

Montana Department of Transportation Stream Mitigation Monitoring Report  
**FOY'S BEND FISHERIES CONSERVATION AREA NH\_MT5-3(50)109F UPN #: 2038013**

**Project Overview**

**Watershed:** Watershed #4 - Flathead

**Monitoring Year:** 2021

**Years Monitored:** 9<sup>th</sup> year of monitoring

**Corps Permit Number:** NWO-2009-01808-MTM

**Stream Protection Authorization (SPA) #:** MDT-R1-77-2012

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

**Monitoring Dates:** August 13th-14th, 2021

**Purpose of the approved project:**

The Foy's Bend Fisheries Conservation Area (FCA) mitigation project was created to offset stream and riparian impacts resulting from the Kalispell Bypass and other transportation projects in the Kalispell Region of the Missoula District. Specific project objectives were to: create 6,050 linear feet of riparian buffer by installing woody vegetation in 14 of 18 fenced enclosures, and to stabilize 1,350 feet of eroding bank on the Flathead River utilizing a soil lift and coir fascine.

**Bank Treatment Site Location:**

**Upstream Coordinates:** 48.153341, -114.2353694

**Downstream Coordinates:** 48.155196, -114.2306218

**Enclosure Locations:** See Appendix H

**County:** Flathead **Nearest Town:** Kalispell

**Map Included:** Figure 1, page 11

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

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

**Activity:** Noxious weed control **Date:** June 2021

**Specific recommendations for additional corrective actions:** Fencing was repaired around several of the planting enclosures on July 20, 2020. To meet the established performance criteria, woody vegetation may need to be replanted and maintained, and portions of the riverbank will need to be stabilized. If monitoring is to continue in future years bank pins at Transects 0.5 and 4 will need to be replaced.

**Previous Monitoring Reports and Methods Descriptions:**

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

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

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

**Performance Standards:**

Results from the 2021 monitoring event indicate the Foy's Bend FCA stream mitigation site is meeting six of the nine performance standards established in the monitoring plan (Table 1). The site failed to meet the success criteria established for planted woody vegetation survival and cover, and density of willow growth from the installed willow mats. Reaches 1 and 3 of the stabilized bank met all success criteria, however Reach 2 did not.

**Table 1.** Summary of Performance Standards

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Riparian Buffer Success	Areas within creditable riparian buffer (i.e. riparian exclosures) must have at least 50% aerial cover of non-noxious plant species	Y	Riparian exclosures exhibited 90% cover by non-noxious species
	Planted trees and shrubs must exhibit 50% survival after 5 years	N	Nine years following planting, 30% of planted woody species are surviving
	Woody Plants: Planted trees and shrubs must exhibit 50% aerial coverage after 5 years	N	2.1% cover of woody plantings observed within planted riparian exclosures
Riparian and Stream Bank Success	Combined aerial cover of riparian and stream bank vegetation communities is at least 70%	Y	Combined aerial cover of riparian and riverbank vegetation was 94%
	Noxious weeds do not exceed 5% cover within the riparian and stream bank buffer areas	Y	3.5% noxious weed cover was observed within riparian exclosures and stream bank buffers
Bank Restoration Success*	i.) Rate of $\leq 0.5$ feet of erosion annually - Functioning ii.) Rate of $\leq 1.0$ foot of erosion annually - Functioning iii.) Rate of $\leq 1.5$ feet of erosion annually - Functioning at Risk iv.) Rate of $\geq 3$ feet of erosion annually - Functioning at Risk or not Functioning v.) Rate of $> 5$ feet or more of erosion annually - Not Functioning	Y/N	Reaches 1 and 3 met the success criteria in 2021 with average bank erosion rates of 0.9 and 0.15 feet per year respectively. Reach 2 failed the success criteria in 2021 as the average bank erosion rate was 1.9 feet/year.
	Proper Functioning Condition Rating = Functional	NA	A complete PFC assessment was not conducted in 2021, as it was not the final year of monitoring
Willow Mats	Density of new willow stem growth achieves 50% aerial coverage after five years	N	Density of new willow growth along reconstructed bank segment is approximately 1%
Stream Bank Vegetation	Majority of plants on the stream bank must have root stability indices of at least 6	Y	Dominant vegetation along the majority of the stream bank is reed canary grass ( <i>Phalaris arundinacea</i> ), which has a root stability index of 9
Weed Control	Montana State-listed noxious weeds do not exceed 5% cover within the bank restoration and riparian planting zones.	Y	3.5% noxious weed cover observed within riparian exclosures and stream bank buffers.

\* Pritchard (1998)

## Summary Data

**Riparian Vegetation Inventory** – Percent vegetative cover was estimated along four riparian belt transects. Data collected at each riparian transect are considered representative of the vegetative cover in one or more of the 18 riparian exclosure areas that are scattered across the site (Figures 4-6, Appendix A). Data collected along Transects 1 and 2 are representative of the 14 exclosures planted with woody vegetation (exclosures 1-7, 9, 10, and 13-17). Transect 3 is representative of the three exclosures that were not planted and contained no naturally occurring woody vegetation prior to the mitigation project exclosures 8, 11, and 12). These three exclosures were intended to promote natural woody vegetation development due to their proximity to existing stands of aspen (*Populus tremuloides*) and cottonwood (*Populus balsamifera*). Transect 4 is in the only riparian exclosure (exclosure 18), which contained naturally occurring woody vegetation prior to the mitigation project. This exclosure is also unique because it was established for MDT by FWP prior to the project.

Minimal change in vegetation cover was observed along the four riparian belt transects and the single stream bank belt transect in 2021 as compared to recent years (Table 2). Decreases in total cover observed along transects 2, 3, and 4, corresponded with slight increases in bare ground.

The average vegetative cover for transects 1 and 2 was 94% and therefore exclosures 1-7, 9, 10, and 13-17 are assumed to also contain 94% cover. The estimated vegetation cover for Transect 3 was 93%, and this value was extrapolated to riparian exclosures 8, 11, and 12. The vegetation cover from Transect 4, estimated at 93%, is representative of exclosure 18 only (Tables 2 & 3). The area-weighted-average of total vegetation cover for all riparian exclosure areas, was approximately 94% in 2021 (Table 3).

**Table 2.** Percent cover of vegetation transects at the Foy’s Bend stream mitigation site in 2013, and 2019 through 2021.

Transect	Location	Transect Type	Length (ft.)	Total % Vegetation Cover			
				2013	2019	2020	2021
1	Exclosure 2	Riparian	274	100	98	95	95
2	Exclosure 6	Riparian	425	100	97	96	93
3	Exclosure 8	Riparian	230	100	97	95	93
4	Exclosure 18	Riparian	275	100	96	95	93

The vegetation belt transect along the stream bank (Transect 5) is 1,350 feet long, 10 feet wide, and covers approximately 0.3 acres. It is aligned parallel and immediately adjacent to the Flathead River on the southern boundary of the project area (Figure 6, Appendix A). Total vegetation cover of the stream bank transect was 95%, representing an increase by 32% since the initial monitoring event in 2013 (Table 4). Very little willow stem growth (approximately 1%) was observed within the stream bank transect.

Transect data were used to determine if the performance standards were met in each of the 18 riparian exclosures and for the riverbank. The three performance standards related to total vegetative and noxious weed cover were all met because: 1) riparian exclosures contained greater than 50% cover of non-noxious species, 2) the combined aerial vegetative cover in the riparian and riverbank transects was greater than 70%, and 3) noxious weed cover in the riparian and riverbank transects combined was less than 5%.

**Table 3.** Total percent riparian cover by enclosure at the Foy's Bend stream mitigation site in 2013, and 2019 through 2021.

Enclosure	Planted	Acres	Total % Vegetation Cover			
			2013	2019	2020	2021
1	Yes	0.74	100	97	96	94
2	Yes	1.06	100	97	96	94
3	Yes	0.34	100	97	96	94
4	Yes	0.87	100	97	96	94
5	Yes	1.20	100	97	96	94
6	Yes	1.23	100	97	96	94
7	Yes	0.93	100	97	96	94
8	No	0.56	100	97	95	93
9	Yes	1.16	100	97	96	94
10	Yes	0.67	100	97	96	94
11	No	0.26	100	97	95	93
12	No	0.91	100	97	95	93
13	Yes	0.75	100	97	96	94
14	Yes	0.89	100	97	96	94
15	Yes	0.55	100	97	96	94
16	Yes	0.41	100	97	96	94
17	Yes	0.34	100	97	96	94
18	No	1.22	100	96	95	93
<b>Area-Weighted Average</b>			<b>100</b>	<b>97</b>	<b>96</b>	<b>94</b>

**Table 4.** Area-weighted-average of aerial vegetation cover for riparian and stream bank transects at the Foy's Bend stream mitigation site in 2013, and 2019 through 2021.

Area Type	Acres	Total % Vegetation Cover			
		2013	2019	2020	2021
Riparian Enclosures	14.1	100	97	96	94
Streambank Enclosure	0.3	63	98	96	95
<b>Area-Weighted Average</b>		<b>99</b>	<b>97</b>	<b>96</b>	<b>94</b>

Twelve vegetation community types were identified and mapped within the riparian enclosures in 2021 (Table 5; Figures 6 and 7, Appendix A). Vegetation community types in all enclosures remained consistent with those observed during the 2020 monitoring event. Ten of the twelve community types were dominated by species with a wetland indicator status of FAC or FACW, indicating these communities are more hydrophytic than community types 5 and 8 which are dominated by species with a wetland indicator status of FAC, FACU, and/or UPL (Appendix C).

In 2020 and 2021, 133 plant species were observed at the Foy's Bend stream mitigation site (Appendix C). This is an increase of 71 species since the initial monitoring event in 2013. In 2021, 67 of the species identified (50%) were considered hydrophytic based on the National Wetland Plant List (USACE 2018).



**Table 5.** Vegetation community types observed at Foy’s Bend stream mitigation site in 2021.

Community Type	Dominant Species
2	<i>Populus</i> spp.
4	<i>Alopecurus arundinaceus</i> / <i>Poa pratensis</i>
5	<i>Bromus inermis</i> / <i>Symphoricarpos albus</i>
6	<i>Phalaris arundinacea</i> / <i>Symphoricarpos albus</i>
8	<i>Bromus inermis</i> / <i>Poa pratensis</i>
9	<i>Phalaris arundinacea</i>
11	<i>Elymus repens</i> / <i>Poa pratensis</i>
12	<i>Poa pratensis</i> / <i>Populus tremuloides</i>
13	<i>Phalaris arundinacea</i> / <i>Populus tremuloides</i>
16	<i>Phalaris arundinacea</i> / <i>Alopecurus arundinaceus</i>
17	<i>Elymus repens</i> / <i>Alopecurus arundinaceus</i>
18	<i>Elymus repens</i> / <i>Phalaris arundinacea</i>

**Stream Bank Vegetation Composition** – In 2021, 49 plant species were observed along vegetation Transect 5, running the length of the reconstructed stream bank (Appendix D). Reed canary grass (RCG) was the dominant plant species observed in 2021, which comprises greater than 50% cover of the stream bank vegetation transect. RCG is an aggressive, perennial plant species that outcompetes surrounding vegetation and diminishes overall species diversity. While the presence of RCG decreases habitat complexity and species diversity, it does provide effective resistance to erosion through a dense rhizomatous root system and root stability index (RSI) score of 9. Other species, observed along the bank at 6-10% cover, included spreading bentgrass (*Agrostis stolonifera*; RSI=3), Northwest Territory sedge (*Carex utriculata*; RSI=9), woolly sedge (*Carex pellita*; RSI=not defined), red-tinge bulrush (*Scirpus microcarpus*; RSI=9), Kentucky blue grass (*Poa pratensis*; RSI=3), and fowl blue grass (*Poa palustris*; RSI=not defined).

**Noxious Weed Inventory** – Seven Montana State-listed Priority 2B noxious weeds were observed within the Foy’s Bend project area in 2021 (Appendix E). A total of 29 infestations of Canada thistle (*Cirsium arvense*) and two infestations of yellow toadflax (*Linaria vulgaris*) were mapped. All infestations had between 1 and 5 percent cover and were assigned a cover class of “low” (Appendix A). Isolated and trace occurrences of houndstongue (*Cynoglossum officinale*), field bindweed (*Convolvulus arvensis*), leafy spurge (*Euphorbia esula*), oxeye daisy (*Leucanthemum vulgare*), common tansy (*Tanacetum vulgare*), Canada thistle, and yellow toadflax were also observed, but not mapped. While these occurrences were sparse, their total combined areas are included in the estimated percent cover of noxious weeds within each riparian enclosure.

Noxious weed cover within the enclosures, was estimated at 3.5% (Appendix E), which is a decrease of 0.8% since the 2020 monitoring event. MDT has an ongoing weed-management program for the site that includes annual monitoring of noxious weed infestations and herbicide application for those mapped locations. The continued weed management efforts have been effective in decreasing overall noxious weed cover within the enclosures since monitoring began.

**Woody Plant Survival** – In 2021, woody plant survival rates within each enclosure ranged from 13% to 70%, and average woody planting survival was 30 percent. Thus, the criterion for woody planting survival was not met in 2021.

Survivorship of woody plantings has continued to decrease over the years. In 2021, 28% of the surviving plants were stunted, exhibited poor vigor, or were sprouting from the base of the plant. Survival rates dropped in eight of the 14 planted areas over the past year, while the remaining six exclosures exhibited higher survival rates (Table 6). Based upon 2021 observations by MDT staff, vole herbivory had hindered woody plant survival within the planted exclosures.

**Table 6.** 2021 planted woody vegetation inventory and survival rates for 2013, and 2019 through 2021.

Exclosure Number	Total Plants Inspected (2021)	# of Healthy Plants (2021)	# of Stunted Plants (2021)	% Stunted Plants (2021)	% Survival			
					2013	2019	2020	2021
1	134	13	14	52	96	25	26	20
2	239	32	31	49	70	28	27	26
3	87	13	9	41	92	19	18	25
4	170	28	12	30	97	43	53	24
5	117	11	16	59	97	18	29	23
6	162	29	8	22	84	17	42	23
7	94	21	5	19	88	23	12	28
9	97	10	3	23	92	21	14	13
10	137	61	12	16	97	50	30	53
13	76	20	5	20	93	27	28	33
14	126	21	9	30	95	29	27	24
15	50	16	8	33	97	71	52	48
16	34	10	4	29	96	26	16	41
17	105	69	4	5	99	37	57	70
<b>Total/Avg.</b>	<b>1628</b>	<b>354</b>	<b>140</b>	<b>28</b>	<b>91</b>	<b>29</b>	<b>30</b>	<b>30</b>

Table F-1 (Appendix F) provides a summary of percent cover by volunteer woody species within each of the 18 exclosures from 2014, and 2019 through 2021; and the total percent cover of volunteer woody species within all 18 exclosures in 2021. Between 2020 and 2021, percent cover of volunteer woody species increased in exclosure 11 and remained constant in all remaining exclosures. Averages of these data indicate woody volunteers occupied approximately 12.4% cover within all 18 exclosures in 2021.

Table F-2 (Appendix F) provides the total percent woody cover, including woody volunteers and woody plantings observed within all exclosures in 2021. These data indicate approximately 2 percent cover from woody plantings within all 14 planted exclosures, 12 percent cover from woody volunteers within all 18 exclosures, and 15 percent total woody cover across all 18 exclosures.

**Flathead Riverbank Treatment Stability** – The reconstructed portion of the Flathead Riverbank was monitored in April 2021 to document bank conditions when the lake level was low prior to spring runoff, and in August 2021 when the lake level was high. Twenty-two perpendicular transects along the upper bank were surveyed (see survey plots in Appendix G) and photographed (Appendix B) during both monitoring events. Bathymetric surveys of the lower bank and river channel were also conducted during the July monitoring event (Appendix G). Estimates of bank retreat rates are provided in Table 7.

Over the past several years, erosion has been observed and documented along this bank, especially on the upstream end. The types of erosion previously observed include internal erosion from soil piping, rill

erosion, wave erosion, and mass wasting; all of which are described in previous monitoring reports. Although not directly observed, it is also assumed that this bank is subject to wind erosion and bank scour in the winter from river ice. The dominant erosive force along this bank is wave action which causes soil sloughing and mass wasting along areas of the bank that are unprotected by either bank treatments or vegetation. Active erosion from wave action was directly observed during the July 2020 monitoring event when a large motorboat repeatedly passed by the bank leaving a large wake.

For the purposes of describing the reconstructed bank segment, it has been divided into three reaches based on conditions observed during previous site visits (Figure 7, Appendix A). The following sections describe monitoring data documented within each of the three reaches as well as immediately upstream of the reconstructed bank. Bank profiles surveyed at each transect, and a longitudinal profile of fascine elevations can be found in Appendix G.

*Erosion Upstream of Reconstructed Bank* – Erosion has been monitored at three transects (-0.5, 0, 0.5) upstream of the treated bank since 2016, where approximately 775 feet of bank is actively eroding (Figures 2 and 5, Appendix G). This bank segment was not treated and over time has exhibited higher erosion rates as compared the treated reach further downstream (Table 7). The erosion intercepts the reconstructed bank in Reach 1 and has captured a portion of the protective fencing installed around the revegetated stream bank (Additional Photo 2, Appendix B). Over the survey timeframe, Transect -0.5 has exhibited the highest bank retreat rate when compared to all other transects surveyed. Between 2016 and 2021, Transect -0.5 retreated by 14.2 feet (2.8 feet/year). The bank is also retreating at Transects 0.0 and 0.5, although at a slower pace of 1.6-1.8 feet per year. This trend of rapid bank retreat upstream of the treated reach has been consistent over the monitoring period, with much of the erosion occurring during the summer months. For example, the bank retreated approximately 1.4 feet between April and July of 2021 (Table 7; Appendix G, pages G2-G7). Since this reach was not a treated or reconstructed portion of the mitigation project, it is not compared against the success criteria.

*Reach 1* – Reach 1 spans the upstream 235 feet of reconstructed bank and contains five transects (Appendix A, Figure 2). For several years, annual surveys of these transects indicated that upper portions of the reconstructed bank remained stable while lower portions of the bank retreated by an average of 6.8 feet since 2013 (Table 7). Bank survey data collected in 2021 indicates that the lower bank has now eroded enough to affect the upper bank (Appendix G, pages G-8-G17). Bank failures were first observed at Transects 2.5 and 3 in 2020 when the bank had retreated past the edge of the coir mat at these transects. Bank failure continued at these transects over the winter of 2020-2021, and in April of 2021 the fascine could no longer be located and had likely washed away (Additional Photo 3, Appendix B). Between April and August 2021, the bank retreated again by an average of two feet across all Reach 1 transects (Table 7). The bank erosion observed in this reach is primarily attributed to undercutting beneath the reconstructed portion of the bank. Erosion is expected to continue at a relatively rapid pace along these transects now that the bank is no longer protected by stabilization treatments.

The average annual retreat rate of lower bank in Reach 1 is approximately 0.9 feet/year which is still considered “functional” in the performance standards (less than 1 foot annually). However, this is a rate increase of approximately 0.3 feet per year since the 2020. If bank erosion rates continue to increase, the rating for this performance criteria may change in the future.

**Table 7.** Bank retreat rates and fascine elevations for 22 perpendicular bank transects over the entire monitoring period and Summer 2021.

Reach	Transect	Bank retreat 2013-2021*	Bank retreat April-July 2021	Fascine Elevation April 2021	Fascine Elevation Change from Design (ft)	Fascine Elevation Change from 2020 (ft)
Upstream	-0.5	14.2	1.5	NA	NA	NA
	0	7.8	1.2	NA	NA	NA
	0.5	9.2	1.5	NA	NA	NA
	<b>Average</b>	<b>10.4</b>	<b>1.4</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
1	1	7	3.6	2893.57	-1.37	-0.89
	1.5	4.3	1.5	2893.02	-1.92	-2.43
	2	4.5	1.3	2894.05	-0.89	-0.53
	2.5	10.6	1.0	NA	NA	NA
	3	7.6	3.0	NA	NA	NA
	<b>Average</b>	<b>6.8</b>	<b>2.1</b>	<b>2893.55</b>	<b>1.4</b>	<b>-1.28</b>
2	3.5	10.4	0.5	NA	NA	NA
	4	17	5.5	NA	NA	NA
	4.5	10.8	1.8	2888.5	NA	NA
	<b>Average</b>	<b>12.7</b>	<b>2.6</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
3	5	1	0	2894.85	-0.09	-1.45
	5.5	2.9	1.5	2894.41	-0.53	-0.66
	6	4	0.2	2894.25	-0.69	-1.11
	7	4.5	0.5	2893.56	-1.38	-0.76
	8	3.1	0.0	2893.88	-1.06	-0.59
	9	4.5	0.5	2893.91	-1.03	-0.38
	10	2.0	0.5	2894.06	-0.88	-0.46
	11	3.0	1.3	2894.05	-0.89	-0.71
	12	4.6	2.0	2893.86	-1.08	-1.12
	13	2.8	0.8	2893.91	-1.03	-1.10
	14	4.2	1.0	2893.66	-1.28	-0.69
	<b>Average</b>	<b>3.3</b>	<b>0.8</b>	<b>2894.03</b>	<b>0.90</b>	<b>-0.82</b>

\*Bank retreat rates shown for the Upstream reach were for 2016-2020, and for 2015-2021 for Transects 1.5, 2.5, 3.5, 4.5, and 5.5.

*Reach 2* – Reach 2 is 135 feet long and is represented by Transects 3.5 through 4.5 (Appendix A, Figure 2). Between 2013 and 2017, severe bank erosion beneath the woody fascines was observed in Reach 2, and the woody fascine eventually became detached from the bank. The elevation of the fascine in Reach 2 has continued to drop over the past four years and as of April 2021, the fascine had washed away and could no longer be identified (Table 7). Due to the loss of bank protection from the fascines, the bank has eroded more rapidly over the past four years. Extended transect surveys indicate that the submerged toe of the bank has moved northward approximately 5 feet between 2016 and 2021 and is therefore likely contributing to the soil loss beneath the bank treatment in Reach 2 (Appendix G, pages G-19, G-21, & G-23). The lower banks have eroded enough to begin to affect the upper portions of the bank, especially at Transect 4 where 3-6 feet of the upper bank has slumped off (Additional Photo 4, Appendix B; Appendix G, page G-20). The leading edge of the bank has retreated by average of 12.7 feet since monitoring began in 2013 (Table 7).

The average retreat rate for Reach 2 is 1.9 feet/year over the entire monitoring period, which is considered “functional at risk” in the performance standards. The average bank erosion rate in Reach 2 increased by approximately 0.5 feet between 2020 and 2021. Accelerated bank retreat is expected to continue in Reach 2 given the current lack of bank protection due to the loss of the fascines at the upper end of the reach.

Reach 3 – Reach 3 contains 1,000 feet of the reconstructed bank and is represented by transects 5-14 (Appendix A, Figure 2). The upper, re-sloped portion of the reconstructed bank above the soil lift in Reach 3 has maintained a stable configuration with no documentation of lateral erosion. The lower portion of the bank has eroded some, but at much lower erosion rates than in the other two reaches, with lateral erosion ranging from 1-4.6 feet over the monitoring period. On average, the bank has laterally eroded by 3.3 feet since 2013 as of the August 2021 monitoring event (Table 7). Averaged across all monitoring years, this equates to an average annual erosion rate of 0.15 feet per year. This erosion rate is considered “functional” in the performance standards. On average, the elevation of the woody fascine in Reach 3 has only dropped by approximately 0.2 feet since 2019 and has dropped less than 1 foot since 2013 (Table 7). However, increased erosion of up to 2.0 feet was observed at individual transects in Reach 3 between the April and August 2021 monitoring events, indicating that the lower banks in this reach may be destabilizing. If this trend continues, the fascine will likely begin to destabilize within this reach.

Extended bank transects indicate some variability in bank slope, thalweg location, and bed features below the low water elevation, but the bank toe does not appear to be trending northward (Appendix G). The majority of the Reach 3 transect plots indicate that there may be an interannual trend, where sediment accumulates at the toe of the bank between April and August and then washes away over the fall and winter months. Erosion below the bank treatment area in Reach 3 is primarily attributed to wave action against the fine-grained soils during the summer months.

### **Conclusions**

The performance criteria for the Foys Bend FCA mitigation site were partially met in 2021. The vast majority of disturbed areas have successfully revegetated with non-noxious species and the plant communities observed on site are well established. The riparian and stream bank enclosures all have high amounts of total plant cover and low amount of noxious weed cover. However, the performance criteria pertaining to woody vegetation have not been met. Poor establishment and survival of planted woody species is a result of several contributing factors, including vole and ungulate herbivory, plant injury from herbicide applications, and competition from aggressive species such as reed canary grass and creeping meadow-foxtail.

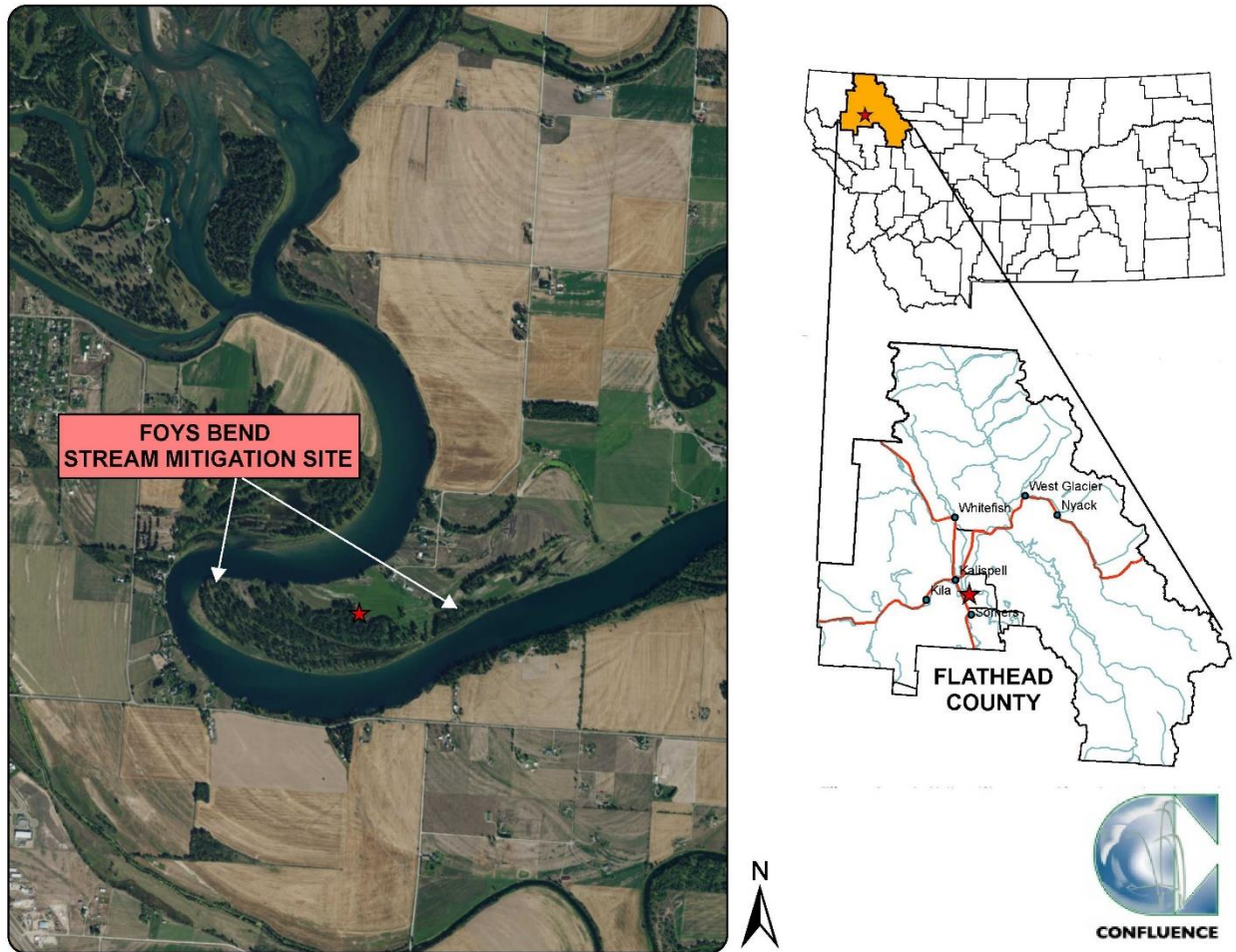
Bank stability criteria are being met for the majority of the restored stream bank, however, now that the fascine has started to wash away in Reaches 1 and 2, and the upper banks have begun to erode, the entire bank in this area is likely to become increasingly unstable. Since 2015, the elevation of the woody fascine below the soil lift has consistently dropped below the design elevation (i.e. the assumed constructed elevation). These elevation changes are primarily the result of slope failure beneath the fascine which has caused the leading edge of the reconstructed bank to slump into the river, although settling of the soil and the fascines post-construction may have also been a contributing factor. Slope failure beneath the fascines is a byproduct of the fine-grained bank material being unprotected from the Flathead River current. Any material that sloughs off the bank and deposits at the toe, is washed away by swift river currents when the lake levels are low (Additional Photos 5 & 6, Appendix B). This cycle prevents the formation of a supportive sub-surface bank, and therefore the bank continues to undercut. Without solid bank material to hold the remaining soil lift and fascine in place, the fascine will continue to fall further into the water.

The original bank reconstruction design specified that the fascines be installed over a wide range of elevations to account for fluctuating water levels in Flathead Lake, but various permitting agencies limited the design elevation to the mean summer water level. In Reach 3, the soil lift and fascine bank treatments that were installed to protect the riverbank are now located at an elevation that is typically below the summer high-water lake level. Because the bank treatments are below the water level, the bank is directly exposed to significant amounts of wave erosion during the summer. While the upper bank is well vegetated, the vegetation community consists of species such as orchard grass (*Dactylis glomerata*), smooth brome, spreading bent grass, and Kentucky blue grass. The height of the bank exceeds the rooting depth of these species and therefore, the vegetation observed here offers virtually no protection from erosive forces exerted laterally on the bank. Due to the frequency and duration of inundation during high lake levels, minimal vegetation exists along the lower bank below the bank treatments. So, while this reach has remained more stable than those further upstream, the bank in Reach 3 will likely continue to erode given the lack of protection.

Performance criteria are not applied to the reach upstream of the stabilized riverbank, but this portion of bank is quite unstable and would fail the performance criteria if applied. Erosion in this bank segment is potentially due to a short segment of riprap that was placed immediately upstream of transect -0.5, which has had the highest erosion rates of any transect throughout time. This riprap now extends well into the river and may create an erosive eddy when Flathead River flows are high and the lake levels are low. Bank retreat upstream of the treated reaches has begun to capture the upstream-most portion of Reach 1 and the protective fencing around it. Continued erosion upstream of the treated bank may result in additional bank loss within the treated reach.

