North Fork Mountain Creek Monitoring Report

Monitoring Year 4 of 7

Stream and Wetland
NCDMS Contract No.002024
NCDMS Project No. 94151

Catawba County, NC
Data Collected: 3/11 – 11/12/2015
Submitted: November 2015

Submitted to:

North Carolina Division of Mitigation Services

NCDEQ-DMS, 1652 Mail Service Center Raleigh NC 27699-1652

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Prepared for:

302 Jefferson Street, Suite 110
Raleigh, North Carolina 27605

Prepared by:

EQUINOX

balance through proper planning

37 Haywood Street, Suite 100
Asheville, NC 28801

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Contents

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1.0 PROJECT SUMMARY

1.1. Project Setting and Background

The North Fork Mountain Creek Stream and Wetland Mitigation Site was identified and developed through the North Carolina Division of Mitigation Services (NCDMS) full delivery process. The site is located approximately six miles south of Catawba, North Carolina in southeastern Catawba County (Figure 1). The project lies within the Piedmont physiographic region (NCGS 2004) and USGS (2002) Level III ecoregion. The North Fork Mountain Creek watershed is within Catawba River Basin 14-digit Hydrologic Unit Code 03050101150030 and the North Carolina Division of Water Quality (NCDWQ) sub-basin 03-08-32 (NCDWQ 2010).

The mitigation site encompasses 17.2 acres containing 5,299 linear feet (lf) of stream channel and 4.44 acres of wetlands. The project consists of four reaches; reach 1 is on the mainstem of North Fork Mountain Creek, while reaches 2, 3, and 4 are on primary and secondary unnamed tributaries (UT1 and UT2) of North Fork Mountain Creek (Figure 2). An additional 0.97 acre of existing wetlands were preserved on the site; however, no mitigation credit is being claimed for this wetland preservation acreage per RFP 16-001117.

Prior to restoration the stream channels and wetlands were highly disturbed due to the presence of livestock that had unrestricted access to the riparian areas and stream channels. The riparian vegetation was decimated by overgrazing and trampling. The subsequently bare banks were then subject to severe erosion that was only exacerbated by hooves of the cattle.

1.2. Project Approach

Channel restoration involving improved pattern, dimension, and profile was completed on all four stream reaches. Priority I and II approaches were applied to the mainstem North Fork Mountain Creek (Rosgen 1996; NCSRI 2004), while only a Priority II approach was used on the tributary reaches. A total of 1.17 acres of wetlands were restored along reaches 1, 2, 3, and 4, while 3.27 acres of wetlands were created along reaches 2 and 4 (Figure 2).

1.3. Project Goals

The primary and secondary project goals, as outlined in the 2011 restoration plan, are as follows:

Primary goals:

- Provide stable stream channels throughout 5,180 linear feet of channel restoration
- Restore riparian buffers throughout the project site
- Restore 1.16 acres of riparian wetland
- Create 3.03 acres of riparian wetland
- Provide permanent protection through conservation easement for the entire floodplain of North Fork Mountain Creek and its tributaries within the project area.
- Improve water quality by significantly reducing sediment loads from bank erosion and fencing out cattle.

Secondary goals:

- Increase the diversity and quantity of macrobenthos, salamanders, and fish by improving habitat and coarsening of the stream bed
- Improve vegetative communities and terrestrial habitat diversity
- Improve hydrology by increasing groundwater recharge, groundwater and surface water storage, and groundwater/surface water interaction.

1.4. Success Criteria

1.4.1. Stream

Success criteria pertain to the stability of the restored channel's dimension, pattern, and sediment transport. The restored channel must demonstrate the general maintenance of a stable cross-section and have hydrologic access to the floodplain over the monitoring period. The restoration reach should mimic reference reach conditions and the channel will be considered stable if there are little or insignificant changes from the as-built dimensions. Some change in stream dimension is natural and expected.

Traditionally, the success of a stream's pattern and dimension is determined utilizing the dimensionless ratios of reference reaches. The range of values for the dimensionless ratios of the reference reaches are applied to the design reaches. In this case, design reaches are deemed successful if the variability of its pattern and dimension remain within the range of the dimensionless ratios taken from the reference reaches, plus or minus one-half the value of that range. For the North Fork Mountain Creek restoration project, dimensionless ratios of the design reaches vary slightly from the dimensionless ratios of the reference reaches. As a result, the restoration will be determined to be successful if the dimensionless ratios of the pattern and dimension of the restoration reaches remain within their 'as-built' range, plus or minus one-half the value of the range of the dimensionless ratios of the reference reaches. Pattern features (bedform distributions and riffle/pool lengths and slopes) should demonstrate little adjustment within the 7-year monitoring period. In terms of sediment transport, no significant trend in the aggradational or depositional potential of the restoration reaches should occur over the monitoring period. A minimum of two-bankfull events must be documented by crest gage [data] within the standard monitoring period.

1.4.2. Wetland

As per USACE guidelines, wetlands exhibiting water within 12 inches of the surface consecutively between 5% and 12.5% of the growing season in most years may be considered wetlands. The growing season at the North Fork Mountain Creek site extends from March 21 to November 11, a total of 236 days (NRCS 2012). Restored wetland hydrology is being compared to reference wetland hydrology both on-site and at the South Fork project (NCNCDMS Project No. 346, unpublished data). Based on data collected on-site, an 8% hydroperiod will be used as success criteria for this project.

1.5. Project Performance

As outlined in the Baseline Monitoring Report (EBX 2012), no geomorphic or vegetation data were scheduled for collection during MY4. The following presents the results of MY4 visual assessment and hydrologic data collection for MY4.

Visual assessment of the site consisted of re-visiting 31 photographic reference locations (Appendix B), visually assessing the integrity of the channel and structures, assessing the establishment of planted and volunteer vegetation, and documenting the presence of invasive species. Problem areas consist of bed degradation, bank scour, and stressed structures (Appendix B, Figure 2, Table 4a). Two beaver dams were identified, and subsequently removed, during September 2015 at stations 313+75 and 316+75. Vegetation problem areas consist of small, localized pockets of bare areas and low stem density

(Appendix B, Figure 2, Table 4b). Representative photos of problem areas are located in Appendix B. Photos of each problem area can be accessed through the digital e-submission file submitted to NCDMS.

Dry conditions were persistent through the spring and summer at the North Fork Mountain Creek Site. Precipitation at the Site was below average 6 of the 7 months of the growing season with three months falling below the 30th percentile for precipitation in Catawba County (Appendix E, Table 11). During MY4, six of the ten original monitoring wells met the 8% hydroperiod success criteria (Table 12). Hydroperiods for the original wells (NFMC-1 through NFMC-10) ranged from 1.3% to 37.7%. NFMC-1 and NFMC-10 failing to meet the success criteria is likely a result of the dry conditions during MY4. Two of the supplemental wells, installed during MY3, met the success criteria; however, NFMC-S1 and NFMC-S2, located closest to the failing NFMC 4 and NFMC 5, also failed to meet during MY4. On February 4, 2015, RES, IRT, and DMS conducted an onsite meeting to review and discuss non-performing areas within the restored wetland that were failing to meet wetland criteria based on the Restoration Plan. Based on monitoring well data, portions of the constructed wetland area appeared not to be meeting the minimum hydrology standard, while other areas that were not proposed for restoration did appear to be returning to wetland conditions. RES requested the areas be swapped so that mitigation credit could be obtained for the areas that were returning to wetland in lieu of the area not meeting criteria; to which the IRT agreed. Two supplemental wells were installed in the area to be added and will be monitored for wetland hydrology for the duration of the monitoring period (Figure 2). This new area is subject to the same performance standards as the other wetlands restored on the site. Both supplemental wells in this area met the hydroperiod success criteria during MY4.

Since project completion in June 2012 four bankfull events have occurred at the project site (Table 10). An initial bankfull event occurred in August 2012, which registered 0.58 feet above bankfull on UT1-Reach 2. The crest gauge on North Fork Mountain Creek- Reach 1 was damaged from the event and, as a consequence, the water level above bankfull could not be determined; however, the event was photo documented. A second event was documented using wrack lines in January 2013. The third event registered on the Reach 1 crest gauge as 0.33 feet above bankfull. The Reach 2 crest gauge did not register a bankfull event; however, photo-documentation of wrack lines along the reach indicated that a bankfull did occur on this reach as well. During MY4, a bankfull event was recorded through crest gauge and wrack lines on both Reach 1 and Reach 2 (Appendix E; Table 10).

Summary information/data related to the occurrence of such things as beaver or encroachment, and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Additional background and supporting information can be found in the Baseline Monitoring Report (EBX 2012) and in the Mitigation Plan (EBX 2011) documents.

2.0 METHODS

This report presents the results of the Monitoring Year 4 (MY4) visual and hydrologic data and the Monitoring Year 3 (MY3) morphological and vegetative collected from 26 cross sections, 12 bank pin arrays, 2 crest gauges, 16 automated groundwater monitoring stations, 1 automated rain gauge, 14 vegetation monitoring plots, and 31 photographic reference locations; as specified in the approved Restoration Plan and Baseline Report (EBX 2011, 2012).

Visual assessment of the stream was performed quarterly. Permanent photo station photos at 31 photographic reference locations were collected during the initial visual assessment at the beginning of the monitoring year during leaf-off conditions. Additional photos of vegetation or stream problem areas were documented with photographs and included in the electronic data submittal.

Geomorphological measurements were taken during low flow conditions using a Nikon NPR 332 Total Station. Three-dimensional coordinates associated with cross-sections were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data was limited to 26 cross-sections, as collection of longitudinal profile is not required during annual monitoring events. Survey data was imported into CAD, ArcGIS, and Excel for data processing and analysis. Channel substrate was characterized using a Wolman Pebble Count outlined in the Harrelson et al. (1994) and processed using Microsoft Excel. Pebble counts were conducted at all riffle cross-sections; a reachwide pebble count was made in each reach. Bank-pin arrays were installed at each pool cross-section. Pins were installed at three locations at each cross-section; the upper-third, at the cross-section, and the lower-third of the bend. The first set of pins was installed at the "normal" water line with an additional set of pins installed for each 2-feet increment of vertical bank. Once per monitoring year, starting in MY3, the length of exposed pin was recorded and the pin reset flush with the bank.

Vegetation success is being monitored using 14 permanent monitoring plots. Vegetation monitoring follows the CVS-EEP Level 2 Protocol for Recording Vegetation, Version 4.2 (Lee et al. 2008) and includes analysis of composition and density of planted species. Data is processed using the CVS data entry tool. In the field, the four corners of each plot were permanently marked with rebar and photos of each plot are taken from the origin each monitoring year.

Precipitation data was collected using an Onset HOBO Data Logging Rain Gauge. Groundwater for hydrologic success of the restored wetlands was monitored using 16 Onset HOBO U20 Water Level Loggers. An additional logger was installed on site, above ground, for use as a barometric reference. Data loggers collected depth to groundwater daily and all data were processed using HOBOware and analyzed using Microsoft Excel.

Bankfull events were documented with crest gauges located on Reaches 1 and 2. During quarterly visits to the site, the height of the corkline in each gauge was recorded and cross-referenced with known bankfull elevations at each crest gauge.

3.0 REFERENCES

EBX (Environmental Banc & Exchange). 2011. North Fork Mountain Creek Stream and Wetland Restoration, Restoration Plan, Catawba County, North Carolina. NCEEP Project No. 94151. Raleigh, North Carolina.

EBX (Environmental Banc & Exchange). 2012. North Fork Mountain Creek Stream and Wetland Restoration Final Baseline Monitoring Document and As-Built Baseline Report. Catawba County, North Carolina. NCEEP Project Number 94151. Prepared by Stantec Consulting Services, Inc. for EBX. Raleigh.

Harrelson, Cheryl, C. Rawlins and J. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. General Technical Report RM-245. Rocky Mountain Forest and Range Experiment Station. USDA Forest Service. Fort Collins, Colorado.

Lee, M.T., Peet, R.K., Roberts, S.D. and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. http://cvs.bio.unc.edu/methods.htm; accessed November 2008.

NCDWQ (North Carolina Division of Water Quality). 2010. Catawba River Basinwide Water Quality Plan.

NCGS (North Carolina Geological Survey). 2004. Physiography of North Carolina. Map compiled by the Division of Land Resources. Raleigh.

NCSRI (North Carolina Stream Restoration Institute). 2004. Stream Restoration: A Natural Channel Design Handbook. North Carolina Stream Restoration Institute and North Carolina Sea Grant. Raleigh. http://www.bae.ncsu.edu/programs/extension/wqg/srp/guidebook.html; accessed November 2012.

NRCS (Natural Resources Conservation Service). 2012. Climate Analysis for Wetlands by County. http://www.wcc.nrcs.usda.gov/climate/wetlands.html; accessed June 2012.

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology. Pagosa Springs, Colorado.

USGS (U.S. Geological Survey). 2002. Ecoregions of North Carolina and South Carolina. Color poster with map, descriptive text, summary tables, and photographs. Reston, Virginia.

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Appendix A
General Tables and Figures

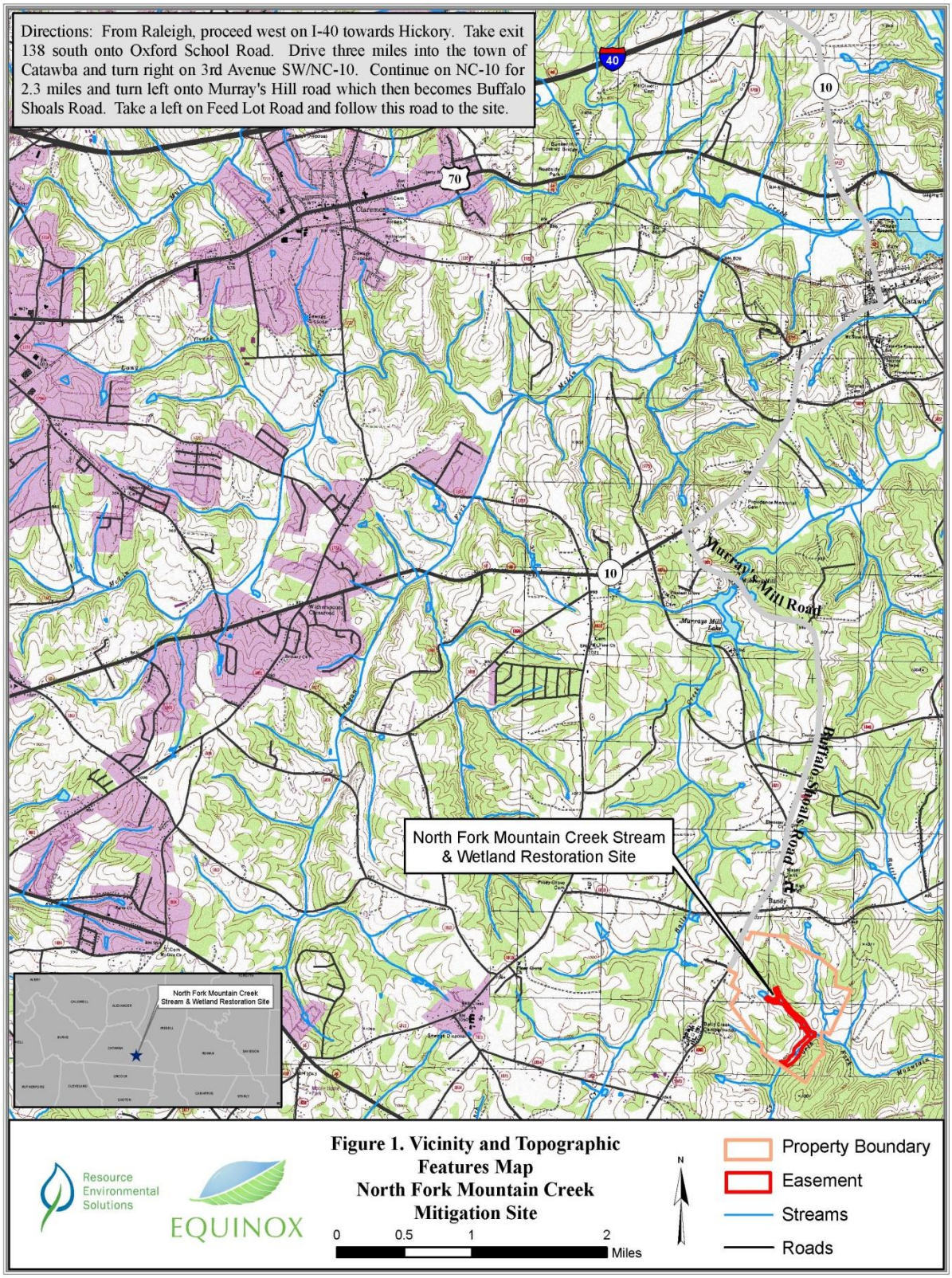
Directions: From Raleigh, proceed west on I-40 towards Hickory. Take exit 138 south onto Oxford School Road. Drive three miles into the town of Catawba and turn right on 3rd Avenue SW/NC-10. Continue on NC-10 for 2.3 miles and turn left onto Murray's Hill road which then becomes Buffalo Shoals Road. Take a left on Feed Lot Road and follow this road to the site.
40
10
70
10
Murray's Mill Road
Buffalo Shoals Road
North Fork Mountain Creek Stream & Wetland Restoration Site
North Fork Mountain Creek Stream & Wetland Restoration Site
Resource Environmental Solutions
EQUINOX
Figure 1. Vicinity and Topographic Features Map
North Fork Mountain Creek
Mitigation Site
0
0.5
1
2
Miles
N
Property Boundary
Easement
Streams
Roads

Table 1. Project Components North Fork Mountain Creek Stream & Wetland / Project No. 94151							
Project Component or Reach ID	**Existing Feet/ Acres**	**Restoration Level**	**Approach**	**Restoration or Restoration Equivalent**	**Footage or Acreage**	**Mitigation Ratio**	**Mitigation Credits (WMUs/ SMUs)**
NFMC-4	2,245	R	R (P1/P2)	R	2,231	1:1	2,231
UT1-1	698	R	R (P1)	R	698	1:1	698
UT1-2	1,542	R	R (P1)	R	1,756	1:1	1,756
UT2-3	598	R	R (P1)	R	614	1:1	614
						Total SMUs	5,299
Wetland-R	-	R	R	R	1.2	1:1	1.17
Wetland-C	-	C	C	RE	3.27	2:1	1.64
Wetland-P	0.97	P	-	-	0.97	-	-
						Total WMUs	2.81

[1]W-R = wetlands restoration; W-C = wetlands creation; W-P = wetlands preservation.
[2]Wetland creation mitigation ratio was 2:1 as agreed upon with the USACE during the 401/404 permitting process (EBX 2012).
[3]Existing wetlands were preserved on the site, but no WMUs were credited to the project.

Table 2. Project Activity and Reporting History		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Restoration Plan	Jul-11	Jul-11
Final Design - Construction Plans	N/A	Oct-11
Construction	N/A	May-12
Temporary S&E mix applied to entire project	N/A	May-12
Permanent seed mix applied to Reach	N/A	May-12
Mitigation Plan / As-Built (Year 0 Monitoring - baseline)	Jun-12	Aug-12
Exotic Invasive Plant Control	Jun-12	Jun-12
Year 1 Monitoring – 2012	Dec-12	Jan-13
Year 2 Monitoring – 2013	Nov-13	Nov-13
Year 3 Monitoring – 2014	Nov-14	Dec-14
Mitigation Plan Addendum	Feb-15	May-15
Beaver Dam Removal	-	Sep-15
Year 4 Monitoring – 2015	Nov-15	Dec-15
Year 5 Monitoring – 2016		
Year 6 Monitoring – 2017		
Year 7 Monitoring – 2018		

Table 3. Project Contacts (NCDMS Project No. 94151)	
Contact	**Provider Information**
Designer Primary Project Design POC	Stantec Consulting, Inc. 801 Jones Franklin Rd. Suite 300 Raleigh, NC 27606 David Bidelspach (919) 218-0864
Construction Contractor Construction Contractor POC	North State Environmental, Inc. 2889 Lowery St. Winston-Salem, NC 27101 Darrell Westmoreland (336) 725-2010 Nate Martin (336) 725-2010
Planting Contractor 1 Planting Contractor 1 POC	New Forest Services 313 Condon Road Manistee, MI 49660 Brian Jarvinen (231) 590-9198
Planting Contractor 2 Planting Contractor 2 POC	Strader Farms, LLC Kenneth Strader
Seed Mix Sources	Green Resource 5204 Highgreen Court Colfax, NC 27235
Nursery Stock Suppliers	ArborGen (Trees and Livestakes) Blenheim, SC Strader Farms (Livestakes)
Baseline Monitoring Performers (Year 0)	Stantec Consulting Services, Inc. 801 Jones Franklin Rd Suite 300 Raleigh, NC 27606
Stream Monitoring POC	Tim Taylor (704) 329-0900
Vegetation Monitoring POC	N/A
Wetland Monitoring POC	N/A
Annual Monitoring Performers (Year 1-7)	Equinox Environmental Consultation and Design, Inc. 37 Haywood St. Suite 100 Asheville, NC 28801
Stream Monitoring POC	Hunter Terrell (828) 253-6856
Vegetation Monitoring POC	Hunter Terrell (828) 253-6856
Wetland Monitoring POC	Hunter Terrell (828) 253-6856

Appendix B
Visual Assessment Data

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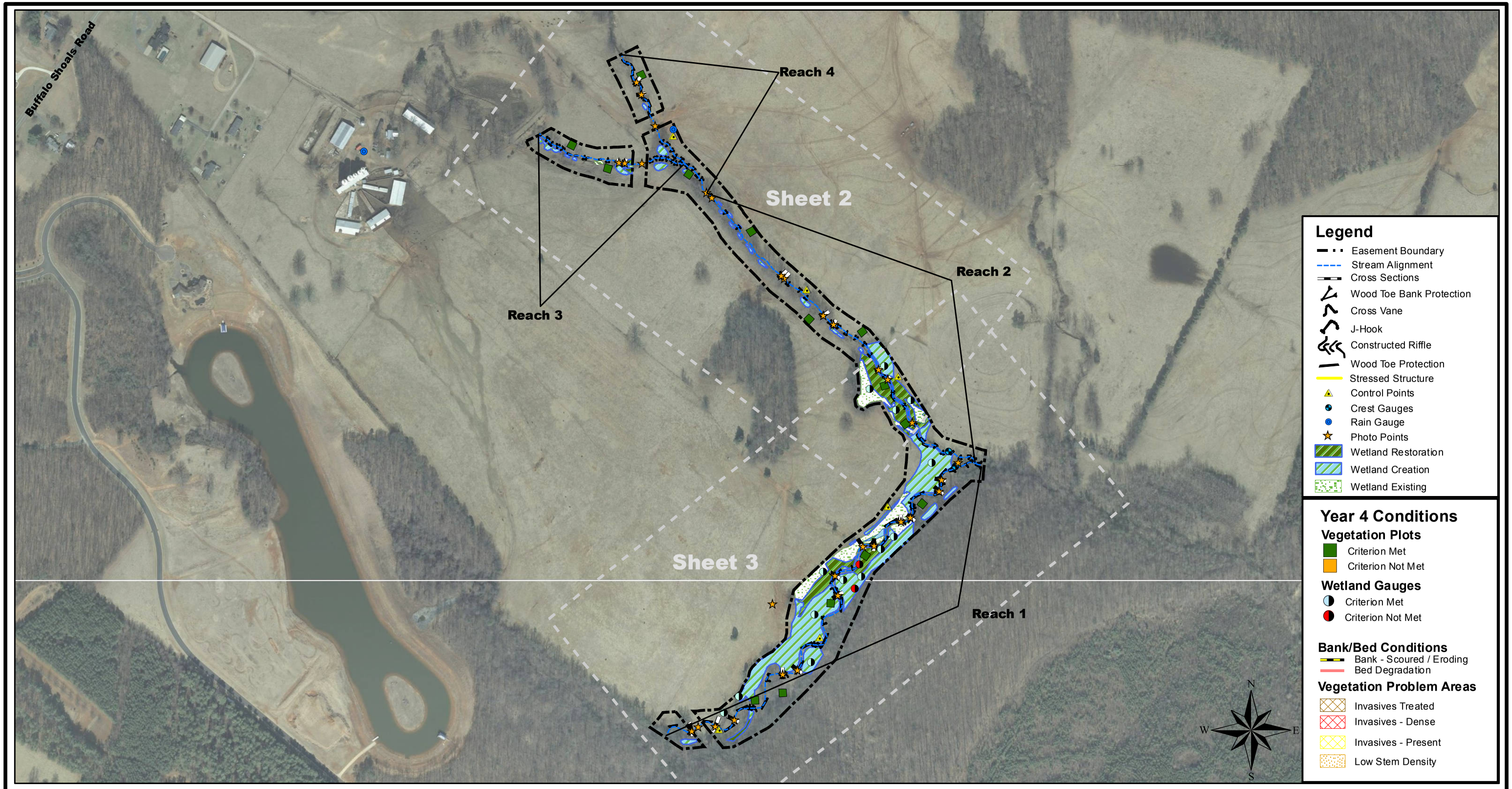
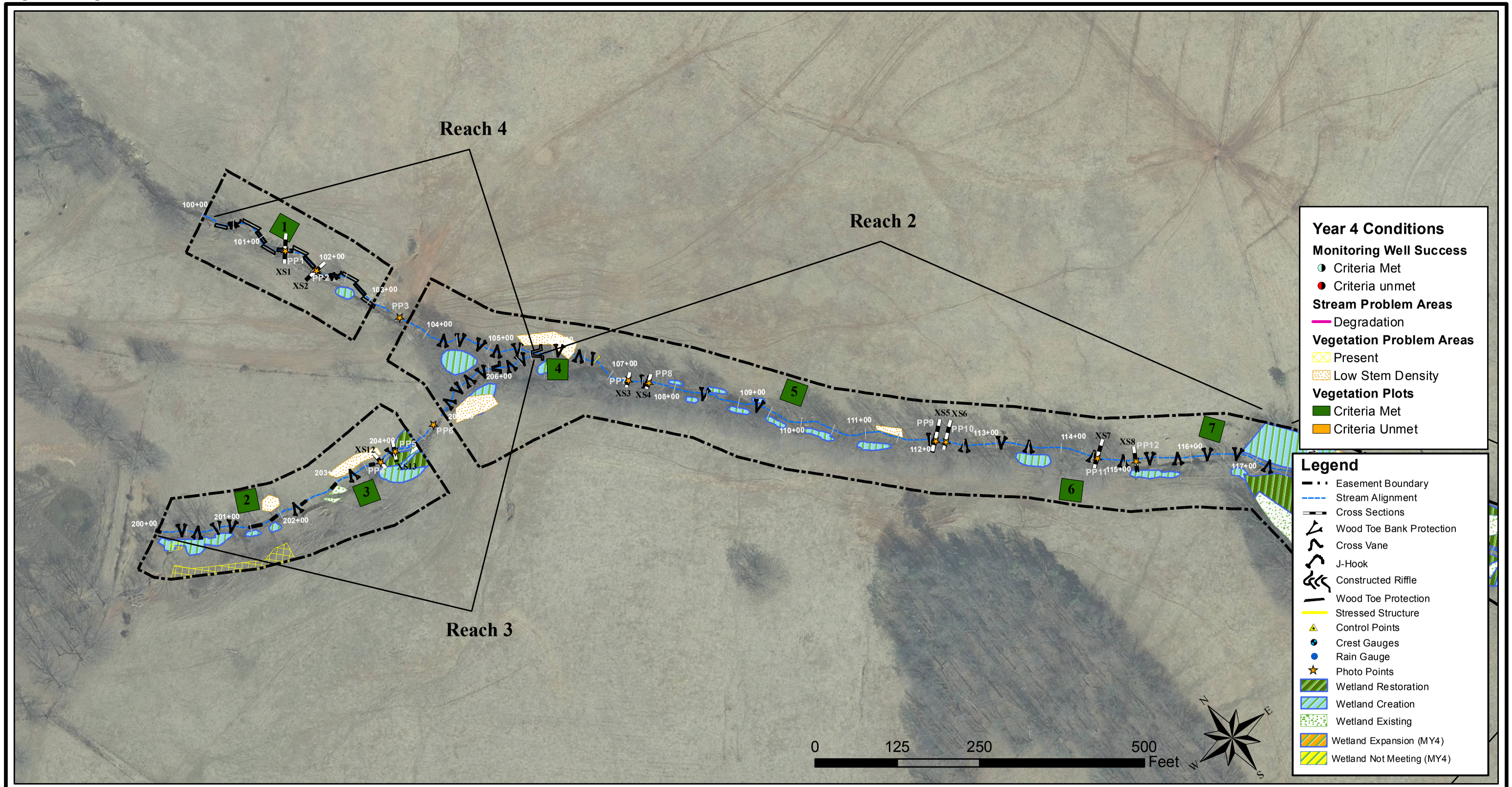
Figure 2. Integrated Current Condition Plan View



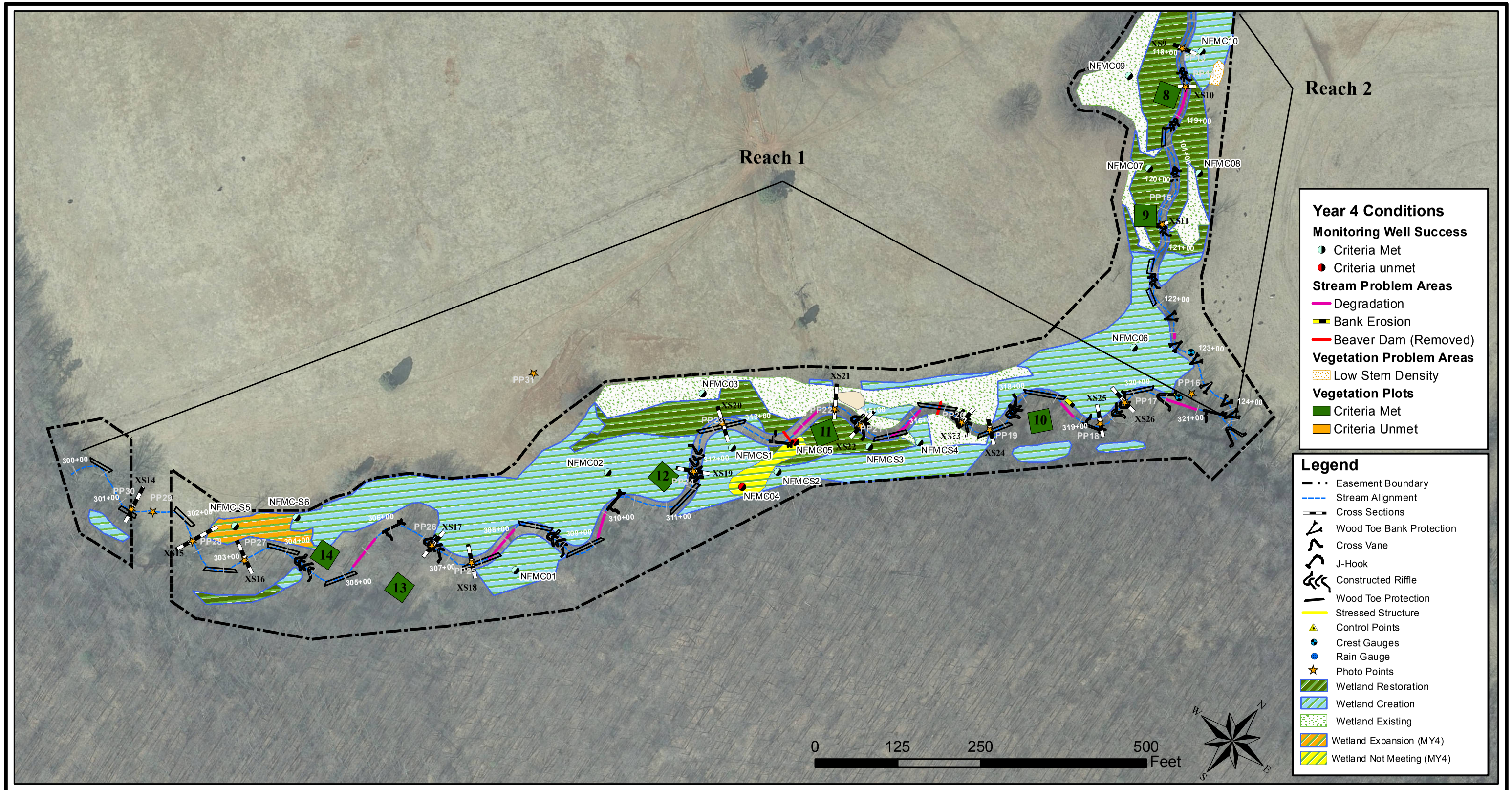
Prepared for	**Project:** North Fork Mountain Creek Stream and Wetland Restoration Year 4 Monitoring Catawba County, North Carolina	Notes: 1) 2010 Aerial Photo 2) Base Map Data Provided by Stantec.	Prepared by:
res	Sheet 1 of 3		EQUINOX
	Date	Project Number	
	November 2015	NCEEP # 94151	

Figure 2. Integrated Current Condition Plan View



Prepared for	**Project:** North Fork Mountain Creek Stream and Wetland Restoration Year 4 Monitoring Catawba County, North Carolina	Notes: 1) 2010 Aerial Photo 2) Base Map Data Provided by Stantec.	Prepared by
res	Sheet 2 of 3		EQUINOX
	Date	Project Number	
	November 2015	NCEEP # 94151	

Figure 2. Integrated Current Condition Plan View



Prepared for	**Project:** North Fork Mountain Creek Stream and Wetland Restoration Year 4 Monitoring Catawba County, North Carolina	Notes: 1) 2010 Aerial Photo 2) Base Map Data Provided by Stantec.	Prepared by
res	Sheet 3 of 3		EQUINOX
	Date	Project Number	
	November 2015	NCEEP # 94151	

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Table 4a. Stream Problem Areas Table North Fork Mountain Creek Stream and Wetland / Project No. 94151				
Reach	**STA**	**Feature**	**Description**	**Notes**
1	305+50, 308+00, 310+00,314+00, 315+75, 320+50	Bed	Degradation	
1	318+50	Bed/Bank	Degradation/Erosion	
1	320+60	Bank	Erosion/Scour	
1	321+50	Bank	Erosion/Scour	
2	118+50	Bed	Headcut/Degradation	
2	122+50	Riffle	Degradation	
4	102+30	Structure	Stressed Structure	

Table 4b. Vegetation Problem Areas Table North Fork Mountain Creek Stream and Wetland / Project No. 94151				
Reach	**STA**	**Feature**	**Description**	**Notes**
2	106+00	Bench	Bare Area	
2	111+50	Bench	Low Stem Density/Bare Area	
2	118+00	Bench	Low Stem Density/Bare Area	
3	201+50	Bench	Low Stem Density/Bare Area	
3	201+50	Easement	Exotic Invasive- Treated	*Lonicera japonica*
3	203+50	Bench	Low Stem Density/Bare Area	
3	205+50	Bench	Low Stem Density/Bare Area	

Reach 4 Permanent Photo Points

Reach 4 – Permanent Photo Point 1
Downstream
March 11, 2015

Reach 4 – Permanent Photo Point 2
Downstream
March 11, 2015

Reach 4 Permanent Photo Points

Reach 4 – Permanent Photo Point 3
Downstream
March 11, 2015

Reach 4 – Permanent Photo Point 3
Upstream
March 11, 2015

Reach 3 Permanent Photo Points

Reach 3 – Permanent Photo Point 4
Downstream
March 11, 2015

Reach 3 – Permanent Photo Point 5
Downstream
March 11, 2015

Reach 3 Permanent Photo Points

Reach 3 – Permanent Photo Point 6
Downstream
March 11, 2015

Reach 3 – Permanent Photo Point 6
Upstream
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 7
Downstream
March 11, 2015

Reach 2 – Permanent Photo Point 8
Downstream
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 9
Downstream
March 11, 2015

Reach 2 – Permanent Photo Point 10
Downstream
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 11
Downstream
March 11, 2015

Reach 2 – Permanent Photo Point 12
Downstream
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 13
Downstream
March 11, 2015

Reach 2 – Permanent Photo Point 14
Downstream
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 15
Downstream
March 11, 2015

Reach 2 – Permanent Photo Point 16
North
March 11, 2015

Reach 2 Permanent Photo Points

Reach 2 – Permanent Photo Point 16
Northwest
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 16
Southwest
March 11, 2015

Reach 1 – Permanent Photo Point 17
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 18
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 19
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 20
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 21
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 22
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 23
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 24
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 25
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 26
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 27
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 28
Downstream
March 11, 2015

Reach 1 – Permanent Photo Point 29
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 29
Upstream
March 11, 2015

Reach 1 – Permanent Photo Point 30
Downstream
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 31
Northeast
March 11, 2015

