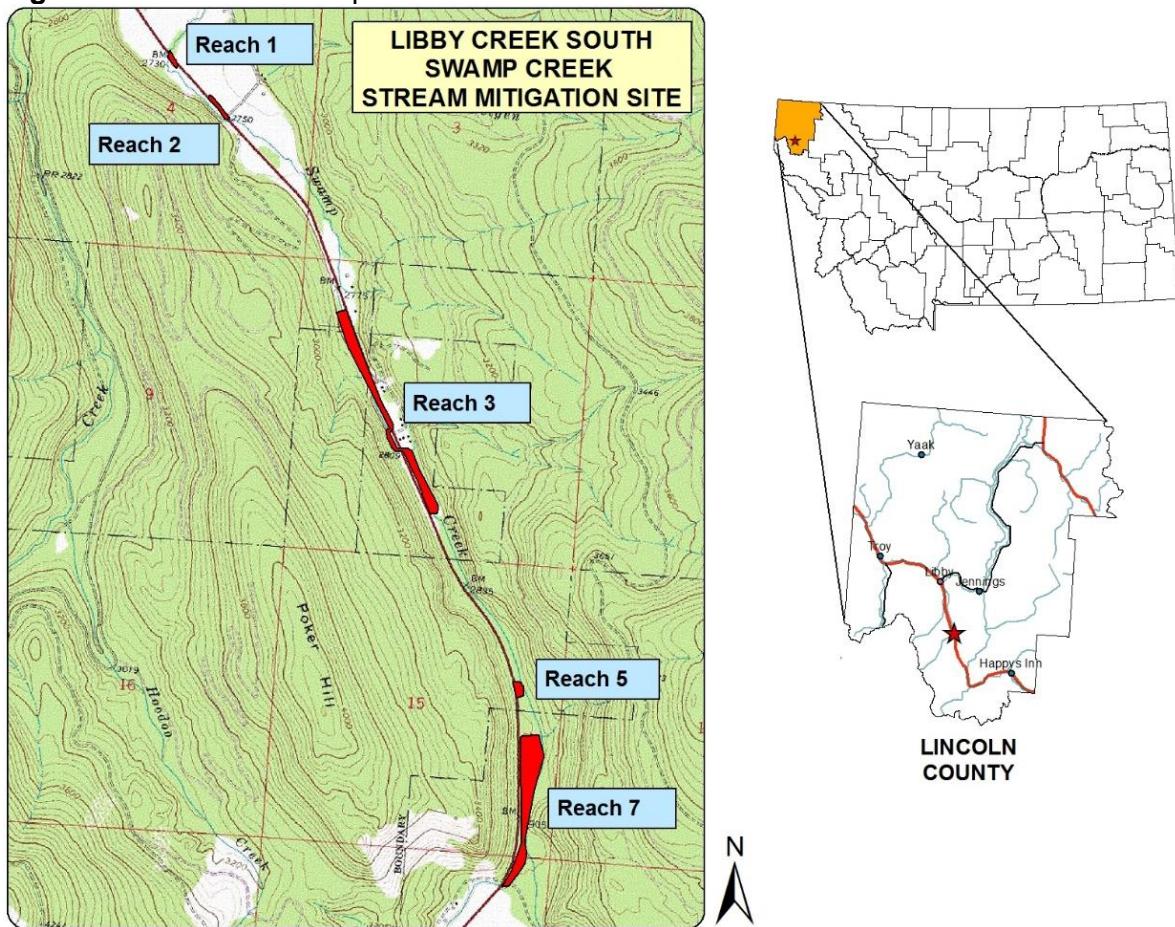
Reach 5 failed to meet performance criteria for noxious weed cover, bankfull width, and pool depth in 2024. Reach 5 exhibited 30% noxious weed cover, which is an increase of 3% since 2023. Noxious weed species observed along Reach 5 include spotted knapweed and common tansy. Reach 5 was treated in 2024 by MDT's contractor. Reach 5 failed to meet the width depth criteria largely due to transect 28 which had a value of 38.8. Pool depth criteria was not met for either of the surveyed pools.

#### ***Reach 7 Conclusions***

Reach 7.1 met all performance criteria with the exception of the width to depth threshold, a criteria that was met in 2023. Reach 7.1 exhibits robust riparian and streambank vegetation, including woody and herbaceous species, and has a little noxious weed cover. In general, the channel has remained largely stable within Reach 7.1 with the exception of the loss of a riffle structure at STA 26+50 that has caused minor upstream scour and downstream deposition. Lastly, the two eroding banks within reach 7.1 have been removed following the 2024 inventory.

Reach 7.2 met all the performance standards except for width to depth ratios and noxious weed cover. In previous monitoring events, herbicide treatments appeared to have negatively impacted the herbaceous and woody vegetation in the treatment area, resulting in decreased plant cover and large patches of bare ground. These areas are recovering, and the combined vegetative cover along Reach 7.2 was 73% in 2024, which meets the combined areal cover performance standard. The average width to depth ratio in Reach 7.2 failed to meet the performance standard criterion for the sixth year in a row. High width to depth ratios in Reach 7.2 are due to above average channel widths combined with shallow average depths. Channel widths within this reach are not associated with bank erosion and have remained relatively consistent over the years. Therefore, the failure of this reach to meet the width to depth ratio performance standard is not considered problematic.

**Maps, Plans, Photos:**  
**Figure 4. Site Location Map**



**Project Area Maps/Figures:** See Appendix A

**Photos:** See Appendix B

**Comprehensive Plant List:** See Appendix C

**Stream Bank Vegetation Composition:** See Appendix D

**Noxious Weed Species List:** See Appendix E

**Wolman Pebble Count Data:** See Appendix F

**Perpendicular Transect and Longitudinal Profile Plots:** See Appendix G

**Plans:** See Appendix H of 2015 Swamp Creek Monitoring Report on the MDT Stream Mitigation Monitoring Reports website: <https://www.mdt.mt.gov/publications/brochures/stream-mitigation.aspx>

## **References**

**National Integrated Drought Information System.** Accessed December 2024 at:  
<https://www.drought.gov/historical-information?state=montana&countyFips=30053&dataset=0&selectedDateUSDM=20210831>

**Montana Department of Agriculture (MDA).** June 2019. *Montana Noxious Weed List*. Accessed November 2024 at: [https://agr.mt.gov/\\_docs/weeds-docs/2019-Montana-Noxious-Weed-List.pdf](https://agr.mt.gov/_docs/weeds-docs/2019-Montana-Noxious-Weed-List.pdf)

**Pick, T., P. Husby, W. Kellogg, B. Leinard, and R. Apfelbeck.** 2004. Riparian Assessment: Using the NRCS Riparian Assessment Method. U.S. Department of Agriculture, Natural Resources Conservation Service. Bozeman, MT.

**U.S. Army Corps of Engineers (USACE).** 2020. *National Wetland Plant List* (Version 3.5), prepared by U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH

**U.S. Geological Survey (USGS).** *Stream flow data for gage #12302055 – Fisher River near Libby Montana*. Accessed December 2024 at:  
<https://waterdata.usgs.gov/monitoring-location/12302055/#dataTypeld=continuous-00065-0&period=P7D&showMedian=false>

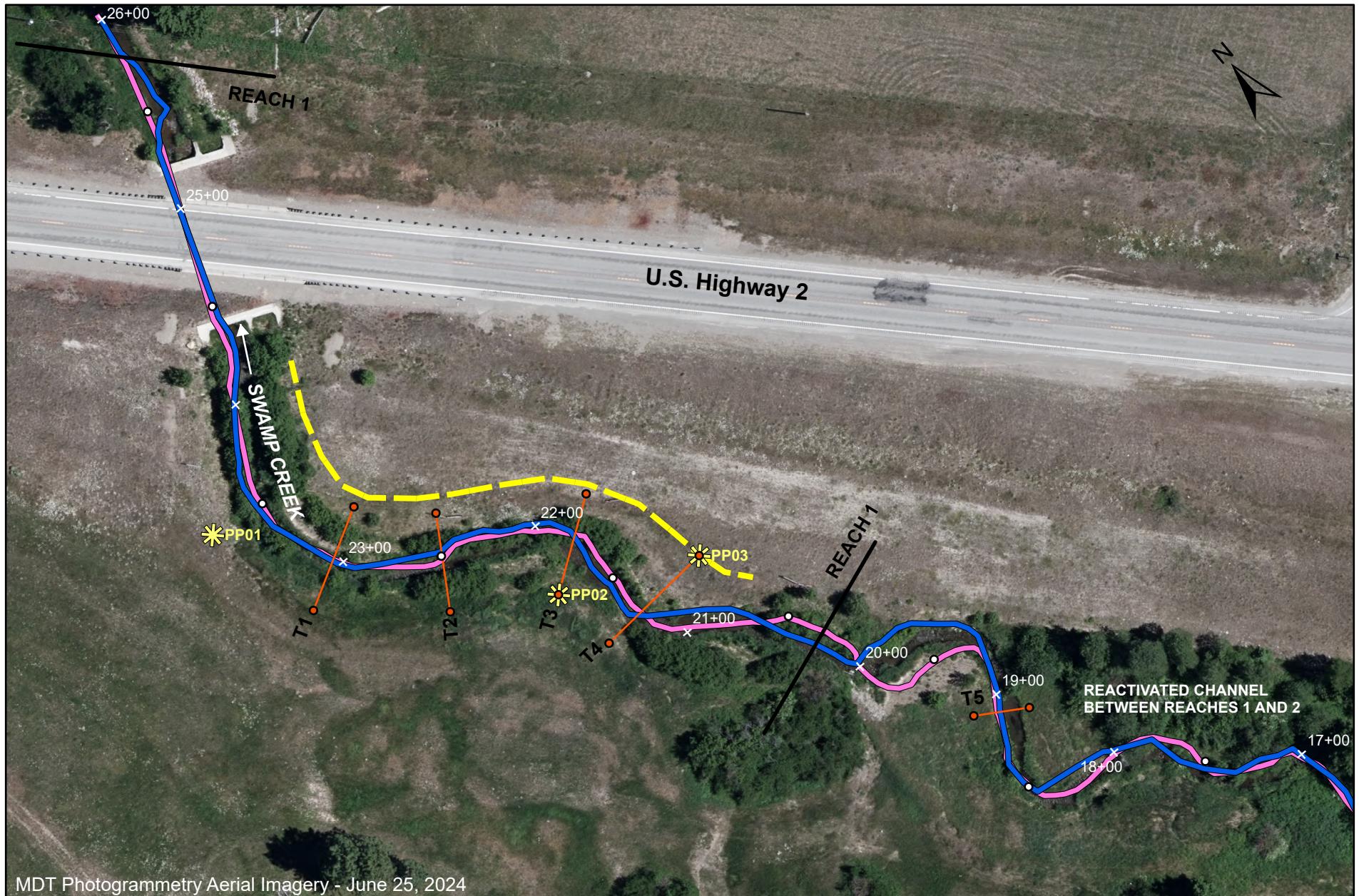
**Winward, Alma H.** 2000. *Monitoring the Vegetation Resources in Riparian Areas*. Gen. Tech. Rep. RMRS-GTR-47. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

---

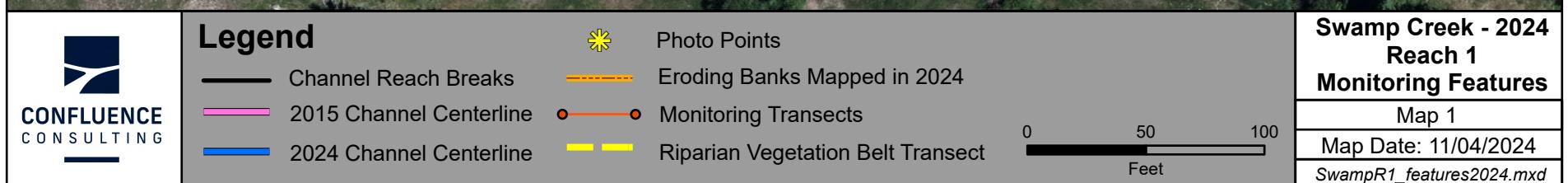
## APPENDIX A PROJECT AREA MAPS

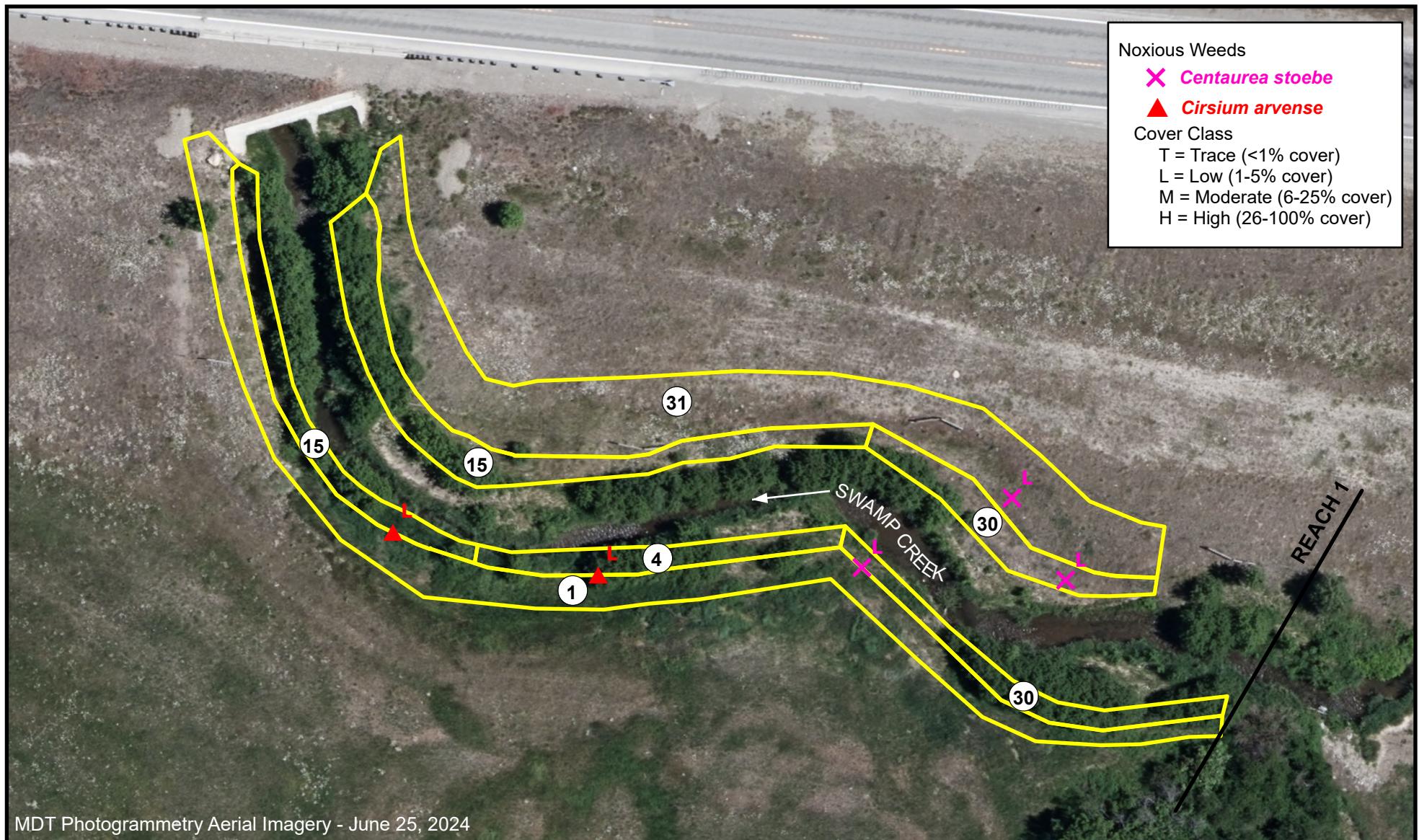
---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

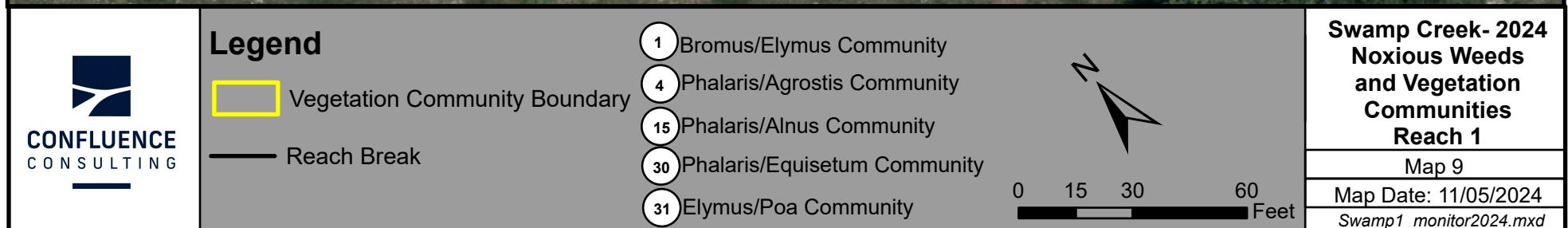


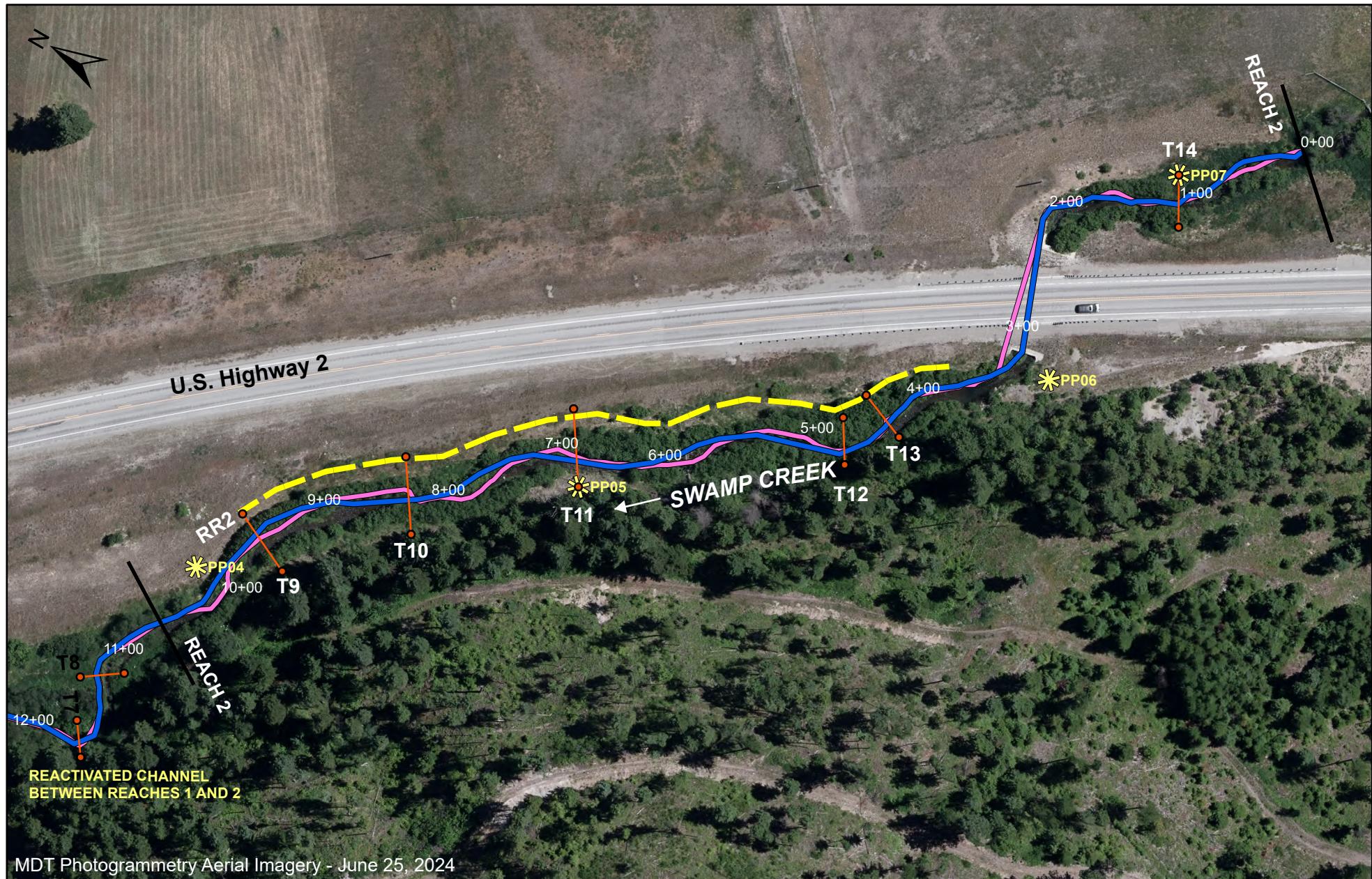
MDT Photogrammetry Aerial Imagery - June 25, 2024





MDT Photogrammetry Aerial Imagery - June 25, 2024





CONFLUENCE  
CONSULTING

### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline
- Photo Points
- Eroding Banks Mapped in 2024
- Monitoring Transects
- Riparian Vegetation Belt Transect

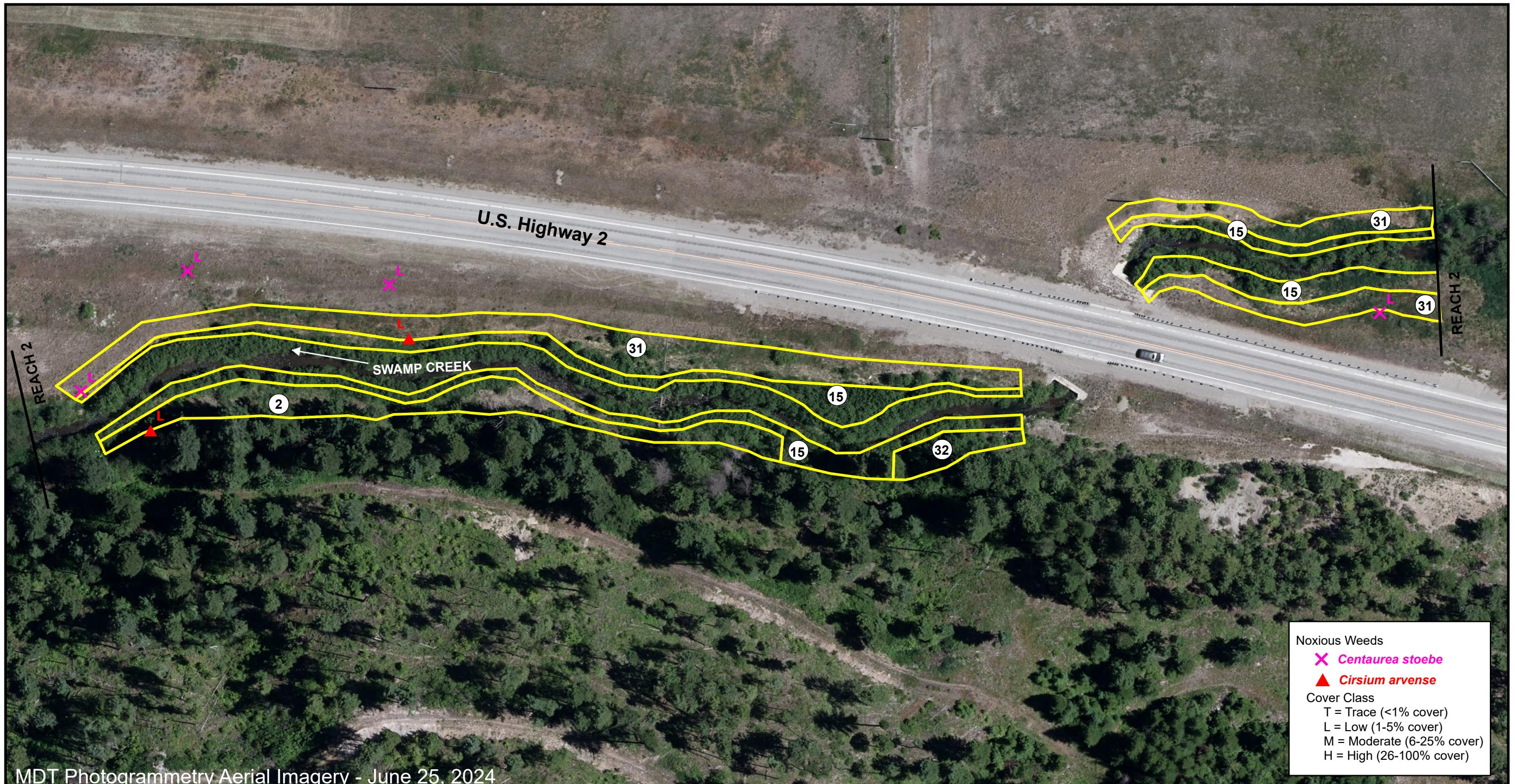
0 50 100  
Feet

### Swamp Creek - 2024 Reach 2 Monitoring Features

Map 2

Map Date: 11/04/2024

SwampR2\_features2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024

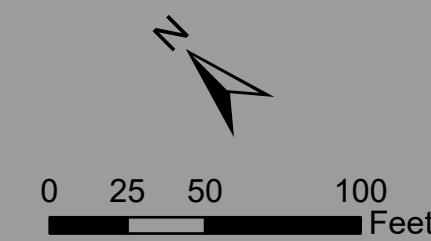


### Legend

Vegetation Community Boundary

Reach Breaks

- 2 Elymus Community
- 15 Phalaris/Alnus Community
- 31 Elymus/Poa Community
- 32 Agrostis/Equisetum Community



**Swamp Creek- 2024**  
**Noxious Weeds**  
**and Vegetation**  
**Communities**  
**Reach 2**



## Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline
- Eroding Banks Mapped in 2024
- Monitoring Transects
- Riparian Vegetation Belt Transect



# CONFLUENCE CONSULTING

-  Photo Points
-  Failing Rock Weir
-  2017 Headcut

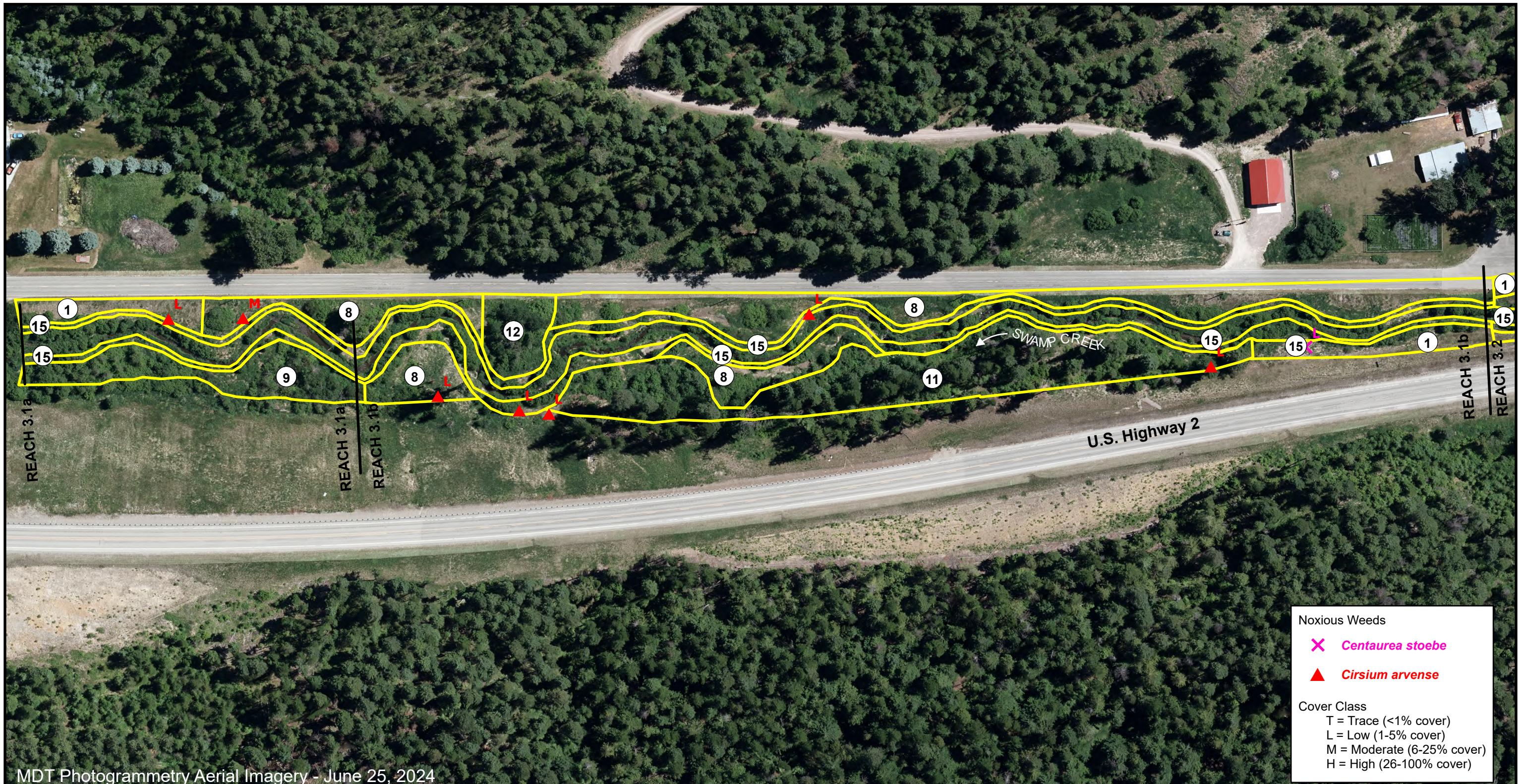
MDT Photogrammetry Aerial Imagery - June 25, 2024