**Maps, Plans, Photos:**

**Figure 1. Site Location Map**



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

**Photos:** See Appendix B

**Comprehensive Plant List:** See Appendix C

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

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

**Woody Plant Survival:** See Appendix F

**Reconstructed Bank Transect Plots:** See Appendix G

**Planting Exclosure Coordinates:** See Appendix H

**Plans:** See Appendix E of 2013 Monitoring Report

[https://www.mdt.mt.gov/other/webdata/external/planning/STREAM-MITIGATION/2013\\_REPORTS/2013\\_FOYSBEND\\_MONITORING\\_REPORT.PDF](https://www.mdt.mt.gov/other/webdata/external/planning/STREAM-MITIGATION/2013_REPORTS/2013_FOYSBEND_MONITORING_REPORT.PDF)

## References

- Montana Department of Agriculture.** June 2019. *Montana Noxious Weed List*. Accessed October 2021 at: <https://agr.mt.gov/Portals/168/Documents/Weeds/201920Montana20Noxious20Weed20List.pdf?ver=2019-07-02-095540-487>
- Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Gebhardt, R. Krapf, S. Leonard, B. Mitchell, and J. Staats.** 1998. *Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas*. Technical Reference 1737-15. U.S. Department of the Interior, Bureau of Land Management, Denver, CO. 126 pp.
- U.S. Army Corps of Engineers (USACE).** 2018. *National Wetland Plant List* (Version 3.4), prepared by U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH

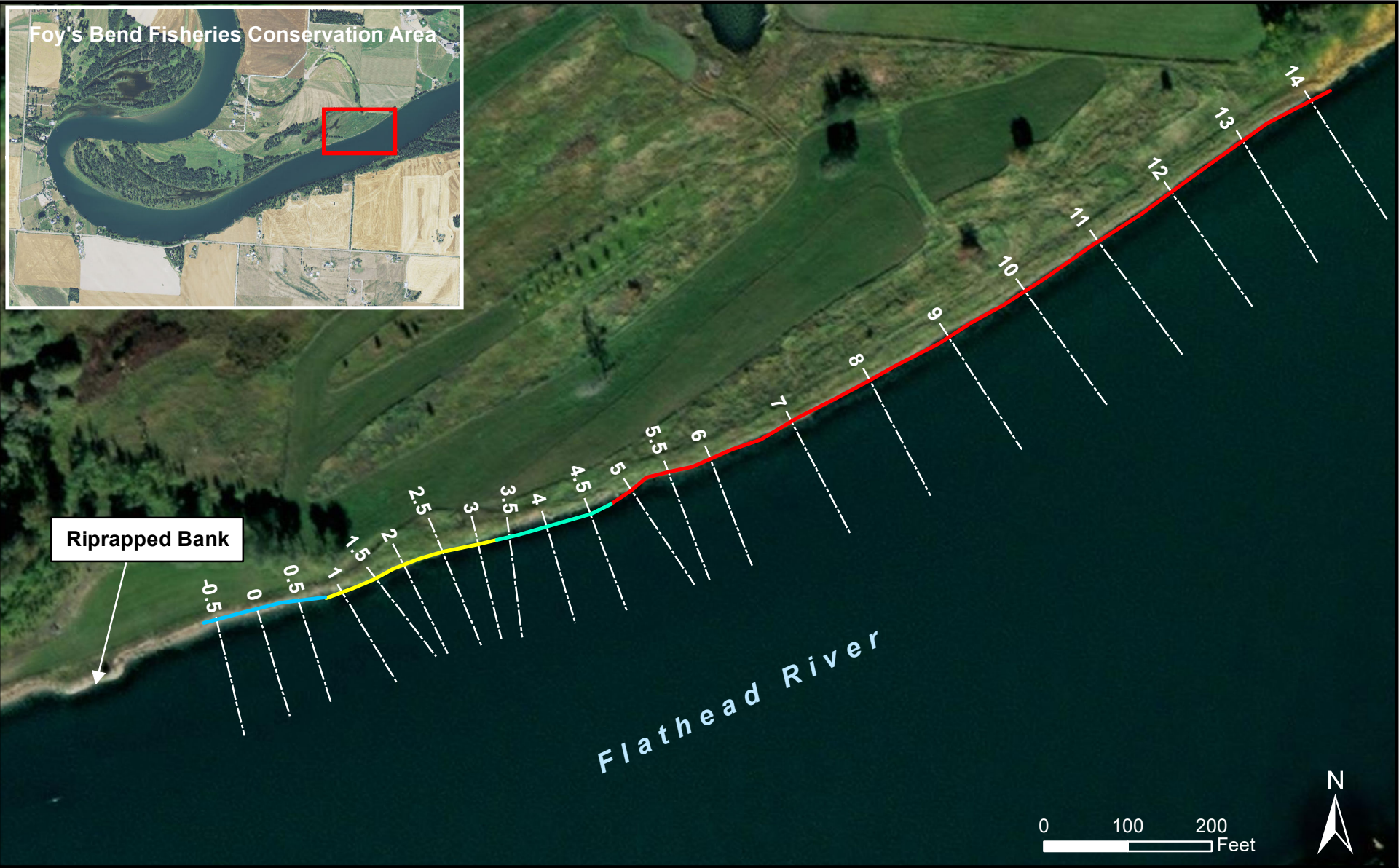


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**APPENDIX A**  
**PROJECT AREA MAPS**

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana

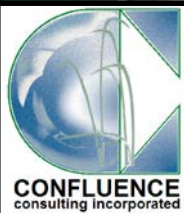
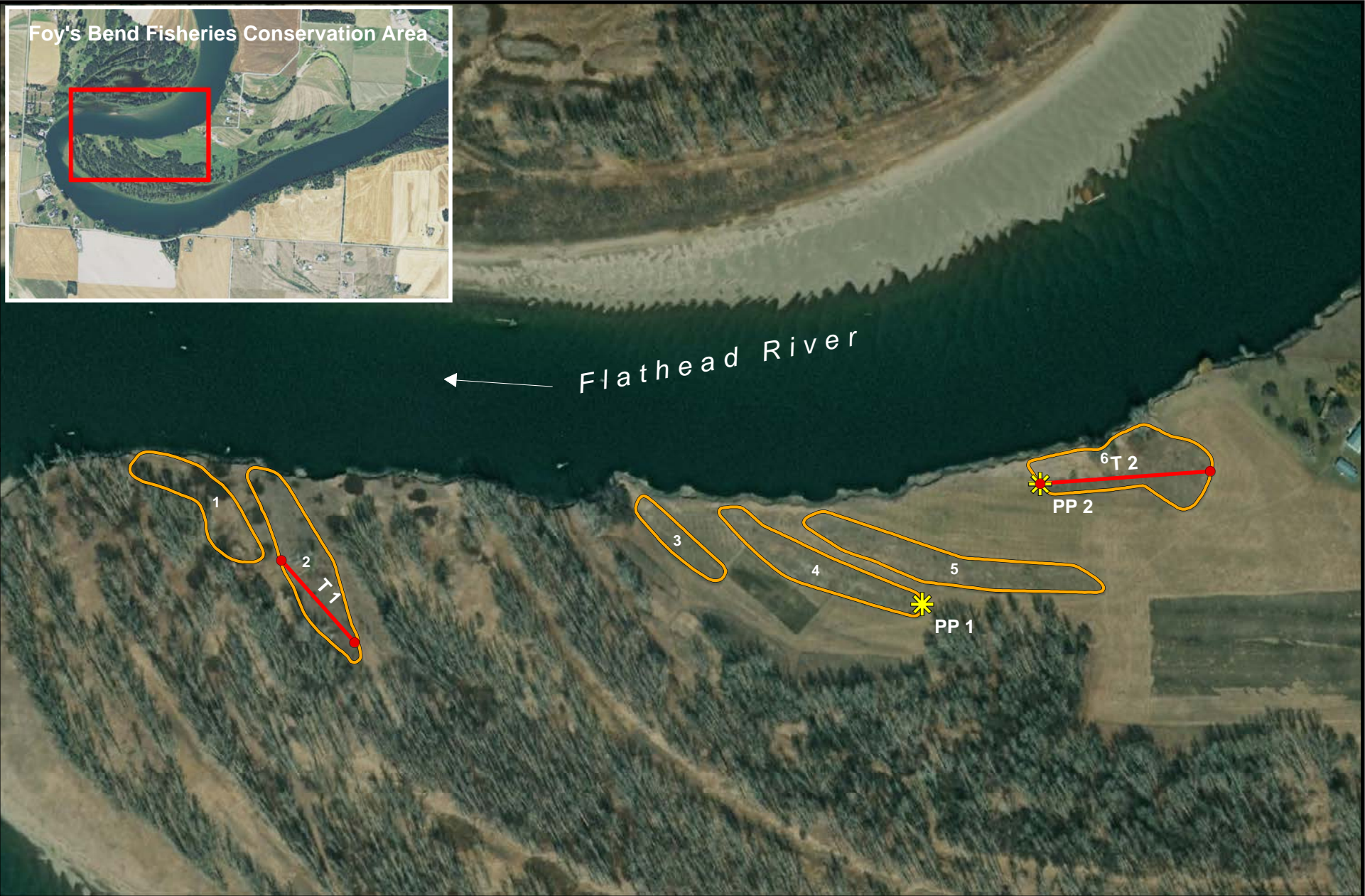


**Legend**




- Reconstructed Bank - Reach 1
- Reconstructed Bank - Reach 2
- Reconstructed Bank - Reach 3
- Reach Upstream of Bank Treatment
- - - Surveyed Bank Transects

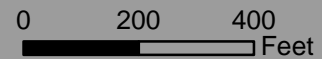
<b>Foy's Bend 2021 Surveyed Bank Transects</b>
Figure 2
Date: 10/29/2021
<i>2021 Bank Surveys.mxd</i>





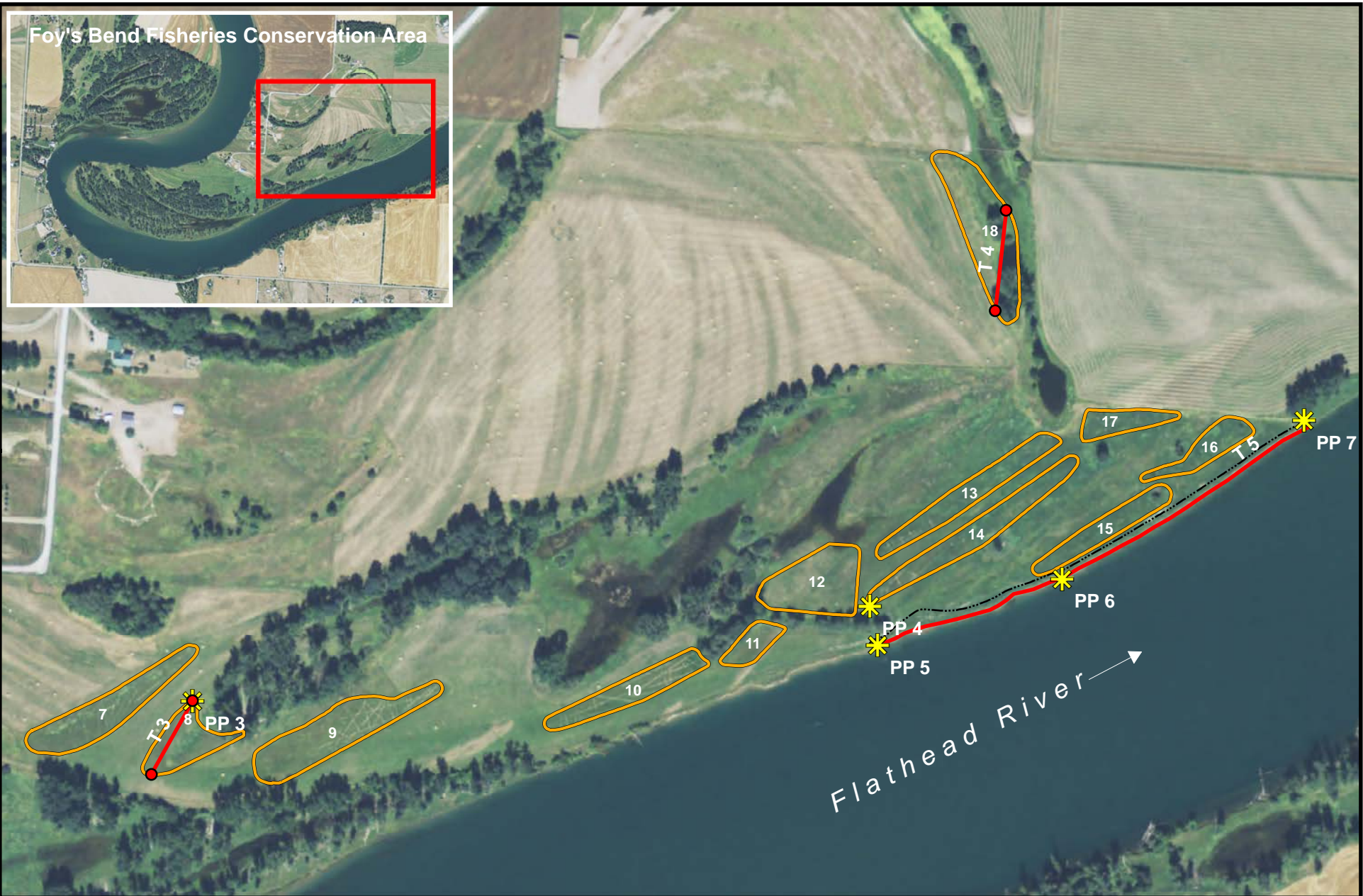
**Legend**

-  Photo Points
-  Exclosures
-  Riparian Transects



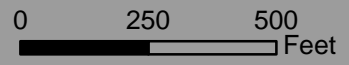
<b>Foy's Bend 2021 Monitoring Features</b>
Figure 3
Date: 10/29/2021
<i>Foys1_features2021</i>





**Legend**



- Photo Points
- Exclosures
- Riparian Transect
- Reconstructed Bank Fence






<b>Foy's Bend 2021 Monitoring Features</b>
Figure 4
Date: 10/29/2021
<i>Foys2_features2021</i>



**Legend**

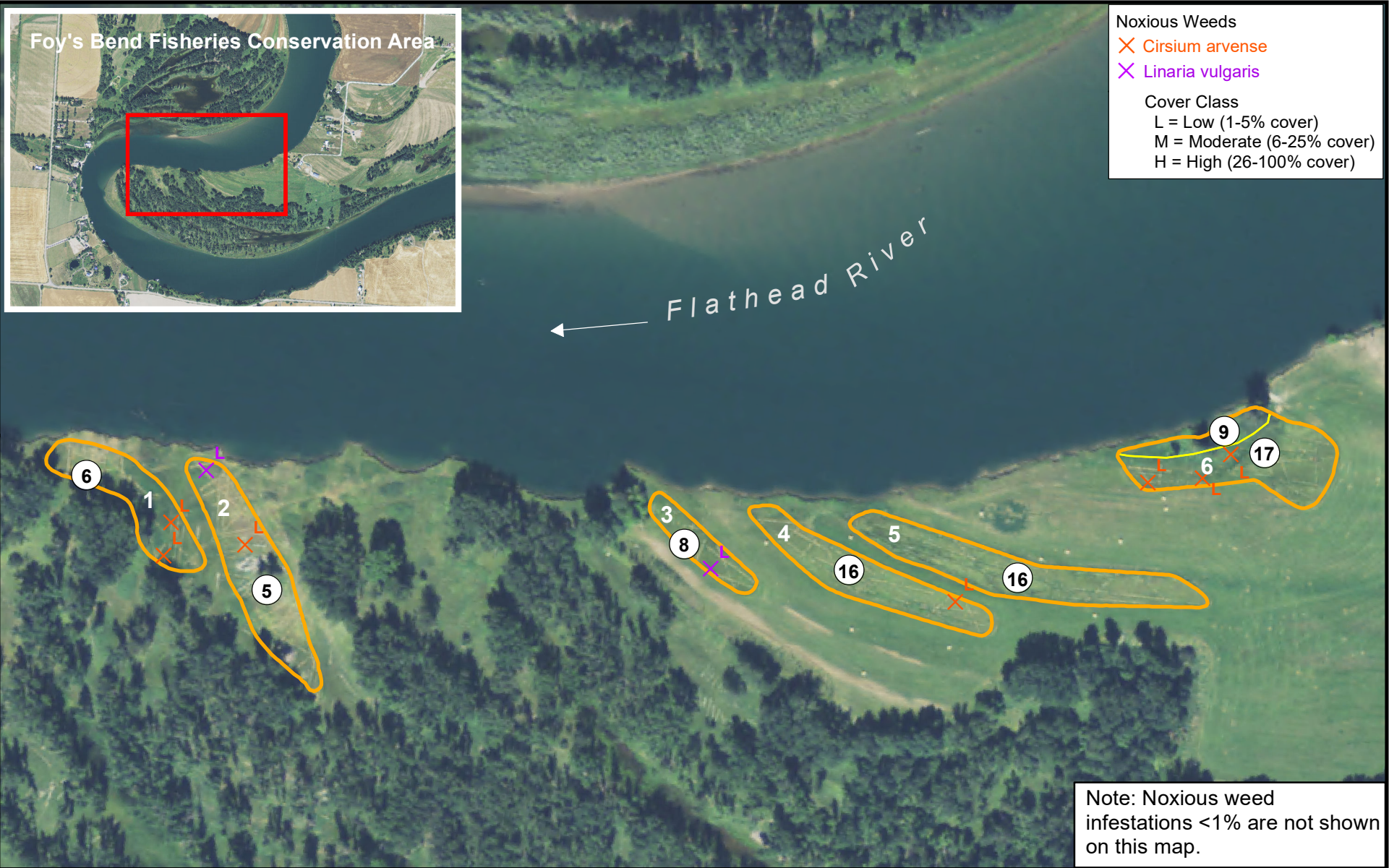
-  Photo Points
-  Exclosures

-  Vegetation Transect #5 along reconstructed bank
-  Perpendicular Bank Profiles
-  Reconstructed Bank Fenceline



<b>Foy's Bend 2021 Monitoring Features</b>
Figure 5
Date: 10/29/2021
<i>Foy3_features2021</i>





**Legend**

- Planted Enclosure
- Vegetation Community Boundary

0 100 200 300 400 500 Feet

4 Alopecurus/Poa Community	16 Phalaris/Alopecurus Community
5 Bromus/Symphoricarpos Community	17 Elymus/Alopecurus Community
6 Phalaris/Symphoricarpos Community	
8 Bromus/Poa Community	
9 Phalaris Community	

**Foy's Bend- 2021 Noxious Weeds and Vegetation Communities**

Figure 6

Date: 11/3/2021

Foys1\_monitor2021.mxd





Noxious Weeds  
 X *Cirsium arvense*  
 Cover Class  
 L = Low (1-5% cover)  
 M = Moderate (6-25% cover)  
 H = High (26-100% cover)

Note: Noxious weed infestations <1% are not shown on this map.



**Legend**

- Planted Exclosure
- Unplanted Exclosure
- Vegetation Community Boundary
- Reconstructed Bank Fenceline

- 2 Populus Community
- 12 Poa/Populus Community
- 4 Alopecurus/Poa Community
- 13 Phalaris/Populus Community
- 8 Bromus/Poa Community
- 18 Elymus/Phalaris Community
- 9 Phalaris Community
- 11 Elymus/Poa Community



**Foy's Bend- 2021 Noxious Weeds and Vegetation Communities**

Figure 7  
 Date: 11/3/2021  
 Foy's2\_monitor2021.mxd



Noxious Weeds  
 X *Cirsium arvense*

Cover Class  
 L = Low (1-5% cover)  
 M = Moderate (6-25% cover)  
 H = High (26-100% cover)



Note: Noxious weed infestations <1% are not shown on this map.



**Legend**

- Planted Exclosure
- Perpendicular Bank Profile
- Reconstructed Bank Fence Line



**Foy's Bend- 2021 Noxious Weeds and Stream Bank Transects**

Figure 8  
 Date: 11/3/2021  
 Foy3\_monitor2021.mxd



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**APPENDIX B**  
**PROJECT AREA PHOTOGRAPHS**

---

MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana

# MONITORING PHOTO LOG

SITE NAME: Foy's Bend  
MONITORING YEARS: 2013 and 2021



2013



2021

**Photo 1:** Exclosure 4, looking northwest.



2013



2021

**Photo 2:** Exclosure 6, looking east.



2013



2021

**Photo 3.2:** Exclosure 8 looking south-southeast.



**MONITORING PHOTO LOG**

SITE NAME: Foy's Bend  
MONITORING YEAR: 2013 and 2021



2013



2021

**Photo 3.3:** Enclosure 8, looking south-southwest.



2013



2021

**Photo 4:** Enclosure 14, looking east.



2013



2021

**Photo 5.1:** Upstream extent of restored stream bank looking upstream (west).



# MONITORING PHOTO LOG

SITE NAME: Foy's Bend  
MONITORING YEAR: 2013 and 2021



2013



2021

**Photo 5.2:** Upstream extent of restored stream bank looking downstream (northeast).



2013



2021

**Photo 6.1:** Middle of restored stream bank, looking upstream (west).



2013



2021

**Photo 6.2:** Middle of restored streambank looking downstream (northeast).



## MONITORING PHOTO LOG

SITE NAME: Foy's Bend

MONITORING YEAR: 2013 and 2021



**2013**



**2021**

**Photo 7:** Downstream end of restored stream bank, looking upstream (west).



**August 2021**

**Additional Photo 1:** Fascine underwater at T-1.



**April 2021**

**Additional Photo 2:** Bank Erosion and fence entrapment at T-1.



**April 2021**

**Additional Photo 3:** Looking downstream (East) from T-2 at bank erosion. Note the absence of the fascine.



**April 2021**

**Additional Photo 4:** Looking downstream (East) at severe bank erosion at T-4.

## MONITORING PHOTO LOG

SITE NAME: Foy's Bend

MONITORING YEAR: 2013 and 2021



**April 2021**

**Additional Photo 5:** Looking upstream at exposed fascine and unprotected bank exposed to erosion between T-8 and T-9.



**April 2021**

**Additional Photo 6:** Looking upstream at exposed, degrading fascine and unprotected bank exposed to erosion near T-13.



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend  
**MONITORING YEAR:** 2014-2016 and 2021



**August 2016**



**August 2021**

**Survey Photo 1: T -0.5 Looking North**



**August 2016**



**August 2021**

**Survey Photo 2: T -0.5 Looking West**



**August 2016**



**August 2021**

**Survey Photo 3: T -0.5 Looking East**



**SURVEY PHOTO LOG**

SITE NAME: Foy's Bend

MONITORING YEAR: 2014-2016 and 2021



**August 2016**



**August 2021**

**Survey Photo 4: T 0.0 Looking North**



**August 2016**



**August 2021**

**Survey Photo 5: T 0.0 Looking West**



**August 2016**



**August 2021**

**Survey Photo 6: T 0.0 Looking East**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 7: T 0.5 Looking North**



**August 2015**



**August 2021**

**Survey Photo 8: T 0.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 9: T 0.5 Looking East**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 10: T 1.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 11: T 1.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 12: T 1.5 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 13: T 1.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 14: T 1.5 Looking East**



**August 2014**



**August 2021**

**Survey Photo 15: T 2.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 16: T 2.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 17: T 2.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 18: T 2.5 Looking North**

**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 19: T 2.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 20: T 2.5 Looking East**



**August 2015**



**August 2021**

**Survey Photo 21: T 3.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 22: T 3.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 23: T 3.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 24: T 3.5 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 25: T 3.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 26: T 3.5 Looking East**



**August 2015**



**August 2021**

**Survey Photo 27: T 4.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 28: T 4.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 29: T 4.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 30: T 4.5 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 31: T 4.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 32: T 4.5 Looking East**



**August 2021**

**Survey Photo 33: T 5.0: Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 34: T 5.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 35: T 5.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 36: T 5.5 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2015**



**August 2021**

**Survey Photo 37: T 5.5 Looking West**



**August 2015**



**August 2021**

**Survey Photo 38: T 5.5 Looking East**



**August 2014**



**August 2021**

**Survey Photo 39: T 6.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 40: T 6.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 41: T 6.0 Looking East**



**August 2014**



**August 2021**

**Survey Photo 42: T 7.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 43: T 7.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 44: T 7.0 Looking East**



**August 2014**



**August 2021**

**Survey Photo 45: T 8.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 46: T 8.0: Looking West**



**August 2014**



**August 2021**

**Survey Photo 47: T 8.0 Looking East**



**August 2014**



**August 2021**

**Survey Photo 48: T 9.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 49: T 9.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 50: T 9.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 51: T 10.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 52: T 10.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 53: T 10.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 54: T 11.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 55: T 11.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 56: T 11.0 Looking East**



**August 2015**



**August 2021**

**Survey Photo 57: T 12.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 58: T 12.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 59: T 12.0 Looking East**



**August 2014**



**August 2021**

**Survey Photo 60: T 13.0 Looking North**



**SURVEY PHOTO LOG**

**SITE NAME:** Foy's Bend

**MONITORING YEAR:** 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 61: T 13.0 Looking West**



**August 2014**



**August 2021**

**Survey Photo 62: T 13.0 Looking East**



**August 2014**



**August 2021**

**Survey Photo 63: T 14.0 Looking West (August 2014) and North (August 2021)**

**SURVEY PHOTO LOG**

SITE NAME: Foy's Bend

MONITORING YEAR: 2014-2016 and 2021



**August 2014**



**August 2021**

**Survey Photo 64: T 14.0 Looking East**



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**APPENDIX C**  
**2013 – 2021 COMPREHENSIVE PLANT SPECIES LIST**

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana

**Table C-1.** Comprehensive list of plant species observed at the Foy's Bend Fisheries Conservation Area Stream Mitigation Site from 2013 through 2021.

Scientific Name	Common Name	WMVC Indicator Status*
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agastache urticifolia</i>	Nettle-Leaf Giant-Hyssop	FACU
<i>Agropyron</i> sp.	Wheatgrass	N/A
<i>Agrostis gigantea</i>	Black Bent	FAC
<i>Agrostis stolonifera</i>	Spreading Bent	FAC
<i>Alnus incana</i>	Speckled Alder	FACW
<i>Alopecurus aequalis</i>	Short-Awn Meadow-Foxtail	OBL
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FAC
<i>Alopecurus pratensis</i>	Field Meadow-Foxtail	FAC
<i>Alyssum alyssoides</i>	Pale Alyssum	UPL
<i>Apocynum cannabinum</i>	Indian-Hemp	FAC
<i>Arctium lappa</i>	Greater Burdock	UPL
<i>Arctium minus</i>	Lesser Burrdock	UPL
<i>Asclepias</i> sp.	Milkweed	N/A
<i>Asparagus officinalis</i>	Asparagus	FACU
<i>Asperugo procumbens</i>	German-Madwort	UPL
<i>Aster</i> sp. (white rays)	Aster	N/A
<i>Aster</i> sp. (purple rays)	Aster	N/A
<i>Bassia scoparia</i>	Mexican-Fireweed	FAC
<i>Brassica juncea</i>	Chinese Mustard	UPL
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Calamagrostis canadensis</i>	Bluejoint	FACW
<i>Carduus acanthoides</i>	Spiny Plumeless-thistle	UPL
<i>Carduus nutans</i>	Nodding Plumeless-Thistle	UPL
<i>Carex aquatilis</i>	Leafy Tussock Sedge	OBL
<i>Carex bebbii</i>	Bebb's Sedge	OBL
<i>Carex nebrascensis</i>	Nebraska Sedge	OBL
<i>Carex pellita</i>	Woolly 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>Carex vesicaria</i>	Lesser Bladder Sedge	OBL
<i>Carum carvi</i>	Caraway	FACU
<i>Chamaenerion angustifolium</i>	Narrow-Leaf Fireweed	FACU
<i>Chenopodium album</i>	Lamb's-Quarters	FACU
<i>Chenopodium leptophyllum</i>	Narrow-Leaf Goosefoot	FACU
<i>Chenopodium rubrum</i>	Red Goosefoot	FACW



Scientific Name	Common Name	WMVC Indicator Status*
<i>Cirsium arvense</i>	Canadian Thistle	FAC
<i>Cirsium vulgare</i>	Bull Thistle	FACU
<i>Clematis ligusticifolia</i>	Deciduous Traveler's-Joy	FAC
<i>Convolvulus arvensis</i>	Field Bindweed	UPL
<i>Coreopsis tinctoria</i>	Golden Tickseed	FACU
<i>Cornus alba</i>	Red Osier	FACW
<i>Crataegus douglasii</i>	Black Hawthorn	FAC
<i>Cynoglossum officinale</i>	Gypsy-Flower	FACU
<i>Dactylis glomerata</i>	Orchard Grass	FACU
<i>Descurainia sophia</i>	Herb Sophia	UPL
<i>Elaeagnus commutata</i>	American Silver-Berry	FAC
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL
<i>Elymus canadensis</i>	Nodding Wild Rye	FAC
<i>Elymus hispidus</i>	Intermediate Wheatgrass	UPL
<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 ciliatum</i>	Fringed Willowherb	FACW
<i>Equisetum arvense</i>	Field Horsetail	FAC
<i>Equisetum hyemale</i>	Tall Scouring-Rush	FACW
<i>Euphorbia esula</i>	Leafy Spurge	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>Heracleum maximum</i>	American Cow-Parsnip	FAC
<i>Hordeum jubatum</i>	Fox-Tail Barley	FAC
<i>Juncus balticus</i>	Baltic Rush	FACW
<i>Juncus bufonius</i>	Toad Rush	FACW
<i>Juncus compressus</i>	Round-Fruit Rush	OBL
<i>Juncus effusus</i>	Lamp Rush	FACW
<i>Juncus ensifolius</i>	Dagger-Leaf Rush	FACW
<i>Juncus nodosus</i>	Knotted Rush	OBL
<i>Juncus sp.</i>	Rush	N/A
<i>Juncus tenuis</i>	Lesser Poverty Rush	FAC
<i>Lactuca serriola</i>	Prickly Lettuce	FACU
<i>Lemna minor</i>	Common Duckweed	OBL
<i>Leucanthemum vulgare</i>	Ox-Eye Daisy	FACU
<i>Linaria vulgaris</i>	Butter-and-eggs	UPL
<i>Lonicera tatarica</i>	Twinsisters	FACU

Scientific Name	Common Name	WMVC Indicator Status*
<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>Nepeta cataria</i>	Catnip	FACU
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Persicaria amphibia</i>	Water Smartweed	OBL
<i>Persicaria sp.</i>	Smartweed	N/A
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Phleum pratense</i>	Common Timothy	FAC
<i>Plantago lanceolata</i>	English Plantain	FACU
<i>Plantago major</i>	Great Plantain	FAC
<i>Poa palustris</i>	Fowl Blue Grass	FAC
<i>Poa pratensis</i>	Kentucky Blue Grass	FAC
<i>Polygonum aviculare</i>	Yard Knotweed	FAC
<i>Populus angustifolia</i>	Narrow-Leaf Cottonwood	FACW
<i>Populus balsamifera</i>	Balsam Poplar	FAC
<i>Populus tremuloides</i>	Quaking Aspen	FACU
<i>Potentilla anserina</i>	Silverweed	OBL
<i>Potentilla recta</i>	Sulphur Cinquefoil	N/A
<i>Prunus virginiana</i>	Choke Cherry	FACU
<i>Ribes inerme</i>	White-Stem Gooseberry	FAC
<i>Ribes sp.</i>	Currant	N/A
<i>Rosa woodsii</i>	Woods' Rose	FACU
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex fueginus</i>	Tierra del Fuego Dock	FACW
<i>Rumex salicifolius</i>	Willow Dock	FACW
<i>Sagittaria cuneata</i>	Arum-Leaf Arrowhead	OBL
<i>Salix bebbiana</i>	Gray Willow	FACW
<i>Salix exigua</i>	Narrow-Leaf Willow	FACW
<i>Salix sp.</i>	Willow	N/A
<i>Schedonorus pratensis</i>	Meadow False Rye Grass	FACU
<i>Schoenoplectus acutus</i>	Hard-Stem Club-Rush	OBL
<i>Scirpus microcarpus</i>	Red-Tinge Bulrush	OBL
<i>Scirpus sp.</i>	Bulrush	N/A
<i>Shepherdia argentea</i>	Silver Buffalo-Berry	FACU
<i>Silene vulgaris</i>	Maiden's-tears	UPL
<i>Solanum dulcamara</i>	Climbing Nightshade	FAC
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Sonchus arvensis</i>	Field Sow-Thistle	FACU



Scientific Name	Common Name	WMVC Indicator Status*
<i>Sporobolus airoides</i>	Alkali-Sacaton	FAC
<i>Stachys pilosa</i>	Hairy Hedge-nettle	FACW
<i>Symphoricarpos albus</i>	Common Snowberry	FACU
<i>Symphyotrichum ascendens</i>	Western American-Aster	FACU
<i>Symphyotrichum falcatum</i>	Rough White Prairie American-Aster	FACU
<i>Symphyotrichum laeve</i>	Smooth Blue American-Aster	FACU
<i>Symphyotrichum lanceolatum</i>	White Panicked American-Aster	OBL
<i>Tanacetum vulgare</i>	Common Tansy	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Thlaspi arvense</i>	Field Pennycress	UPL
<i>Tragopogon dubius</i>	Meadow Goat's-beard	UPL
<i>Trifolium pratense</i>	Red Clover	FACU
<i>Trifolium repens</i>	White Clover	FAC
<i>Typha angustifolia</i>	Narrow-Leaf Cat-Tail	OBL
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL
<i>Verbascum thapsus</i>	Great Mullein	FACU

\* 2018 National Wetland Plant List; Western Mountains, Valleys, and Coast Region (USACE 2018).  
Species identified to genus level have been assigned an indicator status of N/A

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**APPENDIX D**  
**2021 STREAM BANK VEGETATION COMPOSITION**

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MDT Streams Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana



**Table D-1.** Stream bank plant species, with their associated cover classes, observed at the Foy’s Bend Fisheries Conservation Area stream mitigation site in 2021.