Reach 1 – Permanent Photo Point 31
Southeast
March 11, 2015

Reach 1 Permanent Photo Points

Reach 1 – Permanent Photo Point 31
South
March 11, 2015

Vegetation Plots

Vegetation Plot 1

Vegetation Plot 2

Vegetation Plot 3

Vegetation Plot 4

Vegetation Plots

Vegetation Plot 5

Vegetation Plot 6

Vegetation Plots

Vegetation Plot 7

Vegetation Plot 8

Vegetation Plots

Vegetation Plot 9

Vegetation Plot 10

Vegetation Plots

Vegetation Plot 11

Vegetation Plot 12

Vegetation Plot 13

Vegetation Plot 14

Representative Photos Documenting Bankfull Event

Reach 2 Sta. 110+50 – Wrack Lines

Reach 1 Sta. 308+00 – Wrack Lines

Representative Photo of Stream and Vegetation Area Requiring Observation

Reach 1 Sta. 305+50 – Riffle Degradation

Reach 2 Sta. 309+50– Riffle Degradation

Representative Photos of Stream and Vegetation Area Requiring Observation

Reach 2 Sta. 118+50—Bed Degradation with Headcut (Looking Downstream)

Reach 1 Sta. 321+50—Erosion along Left Descending Bank

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Appendix C
Vegetation Plot Data

Table 5. MY3 Vegetation Plot Criteria Attainment North Fork Mountain Creek / Project No. 94151		
Vegetation Plot ID	**Vegetation Survival Threshold Met?**	**Tract Mean**
1	Yes	100%
2	Yes	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	
8	Yes	
9	Yes	
10	Yes	
11	Yes	
12	Yes	
13	Yes	
14	Yes	

Table 6. CVS Vegetation Plot Metadata North Fork Mountain Creek/Project No. 94151	
Report Prepared By	Owen Carson
Date Prepared	8/11/2014 12:44
database name	Equinox_2014_B_NFMC_MY3.mdb
database location	Z:\ES\NRI&M\EBX Monitoring\NF Mountain Creek\NFMC-MY3-2014\Data\Veg
computer name	FIELDTECH3-PC
file size	46088192
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	171300307
project Name	North Fork Mountain Creek
Description	
River Basin	Catawba
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	14

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Table 7a. Planted and Total Stem Counts (Species by Plot with Annual Means)

North Fork Mountain Creek/Project No. 94151

			Current Plot Data (MY3 2014)																								
			Plot 1			Plot 2			Plot 3			Plot 4			Plot 5			Plot 6			Plot 7			Plot 8		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum var. rubrum	Red maple	Tree																								
Alnus serrulata	Hazel alder	Shrub										1	1	2												1
Betula nigra	River birch	Tree																						4	4	4
Carpinus caroliniana	American hornbeam	Tree																								
Carpinus caroliniana var. carolinia	Coastal american hornb	Tree																								
Cephalanthus occidentalis	Common buttonbush	Shrub																								
Cornus amomum	Silky dogwood	Shrub	1	1	1				3	3	3															
Diospyros virginiana	Common persimmon	Tree																								3
Fraxinus pennsylvanica	Green ash	Tree	1	1	1	4	4	4	1	1	1	9	9	9				1	1	1	4	4	4	2	2	2
Juglans nigra	Black walnut	Tree							3	3	3	1	1	1												
Liquidambar styraciflua	Sweetgum	Tree			1															31						
Liriodendron tulipifera	Tuliptree	Tree	3	3	3	2	2	2	5	5	5	2	2	2	9	9	9	6	6	6						
Liriodendron tulipifera var. tulipife	Tulip-tree, Yellow Popla	Tree												4												
Nyssa sylvatica	Blackgum	Tree																								
Platanus occidentalis	American sycamore	Tree	1	1	1	3	3	3	2	2	2	12	12	12	4	4	4	1	1	1	15	15	15	12	12	12
Platanus occidentalis var. occident	Sycamore, Plane-tree	Tree												4												2
Prunus serotina var. serotina	Black cherry	Tree			1			1									2			2						
Quercus	Oak	Tree																								
Quercus alba	White oak	Tree	5	5	5	1	1	1	1	1	1				6	6	6	4	4	4	3	3	3			
Quercus phellos	Willow oak	Tree	1	1	1	7	7	7	6	6	6	6	6	6	4	4	4	5	5	5	8	8	9	6	6	6
Quercus rubra	Northern red oak	Tree	3	3	3	1	1	1							2	2	2	1	1	1	2	2	2			
Quercus rubra var. rubra	Northern red oak	Tree			1																		1			
Rhus	Sumac	shrub																								
Rhus aromatica var. aromatica	Fragrant sumac	Shrub																								
Rhus glabra	Smooth sumac	shrub						1			6						1									
Salix nigra	Black willow	Tree						1						11												3
Unknown		Shrub or Tree																								
		Stem count	15	15	18	18	18	21	21	21	27	31	31	51	25	25	28	18	18	51	32	32	34	24	24	33
		size (ares)	1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	7	7	10	6	6	9	7	7	8	6	6	9	5	5	7	6	6	8	5	5	6	4	4	8
		Stems per ACRE	607	607	728	728	728	850	850	850	1093	1255	1255	2064	1012	1012	1133	728	728	2064	1295	1295	1376	971	971	1335

Color for Density
Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%

Table 7b. Planted and Total Stem Counts (Species by Plot with Annual Means)

North Fork Mountain Creek/Project No. 94151

			Plot 9			Plot 10			Plot 11			Plot 12			Plot 13			Plot 14			Annual Means								
																					MY3 (2014)			MY2 (2013)			MY1 (2012)			MY0 (2012)		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum var. rubrum	Red maple	Tree						2												5			7			1					
Alnus serrulata	Hazel alder	Shrub						17			25	1	1	2	2	2	5				4	4	52	4	4	51	3	3	17	3	3	3
Betula nigra	River birch	Tree	2	2	2	5	5	5				7	7	9				3	3	4	21	21	24	21	21	21	24	24	24	25	25	25
Carpinus caroliniana	American hornbeam	Tree				1	1	1	3	3	3	1	1	1							5	5	5	7	7	7	7	7	7	8	8	8
Carpinus caroliniana var. carolinia	Coastal american hornb	Tree				1	1	1													1	1	1	1	1	1						
Cephalanthus occidentalis	Common buttonbush	Shrub										2	2	2	1	1	1	1	1	1	4	4	4	4	4	7	4	4	4	4	4	4
Cornus amomum	Silky dogwood	Shrub															1			7	4	4	12	4	4	6	3	3	3			
Diospyros virginiana	Common persimmon	Tree																		2			5			3						
Fraxinus pennsylvanica	Green ash	Tree	3	3	4	2	2	2	3	3	3	1	1	1	1	1	1	7	7	7	39	39	40	40	40	40	41	41	41	44	44	44
Juglans nigra	Black walnut	Tree				2	2	2	1	1	1				1	1	1	3	3	3	11	11	11	11	11	14	10	10	10	11	11	11
Liquidambar styraciflua	Sweetgum	Tree						9						9			23						73			15			10			
Liriodendron tulipifera	Tuliptree	Tree				4	4	4	3	3	3				3	3	3	2	2	2	39	39	39	40	40	40	41	41	45	47	47	47
Liriodendron tulipifera var. tulipife	Tulip-tree, yellow popla	Tree																		1			5			11						
Nyssa sylvatica	Blackgum	Tree																											5			
Platanus occidentalis	American sycamore	Tree	11	11	11	3	3	3	9	9	9	8	8	8	2	2	2	1	1	1	84	84	84	86	86	86	86	86	86	91	91	91
Platanus occidentalis var. occident	Sycamore, plane-tree	Tree															1						7			3						
Prunus serotina var. serotina	Black cherry	Tree																					6			3						
Quercus	Oak	Tree																									3	3	3	28	28	28
Quercus alba	White oak	Tree																			20	20	20	19	19	19	5	5	5			
Quercus phellos	Willow oak	Tree	2	2	2	4	4	4	4	4	4	3	3	3	4	4	4	2	2	2	62	62	63	67	67	67	62	62	62	49	49	49
Quercus rubra	Northern red oak	Tree													1	1	1				10	10	10	11	11	11	23	23	23	31	31	31
Quercus rubra var. rubra	Northern red oak	Tree																					2									
Rhus	Sumac	shrub																											5			
Rhus aromatica var. aromatica	Fragrant sumac	Shrub																								6						
Rhus glabra	Smooth sumac	shrub																					8			1						
Salix nigra	Black willow	Tree			1			1															17			6			3			
Unknown		Shrub or Tree																												1	1	1
		Stem count	18	18	20	22	22	51	23	23	48	23	23	35	15	15	43	19	19	35	304	304	495	315	315	419	312	312	353	342	342	342
		size (ares)	1			1			1			1			1			1			14			14			14			14		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.35			0.35			0.35			0.35		
		Species count	4	4	5	8	8	12	6	6	7	7	7	8	8	8	11	7	7	11	13	13	22	13	13	22	13	13	17	12	12	12
		Stems per ACRE	728	728	809	890	890	2064	931	931	1942	931	931	1416	607	607	1740	769	769	1416	879	879	1431	911	911	1211	902	902	1020	989	989	989

Color for Density
Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%

Appendix D
Stream Geomorphology Data

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Table 8. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 1 (2,231 feet)

	Cross-Section 14 Pool						Cross-Section 15 Riffle						Cross-Section 16 Riffle						Cross-Section 17 Riffle						Cross-Section 18 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	890.9	890.9	890.9	890.9	-		889.7	889.7	889.7	889.7	-		889.4	889.4	889.4	889.4	-		886.6	886.6	886.6	886.6	-		886.2	886.2	886.2	886.2	-	
Bankfull Width (ft)	20.6	19.4	18.3	18.4	-		17.3	16.3	16.2	16.1	-		19.3	18.6	18.7	18.4	-		17.5	18.6	19.8	19.4	-		25.8	27.8	27.2	28.0	-	
Floodprone Width (ft)	59.3	>150.0	>150.0	>150	-		100.0	>150.0	>150.0	>150	-		55.7	>150.0	>150.0	>150	-		50.3	>150.0	>150.0	>150	-		53.3	>150.0	>150.0	>150	-	
Bankfull Mean Depth (ft)	1.2	1.3	1.4	1.3	-		1.2	1.0	1.0	1.0	-		1.3	1.2	1.2	1.2	-		1.4	1.2	1.2	1.2	-		1.4	1.3	1.3	1.2	-	
Bankfull Max Depth (ft)	3.1	3.0	3.0	3.1	-		2.2	2.1	2.2	2.2	-		2.3	2.2	2.2	2.2	-		2.3	2.2	2.6	2.8	-		3.4	3.6	3.5	3.2	-	
Bankfull Cross Sectional Area (ft^2)	25.6	25.0	25.5	24.7	-		19.9	17.0	16.7	15.9	-		25.4	22.4	22.5	21.8	-		23.9	23.0	23.8	24.0	-		35.1	36	34	32.2	-	
Bankfull Width/Depth Ratio	16.6	15.0	13.1	13.7	-		15.1	15.6	15.7	16.2	-		14.8	15.4	15.6	15.5	-		12.7	15.0	16.5	15.7	-		19.0	21.5	21.7	24.3	-	
Bankfull Entrenchment Ratio	2.9	7.7	8.2	8.6	-		5.8	9.2	9.3	9.3	-		2.9	8.1	8.0	8.2	-		2.9	8.1	7.6	7.7	-		2.1	5.4	5.5	5.4	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	83.1	-		-	-	-	70.4	-		-	-	-	61.8	-		-	-	-	67.4	-		-	-	-	91.6	-	
d50 (mm)	-	-	-	-	-		-	-	-	10.0	-		-	-	-	17.0	-		-	-	-	18.0	-		-	-	-	-	-	

Table 8. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 1 (2,231 feet)

	Cross-Section 19 Riffle						Cross-Section 20 Pool						Cross-Section 21 Pool						Cross-Section 22 Riffle						Cross-Section 23 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	883.0	883.0	883.0	883.0	-		882.6	882.6	882.6	882.6	-		880.6	880.6	880.6	880.6	-		880.0	880.0	880.0	880.0	-		878.2	878.2	878.2	878.2	-	
Bankfull Width (ft)	21.7	21.5	22.3	22.1	-		25.3	24.8	25.1	25.3	-		23.0	21.4	21.0	21.5	-		20.7	18.2	18.1	18.0	-		18.6	19.0	19.6	19.6	-	
Floodprone Width (ft)	100.0	>150.0	>150.0	>150.0	-		56.1	>150.0	>150.0	>150.0	-		54.5	>150.0	>150.0	>150.0	-		54.0	>150.0	>150.0	>150.0	-		39.5	>150.0	>150.0	>150.0	-	
Bankfull Mean Depth (ft)	1.2	1.1	1.0	1.0	-		1.5	1.2	1.1	1.1	-		1.5	1.5	1.5	1.3	-		1.1	1.1	1.1	1.1	-		1.2	1.1	1.1	1.0	-	
Bankfull Max Depth (ft)	2.1	2.1	2.1	2.2	-		3.3	2.9	3.0	3.0	-		3.4	3.4	4.1	3.1	-		2.2	1.9	2.2	2.3	-		2.4	2.3	2.5	2.5	-	
Bankfull Cross Sectional Area (ft^2)	25.8	23.9	23.3	22.5	-		36.7	30.3	28.8	28.3	-		34.2	31.5	31.9	27.8	-		22.0	19.6	19.6	19.9	-		22.7	21.0	21.0	19.8	-	
Bankfull Width/Depth Ratio	18.2	19.4	21.4	21.7	-		17.4	20.3	22.0	22.6	-		15.5	14.5	13.9	16.6	-		19.6	17.0	16.7	16.3	-		15.2	17.3	18.3	19.4	-	
Bankfull Entrenchment Ratio	4.6	7.0	6.7	6.8	-		2.2	6.0	6.0	5.9	-		2.4	7.0	7.1	7.0	-		2.6	8.2	8.3	8.3	-		2.1	7.9	7.6	7.7	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	58.9	-		-	-	-	79.0	-		-	-	-	70.4	-		-	-	-	56.6	-		-	-	-	66.2	-	
d50 (mm)	-	-	-	12.0	-		-	-	-	-	-		-	-	-	-	-		-	-	-	29.0	-		-	-	-	8.9	-	

Table 8. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 1 (2,231 feet)

	Cross-Section 24 Pool						Cross-Section 25 Pool						Cross-Section 26 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	877.8	877.8	877.8	877.8	-		876.2	876.2	876.2	876.2	-		875.2	875.2	875.2	875.2	-	
Bankfull Width (ft)	18.6	18.2	18.6	18.1	-		18.7	19.4	18.9	19.6	-		18.8	19.5	19.9	20.5	-	
Floodprone Width (ft)	42.3	>150.0	>150.0	>150.0	-		50.3	>150.0	>150.0	>150.0	-		50.1	>150.0	>150.0	>150.0	-	
Bankfull Mean Depth (ft)	1.1	1.1	1.1	1.1	-		1.4	1.4	1.3	1.2	-		1.0	1.0	1.0	1.0	-	
Bankfull Max Depth (ft)	2.5	2.5	2.7	2.6	-		3.0	3.2	3.0	2.9	-		1.6	2.5	2.3	2.7	-	
Bankfull Cross Sectional Area (ft^2)	21.2	20.7	20.5	19.4	-		26.2	26.3	25.3	24.4	-		19.4	19.8	19.9	19.6	-	
Bankfull Width/Depth Ratio	16.3	16.0	16.8	16.9	-		13.3	14.2	14.1	15.7	-		18.2	19.3	19.9	21.4	-	
Bankfull Entrenchment Ratio	2.3	8.2	8.1	8.3	-		2.7	7.7	7.9	7.7	-		2.7	7.7	7.5	7.3	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	76.5	-		-	-	-	73.3	-		-	-	-	83.6	-	
d50 (mm)	-	-	-	-	-		-	-	-	-	-					29.0	-	

Table 8. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 2 (1,756 feet)

	Cross-Section 3 Riffle						Cross-Section 4 Pool						Cross-Section 5 Pool						Cross-Section 6 Riffle						Cross-Section 7 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	901.2	901.2	901.2	901.2	-		900.1	900.1	900.1	900.1	-		892.6	892.6	892.6	892.6	-		892.6	892.5	892.5	892.5	-		889.4	889.4	889.4	889.4	-	
Bankfull Width (ft)	12.8	14.4	14.5	14.0	-		10.9	9.3	10.8	10.3	-		9.6	9.8	10.2	10.0	-		12.0	11.4	12.1	11.6	-		15.0	12.7	13.6	13.5	-	
Floodprone Width (ft)	22.5	>25	>25	>23.1	-		22.2	>20	>20	>20	-		50.9	>50	>50	>50	-		45.8	>40	>40	>46.2	-		45.4	>40.0	>40.0	>45	-	
Bankfull Mean Depth (ft)	0.8	0.8	0.8	0.8	-		0.8	0.9	1.0	1.1	-		1.2	1.2	1.1	1.2	-		0.7	0.7	0.7	0.8	-		0.9	0.9	0.9	0.9	-	
Bankfull Max Depth (ft)	1.6	1.7	1.7	1.9	-		1.6	1.5	1.8	2.4	-		2.3	2.0	2.0	2.5	-		1.6	1.7	1.7	1.9	-		2.6	2.2	2.2	2.0	-	
Bankfull Cross Sectional Area (ft^2)	10.1	11.5	11.7	11.8	-		9.2	8.0	10.5	11.7	-		11.0	11.3	11.3	12.4	-		8.7	8.5	8.8	8.8	-		13.7	11.8	12.8	12.5	-	
Bankfull Width/Depth Ratio	16.2	18.0	17.9	16.5	-		13.0	10.9	11.2	9.1	-		8.3	8.4	9.1	8.1	-		16.6	15.2	16.5	15.3	-		16.5	13.6	14.5	14.5	-	
Bankfull Entrenchment Ratio	1.0	1.6	1.6	1.7	-		2.0	2.2	1.9	2.0	-		5.3	5.2	5.0	5.0	-		3.8	4.1	3.8	4.0	-		3.0	3.6	3.4	3.4	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	64.6	-		-	-	-	40.9	-		-	-	-	76.8	-		-	-	-	8.8	-		-	-	-	73.1	-	
d50 (mm)	-	-	-	6.9	-		-	-	-	-	-		-	-	-	-	-		-	-	-	11.0	-		-	-	-	-	-	

N/A - Item does not apply.
- Information unavailable.

Table 8. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 2 (1,756 feet)

	Cross-Section 8 Riffle						Cross-Section 9 Riffle						Cross-Section 10 Pool						Cross-Section 11 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	888.9	888.9	888.9	888.9	-		883.4	883.4	883.4	883.4	-		882.8	882.8	882.8	882.8	-		878.7	878.7	878.7	878.7	-	
Bankfull Width (ft)	11.9	11.4	12.3	11.4	-		15.4	12.8	13.0	13.8	-		13.7	13.3	13.0	12.4	-		11.3	9.0	7.8	6.3	-	
Floodprone Width (ft)	50.0	>40.0	>40	>40	-		40.0	>40	>40	>38.7	-		30.0	>150.0	>150.0	>200	-		30.0	>150.0	>150.0	>150	-	
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.8	-		0.5	0.5	0.5	0.5	-		0.6	0.6	0.7	0.7	-		0.7	0.5	0.6	0.7	-	
Bankfull Max Depth (ft)	1.6	1.7	1.7	1.9	-		1.1	1.1	1.5	1.5	-		1.9	1.4	1.8	1.8	-		1.2	1.0	1.2	1.2	-	
Bankfull Cross Sectional Area (ft^2)	10.2	9.1	9.4	8.9	-		8.1	6.1	6.6	7.4	-		8.8	8.1	8.6	8.6	-		7.4	4.7	4.9	4.3	-	
Bankfull Width/Depth Ratio	13.9	14.3	16.0	14.7	-		29.0	26.8	25.9	25.9	-		21.3	21.8	19.8	17.8	-		17.1	17.0	12.4	9.1	-	
Bankfull Entrenchment Ratio	4.2	3.5	3.3	3.5	-		2.6	3.0	3.0	2.8	-		2.2	11.3	15.3	16.2	-		2.7	16.7	25.7	24.0	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	30.4	-		-	-	-	46.8	-		-	-	-	28.1	-		-	-	-	15.0	-	
d50 (mm)	-	-	-	0.062	-		-	-	-	17.0	-		-	-	-	-	-		-	-	-	12.0	-	

- Information unavailable.
*Elevation data was offset to match MY2 data

Table 8. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 3 (698 feet)												
	Cross-Section 12 Riffle						Cross-Section 13 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	918.0	918.0	918.0	918.0	-		916.8	916.8	916.8	916.8	-	
Bankfull Width (ft)	7.2	8.3	7.9	7.5	-		8.1	7.6	8.6	8.8	-	
Floodprone Width (ft)	22.8	>30	>30	>20	-		33.2	>30	>30	>30	-	
Bankfull Mean Depth (ft)	0.6	0.5	0.5	0.5	-		1.1	1.2	1.1	1.0	-	
Bankfull Max Depth (ft)	1.0	0.9	0.9	0.8	-		2.2	2.1	2.0	1.9	-	
Bankfull Cross Sectional Area (ft^2)	4.2	3.8	3.8	3.5	-		9.1	9.4	9.4	9.0	-	
Bankfull Width/Depth Ratio	12.5	17.9	16.4	15.9	-		7.2	6.1	7.9	8.6	-	
Bankfull Entrenchment Ratio	3.2	2.7	2.8	2.8	-		4.1	4.4	3.9	3.8	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	45.0	-		-	-	-	60.1	-	
d50 (mm)	-	-	-	0.062	-		-	-	-	-	-	

- Information unavailable.
*Elevation data was offset to match MY2 data

Table 8. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) North Fork Mountain Creek Stream & Wetland / Project No. 94151 - Reach 4 (614 feet)												
	Cross-Section 1 Riffle						Cross-Section 2 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	919.6	919.6	919.6	919.6	-		917.5	917.5	917.5	917.5	-	
Bankfull Width (ft)	7.8	8.4	8.4	8.5	-		7.1	10.2	10.8	8.1	-	
Floodprone Width (ft)	50.0	>40.0	>40.0	>40.0	-		34.2	>40.0	>40	24.3	-	
Bankfull Mean Depth (ft)	0.6	0.5	0.4	0.4	-		1.5	1.3	1.0	0.8	-	
Bankfull Max Depth (ft)	0.9	0.8	0.6	0.8	-		2.1	2.1	2	1.5	-	
Bankfull Cross Sectional Area (ft^2)	4.7	4.2	3.1	3.5	-		10.6	13.6	10.5	9.1	-	
Bankfull Width/Depth Ratio	12.8	16.5	22.8	20.3	-		4.8	7.7	11.2	12.9	-	
Bankfull Entrenchment Ratio	6.4	5.0	5.0	5.0	-		4.8	2.4	2.2	2.2	-	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	-		1.0	1.0	1.0	1.0	-	
Cross Sectional Area between End Pins (ft^2)	-	-	-	12.5	-		-	-	-	52.6	-	
d50 (mm)	-	-	-	0.062	-		-	-	-	-	-	

- Information unavailable.
*Elevation data was offset to match MY2 data

Table 9. North Fork Mountain Creek Stream & Wetland / Project No.94151 MY3 Bank Pin Arrays					
Cross Section #	Length of Exposed Pin (mm)			Rate	
	Upstream	At Cross Section	Downstream	mm/yr	ft/yr
2	0[B]	0[B]	0[B]	0	0.00
4	-	0[B]	5	0	0.01
5	70	14	9	31	0.10
7	0[B]	0[B]	0[B]	0	0.00
10	0[B]	0[B]	M	0	0.00
13	0[B]	0[B]	0[B]	0	0.00
14	0[B]	0[B]	M	0	0.00
18	0[B]	0[B]	0[B]	0	0.00
20 (Lower Transect)	0[B]	0[B]	0[B]	0	0.00
20 (Upper Transect)	50	0	54	35	0.11
21	0[B]	9	0[B]	3	0.01
24	0[B]	0[B]	0[B]	0	0.00
25	-	0[B]	0[B]	0	0.00

- Pin not installed due to constraints in bank.

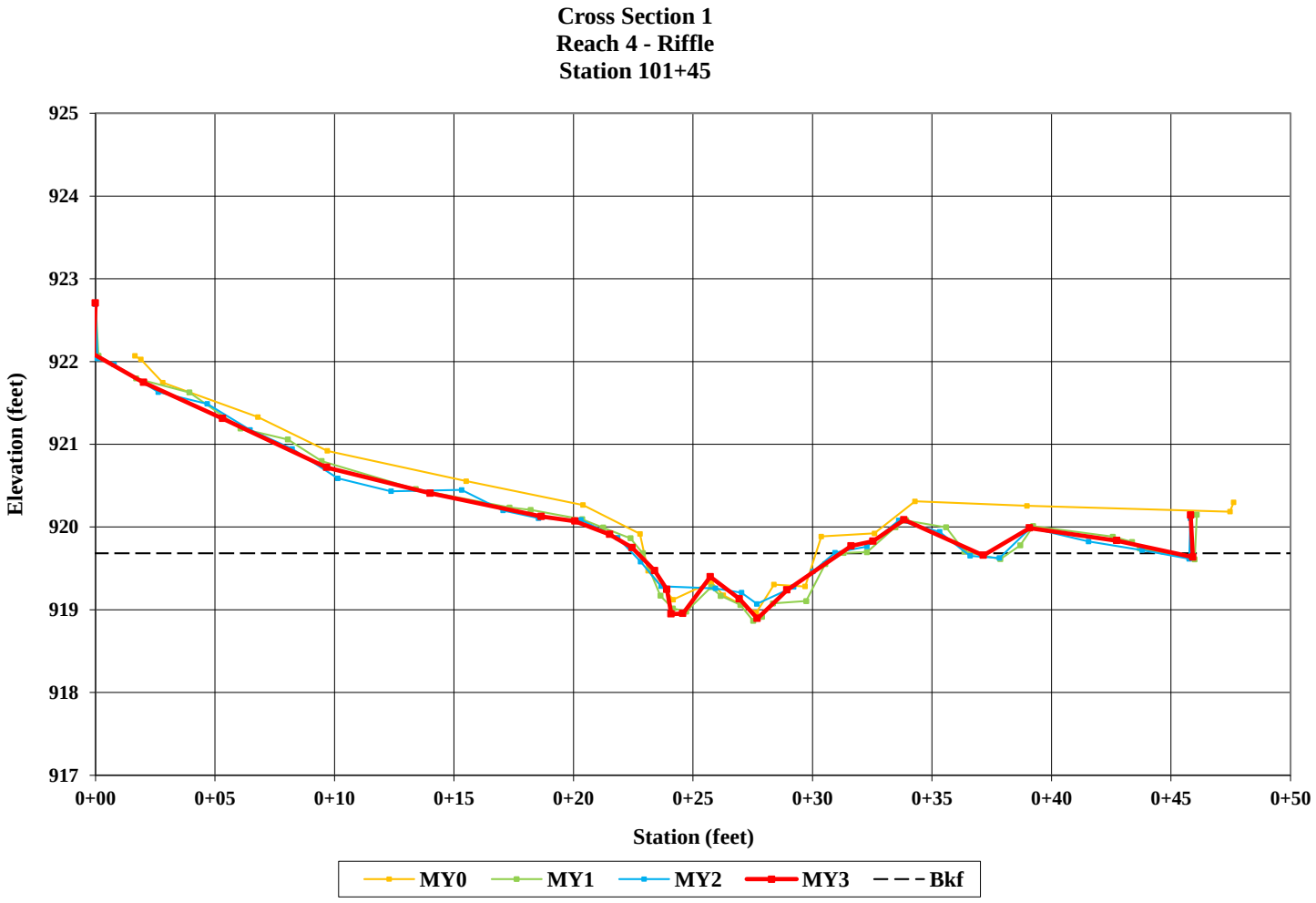
[B] Buried with soft accretions on bank.