## Swamp Creek- 2024 Reach 3.1 Monitoring Features

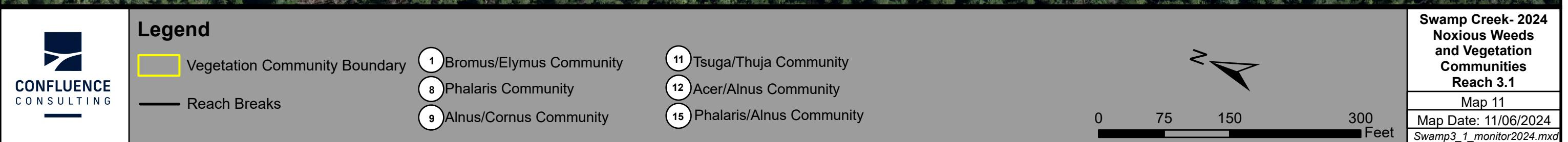
Map 3

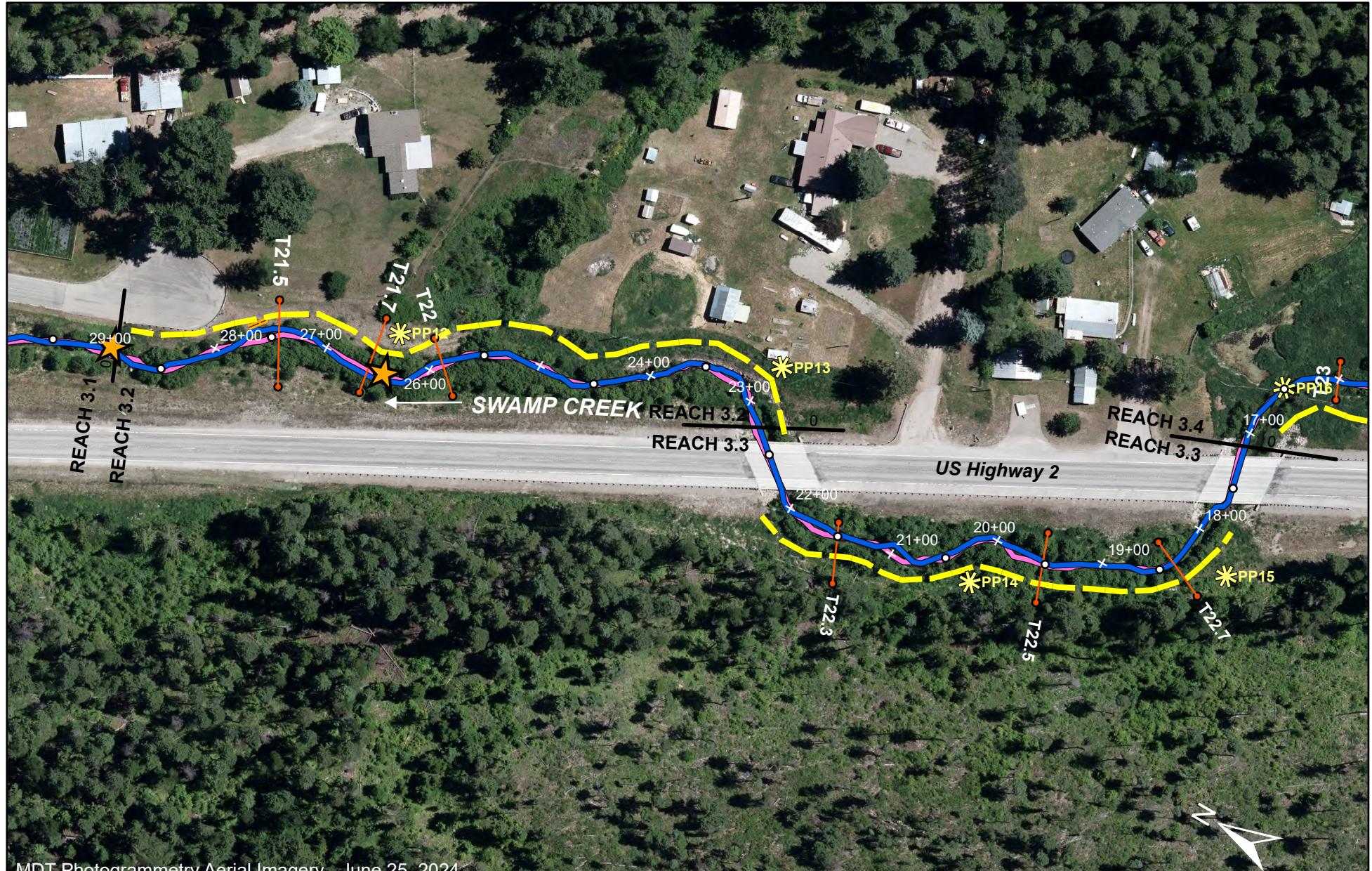
Map Date: 11/05/2024

Swamp3.1\_Features2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024





MDT Photogrammetry Aerial Imagery - June 25, 2024



### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline



Photo Points



Eroding Banks Mapped in 2024



Monitoring Transects



Riparian Vegetation Belt Transect



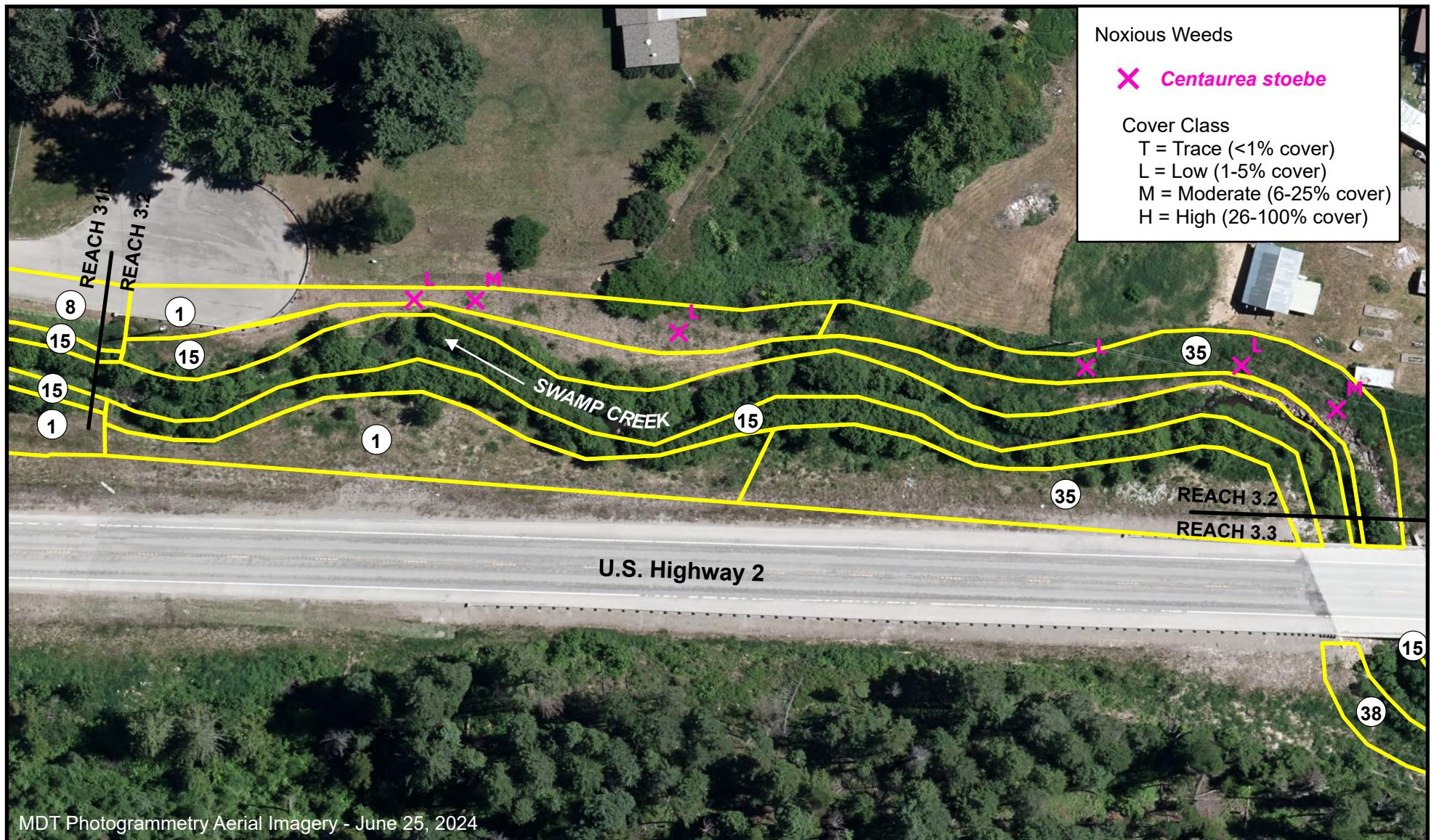
Failing Rock Weir

**Swamp Creek - 2024  
Reach 3.2 and 3.3  
Monitoring Features**

Map 4

Map Date: 11/05/2024

SwampR3.2.3\_features2024



MDT Photogrammetry Aerial Imagery - June 25, 2024



# CONFLUENCE CONSULTING

## Legend

## Vegetation Community Boundary

## — Reach Breaks

- 1 Bromus/Elymus Community
- 8 Phalaris Community
- 15 Phalaris/Alnus Community
- 35 Bromus/Lathyrus sylvestris Community



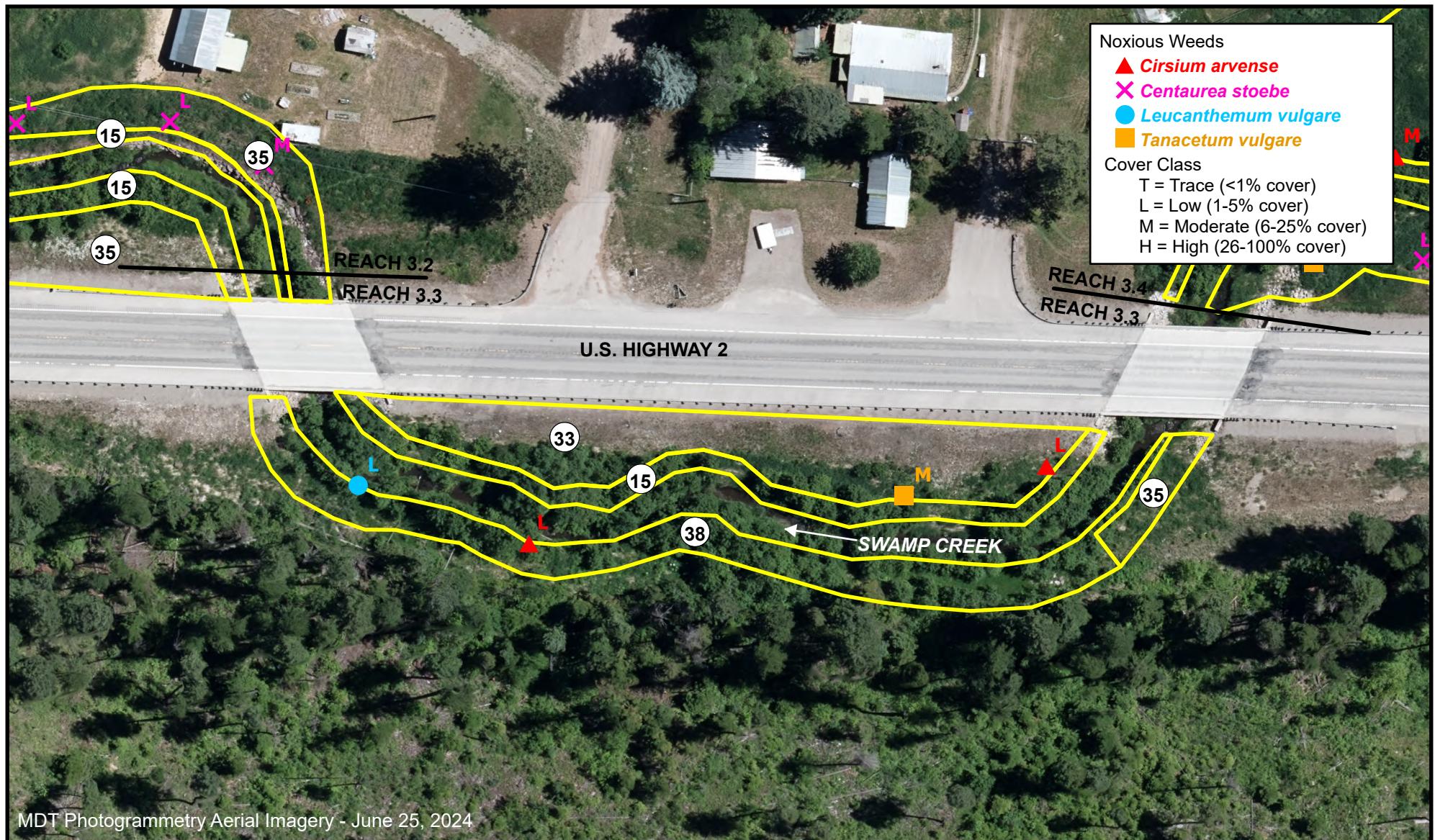
A horizontal scale bar with numerical markings at 0, 25, 50, and 100. The word 'Feet' is written in a cursive font to the right of the scale.

# Swamp Creek- 2024 Noxious Weeds and Vegetation Communities Reach 3.2

## Map 12

Map Date: 11/06/2024

Swamp3\_2\_monitor2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024



### Legend

Vegetation Community Boundary

Reach Breaks

- 15 Phalaris/Alnus Community
- 33 Bromus/Poa Community
- 35 Bromus/Lathyrus sylvestris Community
- 38 Alnus/Equisetum arvense Community



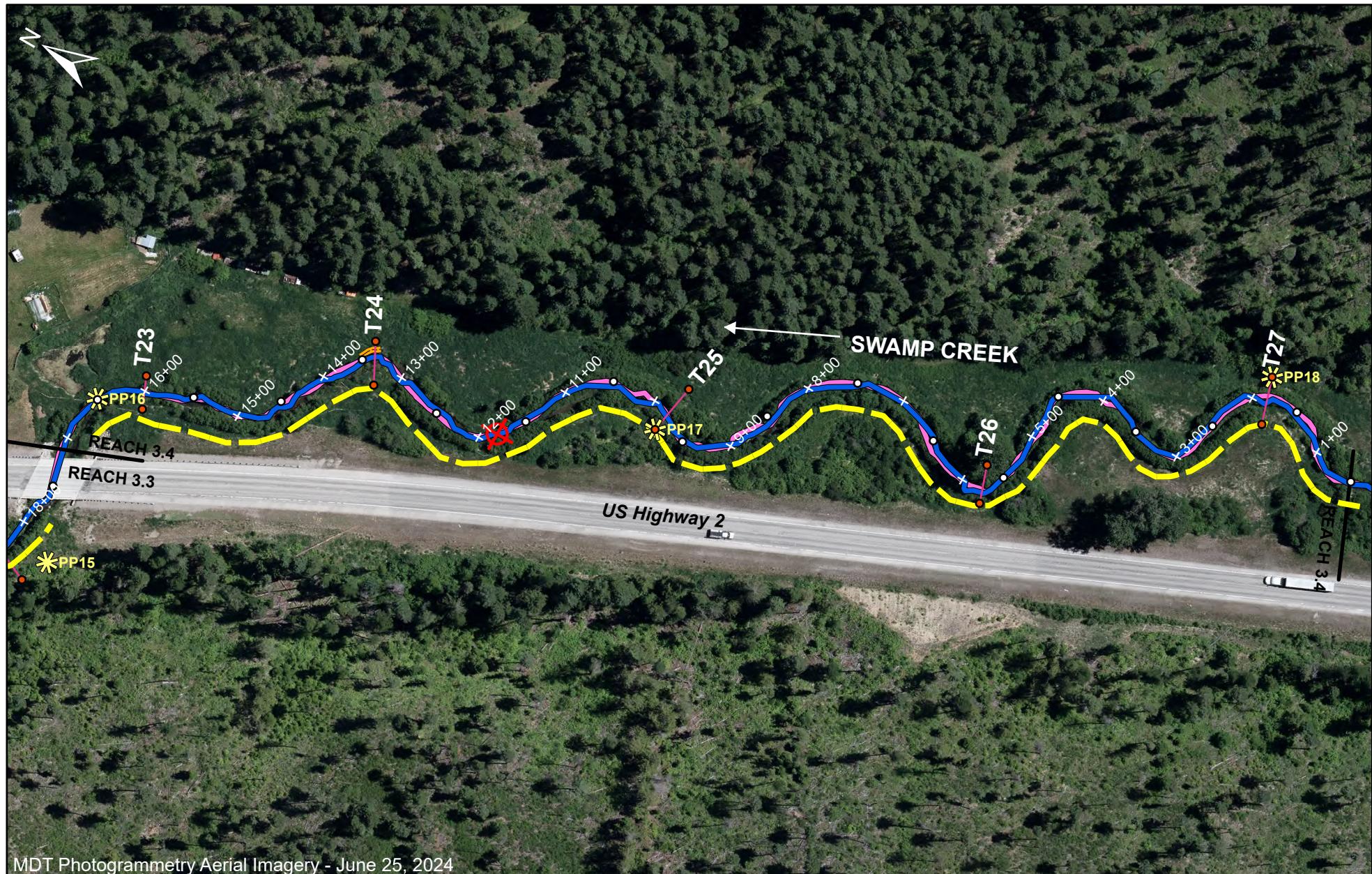
0 20 40 80  
Feet

**Swamp Creek- 2024  
Noxious Weeds  
and Vegetation  
Communities  
Reach 3.3**

Map 13

Map Date: 11/06/2024

Swamp3\_3\_monitor2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024



### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline

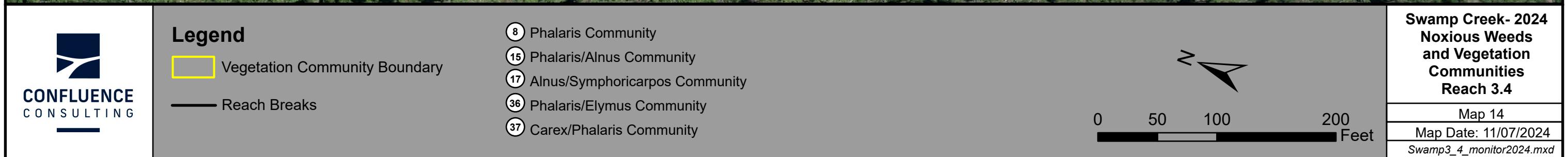
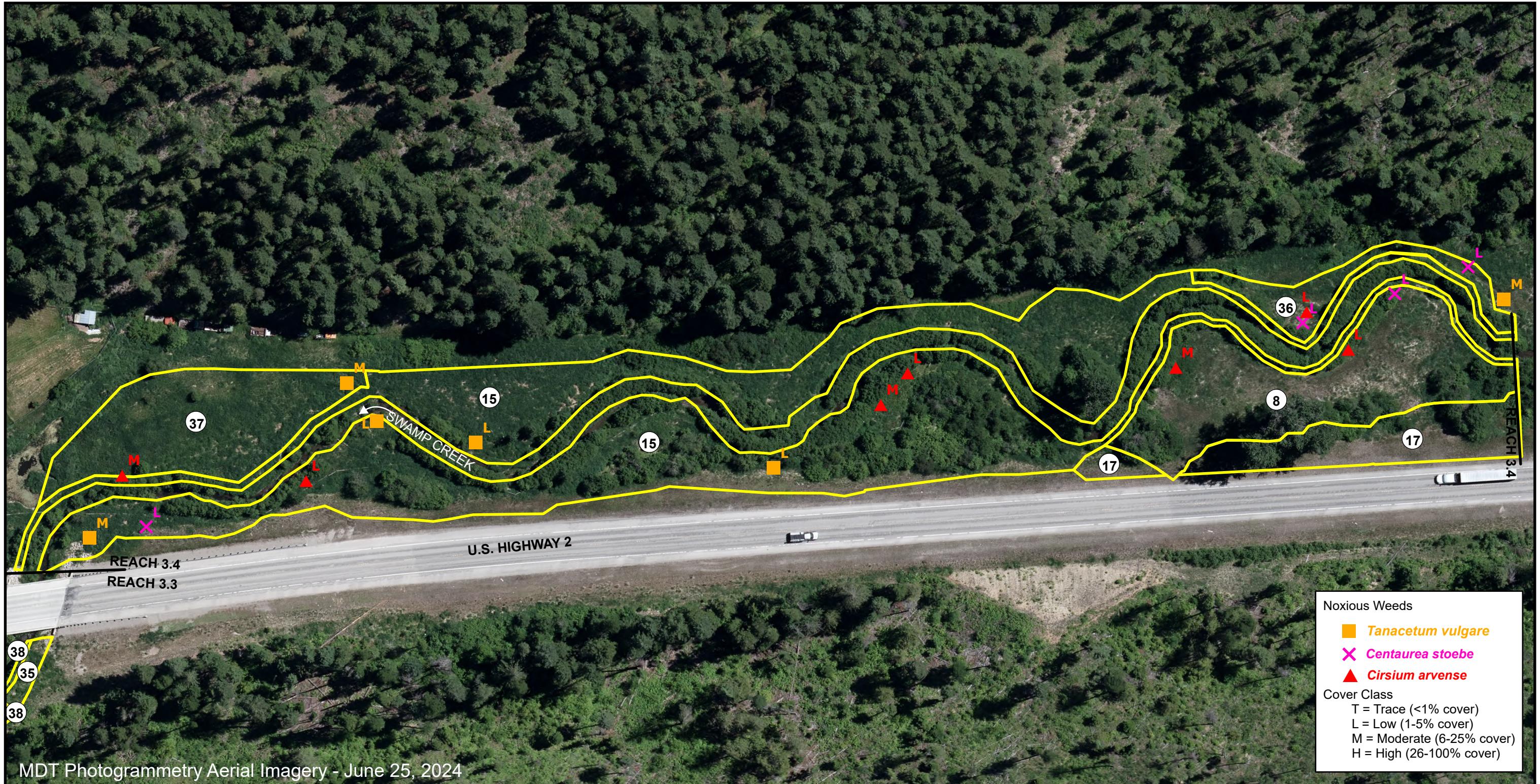
- Eroding Banks Mapped in 2024
- Monitoring Transects
- Riparian Vegetation Belt Transect
- Photo Points

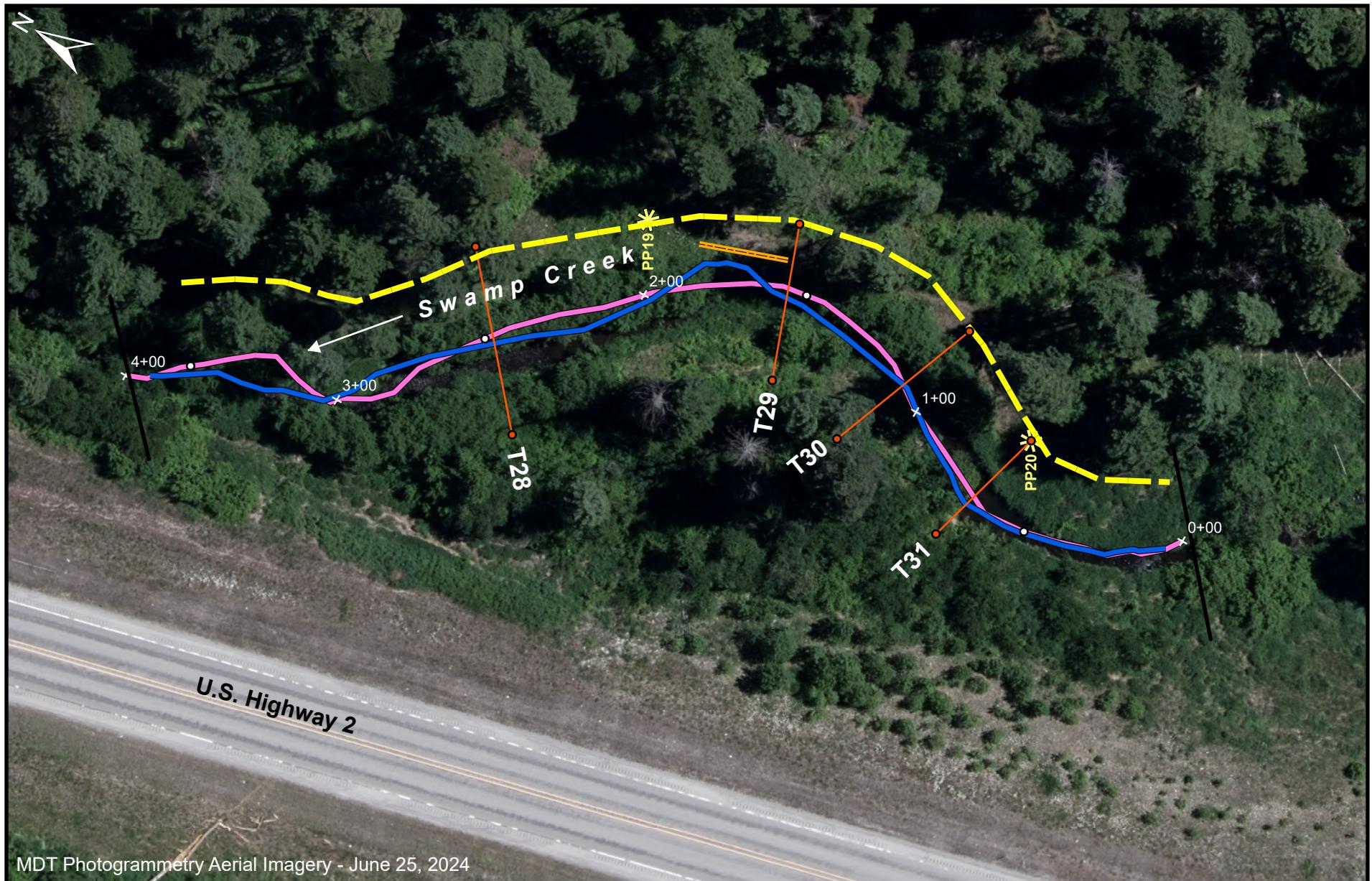
Headcut Stabilized  
in 2019

0 100 200  
Feet

**Swamp Creek - 2024  
Reach 3.4  
Monitoring Features**

Map 5  
Map Date: 11/05/2024  
SwampR3.4\_features2024





### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline



- 2024 Eroding Banks
- Monitoring Transects
- Riparian Vegetation Belt Transect

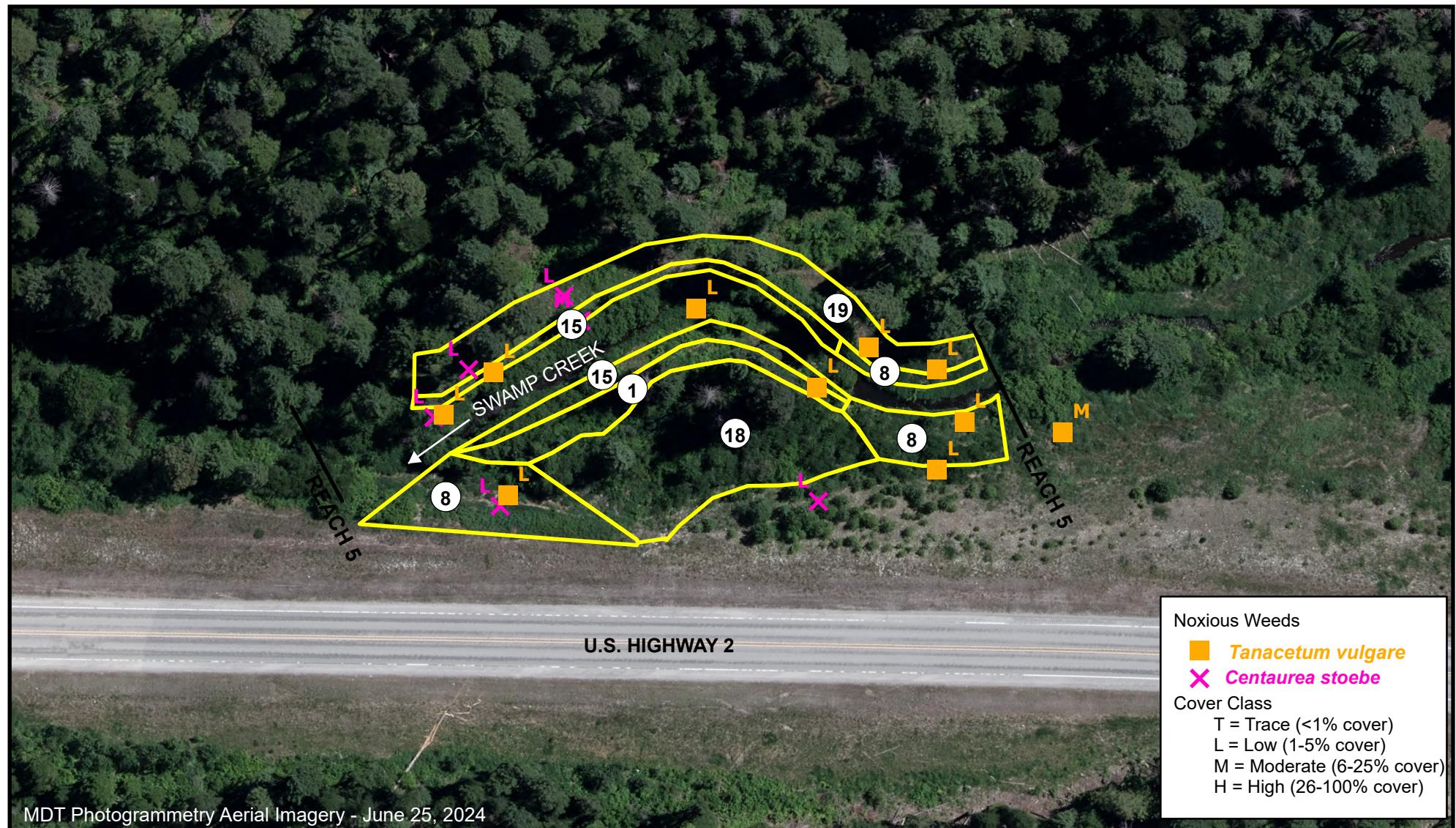


### Swamp Creek - 2024 Reach 5 Monitoring Features

Map 6

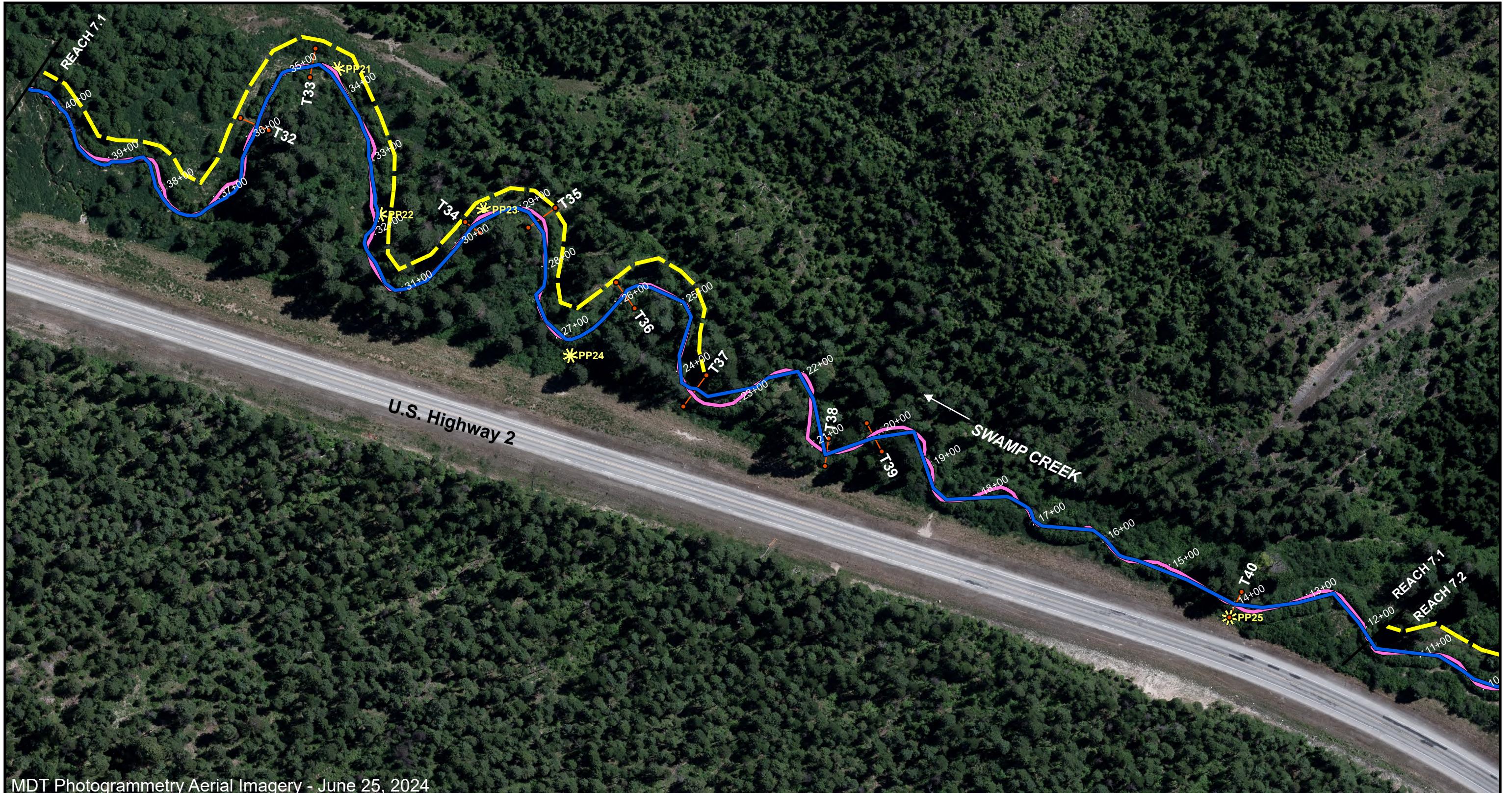
Map Date: 11/05/2024

SwampR5\_features2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024

 <b>CONFLUENCE</b> CONSULTING	<b>Legend</b> <ul style="list-style-type: none"> <li>Vegetation Community Boundary</li> <li>Reach Breaks</li> </ul>	<ul style="list-style-type: none"> <li>1: Bromus/Elymus Community</li> <li>8: Phalaris Community</li> <li>8: Phalaris/Alnus Community</li> <li>15: Pseudotsuga/Crataegus Community</li> <li>19: Pseudotsuga/Thuja/Abies Community</li> <li>1: Pseudotsuga/Crataegus Community</li> <li>18: Pseudotsuga/Crataegus Community</li> <li>8: Pseudotsuga/Crataegus Community</li> </ul>	<b>Swamp Creek- 2024</b> <b>Noxious Weeds and Vegetation Communities</b> <b>Reach 5</b> Map 15 Map Date: 11/07/2024 Swamp5_monitor2024.mxd
	<ul style="list-style-type: none"> <li>Vegetation Community Boundary</li> <li>Reach Breaks</li> </ul>	<ul style="list-style-type: none"> <li>0 25 50 100</li> <li>Feet</li> </ul>	



MDT Photogrammetry Aerial Imagery - June 25, 2024



**CONFLUENCE**  
CONSULTING

### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline
- ★ Photo Points
- Eroding Banks Mapped in 2024
- Monitoring Transects
- Riparian Vegetation Belt Transect