Stream bank Species	WMVC Indicator Status*	Cover Class	Stream bank Species	WMVC Indicator Status*	Cover Class
<i>Agrostis stolonifera</i>	FAC	2	<i>Linaria vulgaris</i>	UPL	0
<i>Alopecurus arundinaceus</i>	FAC	1	<i>Mentha arvensis</i>	FACW	1
<i>Apocynum cannabinum</i>	FAC	1	<i>Nepeta cataria</i>	FACU	0
<i>Brassica juncea</i>	UPL	0	<i>Phalaris arundinacea**</i>	FACW	5
<i>Bromus inermis</i>	UPL	1	<i>Poa palustris</i>	FAC	2
<i>Calamagrostis canadensis</i>	FACW	0	<i>Poa pratensis</i>	FAC	2
<i>Carex bebbii</i>	OBL	1	<i>Populus balsamifera</i>	FAC	0
<i>Carex nebrascensis</i>	OBL	1	<i>Populus tremuloides</i>	FACU	0
<i>Carex pellita</i>	OBL	2	<i>Rumex crispus</i>	FAC	0
<i>Carex stipata</i>	OBL	0	<i>Salix bebbiana</i>	FACW	0
<i>Carex utriculata</i>	OBL	2	<i>Salix exigua</i>	FACW	0
<i>Carex vesicaria</i>	OBL	1	<i>Schedonorus pratensis</i>	FACU	0
<i>Cirsium arvense</i>	FAC	1	<i>Schoenoplectus acutus</i>	OBL	0
<i>Cirsium vulgare</i>	FACU	0	<i>Scirpus microcarpus</i>	OBL	2
<i>Cornus alba</i>	FACW	0	<i>Solidago canadensis</i>	FACU	0
<i>Crataegus douglasii</i>	FAC	0	<i>Sonchus arvensis</i>	FACU	0
<i>Cynoglossum officinale</i>	FACU	0	<i>Symphoricarpos albus</i>	FACU	0
<i>Elaeagnus commutata</i>	FAC	0	<i>Symphyotrichum ascendens</i>	FACU	0
<i>Eleocharis palustris</i>	OBL	0	<i>Symphyotrichum lanceolatum</i>	OBL	0
<i>Elymus lanceolatus</i>	FACU	0	<i>Taraxacum officinale</i>	FACU	0
<i>Elymus repens</i>	FAC	1	<i>Typha latifolia</i>	OBL	0
<i>Epilobium ciliatum</i>	FACW	0	<i>Verbascum thapsus</i>	FACU	0
<i>Equisetum arvense</i>	FAC	1			
<i>Juncus balticus</i>	FACW	1			
<i>Juncus tenuis</i>	FAC	0			
<i>Lactuca serriola</i>	FACU	0			
<i>Leucanthemum vulgare</i>	FACU	0			

\* 2018 National Wetland Plant List; Western Mountains, Valleys, and Coast Region (USACE 2018).

\*\* Dominant species observed along stream bank

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APPENDIX E  
2021 NOXIOUS WEED SPECIES LIST  
2021 NOXIOUS WEED SPECIES COVER

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana



**Table E-1.** Montana State-listed noxious weed species observed in 2021 at the Foy's Bend Fisheries Conservation Area Stream Mitigation Site.

Category*	Scientific Name	Common Name
Priority 2B	<i>Cirsium arvense</i>	Canada Thistle
	<i>Convolvulus arvensis</i>	Field Bindweed
	<i>Cynoglossum officinale</i>	Houndstongue
	<i>Euphorbia esula</i>	Leafy Spurge
	<i>Leucanthemum vulgare</i>	Oxeye Daisy
	<i>Linaria vulgaris</i>	Yellow Toadflax
	<i>Tanacetum vulgare</i>	Common Tansy

\* Based on the MT Department of Agriculture 2019 Noxious Weed List

**Table E-2.** Percent noxious weed coverage at Foy's Bend in 2021.

Exclosure #	Exclosure Acreage	% Noxious Weed Cover	Noxious Weed Acreage
1	0.74	5	0.04
2	1.06	4	0.04
3	0.34	3	0.01
4	0.87	2	0.02
5	1.20	1	0.01
6	1.23	5	0.06
7	0.93	2	0.02
8	0.56	1	0.01
9	1.16	4	0.05
10	0.67	5	0.03
11	0.26	5	0.01
12	0.91	10	0.09
13	0.75	1	0.01
14	0.89	2	0.02
15	0.55	2	0.01
16	0.41	1	0.00
17	0.34	0.5	0.00
18	1.22	5	0.06
Stream Bank	0.31	3	0.01
<b>Total Acreage</b>	<b>14.40</b>		<b>0.50</b>
<b>Total Noxious Weed Cover at Foy's Bend:</b>			<b>3.48</b>

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APPENDIX F  
WOODY PLANT SURVIVAL

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana



**Table F-1.** Woody volunteer plant species establishment within exclosures at Foy's Bend in 2014, and 2019 through 2021; and total percent cover of woody volunteers within exclosures at Foy's Bend in 2021.

Exclosure Number	Planted (Y/N)	% Cover by Volunteers				Alnus incana	Crataegus douglasii	Elaeagnus commutata	Populus balsamifera	Populus tremuloides	Prunus virginiana	Ribes inerme	Rosa woodsii	Salix bebbiana	Symphoricarpos albus
		2014	2019	2020	2021										
1	Y	30%	36%	37%	36%		X	X	X					X	
2	Y	10%	36%	36%	35%			X	X			X		X	
3	Y	5%	3%	3%	3%			X		X					
4	Y	0%	1%	1%	1%			X							
5	Y	0%	1%	1%	1%			X			X				
6	Y	20%	15%	15%	15%			X		X	X			X	
7	Y	1%	2%	2%	2%				X						
8	N	1%	0%	0%	0%										
9	Y	5%	1%	1%	1%				X						
10	Y	25%	20%	21%	21%		X	X		X					
11	N	15%	39%	40%	41%				X	X				X	
12	N	20%	26%	27%	27%				X				X	X	
13	Y	0%	0%	0%	0%										
14	Y	0%	1%	1%	2%			X	X					X	
15	Y	1%	1%	1%	1%			X			X			X	
16	Y	1%	1%	1%	1%									X	
17	Y	5%	5%	5%	5%				X					X	
18	N	5%	26%	27%	27%				X	X	X			X	
Total Acreage of Exclosures		Acreage of Woody Volunteers in 2021				Total % Cover of Woody Volunteers within Exclosures at Foy's Bend in 2021									
14.09		1.75				12.43%									

**Table F-2.** Total percent cover of woody volunteers and woody plantings within exclosures at Foy's Bend in 2021.

Exclosure	Planted (Y/N)	Woody Volunteer Cover (%)	Acreage of Woody Volunteers	Woody Planting Cover (%)	Acreage of Woody Plantings
		2021	2021	2021	2021
1	Y	36	0.27	2	0.01
2	Y	35	0.37	3	0.03
3	Y	3	0.01	2	0.01
4	Y	1	0.01	3	0.03
5	Y	1.0	0.01	2	0.02
6	Y	15	0.18	2	0.02
7	Y	2	0.02	1	0.01
8	N	0	0.00	N/A	N/A
9	Y	1	0.01	2	0.02
10	Y	21	0.14	4	0.03
11	N	41	0.11	N/A	N/A
12	N	27	0.25	N/A	N/A
13	Y	0	0.00	2	0.02
14	Y	2	0.02	1	0.01
15	Y	1	0.01	2	0.01
16	Y	1	0.00	2	0.01
17	Y	5	0.02	2	0.01
18	N	27	0.33	N/A	N/A
Total		12.43%	1.75	2.13%	0.24
Total Woody Cover (%) at Foy's Bend:					14.56%



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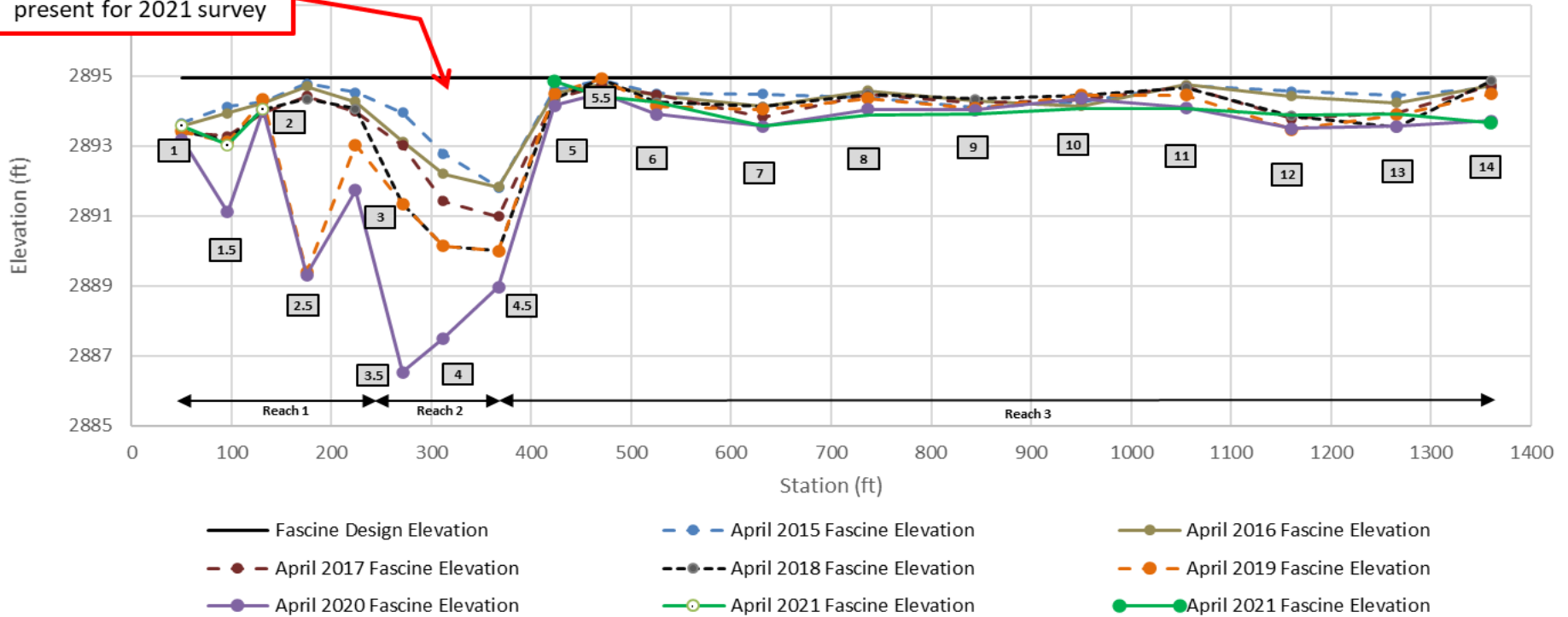
**APPENDIX G**  
**LONGITUDINAL PROFILE AND PERPENDICULAR TRANSECT PLOTS**

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana

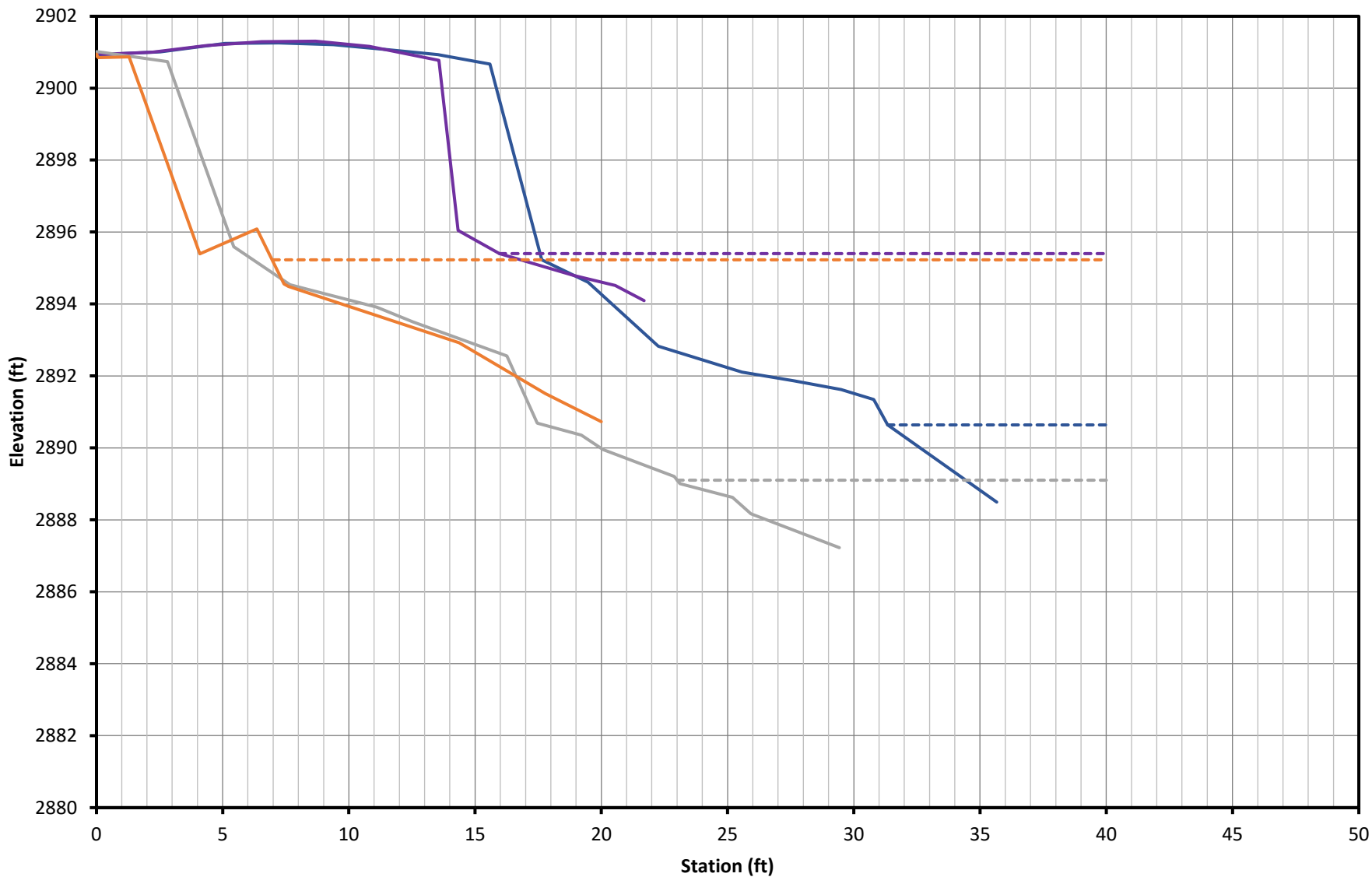
# Foy's Bend Fascine Profile

Fascine no longer present for 2021 survey





# Foy's Bend Upper Bank Transect # -0.5



4/16 XS

8/16 XS

4/21 XS

8/21 XS

XS = Cross section

4/16 WS

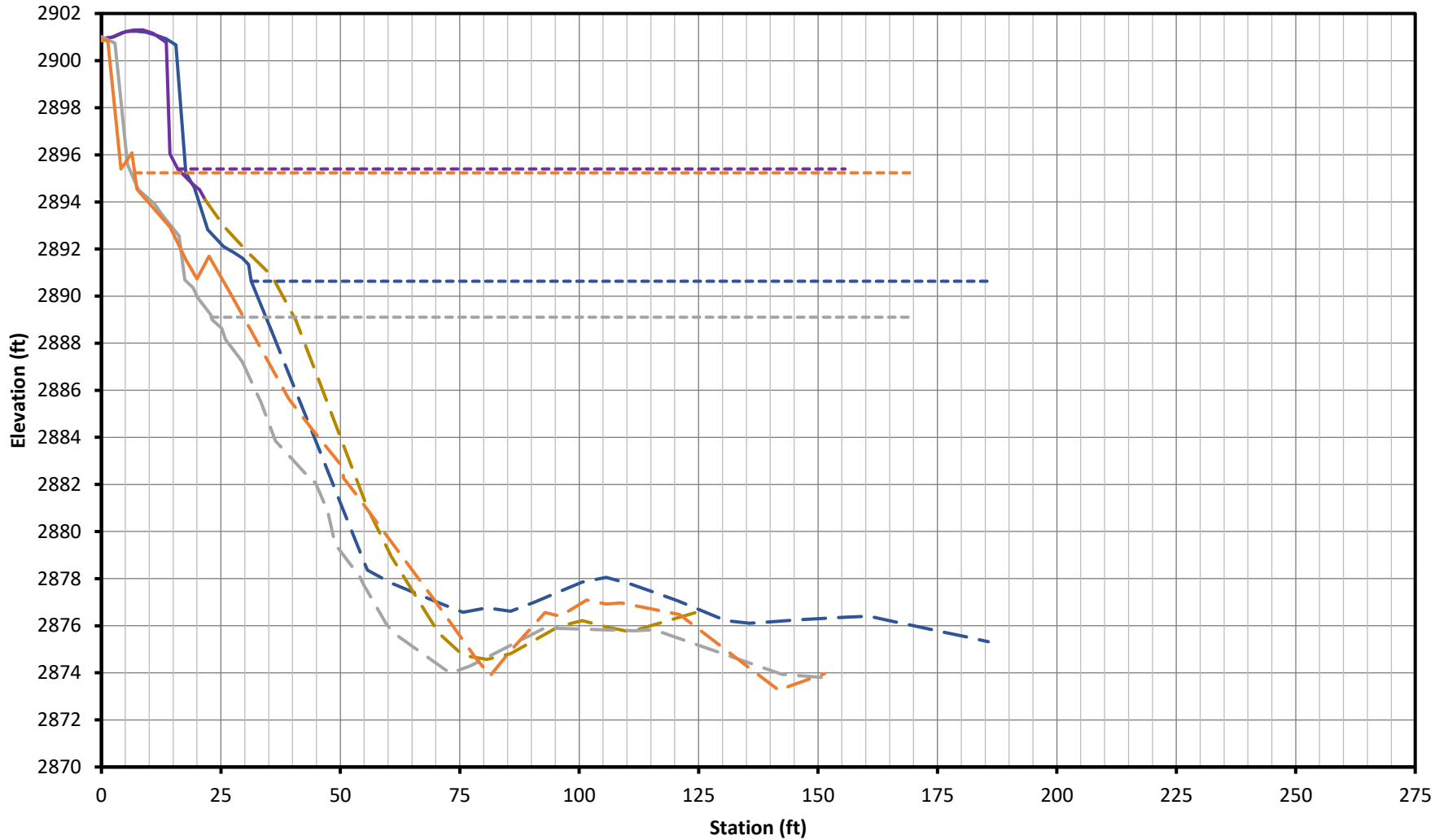
8/16 WS

4/21 WS

8/21 WS

WS = Water Surface

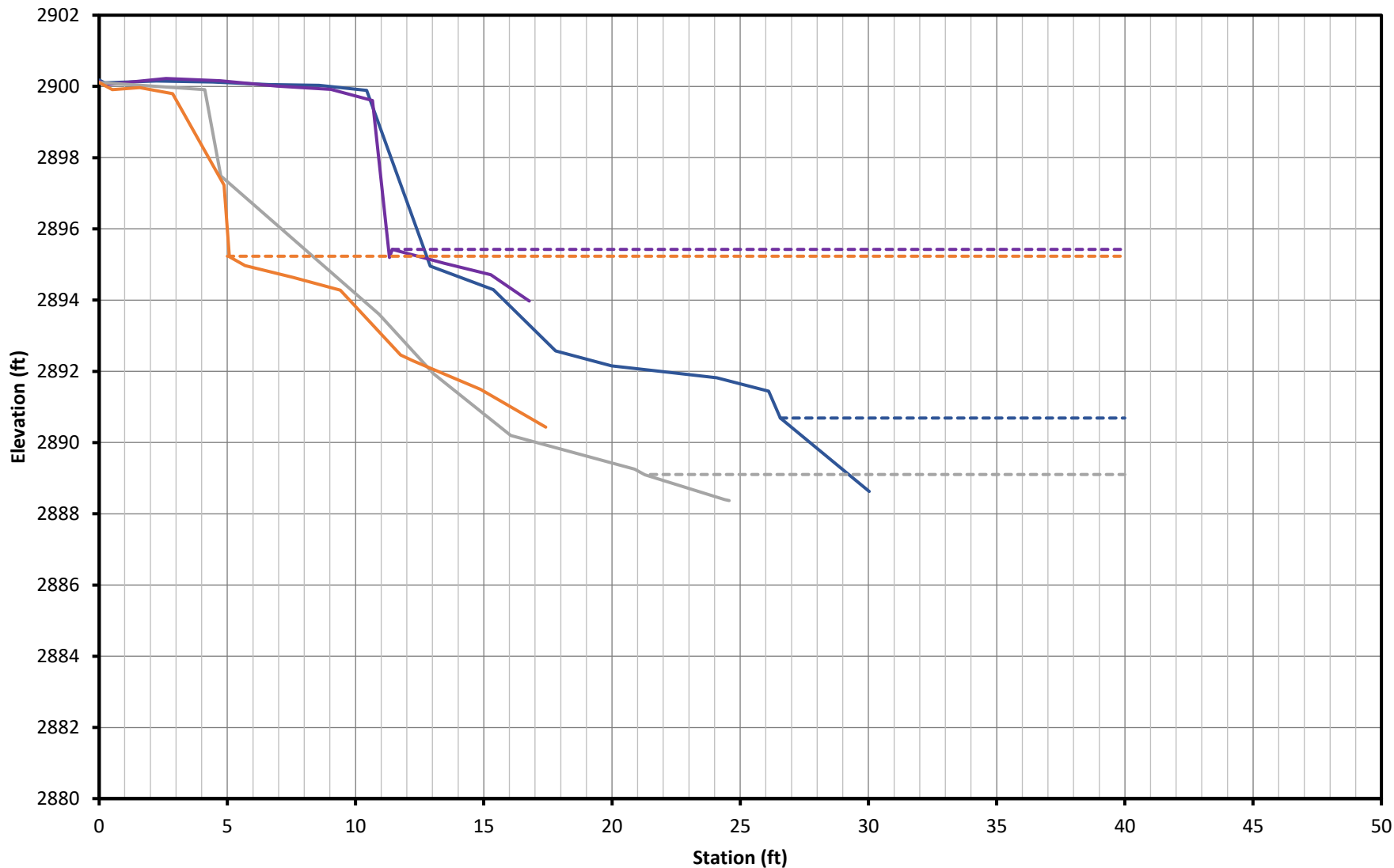
# Foy's Bend Bank Transect # -0.5



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River    - - 8/16 River    - - 4/21 River    - - 8/21 River
- ... 4/16 WS      ... 8/16 WS      ... 4/21 WS      ... 8/21 WS

XS = Cross section  
WS = Water Surface

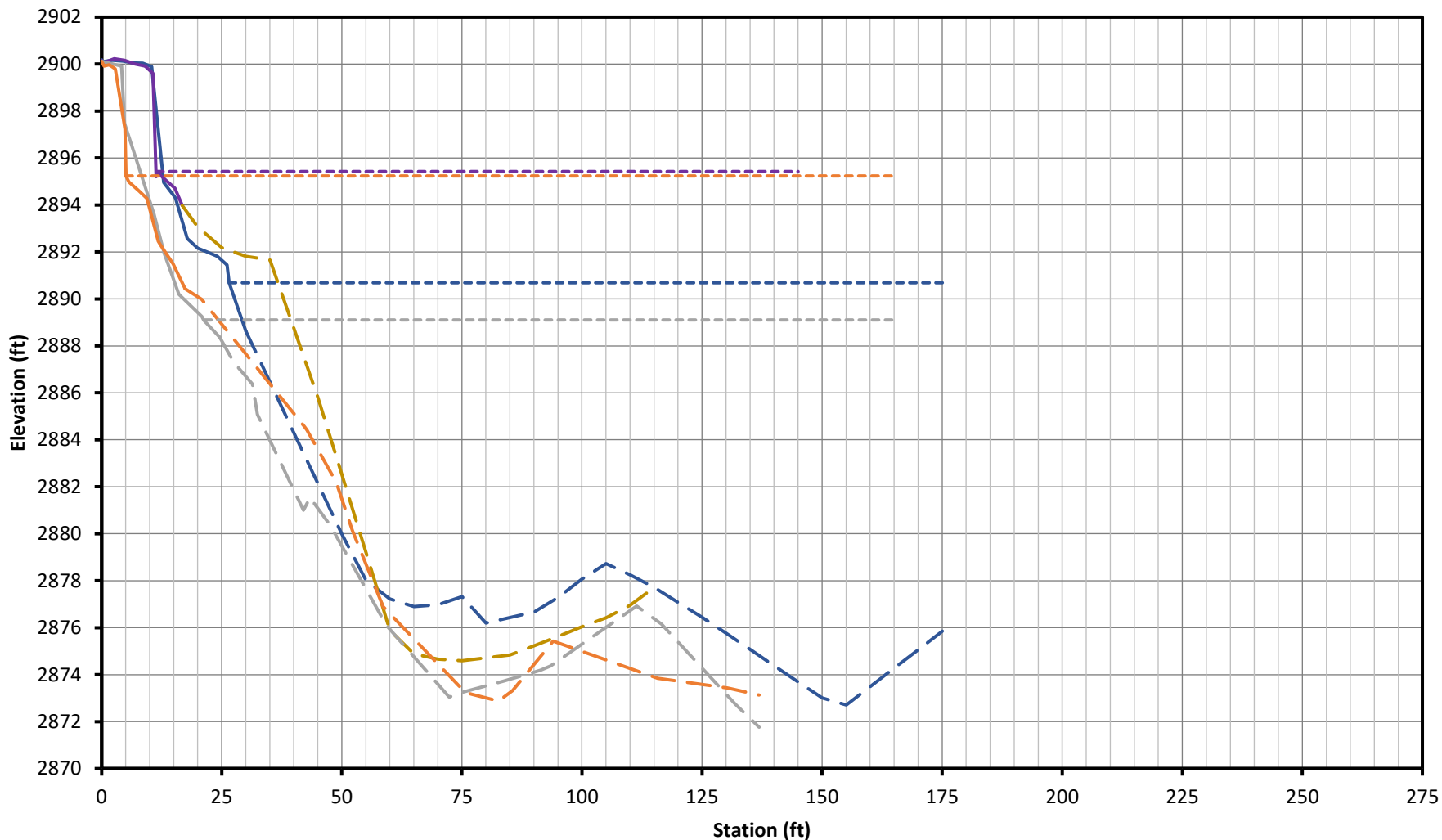
# Foy's Bend Upper Bank Transect #0



— 4/16 XS      — 8/16 XS      — 4/21 XS      — 8/21 XS      XS = Cross section  
- - - 4/16 WS      - - - 8/16 WS      - - - 4/21 WS      - - - 8/21 WS      WS = Water Surface



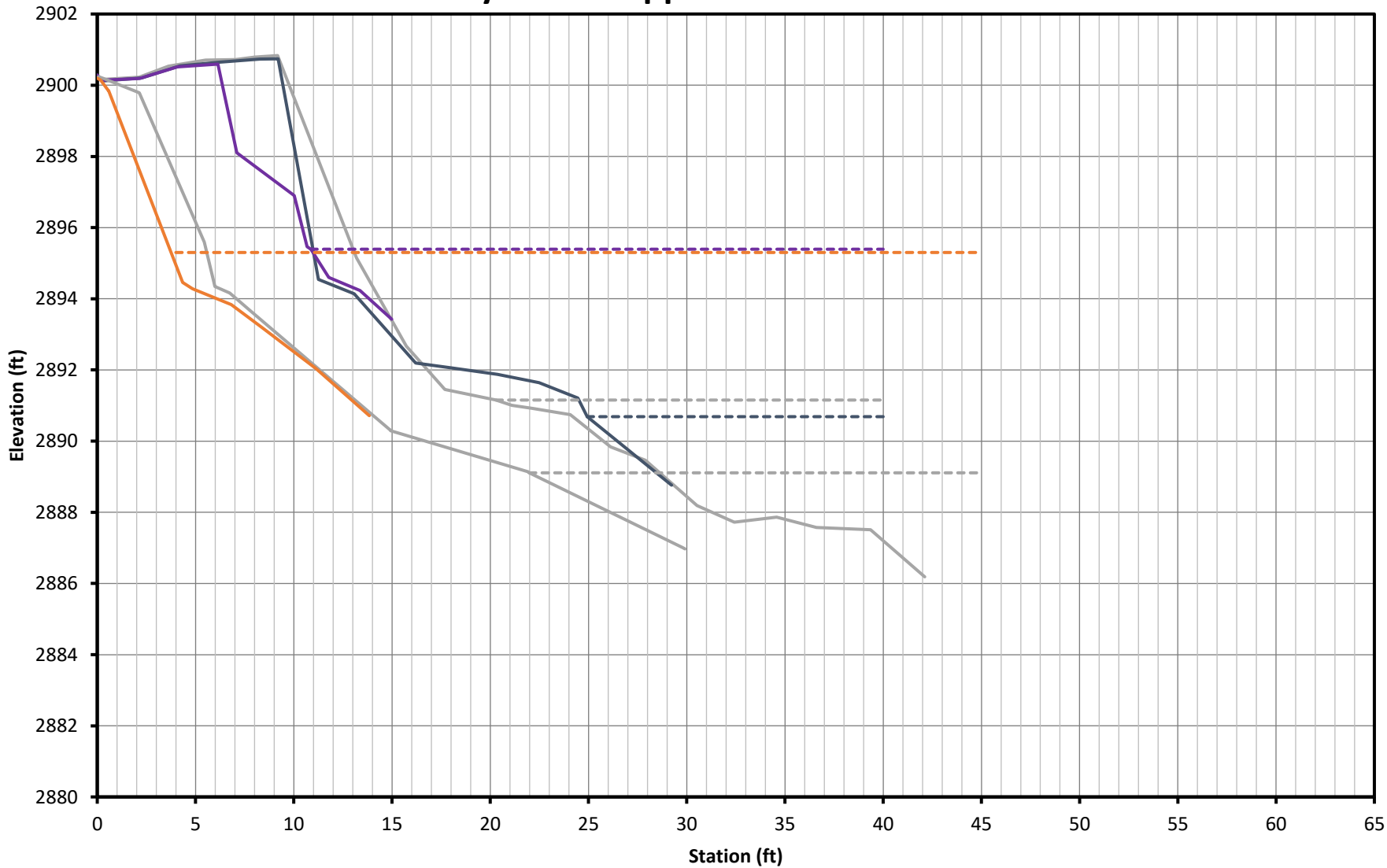
# Foy's Bend Bank Transect #0



- 4/16 Bank
- 4/16 River
- 4/16 WS
- 8/16 Bank
- 8/16 River
- 8/16 WS
- 4/21 Bank
- 4/21 River
- 4/21 WS
- 8/21 Bank
- 8/21 River
- 8/21 WS