M - Missing

Cross Section 1 Reach 4 – Riffle

Left Bank Descending

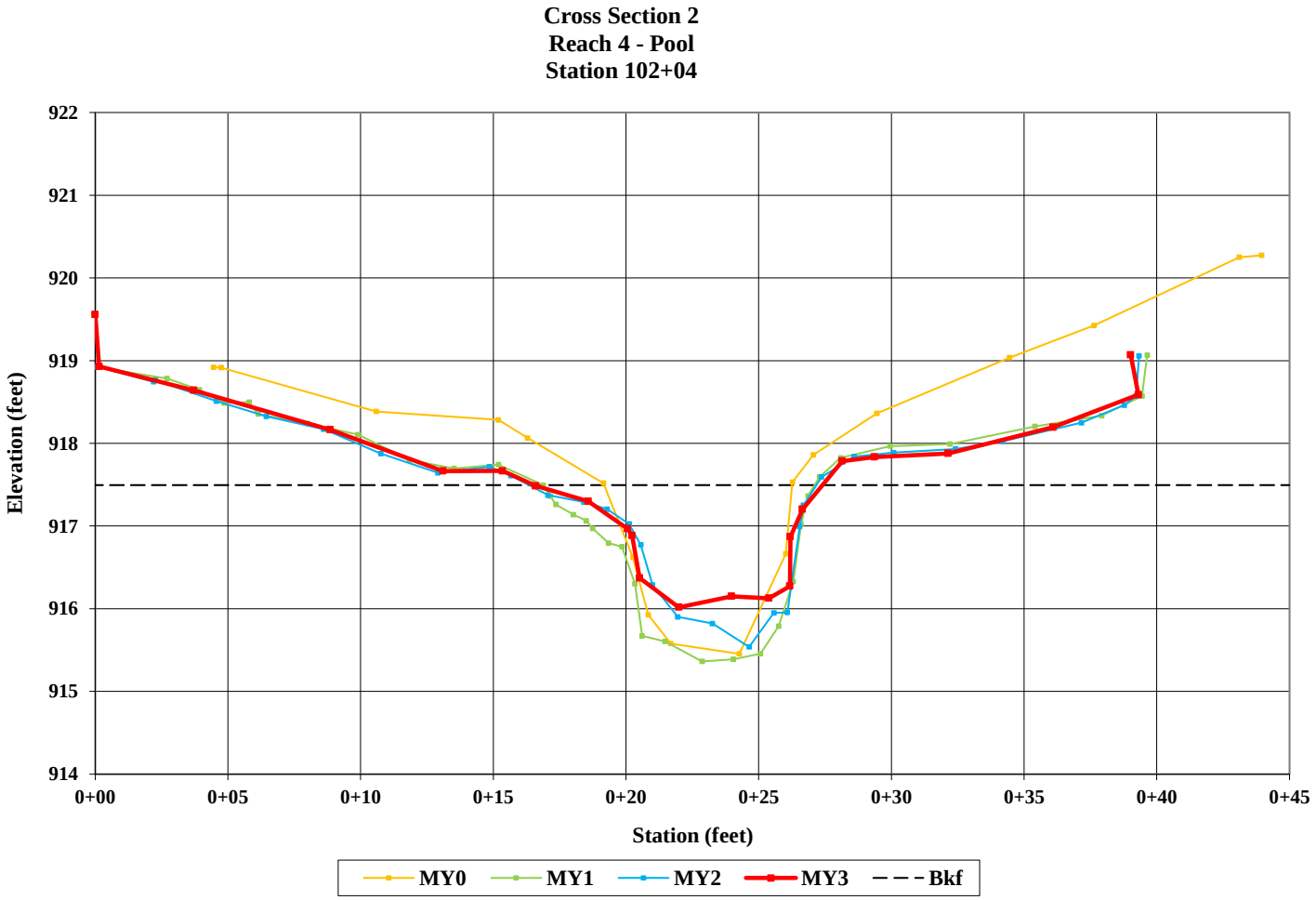
Right Bank Descending



Cross Section 2 Reach 4 – Pool

Left Bank Descending

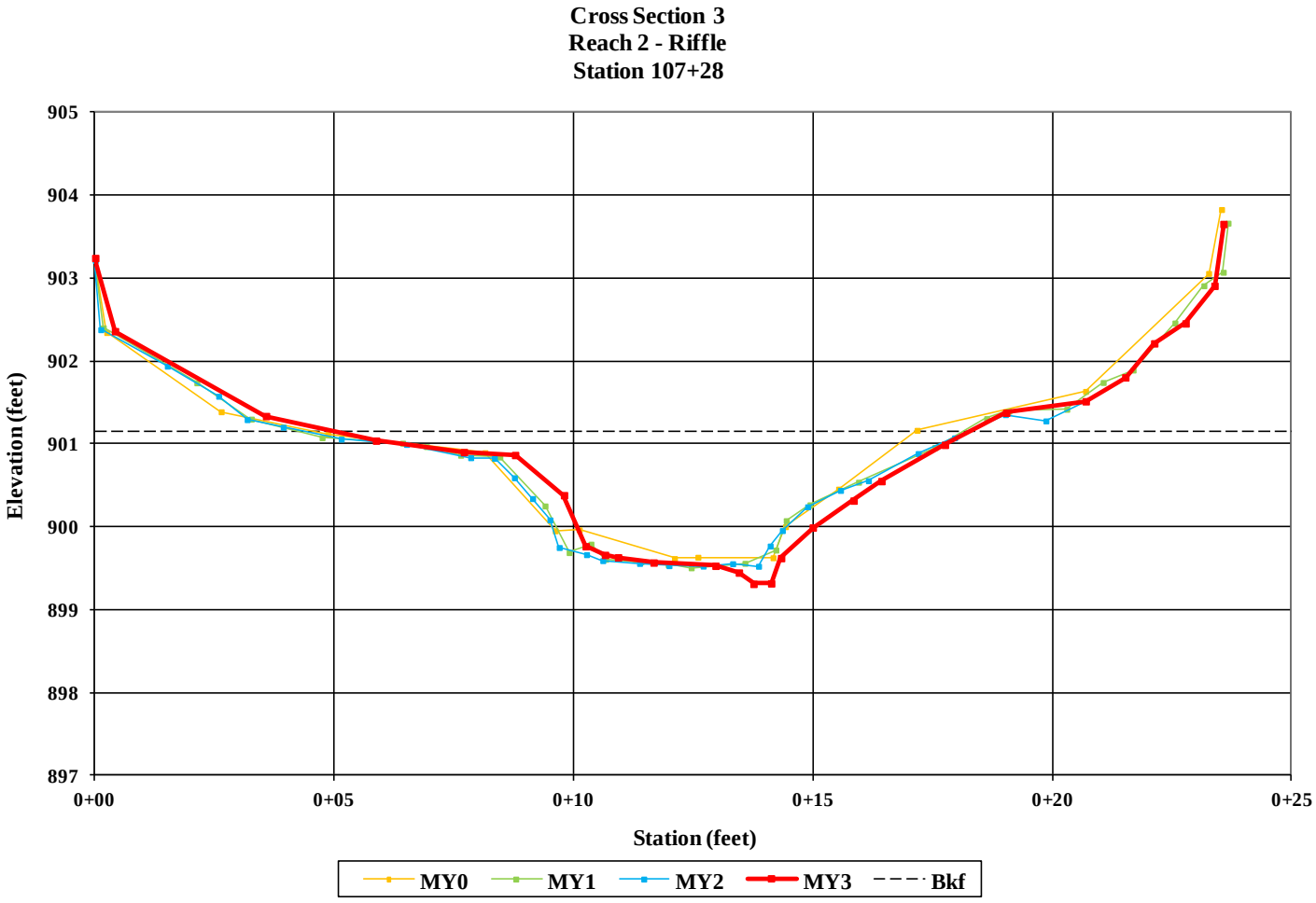
Right Bank Descending



Cross Section 3 Reach 2 – Riffle

Left Bank Descending

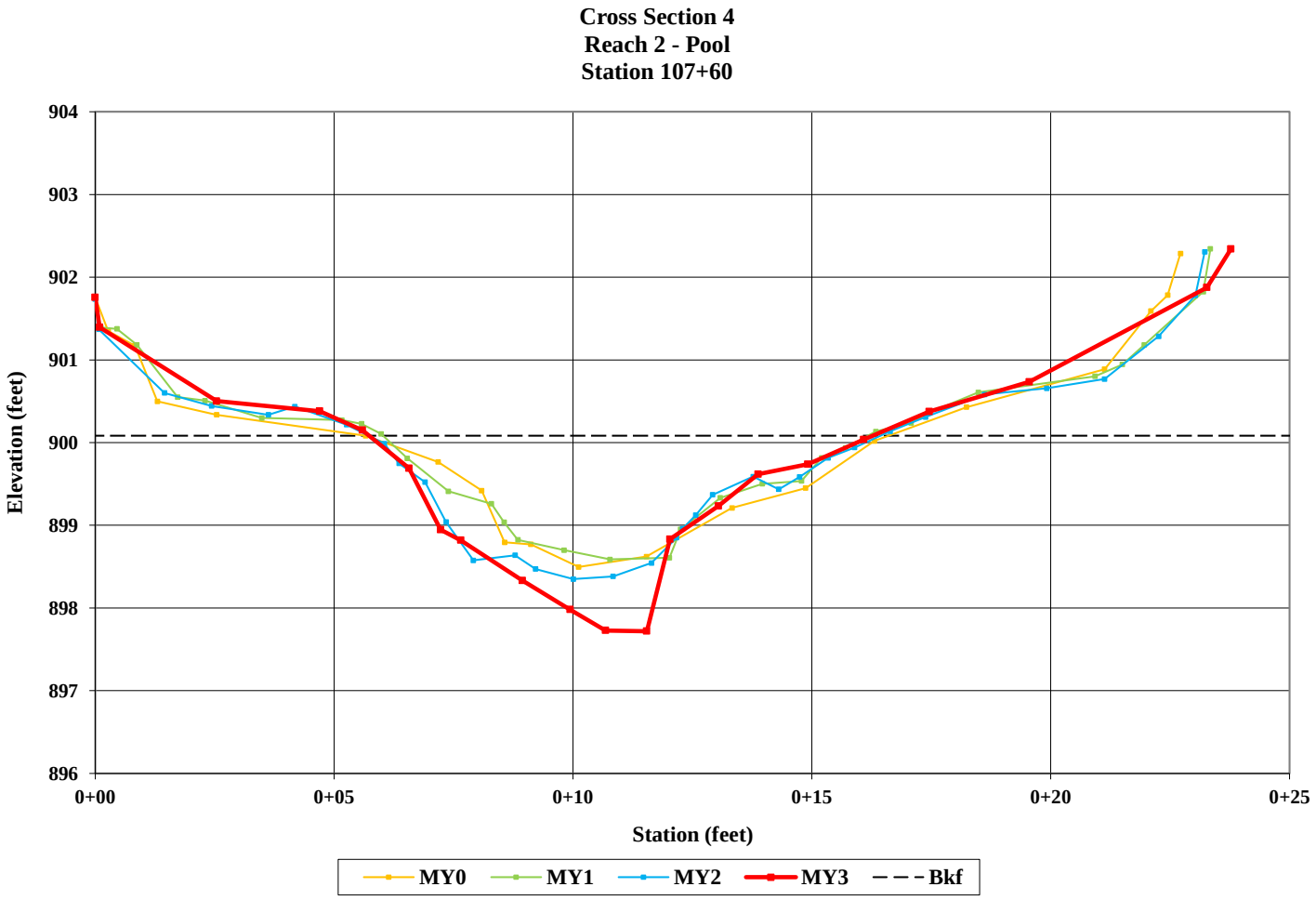
Right Bank Descending



Cross Section 4 Reach 2 – Pool

Left Bank Descending

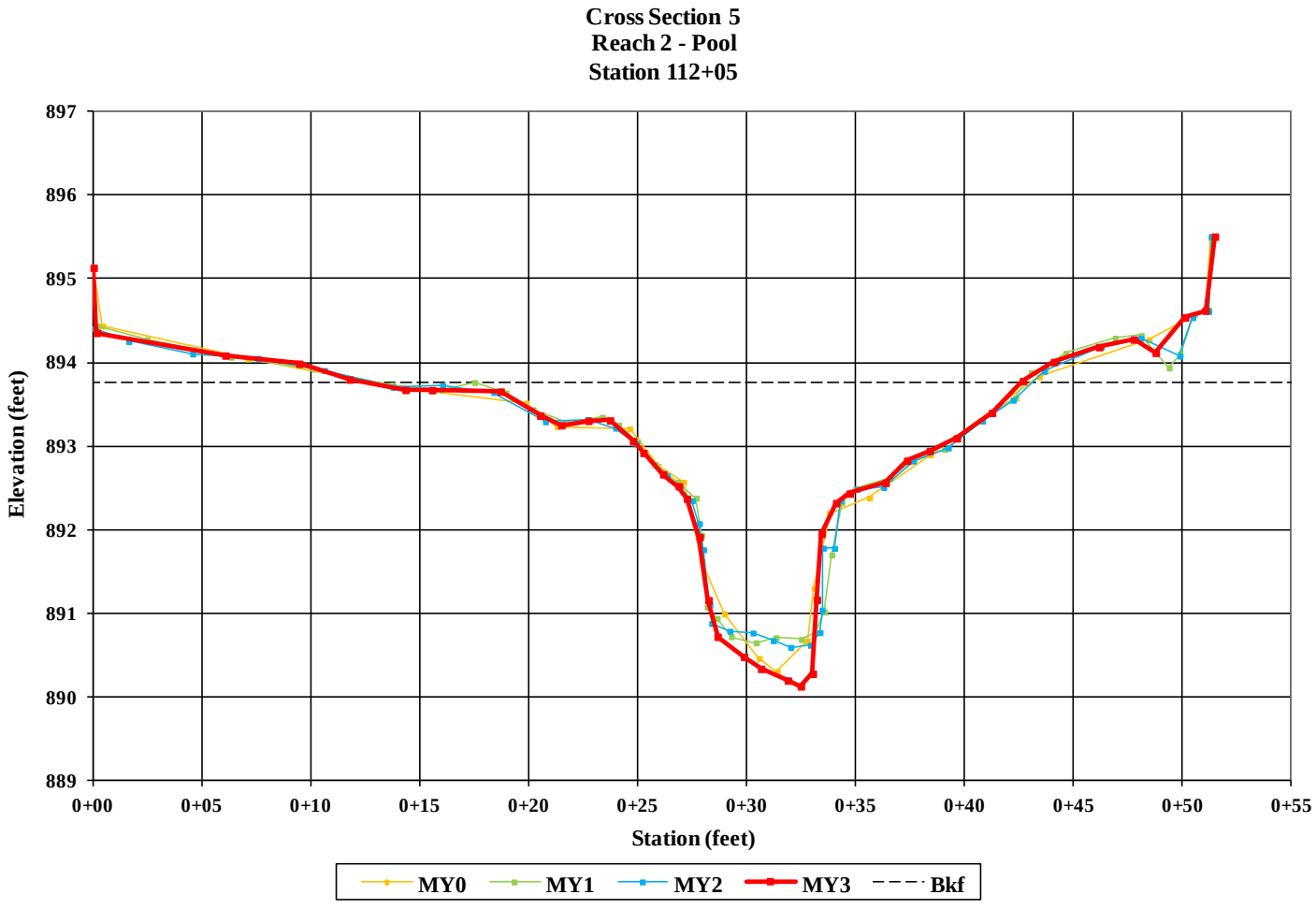
Right Bank Descending



Cross Section 5 Reach 2 – Pool

Left Bank Descending

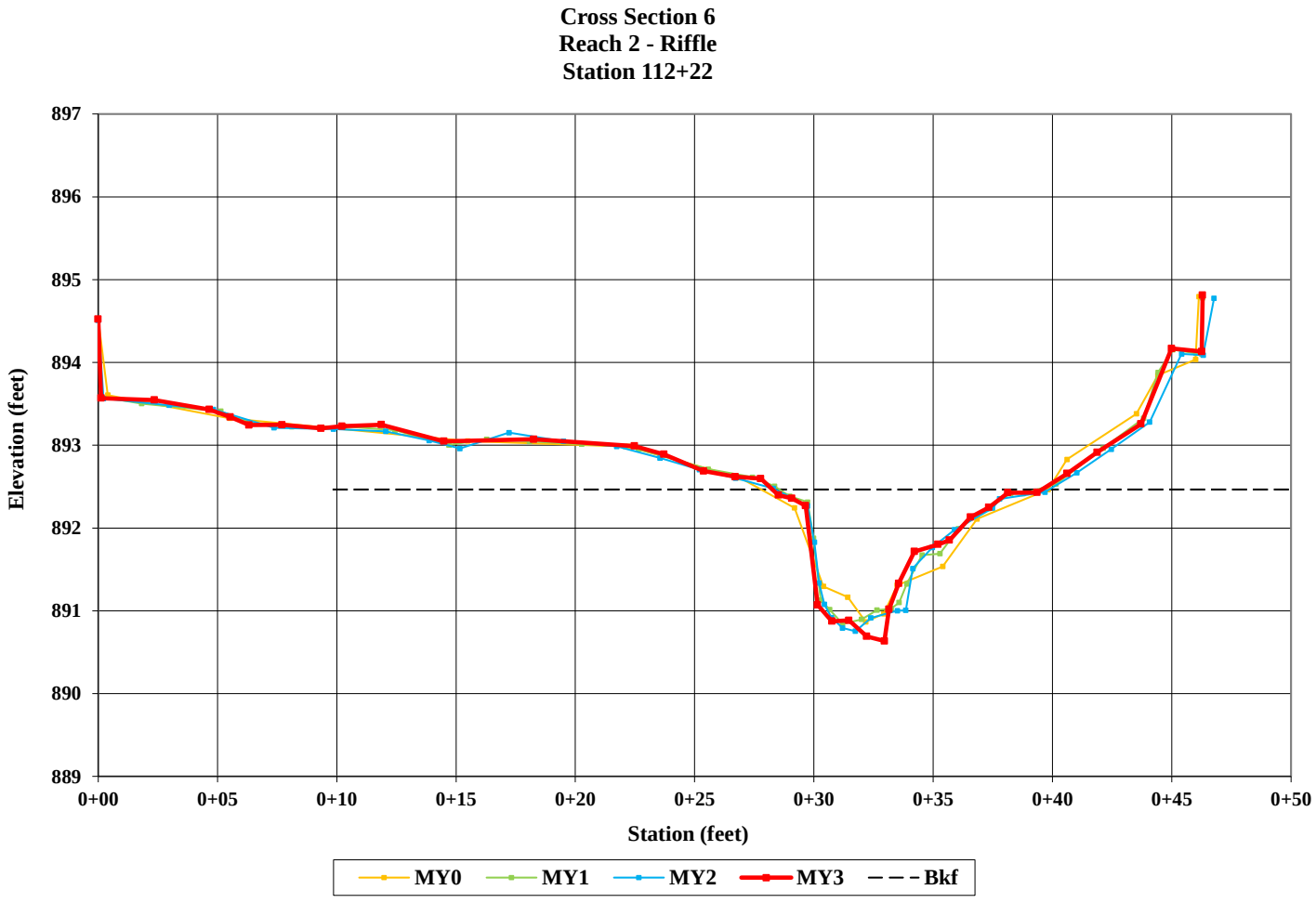
Right Bank Descending



Cross Section 6 Reach 2 – Riffle

Left Bank Descending

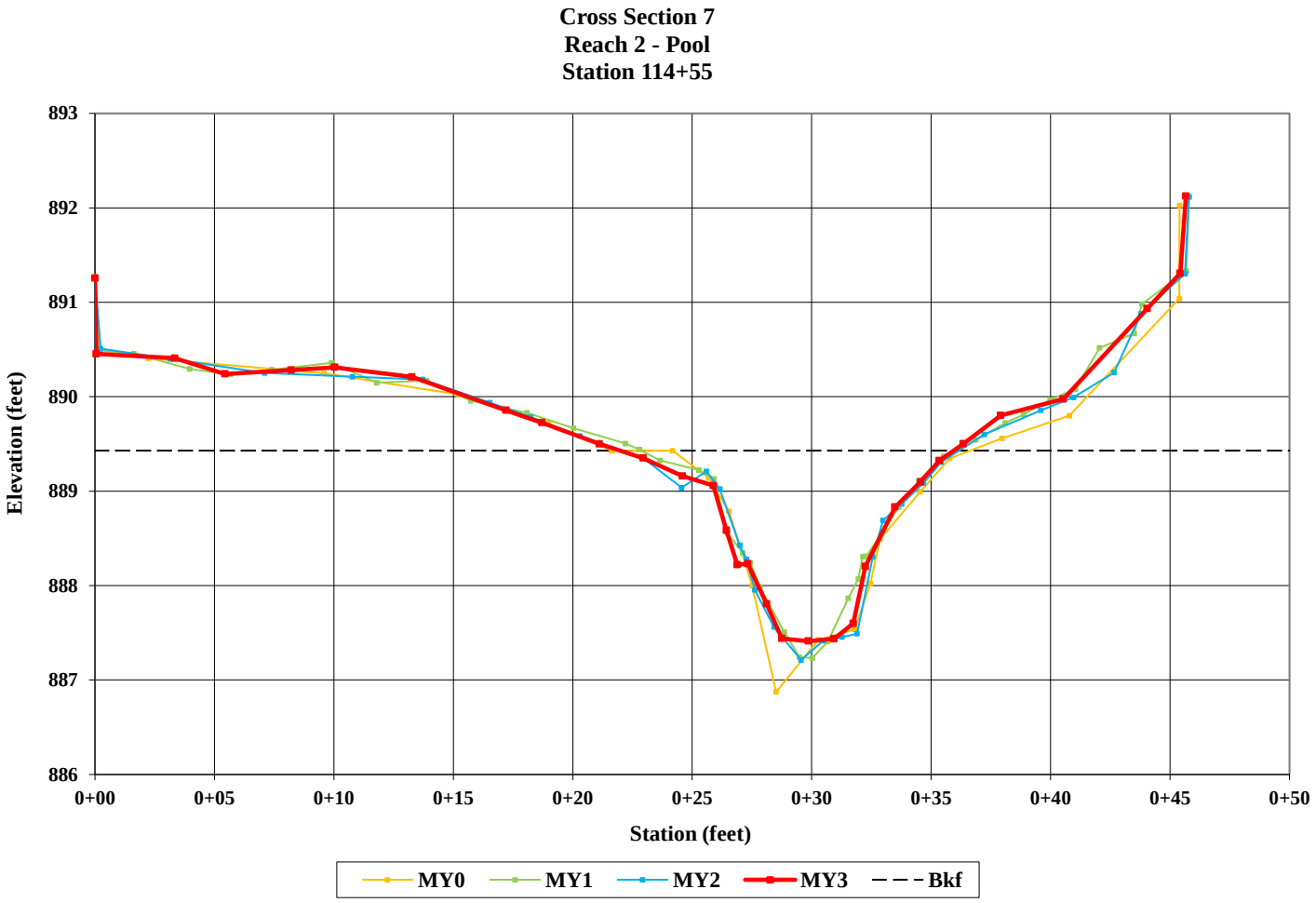
Right Bank Descending



Cross Section 7 Reach 2 – Pool

Left Bank Descending

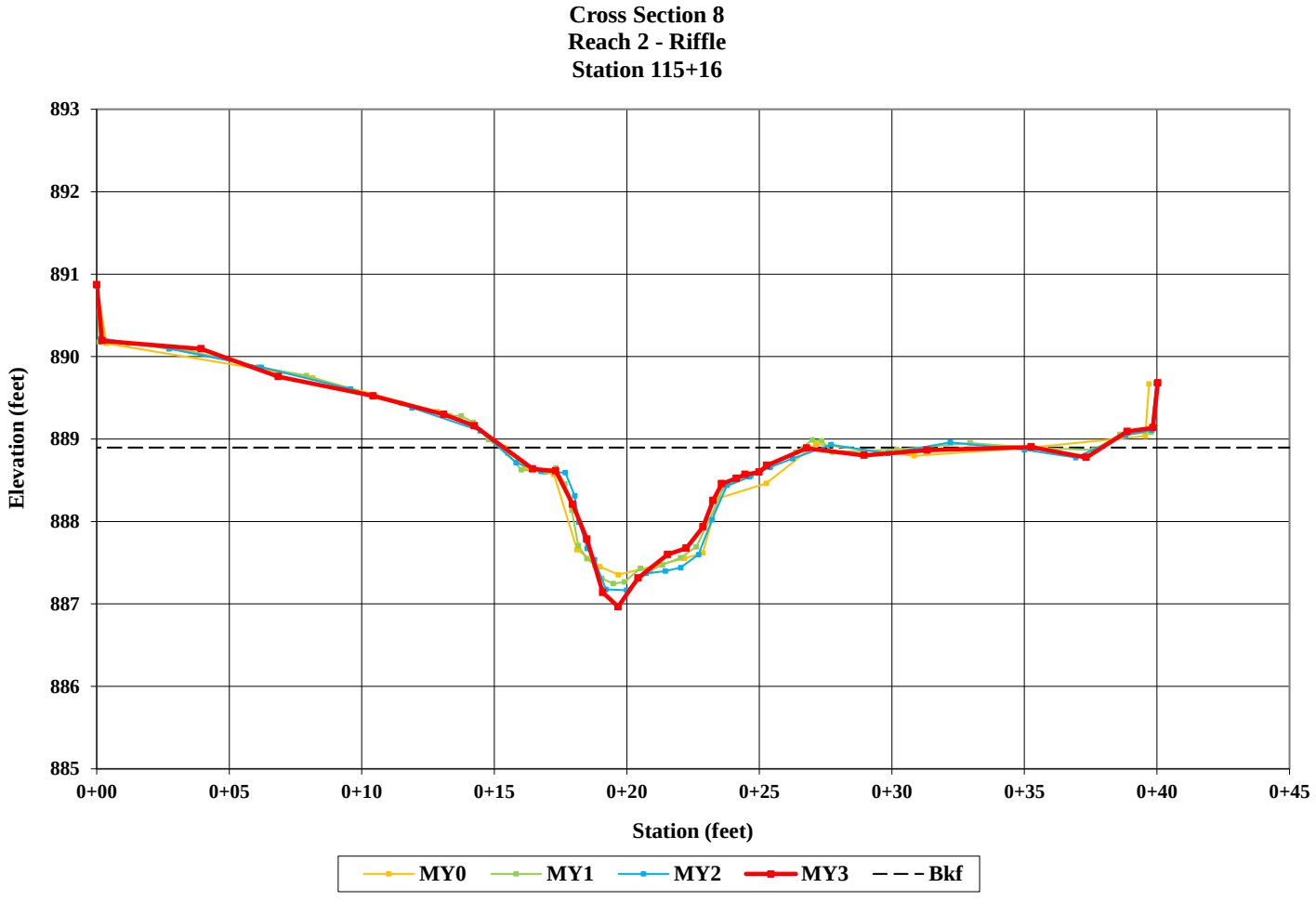
Right Bank Descending



Cross Section 8 Reach 2 – Riffle

Left Bank Descending

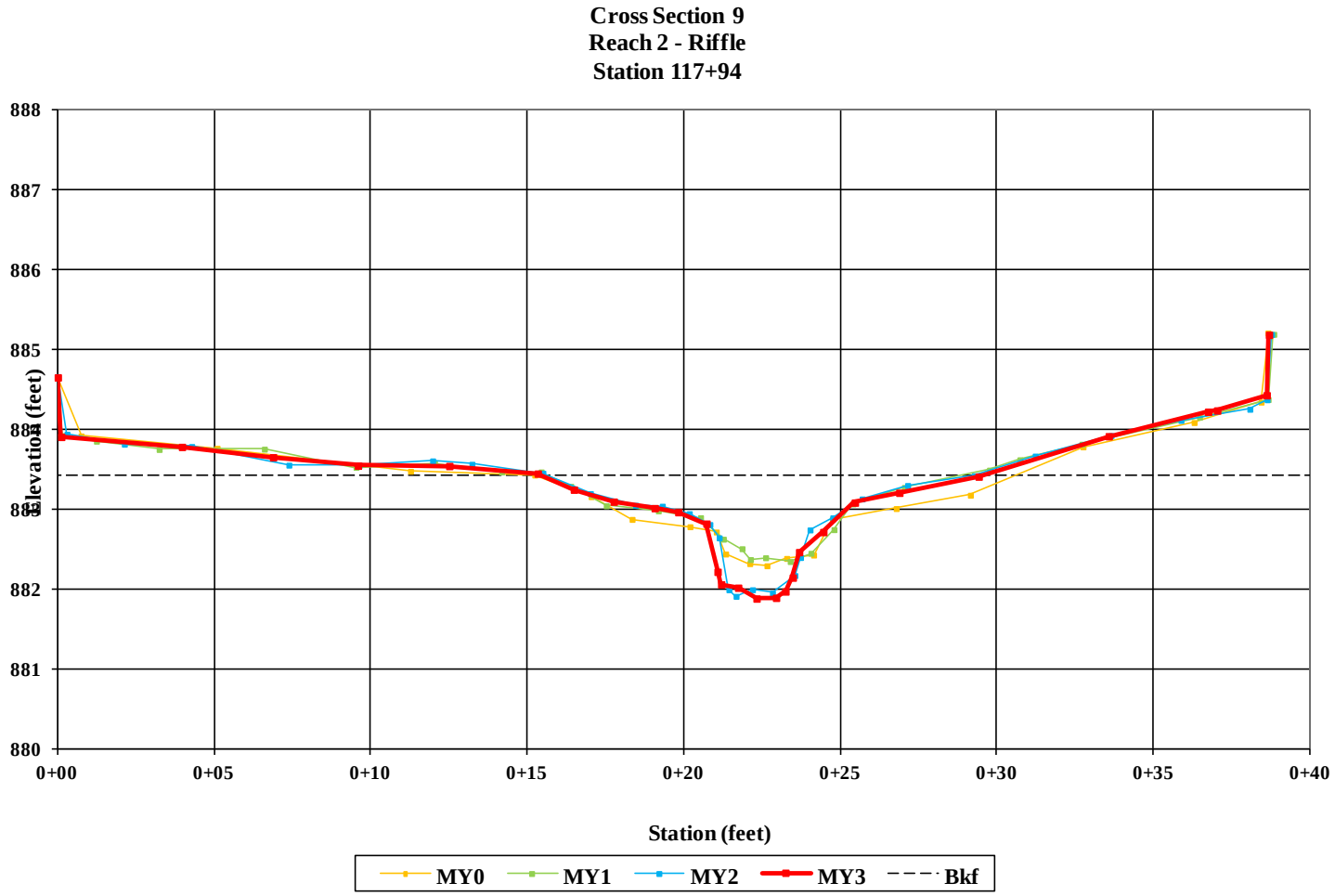
Right Bank Descending



Cross Section 9 Reach 2 – Riffle

Left Bank Descending

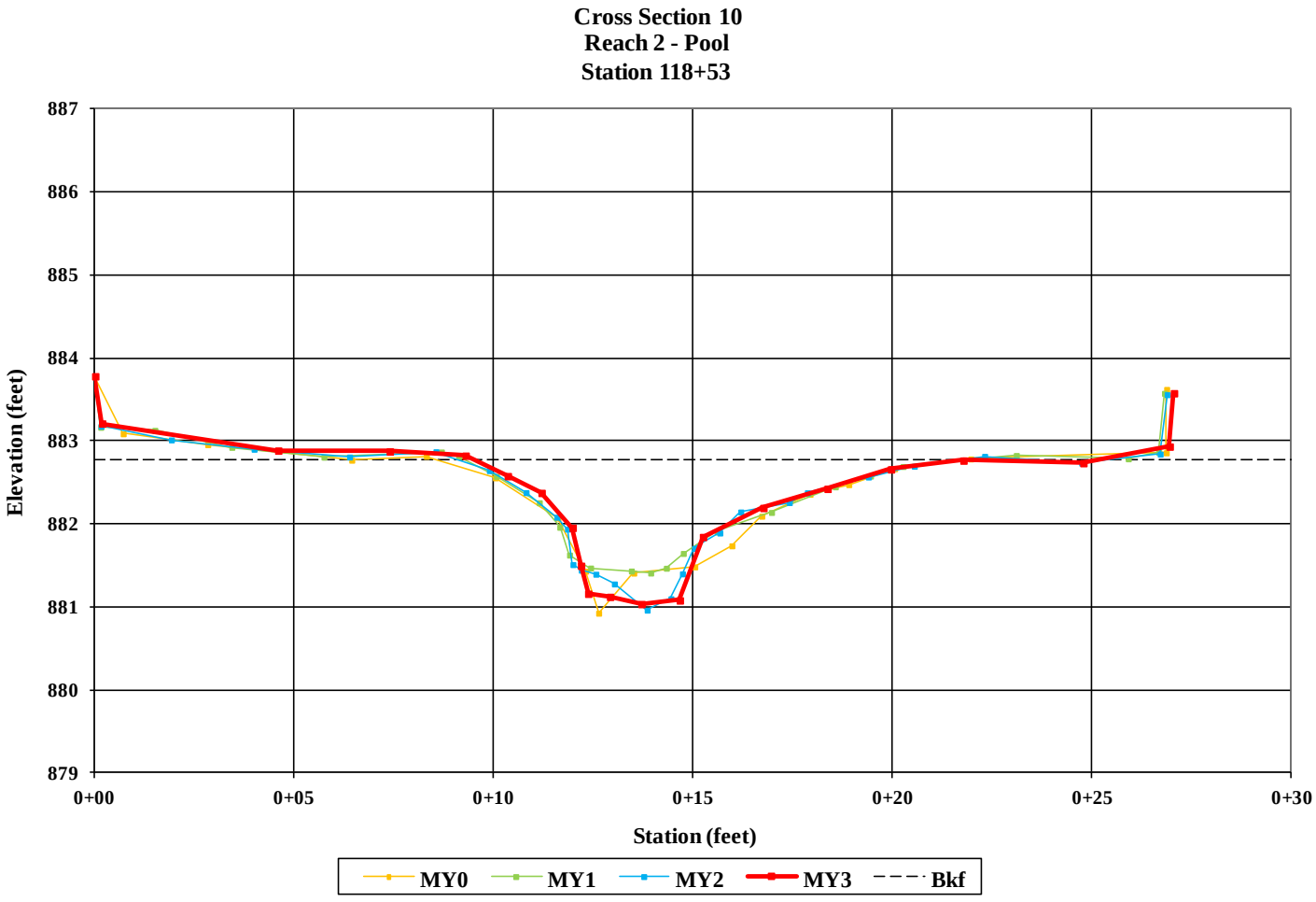
Right Bank Descending



Cross Section 10 Reach 2 – Pool

Left Bank Descending

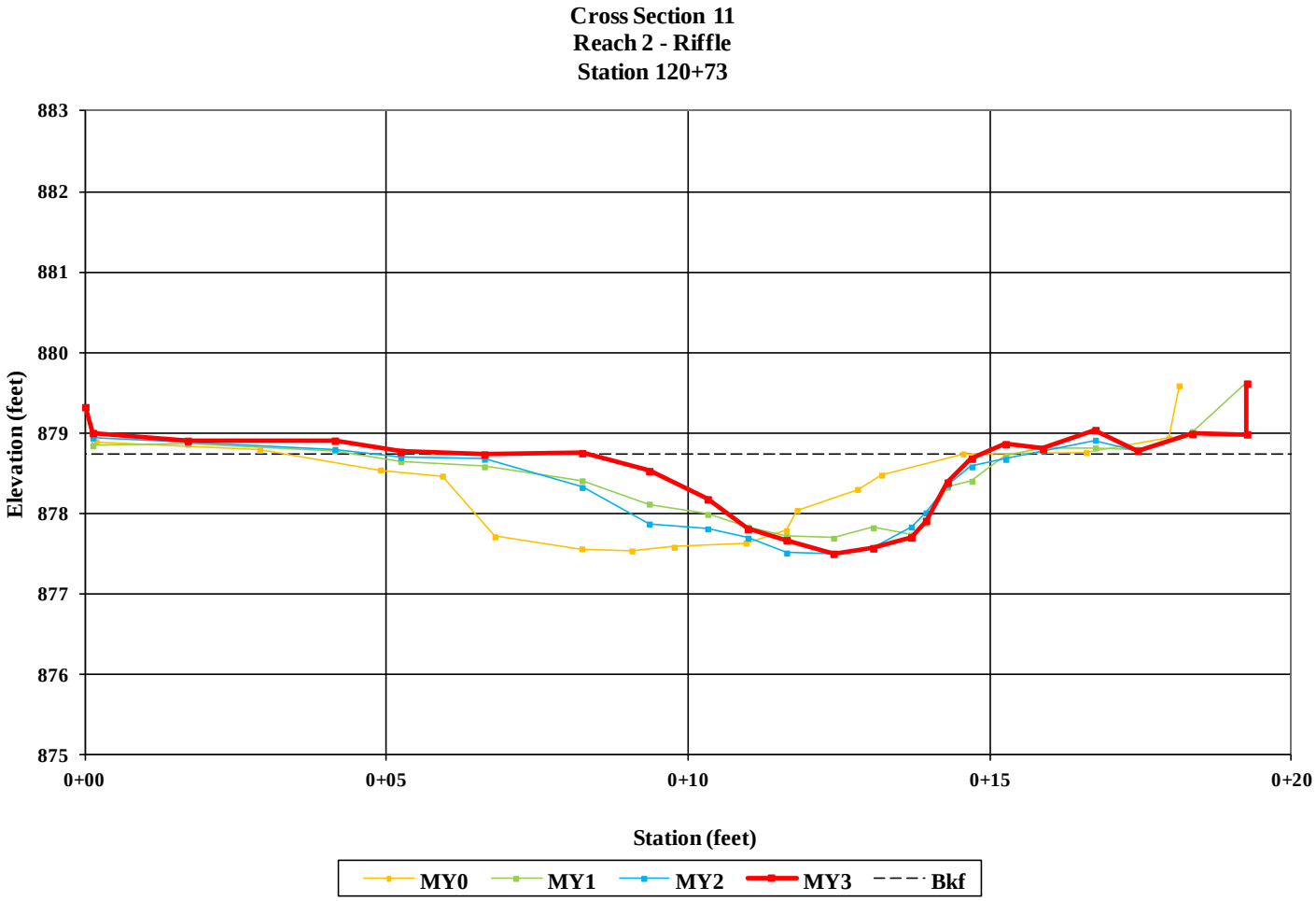
Right Bank Descending



Cross Section 11 Reach 2 – Riffle

Left Bank Descending

Right Bank Descending

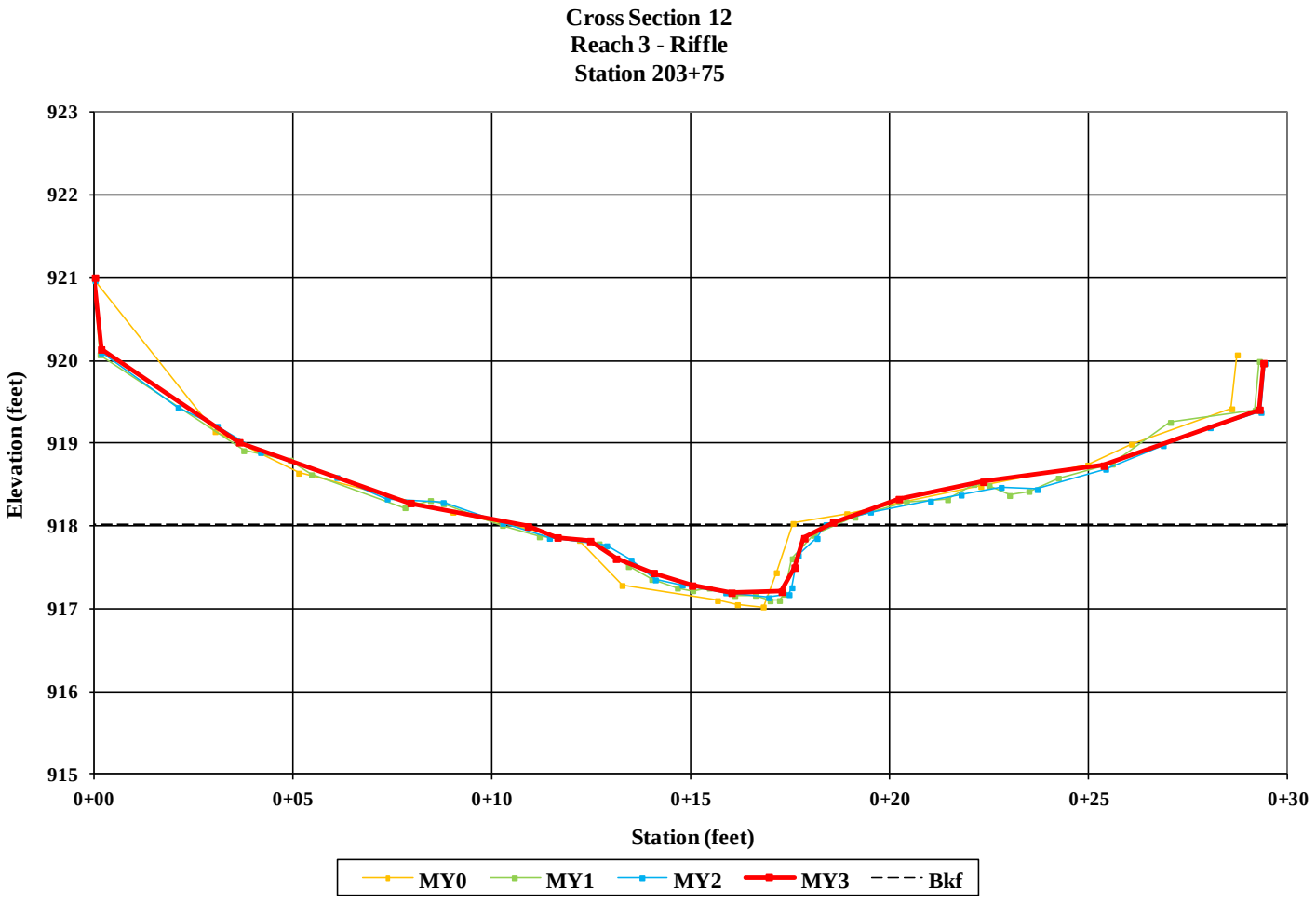


*The shift represented in the above figure is due to an inconsistency in surveying the correct pins between monitoring years.