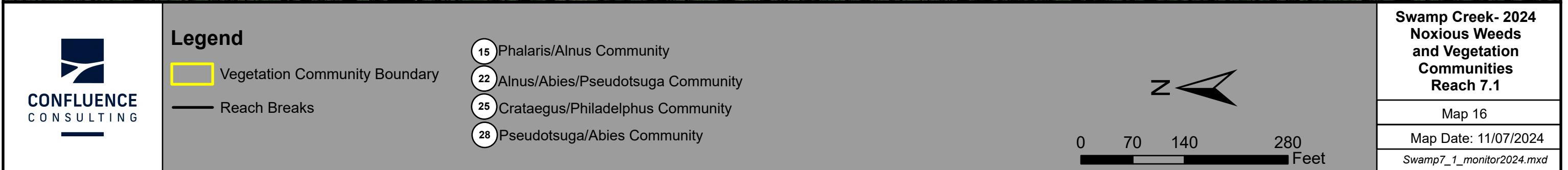
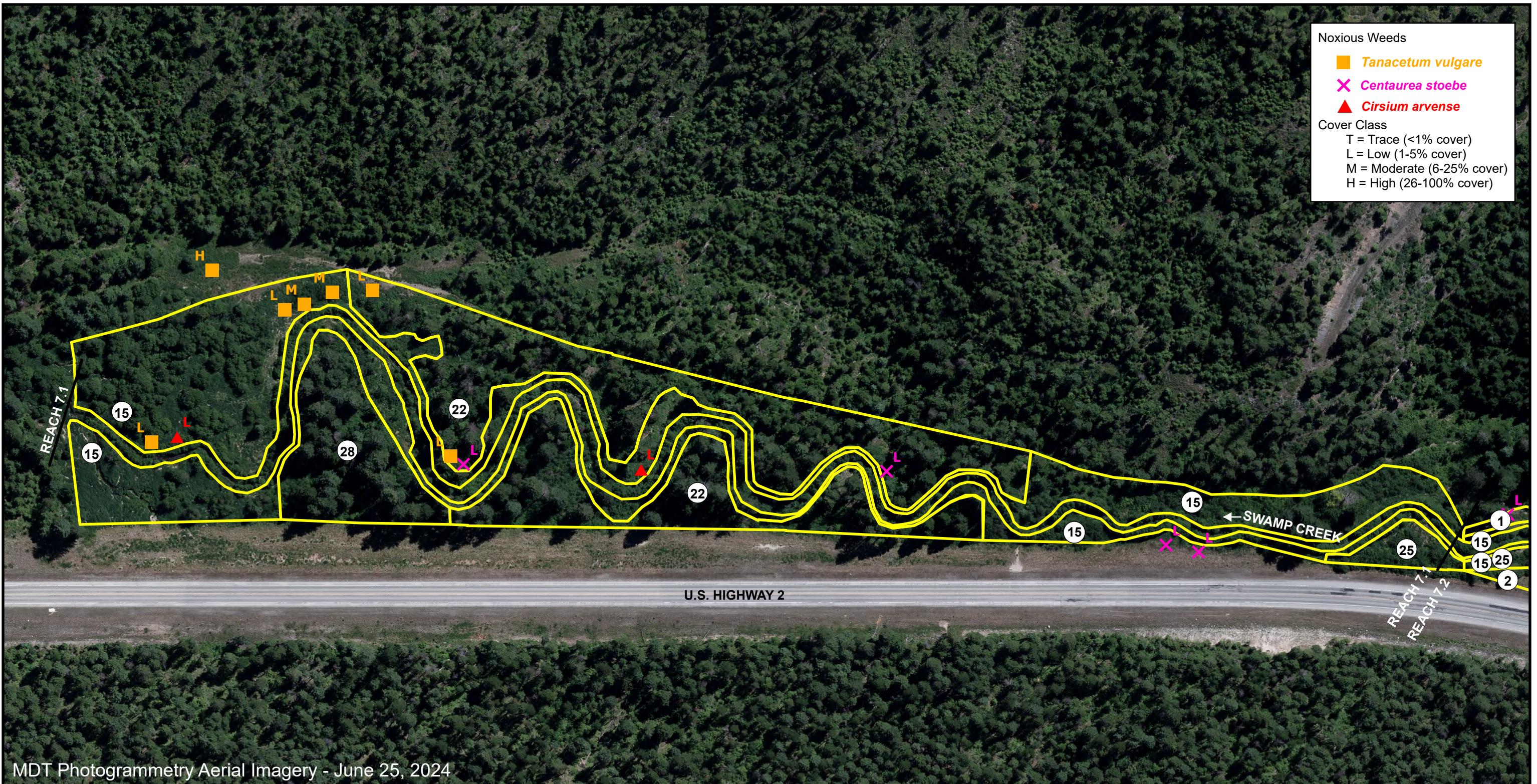
0 150 300  
Feet

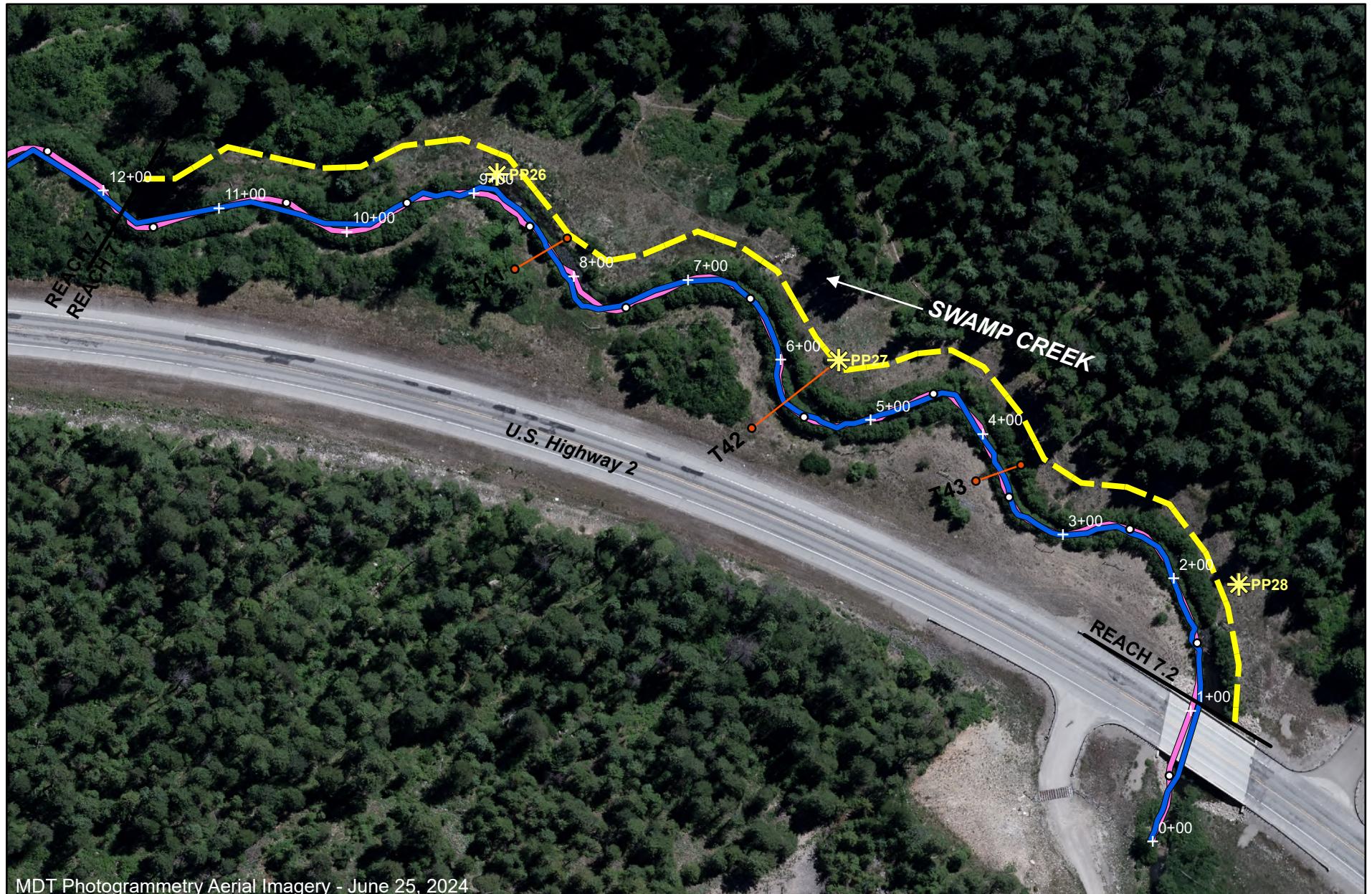
**Swamp Creek- 2024  
Monitoring Features  
Reach 7.1**

Map 7

Map Date: 11/05/2024

Swamp7.1\_features2024.mxd





MDT Photogrammetry Aerial Imagery - June 25, 2024



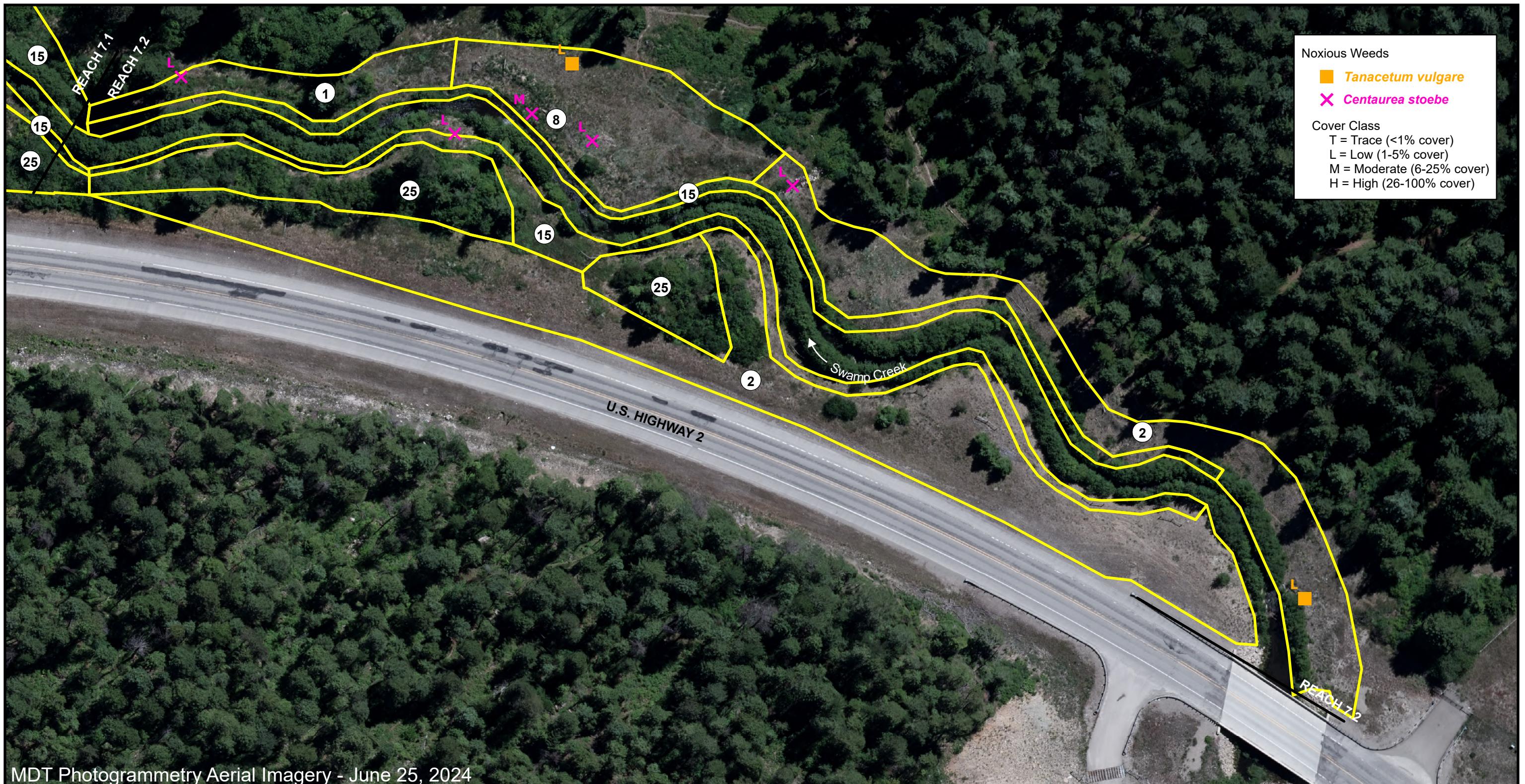
### Legend

- Channel Reach Breaks
- 2015 Channel Centerline
- 2024 Channel Centerline
- ★ Photo Points
- Eroding Banks Mapped in 2024
- Monitoring Transects
- Riparian Vegetation Belt Transect



0 50 100  
Feet

Swamp Creek - 2024 Reach 7.2 Monitoring Features
Map 8
Map Date: 11/05/2024
SwampR7.2_features2024.mxd



MDT Photogrammetry Aerial Imagery - June 25, 2024



#### Legend

Vegetation Community Boundary

Reach Breaks

- 1 Bromus/Elymus Community
- 2 Elymus Community
- 8 Phalaris Community
- 15 Phalaris/Alnus Community
- 25 Crataegus/Philadelphus Community



0 25 50 100  
Feet

**Swamp Creek- 2024  
Noxious Weeds  
and Vegetation  
Communities  
Reach 7.2**

Map 17

Map Date: 11/07/2024

Swamp7\_2\_monitor2024.mxd

---

## APPENDIX B PROJECT AREA PHOTOGRAPHS

---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

## **PHOTO INFORMATION**

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2014 and 2024 Monitoring Events



**CONFLUENCE**  
CONSULTING



**2014**

**Photo Point 1.1:** View looking south at Reach 1.



**2024**



**2014**

**Photo Point 1.2:** View looking south southeast at Reach 1.



**2024**



**2014**

**Photo Point 1.3:** View looking east southeast at Reach 1.



**2024**

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 1.4:** View looking east at Reach 1.



2024



2014

**Photo Point 2.1:** View looking south southeast at Reach 1.



2024



2014

**Photo Point 2.2:** View looking southeast at Reach 1.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 2.3:** View looking east at Reach 1.



2024



2014

**Photo Point 2.4:** View looking northeast at Reach 1.



2024



2014

**Photo Point 2.5:** View looking north at Reach 1.



2024

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2014 and 2024 Monitoring Events



2014

**Photo Point 3.1:** View looking south at Reach 1.



2024



2014

**Photo Point 3.2:** View looking southwest at Reach 1.



2024



2014

**Photo Point 3.3:** View looking west at Reach 1.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 3.4:** View looking northwest at Reach 1.



2024



2014

**Photo Point 3.5:** View looking north at Reach 1.



2024



2014

**Photo Point 4.1:** View looking south southeast at Reach 2.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 4.2:** View looking south at Reach 2.



2024



2014

**Photo Point 4.3:** View looking southwest at Reach 2.



2024



2014

**Photo Point 4.4:** View looking west at Reach 2.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 4.5:** View looking northwest at Reach 2.

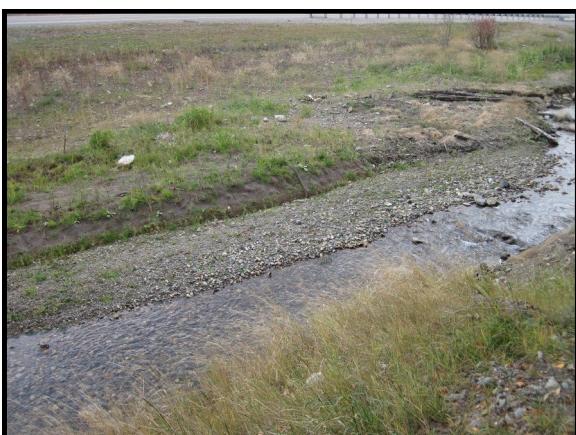
2024



2014

**Photo Point 5.1:** View looking southeast at Reach 2.

2024



2014

**Photo Point 5.2:** View looking east south east Reach 2.

2024

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2014 and 2024 Monitoring Events



2014



2024

**Photo Point 5.3:** View looking east at Reach 2.



2014



2024

**Photo Point 5.4:** View looking east northeast at Reach 2.



2014



2024

**Photo Point 5.6:** View looking northeast at Reach 2.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 6.1:** View looking north northeast at Reach 2.



2014

**Photo Point 6.2:** View looking north northwest at Reach 2.



2014

**Photo Point 7.1:** View looking north northwest (downstream) at the upstream end of Reach 2.

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2014 and 2024 Monitoring Events



**2014**

**Photo Point 7.2:** View looking west at the upstream end of Reach 2.

**2024**



**2014**

**Photo Point 7.4:** View looking southwest at the upstream end of Reach 2.

**2024**



**2014**

**Photo Point 7.5:** View looking south (upstream) at the upstream end of Reach 2.

**2024**

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 8.1:** View looking north at Reach 3.1.

2024



2014

**Photo Point 8.2:** View looking west at Reach 3.1.

2024



2014

**Photo Point 8.3:** View looking southwest at Reach 3.1.

2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 8.4:** View looking south southwest at Reach 3.1.



2014

**Photo Point 8.5:** View looking south at Reach 3.1.



2014

**Photo Point 9.1:** View looking south at Reach 3.1.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 9.2:** View looking southwest at Reach 3.1.



2024



2014

**Photo Point 9.3:** View looking northeast at Reach 3.1.



2024



2014

**Photo Point 10.1:** View looking north northwest at Reach 3.1.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 10.2:** View looking northeast at Reach 3.1.



2024



2014

**Photo Point 11.1:** View looking south at Reach 3.1.



2024



2014

**Photo Point 11.2:** View looking north at Reach 3.1.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 12.1:** View looking north northwest at Reach 3.2



2024



2014

**Photo Point 12.2:** View looking west at Reach 3.2.



2024



2014

**Photo Point 12.3:** View looking west southwest at Reach 3.2.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 12.4:** View looking south southwest at Reach 3.2.



2024



2014

**Photo Point 12.5:** View looking south at Reach 3.2.



2024



2014

**Photo Point 13.1** View looking north northwest at Reach 3.2.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 14.1:** View looking north at Reach 3.3.



2024



2014

**Photo Point 14.2:** View looking east at Reach 3.3.



2024



2014

**Photo Point 14.3:** View looking south southeast at Reach 3.3.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 15.1:** View looking north northwest at Reach 3.3.



2024



2014

**Photo Point 15.2:** View looking east at Reach 3.3.



2024



2014

**Photo Point 16.1:** View looking south southwest at Reach 3.4.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

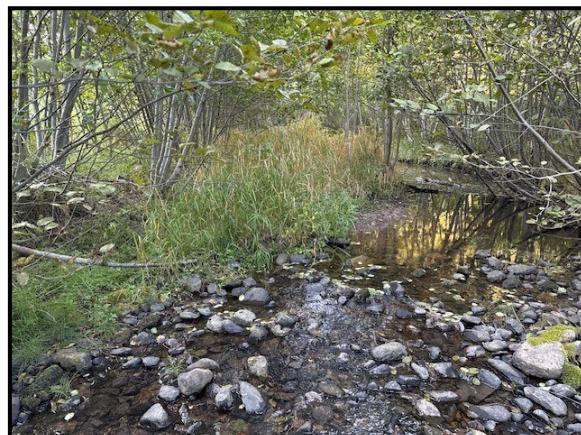


2024

**Photo Point 16.2:** View looking west at Reach 3.4.



2014



2024

**Photo Point 17.1:** View looking south at Reach 3.4. Due to dense vegetation, this photo was taken from a different location than in 2014.



2014



2024

**Photo Point 17.2:** View looking south east at Reach 3.4. Due to dense vegetation, this photo was taken from a different location than in 2014.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014



2024

**Photo Point 17.3:** View looking east at Reach 3.4.



2014



2024

**Photo Point 17.4:** View looking northeast at Reach 3.4.



2014



2024

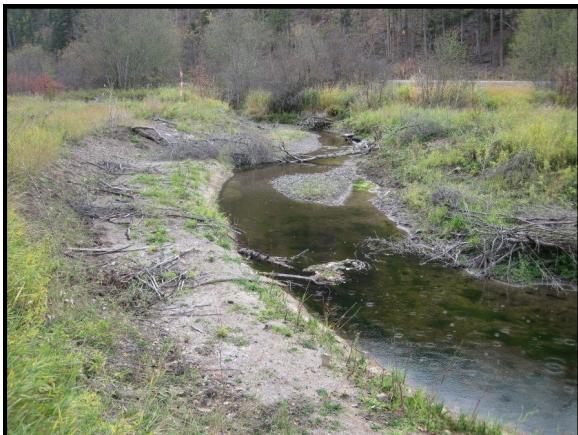
**Photo Point 17.5:** View looking north at Reach 3.4.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 18.1:** View looking southwest at Reach 3.4.



2024

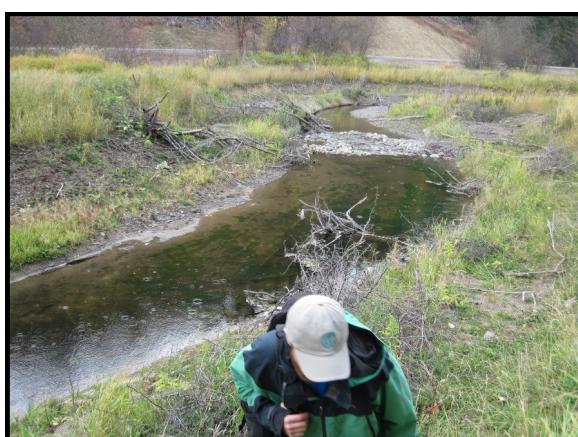


2014

**Photo Point 18.2:** View looking west at Reach 3.4.



2024



2014

**Photo Point 18.3:** View looking northwest at Reach 3.4.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 18.4:** View looking north at Reach 3.4.



2024



2014

**Photo Point 19.1:** View looking south southwest at Reach 5.



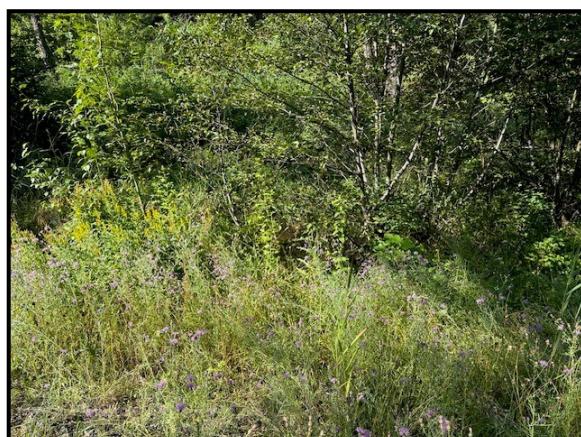
2024



2014

**Photo Point 19.2:** View looking south west at Reach 5.

Note that this photo was taken from a different location than the original due to the presence of dense vegetation.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014



2024

**Photo Point 19.3:** View looking northwest at Reach 5.

Note that this photo was taken from a different location than the original due to the presence of dense vegetation.



2014



2024

**Photo Point 20.1:** View looking west south west at Reach 5.



2014

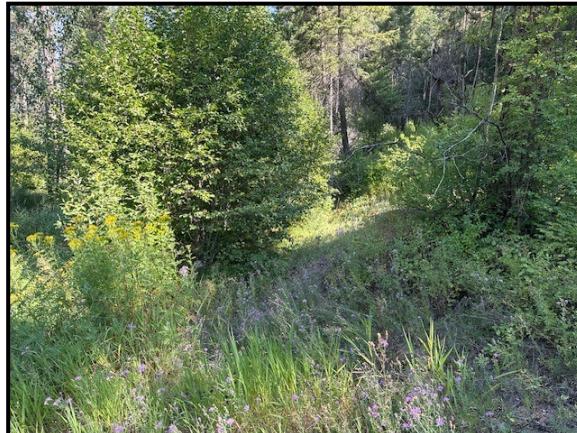


2024

**Photo Point 20.4:** View looking north northwest at Reach 5.

## **PHOTO INFORMATION**

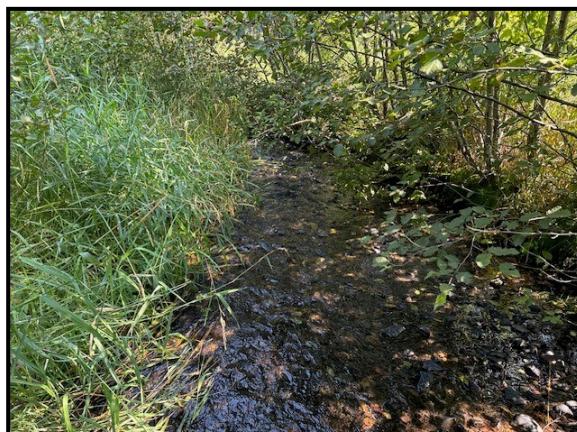
PROJECT NAME: Swamp Creek Stream Mitigation Site  
DATE: 2014 and 2024 Monitoring Events



**2014**  
**Photo Point 20.5:** View looking north northwest at Reach 5.



**2014**  
**Photo Point 21.1:** View looking southwest at Reach 7.1.



**2014**  
**Photo Point 21.2:** View looking northwest at Reach 7.1.

## **PHOTO INFORMATION**

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2014 and 2024 Monitoring Events

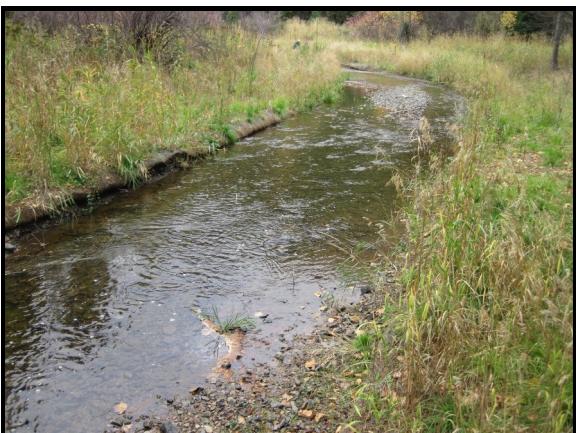


**2014**

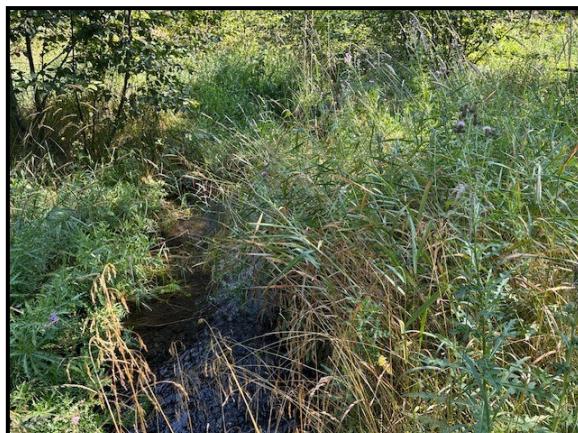


**2024**

**Photo Point 22.1:** View looking west at Reach 7.1.



**2014**

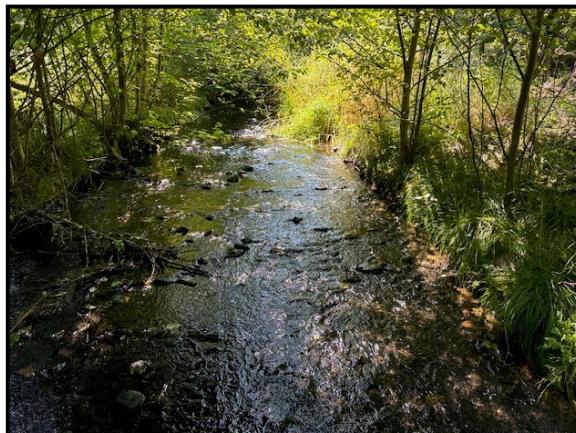


**2024**

**Photo Point 22.2:** View looking south at Reach 7.1.



**2014**



**2024**

**Photo Point 23.1:** View looking south at Reach 7.1. Photo was taken in the channel due to dense vegetation.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

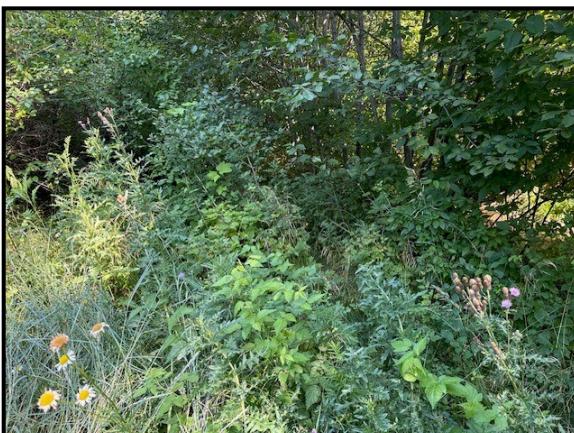


2024

**Photo Point 23.2:** View looking west at Reach 7.1.



2014



2024

**Photo Point 24.1:** View looking northeast at Reach 7.1.



2014



2024

**Photo Point 24.2:** View looking east at Reach 7.1.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 24.3:** View looking east southeast at Reach 7.1.



2014

**Photo Point 24.4:** View looking southeast at Reach 7.1.



2014

**Photo Point 25.1:** View looking north at Reach 7.1.

2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 25.2:** View looking east at Reach 7.1.



2014

**Photo Point 25.3:** View looking south at Reach 7.1.



2014

**Photo Point 26.1:** View looking south (2014) and west (2024) at Reach 7.2.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 26.2:** View looking north at Reach 7.2.



2024



2014

**Photo Point 27.1:** View looking south at Reach 7.2.



2024



2014

**Photo Point 27.2:** View looking southwest at Reach 7.2.



2024

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 27.4:** View looking west northwest at Reach 7.2.



2014

**Photo Point 27.5:** View looking north at Reach 7.2.



2014

**Photo Point 28.1:** View looking west southwest at Reach 7.2.

PROJECT NAME:

Swamp Creek Stream Mitigation Site

DATE:

2014 and 2024 Monitoring Events



2014

**Photo Point 28.2:** View looking west at Reach 7.2.



2014

**Photo Point 28.3:** View looking north northwest at Reach 7.2.



2018

2024

**Additional Photo 1:** Washed out riprap placed to stabilize seep just downstream of bridge in Reach 2.

PROJECT NAME: Swamp Creek Stream Mitigation Site

DATE: 2021 and 2024 Monitoring Events



2021



2024

**Additional Photo 2:** Failed rock weir flanked by channel at upstream end of Reach 3.1.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



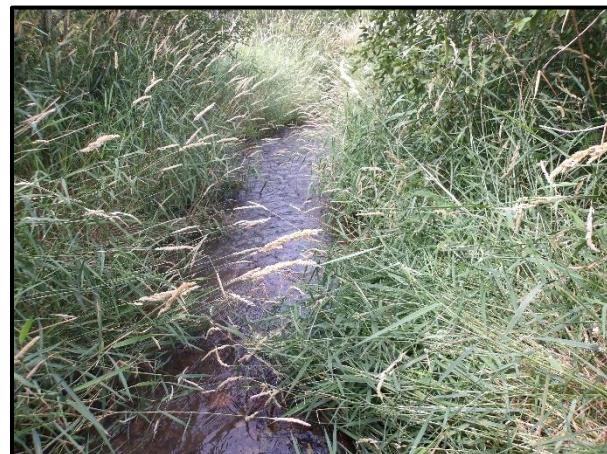
**Survey Photo 1:** T1 Center looking upstream East.



**Survey Photo 2:** T1 Center downstream looking North.



**Survey Photo 3:** T2 Center looking East upstream.



**Survey Photo 4:** T2 Center looking Northwest downstream.



**Survey Photo 5:** T3 Center looking East upstream.



**Survey Photo 6:** T3 Center looking Northwest downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 7:** T4 Center looking South upstream.



**Survey Photo 8:** T4 Center looking Northwest downstream.



**Survey Photo 9:** T5 Center looking South upstream.



**Survey Photo 10:** T5 Center looking North downstream.



**Survey Photo 11:** T6 Center looking East upstream.



**Survey Photo 12:** T6 Center looking Northwest downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 13:** T7 Center looking South upstream.



**Survey Photo 14:** T7 Center looking North downstream.



**Survey Photo 15:** T8 Center looking South upstream. (2024)



**Survey Photo 16:** T8 Center looking North downstream. (2024)



**Survey Photo 17:** T9 Center looking Southeast upstream.



**Survey Photo 18:** T9 Center looking Northwest downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 19:** T10 Center looking Southeast upstream.



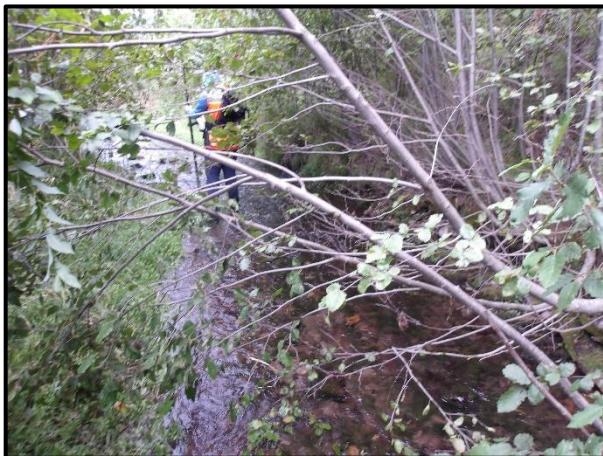
**Survey Photo 20:** T10 Center looking Northwest downstream.



**Survey Photo 21:** T11 Center looking East upstream.



**Survey Photo 22:** T11 Center looking West downstream.



**Survey Photo 23:** T12 Center looking East upstream.



**Survey Photo 24:** T12 Center looking West downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 25:** T13 Center looking East upstream.