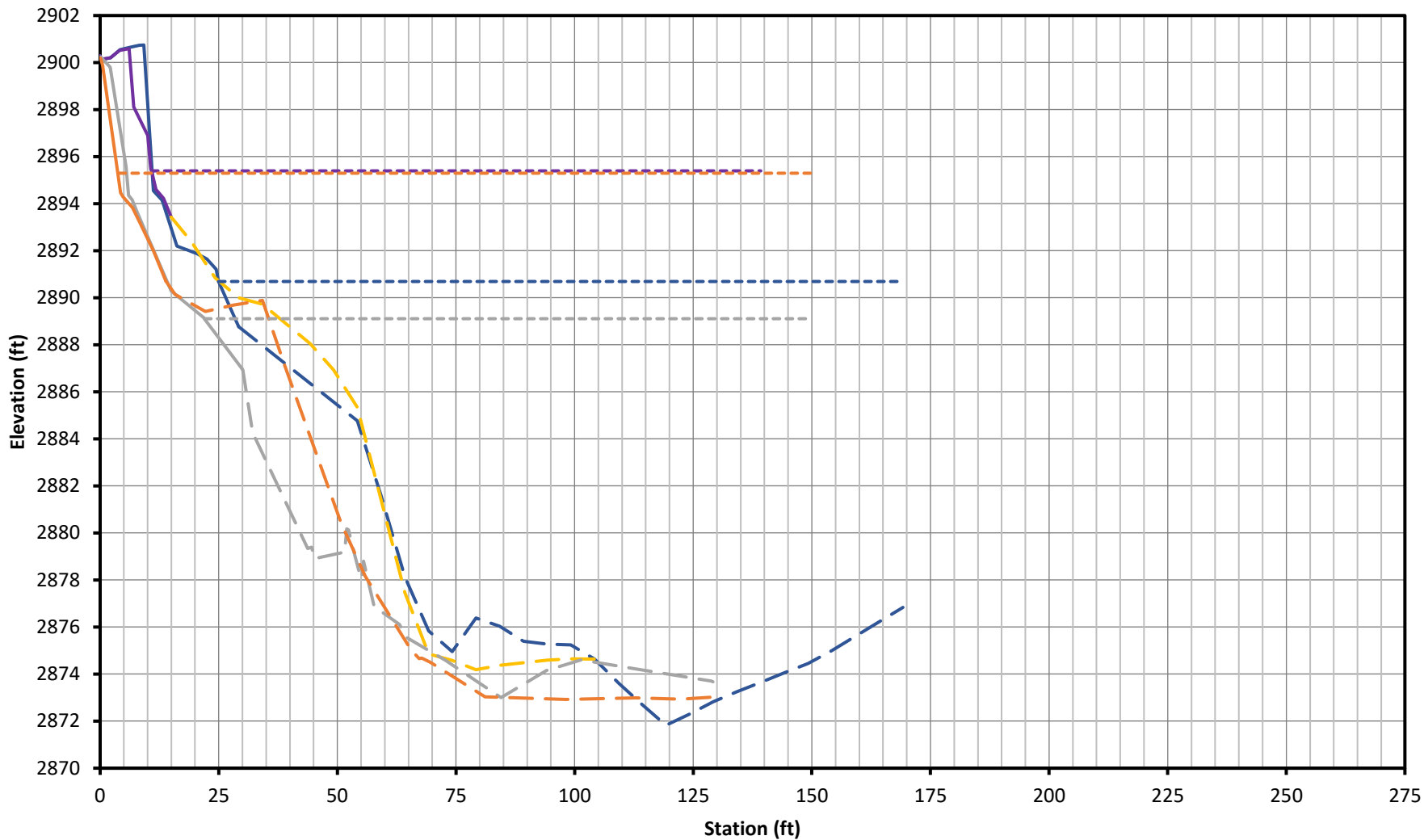
XS = Cross section  
 WS = Water Surface

# Foy's Bend Upper Bank Transect #0.5



— 4/15 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS    XS = Cross section  
 - - - 4/15 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS    WS = Water Surface

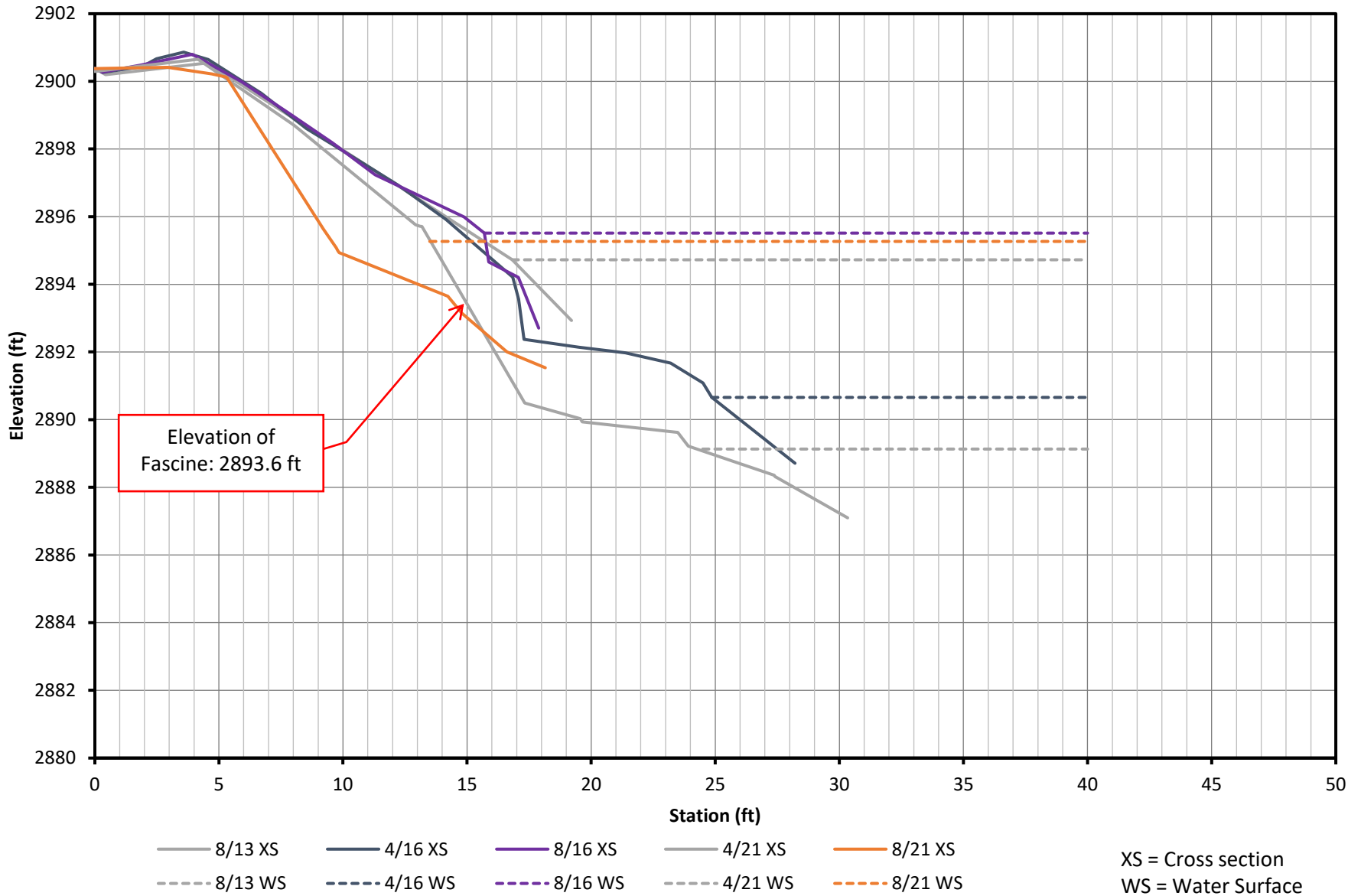
# Foy's Bend Bank Transect #0.5



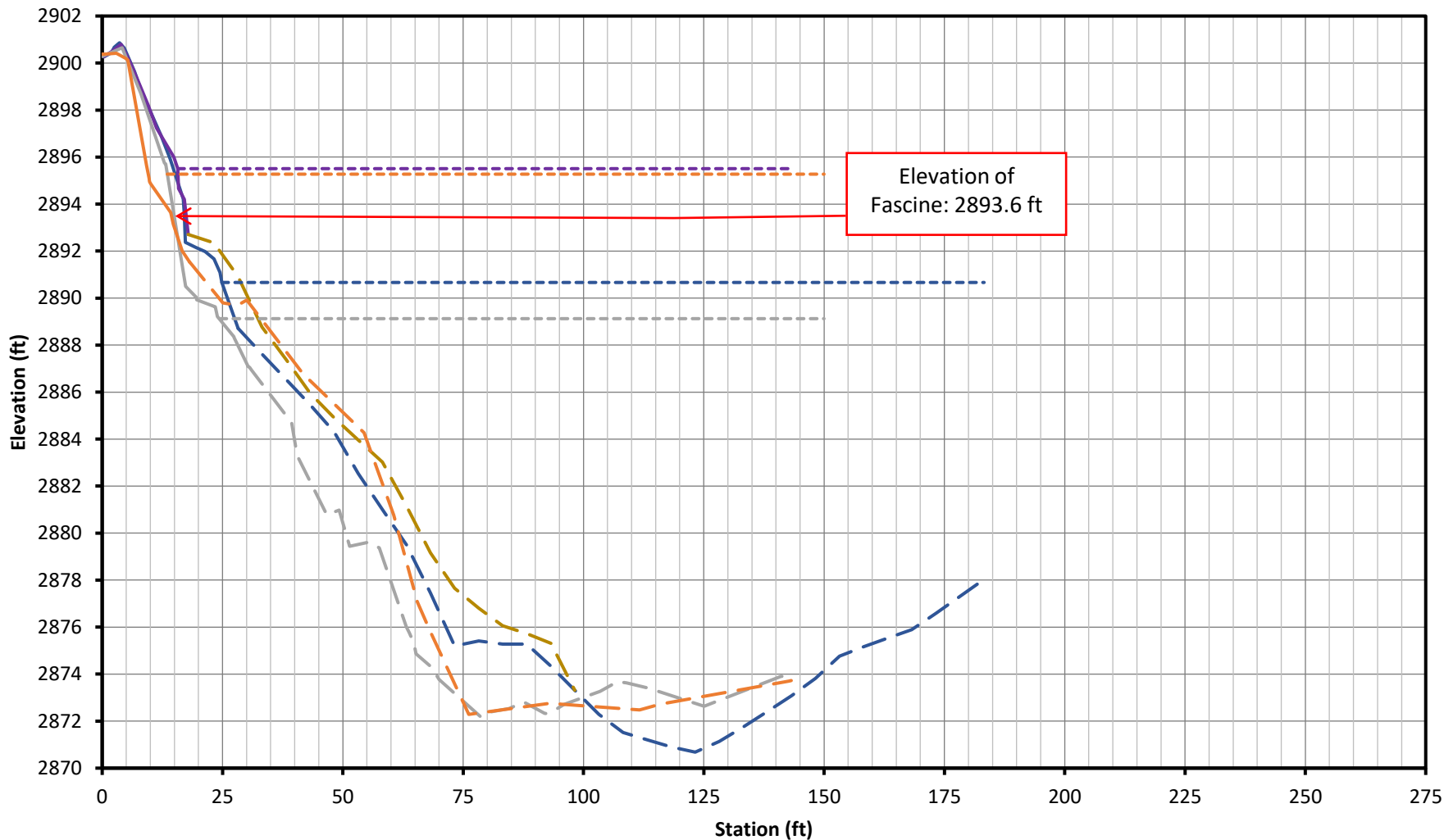
- |            |            |            |            |  |
|------------|------------|------------|------------|--|
| 4/16 Bank  | 8/16 Bank  | 4/21 Bank  | 8/21 Bank  | XS = Cross section<br>WS = Water Surface |
| 4/16 River | 8/16 River | 4/21 River | 8/21 River |  |
| 4/16 WS    | 8/16 WS    | 4/21 WS    | 8/21 WS    |  |



# Foy's Bend Upper Bank Transect #1



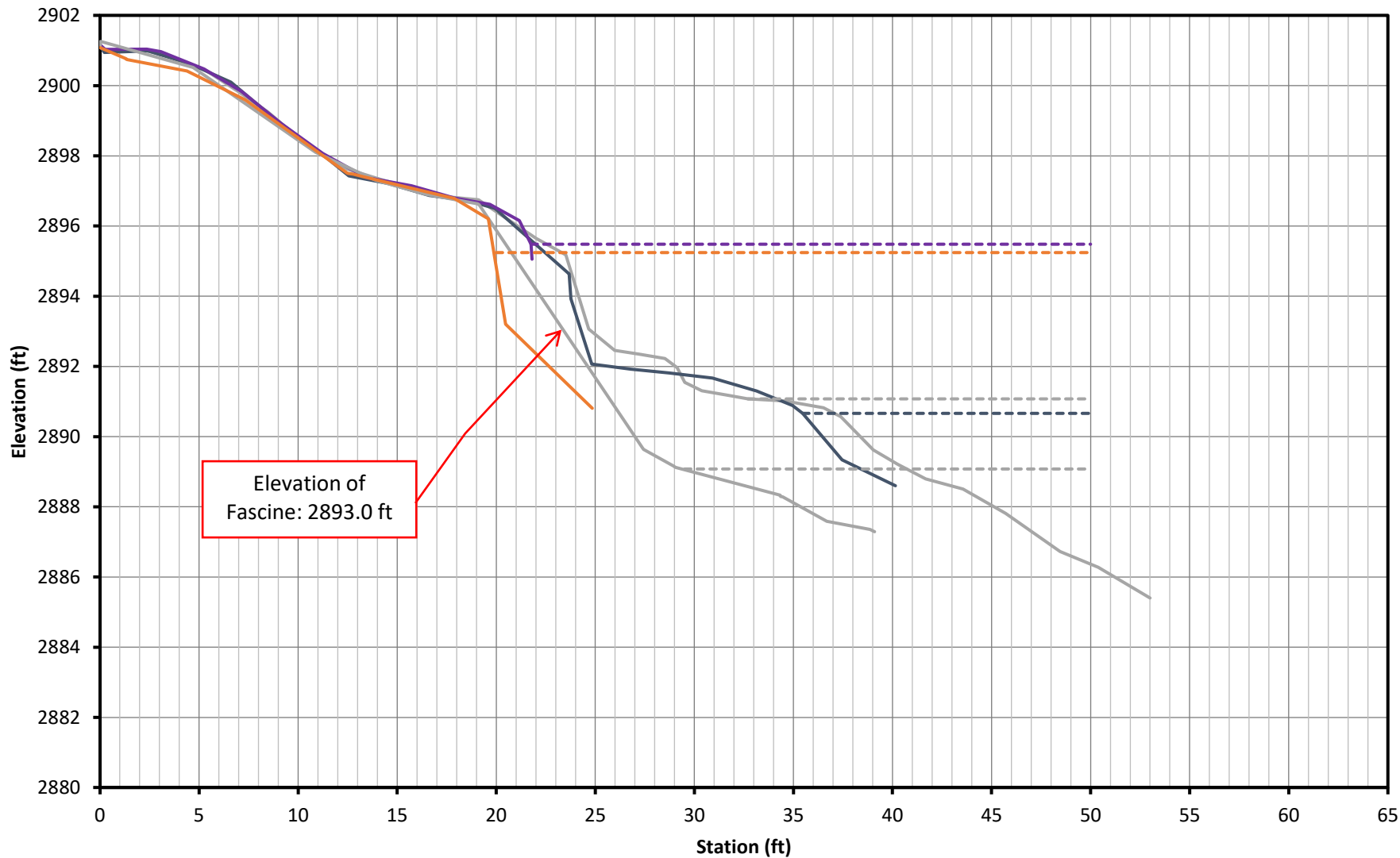
# Foy's Bend Bank Transect #1



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River      - - 8/16 River      - - 4/21 River      - - 8/21 River
- ... 4/16 WS      ... 8/16 WS      ... 4/21 WS      ... 8/21 WS

XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #1.5

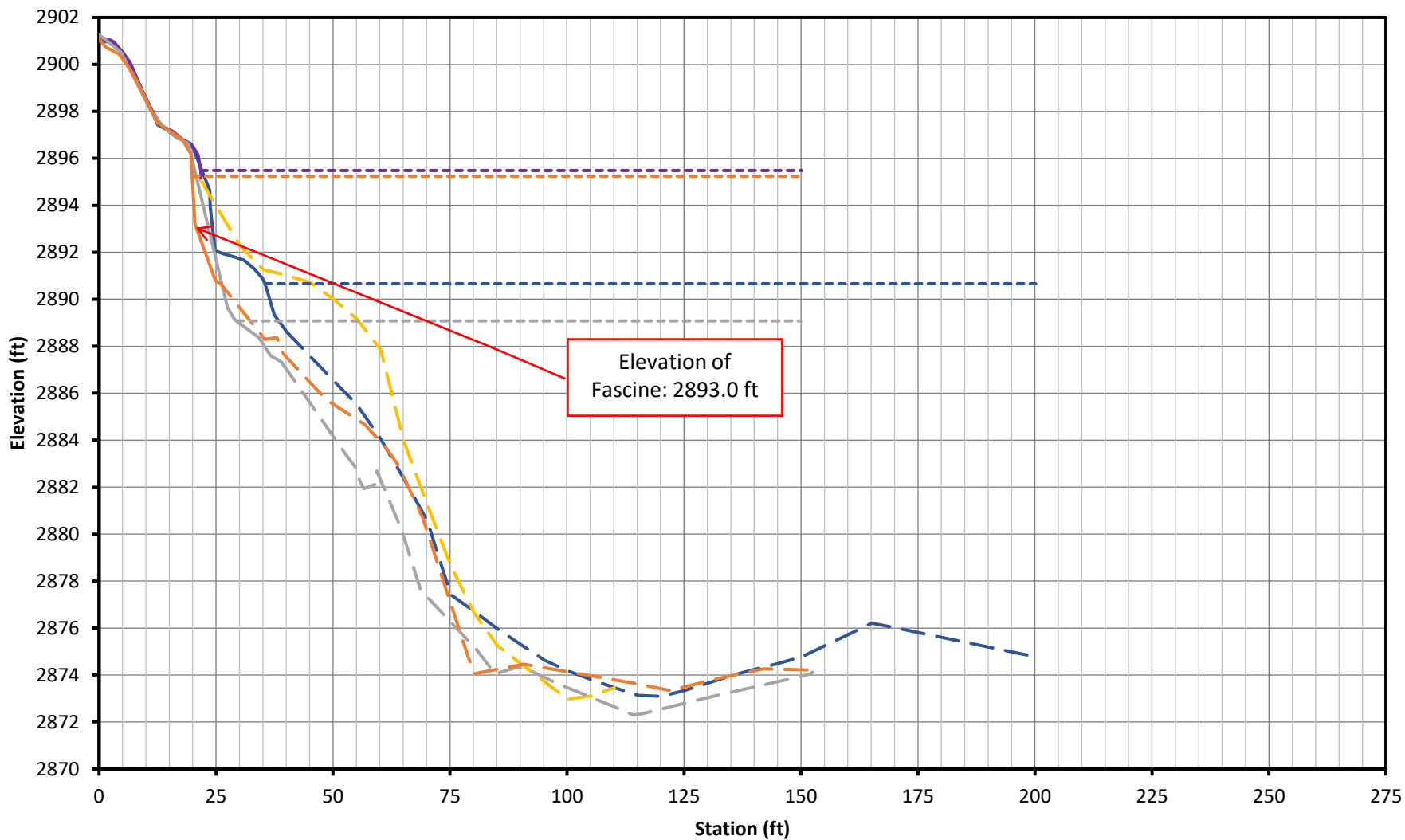


Elevation of Fascine: 2893.0 ft

— 4/15 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS    XS = Cross section  
 - - - 4/15 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS    WS = Water Surface



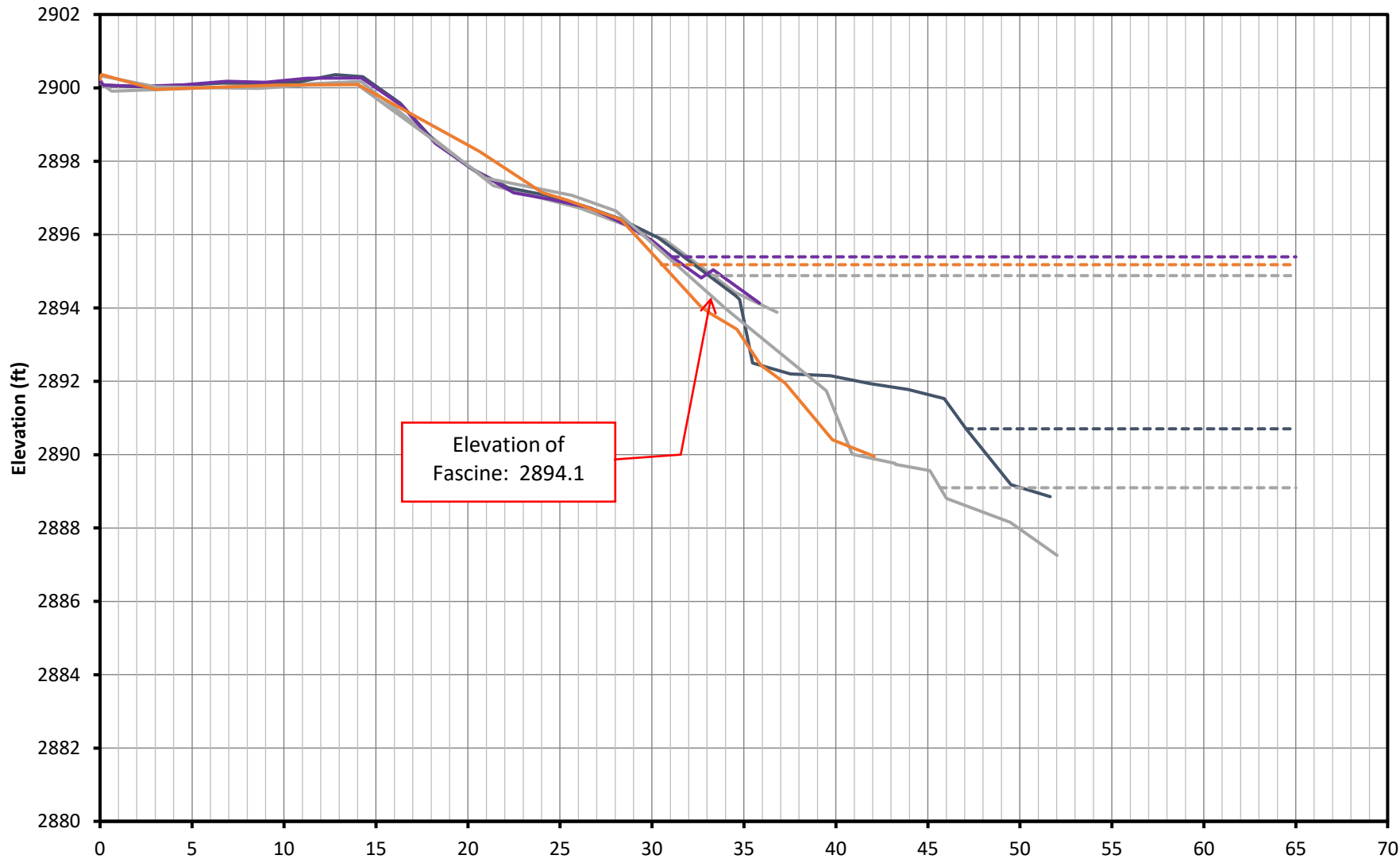
# Foy's Bend Bank Transect #1.5



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- 4/16 River    — 8/16 River    — 4/21 River    — 8/21 River
- 4/16 WS        — 8/16 WS        — 4/21 WS        — 8/21 WS

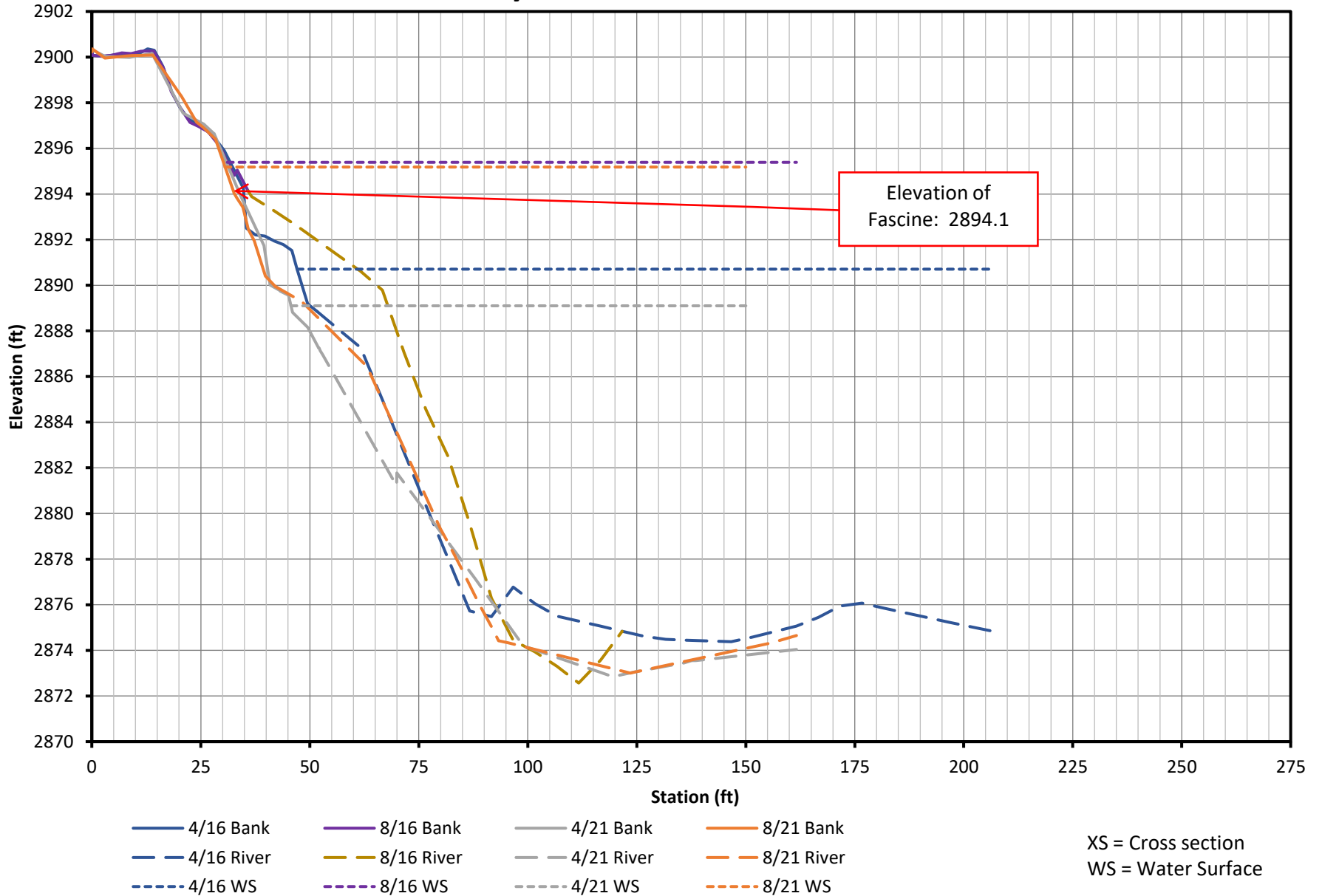
XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #2



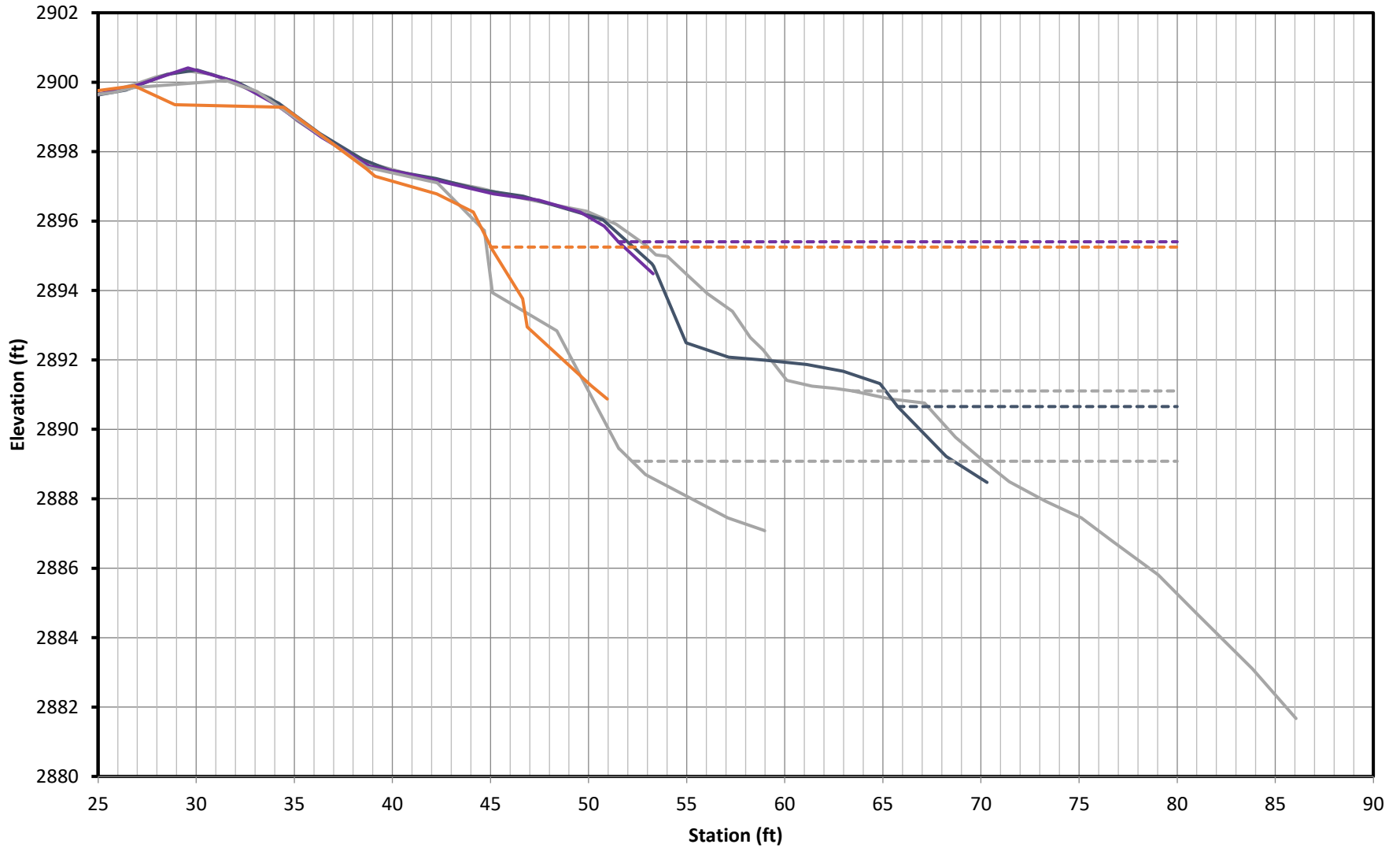
— 8/13 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS    XS = Cross section  
 - - - 8/13 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS    WS = Water Surface