Cross Section 12 Reach 3 – Riffle

Left Bank Descending

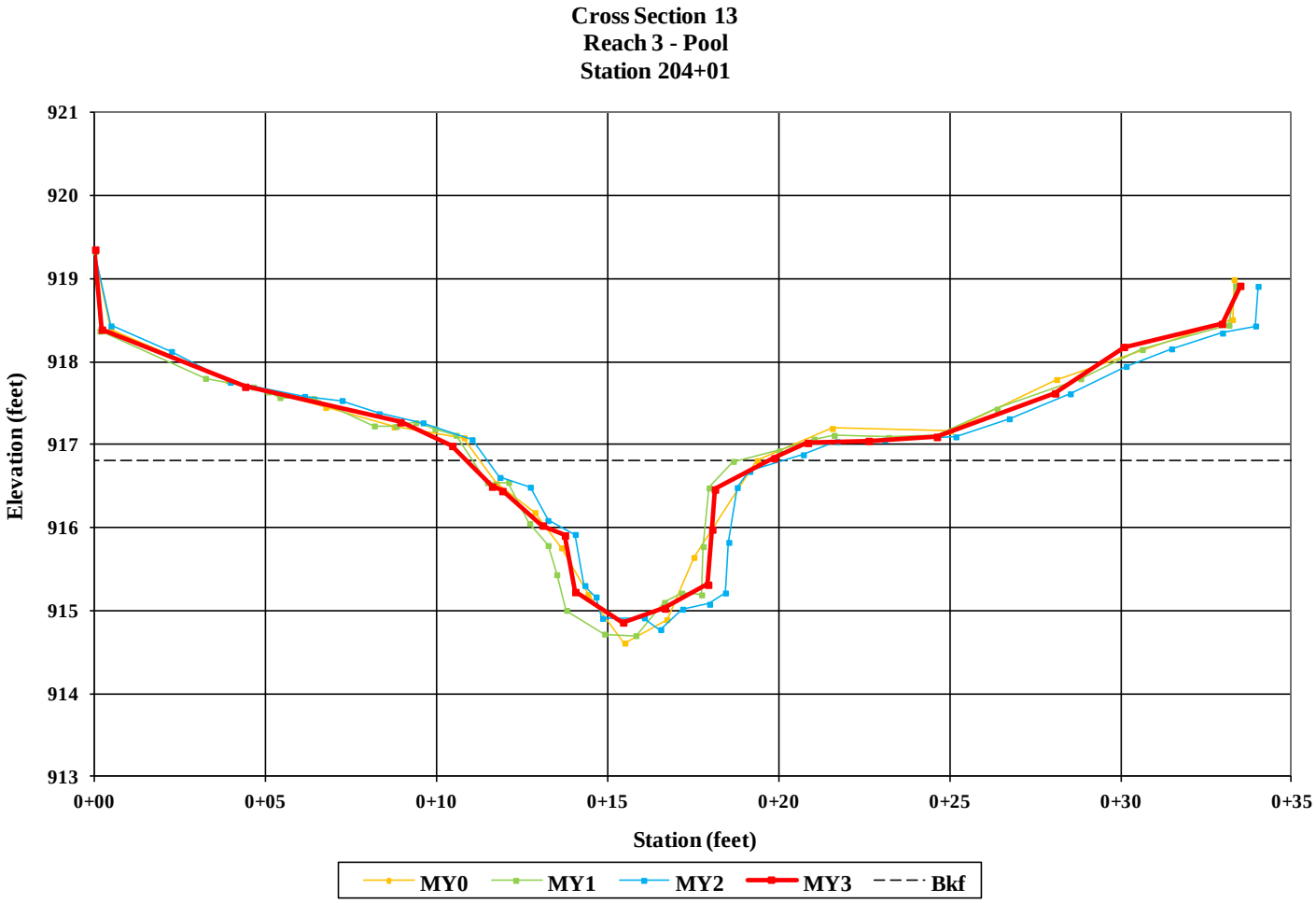
Right Bank Descending



Cross Section 13 Reach 3 – Pool

Left Bank Descending

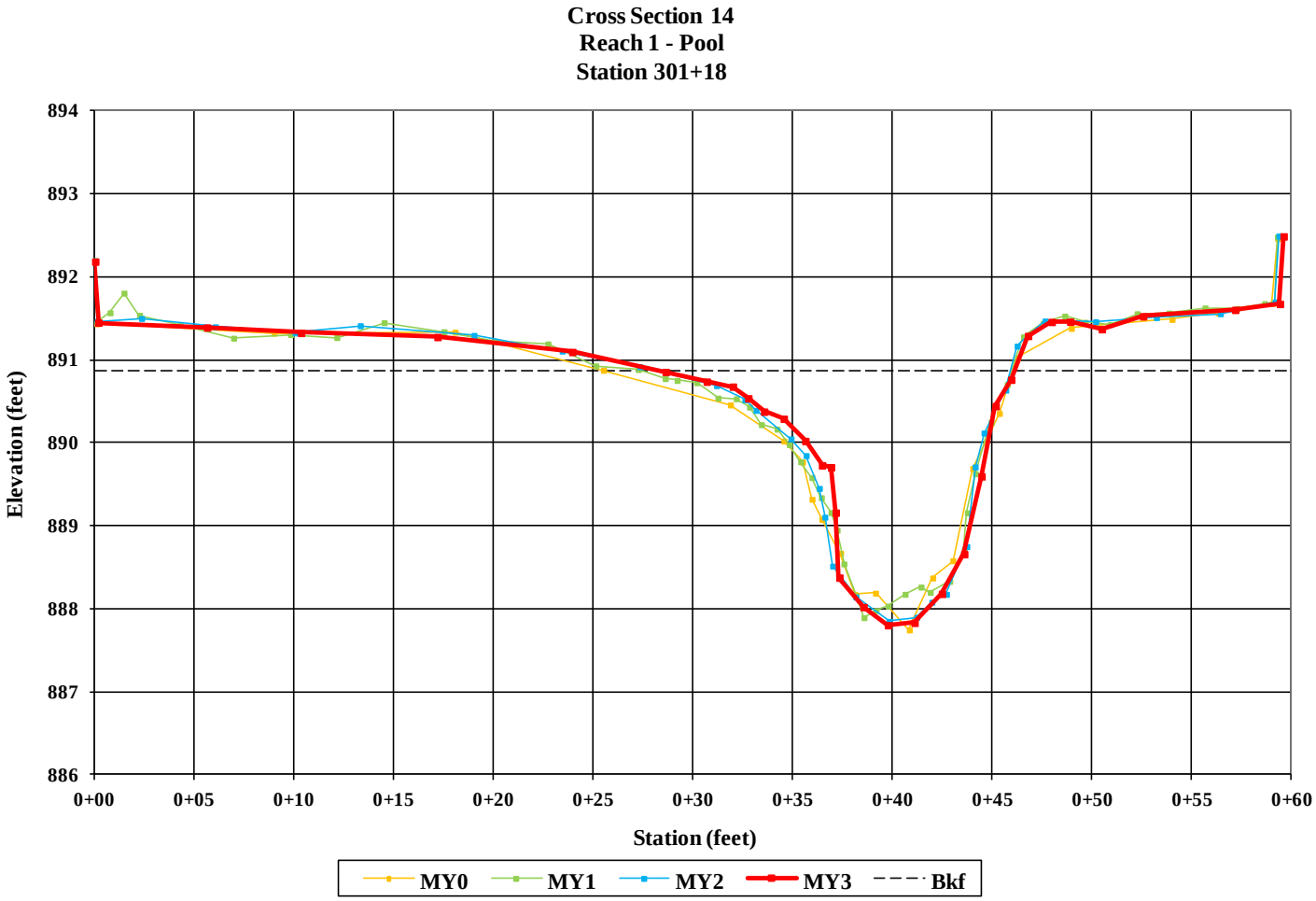
Right Bank Descending



Cross Section 14 Reach 1 – Pool

Left Bank Descending

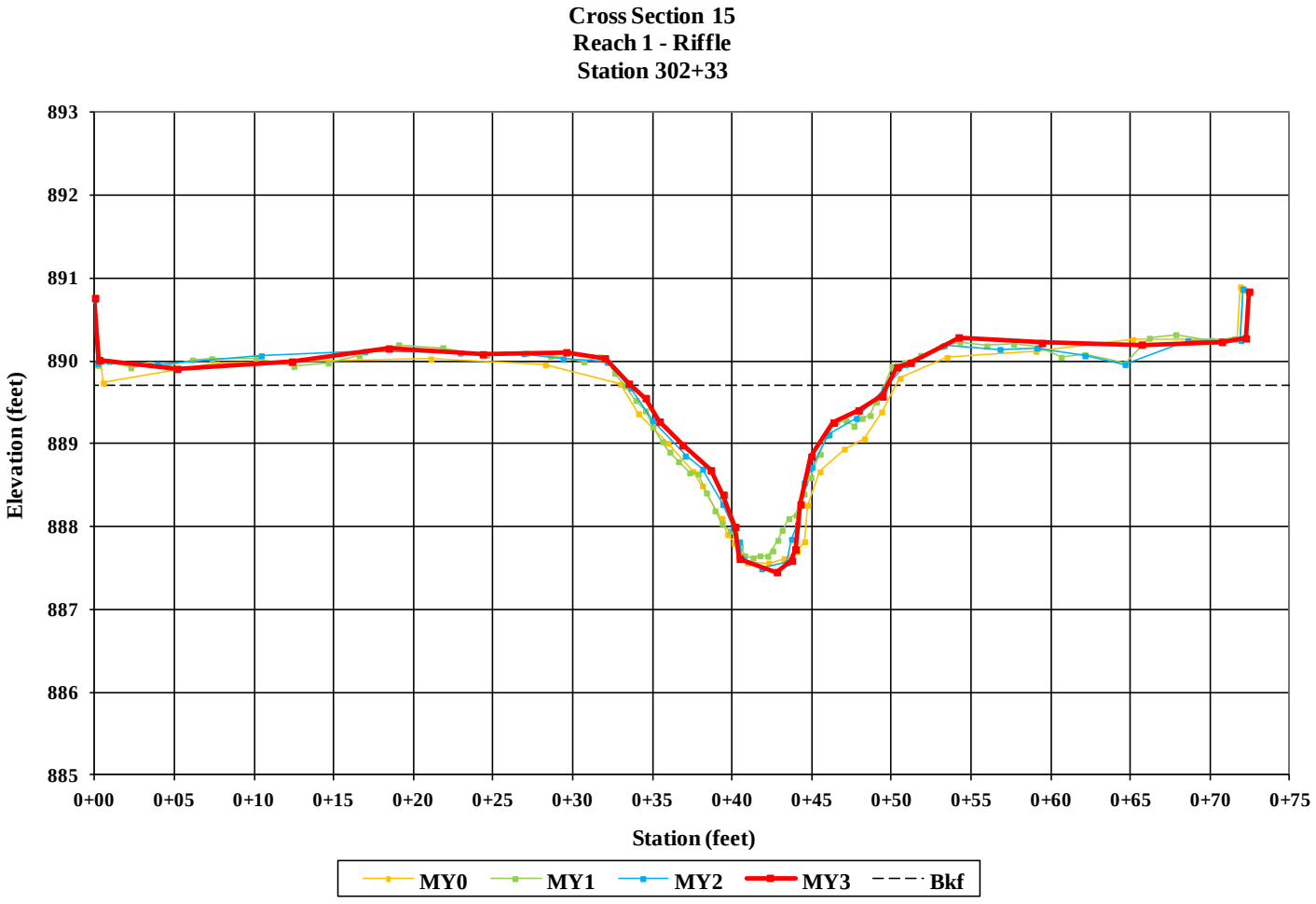
Right Bank Descending



Cross Section 15 Reach 1 – Riffle

Left Bank Descending

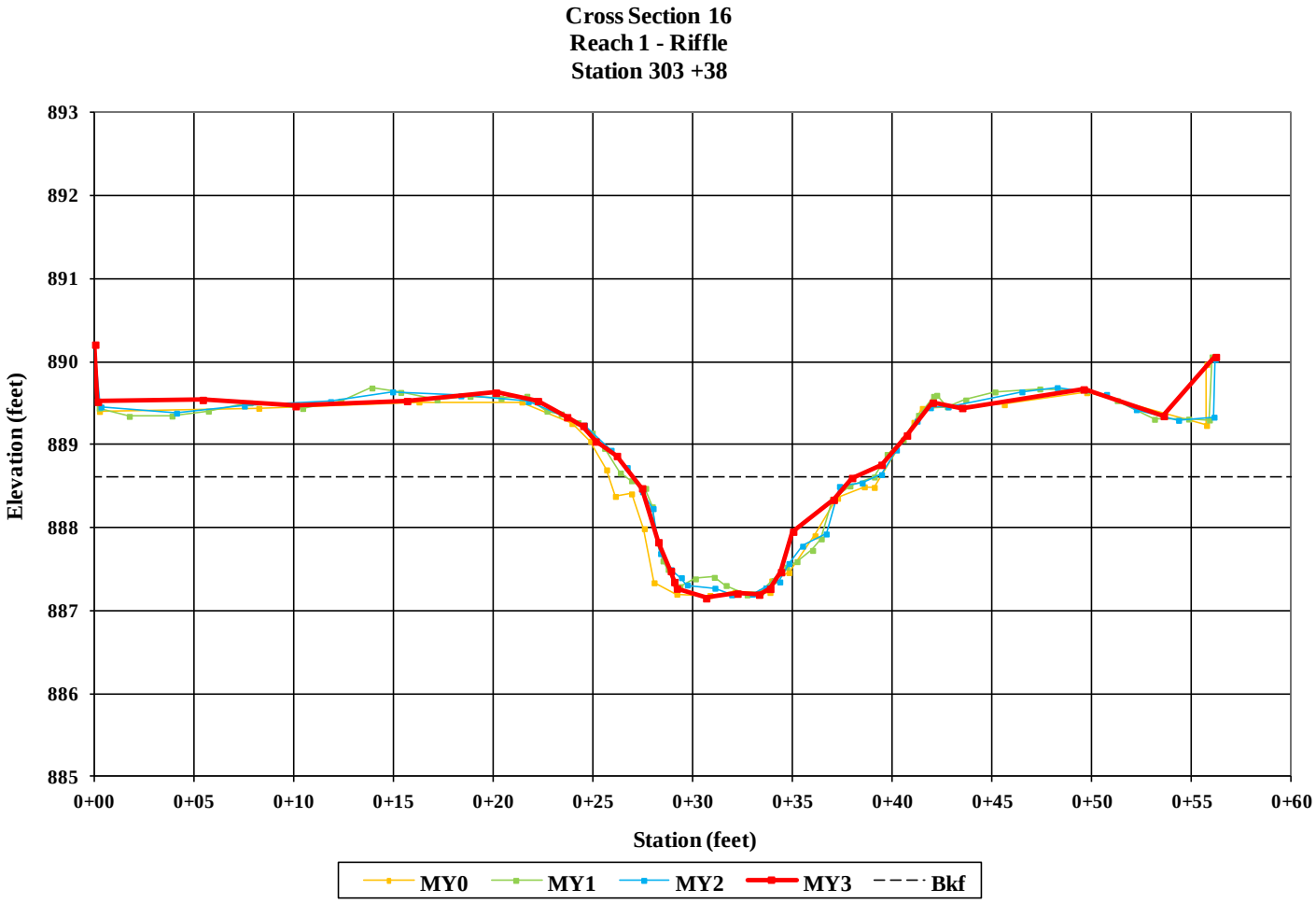
Right Bank Descending



Cross Section 16 Reach 1 – Riffle

Left Bank Descending

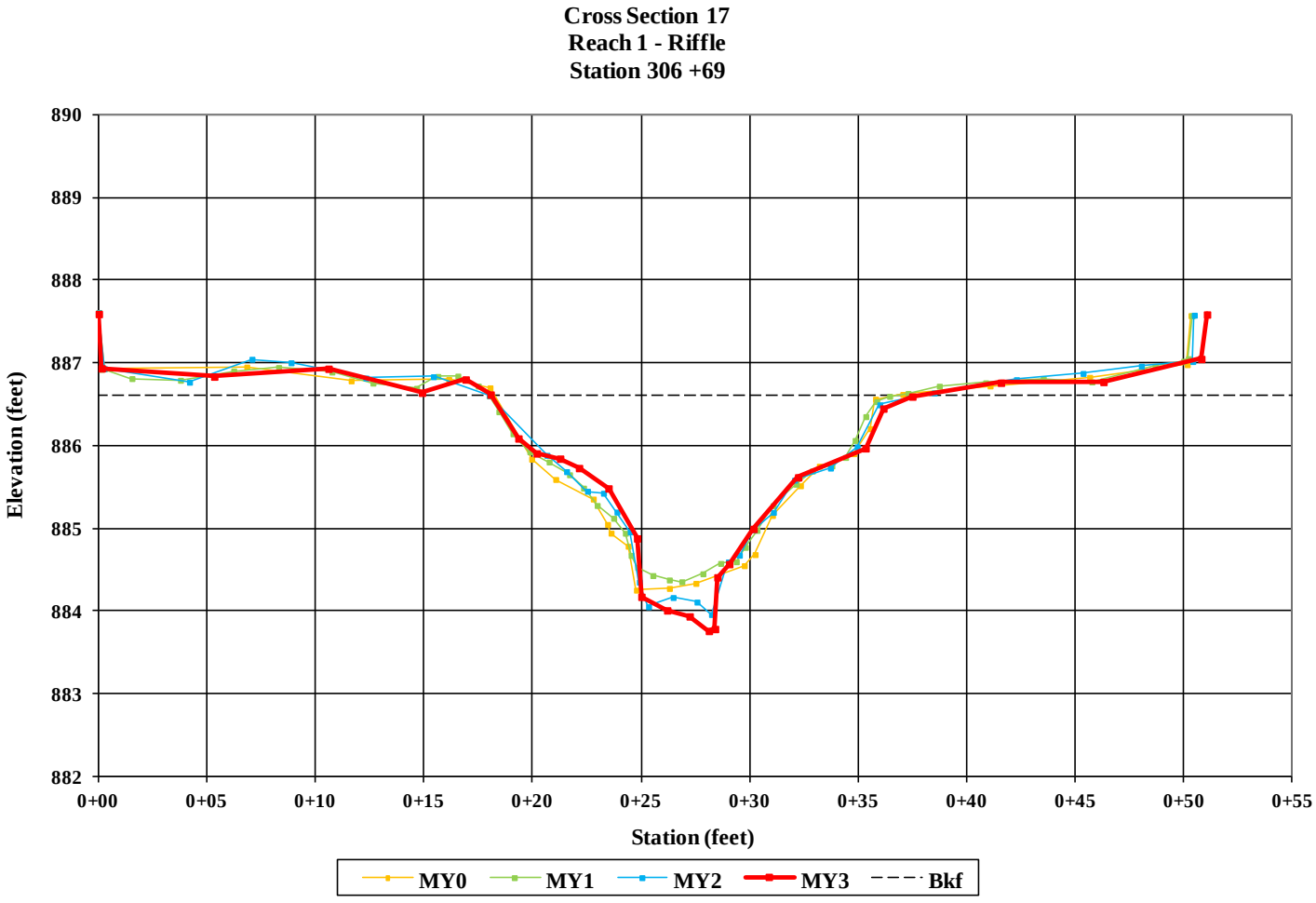
Right Bank Descending



Cross Section 17 Reach 1 – Riffle

Left Bank Descending

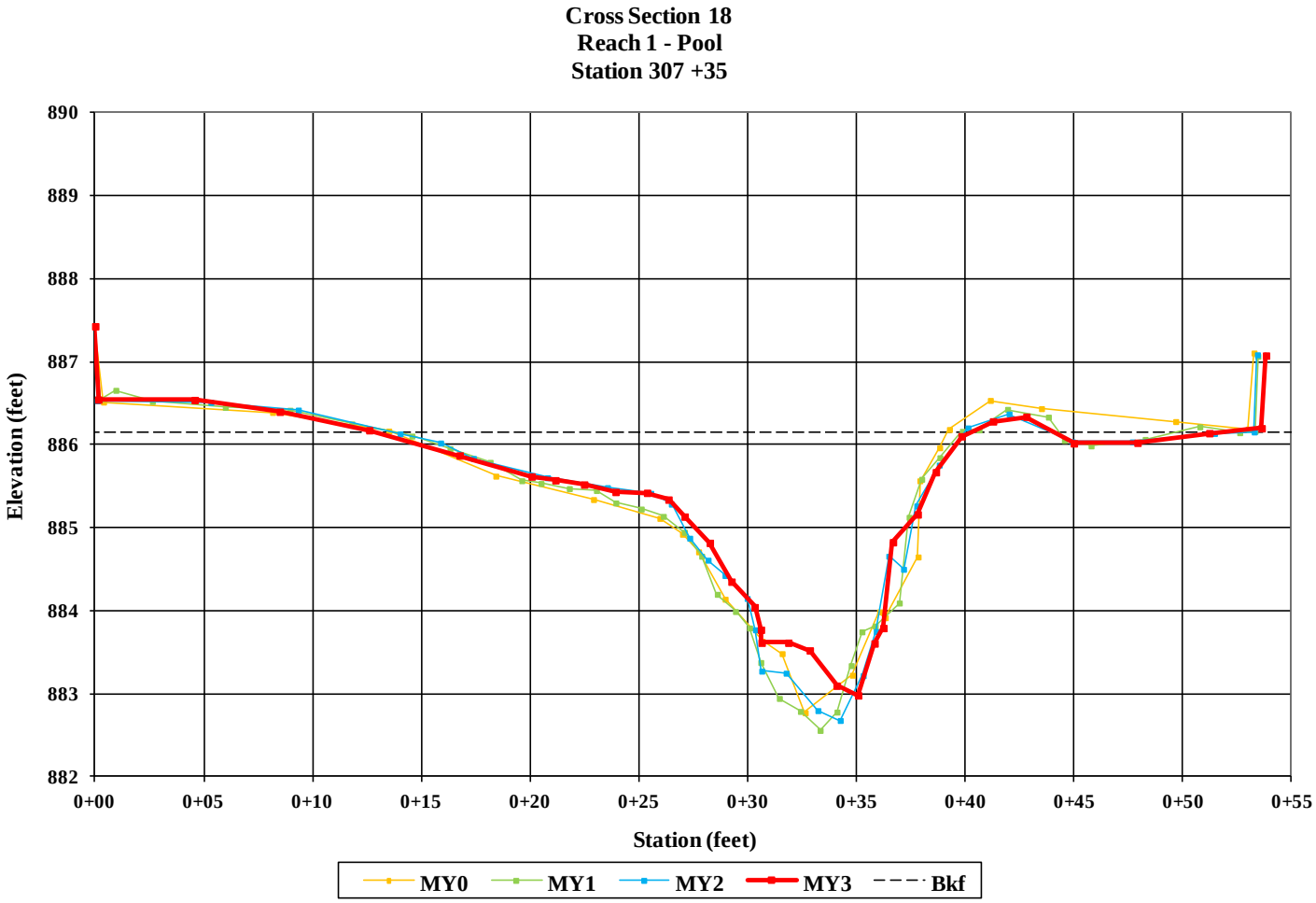
Right Bank Descending



Cross Section 18 Reach 1 – Pool

Left Bank Descending

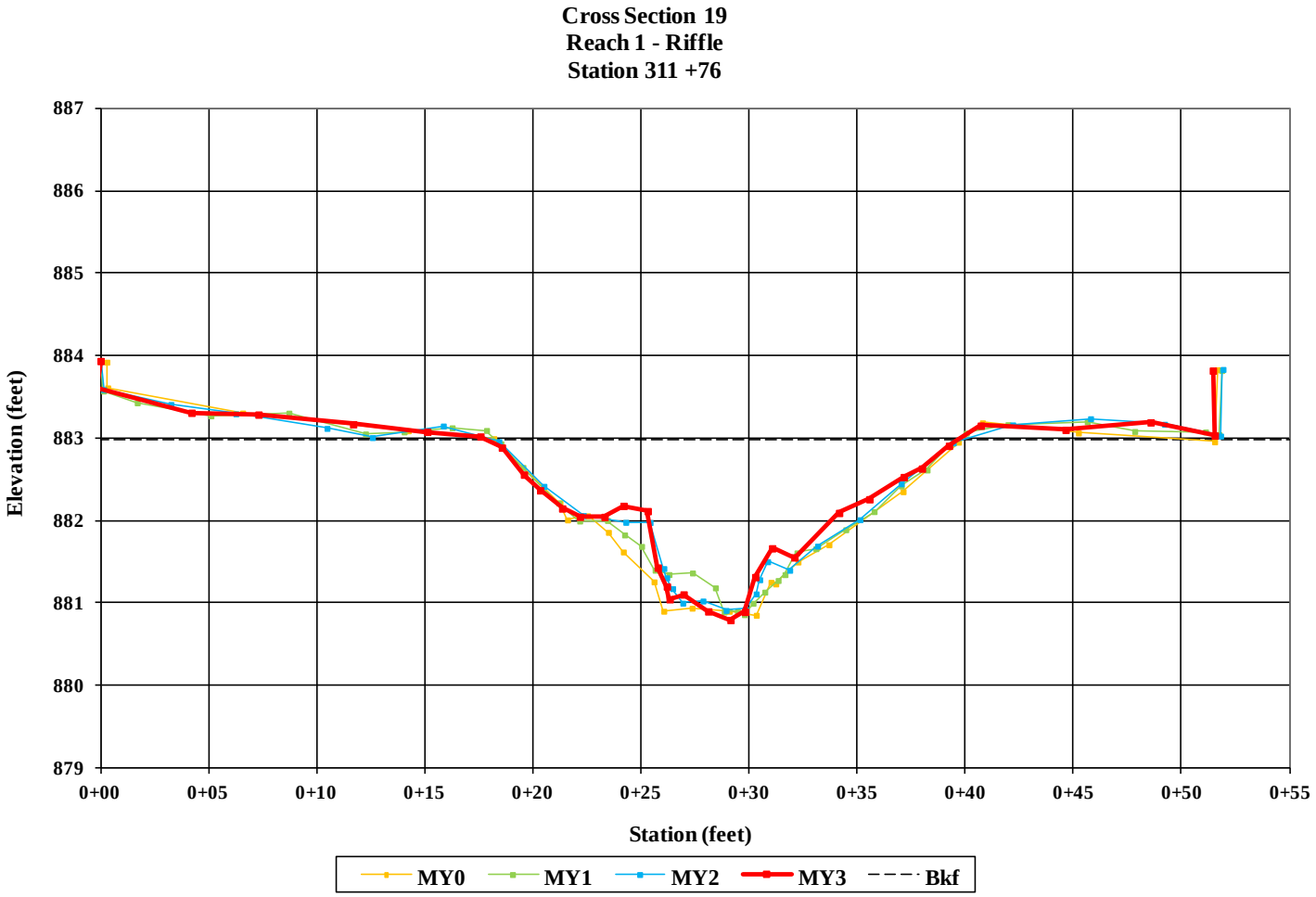
Right Bank Descending



Cross Section 19 Reach 1 – Riffle

Left Bank Descending

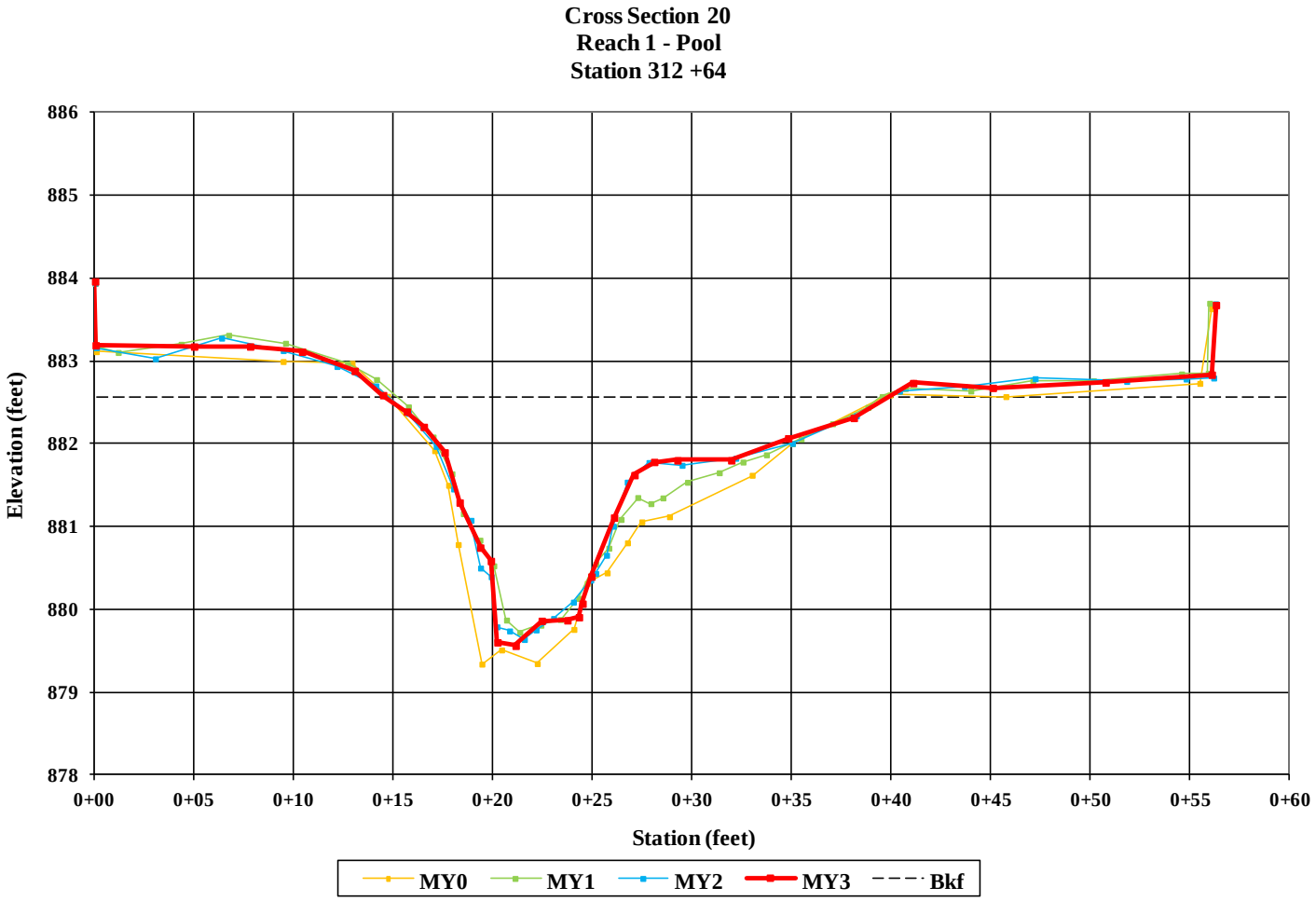
Right Bank Descending



Cross Section 20 Reach 1 – Pool

Left Bank Descending

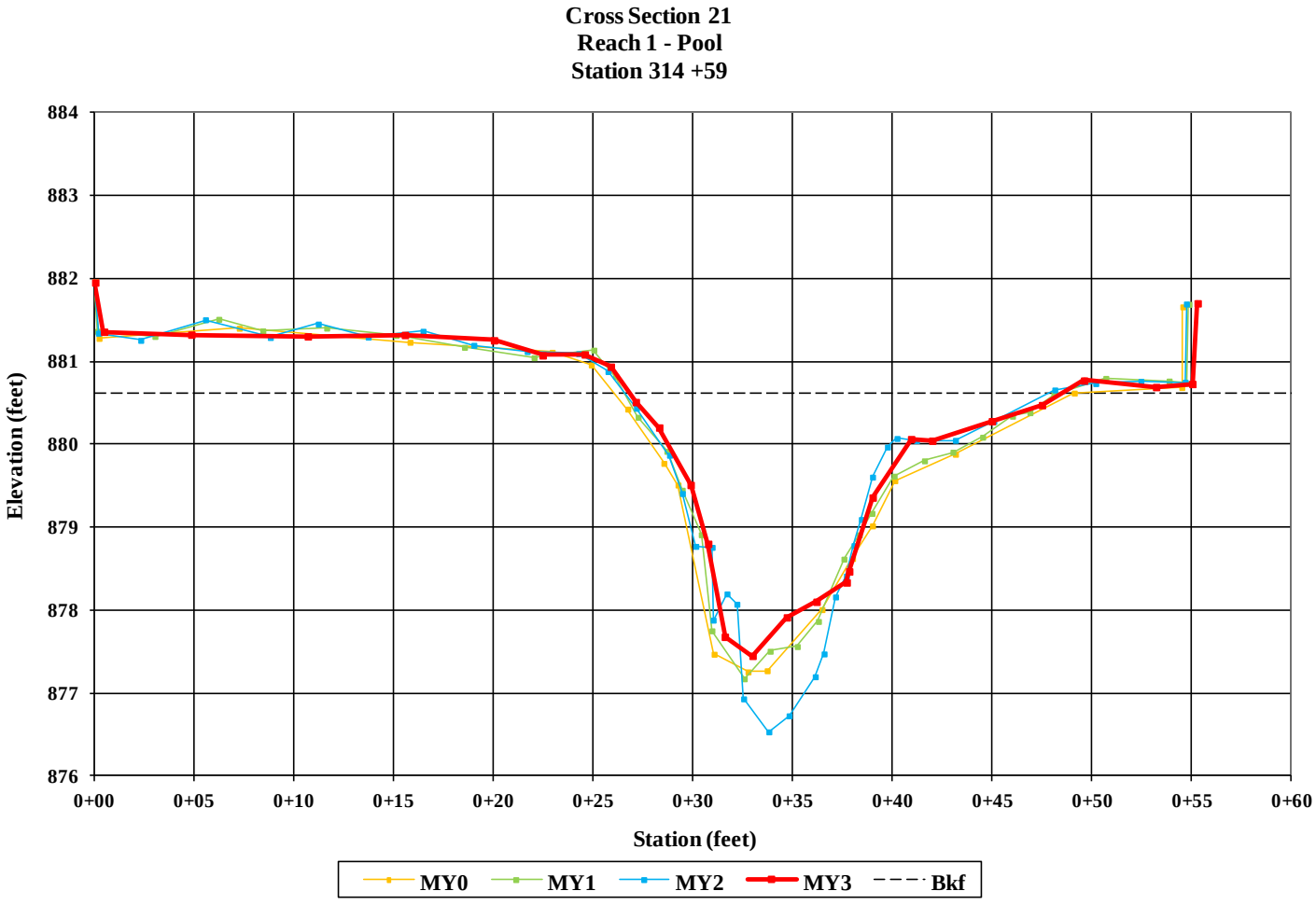
Right Bank Descending



Cross Section 21 Reach 1 – Pool

Left Bank Descending

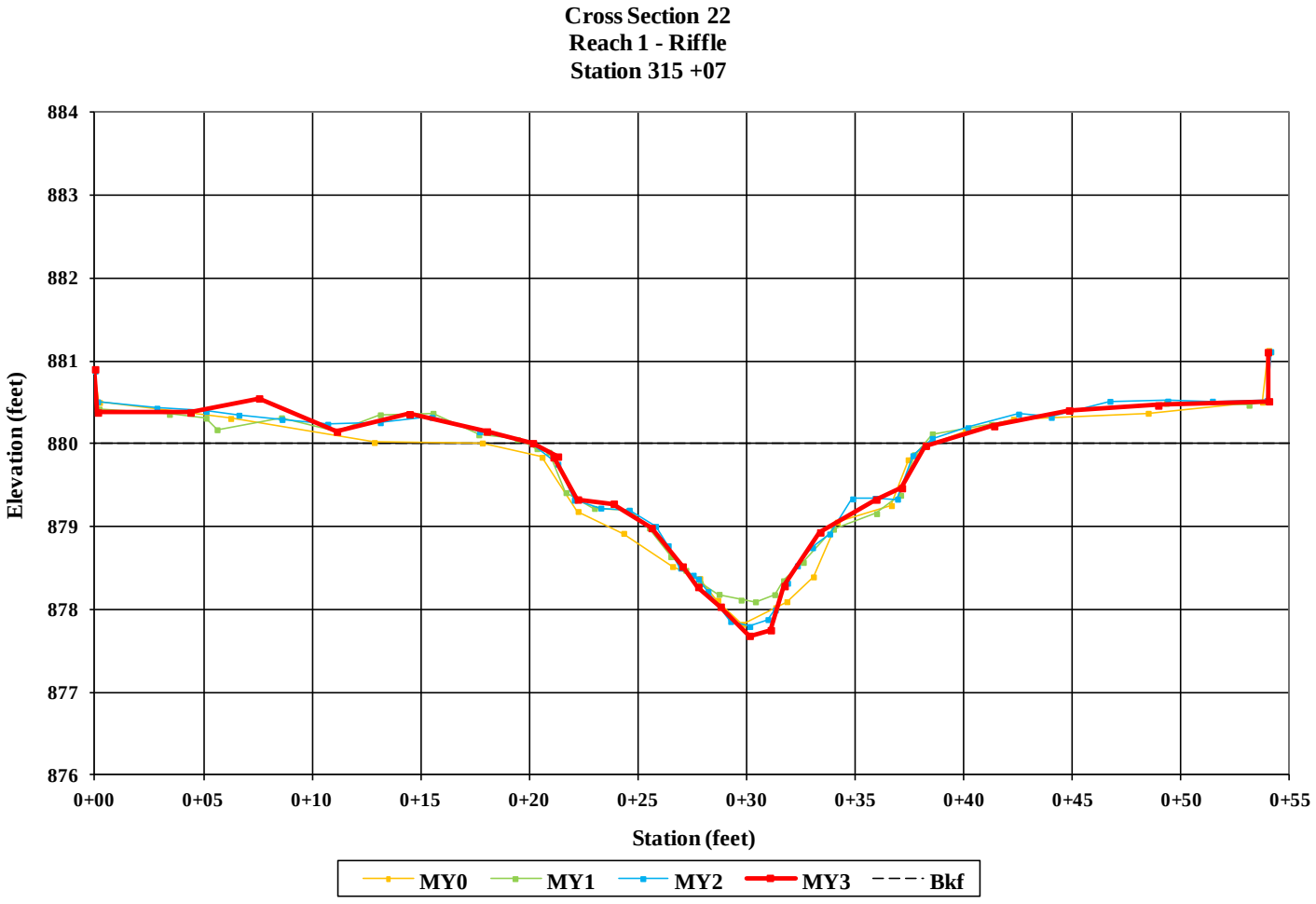
Right Bank Descending



Cross Section 22 Reach 1 – Riffle

Left Bank Descending

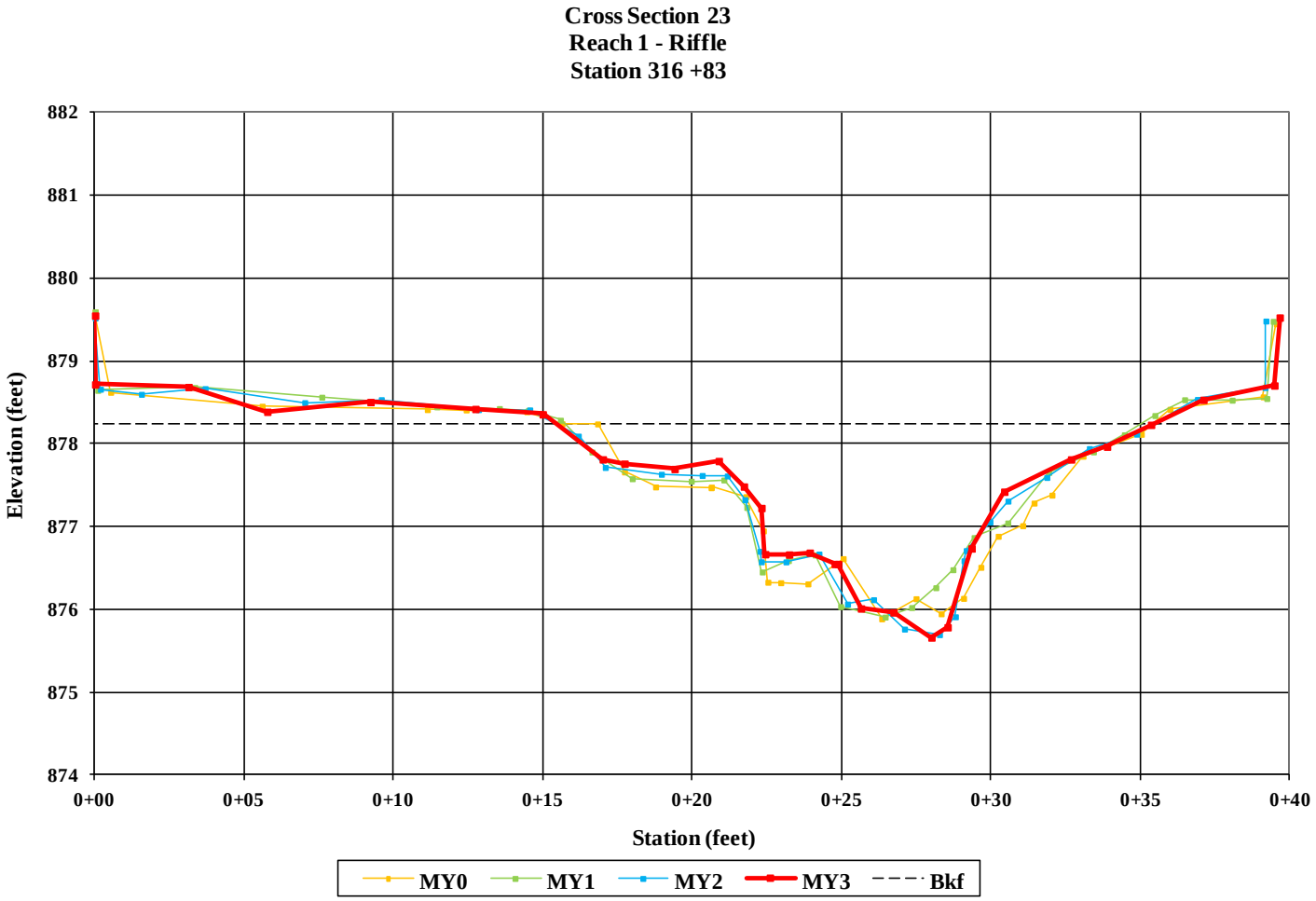
Right Bank Descending



Cross Section 23 Reach 1 – Riffle

Left Bank Descending

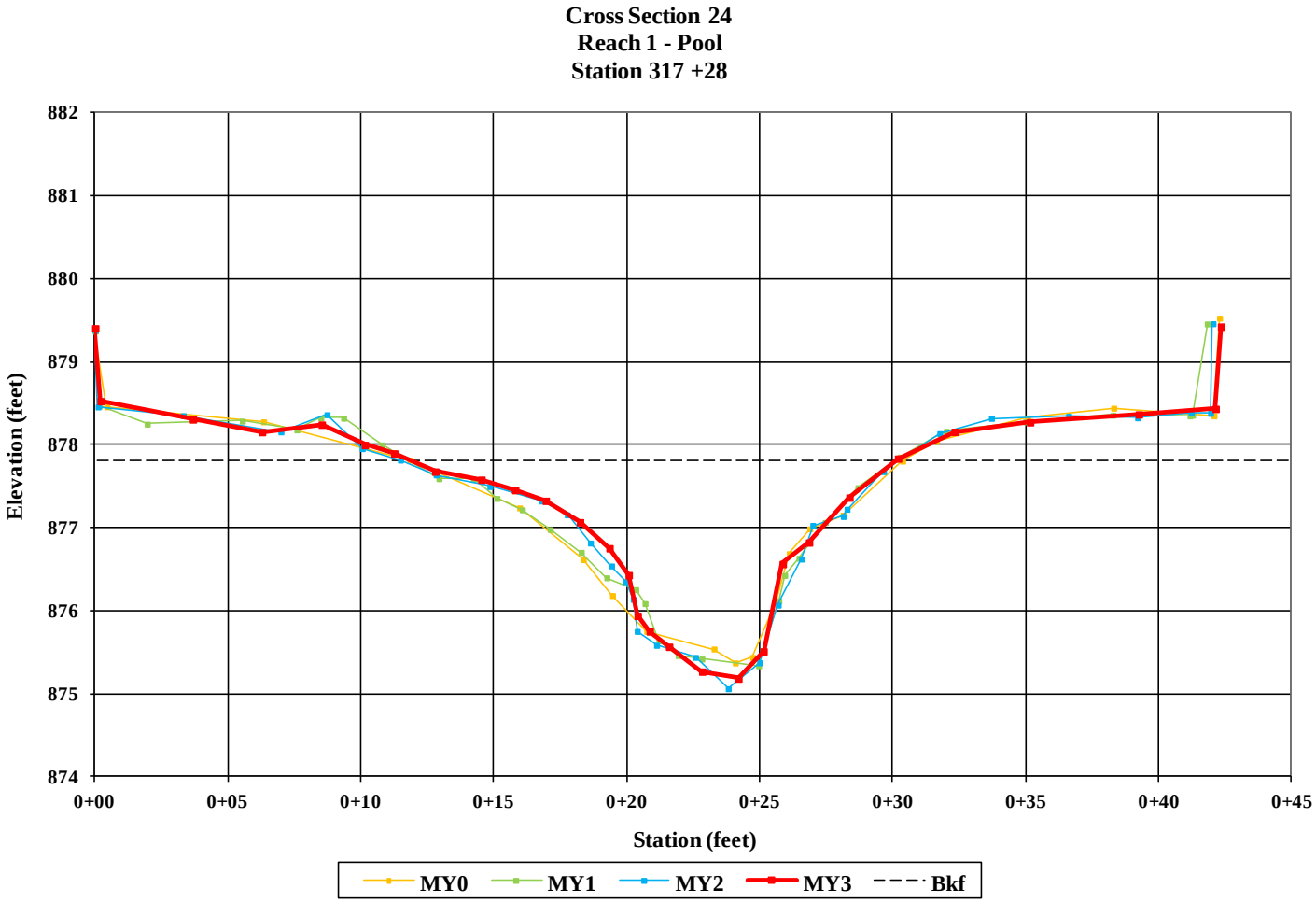
Right Bank Descending



Cross Section 24 Reach 1 – Pool

Left Bank Descending

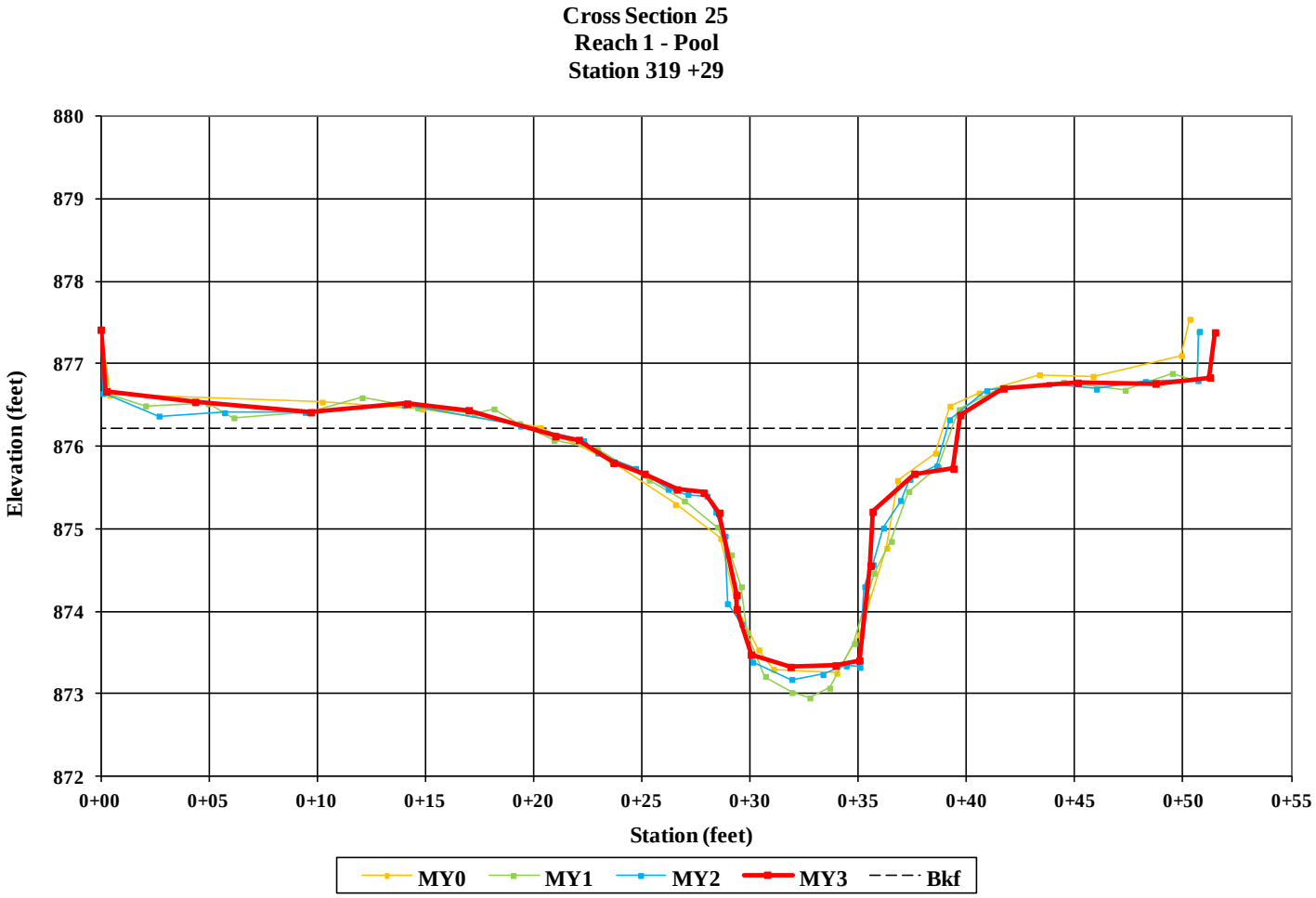
Right Bank Descending



Cross Section 25 Reach 1 – Pool

Left Bank Descending

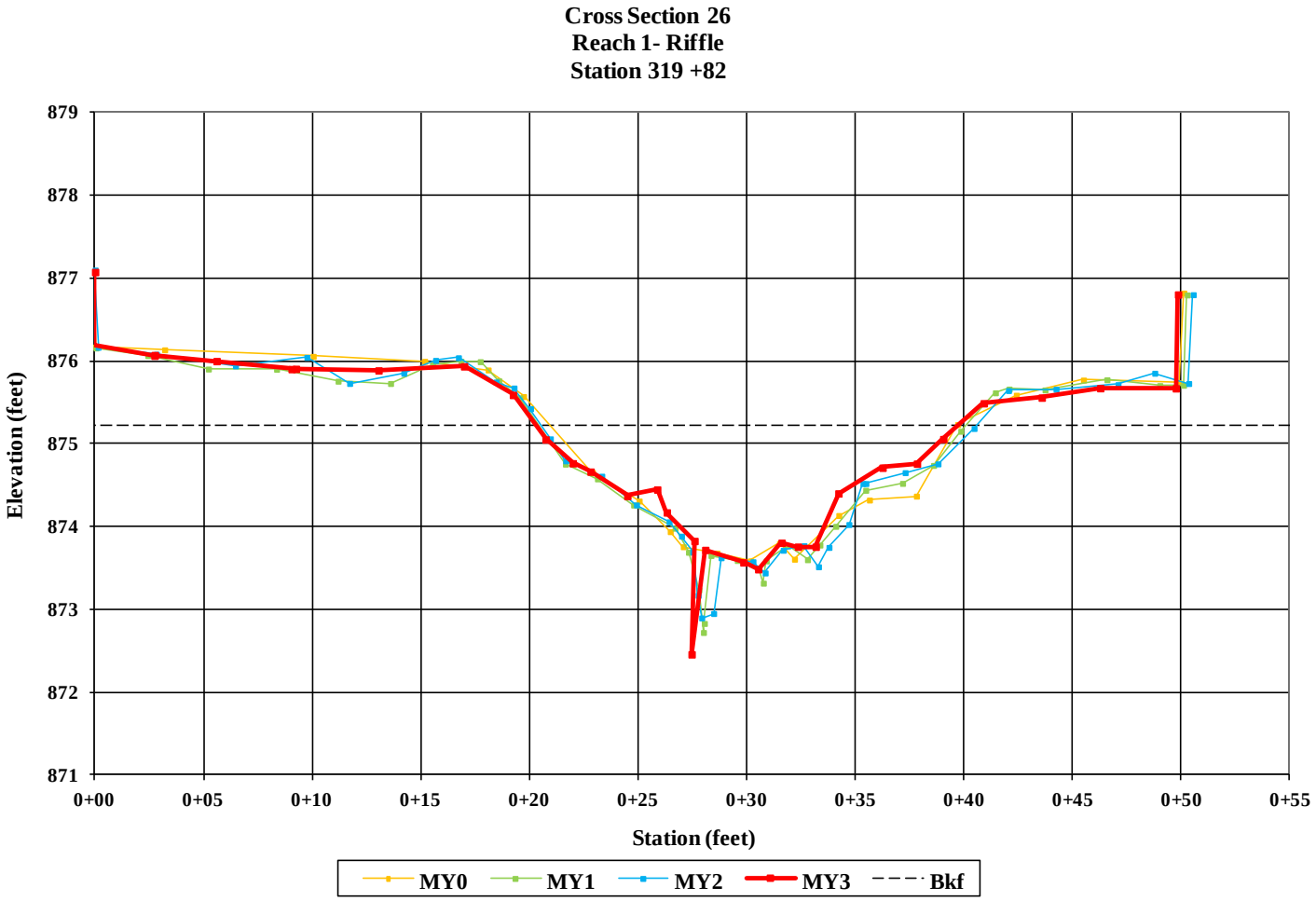
Right Bank Descending



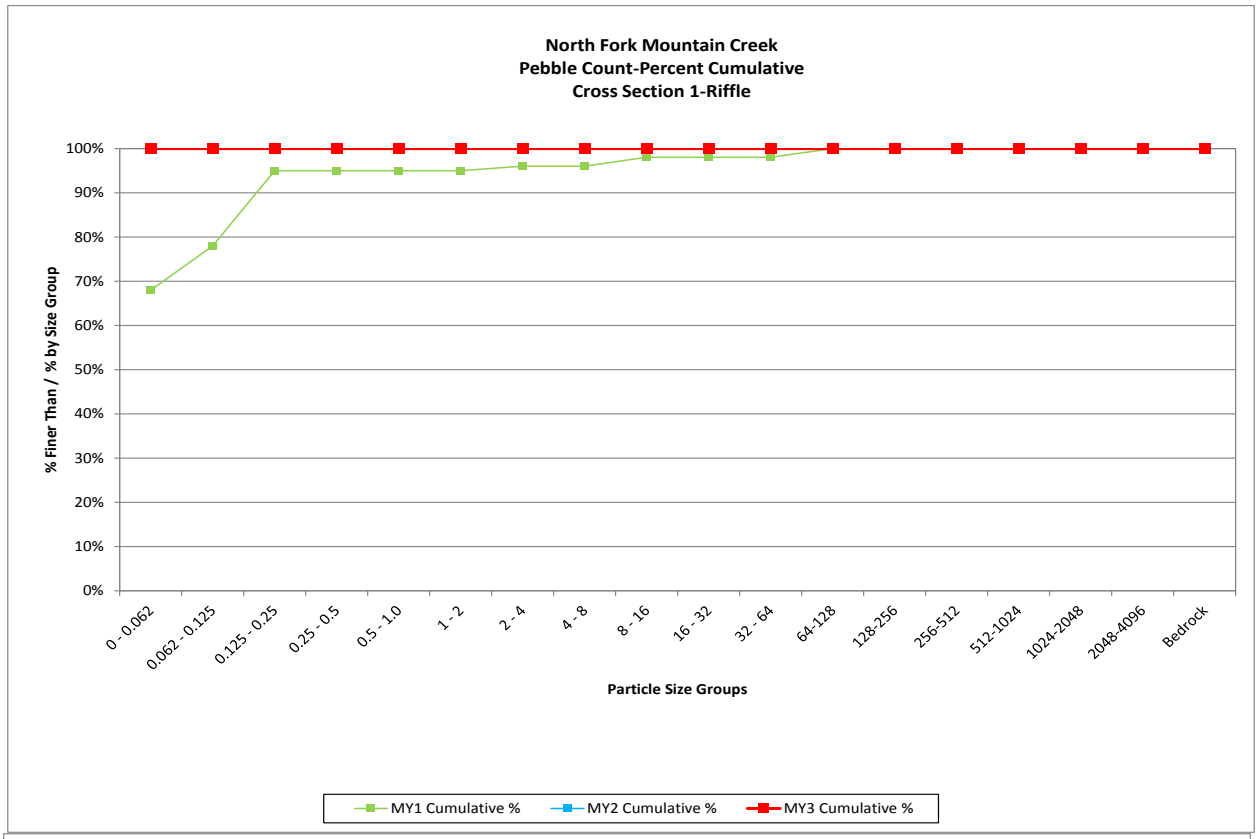