**Survey Photo 26:** T13 Center looking West downstream.



**Survey Photo 27:** T14 Center looking East upstream.



**Survey Photo 28:** T14 Center looking West downstream.



**Survey Photo 29:** T15 Center looking Northeast upstream.



**Survey Photo 30:** T15 Center looking Southwest downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



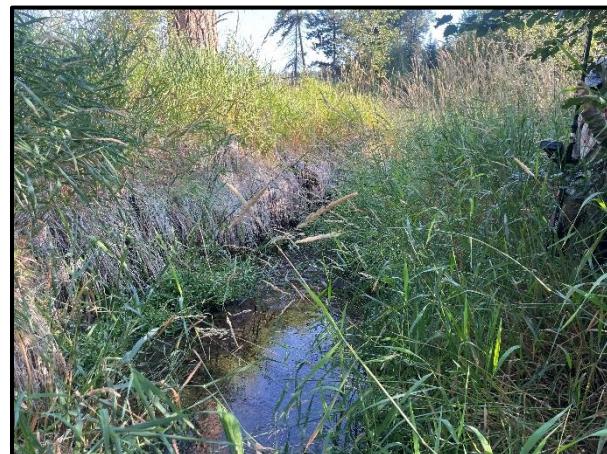
**Survey Photo 31:** T16 Center looking Southeast upstream.



**Survey Photo 32:** T16 Center looking West downstream.



**Survey Photo 33:** T17 Center looking South upstream.



**Survey Photo 34:** T17 Center looking North downstream.



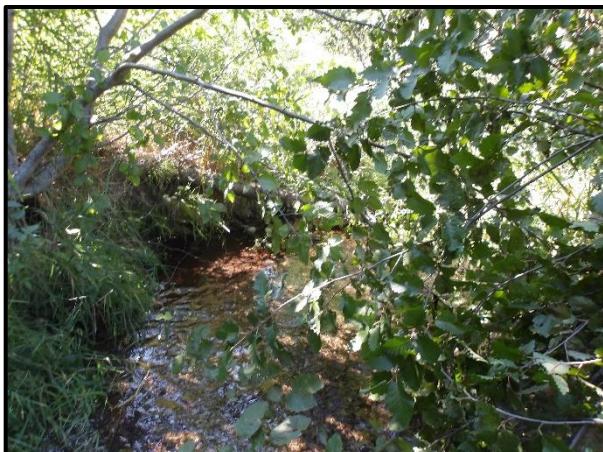
**Survey Photo 35:** T18 Center looking South upstream.



**Survey Photo 36:** T18 Center looking Northwest downstream.

## SURVEY PHOTO LOG

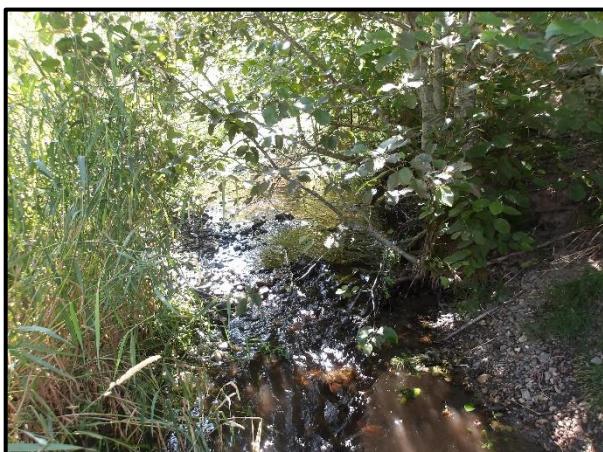
SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 37:** T19 Center looking South upstream.



**Survey Photo 38:** T19 Center looking North downstream.



**Survey Photo 39:** T20 Center looking South upstream.



**Survey Photo 40:** T20 Center looking North downstream.



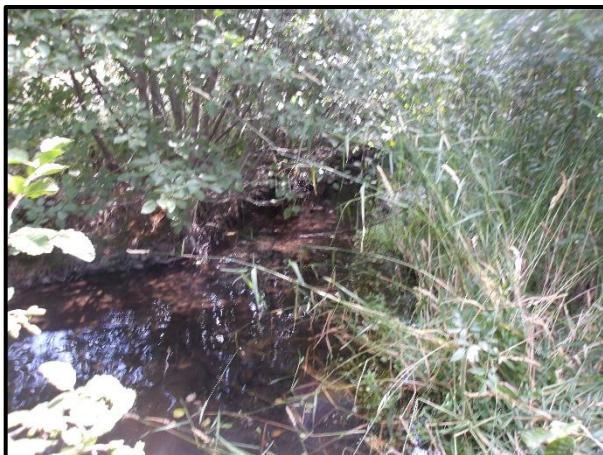
**Survey Photo 41:** T21 Center looking Southeast upstream.



**Survey Photo 42:** T21 Center looking Northwest downstream.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



**Survey Photo 43:** T21.5 Center looking South upstream.



**Survey Photo 44:** T21.5 Center looking North downstream.



**Survey Photo 45:** T21.7 Center looking South upstream.



**Survey Photo 46:** T21.7 Center looking North downstream.



**Survey Photo 47:** T22 Center looking Southeast upstream.



**Survey Photo 48:** T22 Center looking Northwest downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 49:** T22.3 Center looking Southeast upstream.



**Survey Photo 50:** T22.3 Center looking Northwest downstream.



**Survey Photo 51:** T22.5 Center looking Southeast upstream.



**Survey Photo 52:** T22.5 Center looking Northwest downstream.



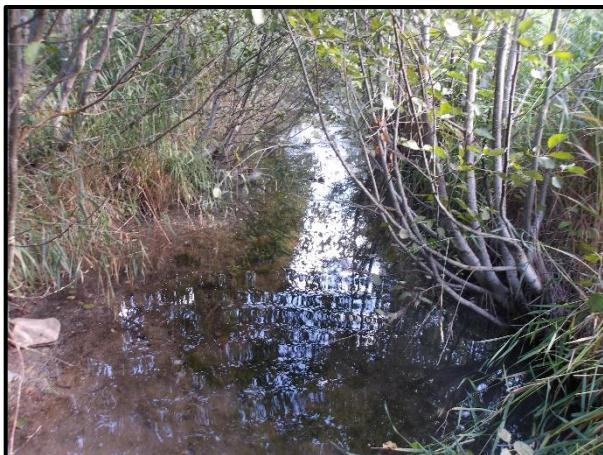
**Survey Photo 53:** T22.7 Center looking Southeast upstream.



**Survey Photo 54:** T22.7 Center looking Northwest downstream.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



**Survey Photo 55:** T23 Center looking Southeast upstream.



**Survey Photo 56:** T23 Center looking Northwest downstream.



**Survey Photo 57:** T24 Center looking South upstream.



**Survey Photo 58:** T24 Center looking Northwest downstream.



**Survey Photo 59:** T25 Center looking South upstream.



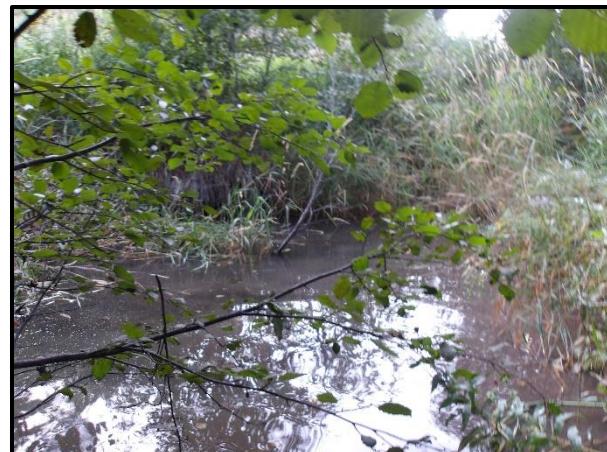
**Survey Photo 60:** T25 Center looking North downstream.

## SURVEY PHOTO LOG

SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 61:** T26 Center looking East upstream.



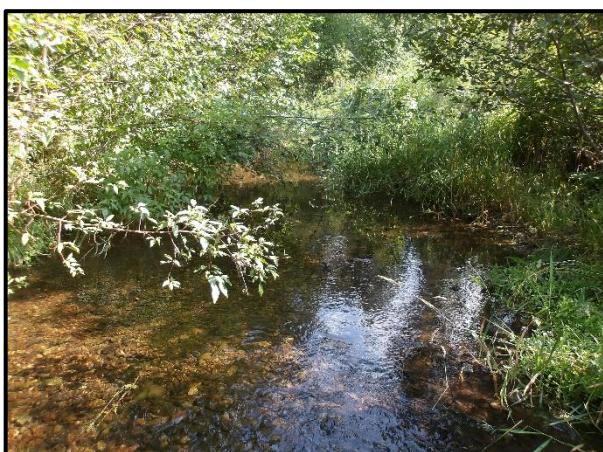
**Survey Photo 62:** T26 Center looking West downstream.



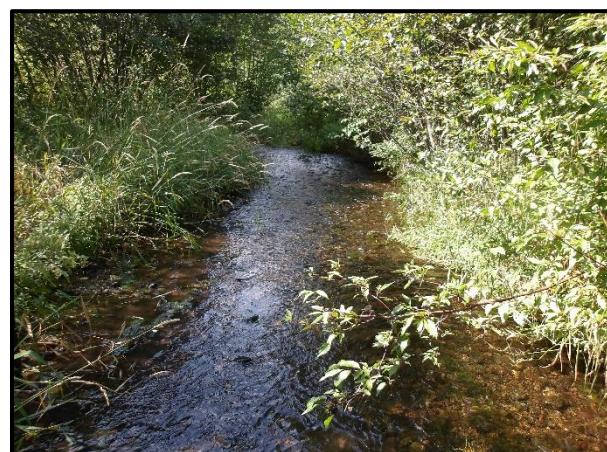
**Survey Photo 63:** T27 Center looking East upstream.



**Survey Photo 64:** T27 Center looking West downstream.



**Survey Photo 65:** T28 Center looking Southeast upstream.



**Survey Photo 66:** T28 Center looking Northwest downstream.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



**Survey Photo 67:** T29 Center looking Southeast upstream.



**Survey Photo 68:** T29 Center looking Northwest downstream.



**Survey Photo 69:** T30 Center looking South upstream.



**Survey Photo 70:** T30 Center looking North downstream.



**Survey Photo 71:** T31 Center looking South upstream.



**Survey Photo 72:** T31 Center looking North downstream.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



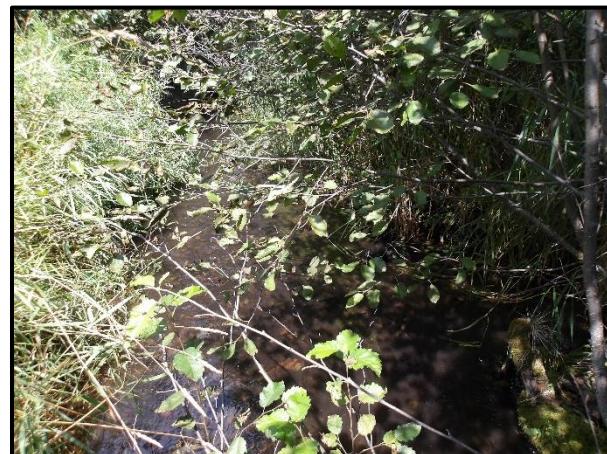
**Survey Photo 73:** T32 Center looking East upstream.



**Survey Photo 74:** T32 Center looking West downstream.



**Survey Photo 75:** T33 Center looking Southeast upstream.



**Survey Photo 76:** T33 Center looking Northwest downstream.



**Survey Photo 77:** T34 Center looking Southeast upstream.



**Survey Photo 78:** T34 Center looking West downstream.

## SURVEY PHOTO LOG

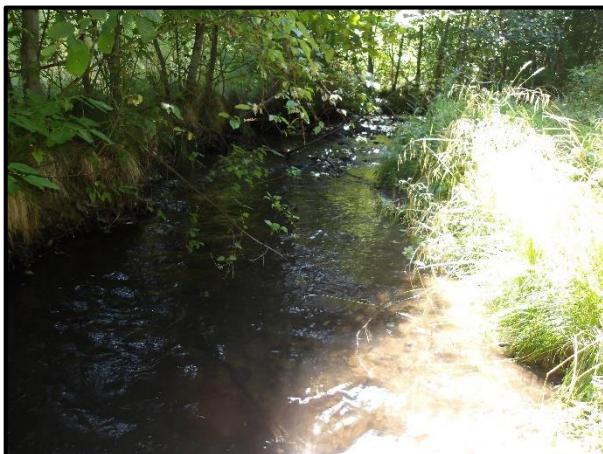
SITE NAME: Swamp Creek  
MONITORING YEAR: 2024



**Survey Photo 79:** T35 Center looking Southwest upstream.



**Survey Photo 80:** T35 Center looking North downstream.



**Survey Photo 81:** T36 Center looking Southwest upstream.



**Survey Photo 82:** T36 Center looking North downstream.



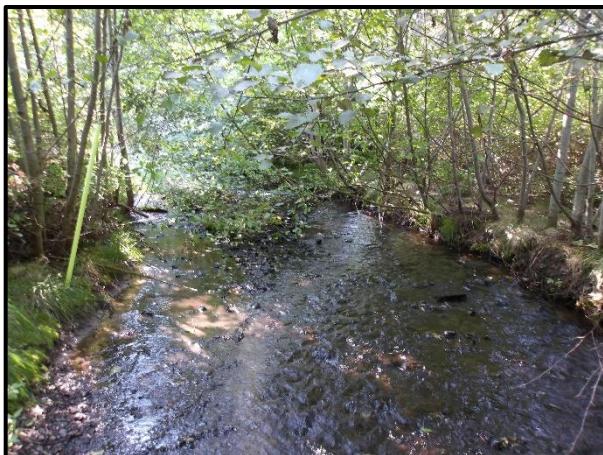
**Survey Photo 83:** T37 Center looking South upstream.



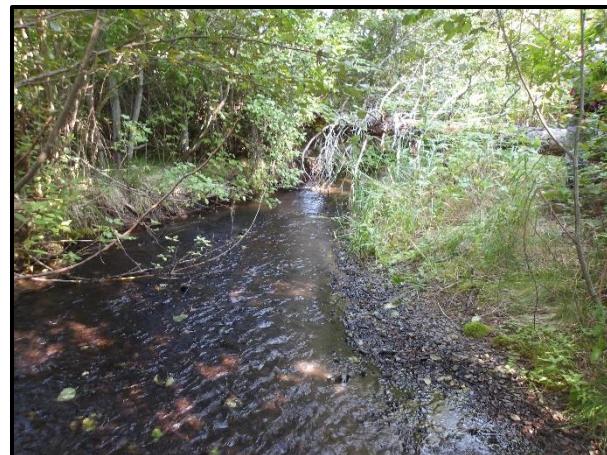
**Survey Photo 84:** T37 Center looking North downstream.

## SURVEY PHOTO LOG

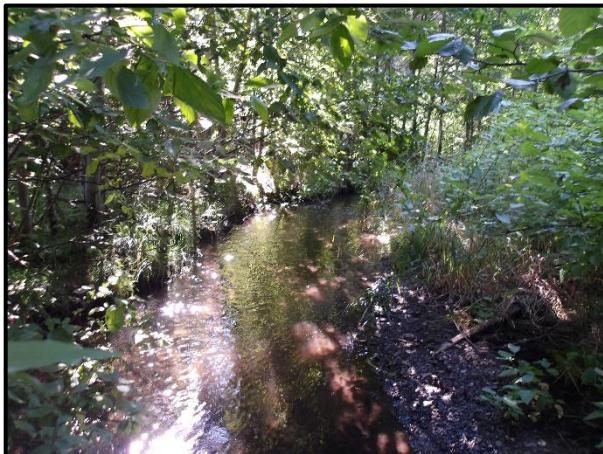
**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



**Survey Photo 85:** T38 Center looking Southeast upstream.



**Survey Photo 86:** T38 Center looking North downstream.



**Survey Photo 87:** T39 Center looking Southeast upstream.



**Survey Photo 88:** T39 Center looking Northwest downstream.



**Survey Photo 89:** T40 Center looking Southeast upstream.



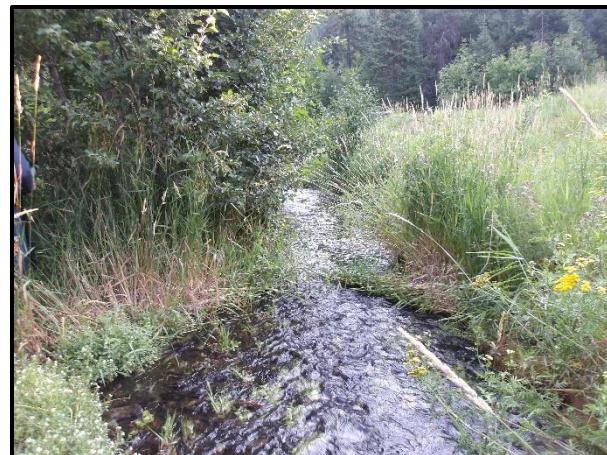
**Survey Photo 90:** T40 Center looking Northwest downstream.

## SURVEY PHOTO LOG

**SITE NAME:** Swamp Creek  
**MONITORING YEAR:** 2024



**Survey Photo 91:** T41 Center looking South upstream.



**Survey Photo 92:** T41 Center looking North downstream.



**Survey Photo 93:** T42 Center looking Southwest upstream.



**Survey Photo 94:** T42 Center looking Northeast downstream.



**Survey Photo 95:** T43 Center looking Southwest upstream.



**Survey Photo 96:** T43 Center looking Northeast downstream.

---

## **APPENDIX C**

### **2015 – 2024 COMPREHENSIVE PLANT SPECIES LIST**

---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

## Channel Segment 1 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agropyron cristatum</i>	Crested Wheatgrass	UPL
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC
<i>Anaphalis margaritacea</i>	Pearly-Everlasting	FACU
<i>Angelica arguta</i>	Lyall's Angelica	FACW
<i>Artemisia biennis</i>	Biennial Wormwood	FACW
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex pellita</i>	Woolly Sedge	OBL
<i>Carex simulata</i>	Analogue Sedge	OBL
<i>Carex</i> sp.	Sedge	N/A
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Carex utriculata</i>	Northwest Territory Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Collomia linearis</i>	Narrow-Leaf Mountain-Trumpet	FACU
<i>Crataegus douglasii</i>	Black Hawthorn	FAC
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Panicled Willowherb	UPL
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW
<i>Equisetum arvense</i>	Field Horsetail	FAC
<i>Festuca idahoensis</i>	Bluebunch Fescue	FACU
<i>Filago arvensis</i>	Field Fluffweed	UPL
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Hordeum jubatum</i>	Fox-Tail Barley	FAC
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU
<i>Juncus bufonius</i>	Toad Rush	FACW

## Channel Segment 1 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Juncus effusus</i>	Lamp Rush	FACW
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW
<i>Juncus nodosus</i>	Knotted Rush	OBL
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Mahonia repens</i>	Creeping Oregon-Grape	UPL
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW
<i>Nasturtium officinale</i>	Watercress	OBL
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Penstemon confertus</i>	Yellow Penstemon	UPL
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Phleum pratense</i>	Common Timothy	FAC
<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>Potentilla drummondii</i>	Drummond's Cinquefoil	FAC
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Osmorhiza purpurea</i>	Purple Sweet-Cicely	FAC
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rubus idaeus</i>	Common Red Raspberry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix drummondiana</i>	Drummond's Willow	FACW
<i>Salix sitchensis</i>	Sitka Willow	FACW
<i>Salix</i> sp.	Willow	N/A
<i>Sambucus racemosa</i>	Red Elder	FACU
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<i>Solanum dulcamara</i>	Climbing Nightshade	FAC
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Symporicarpos albus</i>	Common Snowberry	FACU

## Channel Segment 1 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Tragopogon dubius</i>	Meadow Goat's-Beard	UPL
<i>Trifolium pratense</i>	Red Clover	FACU
<i>Trifolium repens</i>	White Clover	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>Veronica americana</i>	American-Brooklime	OBL
<i>Vicia americana</i>	American Purple Vetch	FAC

<sup>1</sup> 2020 NWPL (USACE 2020)

New species identified in 2024 are **bolded**.

## Channel Segment 2 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU
<i>Achnatherum nelsonii</i>	Nelson's Rice Grass	UPL
<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>Anaphalis margaritacea</i>	Pearly-Everlasting	FACU
<i>Arctium minus</i>	Lesser Burdock	UPL
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	FACU
<i>Artemisia biennis</i>	Biennial Wormwood	FACW
<i>Astragalus cicer</i>	Chickpea Milkvetch	UPL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Bromus tectorum</i>	Cheatgrass	UPL
<i>Calamagrostis canadensis</i>	Bluejoint	FACW
<i>Carduus nutans</i>	Nodding Plumeless-Thistle	UPL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex pellita</i>	Woolly Sedge	OBL
<i>Carex simulata</i>	Analogue Sedge	OBL
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Carex vesicaria</i>	Lesser Bladder Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Chenopodium rubrum</i>	Red Goosefoot	FACW
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Cornus alba</i>	Red Osier	FACW
<i>Dactylis glomerata</i>	Orchard Grass	FACU
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC
<i>Elymus glaucus</i>	Blue Wild Rye	FACU
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Panicled Willowhearb	UPL
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW
<i>Equisetum arvense</i>	Field Horsetail	FAC
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW

## Channel Segment 2 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Festuca idahoensis</i>	Bluebunch Fescue	FACU
<i>Filago arvensis</i>	Field Fluffweed	UPL
<i>Galium triflorum</i>	Fragrant Bedstraw	FACU
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Heracleum maximum</i>	American Cow-Parsnip	FAC
<i>Hordeum jubatum</i>	Fox-Tail Barley	FAC
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU
<i>Juncus balticus</i>	Baltic Rush	FACW
<i>Juncus effusus</i>	Lamp Rush	FACW
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW
<i>Juncus nodosus</i>	Knotted Rush	OBL
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Maianthemum stellatum</i>	Starry False Solomon's-Seal	FAC
<i>Matricaria discoidea</i>	Pineapple-Weed	FACU
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Medicago sativa</i>	Alfalfa	UPL
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW
<i>Nasturtium officinale</i>	Watercress	OBL
<i>Penstemon confertus</i>	Yellow Penstemon	UPL
<i>Persicaria amphibia</i>	Water Smartweed	OBL
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Phleum pratense</i>	Common Timothy	FAC
<i>Piperia dilatata</i>	Scentbottle	FACW
<i>Plantago major</i>	Great Plantain	FAC
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU
<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>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	UPL
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL
<i>Rorippa palustris</i>	Bog Yellowcress	OBL
<i>Rosa woodsii</i>	Woods' Rose	FACU

## Channel Segment 2 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix drummondiana</i>	Drummond's Willow	FACW
<i>Salix sitchensis</i>	Sitka Willow	FACW
<i>Sambucus racemosa</i>	Red Elder	FACU
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<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>Sonchus asper</i>	Spiny-Leaf Sow-Thistle	FACU
<i>Symporicarpos albus</i>	Common Snowberry	FACU
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<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>Veronica americana</i>	American-Brooklime	OBL

<sup>1</sup> 2020 NWPL (USACE 2020)

New species identified in 2024 are **bolded**.

### Channel Segment 3 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Abies lasiocarpa</i>	Subalpine Fir	FACU
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agropyron cristatum</i>	Crested Wheatgrass	UPL
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
Algae, brown	Algae, brown	N/A
Algae, green	Algae, green	N/A
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus aequalis</i>	Short-Awn Meadow Foxtail	OBL
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC
<i>Amelanchier alnifolia</i>	Saskatoon Service-Berry	FACU
<i>Artemisia absinthium</i>	Absinthium	UPL
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Berberis repens</i>	Creeping Oregon Grape	UPL
<i>Bidens cernua</i>	Nodding Burr-Marigold	OBL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Calamagrostis canadensis</i>	Bluejoint	FACW
<i>Carex aquatilis</i>	Leafy Tussock Sedge	OBL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex simulata</i>	Analogue Sedge	OBL
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Carex utriculata</i>	Northwest Territory Sedge	OBL
<i>Carex vesicaria</i>	Lesser Bladder Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Cerastium fontanum</i>	Common Mouse-Ear Chickweed	FACU
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Chenopodium album</i>	Lamb's-Quarters	FACU
<i>Chenopodium rubrum</i>	Red Goosefoot	FACW
<i>Cichorium intybus</i>	Chicory	FACU
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Cornus alba</i>	Red Osier	FACW
<i>Crataegus douglasii</i>	Black Hawthorn	FAC
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW
<i>Deschampsia elongata</i>	Slender Hair Grass	FACW
<i>Descurainia sophia</i>	Herb Sophia	UPL
<i>Dryopteris expansa</i>	Spreading Wood Fern	FACW

### Channel Segment 3 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC
<i>Elymus glaucus</i>	Blue Wild Rye	FACU
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Panicled 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>Filago arvensis</i>	Field Fluffweed	UPL
<i>Galium aparine</i>	Sticky-Willy	FACU
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Glyceria striata</i>	Fowl Manna Grass	OBL
<i>Heracleum maximum</i>	American Cow-Parsnip	FAC
<i>Hordeum jubatum</i>	Fox-Tail Barley	FAC
<i>Hylotelephium spectabile</i>	Showy Stonecrop	UPL
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU
<i>Impatiens ecballarata</i>	Spurless Touch-Me-Not	FACW
<i>Juncus bufonius</i>	Toad Rush	FACW
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW
<i>Juncus nodosus</i>	Knotted Rush	OBL
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Lathyrus sylvestris</i>	Flat Pea	UPL
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Madia glomerata</i>	Mountain Tarplant	FACU
<i>Maianthemum stellatum</i>	Starry False Solomon's-Seal	FAC
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Medicago sativa</i>	Alfalfa	UPL
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW
<i>Nasturtium officinale</i>	Watercress	OBL
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Peritoma serrulata</i>	Rocky Mountain Beepplant	FACU

### Channel Segment 3 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Persicaria amphibia</i>	Water Smartweed	OBL
<i>Persicaria lapathifolia</i>	Dock-Leaf Smartweed	FACW
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Philadelphus lewisii</i>	Lewis' Mock Orange	UPL
<i>Phleum pratense</i>	Common Timothy	FAC
<i>Pinus ponderosa</i>	Ponderosa Pine	FACU
<i>Plantago lanceolata</i>	English Plantain	FACU
<i>Plantago major</i>	Great Plantain	FAC
<i>Plantago patagonica</i>	Woolly Plantain	UPL
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU
<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>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC
<i>Prunella vulgaris</i>	Common Selfheal	FACU
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	UPL
<i>Pseudotsuga menziesii</i>	Douglas-Fir	FACU
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL
<i>Ranunculus repens</i>	Creeping Buttercup	FAC
<i>Rorippa palustris</i>	Bog Yellowcress	OBL
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rubus idaeus</i>	Common Red Raspberry	FACU
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix drummondiana</i>	Drummond's Willow	FACW
<i>Salix lasiandra</i>	Pacific Willow	FACW
<i>Salix sitchensis</i>	Sitka Willow	FACW
<i>Sambucus racemosa</i>	Red Elder	FACU
<i>Schedonorus pratensis</i>	Meadow False Rye Grass	FACU
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<i>Silene</i> sp.	Campion	NA
<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

### Channel Segment 3 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Sorbus sitchensis</i>	Sitka Mountain-Ash	FAC
<i>Symporicarpos albus</i>	Common Snowberry	FACU
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Thalictrum occidentale</i>	Western Meadow-Rue	FACU
<i>Thlaspi arvense</i>	Field Pennycress	UPL
<i>Thuja plicata</i>	Western Arborvitae	FAC
<i>Tragopogon dubius</i>	Meadow Goat's-beard	UPL
<i>Tragopogon pratensis</i>	Meadow Goat's-beard	UPL
<i>Trifolium aureum</i>	Yellow Clover	UPL
<i>Trifolium pratense</i>	Red Clover	FACU
<i>Trifolium repens</i>	White Clover	FAC
<i>Tripleurospermum inodorum</i>	Scentless False Mayweed	UPL
<i>Typha angustifolia</i>	Narrow-Leaf Cat-Tail	OBL
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL
<i>Urtica dioica</i>	Stinging Nettle	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>Veronica americana</i>	American-Brooklime	OBL

<sup>1</sup> 2020 NWPL (USACE 2020)

New species identified in 2024 are **bolded**.

## Channel Segment 5 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Abies grandis</i>	Grand Fir	FACU
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Amelanchier alnifolia</i>	Saskatoon Service-Berry	FACU
<i>Anaphalis margaritacea</i>	Pearly Everlasting	FACU
<i>Astragalus americanus</i>	American Milkvetch	FAC
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Boechera stricta</i>	Canadian Rockcress	FACU
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Bromus tectorum</i>	Cheatgrass	UPL
<i>Calamagrostis canadensis</i>	Bluejoint	FACW
<i>Campanula</i> sp.	Bellflower	N/A
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex simulata</i>	Analogue Sedge	OBL
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Cerastium fontanum</i>	Common Mouse-Ear Chickweed	FACU
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Cornus alba</i>	Red Osier	FACW
<i>Crataegus douglasii</i>	Black Hawthorn	FAC
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW
<i>Elymus glaucus</i>	Blue Wild Rye	FACU
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW
<i>Fragaria vesca</i>	Woodland Strawberry	FACU
<i>Galium aparine</i>	Sticky-Willy	FACU
<i>Gayophytum diffusum</i>	Diffuse Groundsmoke	UPL
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Glycyrrhiza lepidota</i>	American Licorice	FAC
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	UPL
<i>Lactuca serriola</i>	Prickly Lettuce	FACU

## Channel Segment 5 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Lathyrus sulvestris</i>	Flat Pea	UPL
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Mahonia repens</i>	Creeping Oregon-Grape	UPL
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW
<i>Nasturtium officinale</i>	Watercress	OBL
<i>Nemophila breviflora</i>	Small-Flower Baby-Blue-Eyes	UPL
<i>Penstemon confertus</i>	Yellow Penstemon	UPL
<i>Penstemon sp.</i>	Penstemon	N/A
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Philadelphus lewisii</i>	Lewis' Mock Orange	UPL
<i>Phleum pratense</i>	Common Timothy	FAC
<i>Pinus ponderosa</i>	Ponderosa Pine	FACU
<i>Plantago major</i>	Great Plantain	FAC
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU
<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>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Pseudotsuga menziesii</i>	Douglas-Fir	FACU
<i>Ranunculus repens</i>	Creeping Buttercup	FAC
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rubus idaeus</i>	Common Red Raspberry	FACU
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Sambucus racemosa</i>	Red Elder	FACU
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Sonchus arvensis</i>	Field Sow-Thistle	FACU
<i>Spiraea betulifolia</i>	Shiny-Leaf Meadowsweet	FACU
<i>Symporicarpos albus</i>	Common Snowberry	FACU
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU

## Channel Segment 5 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Trifolium pratense</i>	Red Clover	FACU
<i>Trifolium repens</i>	White Clover	FAC
<i>Urtica dioica</i>	Stinging Nettle	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>Verbena stricta</i>	Hoary Verbena	UPL
<i>Veronica americana</i>	American-Brooklime	OBL

<sup>1</sup> 2020 NWPL (USACE 2020)

New species identified in 2024 are **bolded**.