# Foy's Bend Bank Transect #2



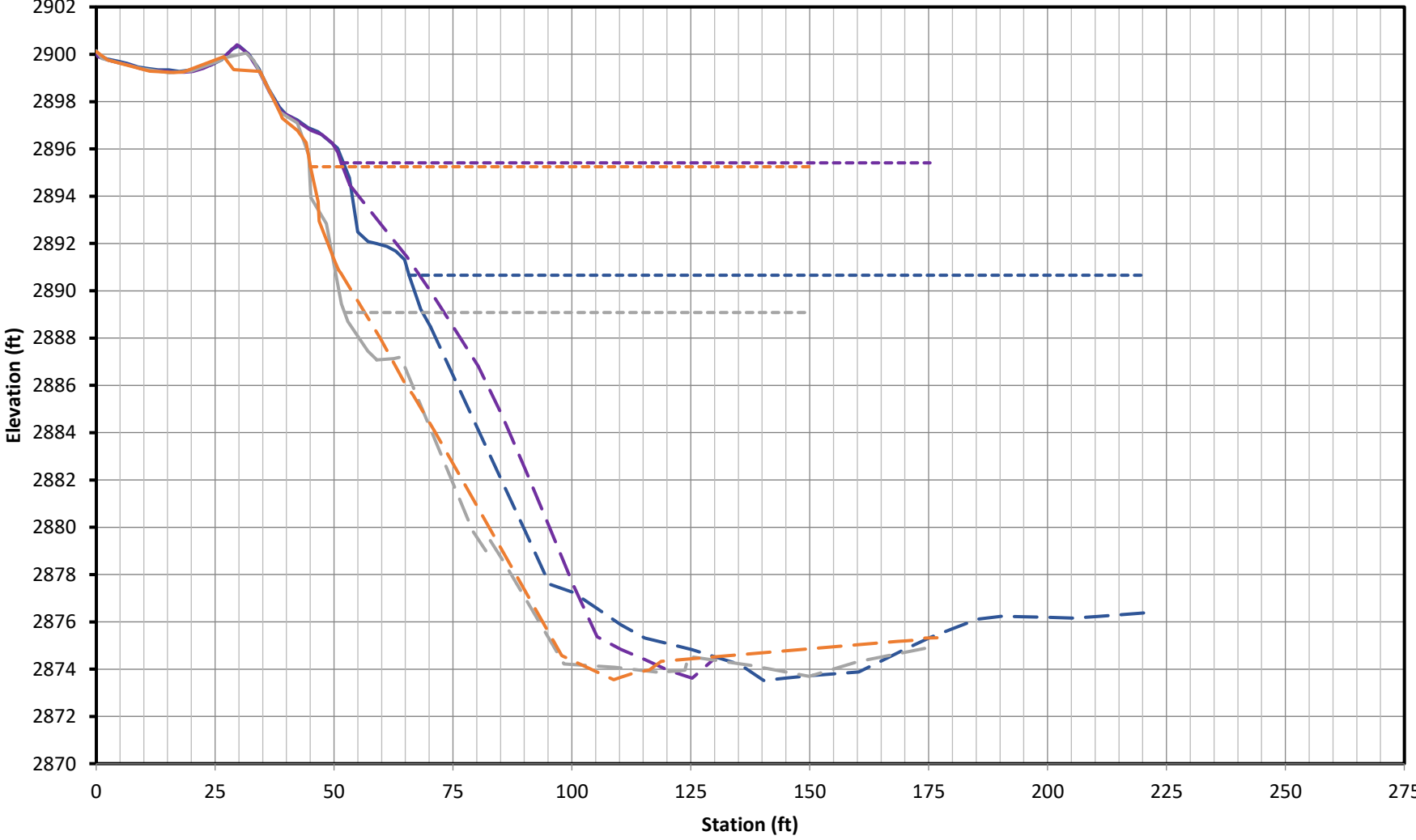


# Foy's Bend Upper Bank Transect #2.5



— 4/15 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS    XS = Cross section  
 - - - 4/15 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS    WS = Water Surface

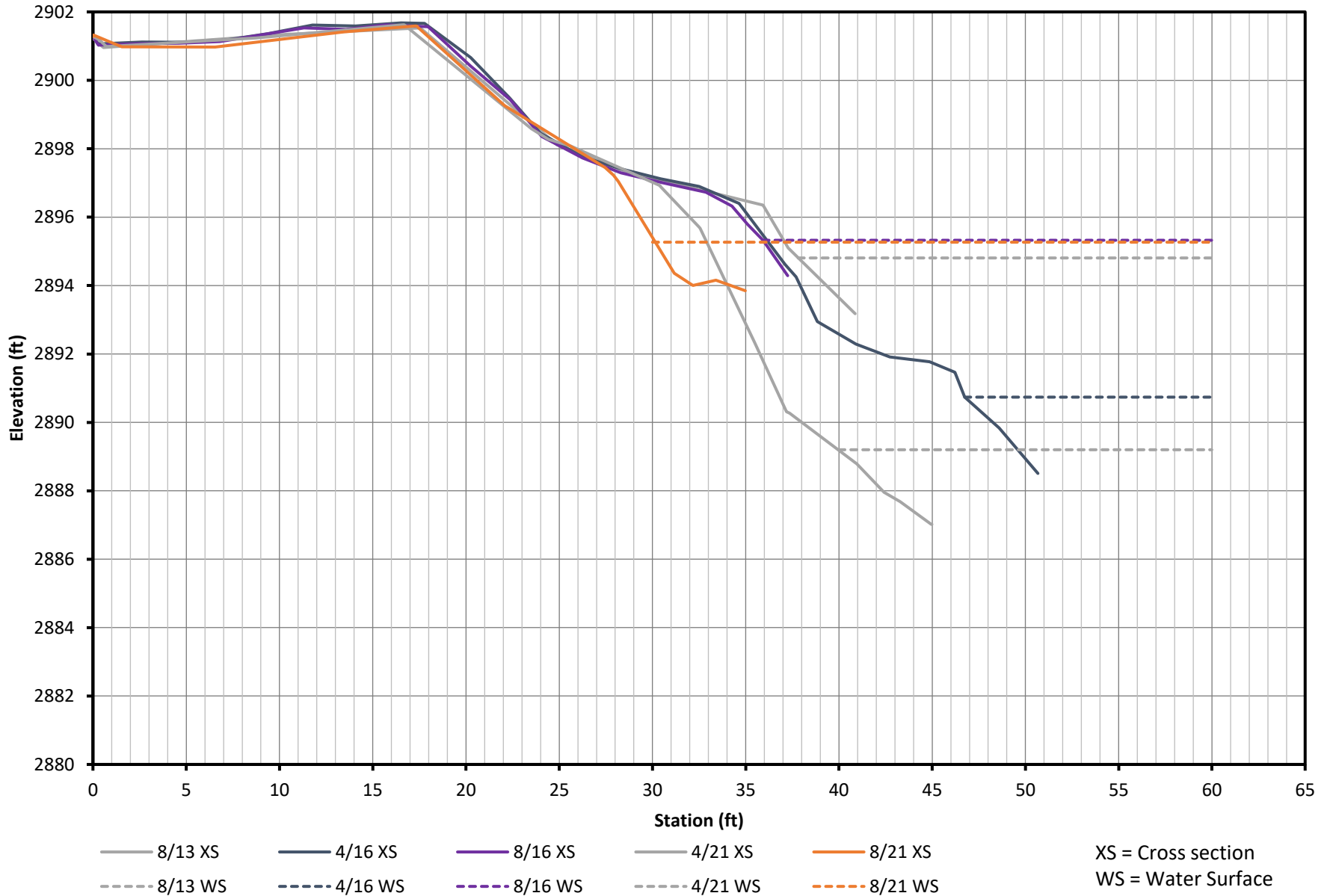
# Foy's Bend Bank Transect #2.5



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River      - - 8/16 River      - - 4/21 River      - - 8/21 River
- ... 4/16 WS      ... 8/16 WS      ... 4/21 WS      ... 8/21 WS

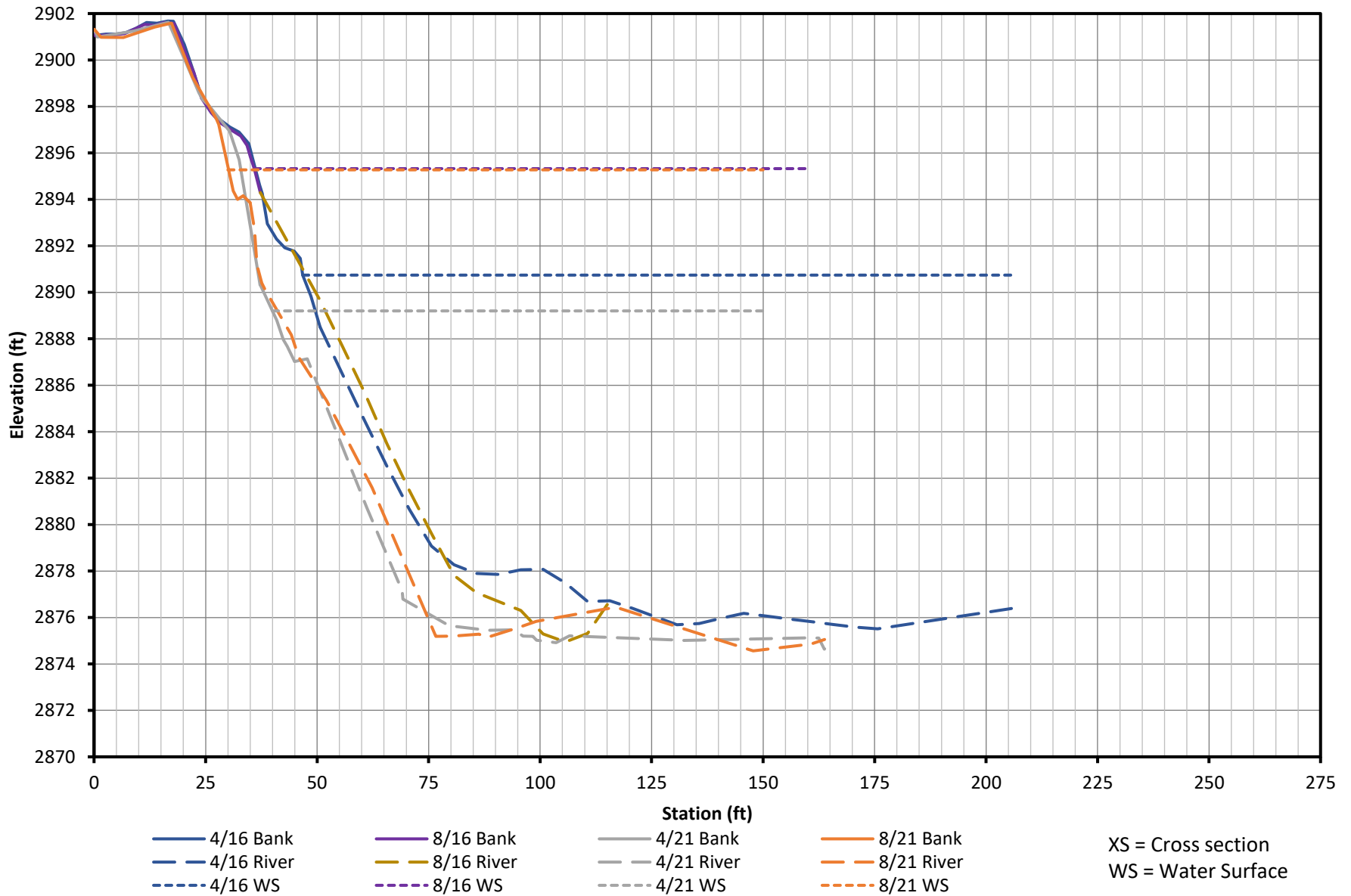
XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #3

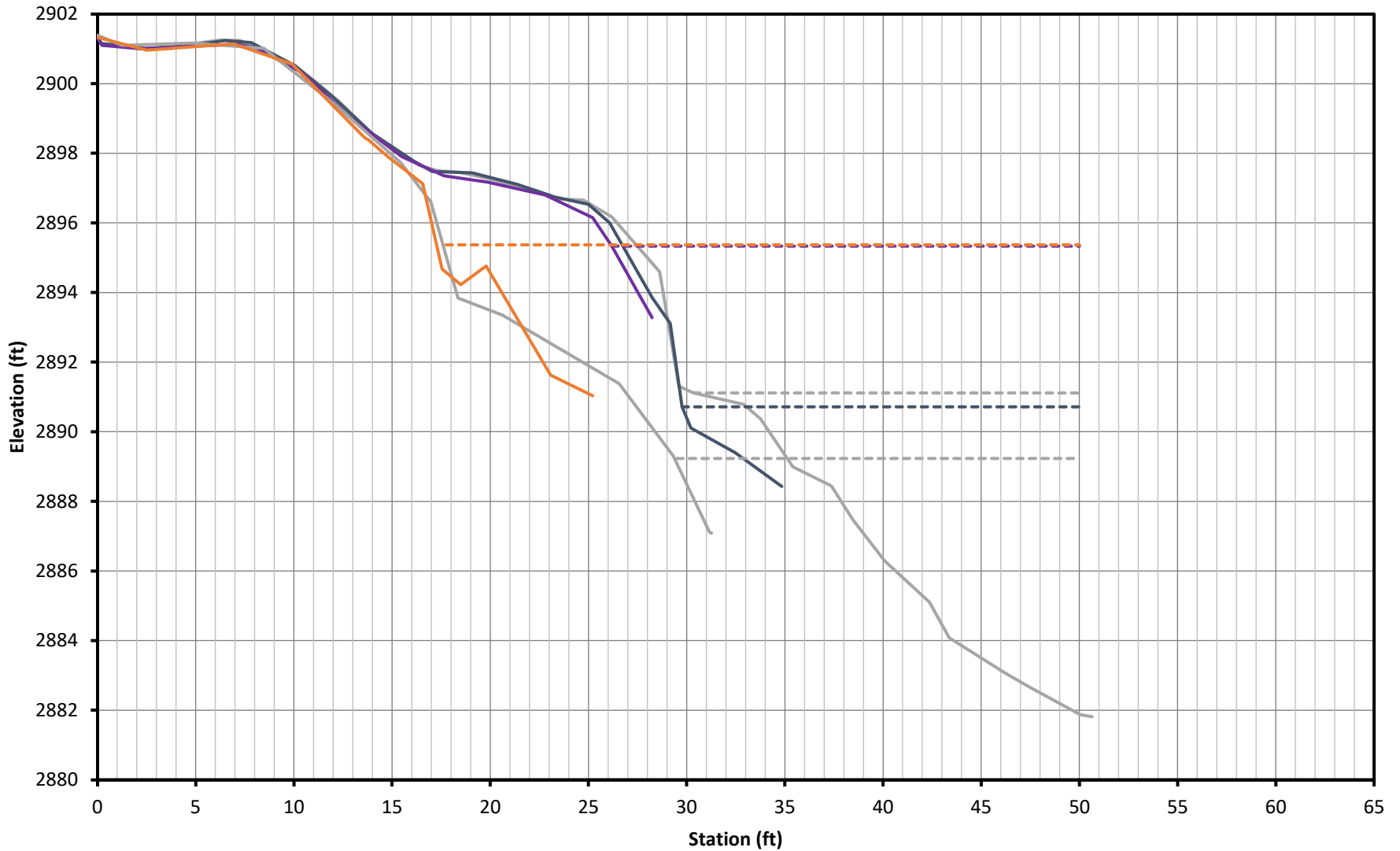




# Foy's Bend Bank Transect #3

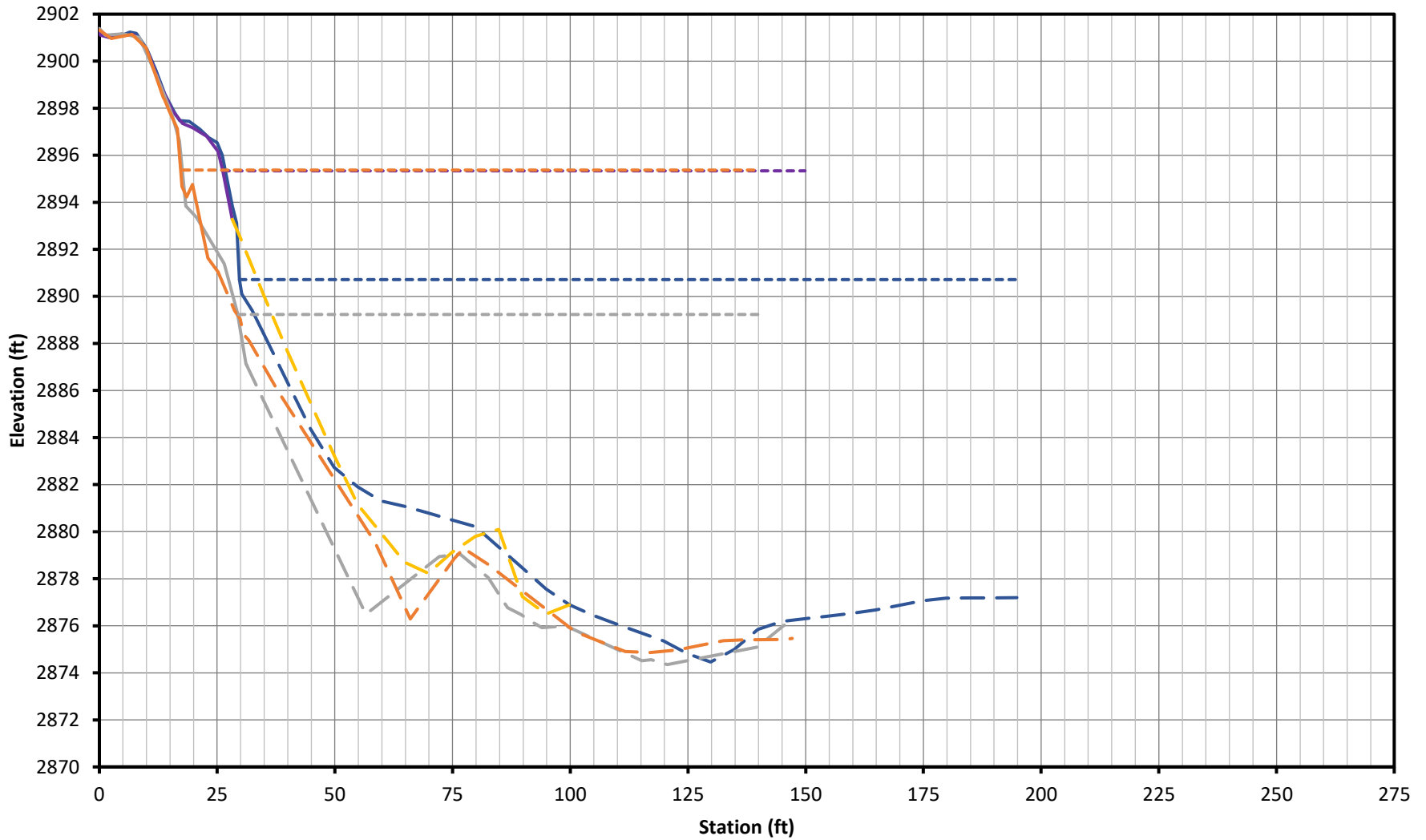


# Foy's Bend Upper Bank Transect #3.5



— 4/15 XS      — 4/16 XS      — 8/16 XS      — 4/21 XS      — 8/21 XS      XS = Cross section  
 - - - 4/15 WS      - - - 4/16 WS      - - - 8/16 WS      - - - 4/21 WS      - - - 8/21 WS      WS = Water Surface

# Foy's Bend Bank Transect #3.5

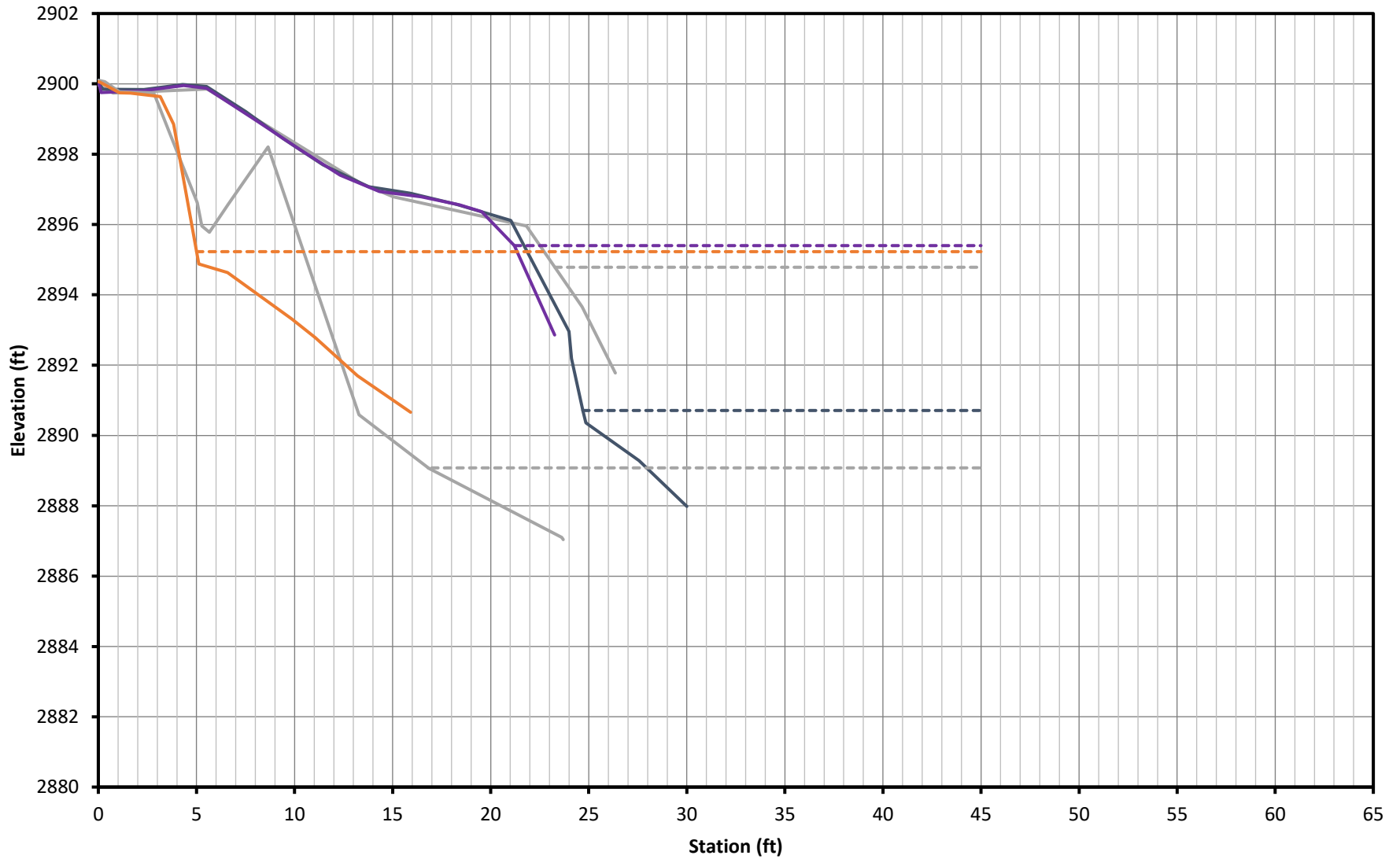


- 4/16 Bank      8/16 Bank      4/21 Bank      8/21 Bank
- 4/16 River    8/16 River      4/21 River      8/21 River
- 4/16 WS       8/16 WS        4/21 WS        8/21 WS

XS = Cross section  
WS = Water Surface

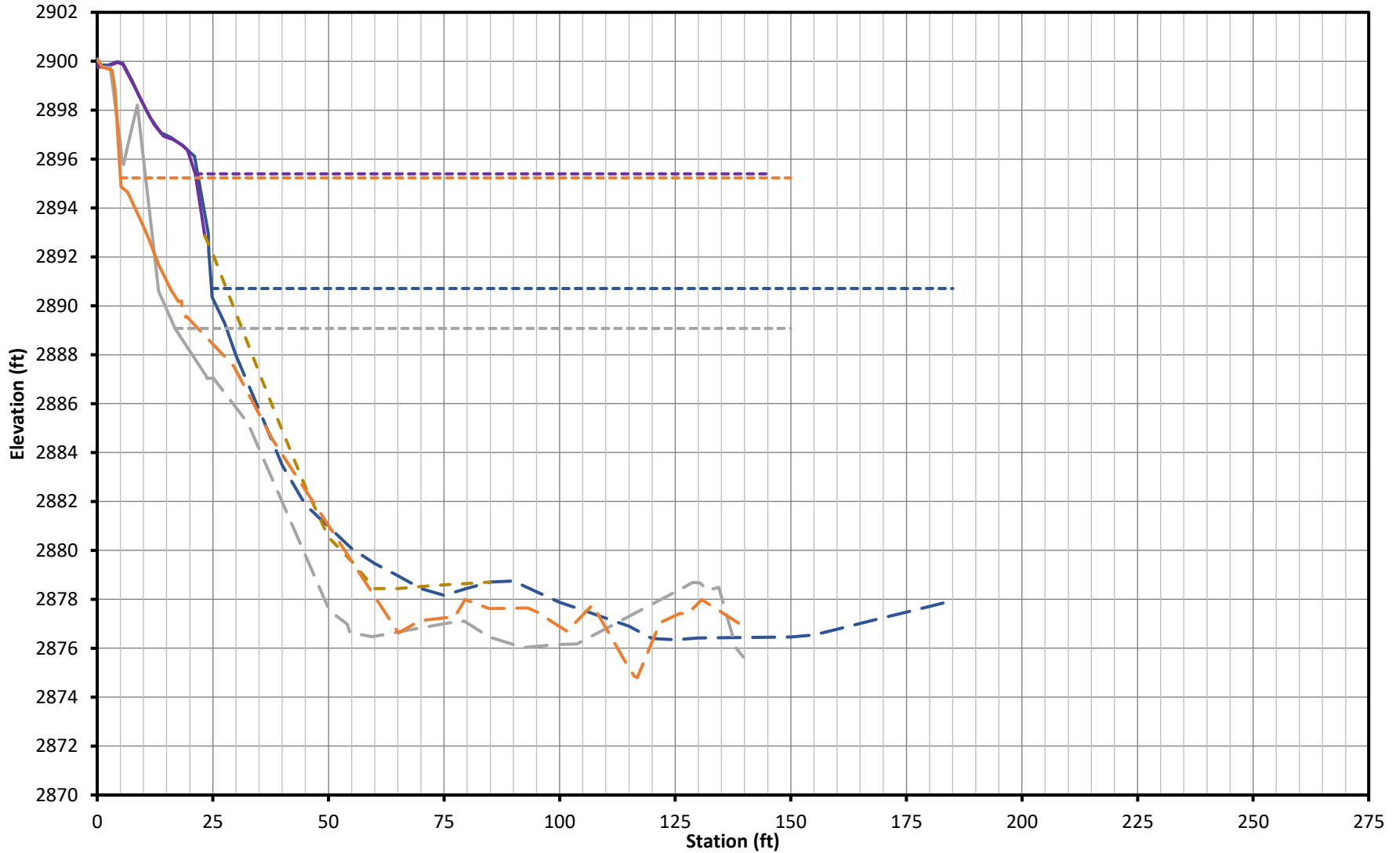


# Foy's Bend Upper Bank Transect #4



— 8/13 XS      — 4/16 XS      — 8/16 XS      — 4/21 XS      — 8/21 XS      XS = Cross section  
 - - - 8/13 WS      - - - 4/16 WS      - - - 8/16 WS      - - - 4/21 WS      - - - 8/21 WS      WS = Water Surface

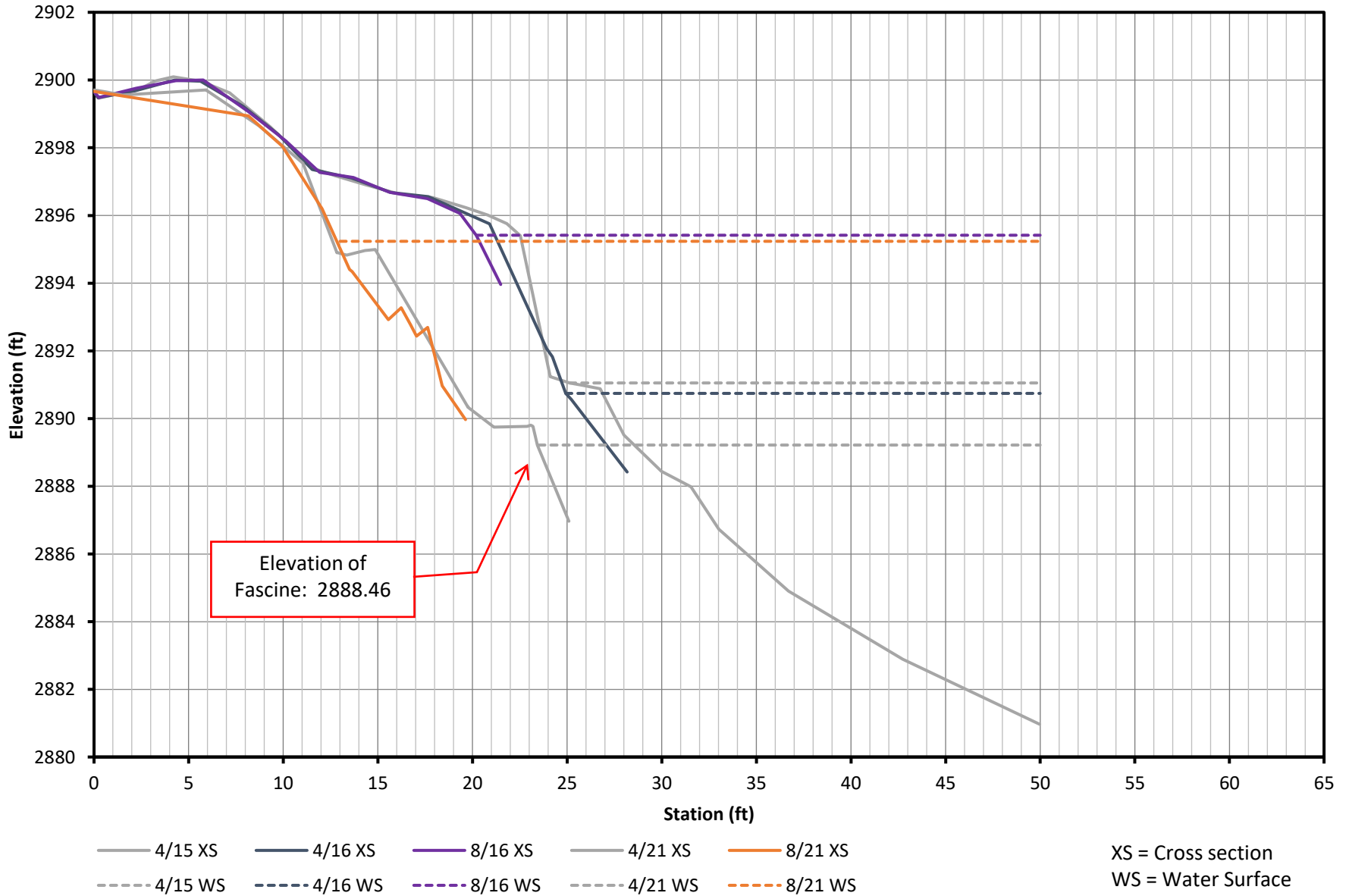
# Foy's Bend Bank Transect #4



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River    - - 8/16 River    - - 4/21 River    - - 8/21 River
- ... 4/16 WS      ... 8/16 WS      ... 4/21 WS      ... 8/21 WS