Cross Section 26 Reach 1 – Riffle

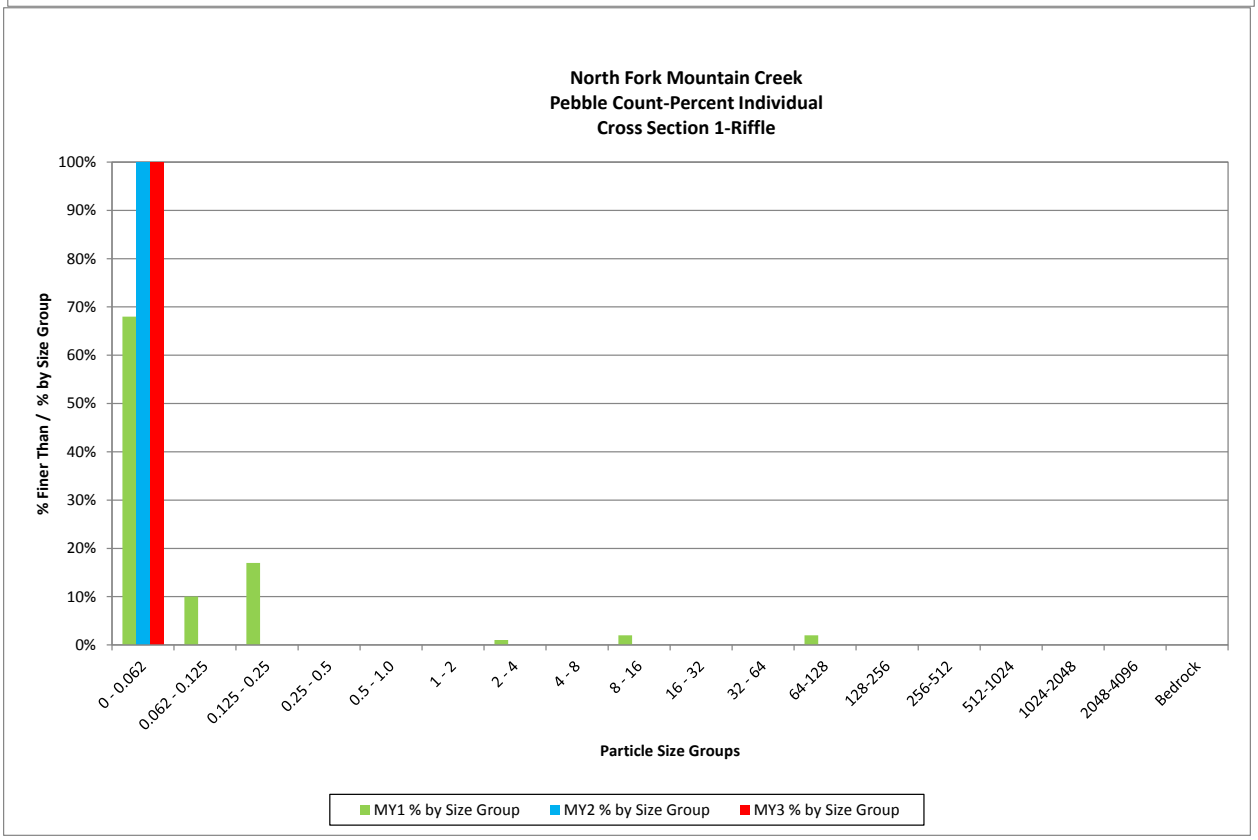
Left Bank Descending

Right Bank Descending

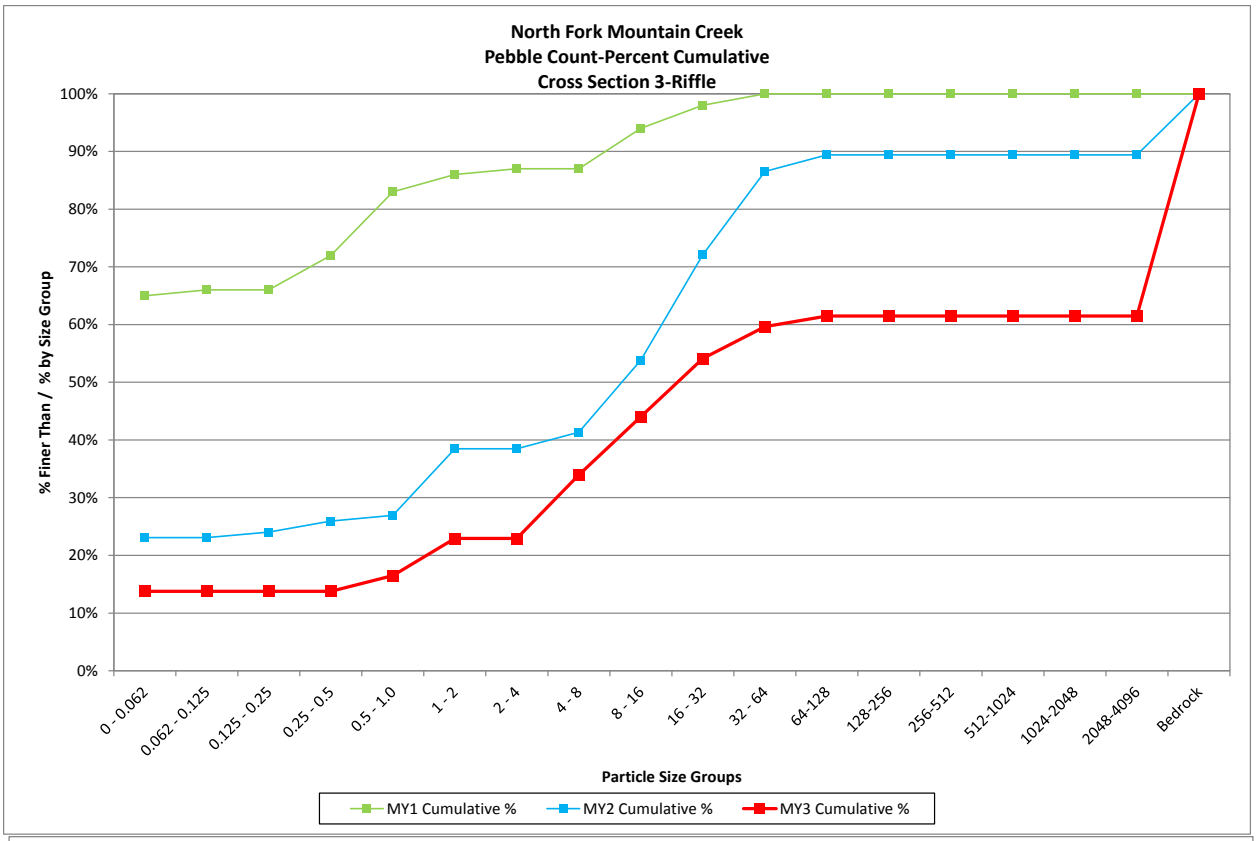


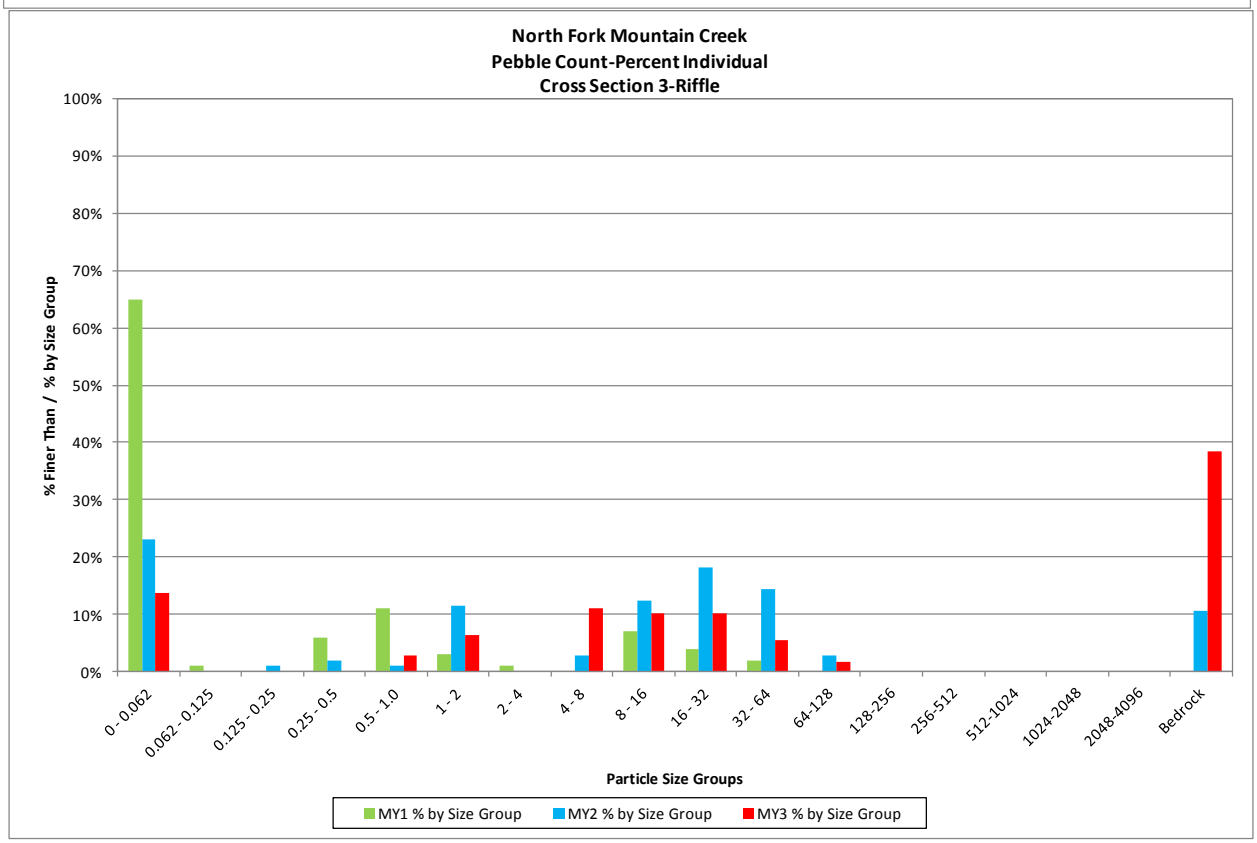
North Fork Mountain Creek			
Cross Section 1 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	105	100.0%	100%
0.062 - 0.125	0	0.0%	100%
0.125 - 0.25	0	0.0%	100%
0.25 - 0.5	0	0.0%	100%
0.5 - 1.0	0	0.0%	100%
1 - 2	0	0.0%	100%
2 - 4	0	0.0%	100%
4 - 8	0	0.0%	100%
8 - 16	0	0.0%	100%
16 - 32	0	0.0%	100%
32 - 64	0	0.0%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.062**
		D95	**0.062**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 1-Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

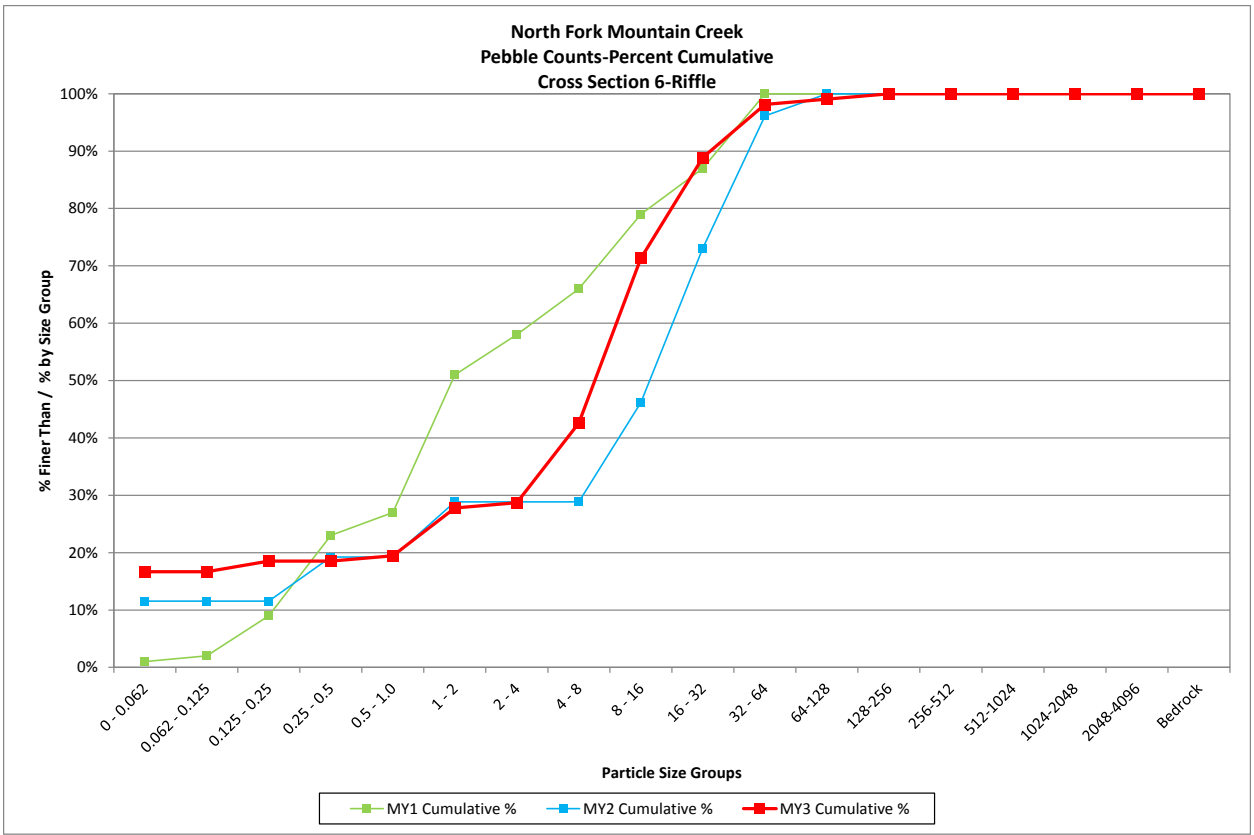

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 1-Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

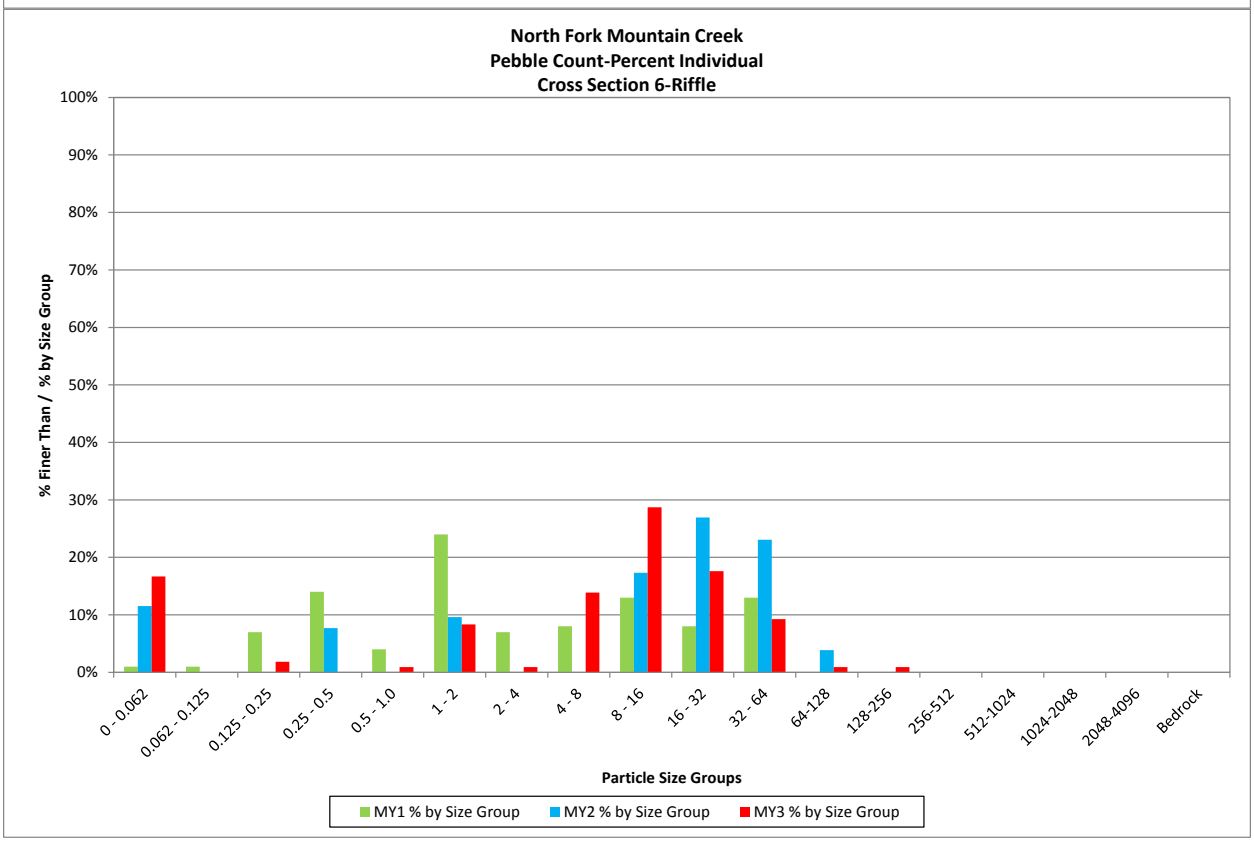
North Fork Mountain Creek			
Cross Section 3 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	15	13.8%	14%
0.062 - 0.125	0	0.0%	14%
0.125 - 0.25	0	0.0%	14%
0.25 - 0.5	0	0.0%	14%
0.5 - 1.0	3	2.8%	17%
1 - 2	7	6.4%	23%
2 - 4	0	0.0%	23%
4 - 8	12	11.0%	34%
8 - 16	11	10.1%	44%
16 - 32	11	10.1%	54%
32 - 64	6	5.5%	60%
64-128	2	1.8%	61%
128-256	0	0.0%	61%
256-512	0	0.0%	61%
512-1024	0	0.0%	61%
1024-2048	0	0.0%	61%
2048-4096	0	0.0%	61%
Bedrock	42	38.5%	100%
Total	**109**	**100%**	**100%**
		Summary Data	
		D50	**6.9**
		D84	**28**
		D95	**44**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 3-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

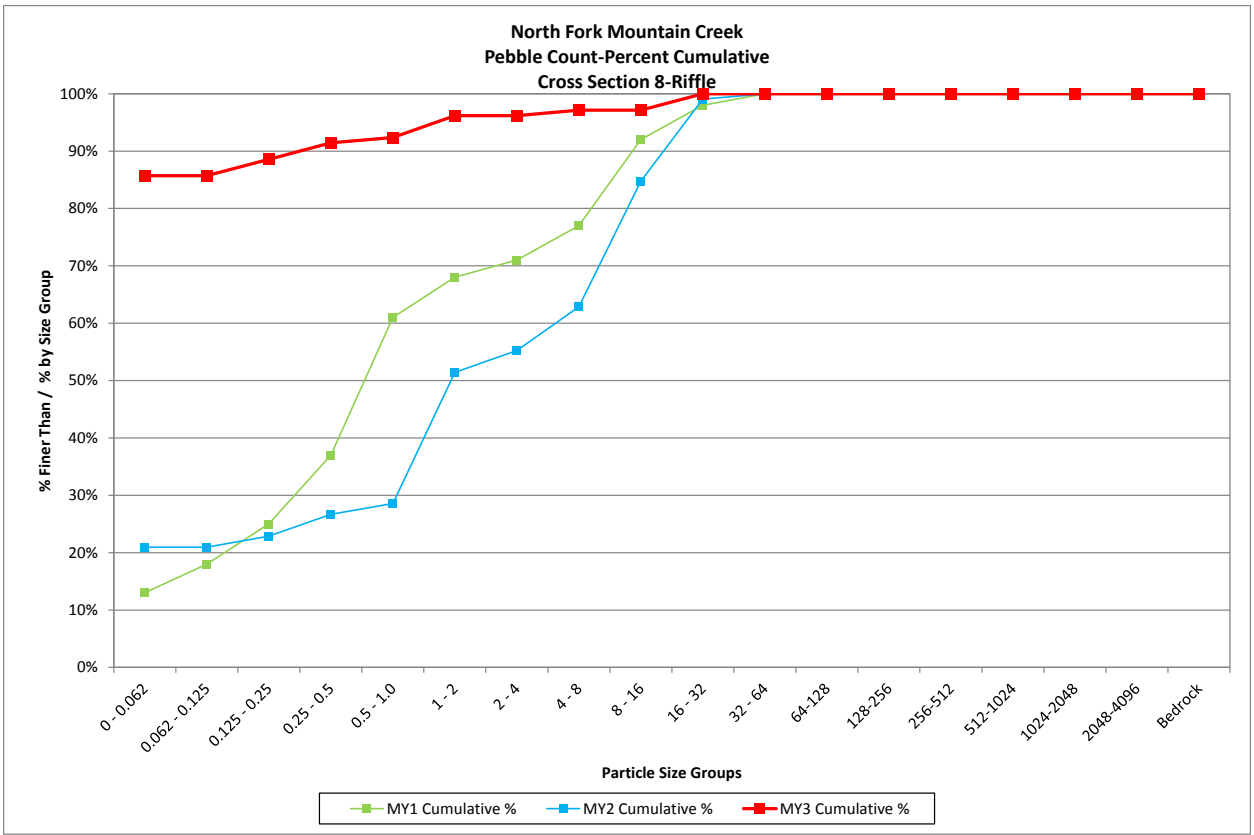

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 3-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