## Channel Segment 7 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Abies grandis</i>	Grand Fir	FACU
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agropyron cristatum</i>	Crested Wheatgrass	UPL
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
Algae, green	Algae, green	N/A
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC
<i>Amelanchier alnifolia</i>	Saskatoon Service-Berry	FACU
<i>Anaphalis margaritacea</i>	Pearly Everlasting	FACU
<i>Antennaria neglecta</i>	Field Pussytoes	FACU
<i>Arnica cordifolia</i>	Heart-Leaved Arnica	UPL
<i>Beckmannia syzigachne</i>	American Slough Grass	OBL
<i>Bidens cernua</i>	Nodding Burr-Marigold	OBL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Bromus japonicus</i>	Japanese Brome	UPL
<i>Calamagrostis stricta</i>	Slim-Stem Reed Grass	FACW
<i>Campanula rotundifolia</i>	Bluebell-of-Scotland	FACU
<i>Campanula parryi</i>	Parry's Bellflower	FAC
<i>Carex atherodes</i>	Wheat Sedge	OBL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex interior</i>	Interior Sedge	OBL
<i>Carex simulata</i>	Analogue Sedge	OBL
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL
<i>Carex vesicaria</i>	Lesser Bladder Sedge	OBL
<i>Carex utriculata</i>	Northwest Territory Sedge	OBL
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL
<i>Cerastium fontanum</i>	Common Mouse-Ear Chickweed	FACU
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Cornus alba</i>	Red Osier	FACW
<i>Crataegus douglasii</i>	Black Hawthorn	FAC
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW
<i>Deschampsia elongata</i>	Slender Hair Grass	FACW
<i>Descurainia sophia</i>	Herb Sophia	UPL
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL
<i>Elymus hispidus</i>	Intermediate Wheatgrass	UPL

## Channel Segment 7 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Elymus repens</i>	Creeping Wild Rye	FAC
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC
<i>Epilobium brachycarpum</i>	Panicled 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>Fragaria vesca</i>	Woodland Strawberry	FACU
<i>Fraxinus pennsylvanica</i>	Green Ash	FAC
<i>Galium aparine</i>	Sticky-Willy	FACU
<i>Galium boreale</i>	Northern Bedstraw	FACU
<i>Gayophytum diffusum</i>	Diffuse Groundsmoke	UPL
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC
<i>Glyceria grandis</i>	American Manna Grass	OBL
<i>Glyceria striata</i>	Fowl Manna Grass	OBL
<i>Heracleum maximum</i>	American Cow-Parsnip	FAC
<i>Hieracium aurantiacum</i>	Orange Hawkweed	UPL
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	UPL
<i>Hordeum jubatum</i>	Fox-Tail Barley	FAC
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU
<i>Juncus bufonius</i>	Toad Rush	FACW
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW
<i>Juncus nodosus</i>	Knotted Rush	OBL
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Larix occidentalis</i>	Western Larch	FACU
<i>Lathyrus sylvestris</i>	Flat Pea	UPL
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Mahonia repens</i>	Creeping Oregon-Grape	UPL
<i>Maianthemum stellatum</i>	Starry False Solomon's-Seal	FAC
<i>Medicago lupulina</i>	Black Medick	FACU
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL
<i>Nasturtium officinale</i>	Watercress	OBL
<i>Osmorhiza purpurea</i>	Purple Sweet-Cicely	FAC
<i>Ozomelis trifida</i>	Pacific Mitrewort	FAC
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Penstemon confertus</i>	Yellow Penstemon	UPL
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW

## Channel Segment 7 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Philadelphus lewisii</i>	Lewis' Mock Orange	UPL
<i>Phleum pratense</i>	Common Timothy	FAC
<i>Plantago major</i>	Great Plantain	FAC
<i>Plantago patagonica</i>	Woolly Plantain	UPL
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU
<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	FACU
<i>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC
<i>Picea engelmannii</i>	Engelmann Spruce	FAC
<i>Pseudotsuga menziesii</i>	Douglas-Fir	FACU
<i>Prunella vulgaris</i>	Common Selfheal	FACU
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Pseudotsuga menziesii</i>	Douglas-Fir	FACU
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL
<i>Rorippa palustris</i>	Bog Yellowcress	OBL
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rubus idaeus</i>	Common Red Raspberry	FACU
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix drummondiana</i>	Drummond's Willow	FACW
<i>Salix sitchensis</i>	Sitka Willow	FACW
<i>Sambucus racemosa</i>	Red Elder	FACU
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<i>Shepherdia canadensis</i>	Russet Buffalo-Berry	FACU
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Spirea betulifolia</i>	Shiny-Leaf Meadowsweet	FACU
<i>Symphoricarpos albus</i>	Common Snowberry	FACU
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Thalictrum occidentalis</i>	Western Meadow-Rue	FACU
<i>Thuja plicata</i>	Western Arborvitae	FAC
<i>Tragopogon dubius</i>	Meadow Goat's-Beard	UPL
<i>Trifolium pratense</i>	Red Clover	FACU

## Channel Segment 7 Vegetation Species List – 2015-2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status
<i>Trifolium repens</i>	White Clover	FAC
<i>Urtica dioica</i>	Stinging Nettle	FAC
<i>Verbascum thapsus</i>	Great Mullein	FACU
<i>Verbena stricta</i>	Hoary Verbena	UPL
<i>Veronica americana</i>	American-Brooklime	OBL
<i>Viola</i> sp.	Violet	N/A

<sup>1</sup> 2020 NWPL (USACE 2020)

New species identified in 2024 are **bolded**.

---

## APPENDIX D

### 2024 STREAM BANK VEGETATION COMPOSITION

---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

## Segment 1, Reach 1 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	3
<i>Alnus incana</i> *	Speckled Alder	FACW	4
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC	0
Bare Ground	Bare Ground	N/A	2
<i>Bromus inermis</i>	Smooth Brome	UPL	0
<i>Bromus japonicus</i>	Japanese Brome	UPL	1
<i>Carex utriculata</i>	Northwest Territory Sedge	OBL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	3
<i>Cirsium arvense</i>	Canadian thistle	FAC	1
<i>Collomia linearis</i>	Narrow-Leaf Mountain-Trumpet	FACU	0
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC	0
<i>Elymus hispidis</i>	Intermediate Wheatgrass	UPL	1
<i>Elymus repens</i>	Creeping Wild Rye	FAC	1
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	3
<i>Glyceria grandis</i>	American Manna Grass	OBL	0
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACW	0
<i>Lactuca serriola</i>	Prickly Lettuce	FACU	1
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	0
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	1
<i>Mentha arvensis</i>	American Wild Mint	FACW	0
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	2
<i>Nasturtium officinale</i>	Watercress	OBL	2
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU	1
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	2
<i>Poa palustris</i>	Fowl Blue Grass	FAC	0
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	2
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Prunus virginiana</i>	Choke Cherry	FACU	0
<i>Rosa woodsii</i>	Woods' Rose	FACU	0
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Rumex salicifolius</i>	Willow Dock	FACW	1
<i>Salix bebbiana</i>	Gray Willow	FACW	1
<i>Salix drummondiana</i>	Drummond's Willow	FACW	1
<i>Salix sitchensis</i>	Sitka Willow	FACW	0

### Segment 1, Reach 1 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	2
<i>Symporicarpos albus</i>	Common Snowberry	FACU	0
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	2
<i>Tanacetum vulgare</i>	Common Tansy	FACU	1
<i>Verbascum thapsus</i>	Great Mullein	FACU	1
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup>2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

## Segment 2, Reach 2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i> *	Speckled Alder	FACW	4
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC	0
<i>Anaphalis margaritacea</i>	Pearly-Everlasting	FACU	0
Bare Ground	Bare Ground	NA	1
<i>Bromus inermis</i>	Smooth Brome	UPL	2
<i>Carduus nutans</i>	Nodding Plumeless-Thistle	UPL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	2
<i>Chamerion angustifolium</i>	Fireweed	UPL	0
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	0
<i>Cirsium arvense</i>	Canadian Thistle	FAC	2
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	0
<i>Dactylis glomerata</i>	Orchard Grass	FACU	0
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC	1
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU	0
<i>Elymus repens</i>	Creeping Wild Rye	FAC	2
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC	1
<i>Epilobium brachycarpum</i>	Panicled Willowherb	UPL	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i> *	Field Horsetail	FAC	2
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	UPL	0
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU	0
<i>Juncus balticus</i>	Baltic Rush	FACW	0
<i>Lactuca serriola</i>	Prickly Lettuce	FACU	1
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Medicago lupulina</i>	Black Medick	FACU	0
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	1
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	3
<i>Nasturtium officinale</i>	Watercress	OBL	2
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	1

## Segment 2, Reach 2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Populus balsamifera</i>	Balsam Poplar	FAC	2
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	0
<i>Rosa woodsii</i>	Woods' Rose	FACU	1
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU	0
<i>Rumex salicifolius</i>	Willow Dock	FACW	0
<i>Salix bebbiana</i>	Gray Willow	FACW	1
<i>Salix drummondiana</i>	Drummond's Willow	FACW	0
<i>Salix sitchensis</i>	Sitka Willow	FACW	1
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	1
<i>Solanum dulcamara</i>	Climbing Nightshade	FAC	0
<i>Syphoricarpos albus</i>	Common Snowberry	FACU	1
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	2
<i>Tanacetum vulgare</i>	Common Tansy	FACU	0
<i>Taraxacum officinale</i>	Common Dandelion	FACU	0
<i>Tragopogon dubius</i>	Yellow Salsify	UPL	0
<i>Trifolium repens</i>	White Clover	FAC	0
<i>Urtica dioica</i>	Stinging Nettle	FAC	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	1
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

### Segment 3, Reach 3.1a Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i> *	Speckled Alder	FACW	3
Bare Ground	Bare Ground	NA	2
<i>Bromus inermis</i>	Smooth Brome	UPL	1
<i>Carex bebbii</i>	Bebb's Sedge	OBL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	1
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian Thistle	FAC	2
<i>Cirsium vulgare</i>	Bull Thistle	FACU	0
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU	0
<i>Elymus repens</i>	Creeping Wild Rye	FAC	1
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	1
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	0
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	3
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	1
<i>Mentha arvensis</i>	American Wild Mint	FACW	2
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	2
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	2
<i>Nasturtium officinale</i>	Watercress	OBL	2
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU	0
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	0
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	0
<i>Rumex occidentalis</i>	Western Dock	FACW	0
<i>Salix bebbiana</i>	Gray Willow	FACW	0
<i>Salix sitchensis</i>	Sitka Willow	FACW	0
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	0
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	1
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	2
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	1
<i>Tanacetum vulgare</i>	Common Tansy	FACU	1

### Segment 3, Reach 3.1a Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Trifolium repens</i>	White Clover	FAC	0
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	1
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup>2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

**Segment 3, Reach 3.1b Stream Bank Vegetation - 2024**

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i>	Speckled Alder	FACW	3
Bare Ground	Bare Ground	N/A	2
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	1
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	0
<i>Cirsium arvense</i>	Canadian Thistle	FAC	2
<i>Cirsium vulgare</i>	Bull Thistle	FACU	0
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus repens</i>	Creeping Wild Rye	FAC	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	2
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Heracleum maximum</i>	American Cow-Parsnip	FAC	0
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW	0
<i>Juncus nodosus</i>	Knotted Rush	OBL	0
<i>Lactuca serriola</i>	Prickly Lettuce	FACU	0
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	3
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	1
<i>Mentha arvensis</i>	American Wild Mint	FACW	2
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	2
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	2
<i>Nasturtium officinale</i>	Watercress	OBL	2
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	5
<i>Plantago major</i>	Great Plantain	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	0
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	0
<i>Rosa woodsii</i>	Woods' Rose	FACU	1
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	0
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU	0
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Salix bebbiana</i>	Gray Willow	FACW	1
<i>Salix sitchensis</i>	Sitka Willow	FACW	0
<i>Sambucus racemosa</i>	Red Elder	FACU	0

### Segment 3, Reach 3.1b Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	0
<i>Silene</i> sp.	Campion	NA	0
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	0
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	2
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	1
<i>Tanacetum vulgare</i>	Common Tansy	FACU	1
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL	0
<i>Urtica dioica</i>	Stinging Nettle	FAC	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	0
<i>Veronica americana</i>	American-Brookline	OBL	0

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

### Segment 3, Reach 3.2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i>	Speckled Alder	FACW	3
Bare Ground	Bare Ground	N/A	2
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	2
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian Thistle	FAC	1
<i>Cornus alba</i>	Red Osier	FACW	0
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	0
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus repens</i>	Creeping Wild Rye	FAC	2
<i>Epilobium brachycarpum</i>	Panicled Willowherb	UPL	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	2
<i>Equisetum arvense</i>	Field Horsetail	FAC	2
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU	0
<i>Lactuca serriola</i>	Prickly Lettuce	FACU	1
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	3
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Medicago lupulina</i>	Black Medick	FACU	0
<i>Medicago sativa</i>	Alfalfa	UPL	0
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	2
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	3
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	1
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	1
<i>Rosa woodsii</i>	Woods' Rose	FACU	0
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	1
<i>Symphytum campestre</i>	Western Meadow Aster	FACU	1
<i>Symphytum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	2
<i>Tanacetum vulgare</i>	Common Tansy	FACU	1
<i>Taraxacum officinale</i>	Common Dandelion	FACU	0

### Segment 3, Reach 3.2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Tragopogon dubius</i>	Meadow Goat's-Beard	UPL	0
<i>Trifolium pratense</i>	Red Clover	FACU	0
<i>Trifolium repens</i>	White Clover	FAC	0
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	0
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup>2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

### Segment 3, Reach 3.3 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
Algae, green	Algae, green	N/A	0
<i>Alnus incana</i>	Speckled Alder	FACW	3
<i>Angelica arguta</i>	Lyall's Angelica	FACW	0
Bare Ground	Bare Ground	NA	1
<i>Calamagrostis canadensis</i>	Bluejoint	FACW	1
<i>Carex atherodes</i>	Wheat Sedge	OBL	1
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	1
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU	0
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian Thistle	FAC	1
<i>Cornus alba</i>	Red Osier	FACW	2
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	1
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus repens</i>	Creeping Wild Rye	FAC	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	3
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW	1
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Hypericum perforatum</i>	Common St. John's-Wort	FACU	0
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW	1
<i>Juncus nodosus</i>	Knotted Rush	OBL	1
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC	1
<i>Lactuca serriola</i>	Prickly Lettuce	FACU	0
<i>Larix occidentalis</i>	Western Larch	FACU	0
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	2
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	1
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	2
<i>Phalaris arundinacea*</i>	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Plantago major</i>	Great Plantain	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	2
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	1
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	1

### Segment 3, Reach 3.3 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Rosa woodsii</i>	Woods' Rose	FACU	1
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	1
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Rumex salicifolius</i>	Willow Dock	FACW	0
<i>Salix lasiandra</i>	Pacific Willow	FACW	0
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	1
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	1
<i>Symphoricarpos albus</i>	Common Snowberry	FACU	1
<i>Symphyotrichum campestre</i>	Western Meadow Aster	FACU	1
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	2
<i>Tanacetum vulgare</i>	Common Tansy	FACU	1
<i>Trifolium repens</i>	White Clover	FAC	0
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL	1
<i>Urtica dioica</i>	Stinging Nettle	FAC	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	0
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

### Segment 3, Reach 3.4 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i> *	Speckled Alder	FACW	4
Bare Ground	Bare Ground	N/A	1
<i>Carex atherodes</i>	Wheat Sedge	OBL	1
<i>Carex bebbii</i>	Bebb's Sedge	OBL	1
<i>Carex stipata</i>	Stalk-Grain Sedge	OBL	0
<i>Carex vesicaria</i>	Lesser Bladder Sedge	OBL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	2
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU	0
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian Thistle	FAC	2
<i>Cirsium vulgare</i>	Bull Thistle	FACU	0
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	0
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	2
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	2
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	UPL	0
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW	1
<i>Juncus nodosus</i>	Knotted Rush	OBL	1
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC	0
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	3
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Maianthemum stellatum</i>	Starry False Solomon's-Seal	FAC	0
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	1
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	2
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Plantago major</i>	Great Plantain	FAC	0
<i>Plantago patagonica</i>	Woolly Plaintain	UPL	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	0
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC	0

### Segment 3, Reach 3.4 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Prunella vulgaris</i>	Common Selfheal	FACU	0
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	0
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	0
<i>Rosa woodsii</i>	Woods' Rose	FACU	0
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Salix bebbiana</i>	Gray Willow	FACW	0
<i>Salix lasiandra</i>	Pacific Willow	FACW	0
<i>Salix sitchensis</i>	Sitka Willow	FACW	0
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	1
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	1
<i>Symphoricarpos albus</i>	Common Snowberry	FACU	0
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	0
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	1
<i>Tanacetum vulgare</i>	Common Tansy	FACU	2
<i>Taraxacum officinale</i>	Common Dandelion	FACU	0
<i>Trifolium pratense</i>	Red Clover	FACU	1
<i>Trifolium repens</i>	White Clover	FAC	1
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL	1
<i>Urtica dioica</i>	Stinging Nettle	FAC	1
<i>Veronica americana</i>	American-Brooklime	OBL	0

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

## Segment 5, Reach 5 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU	0
<i>Achillea millefolium</i>	Common Yarrow	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	1
<i>Alnus incana</i> *	Speckled Alder	FACW	3
<i>Anaphalis margaritacea</i>	Pearly-Everlasting	FACU	0
Bare Ground	Bare Ground	N/A	2
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	3
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	0
<i>Cirsium arvense</i>	Canadian Thistle	FAC	1
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	0
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	2
<i>Elymus glaucus</i>	Blue Wild Rye	FACU	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Fragaria vesca</i>	Woodland Strawberry	FACU	0
<i>Geum macrophyllum</i>	Large-Leaf Avens	FACU	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	UPL	0
<i>Lathyrus sulvestris</i>	Flat Pea	UPL	1
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Mentha arvensis</i>	American Wild Mint	FACW	1
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Myosotis scorpioides</i>	True Forget-Me-Not	FACW	1
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	0
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	0
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	0
<i>Rosa woodsii</i>	Woods' Rose	FACU	0
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	1
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU	0
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	2
<i>Symphoricarpos albus</i>	Common Snowberry	FACU	1
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	0
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	1
<i>Tanacetum vulgare</i>	Common Tansy	FACU	3
<i>Trifolium pratense</i>	Red Clover	FACU	1

### Segment 5, Reach 5 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Urtica dioica</i>	Stinging Nettle	FAC	0

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

## Segment 7, Reach 7.1 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Abies grandis</i>	Grand Fir	FACU	0
<i>Achillea millefolium</i>	Common Yarrow	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i> *	Speckled Alder	FACW	4
Bare Ground	Bare Ground	N/A	1
<i>Calamagrostis stricta</i>	Slim-Stem Reed Grass	FACW	0
<i>Carex atherodes</i>	Wheat Sedge	OBL	0
<i>Carex bebbii</i>	Bebb's Sedge	OBL	1
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	2
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian Thistle	FAC	1
<i>Cirsium vulgare</i>	Bull Thistle	FACU	1
<i>Cornus alba</i>	Red Osier	FACW	2
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	3
<i>Elymus repens</i>	Creeping Wild Rye	FAC	1
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Field Horsetail	FAC	1
<i>Galium aparine</i>	Sticky-Willy	FACU	0
<i>Geum macrophyllum</i>	Large-Leaf Avens	FAC	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	2
<i>Heracleum maximum</i>	American Cow-Parsnip	FAC	0
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW	1
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	1
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Maianthemum stellatum</i>	False Solomon's Seal	FAC	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	2
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Osmorhiza purpurea</i>	Purple Sweet-Cicely	FAC	0
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Picea engelmannii</i>	Engelmann's Spruce	FAC	0
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Pseduotsuga menziesii</i>	Douglas-Fir	FACU	0
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	1
<i>Ranunculus repens</i>	Creeping Buttercup	FAC	1

## Segment 7, Reach 7.1 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Rosa woodsii</i>	Woods' Rose	FACU	1
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	2
<i>Rubus parviflorus</i>	Western Thimble-Berry	FACU	1
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Salix bebbiana</i>	Gray Willow	FACW	1
<i>Salix drummondiana</i>	Drummond's Willow	FACW	0
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	1
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	0
<i>Symphoricarpos albus</i>	Common Snowberry	FACU	1
<i>Symphyotrichum campestre</i>	Western Meadow Aster	UPL	1
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	0
<i>Tanacetum vulgare</i>	Common Tansy	FACU	3
<i>Trifolium pratense</i>	Red Clover	FACU	0
<i>Trifolium repens</i>	White Clover	FAC	1
<i>Urtica dioica</i>	Stinging Nettle	FAC	1
<i>Verbascum thapsus</i>	Great Mullein	FACU	0
<i>Veronica americana</i>	American-Brooklime	OBL	1

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

## Segment 7, Reach 7.2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Acer glabrum</i>	Rocky Mountain Maple	FACU	1
<i>Achillea millefolium</i>	Common Yarrow	FACU	0
<i>Agrostis stolonifera</i>	Spreading Bent	FAC	2
<i>Alnus incana</i> *	Speckled Alder	FACW	4
Bare Ground	Bare Ground	N/A	2
<i>Carex bebbii</i>	Bebb's Sedge	OBL	1
<i>Carex interior</i>	Inland Sedge	OBL	0
<i>Centaurea stoebe</i>	Spotted Knapweed	UPL	2
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU	0
<i>Cicuta douglasii</i>	Western Water-Hemlock	OBL	1
<i>Cirsium arvense</i>	Canadian thistle	FAC	1
<i>Cornus alba</i>	Red Osier	FACW	1
<i>Crataegus douglasii</i>	Black Hawthorn	FAC	0
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	FACW	3
<i>Elymus trachycaulus</i>	Slender Wild Rye	FAC	0
<i>Epilobium ciliatum</i>	Fringed Willowherb	FACW	1
<i>Equisetum arvense</i>	Tall Scouring-Rush	FACW	1
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW	0
<i>Glyceria grandis</i>	American Manna Grass	OBL	1
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW	0
<i>Juncus nodosus</i>	Knotted Rush	OBL	0
<i>Lathyrus sylvestris</i>	Flat Pea	UPL	1
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU	1
<i>Medicago lupulina</i>	Black Medick	FACU	0
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU	0
<i>Mentha arvensis</i>	American Wild Mint	FACW	2
<i>Mimulus guttatus</i>	Seep Monkey-Flower	OBL	1
<i>Phalaris arundinacea</i> *	Reed Canary Grass	FACW	4
<i>Phleum pratense</i>	Common Timothy	FAC	0
<i>Poa palustris</i>	Fowl Blue Grass	FAC	1
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC	1
<i>Populus balsamifera</i>	Balsam Poplar	FAC	1
<i>Ranunculus aquatilis</i>	White Water-Crowfoot	OBL	1
<i>Rosa woodsii</i>	Woods' Rose	FACU	0
<i>Rubus idaeus</i>	Common Red Raspberry	FACU	1
<i>Rumex crispus</i>	Curly Dock	FAC	0
<i>Salix bebbiana</i>	Gray Willow	FACW	0
<i>Salix sitchensis</i>	Sitka Willow	FACW	0

## Segment 7, Reach 7.2 Stream Bank Vegetation - 2024

Scientific Name	Common Name	<sup>1</sup> Wetland Indicator Status	Stream Bank Cover Class
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL	0
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU	0
<i>Symporicarpos albus</i>	Common Snowberry	FACU	1
<i>Symphyotrichum foliaceum</i>	Alpine Leafy-Head American-Aster	FACU	1
<i>Tanacetum vulgare</i>	Common Tansy	FACU	2
<i>Taraxacum officinale</i>	Common Dandelion	FACU	0
<i>Trifolium pratense</i>	Red Clover	FACU	1
<i>Trifolium repens</i>	White Clover	FAC	0
<i>Urtica dioica</i>	Stinging Nettle	FAC	0
<i>Verbascum thapsus</i>	Great Mullein	FACU	1
<i>Veronica americana</i>	American-Brooklime	OBL	1

<sup>1</sup> 2020 NWPL (USACE 2020)

\*Denotes dominant vegetation observed along stream bank

---

## APPENDIX E

### 2024 NOXIOUS WEED SPECIES LIST

---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

**Table E-1.** Montana State-listed noxious weed species observed in 2024 at the Swamp Creek Stream Mitigation Site.

Category*	Scientific Name	Common Name
Priority 2A	<i>Hieracium aurantiacum</i>	Orange Hawkweed
Priority 2B	<i>Centaurea stoebe</i>	Spotted Knapweed
	<i>Cirsium arvense</i>	Canada Thistle
	<i>Hypericum perforatum</i>	St. Johnswort
	<i>Leucanthemum vulgare</i>	Oxeye Daisy
	<i>Tanacetum vulgare</i>	Common Tansy

\*Based on the Montana Dept. of Agriculture's Noxious Weed List, June 2019

---

## APPENDIX F

### 2024 WOLMAN PEBBLE COUNT DATA

---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

### Reach 1 Wolman Pebble Count Data

## Riffle

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	22	22.0%	22.0%
VF Gravel	2	0	0.0%	22.0%
VF Gravel	4	2	2.0%	24.0%
F Gravel	5.7	1	1.0%	25.0%
F Gravel	8	6	6.0%	31.0%
Med Gravel	11	4	4.0%	35.0%
Med Gravel	16	10	10.0%	45.0%
C Gravel	22	22	22.0%	67.0%
C Gravel	32	8	8.0%	75.0%
VC Gravel	45	11	11.0%	86.0%
VC Gravel	64	11	11.0%	97.0%
SM Cobble	90	3	3.0%	100.0%
SM Cobble	128	0	0.0%	100.0%
LG Cobble	256	0	0.0%	100.0%

total count = 100

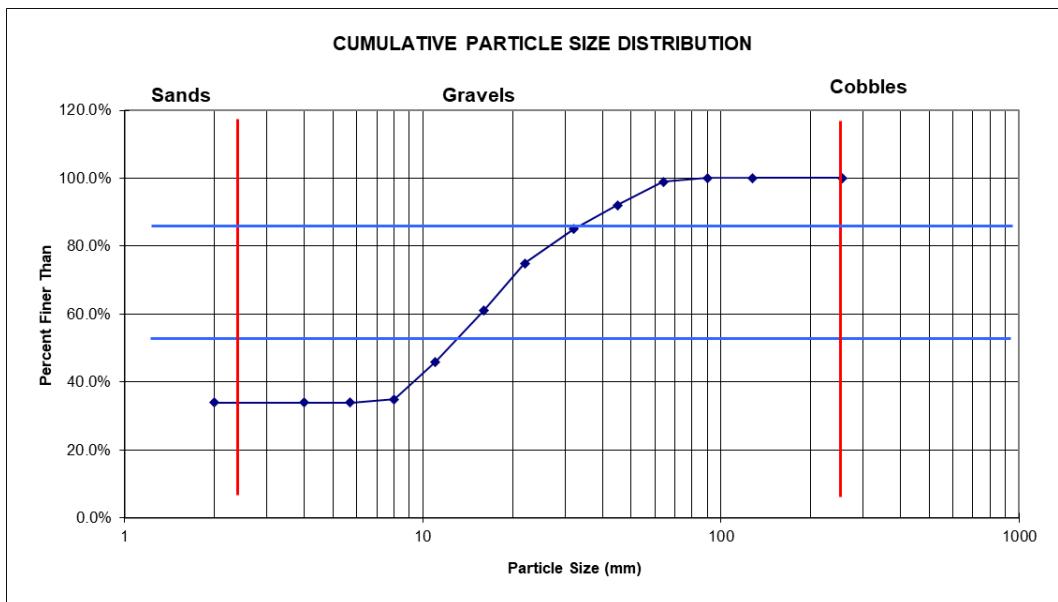
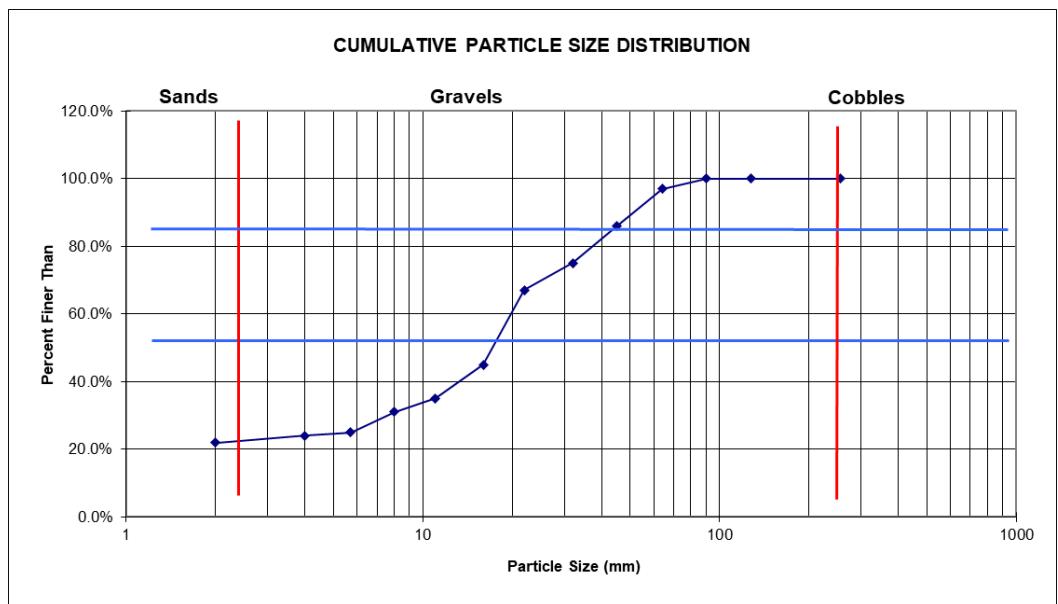
Read From Graph

## Pool

PARTICLE	SEIVE OPENING		PASSING COUNT	PERCENT	CUMULATIVE PERCENT
	MILLIMETERS				
Sand	<2	34	34.0%	34.0%	
VF Gravel	2	0	0.0%	34.0%	
VF Gravel	4	0	0.0%	34.0%	
F Gravel	5.7	0	0.0%	34.0%	
F Gravel	8	1	1.0%	35.0%	
Med Gravel	11	11	11.0%	46.0%	
Med Gravel	16	15	15.0%	61.0%	
C Gravel	22	14	14.0%	75.0%	
C Gravel	32	10	10.0%	85.0%	
VC Gravel	45	7	7.0%	92.0%	
VC Gravel	64	7	7.0%	99.0%	
SM Cobble	90	1	1.0%	100.0%	
SM Cobble	128	0	0.0%	100.0%	
LG Cobble	256	0	0.0%	100.0%	

total count = 100

Read From Graph



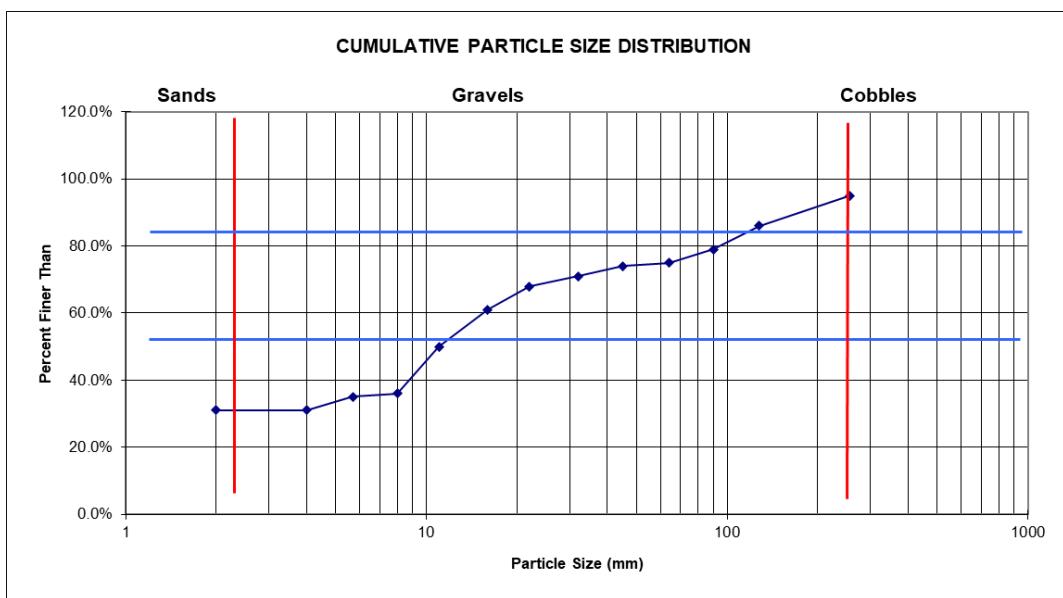
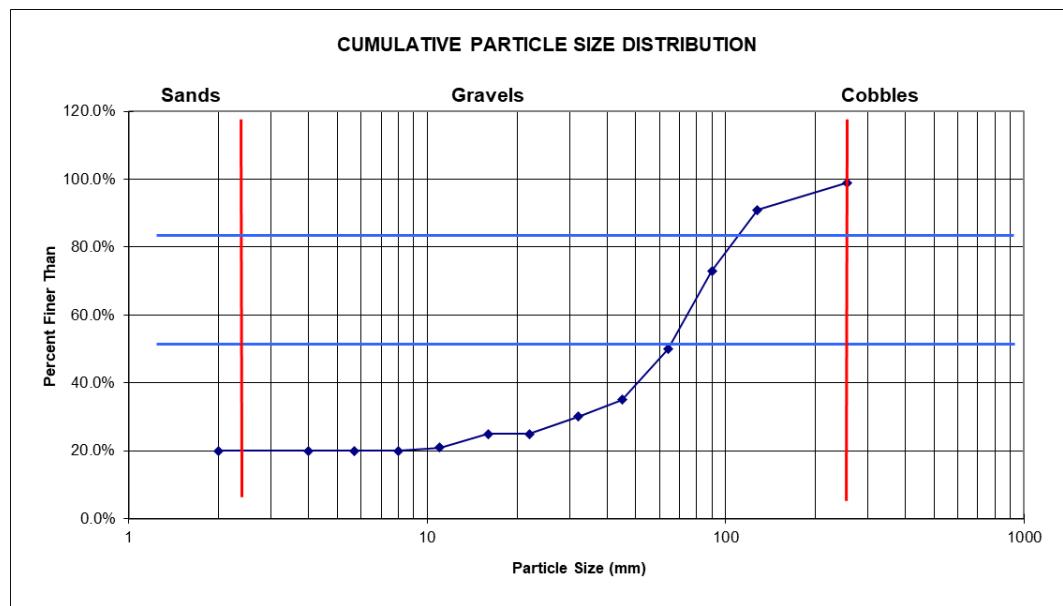
Reach 2 Wolman Pebble Count Data