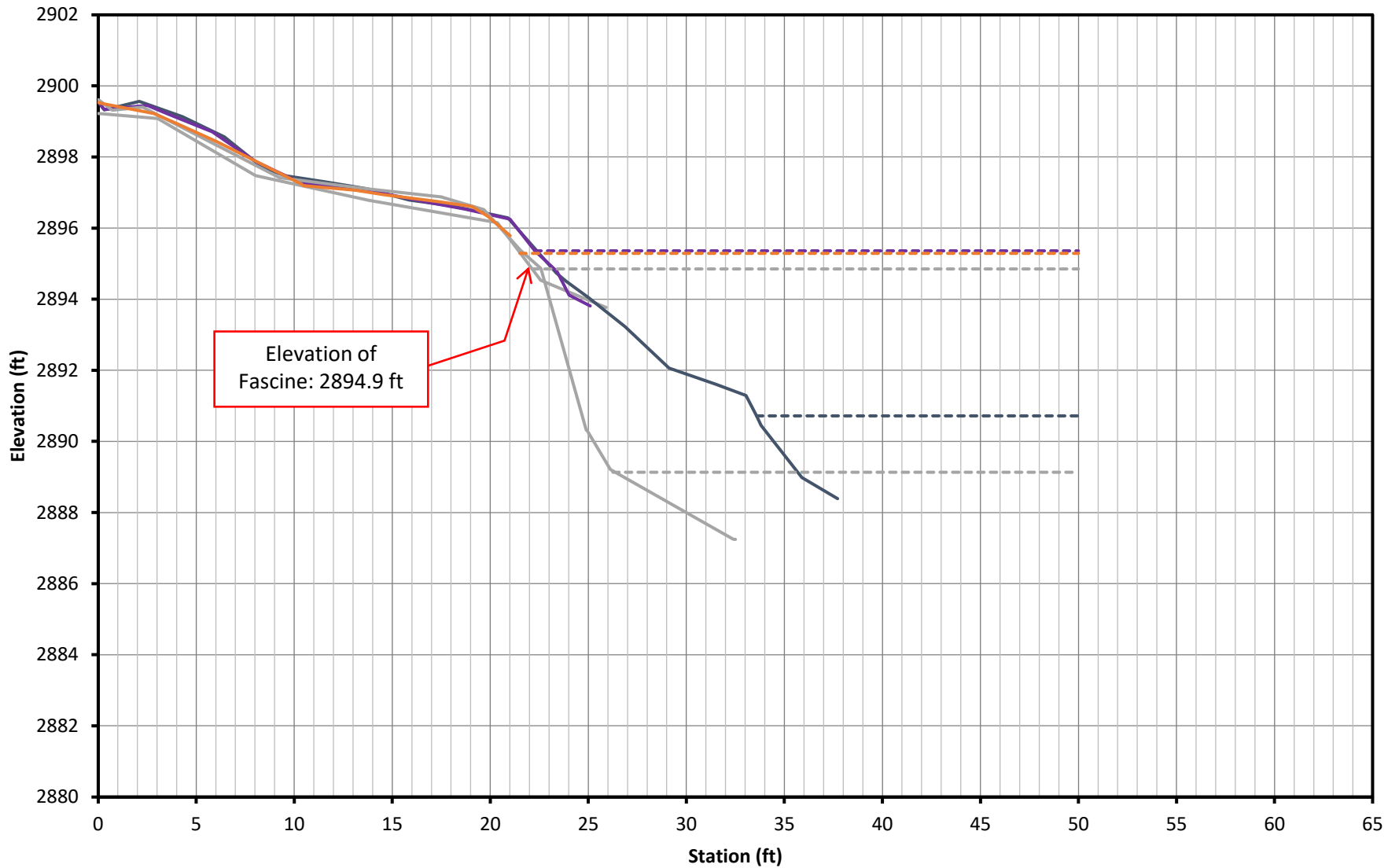
XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #4.5



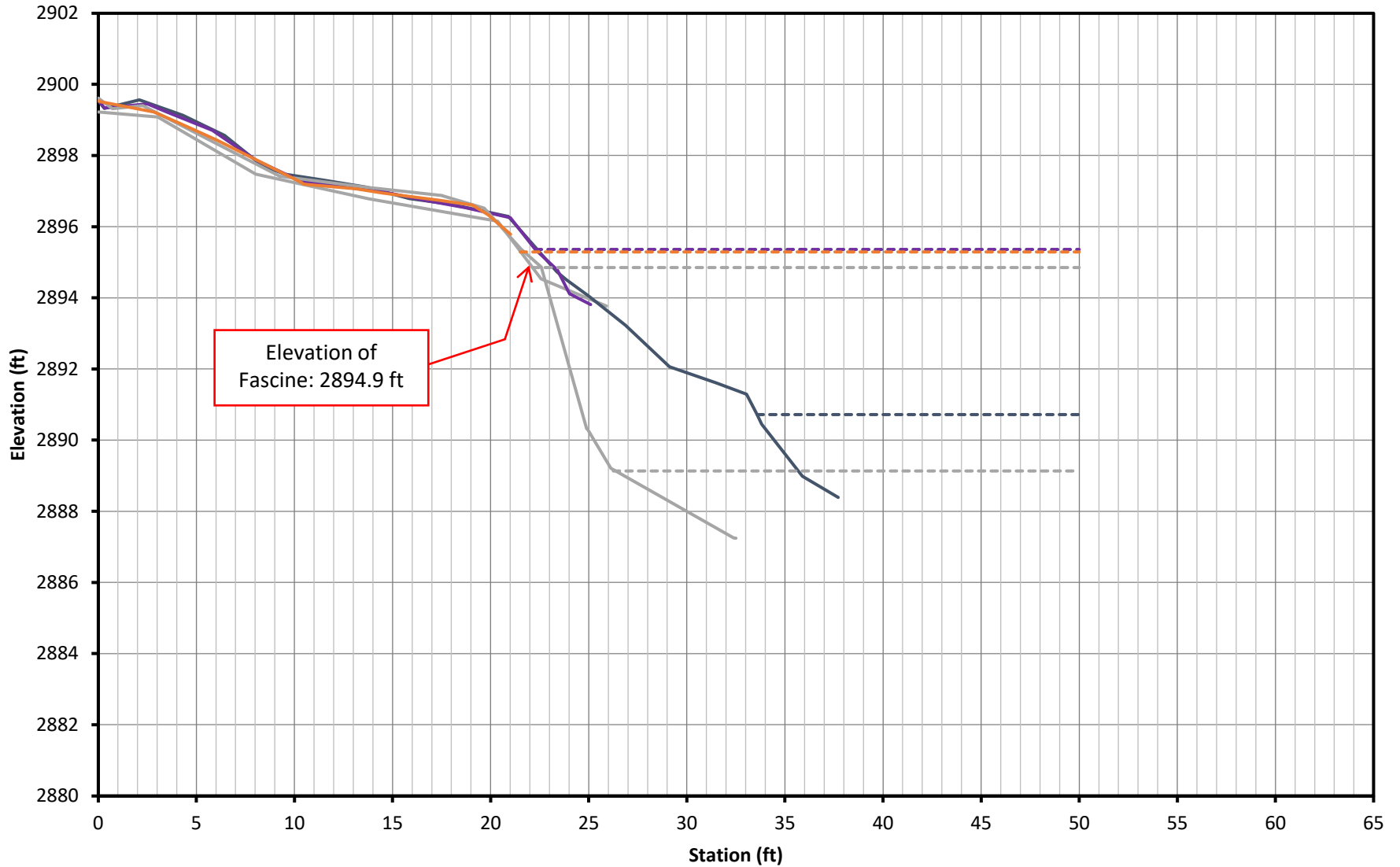


# Foy's Bend Upper Bank Transect #5



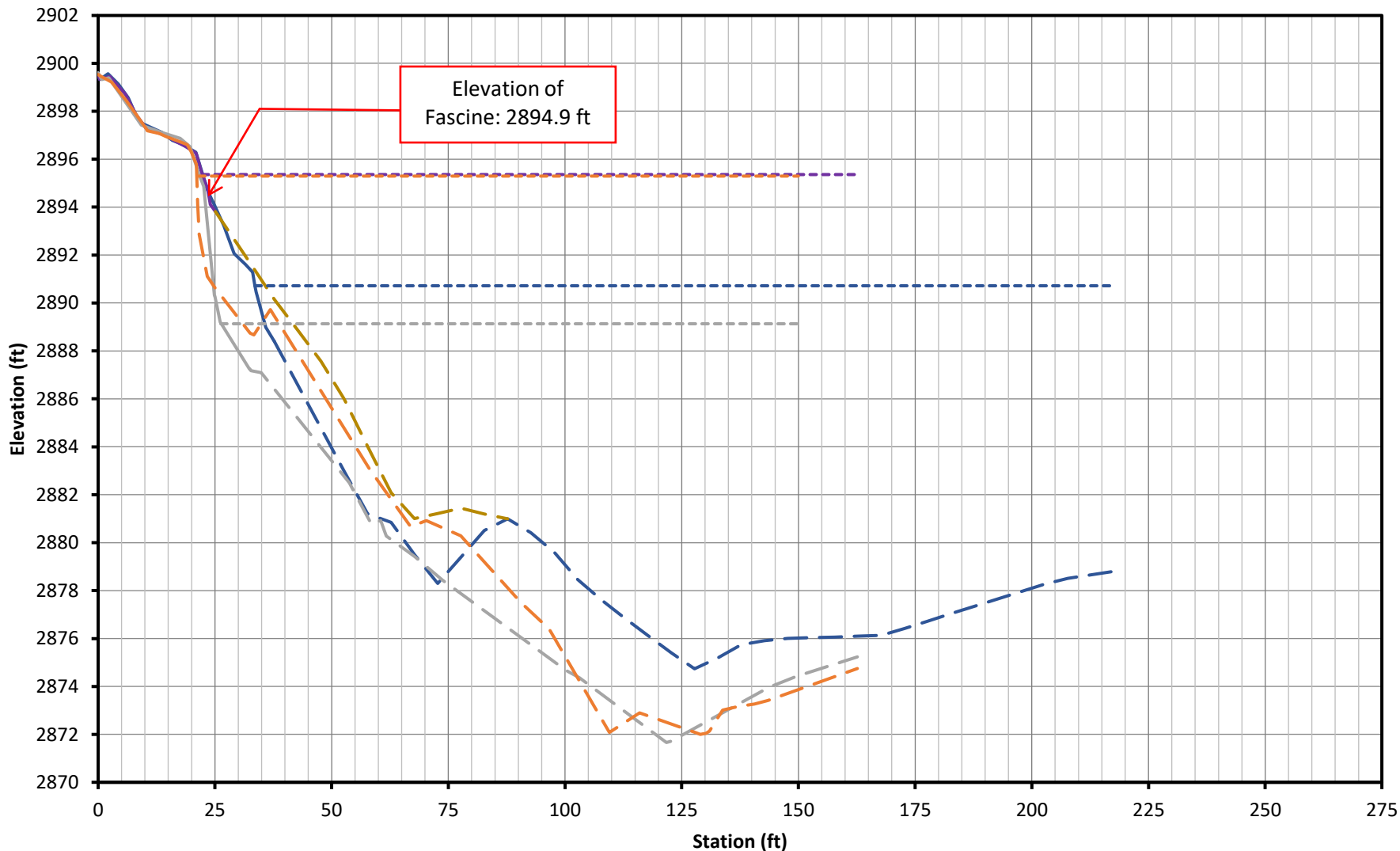
— 8/13 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS  
- - - 8/13 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS

# Foy's Bend Upper Bank Transect #5



— 8/13 XS    — 4/16 XS    — 8/16 XS    — 4/21 XS    — 8/21 XS  
- - - 8/13 WS    - - - 4/16 WS    - - - 8/16 WS    - - - 4/21 WS    - - - 8/21 WS

# Foy's Bend Bank Transect #5

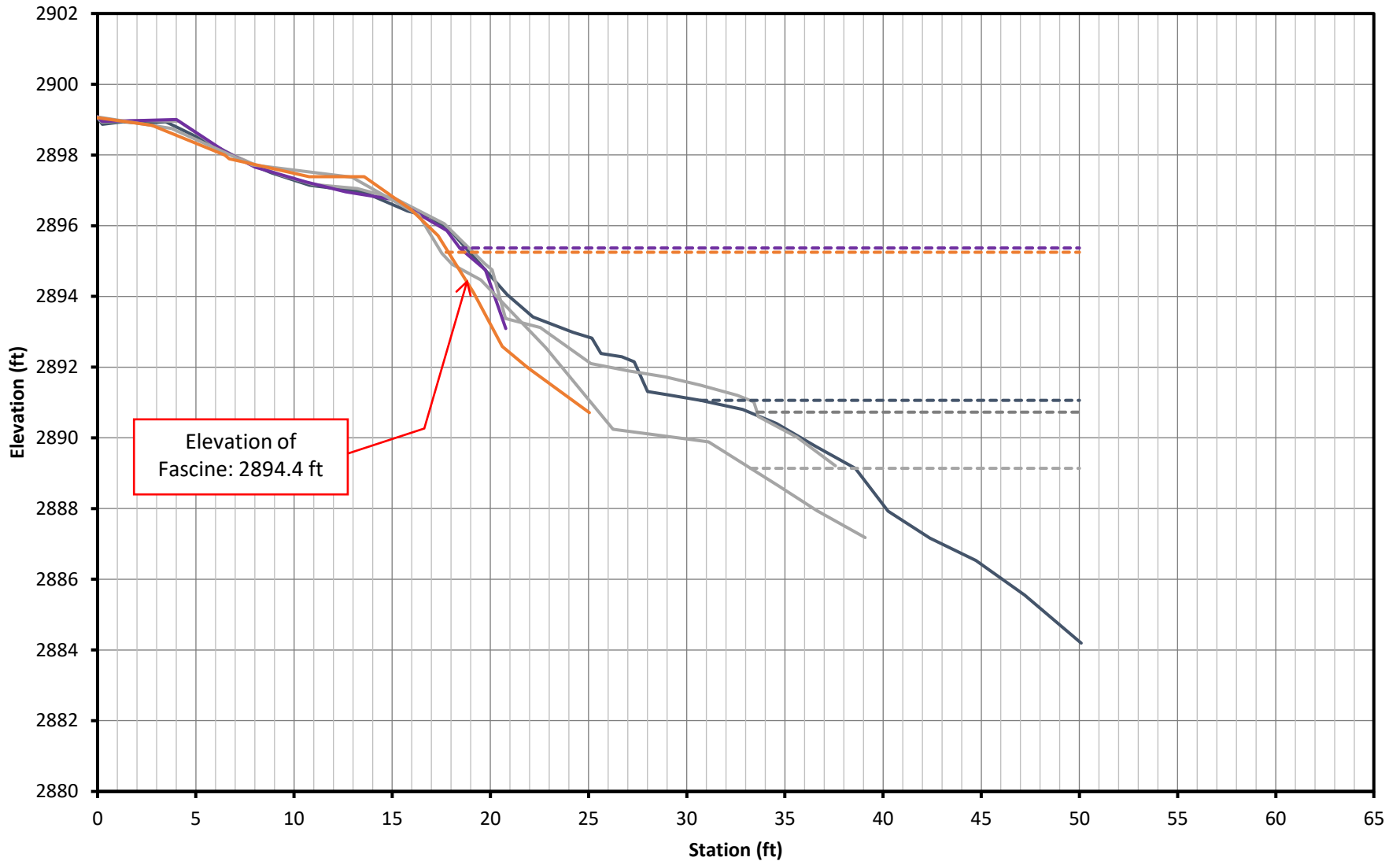


- 4/16 Bank
- 4/16 River
- - - 4/16 WS
- 8/16 Bank
- 8/16 River
- - - 8/16 WS
- 4/21 Bank
- 4/21 River
- - - 4/21 WS
- 8/21 Bank
- 8/21 River
- - - 8/21 WS

XS = Cross section  
WS = Water Surface

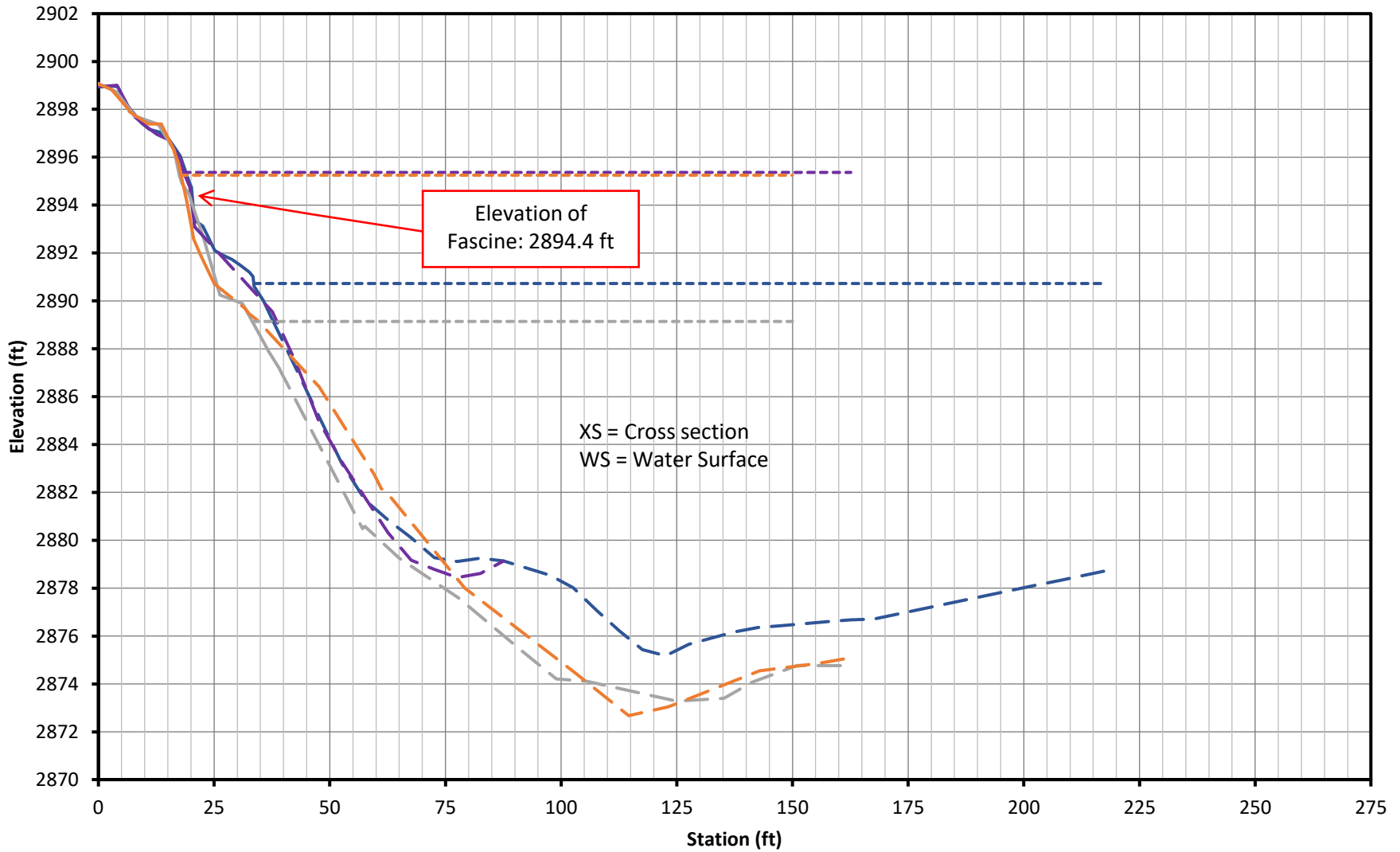


# Foy's Bend Upper Bank Transect #5.5



4/15 XS   
  4/16 XS   
  8/16 XS   
  4/21 XS   
  8/21 XS   
 XS = Cross section  
 4/15 WS   
  4/16 WS   
  8/16 WS   
  4/21 WS   
  8/21 WS   
 WS = Water Surface

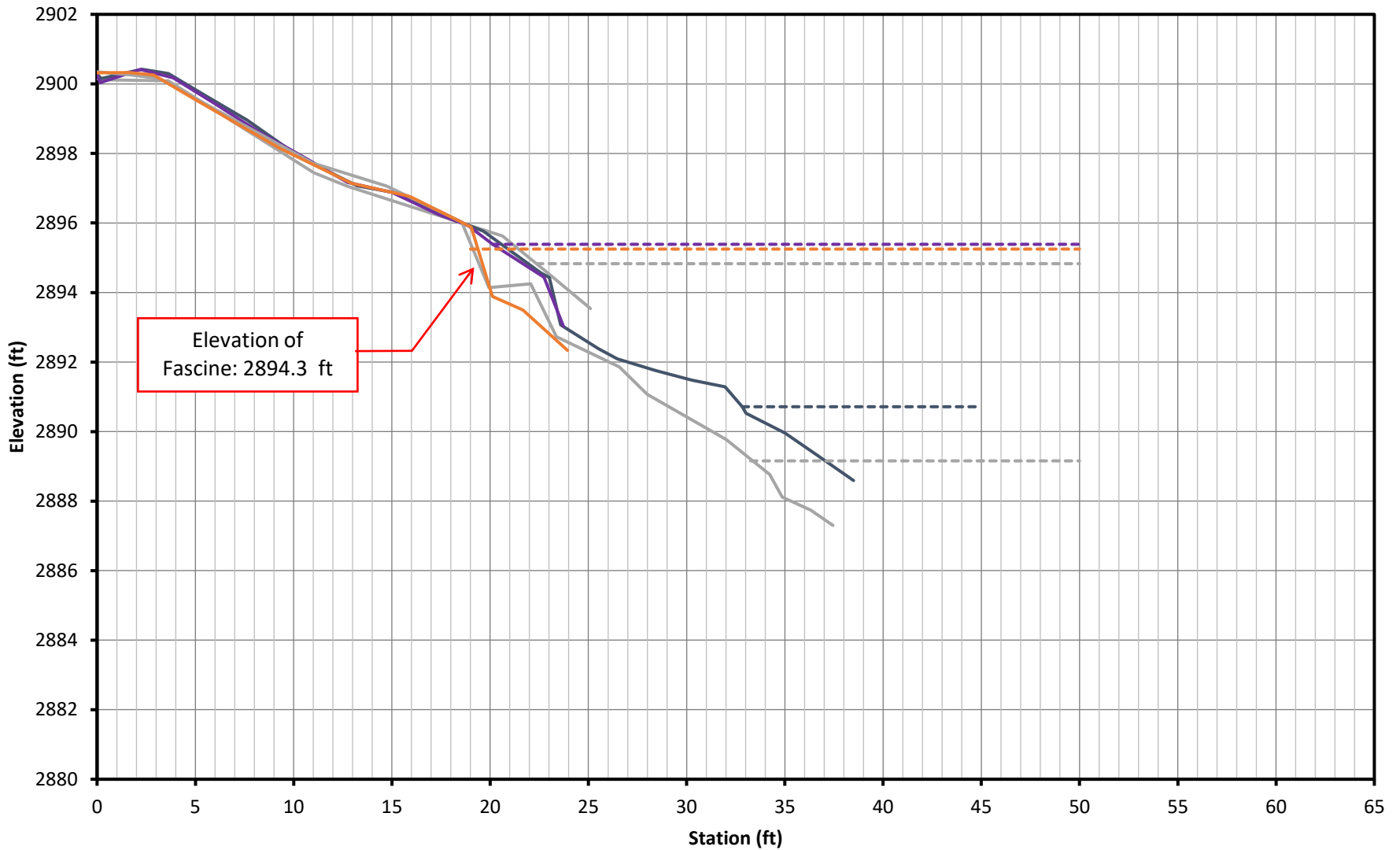
# Foy's Bend Bank Transect #5.5



- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River    - - 8/16 River    - - 4/21 River    - - 8/21 River
- · 4/16 WS        · · 8/16 WS        · · 4/21 WS        · · 8/21 WS

XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #6

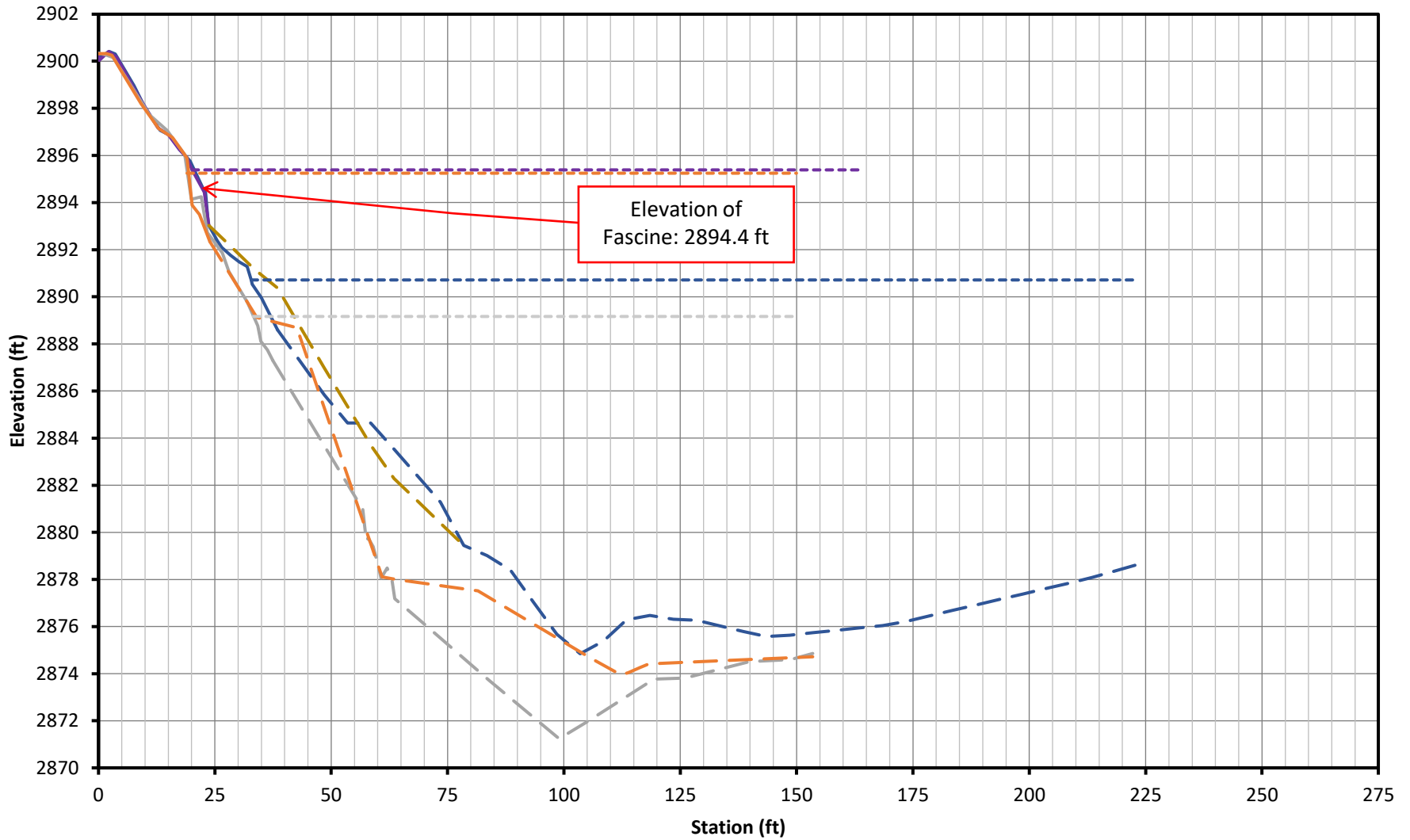


Elevation of Fascine: 2894.3 ft

- 8/13 XS
- 4/16 XS
- 8/16 XS
- 4/21 XS
- 8/21 XS
- - - 8/13 WS
- - - 4/16 WS
- - - 8/16 WS
- - - 4/21 WS
- - - 8/21 WS

XS = Cross section  
WS = Water Surface

# Foy's Bend Bank Transect #6

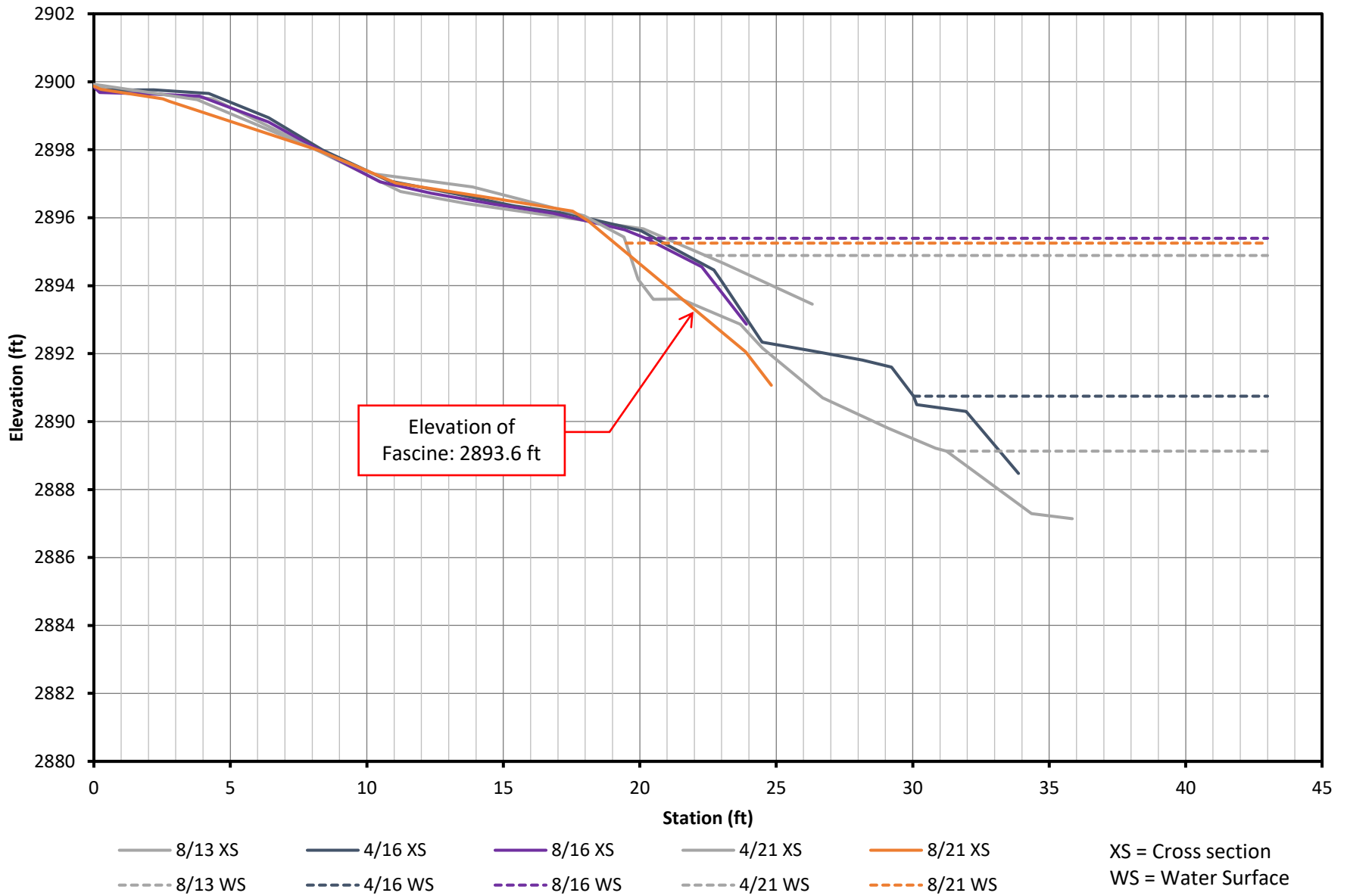


- 4/16 Bank      — 8/16 Bank      — 4/21 Bank      — 8/21 Bank
- - 4/16 River    - - 8/16 River    - - 4/21 River    - - 8/21 River
- ... 4/16 WS      ... 8/16 WS      ... 4/21 WS      ... 8/21 WS