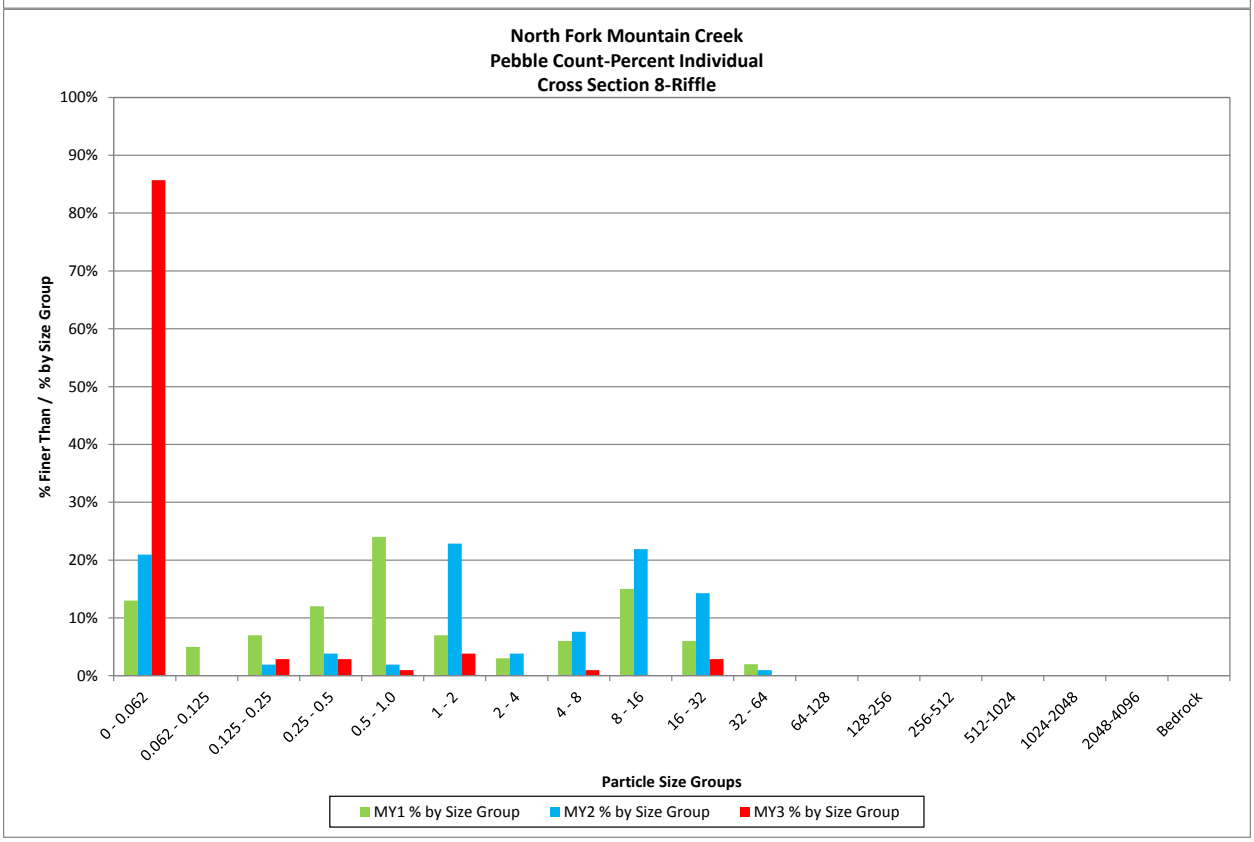
North Fork Mountain Creek			
Cross Section 6 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	18	16.7%	17%
0.062 - 0.125	0	0.0%	17%
0.125 - 0.25	2	1.9%	19%
0.25 - 0.5	0	0.0%	19%
0.5 - 1.0	1	0.9%	19%
1 - 2	9	8.3%	28%
2 - 4	1	0.9%	29%
4 - 8	15	13.9%	43%
8 - 16	31	28.7%	71%
16 - 32	19	17.6%	89%
32 - 64	10	9.3%	98%
64-128	1	0.9%	99%
128-256	1	0.9%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**108**	**100%**	**100%**
		Summary Data	
		D50	**11**
		D84	**25**
		D95	**52**


North Fork Mountain Creek
Pebble Counts-Percent Cumulative
Cross Section 6-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

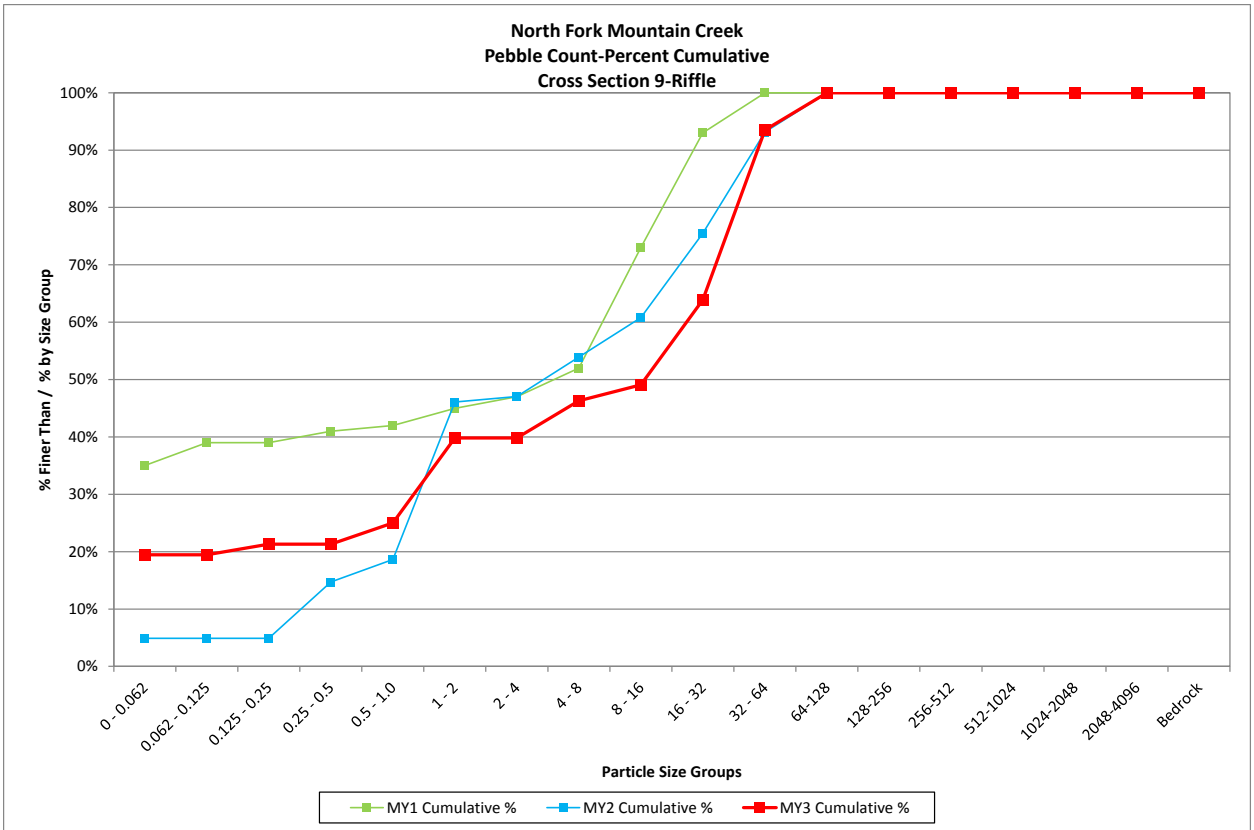

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 6-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

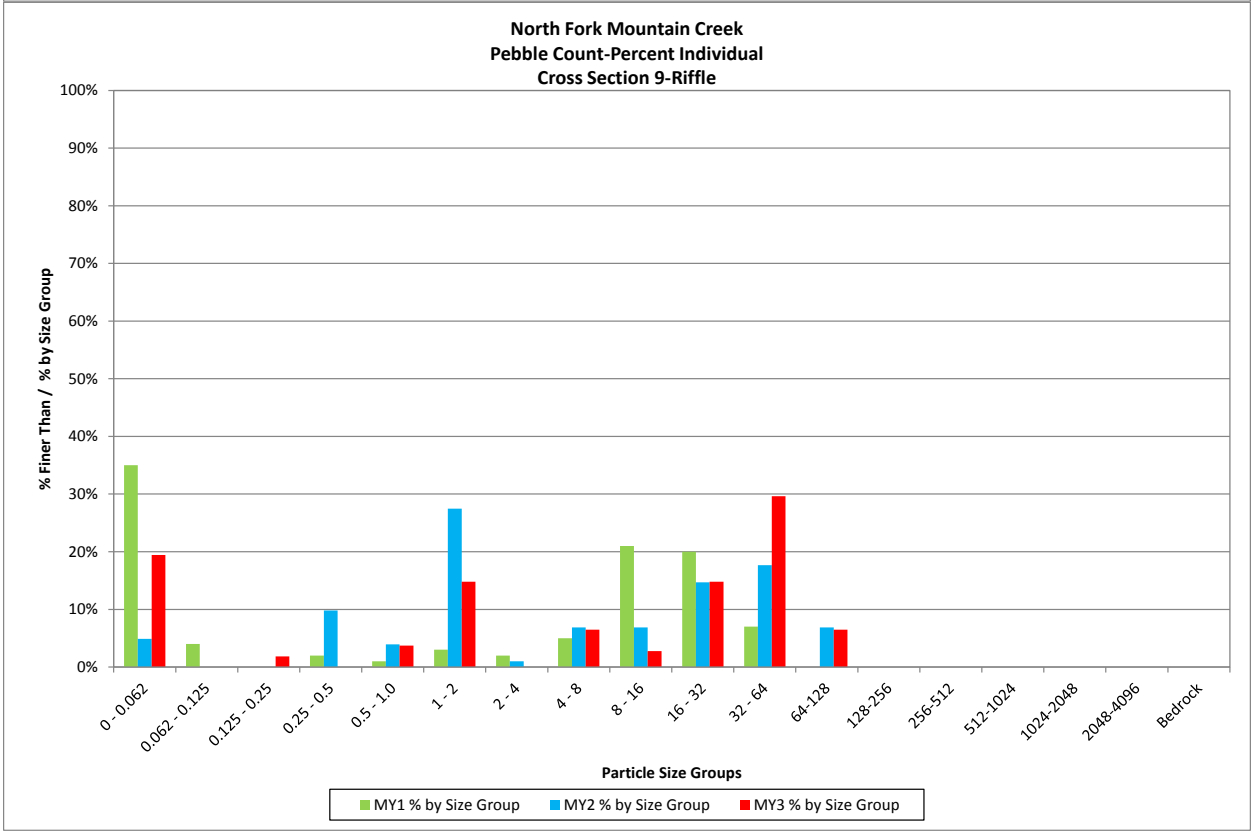
North Fork Mountain Creek			
Cross Section 8 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	90	85.7%	86%
0.062 - 0.125	0	0.0%	86%
0.125 - 0.25	3	2.9%	89%
0.25 - 0.5	3	2.9%	91%
0.5 - 1.0	1	1.0%	92%
1 - 2	4	3.8%	96%
2 - 4	0	0.0%	96%
4 - 8	1	1.0%	97%
8 - 16	0	0.0%	97%
16 - 32	3	2.9%	100%
32 - 64	0	0.0%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.062**
		D95	**1.6**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 8-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

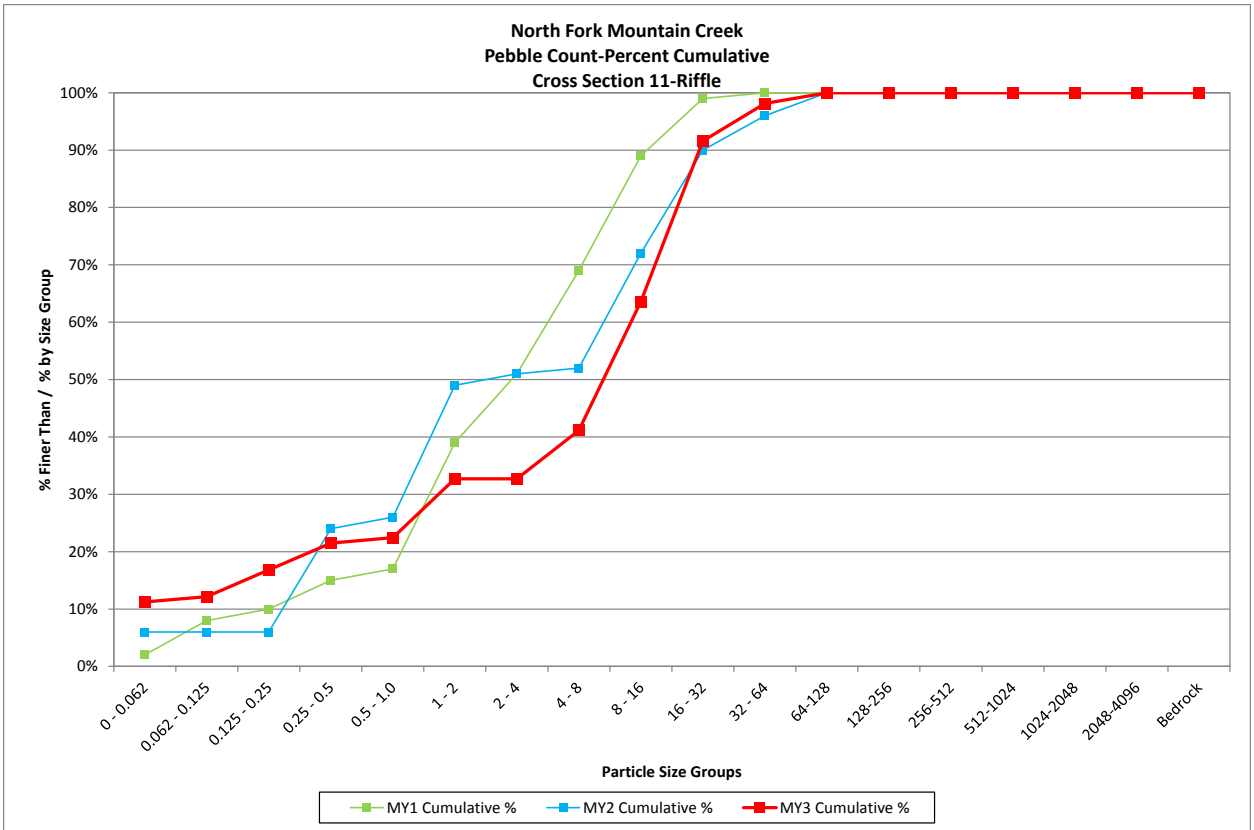

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 8-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

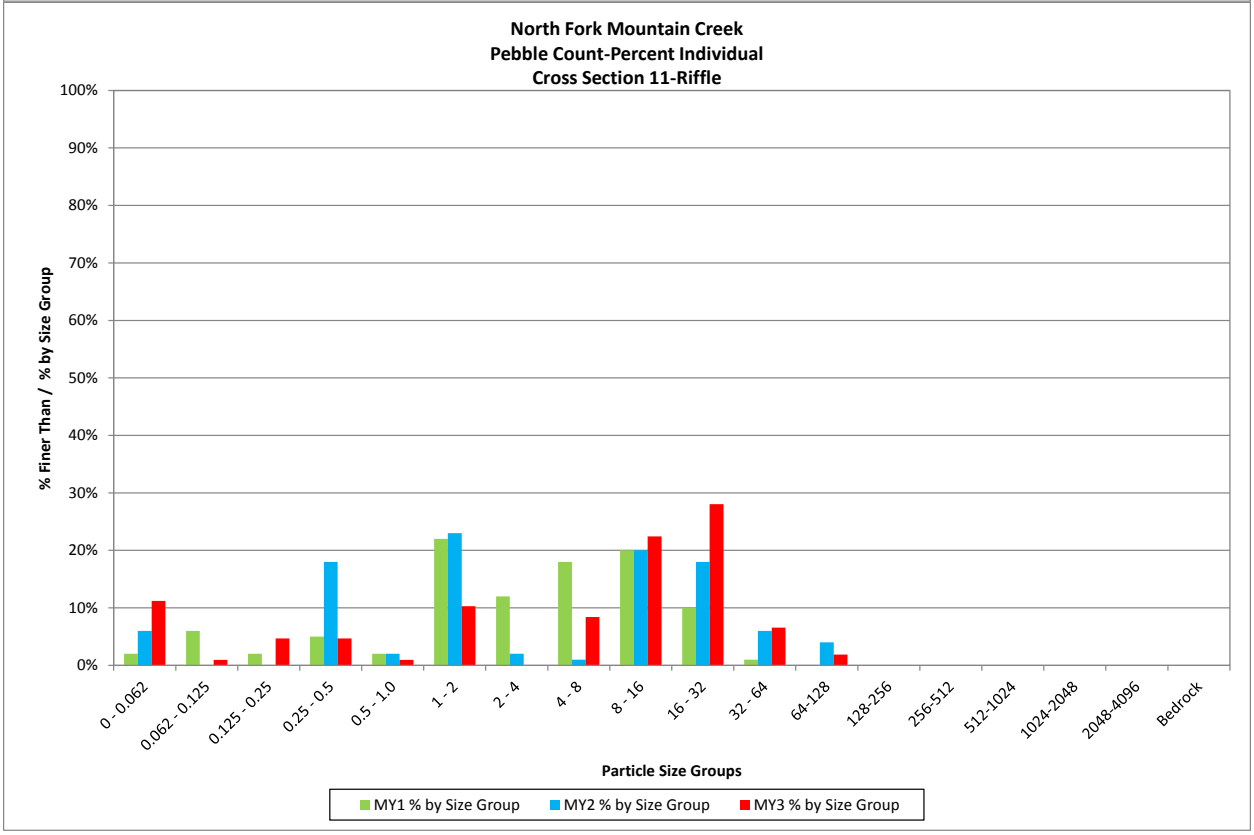
North Fork Mountain Creek			
Cross Section 9 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	21	19.4%	19%
0.062 - 0.125	0	0.0%	19%
0.125 - 0.25	2	1.9%	21%
0.25 - 0.5	0	0.0%	21%
0.5 - 1.0	4	3.7%	25%
1 - 2	16	14.8%	40%
2 - 4	0	0.0%	40%
4 - 8	7	6.5%	46%
8 - 16	3	2.8%	49%
16 - 32	16	14.8%	64%
32 - 64	32	29.6%	94%
64-128	7	6.5%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**108**	**100%**	**100%**
		Summary Data	
		D50	**17**
		D84	**53**
		D95	**77**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 9-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

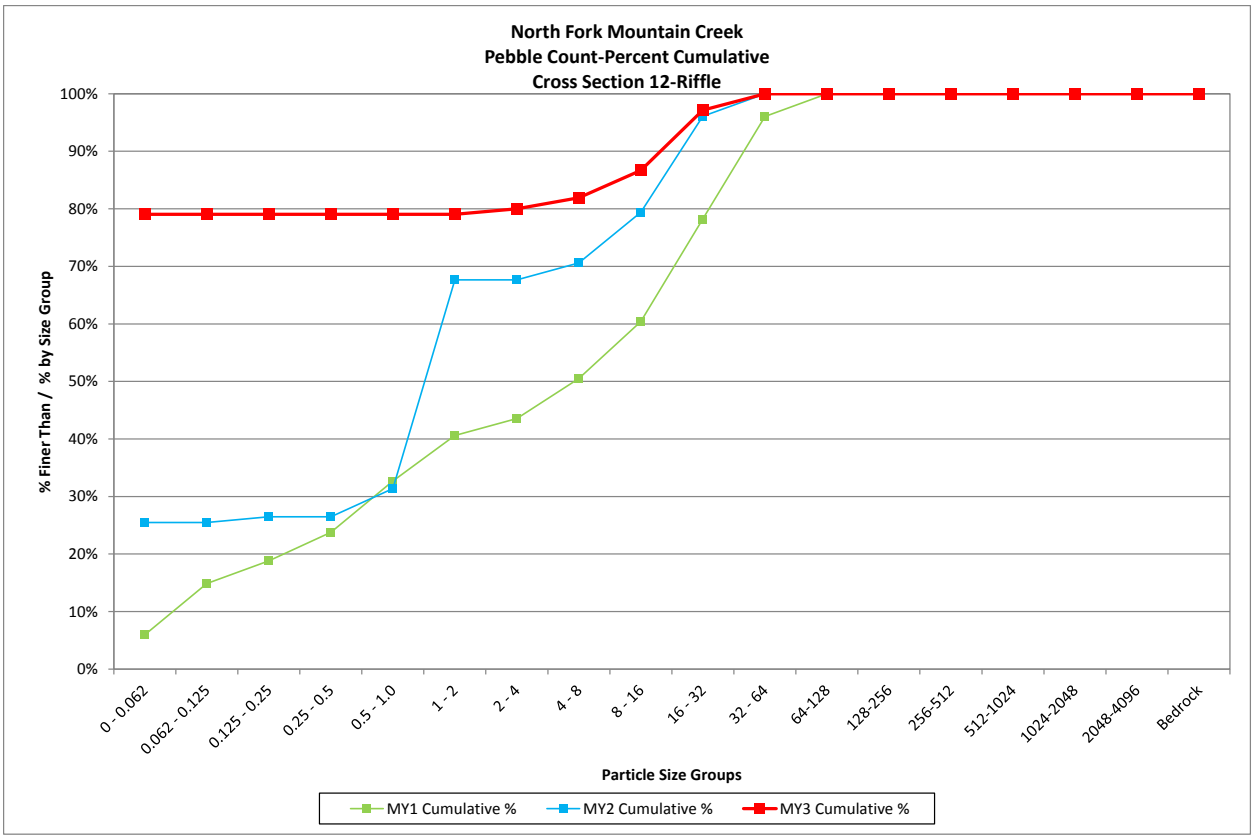

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 9-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

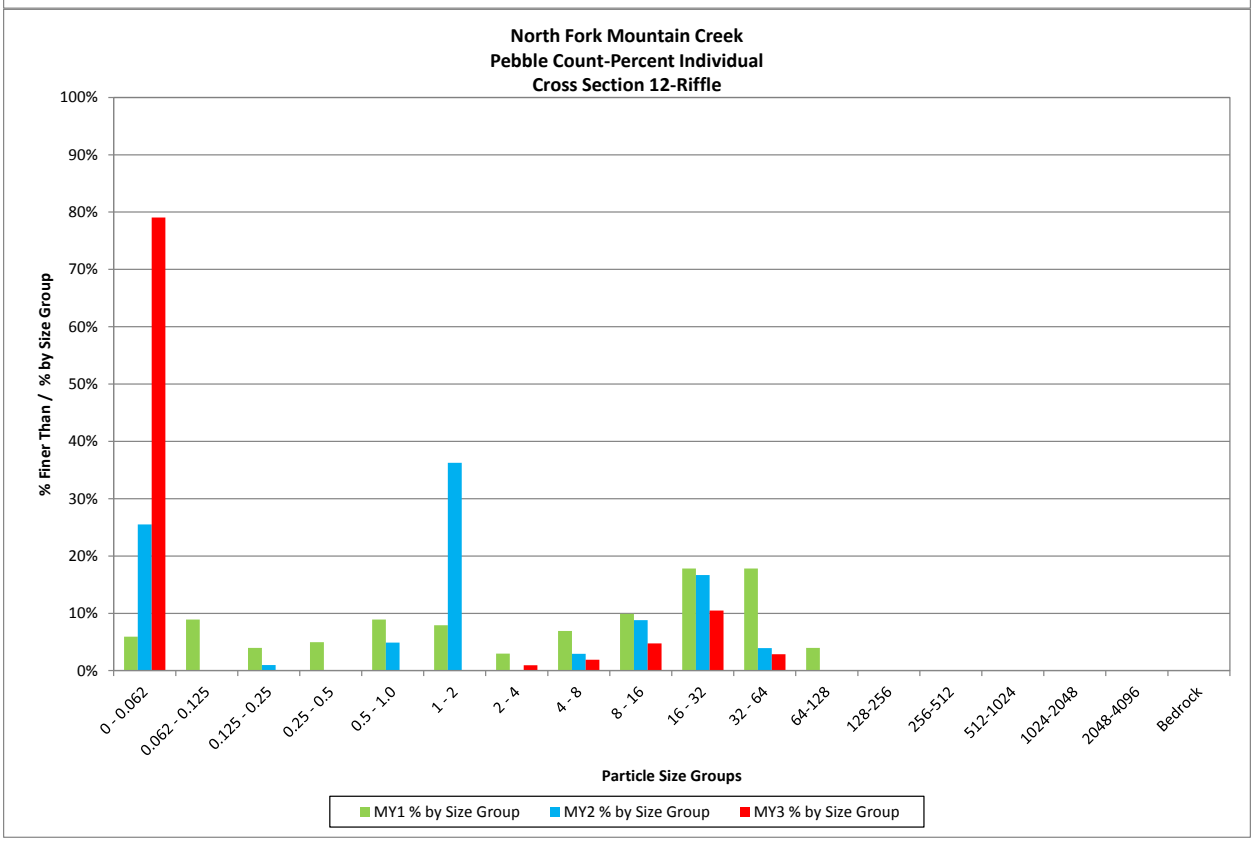
North Fork Mountain Creek			
Cross Section 11 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	12	11.2%	11%
0.062 - 0.125	1	0.9%	12%
0.125 - 0.25	5	4.7%	17%
0.25 - 0.5	5	4.7%	21%
0.5 - 1.0	1	0.9%	22%
1 - 2	11	10.3%	33%
2 - 4	0	0.0%	33%
4 - 8	9	8.4%	41%
8 - 16	24	22.4%	64%
16 - 32	30	28.0%	92%
32 - 64	7	6.5%	98%
64-128	2	1.9%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**107**	**100%**	**100%**
		Summary Data	
		D50	**12**
		D84	**25**
		D95	**39**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 11-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

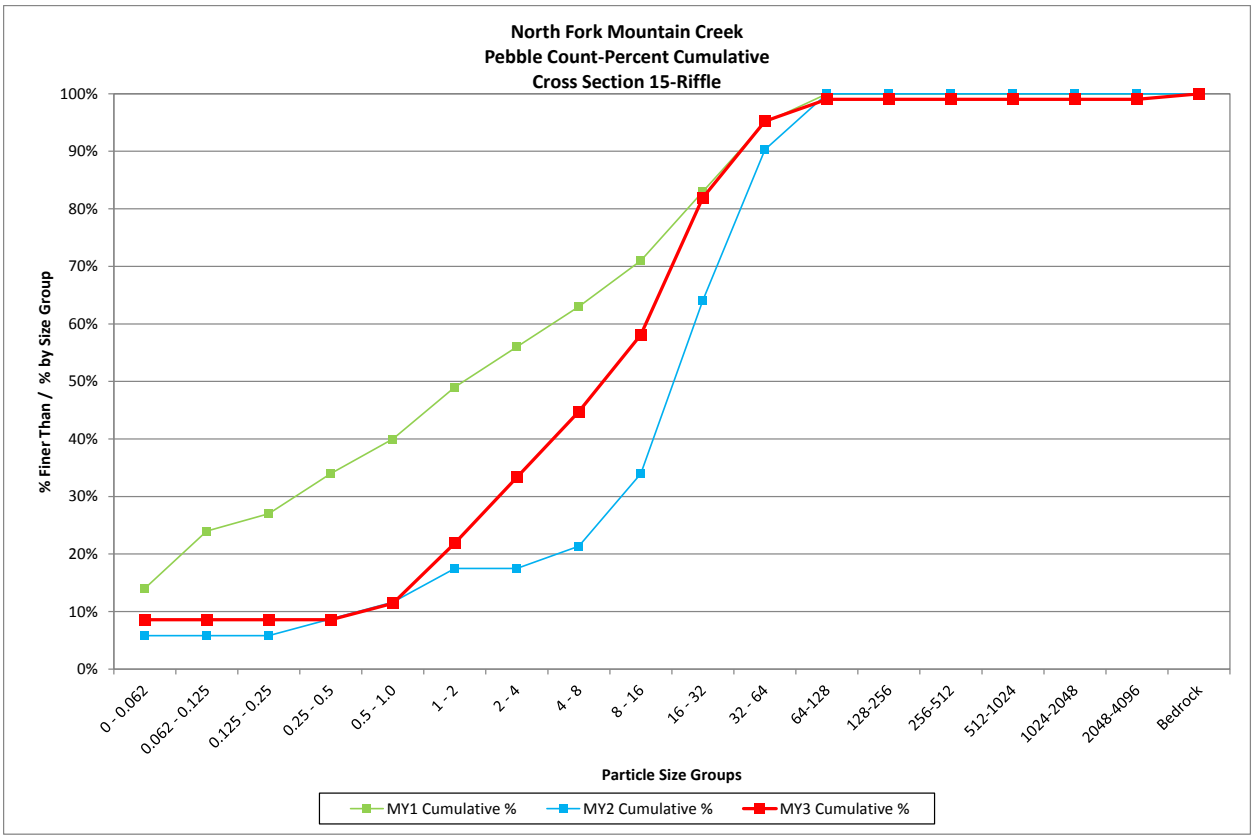

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 11-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

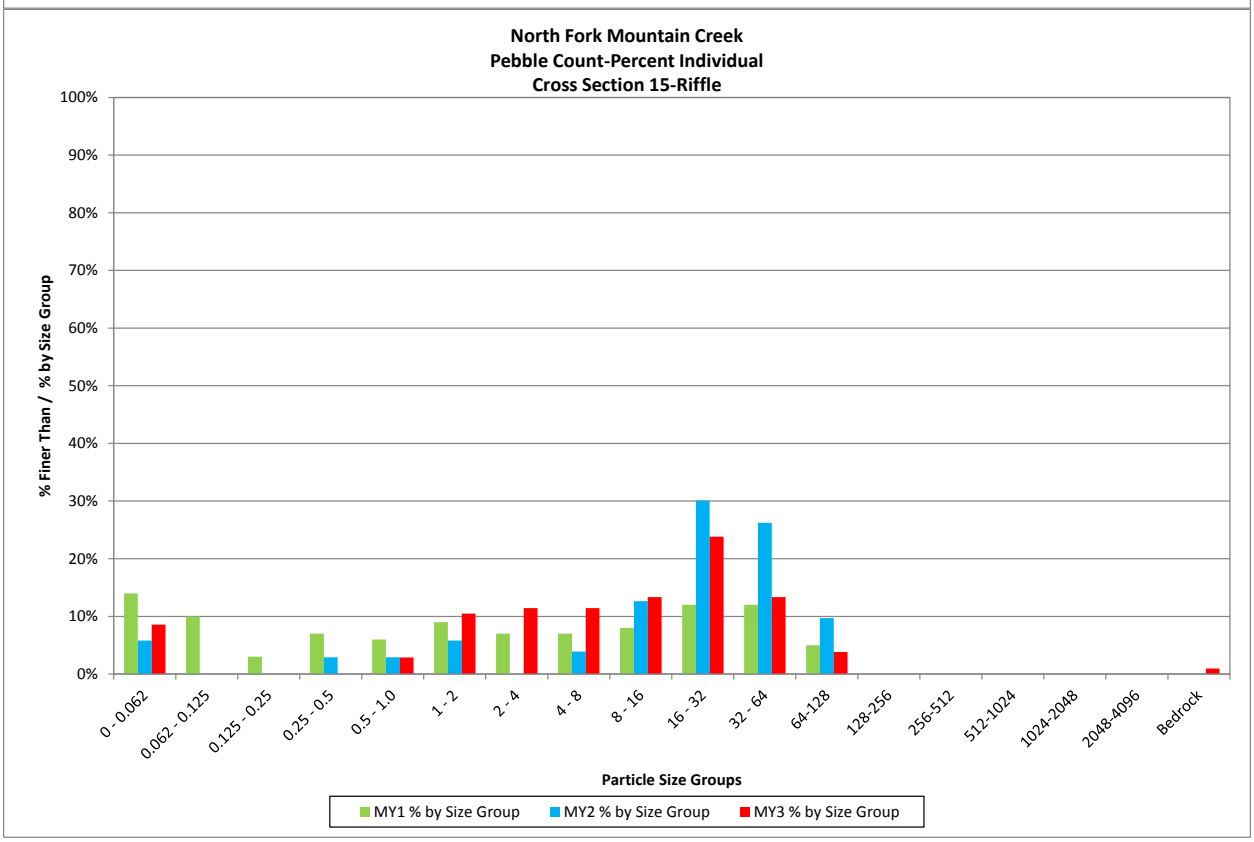
North Fork Mountain Creek			
Cross Section 12 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	83	79.0%	79%
0.062 - 0.125	0	0.0%	79%
0.125 - 0.25	0	0.0%	79%
0.25 - 0.5	0	0.0%	79%
0.5 - 1.0	0	0.0%	79%
1 - 2	0	0.0%	79%
2 - 4	1	1.0%	80%
4 - 8	2	1.9%	82%
8 - 16	5	4.8%	87%
16 - 32	11	10.5%	97%
32 - 64	3	2.9%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**12**
		D95	**28**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 12-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

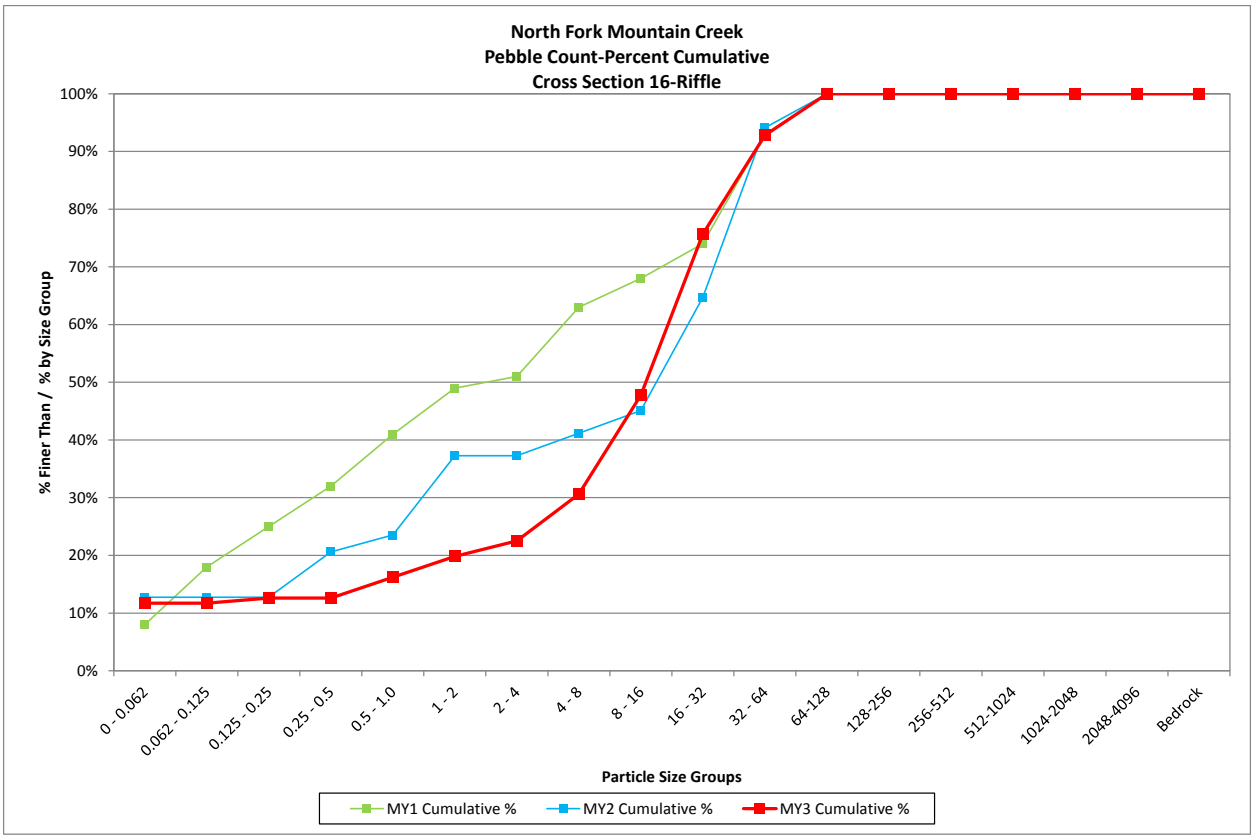

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 12-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