Riffle

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	20	20.0%	20.0%
VF Gravel	2	0	0.0%	20.0%
VF Gravel	4	0	0.0%	20.0%
F Gravel	5.7	0	0.0%	20.0%
F Gravel	8	1	1.0%	21.0%
Med Gravel	11	4	4.0%	25.0%
Med Gravel	16	0	0.0%	25.0%
C Gravel	22	5	5.0%	30.0%
C Gravel	32	5	5.0%	35.0%
VC Gravel	45	15	15.0%	50.0%
VC Gravel	64	23	23.0%	73.0%
SM Cobble	90	18	18.0%	91.0%
SM Cobble	128	8	8.0%	99.0%
LG Cobble	256	1	1.0%	100.0%
total count =		100		
D50 =		65	mm	Read From Graph
D84 =		104	mm	

Pool

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	31	31.0%	31.0%
VF Gravel	2	0	0.0%	31.0%
VF Gravel	4	4	4.0%	35.0%
F Gravel	5.7	1	1.0%	36.0%
F Gravel	8	14	14.0%	50.0%
Med Gravel	11	11	11.0%	61.0%
Med Gravel	16	7	7.0%	68.0%
C Gravel	22	3	3.0%	71.0%
C Gravel	32	3	3.0%	74.0%
VC Gravel	45	1	1.0%	75.0%
VC Gravel	64	4	4.0%	79.0%
SM Cobble	90	7	7.0%	86.0%
SM Cobble	128	9	9.0%	95.0%
LG Cobble	256	5	5.0%	100.0%
total count =		100		
D50 =		12	mm	Read From Graph
D84 =		110	mm	



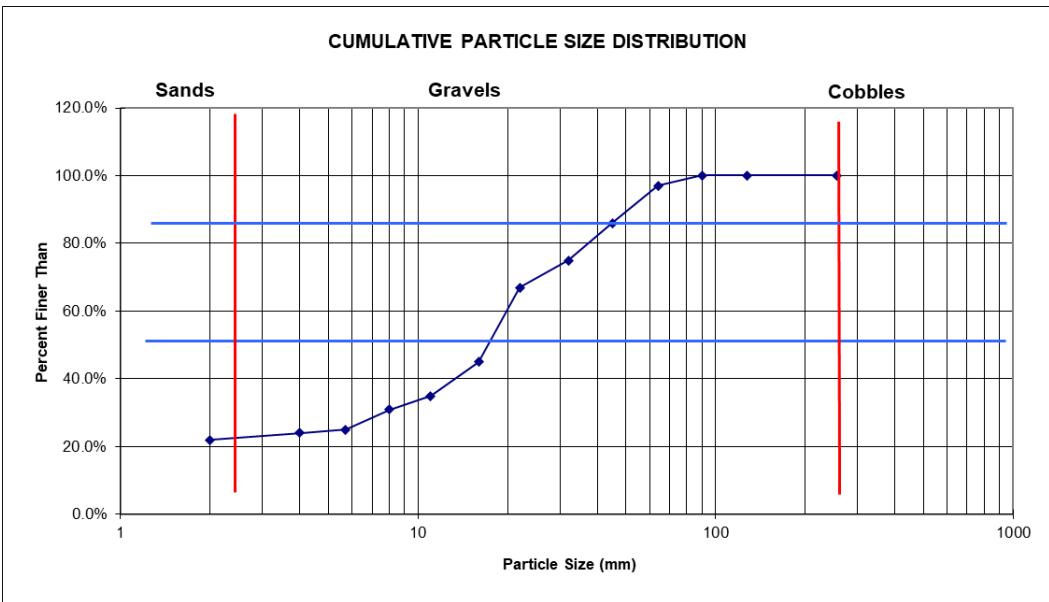
Reach 3.1 Wolman Pebble Count Data

Riffle

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	25	25.0%	25.0%
VF Gravel	2	0	0.0%	25.0%
VF Gravel	4	0	0.0%	25.0%
F Gravel	5.7	0	0.0%	25.0%
F Gravel	8	0	0.0%	25.0%
Med Gravel	11	6	6.0%	31.0%
Med Gravel	16	1	1.0%	32.0%
C Gravel	22	13	13.0%	45.0%
C Gravel	32	16	16.0%	61.0%
VC Gravel	45	27	27.0%	88.0%
VC Gravel	64	11	11.0%	99.0%
SM Cobble	90	1	1.0%	100.0%
SM Cobble	128	0	0.0%	100.0%
LG Cobble	256	0	0.0%	100.0%

total count = 100

Read From Graph  
D50 = 18 mm  
D84 = 45 mm

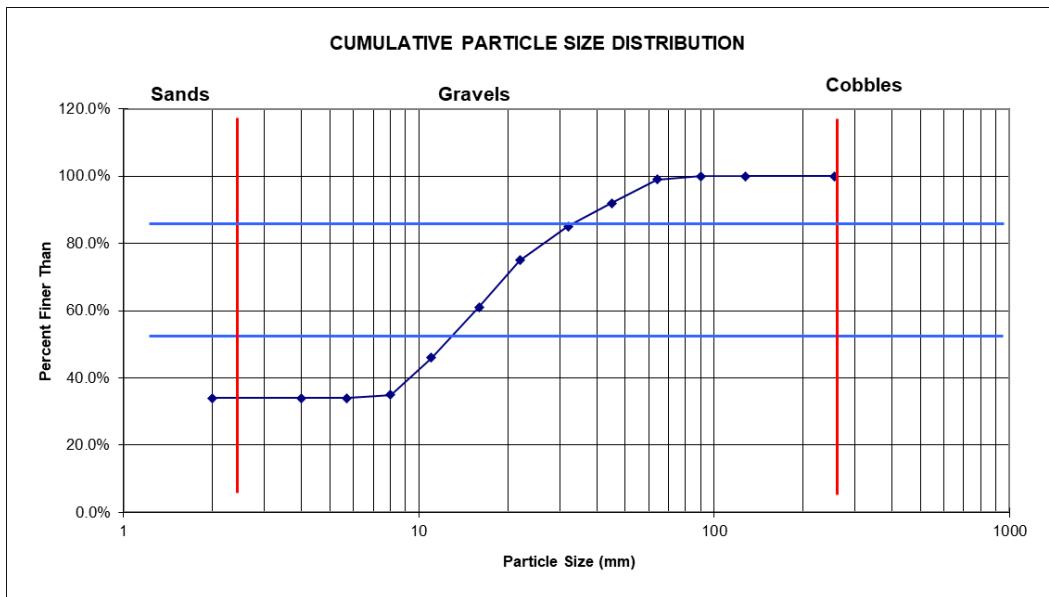


Pool

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	22	22.0%	22.0%
VF Gravel	2	0	0.0%	22.0%
VF Gravel	4	0	0.0%	22.0%
F Gravel	5.7	1	1.0%	23.0%
F Gravel	8	4	4.0%	27.0%
Med Gravel	11	4	4.0%	31.0%
Med Gravel	16	10	10.0%	41.0%
C Gravel	22	11	11.0%	52.0%
C Gravel	32	18	18.0%	70.0%
VC Gravel	45	15	15.0%	85.0%
VC Gravel	64	14	14.0%	99.0%
SM Cobble	90	1	1.0%	100.0%
SM Cobble	128	0	0.0%	100.0%
LG Cobble	256	0	0.0%	100.0%

total count = 100

Read From Graph  
D50 = 13 mm  
D84 = 32 mm

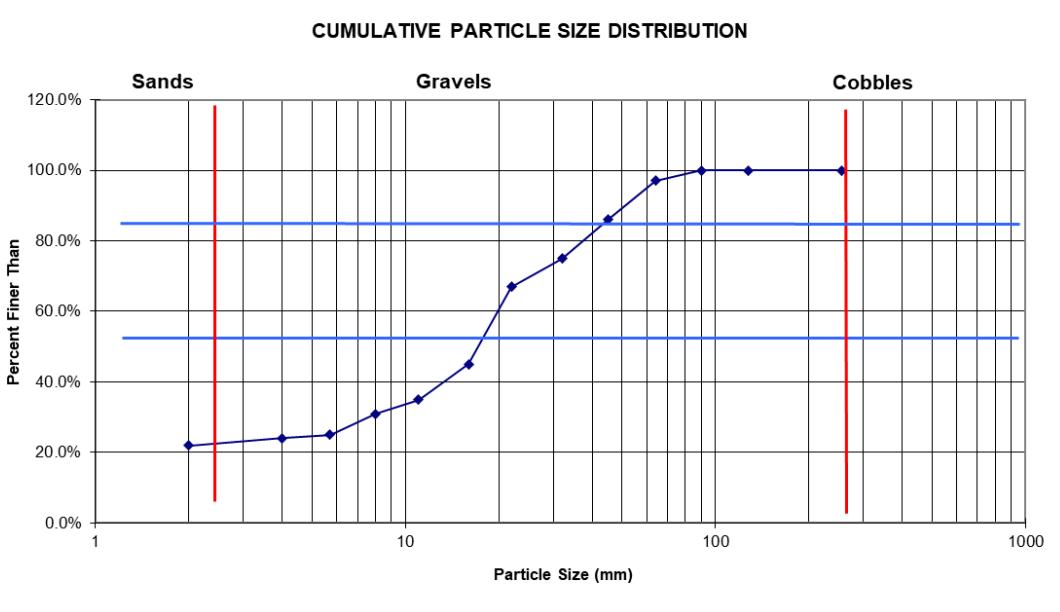


## Riffle

SEIVE OPENING		PASSING		CUMULATIVE PERCENT
PARTICLE	MILLIMETERS	COUNT	PERCENT	
Sand	<2	2	2.0%	2.0%
VF Gravel	2	0	0.0%	2.0%
VF Gravel	4	0	0.0%	2.0%
F Gravel	5.7	0	0.0%	2.0%
F Gravel	8	1	1.0%	3.0%
Med Gravel	11	4	4.0%	7.0%
Med Gravel	16	19	19.0%	26.0%
C Gravel	22	8	8.0%	34.0%
C Gravel	32	14	14.0%	48.0%
VC Gravel	45	22	22.0%	70.0%
VC Gravel	64	25	25.0%	95.0%
SM Cobble	90	5	5.0%	100.0%
SM Cobble	128	0	0.0%	100.0%
LG Cobble	256	0	0.0%	100.0%

total count = 100

Read From Graph

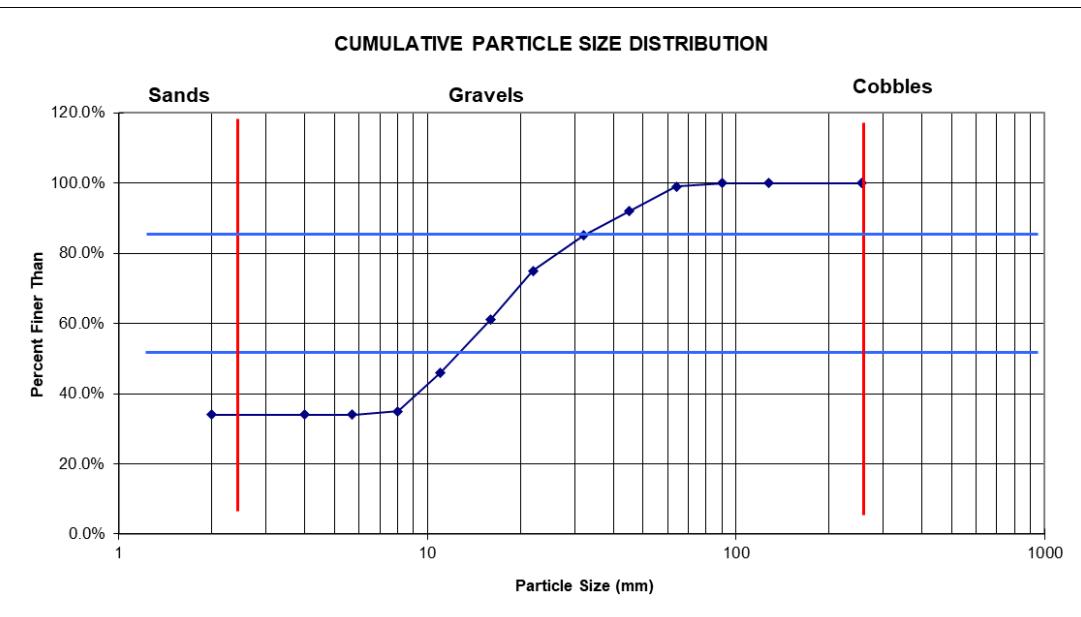


Pool

PARTICLE	SEIVE OPENING		PASSING COUNT	PERCENT	CUMULATIVE PERCENT
	MILLIMETERS				
Sand	<2	6	6.0%	6.0%	
VF Gravel	2	0	0.0%	6.0%	
VF Gravel	4	3	3.0%	9.0%	
F Gravel	5.7	1	1.0%	10.0%	
F Gravel	8	5	5.0%	15.0%	
Med Gravel	11	16	16.0%	31.0%	
Med Gravel	16	15	15.0%	46.0%	
C Gravel	22	7	7.0%	53.0%	
C Gravel	32	8	8.0%	61.0%	
VC Gravel	45	14	14.0%	75.0%	
VC Gravel	64	10	10.0%	85.0%	
SM Cobble	90	4	4.0%	89.0%	
SM Cobble	128	4	4.0%	93.0%	
LG Cobble	256	7	7.0%	100.0%	

total count = 100

Read From Graph

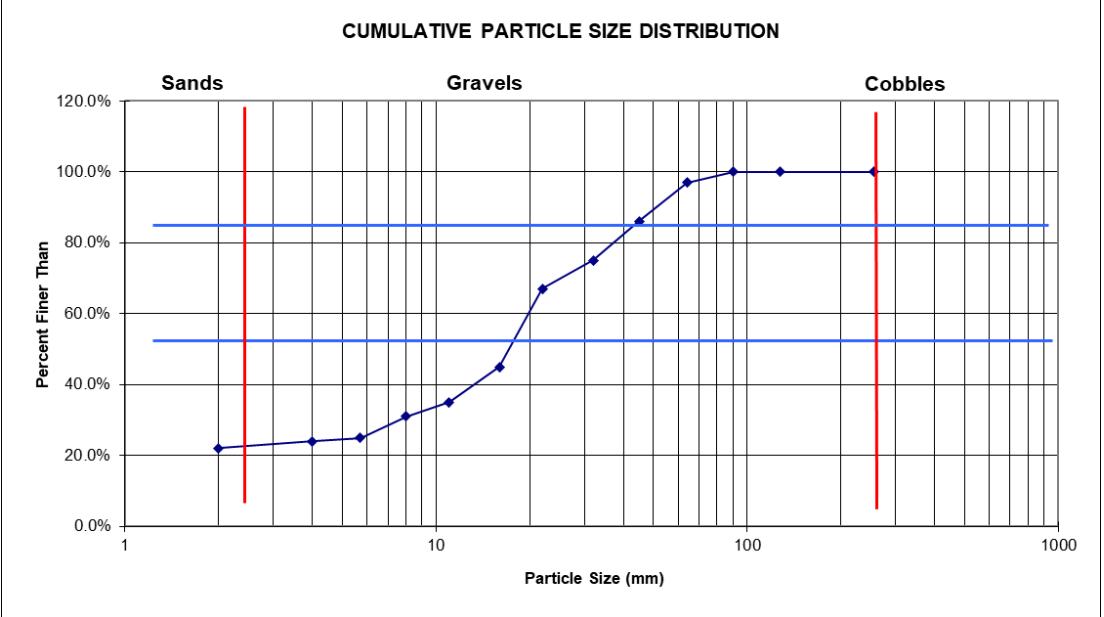


Reach 7.2 Wolman Pebble Count Data

Riffle

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	20	20.0%	20.0%
VF Gravel	2	0	0.0%	20.0%
VF Gravel	4	0	0.0%	20.0%
F Gravel	5.7	2	2.0%	22.0%
F Gravel	8	3	3.0%	25.0%
Med Gravel	11	5	5.0%	30.0%
Med Gravel	16	6	6.0%	36.0%
C Gravel	22	8	8.0%	44.0%
C Gravel	32	12	12.0%	56.0%
VC Gravel	45	8	8.0%	64.0%
VC Gravel	64	13	13.0%	77.0%
SM Cobble	90	12	12.0%	89.0%
SM Cobble	128	6	6.0%	95.0%
LG Cobble	256	5	5.0%	100.0%
total count =		100		

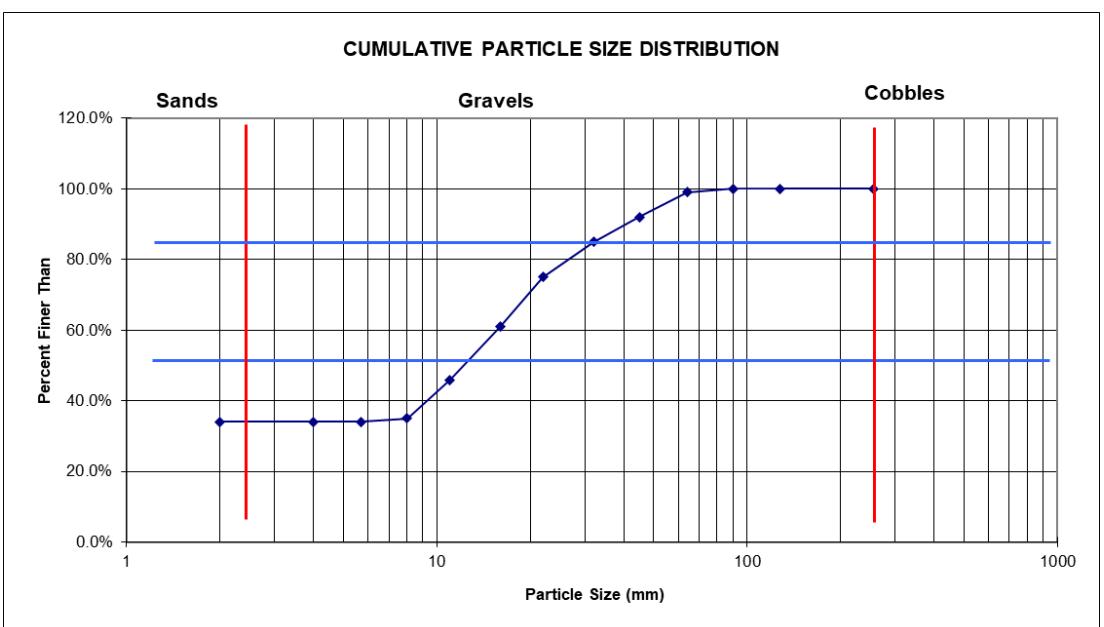
Read From Graph  
D50 = 18 mm  
D84 = 45 mm



Pool

PARTICLE	SEIVE OPENING MILLIMETERS	PASSING COUNT	PERCENT	CUMULATIVE PERCENT
Sand	<2	10	10.0%	10.0%
VF Gravel	2	0	0.0%	10.0%
VF Gravel	4	4	4.0%	14.0%
F Gravel	5.7	3	3.0%	17.0%
F Gravel	8	7	7.0%	24.0%
Med Gravel	10	10	10.0%	34.0%
Med Gravel	13	13	13.0%	47.0%
C Gravel	22	16	16.0%	63.0%
C Gravel	32	11	11.0%	74.0%
VC Gravel	45	5	5.0%	79.0%
VC Gravel	64	10	10.0%	89.0%
SM Cobble	90	4	4.0%	93.0%
SM Cobble	128	6	6.0%	99.0%
LG Cobble	256	1	1.0%	100.0%
total count =		100		

Read From Graph  
D50 = 14 mm  
D84 = 33 mm



---

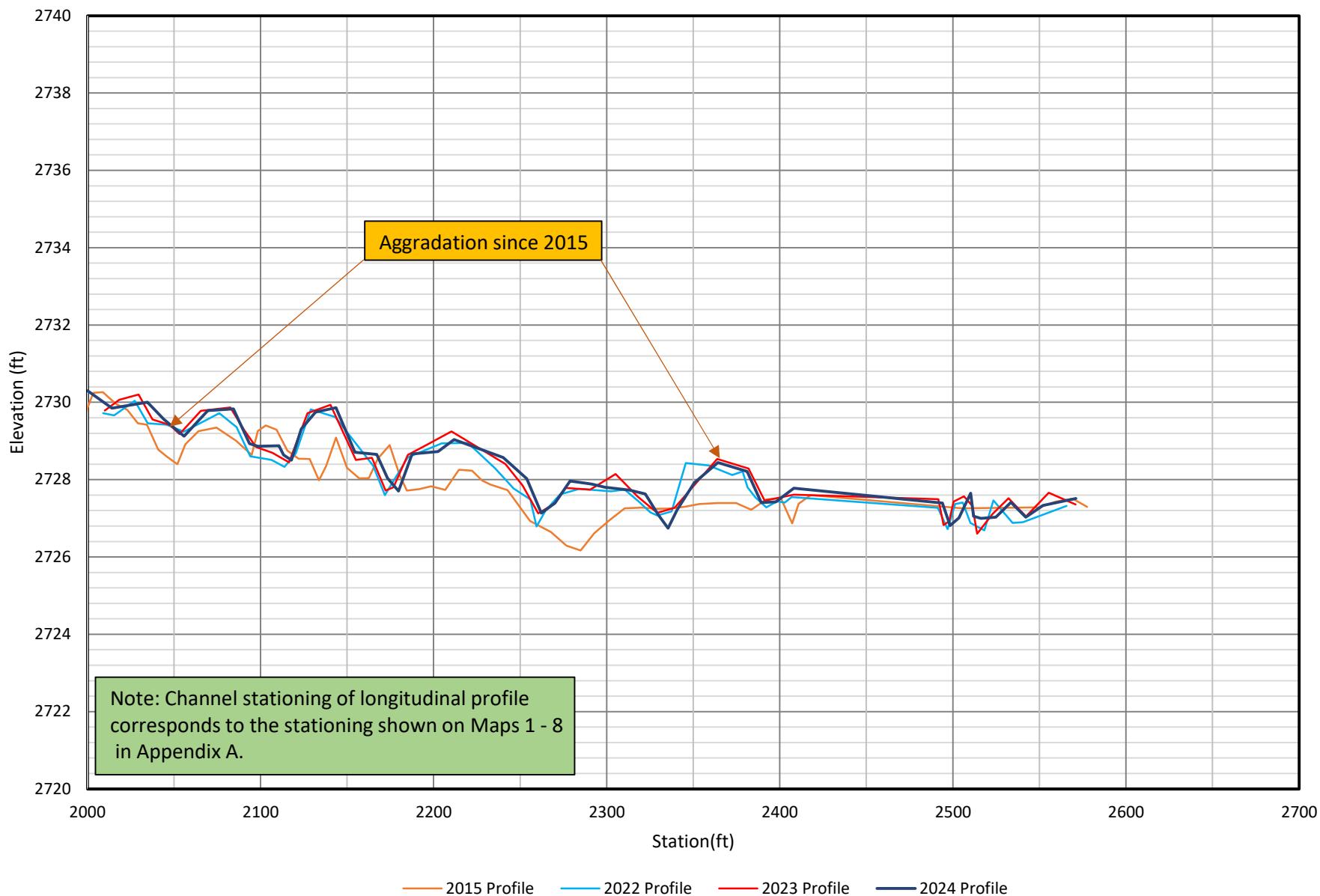
## **APPENDIX G**

### **LONGITUDINAL PROFILE AND PERPENDICULAR TRANSECT PLOTS**

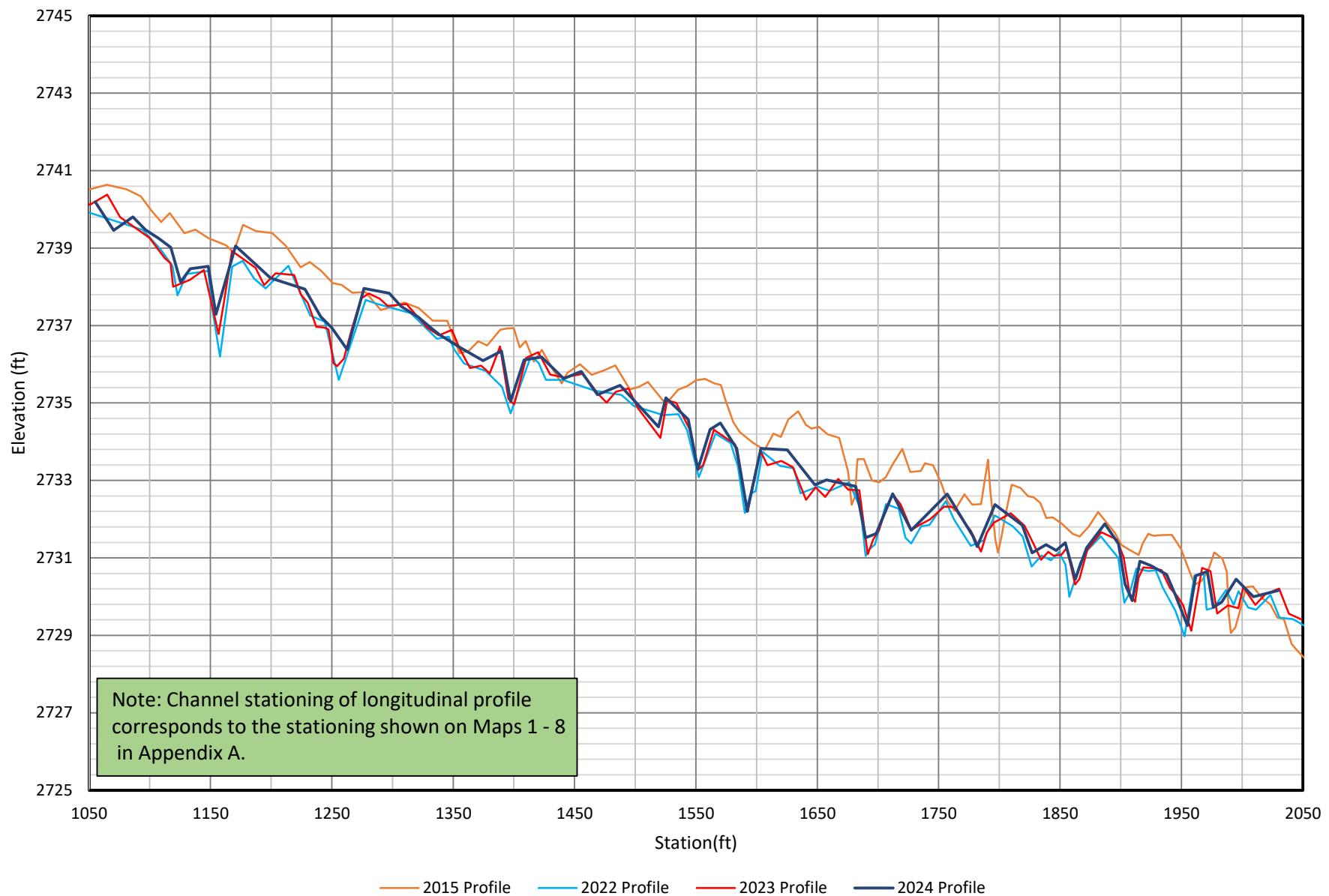
---

MDT Stream Mitigation Monitoring  
Swamp Creek  
Lincoln County, Montana

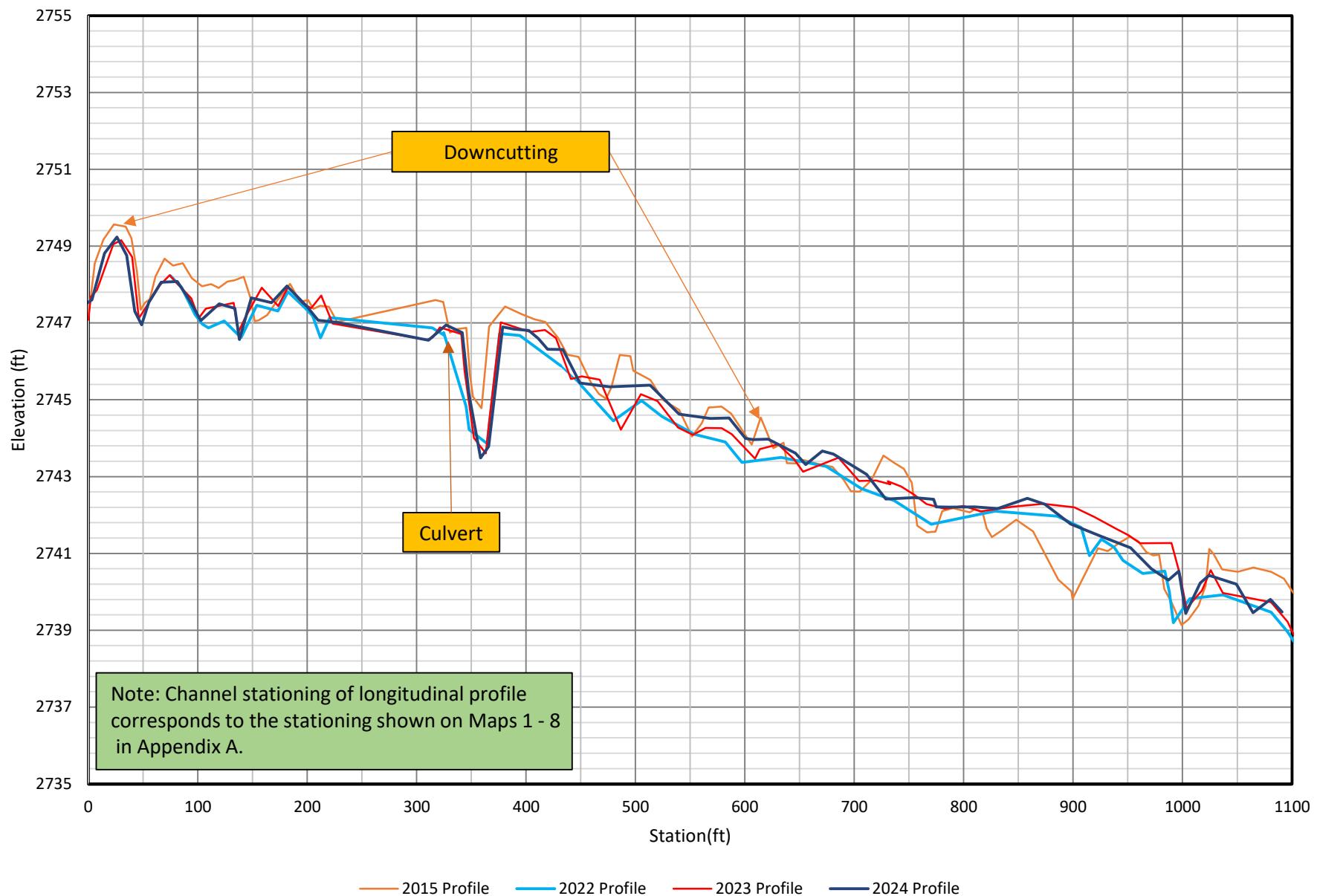
## Swamp Creek Longitudinal Profile: Reach 1



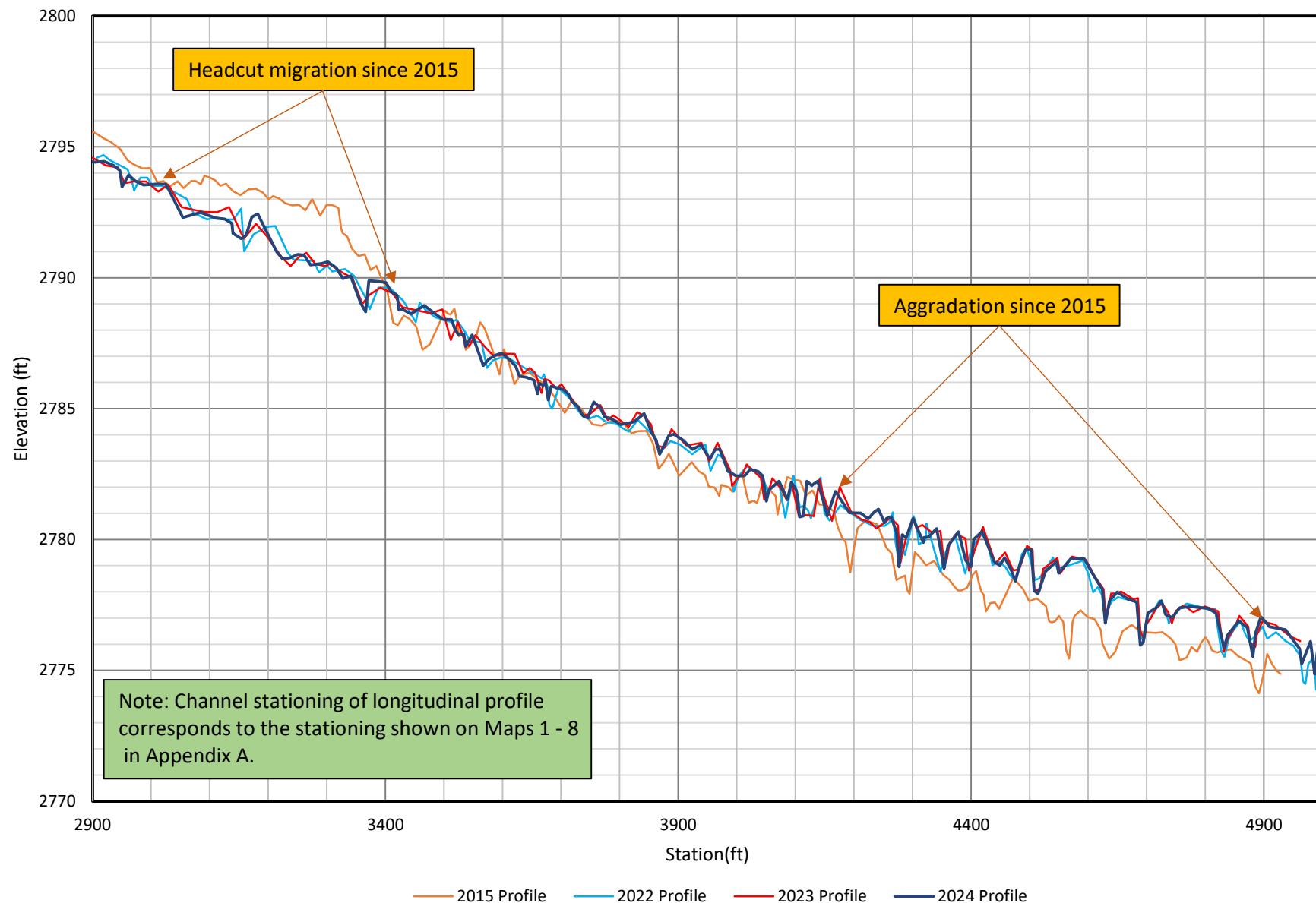
## Swamp Creek Longitudinal Profile: Transition between Reaches 1 and 2