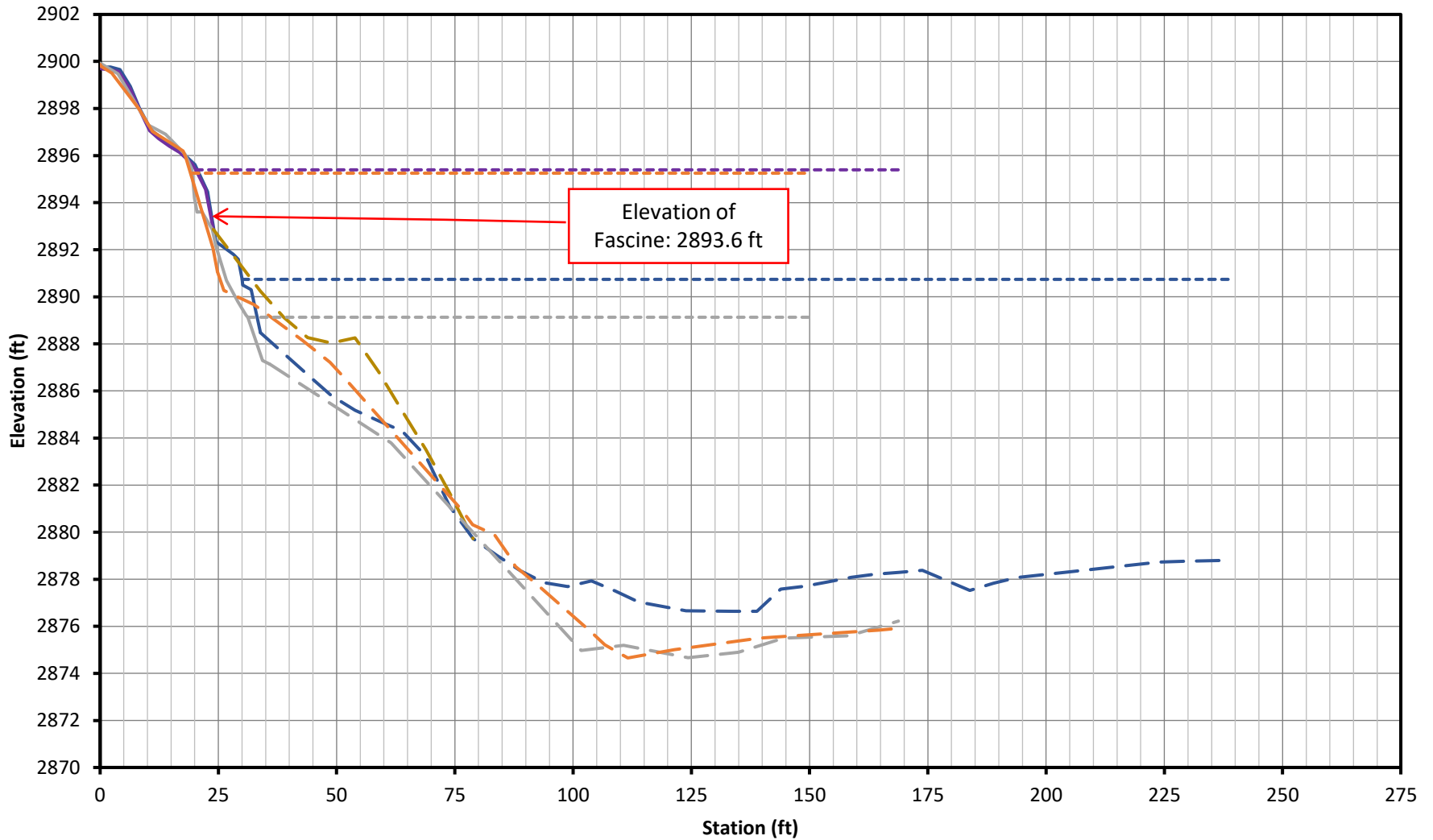
XS = Cross section  
WS = Water Surface



# Foy's Bend Upper Bank Transect #7



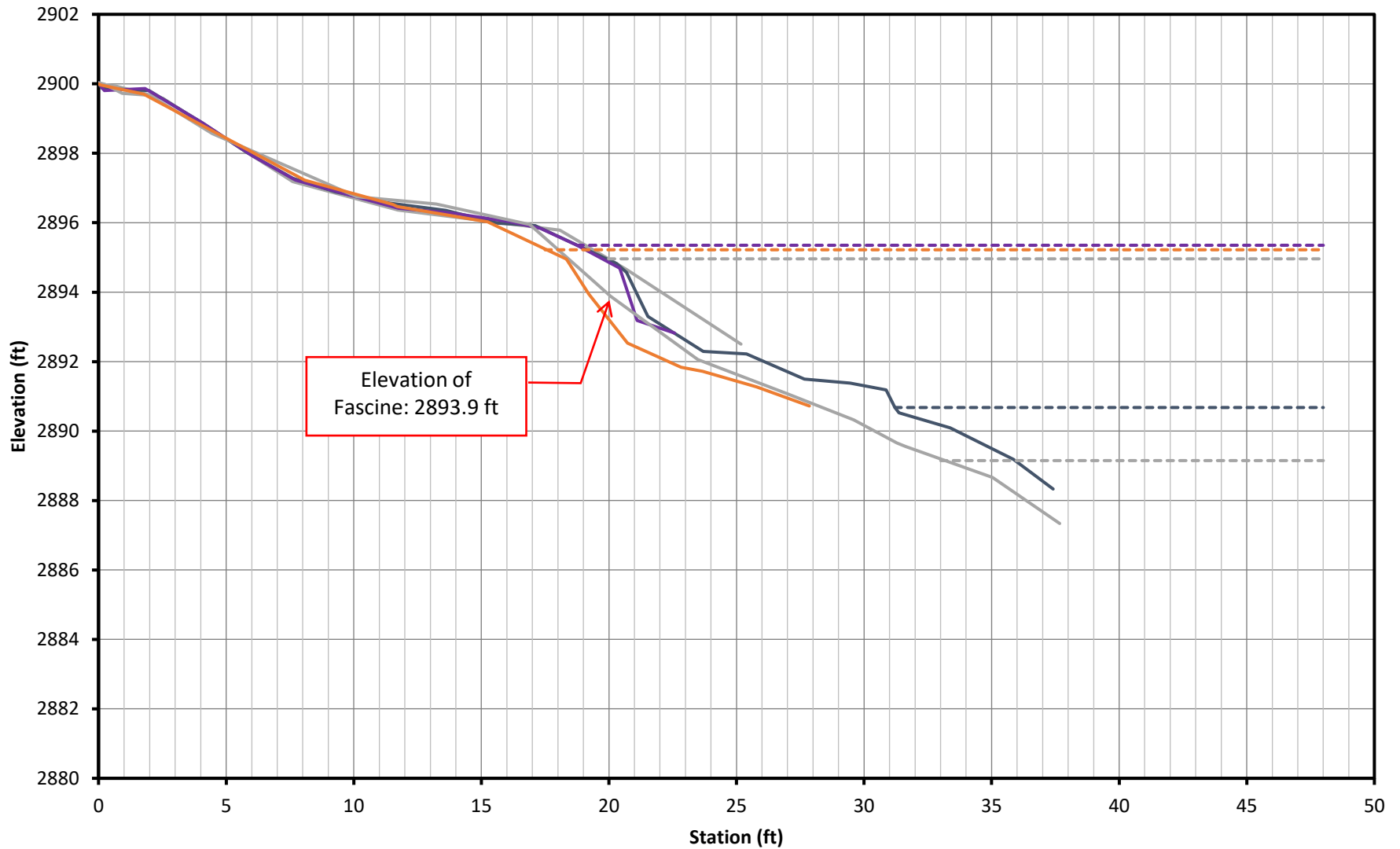
# Foy's Bend Bank Transect #7



- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- - 4-16 River    - - 8-16 River    - - 4-21 River    - - 8-21 River
- ... 4-16 WS      ... 8-16 WS      ... 4-21 WS      ... 8-21 WS

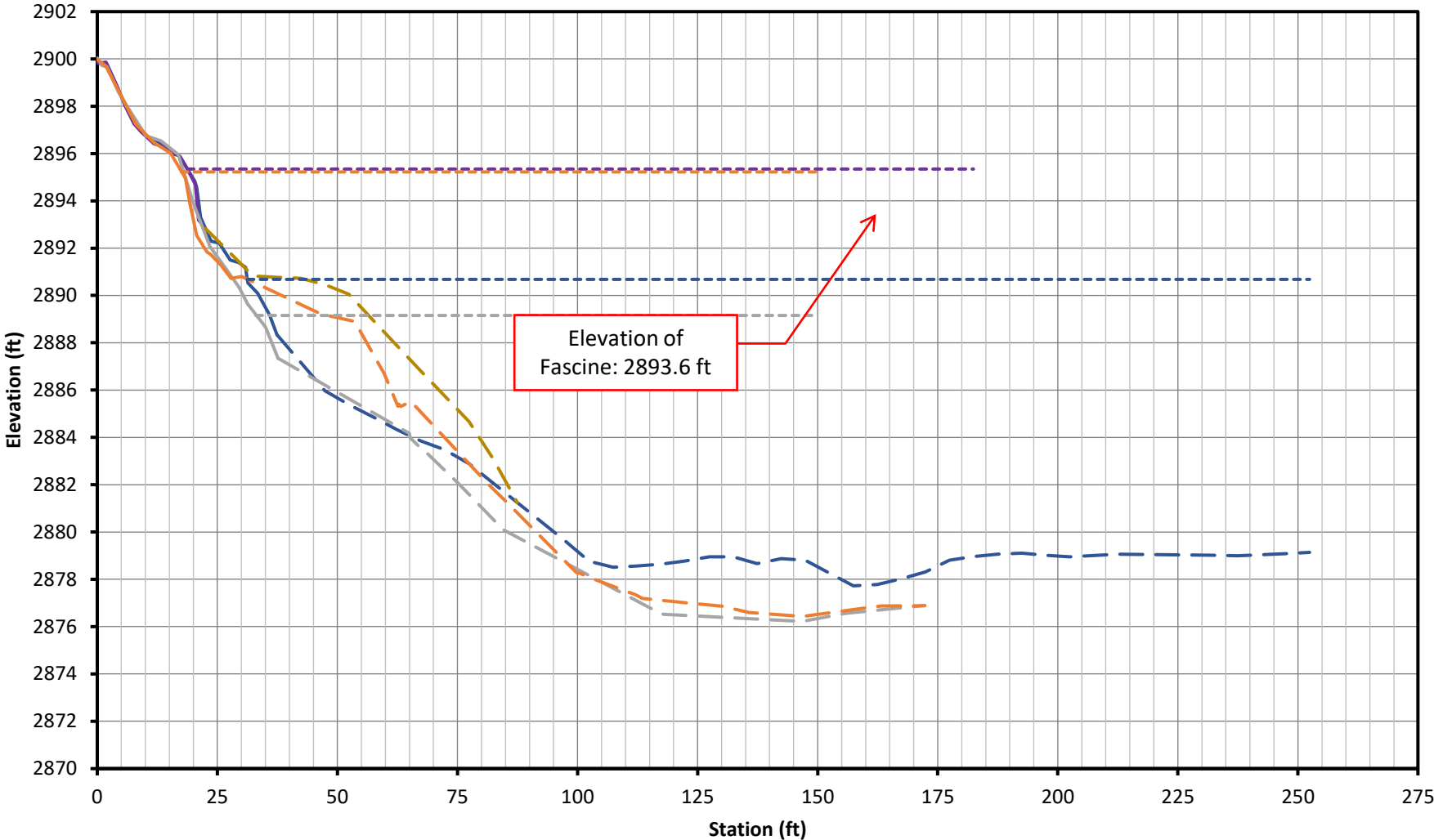
XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #8



— 8-13 XS      — 4-16 XS      — 8-16 XS      — 4-21 XS      — 8-21 XS      XS = Cross section  
 - - - 8-13 WS      - - - 4-16 WS      - - - 8-16 WS      - - - 4-21 WS      - - - 8-21 WS      WS = Water Surface

# Foy's Bend Bank Transect #8

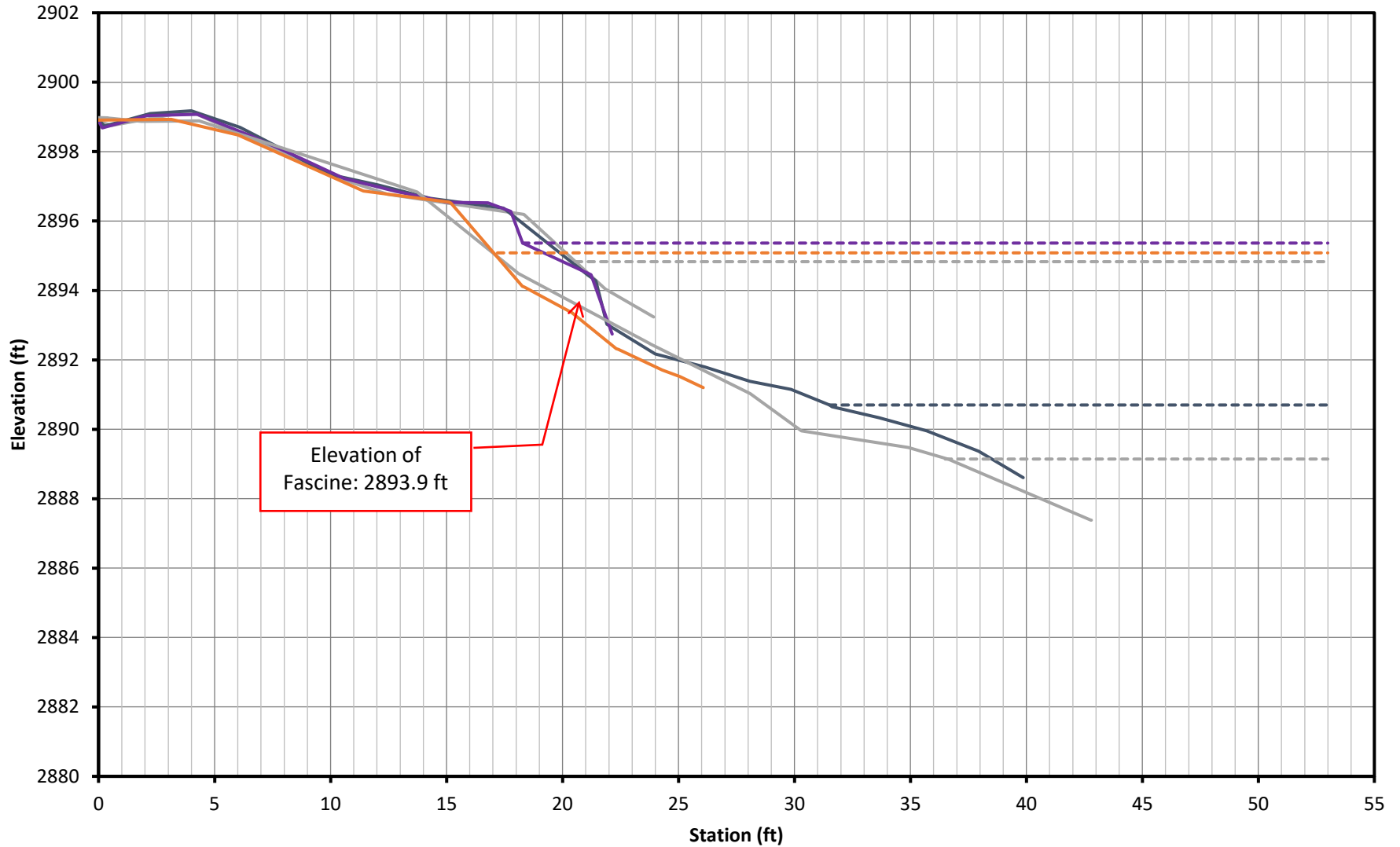


- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- 4-16 River    — 8-16 River    — 4-21 River    — 8-21 River
- - - 4-16 WS    - - - 8-16 WS    - - - 4-21 WS    - - - 8-21 WS

XS = Cross section  
WS = Water Surface



# Foy's Bend Upper Bank Transect #9

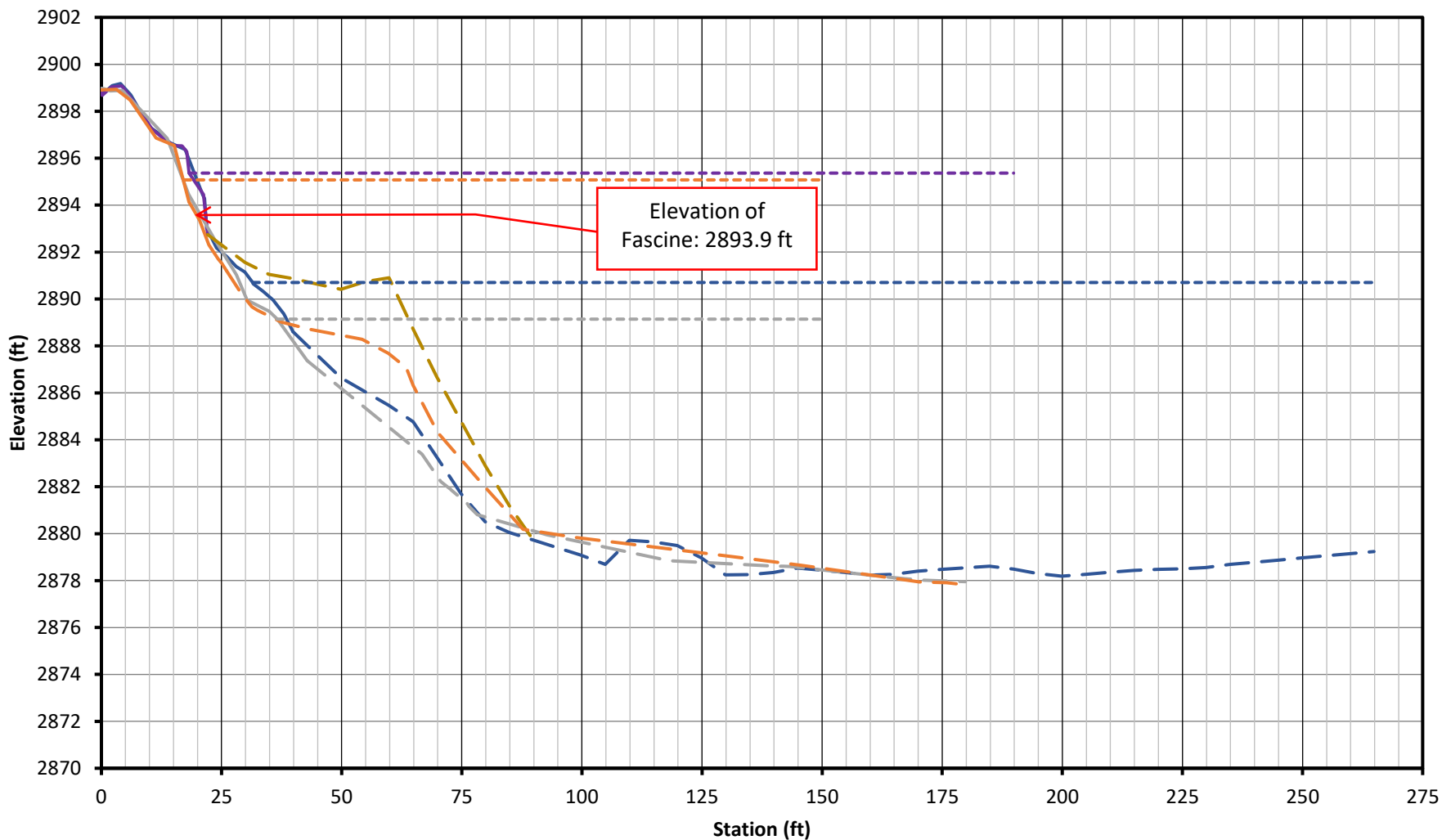


Elevation of Fascine: 2893.9 ft

- 8-13 XS
- 4-16 XS
- 8-16 XS
- 4-21 XS
- 8-21 XS
- - - 8-13 WS
- - - 4-16 WS
- - - 8-16 WS
- - - 4-21 WS
- - - 8-21 WS

XS = Cross section  
WS = Water Surface

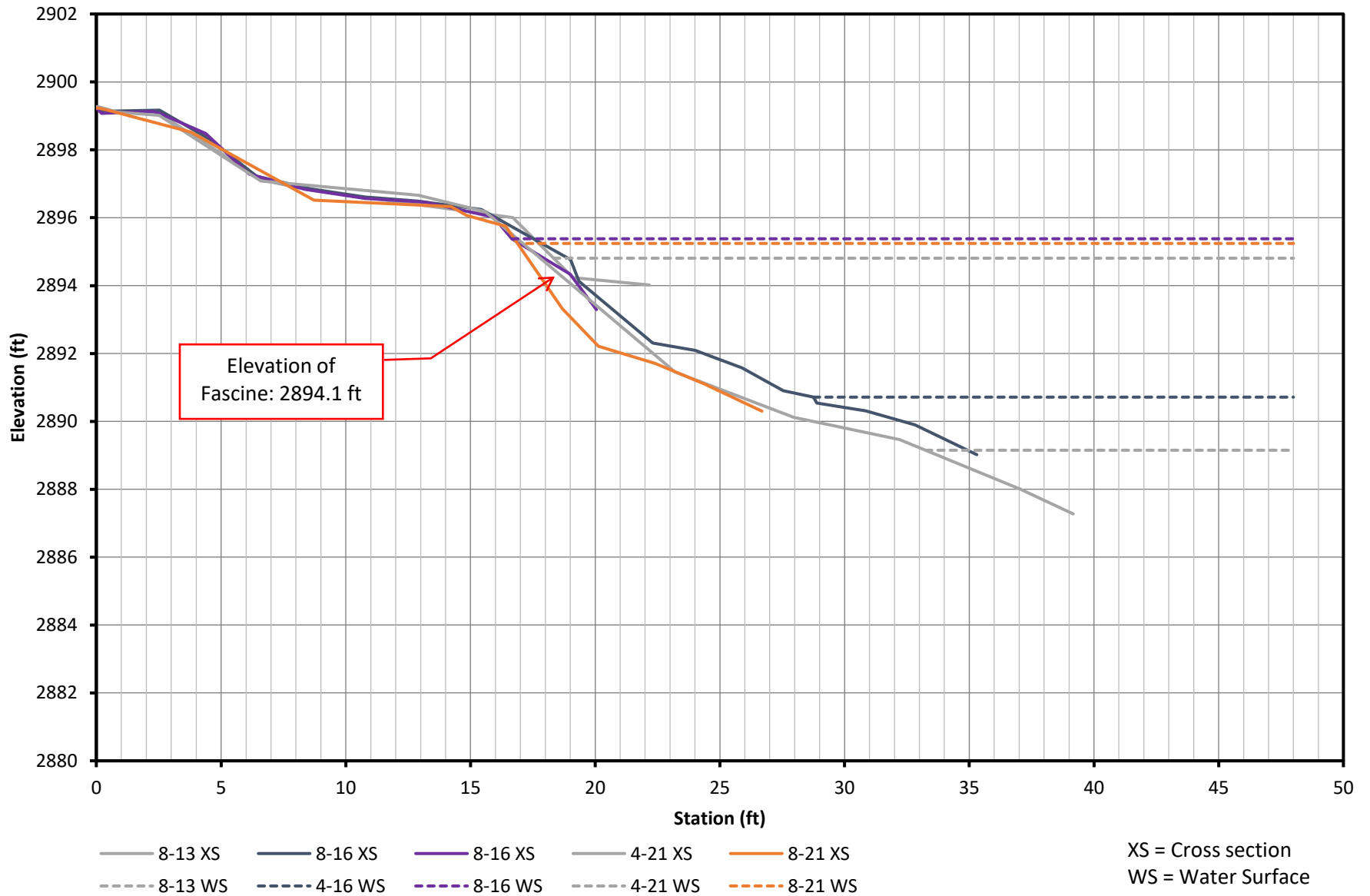
# Foy's Bend Bank Transect #9



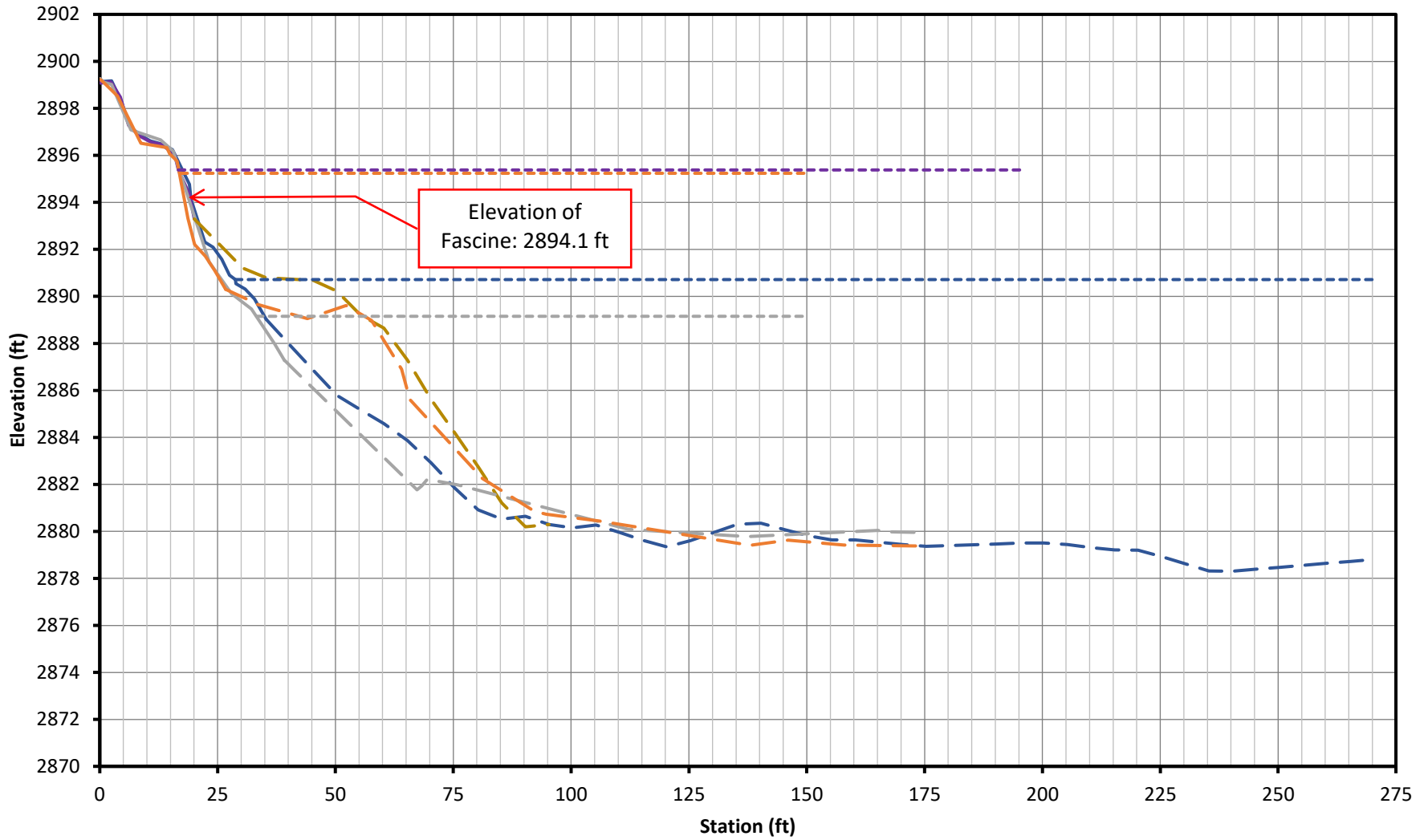
- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- 4-16 River    — 8-16 River     — 4-21 River     — 8-21 River
- - - 4-16 WS    - - - 8-16 WS     - - - 4-21 WS     - - - 8-21 WS

XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #10



# Foy's Bend Bank Transect #10

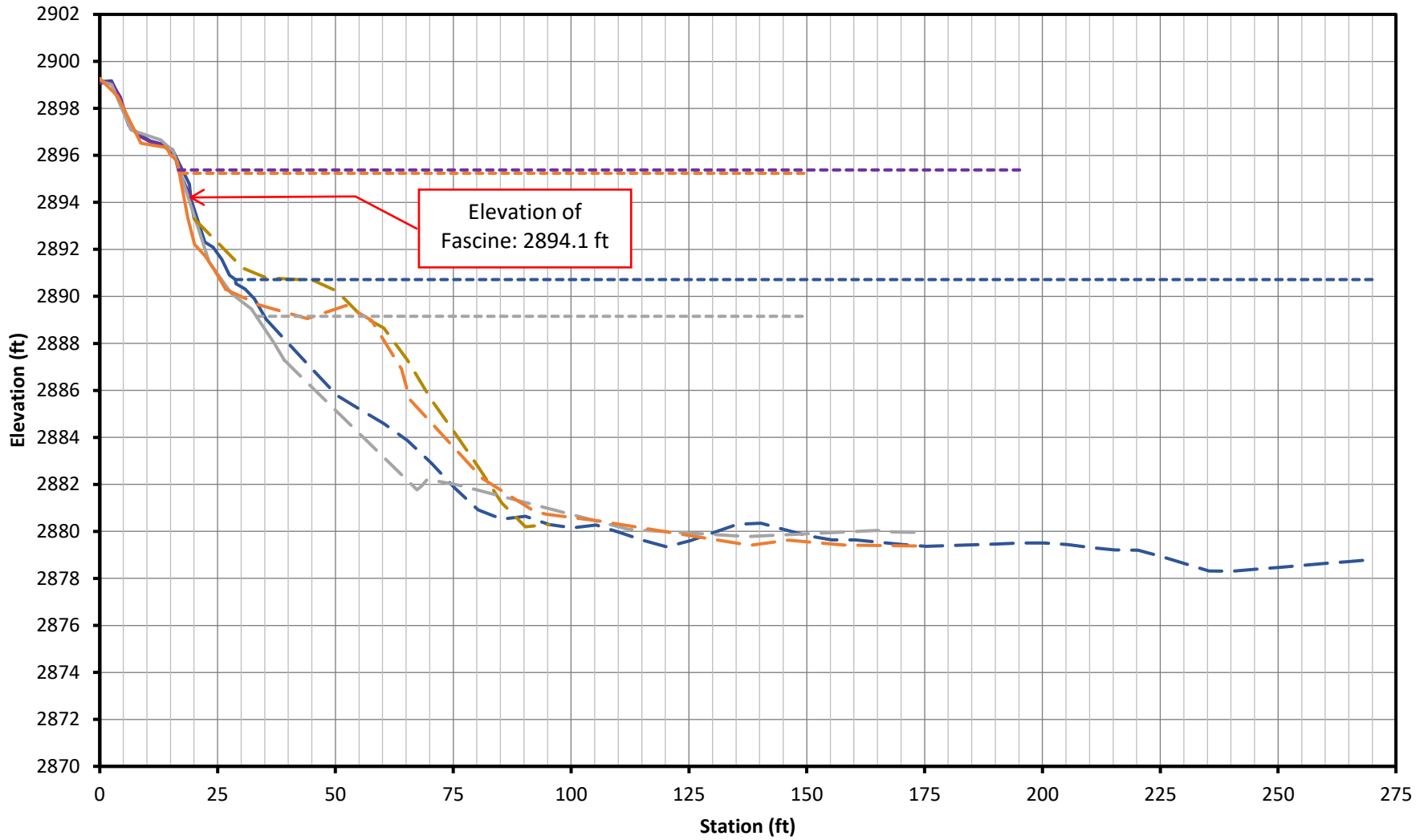


- 4-16 Bank
- 4-16 River
- 4-16 WS
- 8-16 Bank
- 8-16 River
- 4-16 WS
- 4-21 Bank
- 4-21 River
- 4-21 WS
- 8-21 Bank
- 8-21 River
- 8-21 WS

XS = Cross section  
WS = Water Surface



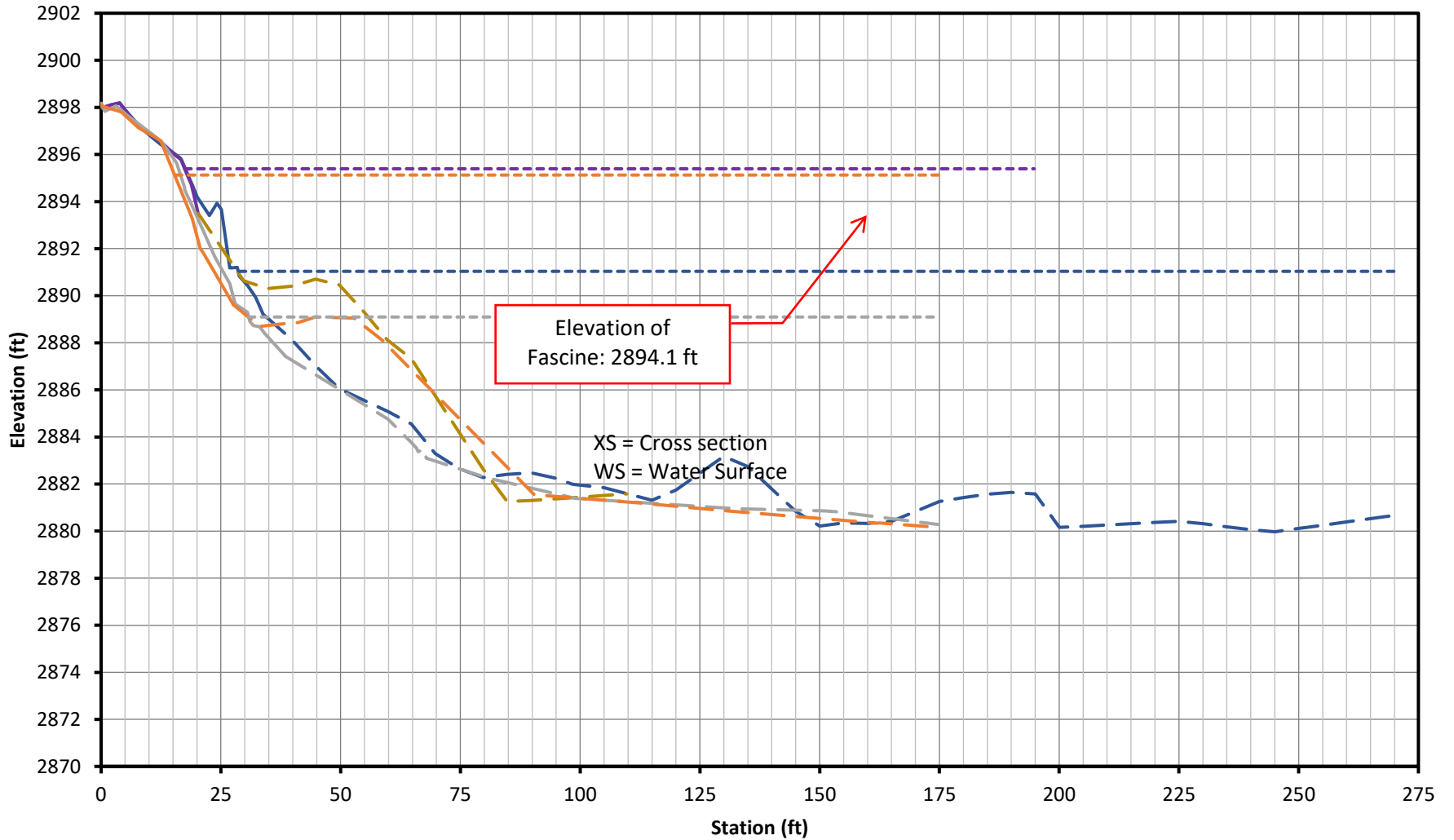
# Foy's Bend Bank Transect #10



- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- 4-16 River    — 8-16 River    — 4-21 River    — 8-21 River
- - - 4-16 WS    - - - 4-16 WS    - - - 4-21 WS    - - - 8-21 WS

XS = Cross section  
WS = Water Surface

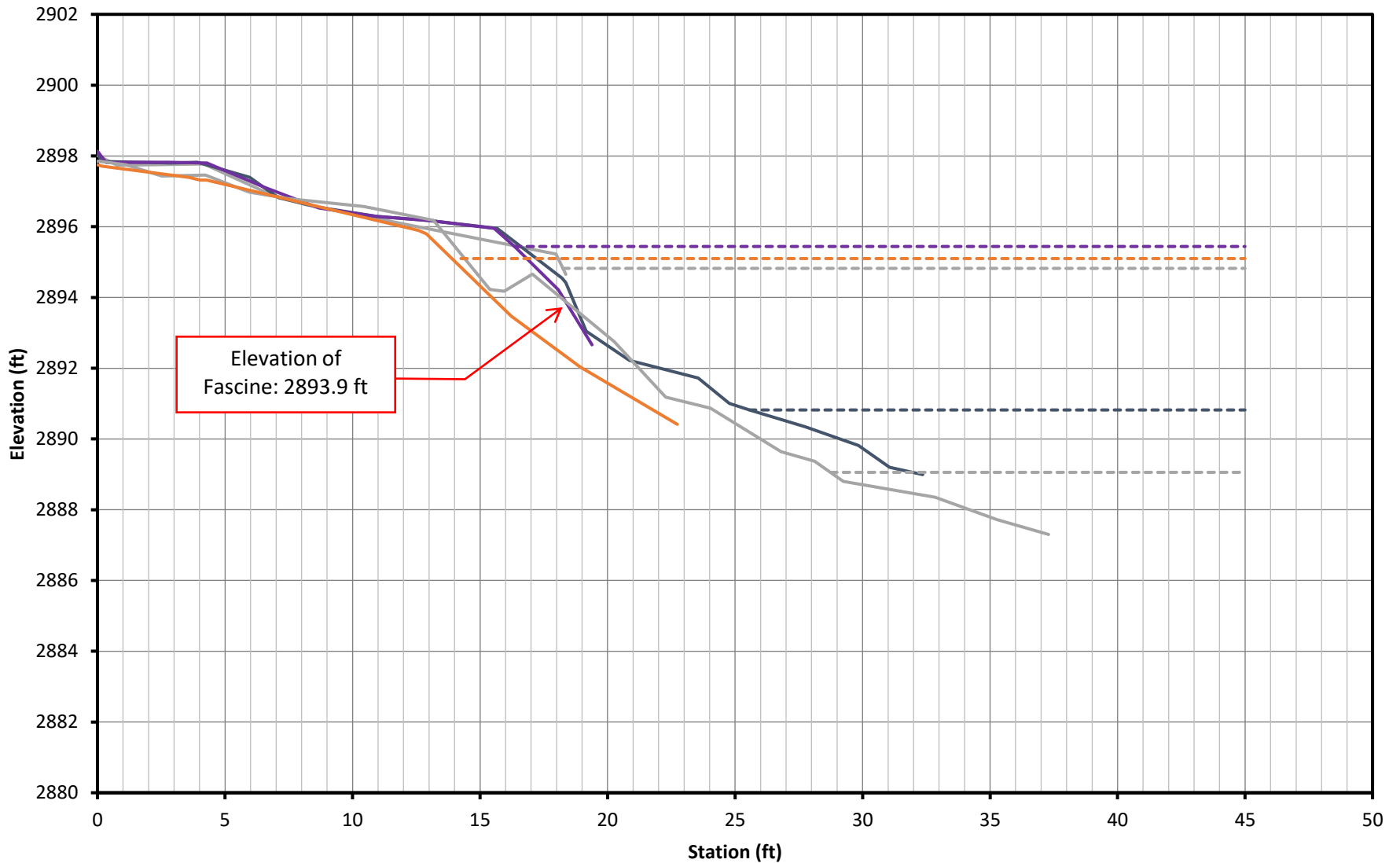
# Foy's Bend Bank Transect #11



- 4-16 Bank
- 4-16 River
- - - 4-16 WS
- 8-16 Bank
- 8-16 River
- - - 8-16 WS
- 4-21 Bank
- 4-21 River
- - - 4-21 WS
- 8-21 Bank
- 8-21 River
- - - 8-21 WS

XS = Cross section  
WS = Water Surface

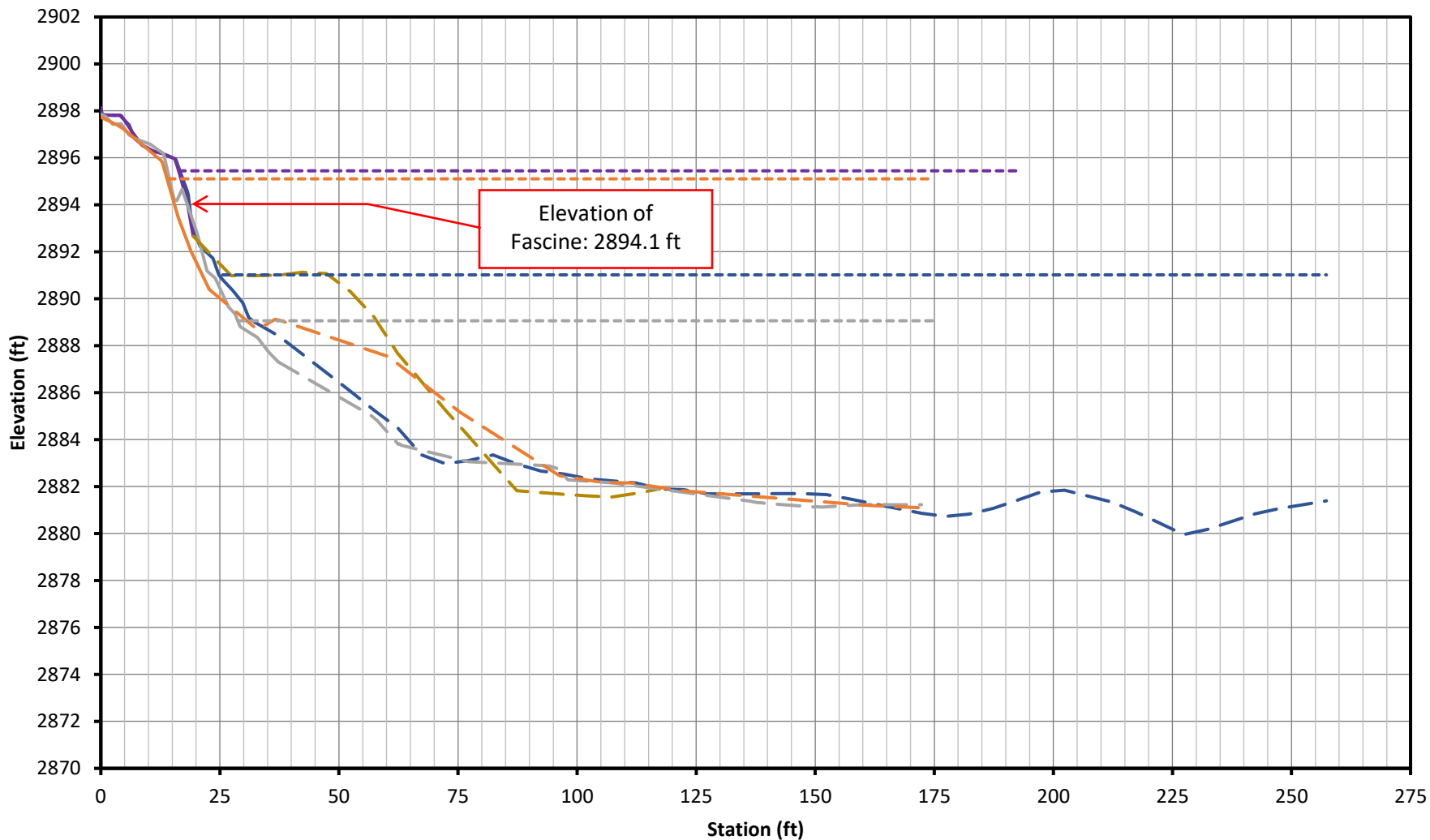
# Foy's Bend UpperBank Transect #12



— 8-13 XS      — 4-16 XS      — 8-16 XS      — 4-21 XS      — 8-21 XS  
 - - - 8-13 WS      - - - 4-16 WS      - - - 8-16 WS      - - - 4-21 WS      - - - 8-21 WS

XS = Cross section  
 WS = Water Surface

# Foy's Bend Bank Transect #12

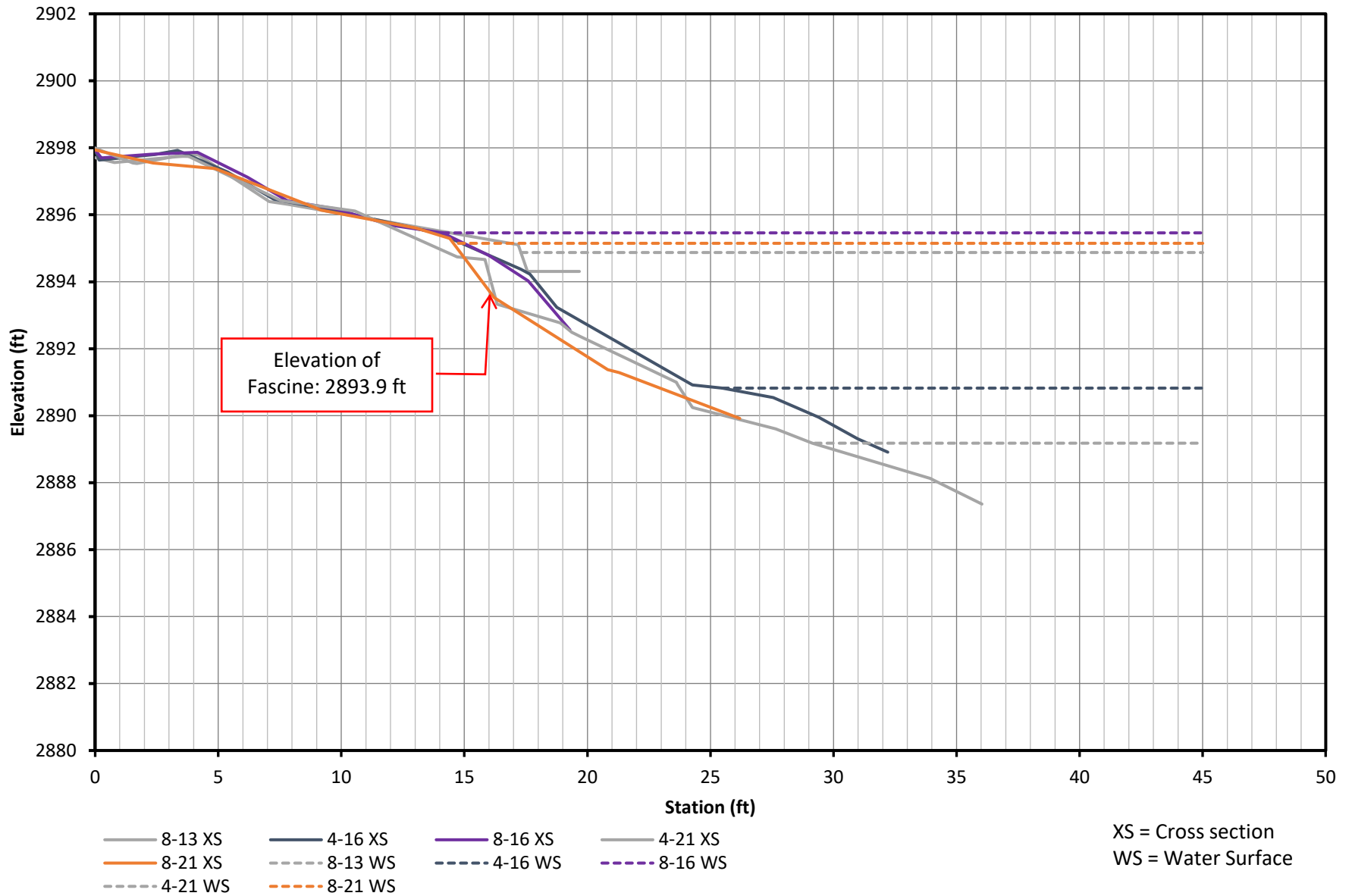


- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- 4-16 River    — 8-16 River    — 4-21 River    — 8-21 River
- 4-16 WS        — 8-16 WS        — 4-21 WS        — 8-21 WS

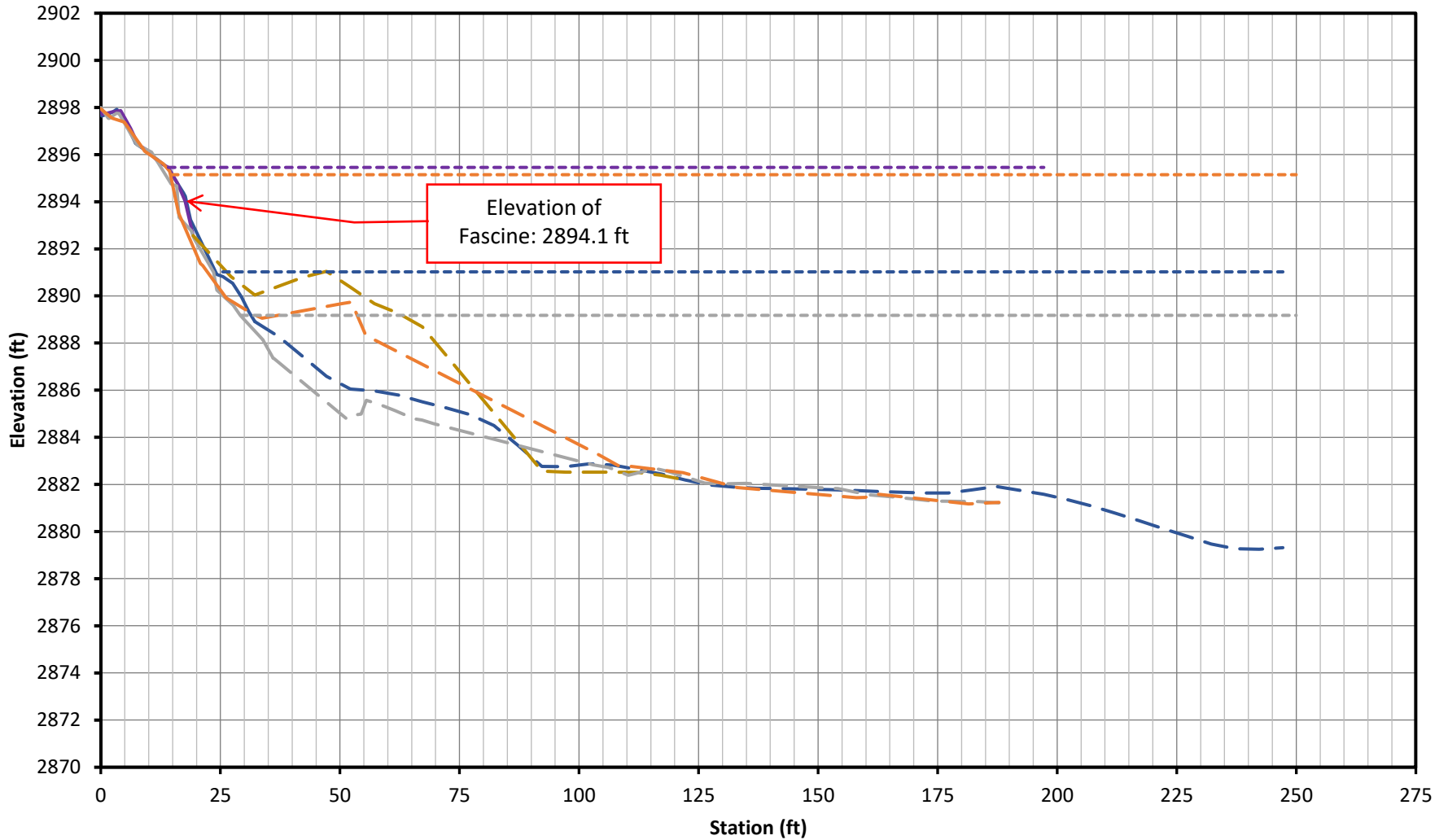
XS = Cross section  
WS = Water Surface



# Foy's Bend Upper Bank Transect #13



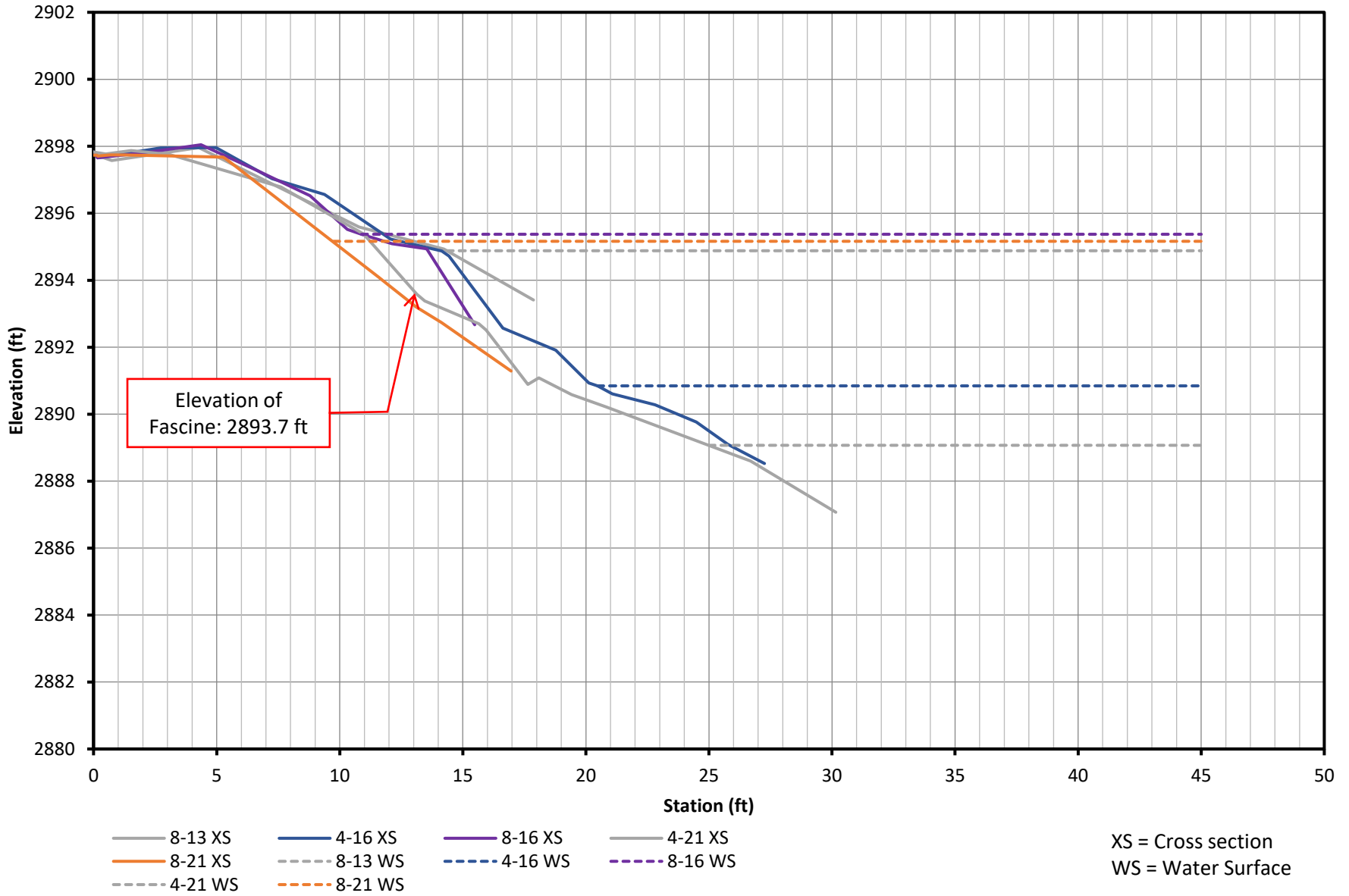
# Foy's Bend Bank Transect #13



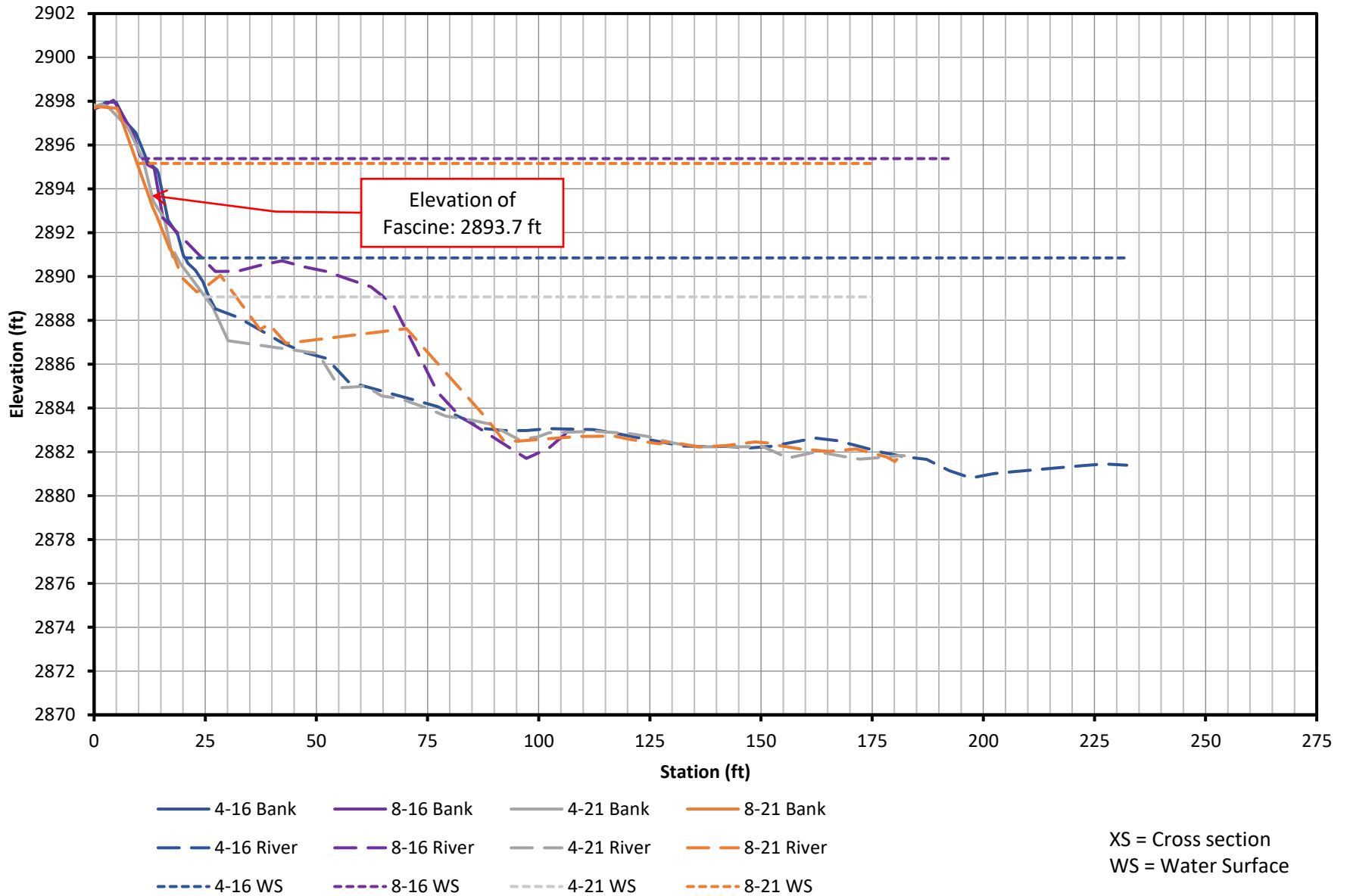
- 4-16 Bank      — 8-16 Bank      — 4-21 Bank      — 8-21 Bank
- 4-16 River    — 8-16 River    — 4-21 River    — 8-21 River
- - - 4-16 WS    - - - 8-16 WS    - - - 4-21 WS    - - - 8-21 WS

XS = Cross section  
WS = Water Surface

# Foy's Bend Upper Bank Transect #14



# Foy's Bend Bank Transect #14





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**APPENDIX H**  
**PLANTING EXCLOSURE COORDINATES**

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MDT Stream Mitigation Monitoring  
Foy's Bend Fisheries Conservation Area  
Flathead County, Montana

**Table H-1.** GPS coordinates for the Foys Bend FCA planting exclosures. Coordinates are for the approximate center of each planting polygon.

Exclosure	Latitude	Longitude
1	48.1521766	-114.2591661
2	48.1517585	-114.2581302
3	48.1520560	-114.2544447
4	48.1519029	-114.2530195
5	48.1519709	-114.2517854
6	48.1527857	-114.2498706
7	48.1524992	-114.2439724
8	48.1522669	-114.2430871
9	48.1524174	-114.2414345
10	48.1529050	-114.2380840
11	48.1532986	-114.2367564
12	48.1537956	-114.2361153
13	48.1545324	-114.2344088
14	48.1542498	-114.2343209
15	48.1543388	-114.2328588
16	48.1550055	-114.2317072
17	48.1551462	-114.2327981
18	48.1565196	-114.2343658