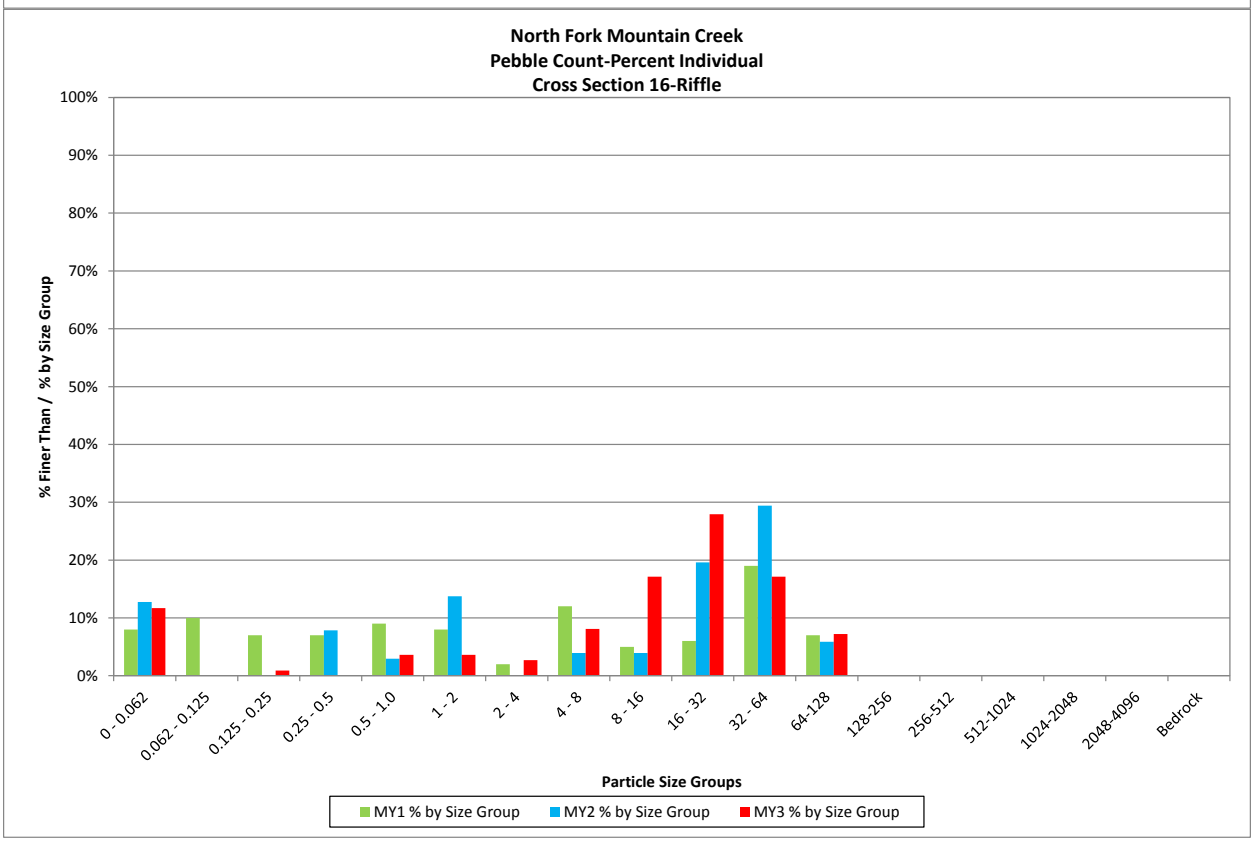
North Fork Mountain Creek			
Cross Section 15 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	9	8.6%	9%
0.062 - 0.125	0	0.0%	9%
0.125 - 0.25	0	0.0%	9%
0.25 - 0.5	0	0.0%	9%
0.5 - 1.0	3	2.9%	11%
1 - 2	11	10.5%	22%
2 - 4	12	11.4%	33%
4 - 8	12	11.4%	45%
8 - 16	14	13.3%	58%
16 - 32	25	23.8%	82%
32 - 64	14	13.3%	95%
64-128	4	3.8%	99%
128-256	0	0.0%	99%
256-512	0	0.0%	99%
512-1024	0	0.0%	99%
1024-2048	0	0.0%	99%
2048-4096	0	0.0%	99%
Bedrock	1	1.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**10**
		D84	**33**
		D95	**56**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 15-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

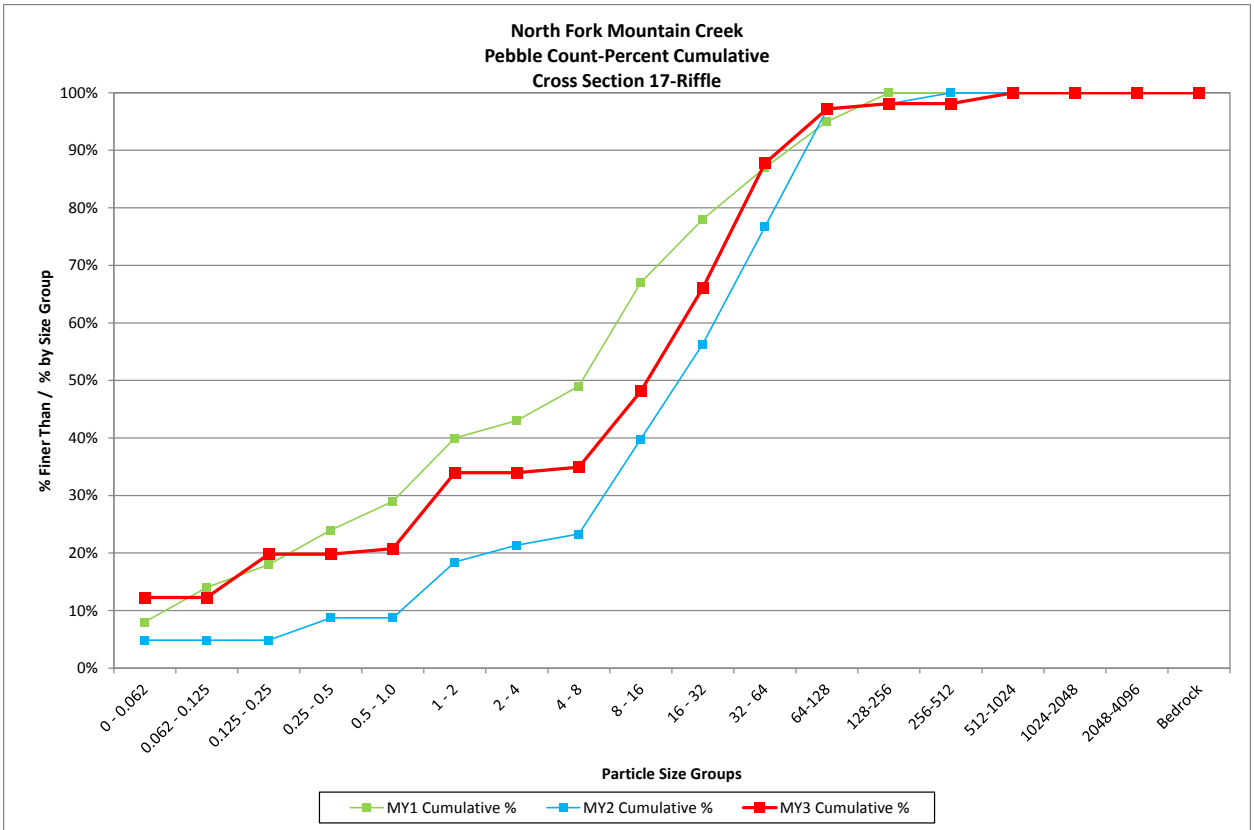

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 15-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

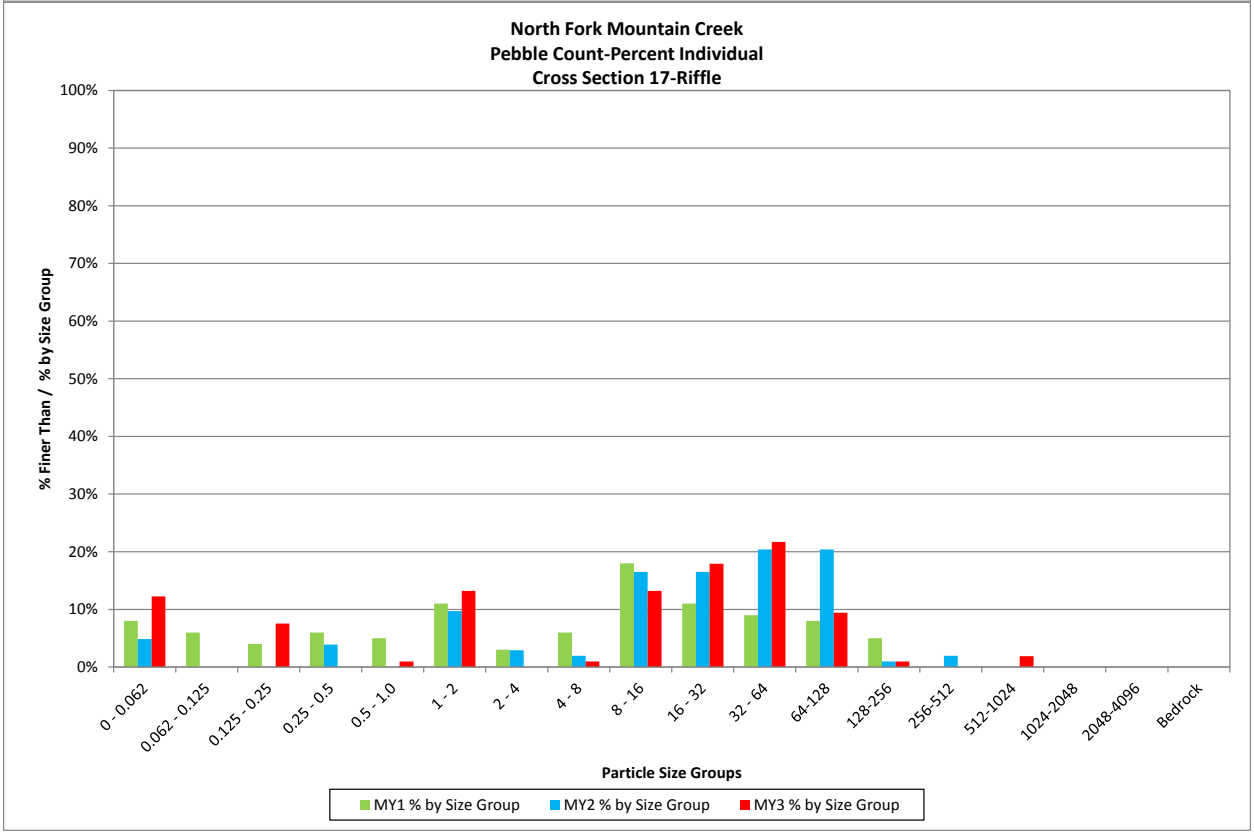
North Fork Mountain Creek			
Cross Section 16 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	13	11.7%	12%
0.062 - 0.125	0	0.0%	12%
0.125 - 0.25	1	0.9%	13%
0.25 - 0.5	0	0.0%	13%
0.5 - 1.0	4	3.6%	16%
1 - 2	4	3.6%	20%
2 - 4	3	2.7%	23%
4 - 8	9	8.1%	31%
8 - 16	19	17.1%	48%
16 - 32	31	27.9%	76%
32 - 64	19	17.1%	93%
64-128	8	7.2%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**111**	**100%**	**100%**
		Summary Data	
		D50	**17**
		D84	**44**
		D95	**74**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 16-Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

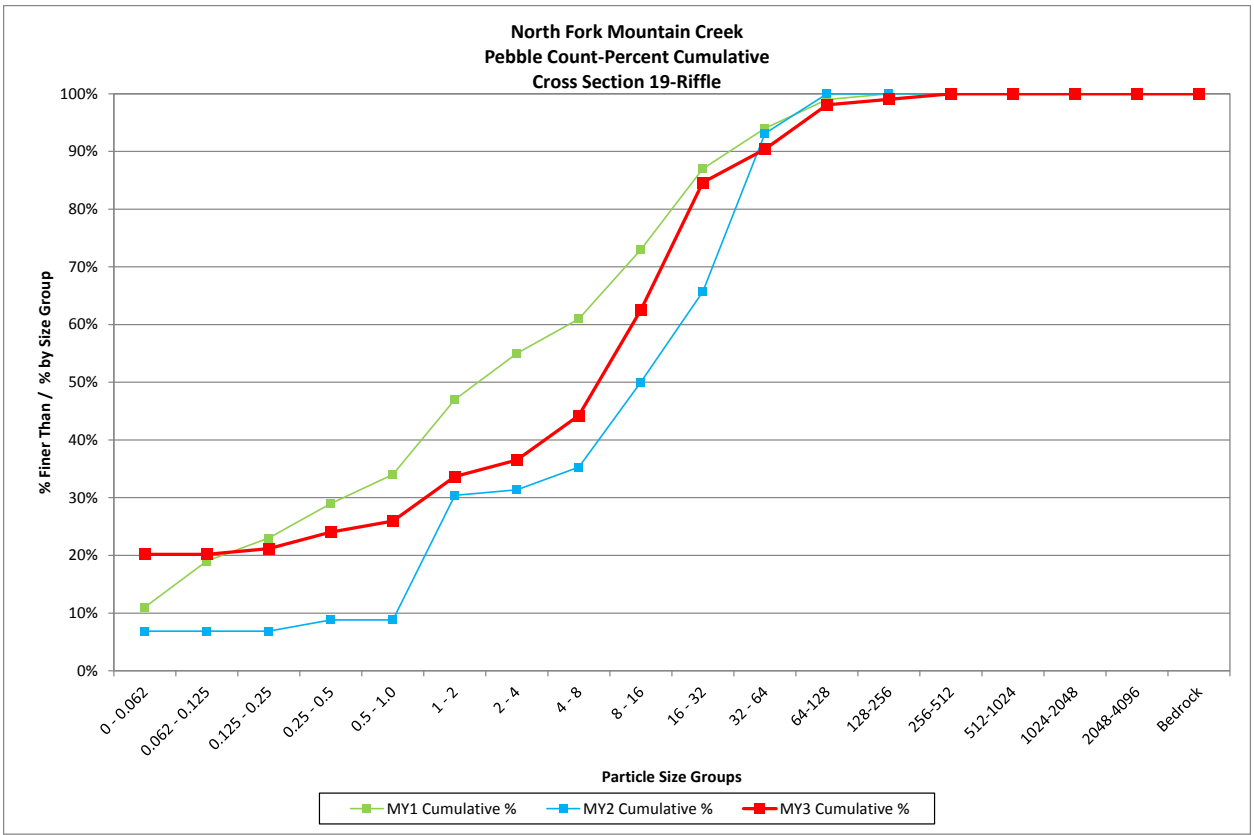

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 16-Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

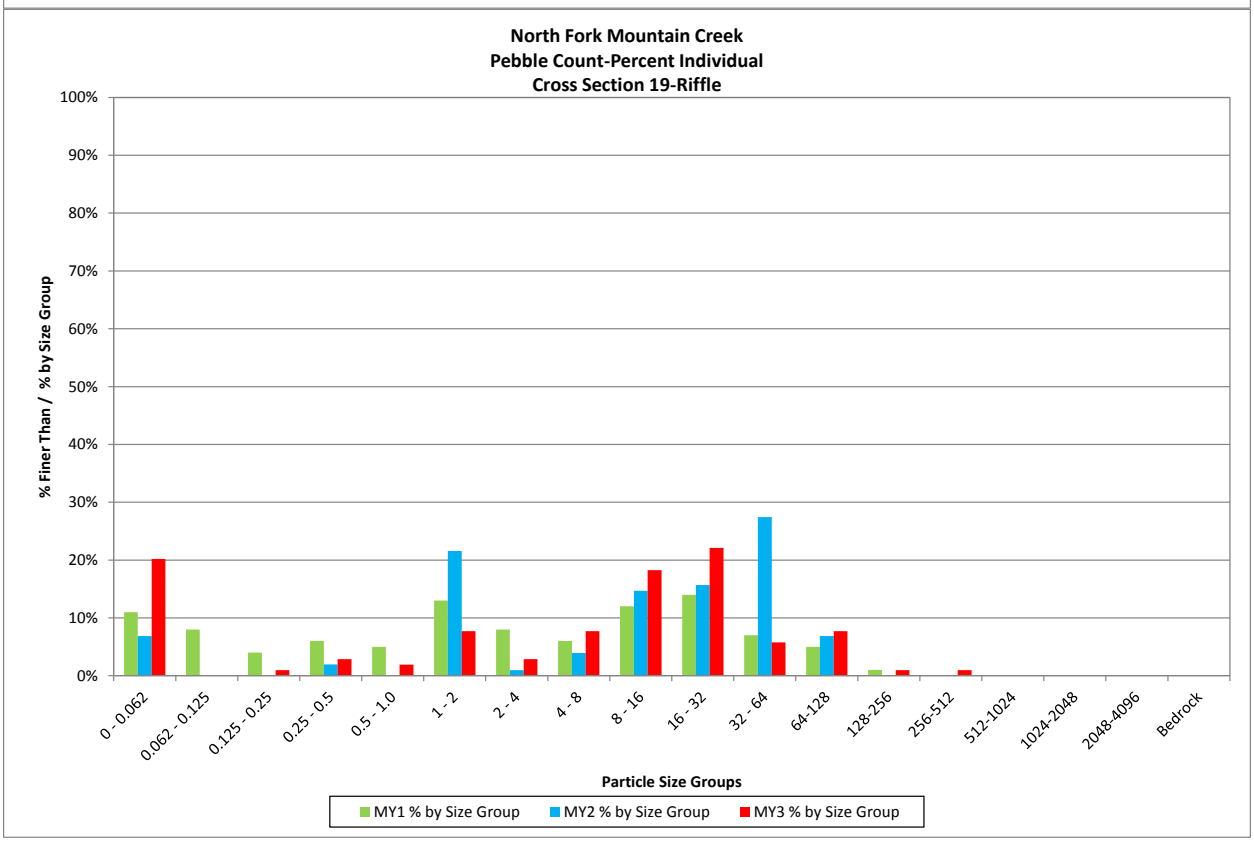
North Fork Mountain Creek			
Cross Section 17 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	13	12.3%	12%
0.062 - 0.125	0	0.0%	12%
0.125 - 0.25	8	7.5%	20%
0.25 - 0.5	0	0.0%	20%
0.5 - 1.0	1	0.9%	21%
1 - 2	14	13.2%	34%
2 - 4	0	0.0%	34%
4 - 8	1	0.9%	35%
8 - 16	14	13.2%	48%
16 - 32	19	17.9%	66%
32 - 64	23	21.7%	88%
64-128	10	9.4%	97%
128-256	1	0.9%	98%
256-512	0	0.0%	98%
512-1024	2	1.9%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**106**	**100%**	**100%**
		Summary Data	
		D50	**18**
		D84	**58**
		D95	**86**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 17-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

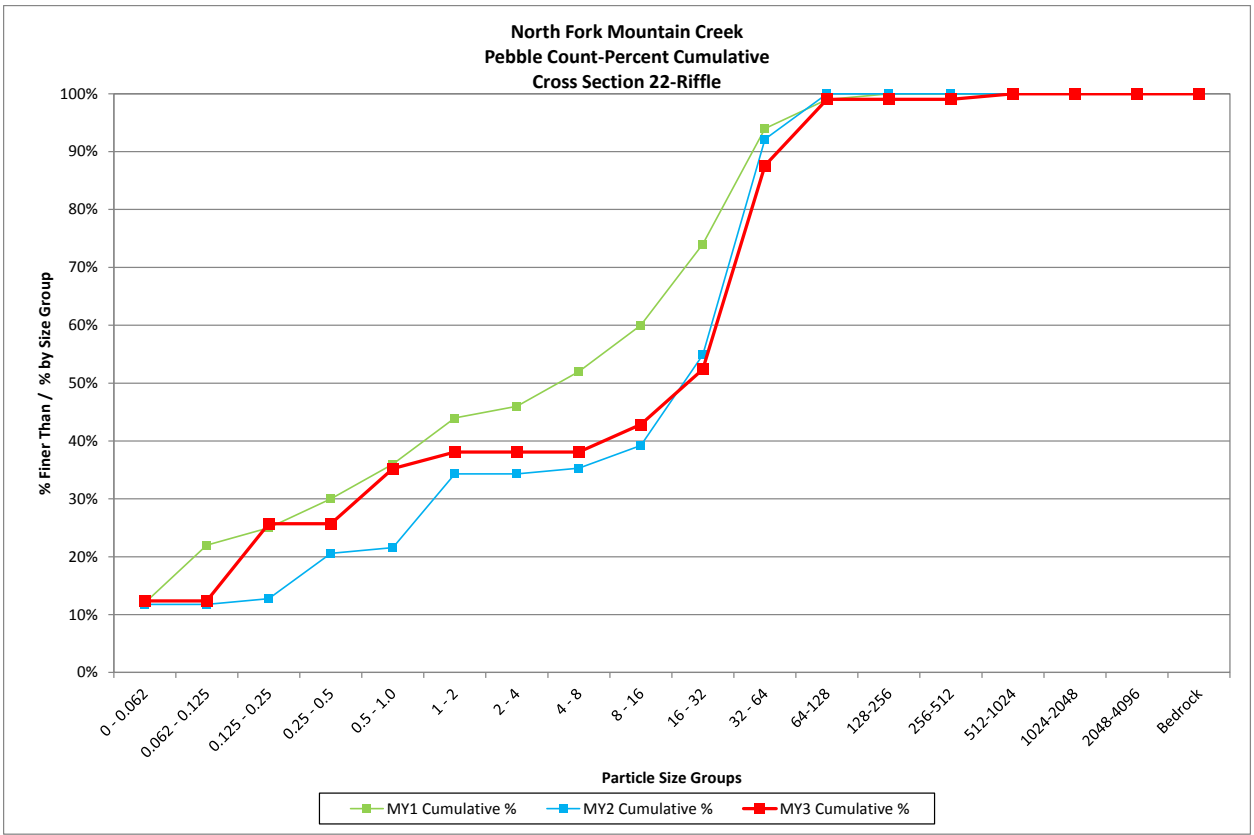

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 17-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

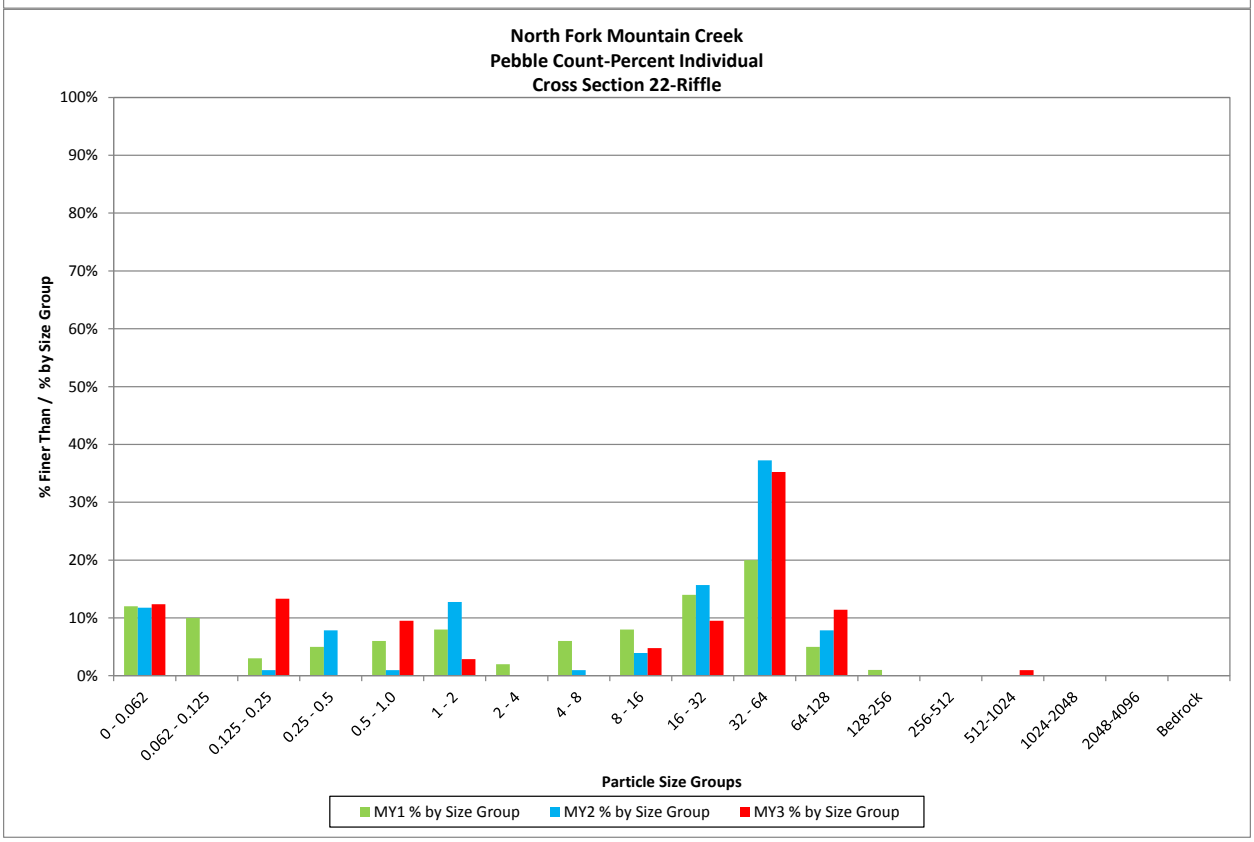
North Fork Mountain Creek			
Cross Section 19 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	21	20.2%	20%
0.062 - 0.125	0	0.0%	20%
0.125 - 0.25	1	1.0%	21%
0.25 - 0.5	3	2.9%	24%
0.5 - 1.0	2	1.9%	26%
1 - 2	8	7.7%	34%
2 - 4	3	2.9%	37%
4 - 8	8	7.7%	44%
8 - 16	19	18.3%	63%
16 - 32	23	22.1%	85%
32 - 64	6	5.8%	90%
64-128	8	7.7%	98%
128-256	1	1.0%	99%
256-512	1	1.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**104**	**100%**	**100%**
		Summary Data	
		D50	**12**
		D84	**31**
		D95	**84**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 19-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

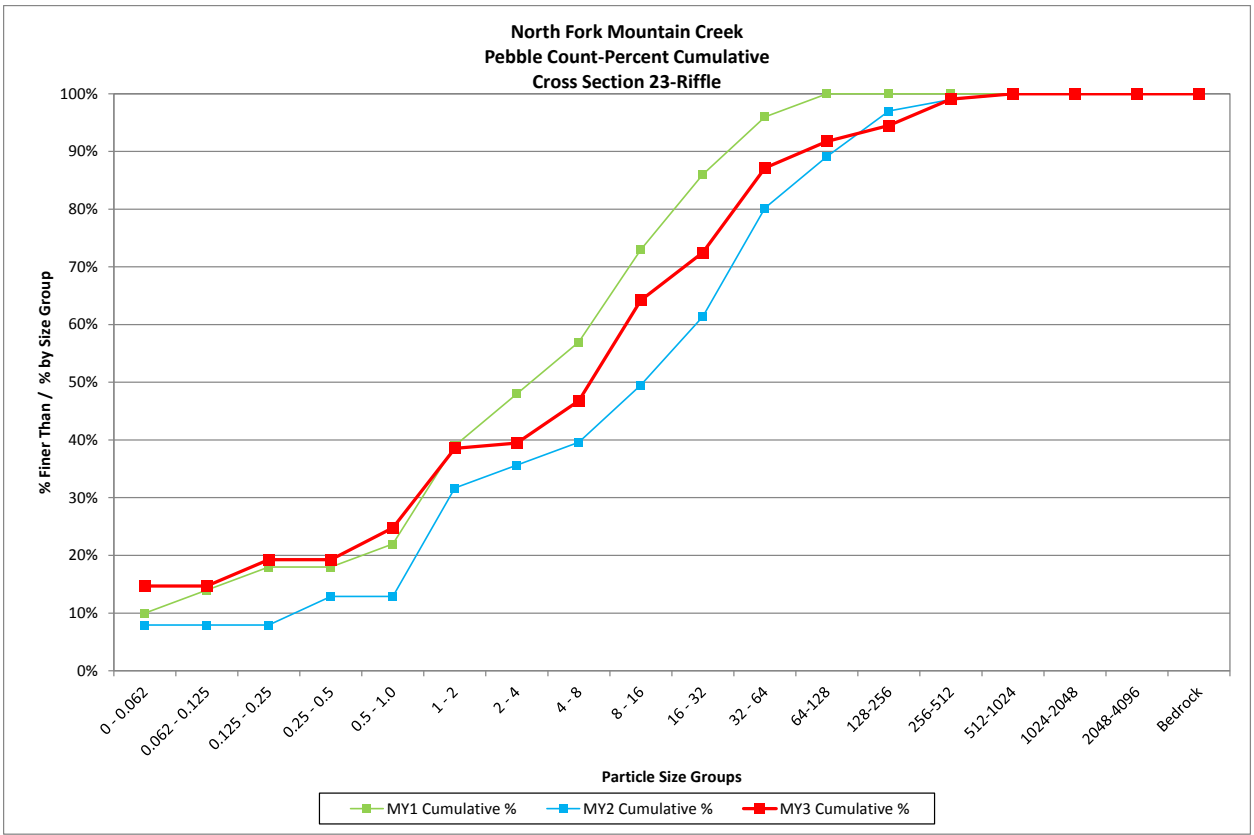

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 19-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

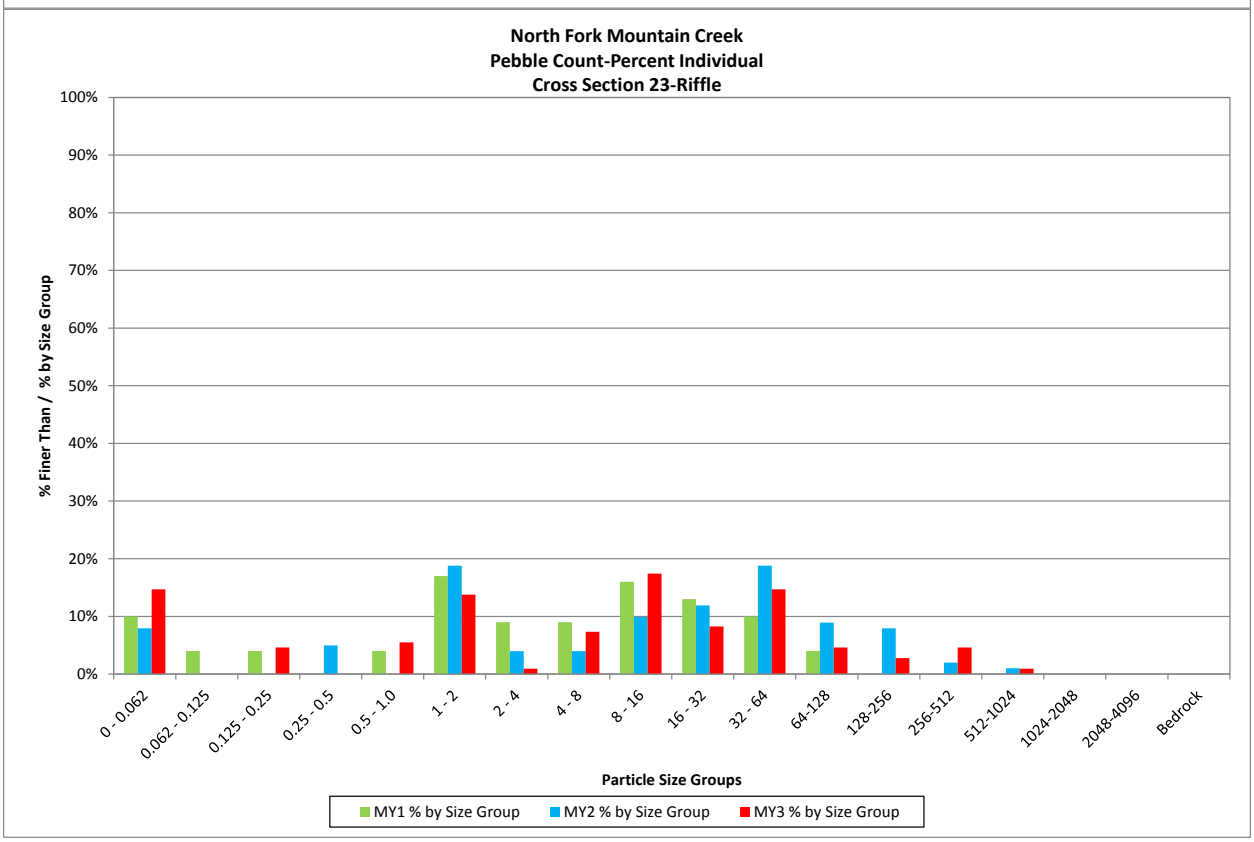
North Fork Mountain Creek			
Cross Section 22 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	13	12.4%	12%
0.062 - 0.125	0	0.0%	12%
0.125 - 0.25	14	13.3%	26%
0.25 - 0.5	0	0.0%	26%
0.5 - 1.0	10	9.5%	35%
1 - 2	3	2.9%	38%
2 - 4	0	0.0%	38%
4 - 8	0	0.0%	38%
8 - 16	5	4.8%	43%
16 - 32	10	9.5%	52%
32 - 64	37	35.2%	88%
64-128	12	11.4%	99%
128-256	0	0.0%	99%
256-512	0	0.0%	99%
512-1024	1	1.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**29**
		D84	**59**
		D95	**86**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 22-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

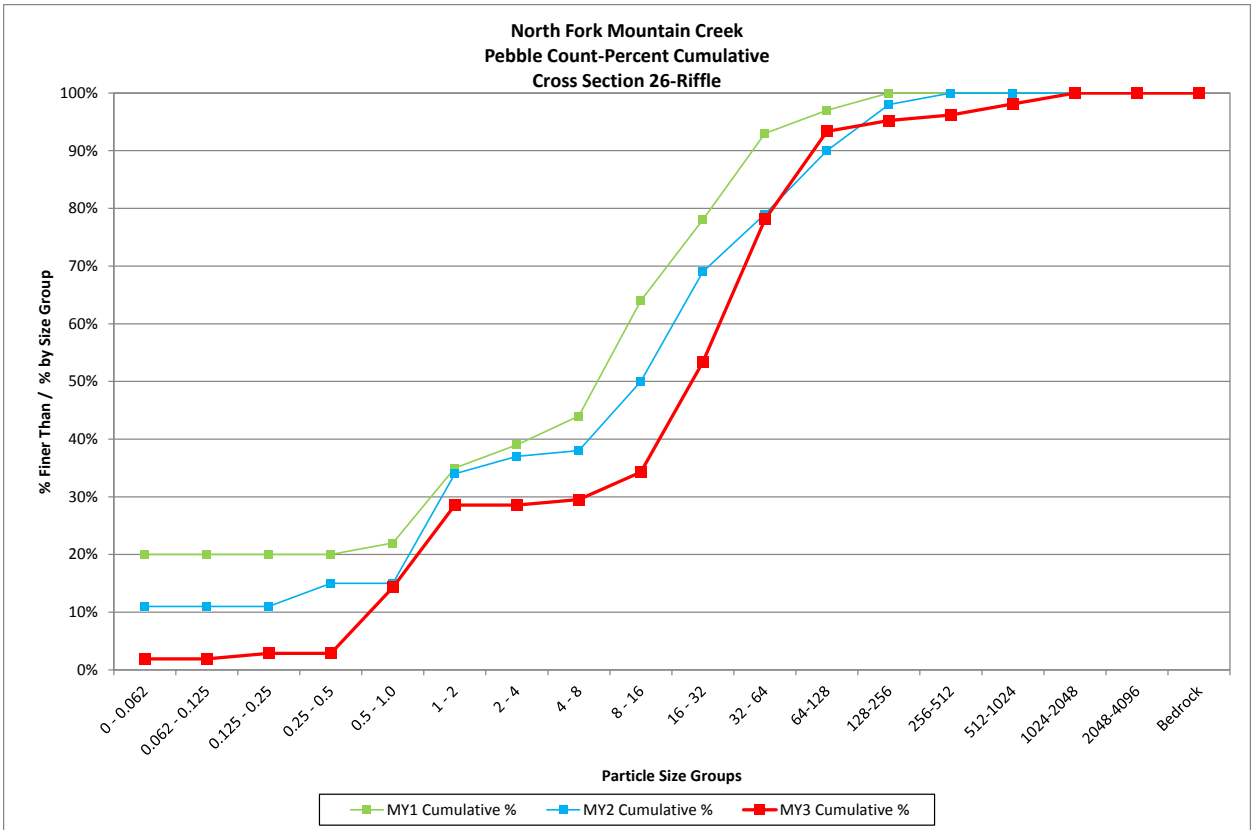

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 22-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