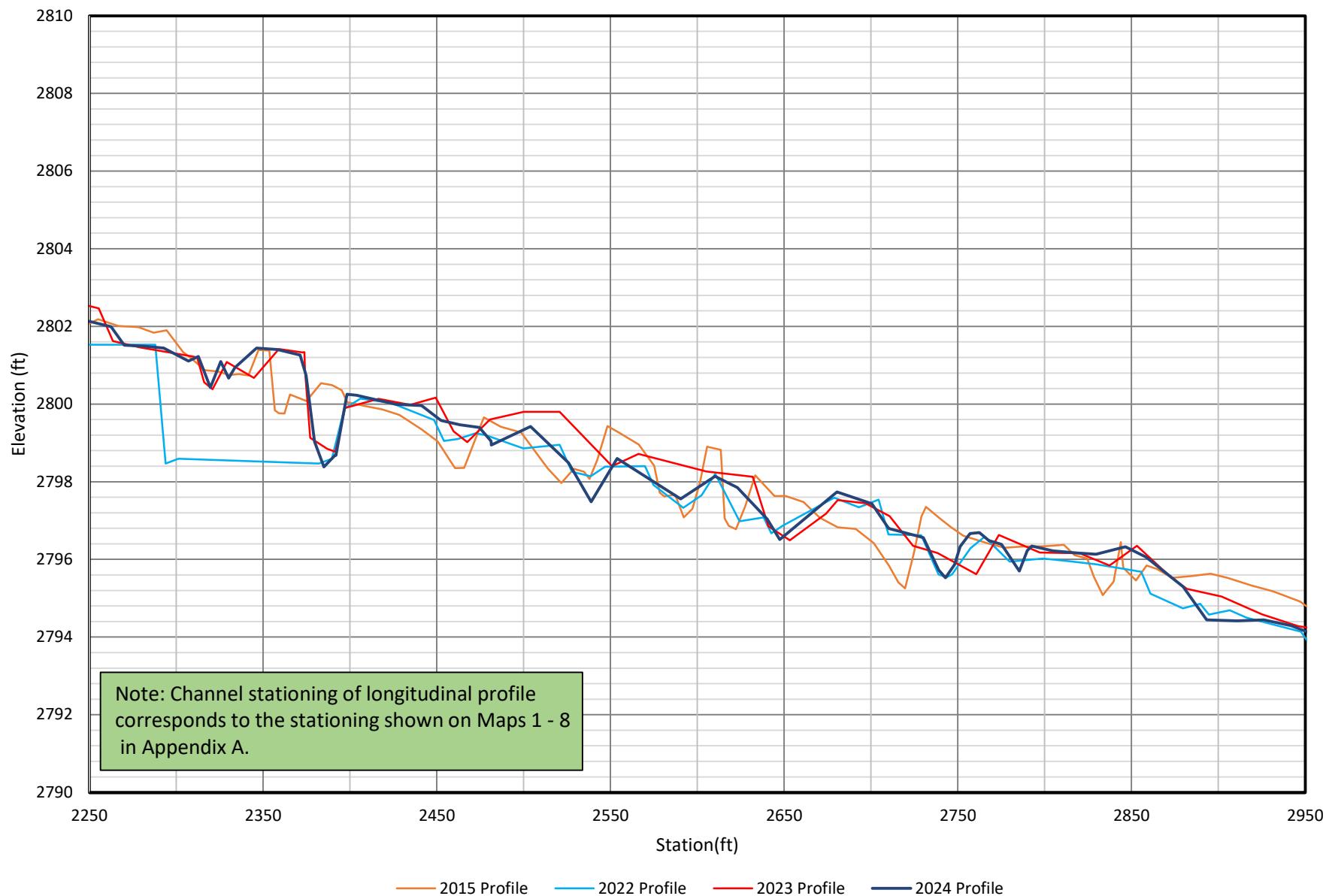
## Swamp Creek Longitudinal Profile: Reach 2



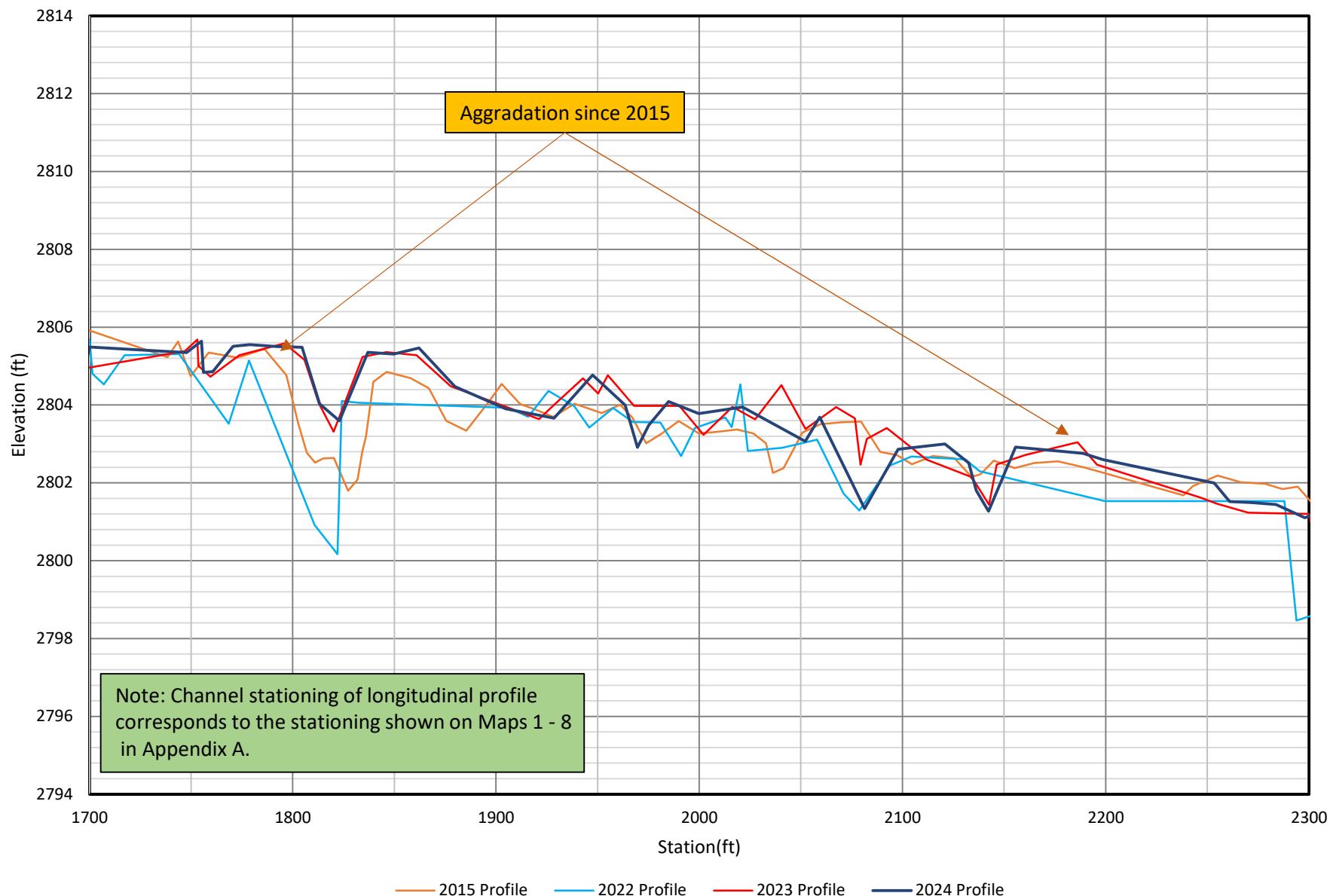
## Swamp Creek Longitudinal Profiles: Reach 3.1



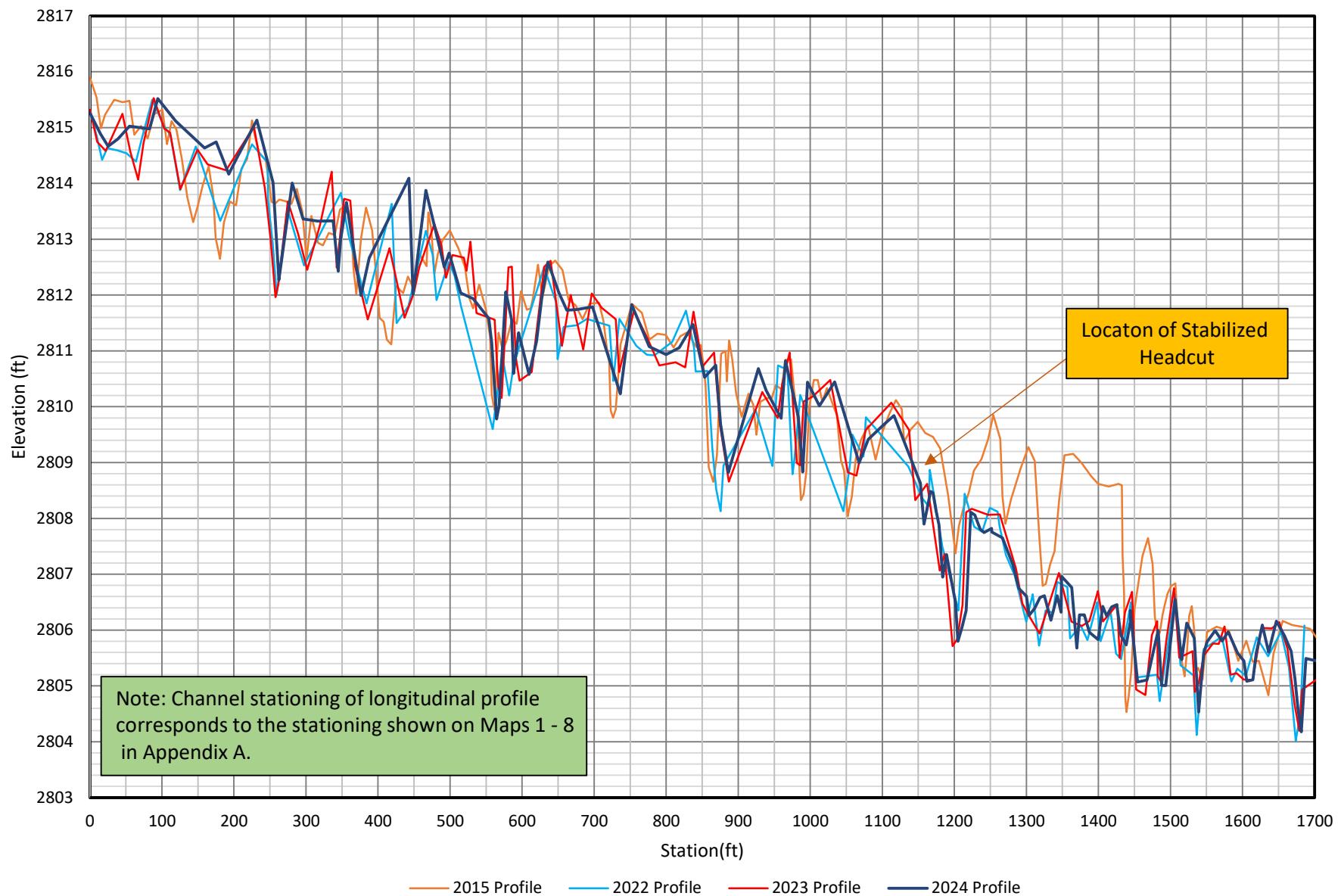
## Swamp Creek Longitudinal Profile: Reach 3.2



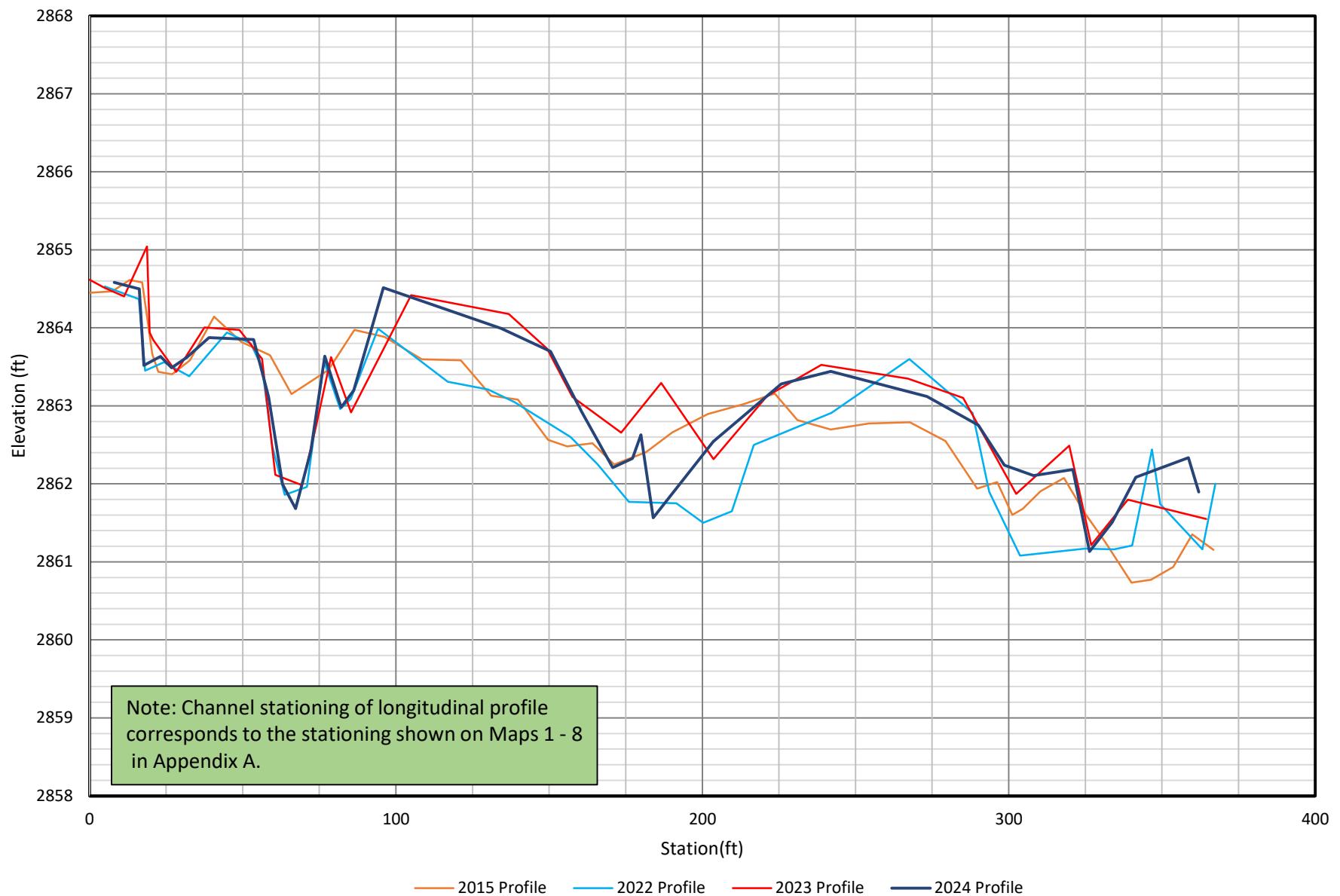
## Swamp Creek Longitudinal Profiles: Reach 3.3



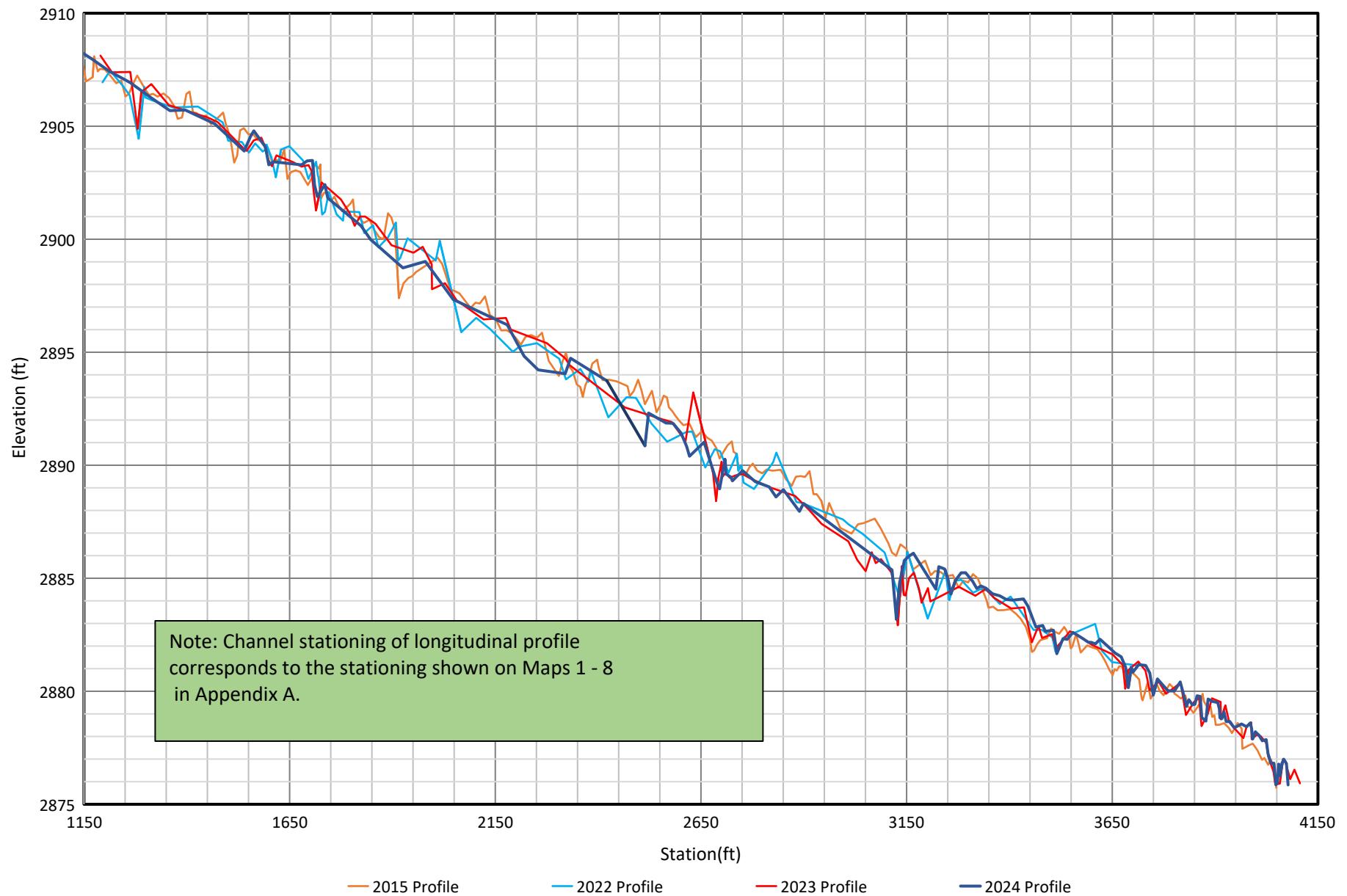
## Swamp Creek Longitudinal Profile: Reach 3.4



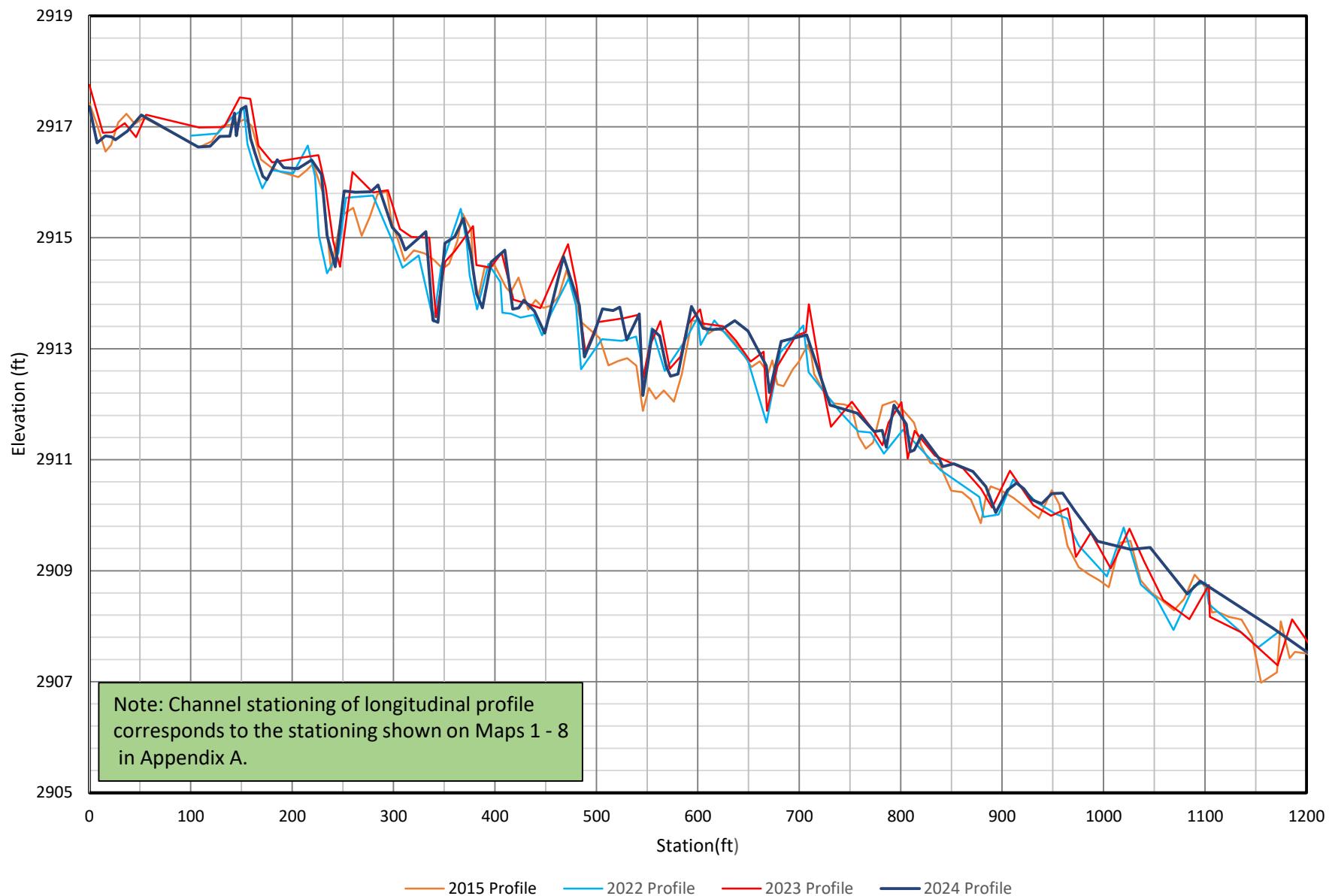
## Swamp Creek Longitudinal Profile: Reach 5

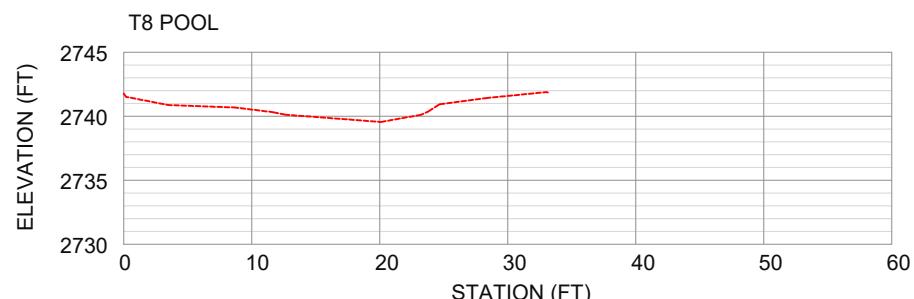
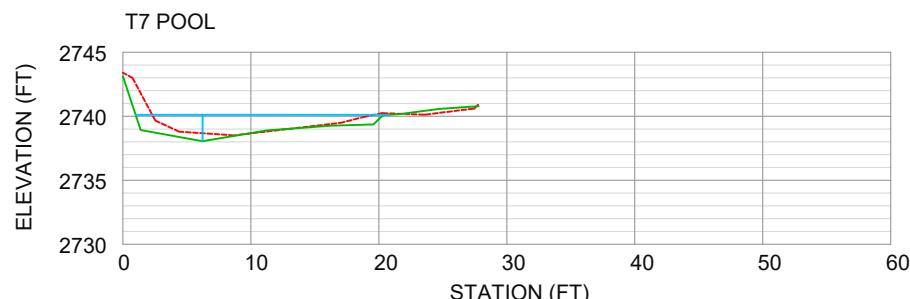
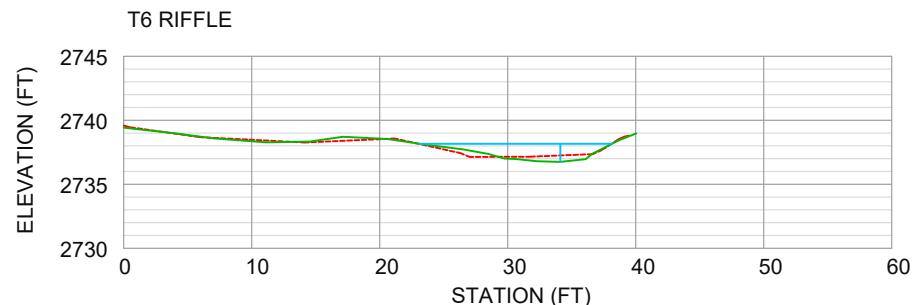
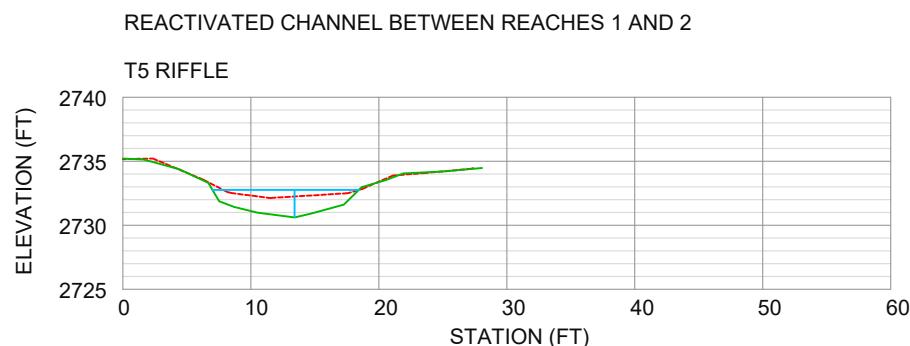
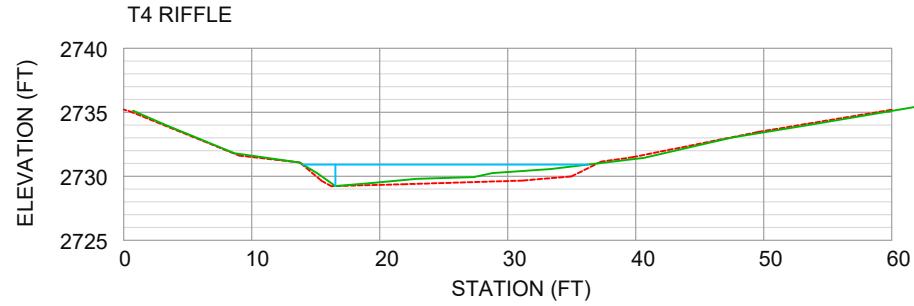
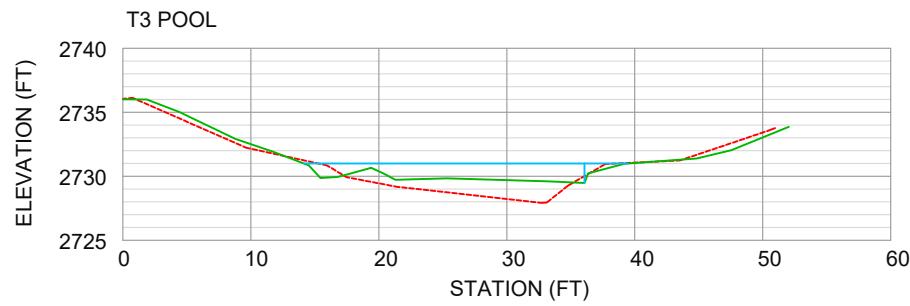
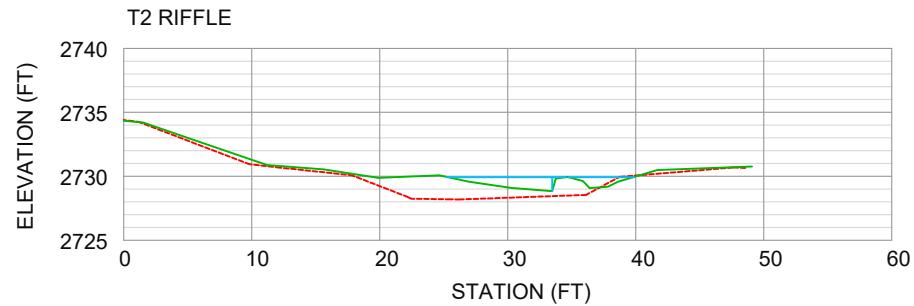
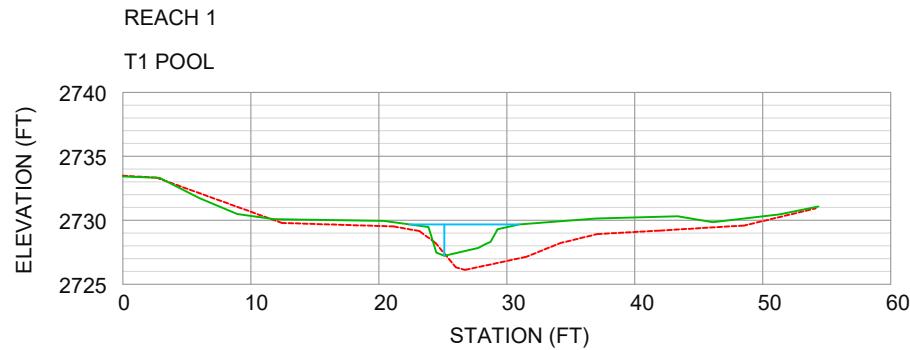


## Swamp Creek Longitudinal Profile: Reach 7.1



## Swamp Creek Longitudinal Profile: Reach 7.2

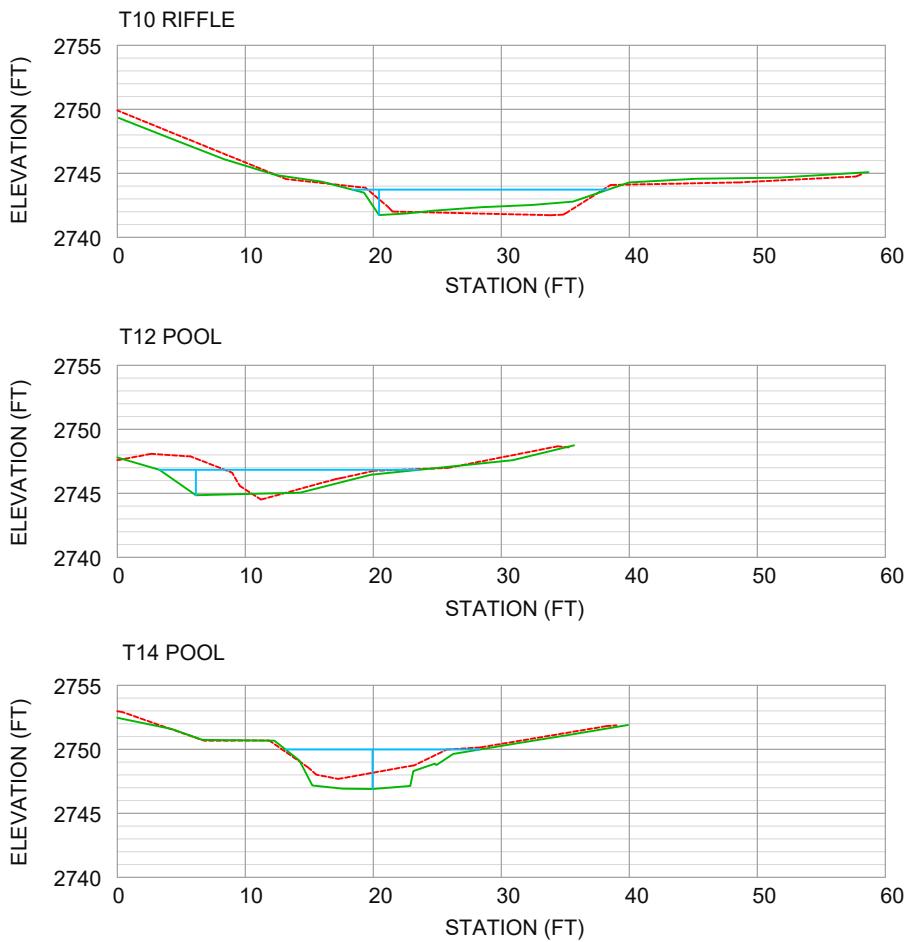
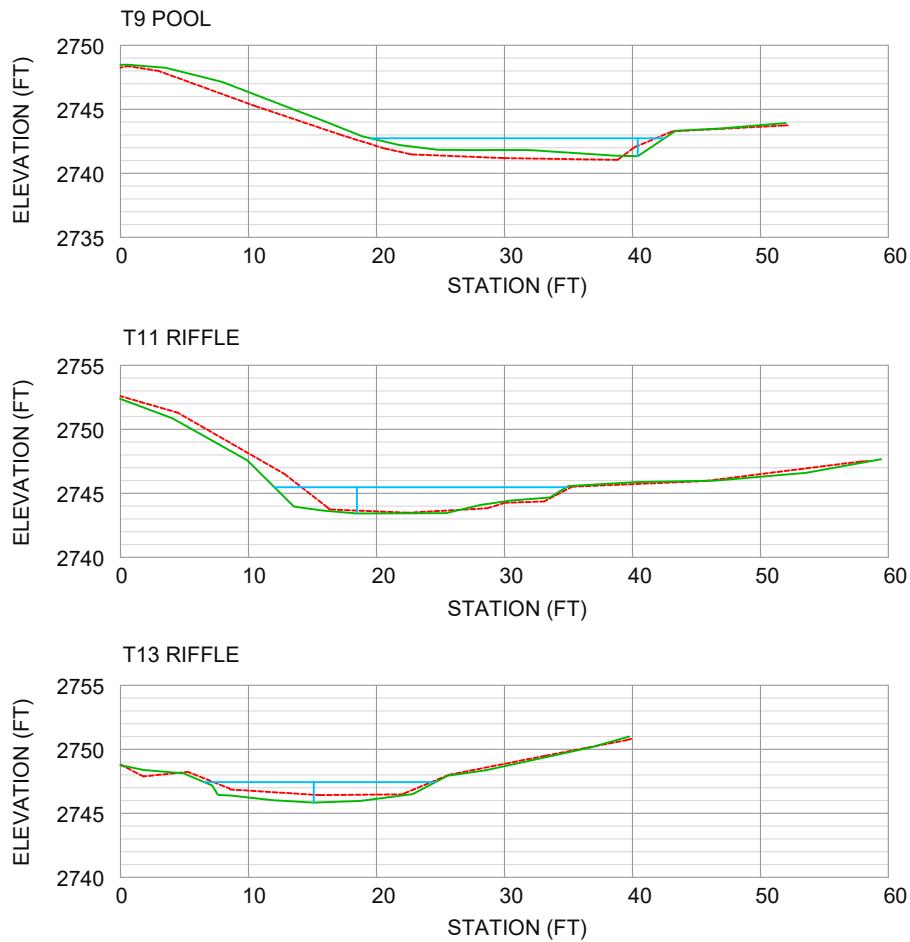




LEGEND

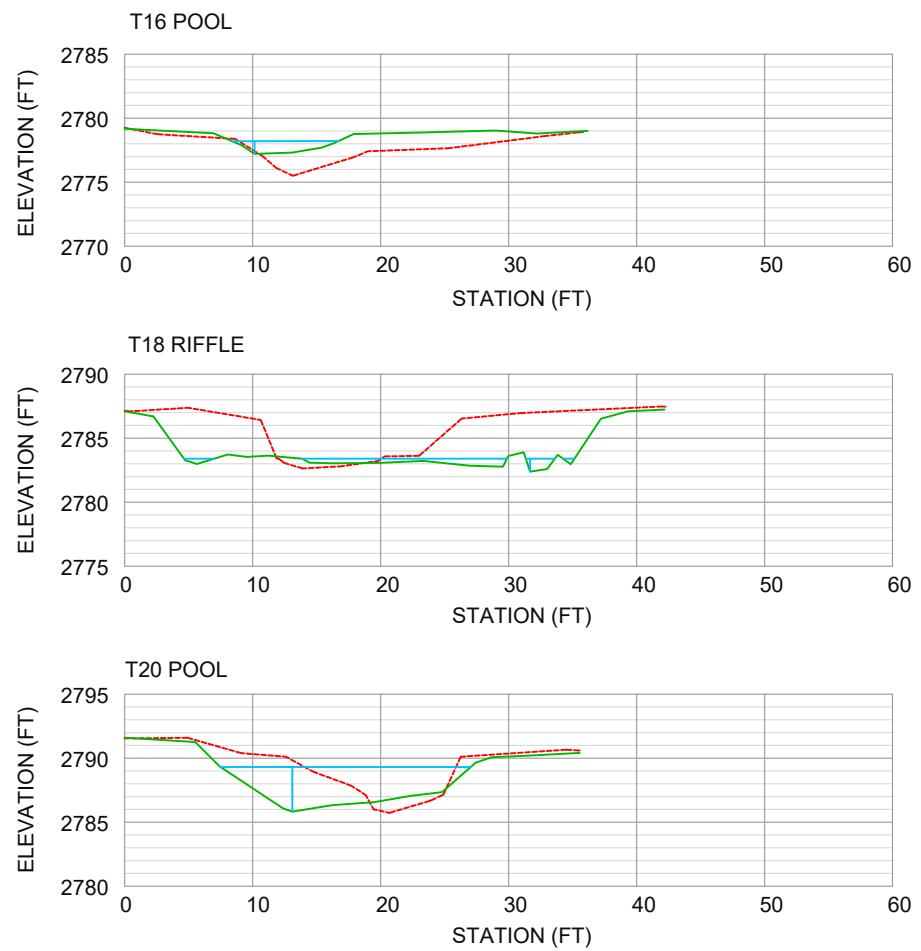
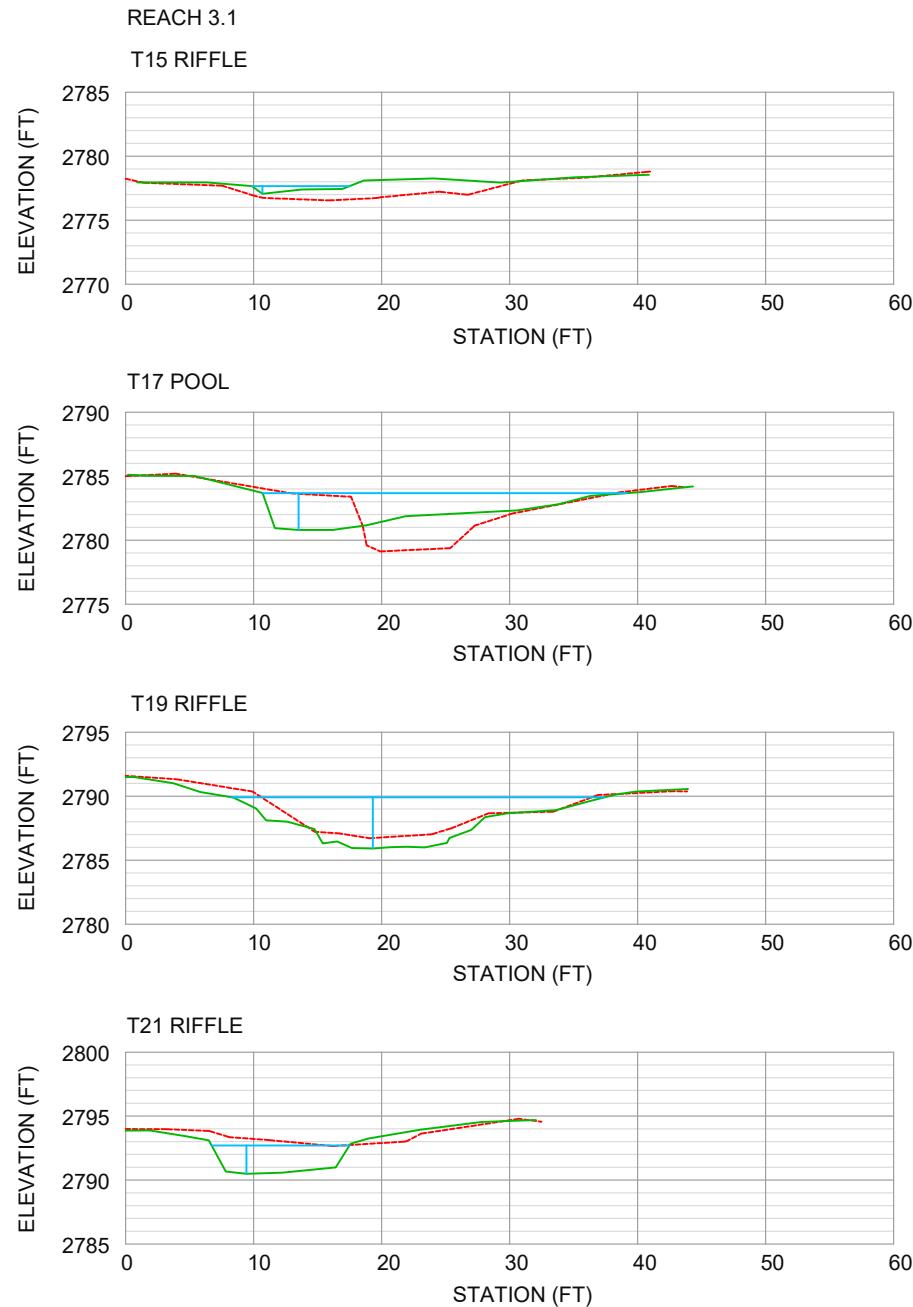
- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

## REACH 2



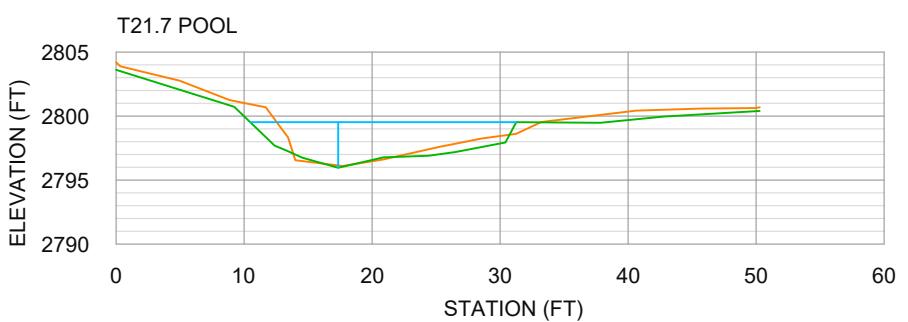
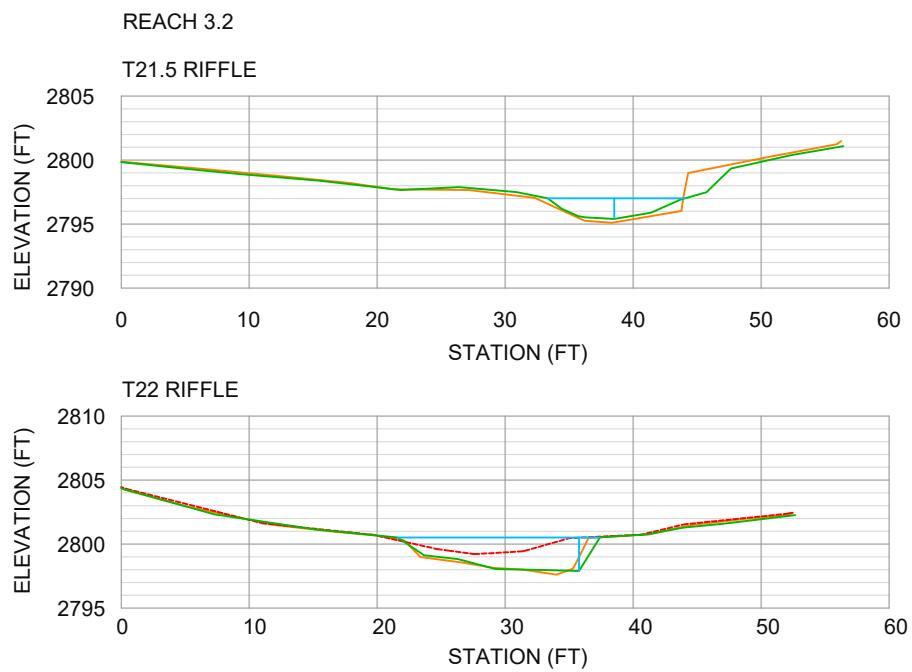
## LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH



LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

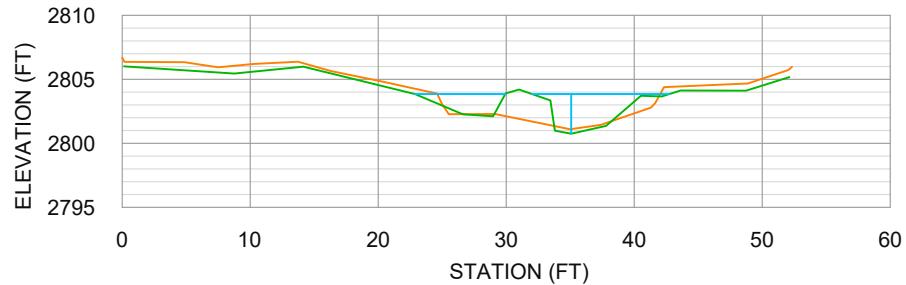


LEGEND

- 2015 CROSS SECTION
- 2018 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

REACH 3.3

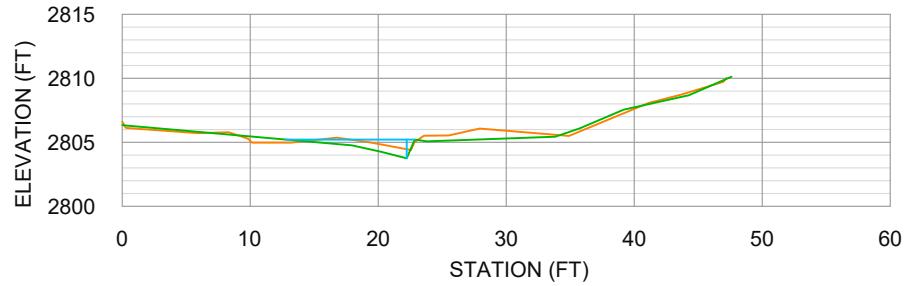
T22.3 POOL



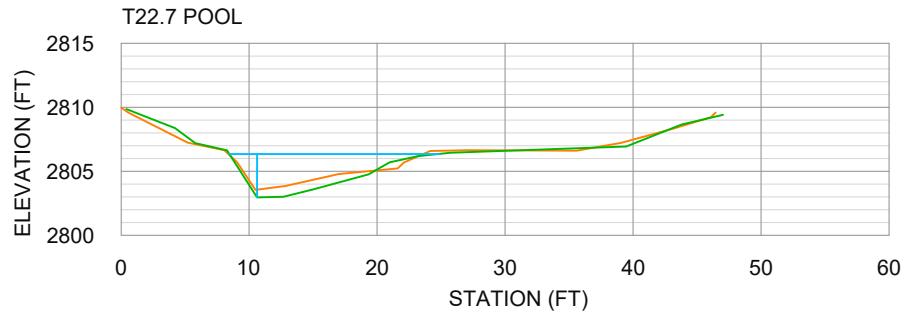
LEGEND

- 2018 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

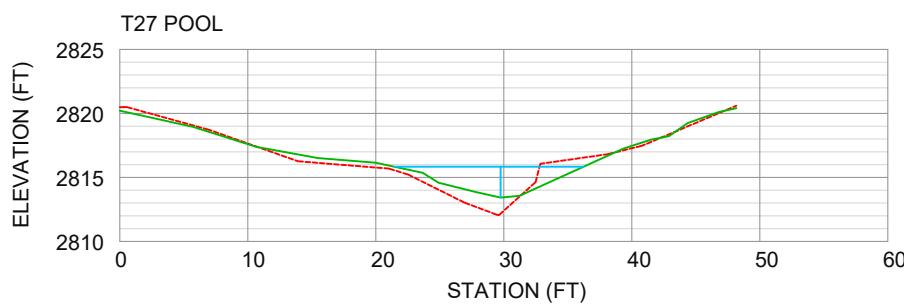
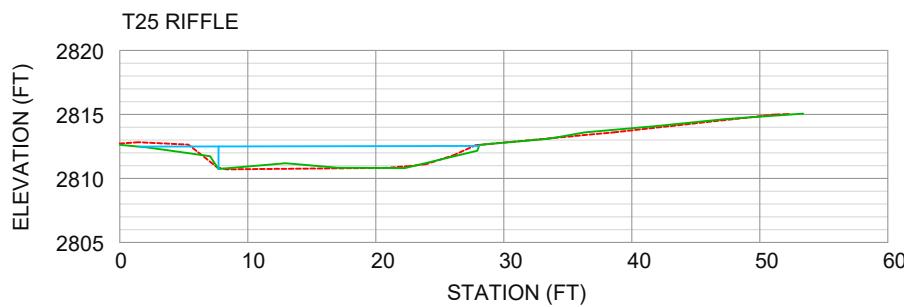
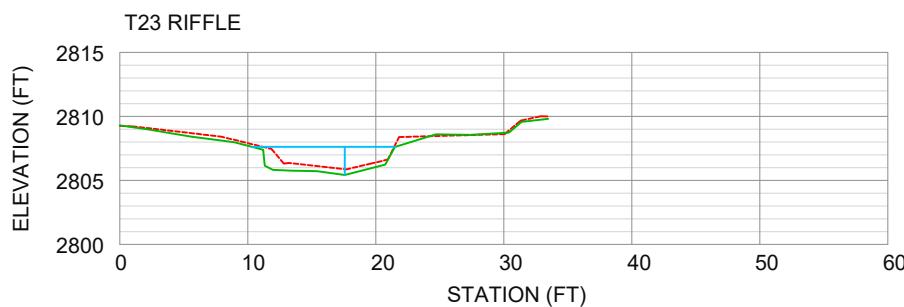
T22.5 RIFFLE



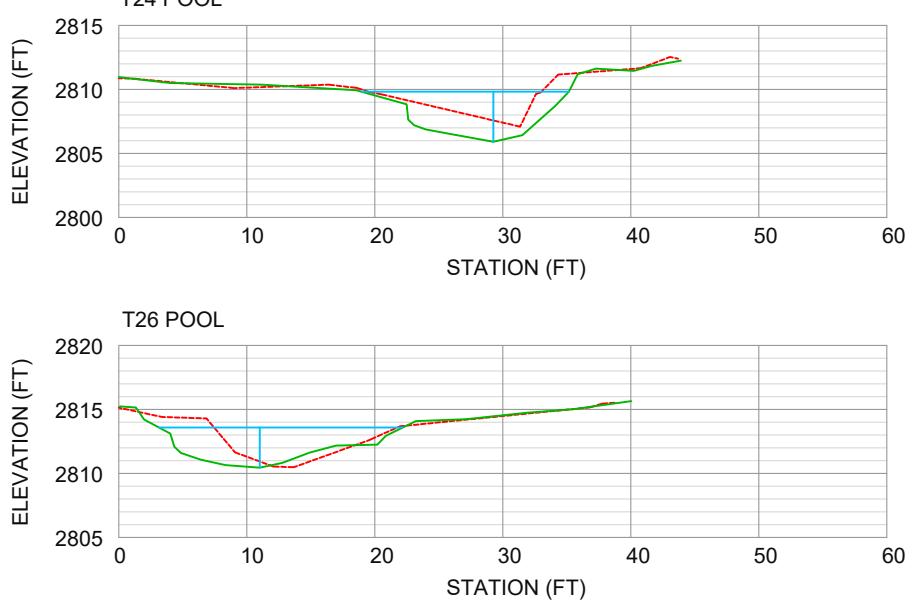
T22.7 POOL



REACH 3.4



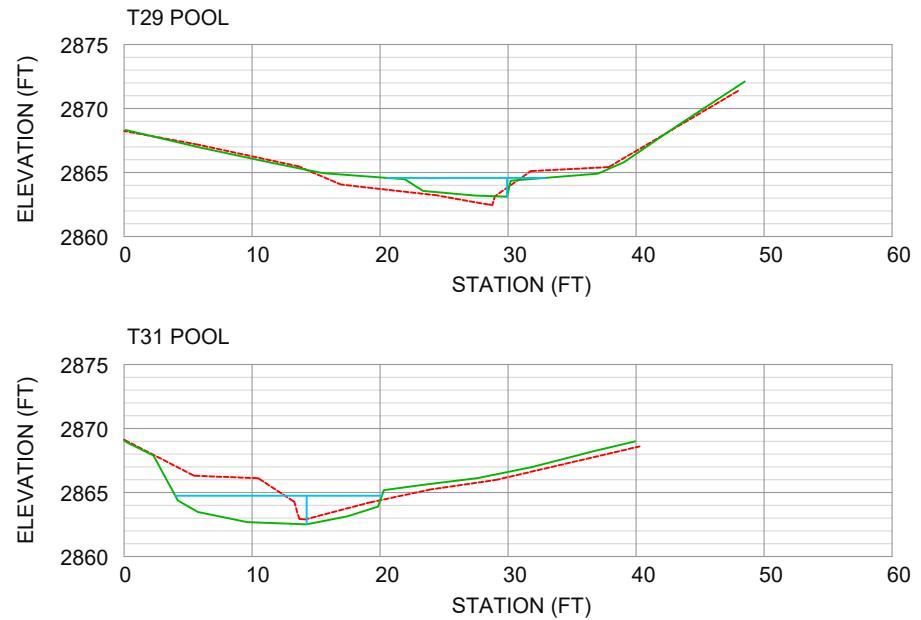
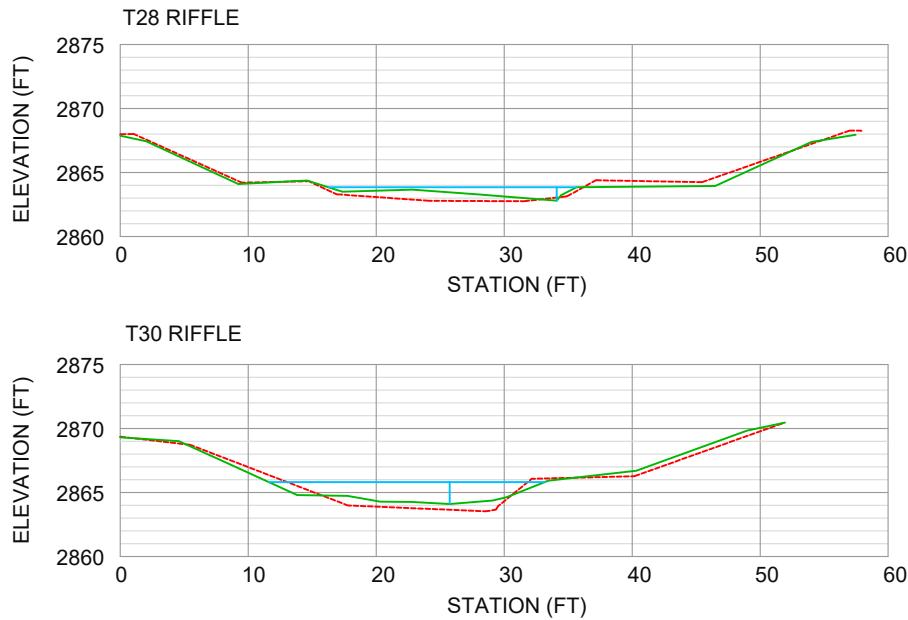
T24 POOL



LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

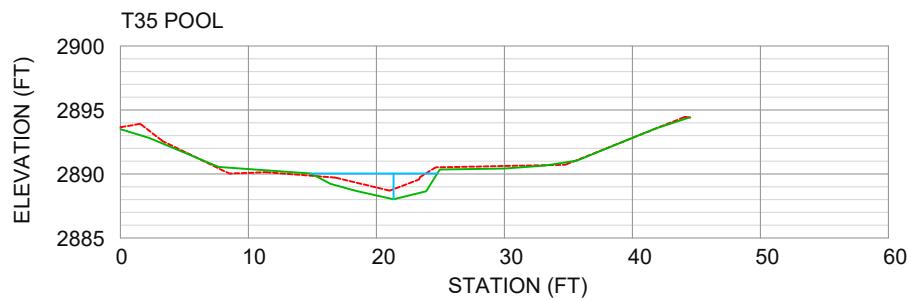
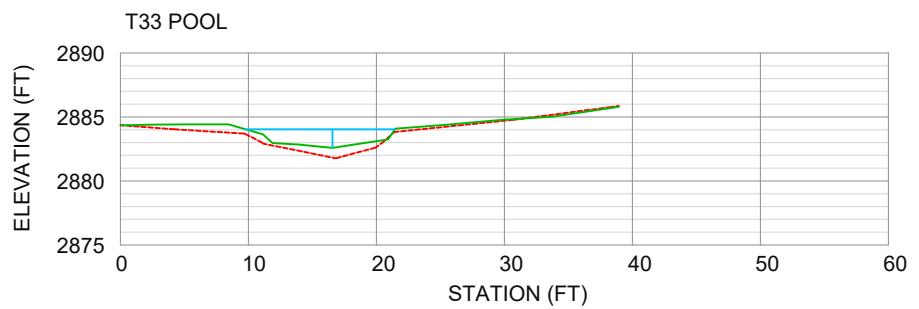
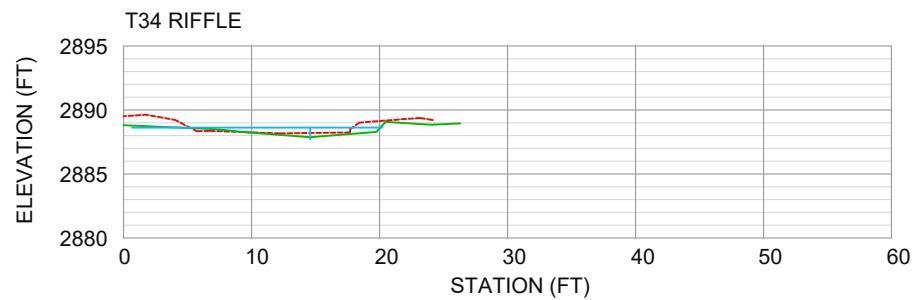
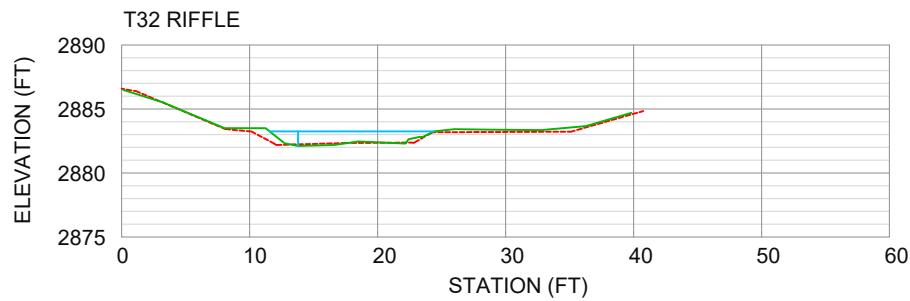
REACH 5



LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

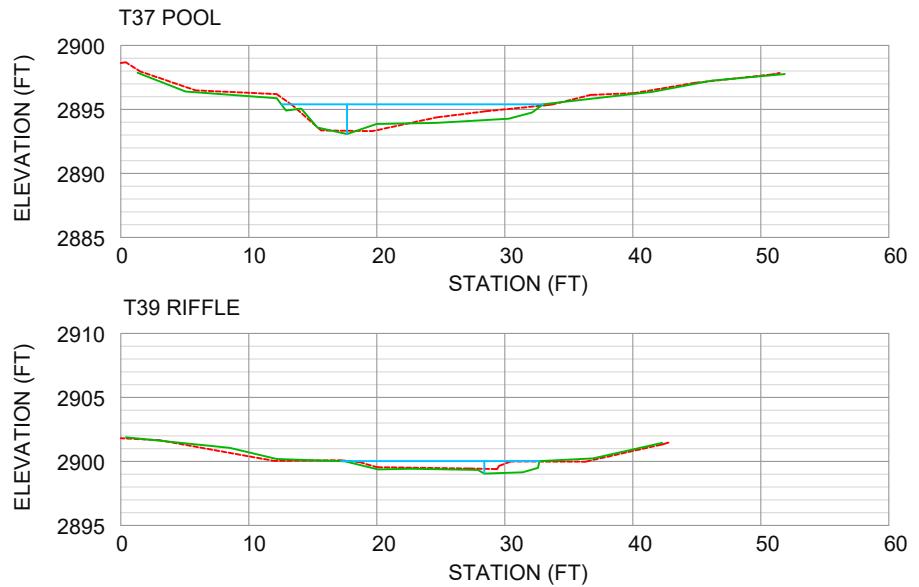
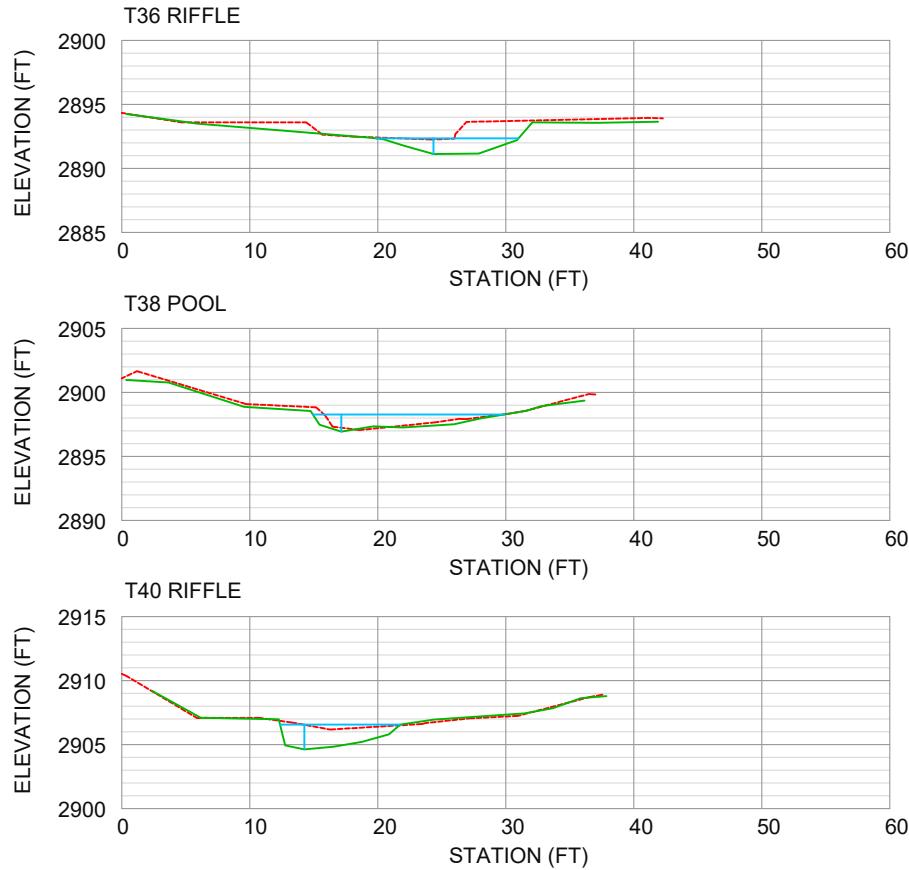
REACH 7.1



LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

REACH 7.1 (continued)



LEGEND

- 2015 CROSS SECTION
- 2024 CROSS SECTION
- 2024 BANKFULL WIDTH AND MAX. DEPTH