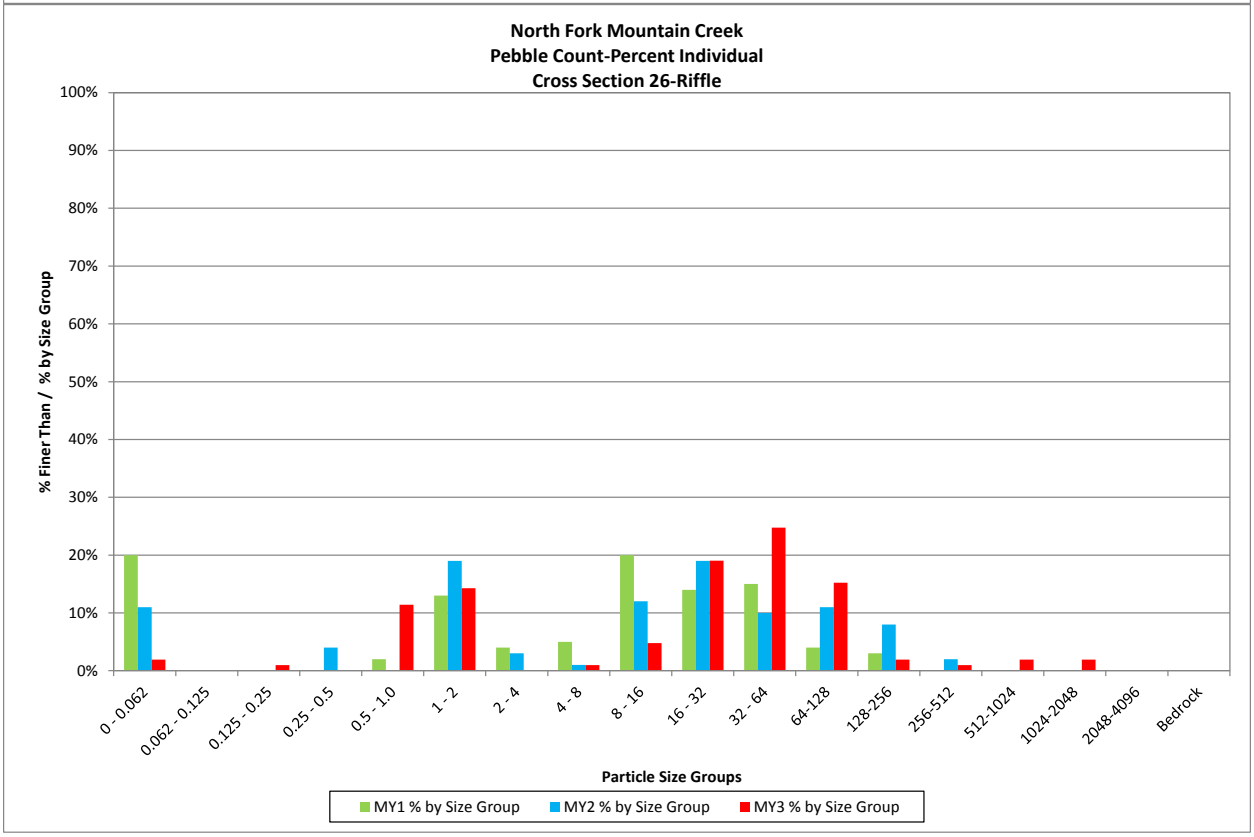
North Fork Mountain Creek			
Cross Section 23 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	16	14.7%	15%
0.062 - 0.125	0	0.0%	15%
0.125 - 0.25	5	4.6%	19%
0.25 - 0.5	0	0.0%	19%
0.5 - 1.0	6	5.5%	25%
1 - 2	15	13.8%	39%
2 - 4	1	0.9%	39%
4 - 8	8	7.3%	47%
8 - 16	19	17.4%	64%
16 - 32	9	8.3%	72%
32 - 64	16	14.7%	87%
64-128	5	4.6%	92%
128-256	3	2.8%	94%
256-512	5	4.6%	99%
512-1024	1	0.9%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**109**	**100%**	**100%**
		Summary Data	
		D50	**8.9**
		D84	**54**
		D95	**280**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 23-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

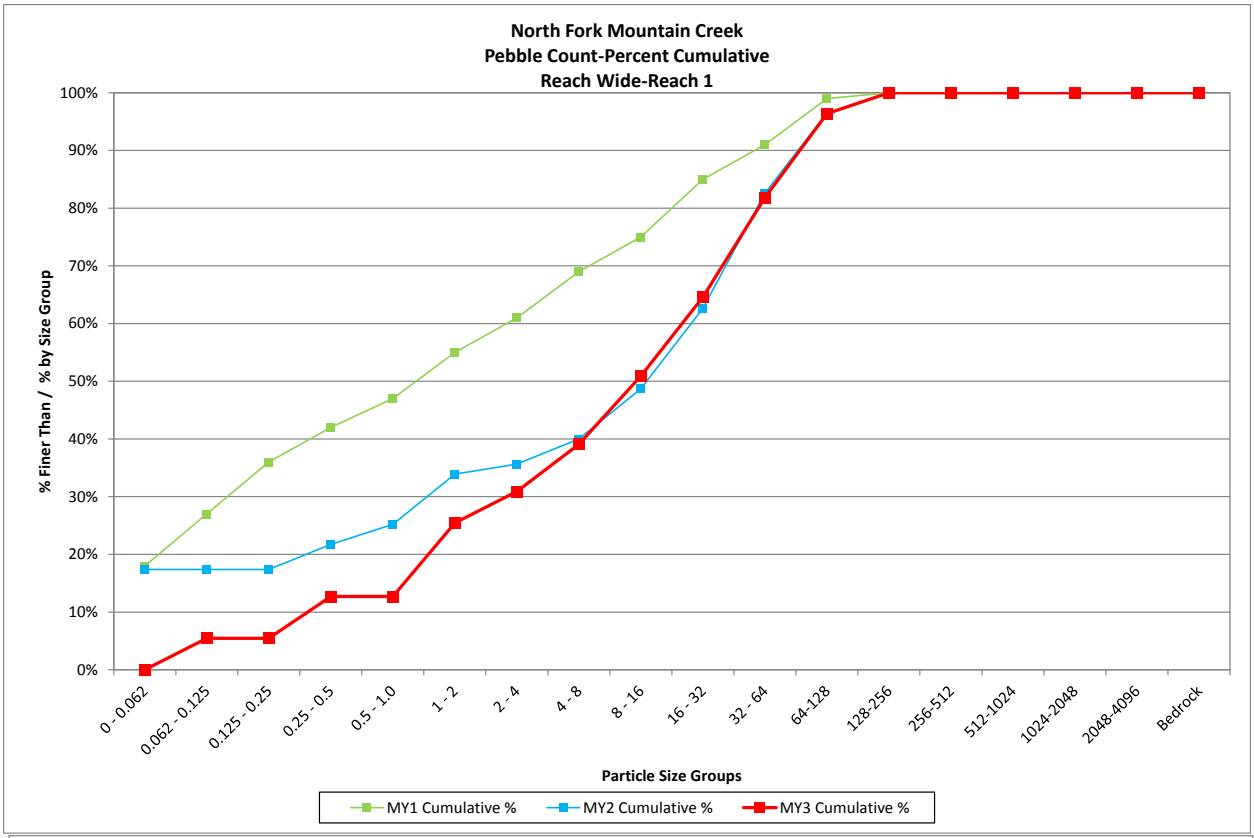

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 23-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

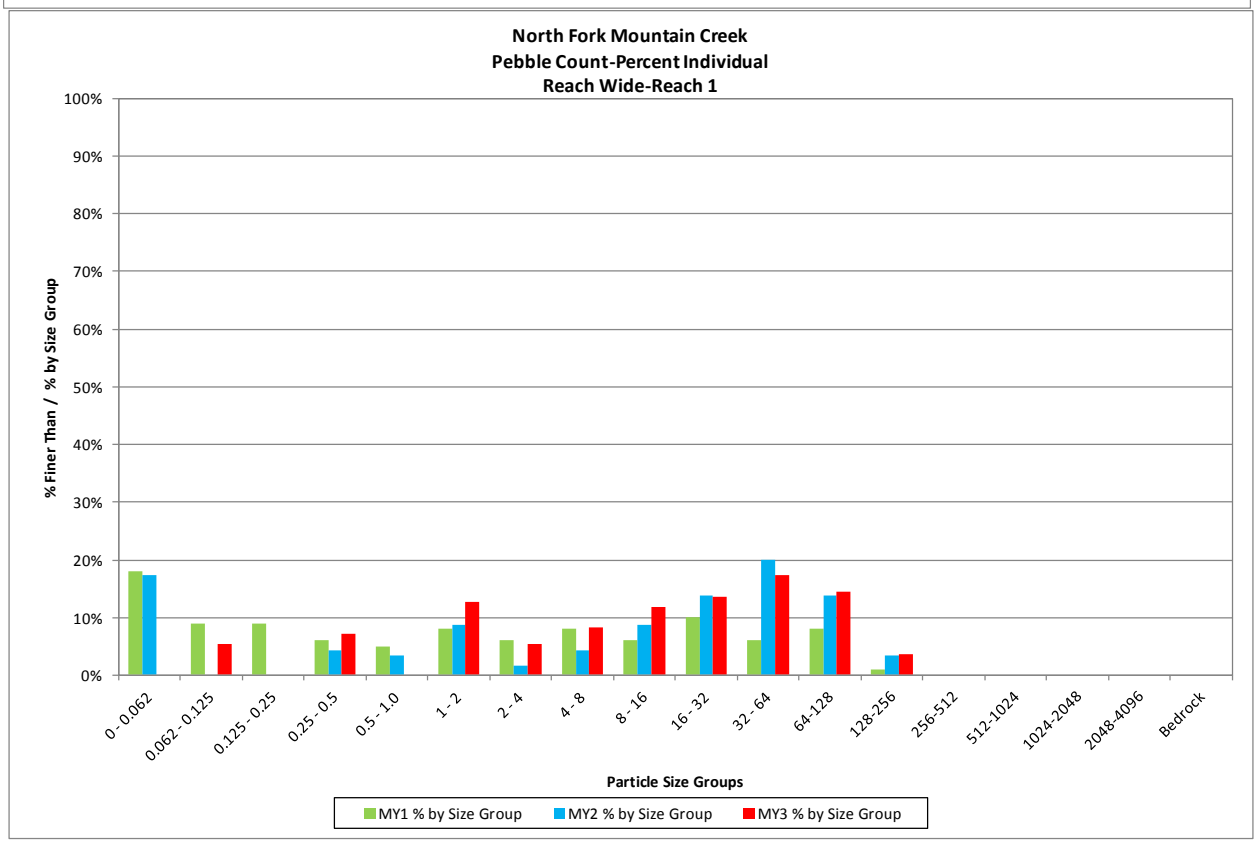
North Fork Mountain Creek			
Cross Section 26 - Riffle			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	2	1.9%	2%
0.062 - 0.125	0	0.0%	2%
0.125 - 0.25	1	1.0%	3%
0.25 - 0.5	0	0.0%	3%
0.5 - 1.0	12	11.4%	14%
1 - 2	15	14.3%	29%
2 - 4	0	0.0%	29%
4 - 8	1	1.0%	30%
8 - 16	5	4.8%	34%
16 - 32	20	19.0%	53%
32 - 64	26	24.8%	78%
64-128	16	15.2%	93%
128-256	2	1.9%	95%
256-512	1	1.0%	96%
512-1024	2	1.9%	98%
1024-2048	2	1.9%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**29**
		D84	**75**
		D95	**170**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Cross Section 26-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

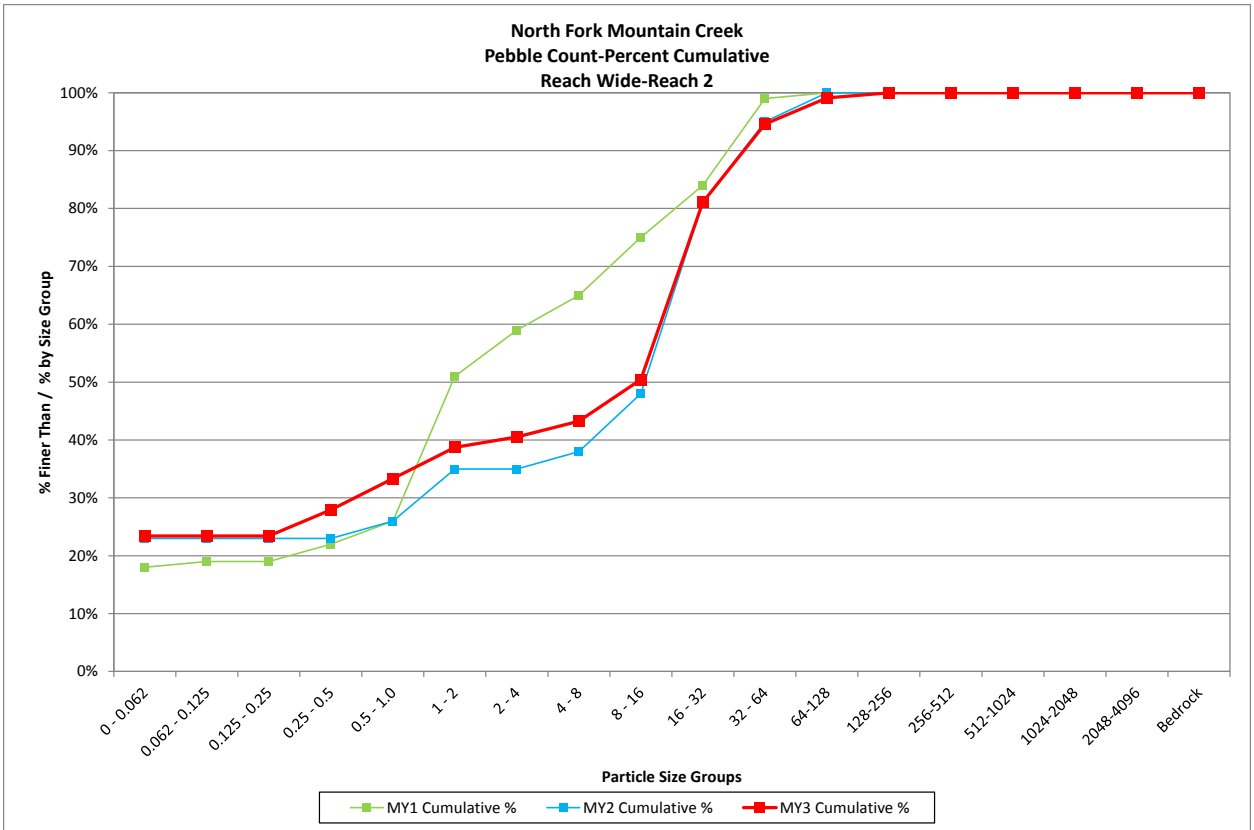

North Fork Mountain Creek
Pebble Count-Percent Individual
Cross Section 26-Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

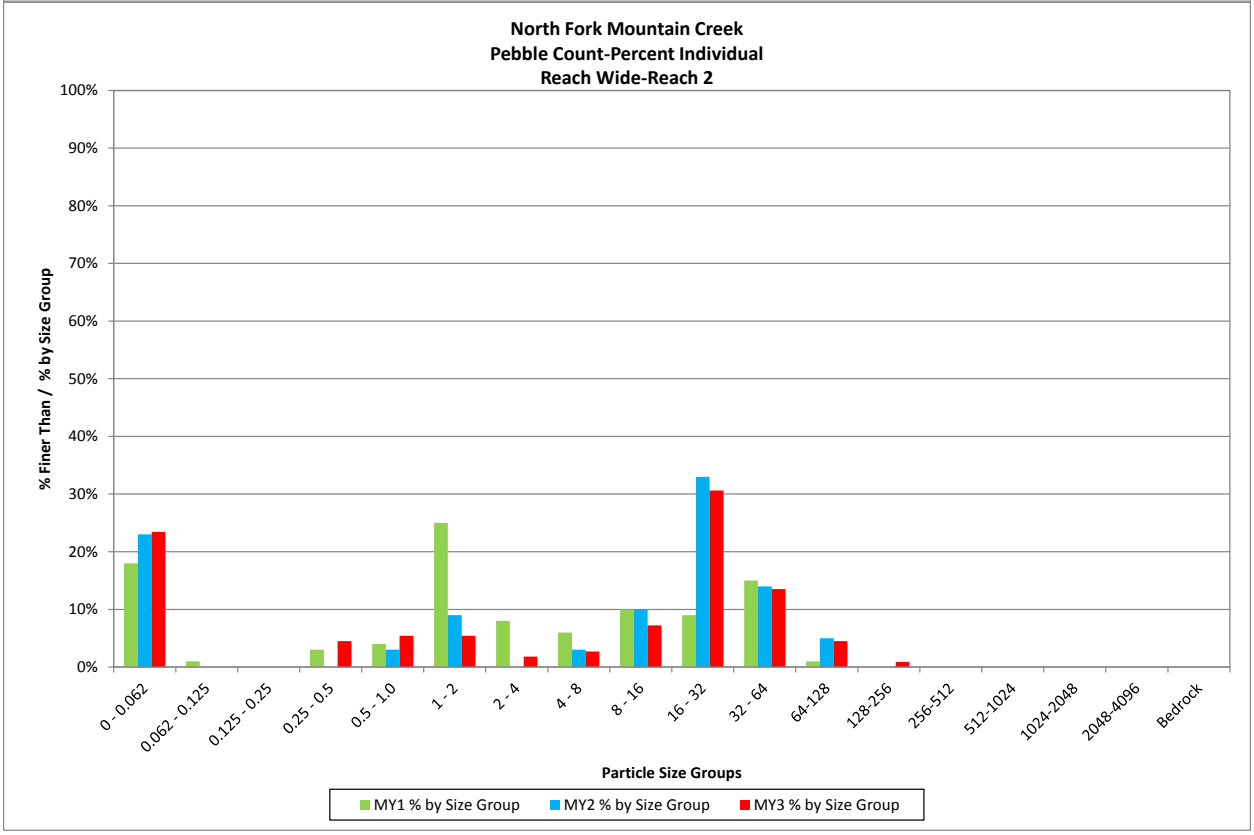
North Fork Mountain Creek			
Reach-Wide Count 1- Reach			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	0	0.0%	0%
0.062 - 0.125	6	5.5%	5%
0.125 - 0.25	0	0.0%	5%
0.25 - 0.5	8	7.3%	13%
0.5 - 1.0	0	0.0%	13%
1 - 2	14	12.7%	25%
2 - 4	6	5.5%	31%
4 - 8	9	8.2%	39%
8 - 16	13	11.8%	51%
16 - 32	15	13.6%	65%
32 - 64	19	17.3%	82%
64-128	16	14.5%	96%
128-256	4	3.6%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**110**	**100%**	**100%**
		Summary Data	
		D50	**15**
		D84	**70**
		D95	**120**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Reach Wide-Reach 1
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

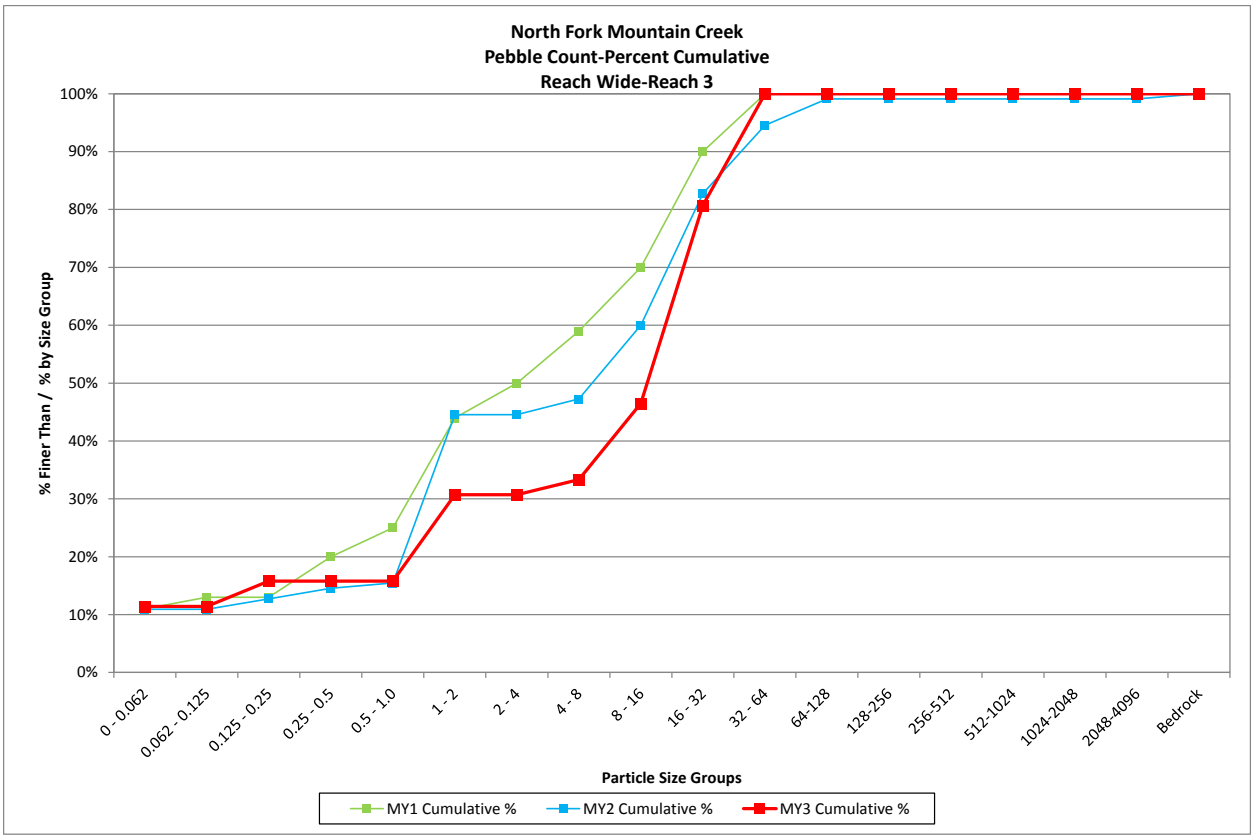

North Fork Mountain Creek
Pebble Count-Percent Individual
Reach Wide-Reach 1
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

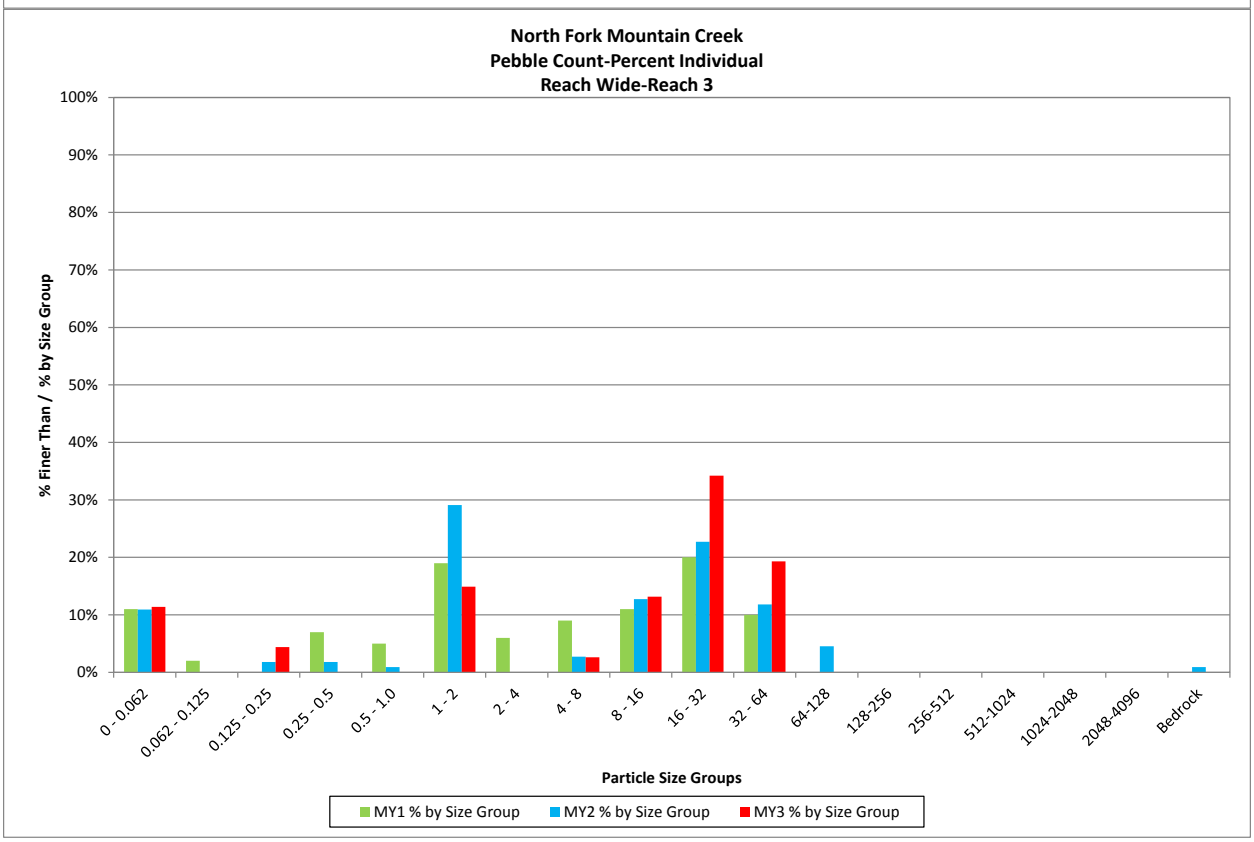
North Fork Mountain Creek			
Reach-Wide Count 2- Reach			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	26	23.4%	23%
0.062 - 0.125	0	0.0%	23%
0.125 - 0.25	0	0.0%	23%
0.25 - 0.5	5	4.5%	28%
0.5 - 1.0	6	5.4%	33%
1 - 2	6	5.4%	39%
2 - 4	2	1.8%	41%
4 - 8	3	2.7%	43%
8 - 16	8	7.2%	50%
16 - 32	34	30.6%	81%
32 - 64	15	13.5%	95%
64-128	5	4.5%	99%
128-256	1	0.9%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**111**	**100%**	**100%**
		Summary Data	
		D50	**15**
		D84	**35**
		D95	**66**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Reach Wide-Reach 2
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %

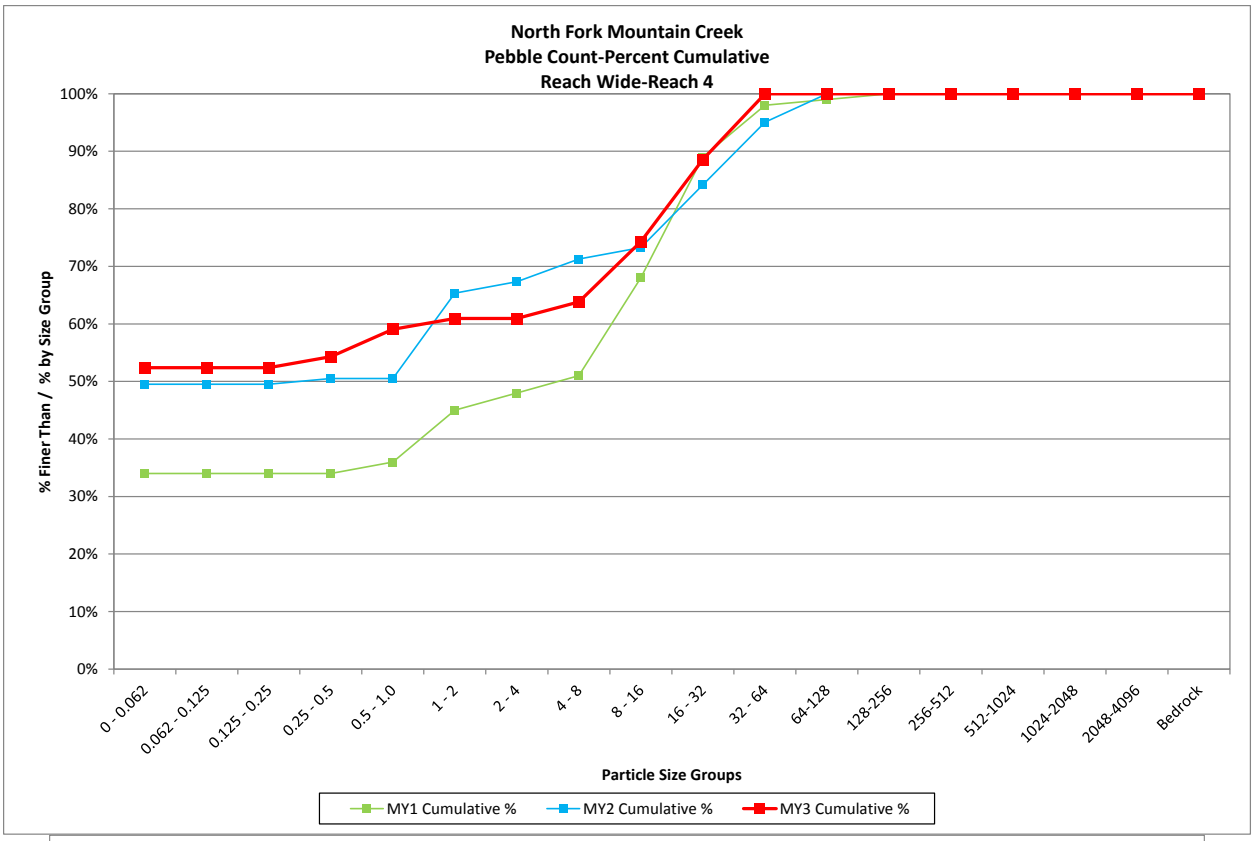

North Fork Mountain Creek
Pebble Count-Percent Individual
Reach Wide-Reach 2
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

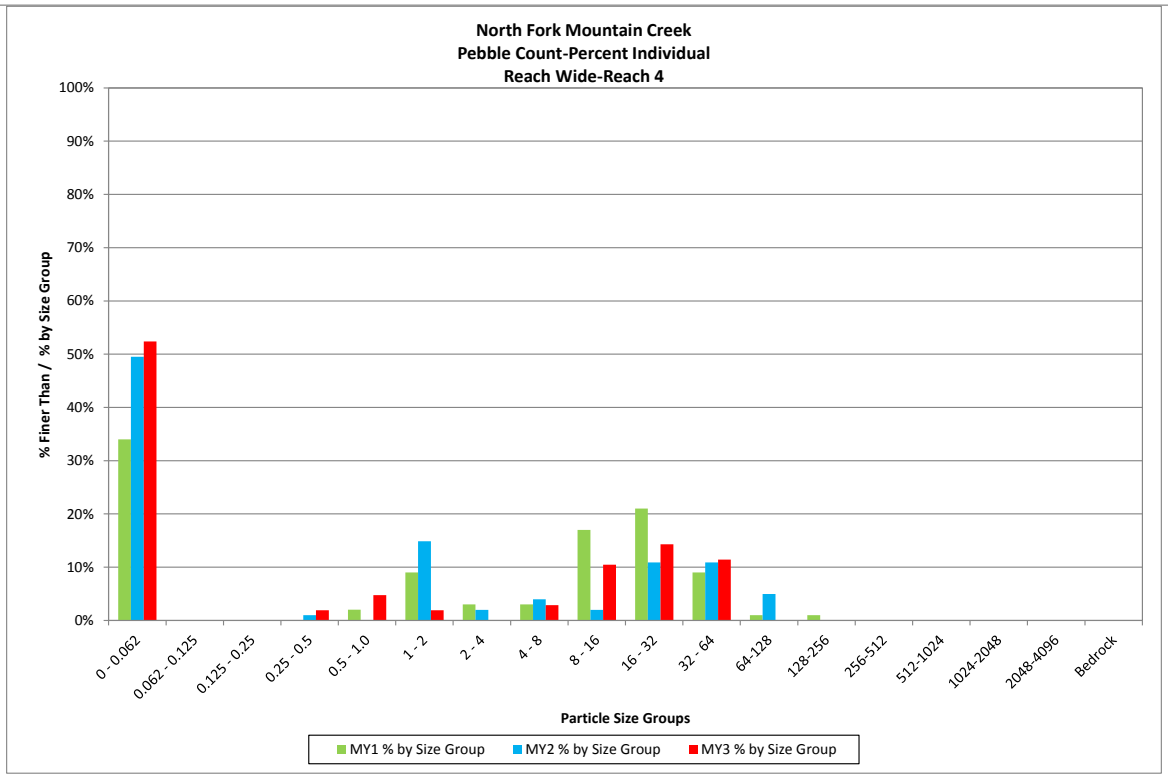
North Fork Mountain Creek			
Reach-Wide Count 3- Reach			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	13	11.4%	11%
0.062 - 0.125	0	0.0%	11%
0.125 - 0.25	5	4.4%	16%
0.25 - 0.5	0	0.0%	16%
0.5 - 1.0	0	0.0%	16%
1 - 2	17	14.9%	31%
2 - 4	0	0.0%	31%
4 - 8	3	2.6%	33%
8 - 16	15	13.2%	46%
16 - 32	39	34.2%	81%
32 - 64	22	19.3%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**114**	**100%**	**100%**
		Summary Data	
		D50	**17**
		D84	**36**
		D95	**52**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Reach Wide-Reach 3
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %


North Fork Mountain Creek
Pebble Count-Percent Individual
Reach Wide-Reach 3
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

North Fork Mountain Creek			
Reach-Wide Count 4- Reach			
Monitoring Year - 2014; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	55	52.4%	52%
0.062 - 0.125	0	0.0%	52%
0.125 - 0.25	0	0.0%	52%
0.25 - 0.5	2	1.9%	54%
0.5 - 1.0	5	4.8%	59%
1 - 2	2	1.9%	61%
2 - 4	0	0.0%	61%
4 - 8	3	2.9%	64%
8 - 16	11	10.5%	74%
16 - 32	15	14.3%	89%
32 - 64	12	11.4%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**28**
		D95	**43**


North Fork Mountain Creek
Pebble Count-Percent Cumulative
Reach Wide-Reach 4
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %


North Fork Mountain Creek
Pebble Count-Percent Individual
Reach Wide-Reach 4
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group

Appendix E
Hydrologic Data

Table 10. Crest gauge data recorded at the North Fork Mountain Creek Site			
Month/Year Recorded	Documentation[1]	North Fork Mountain Creek	UT1
		Reach 1	Reach 2
		(feet above bankfull)	(feet above bankfull)
Aug-12	Crest Gauge/Wrack Lines	2	0.58
Jan-13[2]	Wrack Lines	--	--
Feb-14	Wrack Lines/Crest Gauge	0.33	--
Nov-15	Crest Gauge/Wrack Lines	0.21	0.13

[1]See Appendix D for photo documentation.
[2]Crest Gauge was damaged from bankfull event; no reading was recorded.

Table 11. North Fork Mountain Creek Monthly Rain Gauge Data						
Month	Site Monthly Rainfall	Hickory Monthly Rainfall	SF Reference Monthly Rainfall	Catawba County		
				30th Percentile	70th Percentile	Average
Jan-15	2.30	2.69	3.12	2.64	5.04	3.90
Feb-15	1.92	1.85	2.08	2.33	4.41	3.42
Mar-15	2.25	3.27	2.28	3.12	5.17	4.27
Apr-15	2.84	5.42	5.26	2.06	4.57	3.37
May-15	0.37	2.26	0.53	2.5	4.68	3.77
Jun-15	3.77	4.87	3.58	2.73	5.41	4.27
Jul-15	1.19	2.47	2.39	2.43	4.45	3.92
Aug-15	0.19	5.09	1.46	2.73	4.71	4.00
Sep-15	3.13	5.07	4.08	2.39	5.2	3.75
Oct-15	6.27	10.13	5.97	1.96	3.98	3.40
Nov-15	4.76	4.67	4.68	2.33	4.3	3.47
Dec-15	-	-	-	2.17	3.96	3.21
Total	28.99	47.79	35.43			

North Fork Mountain Creek Monthly Rain Statistics

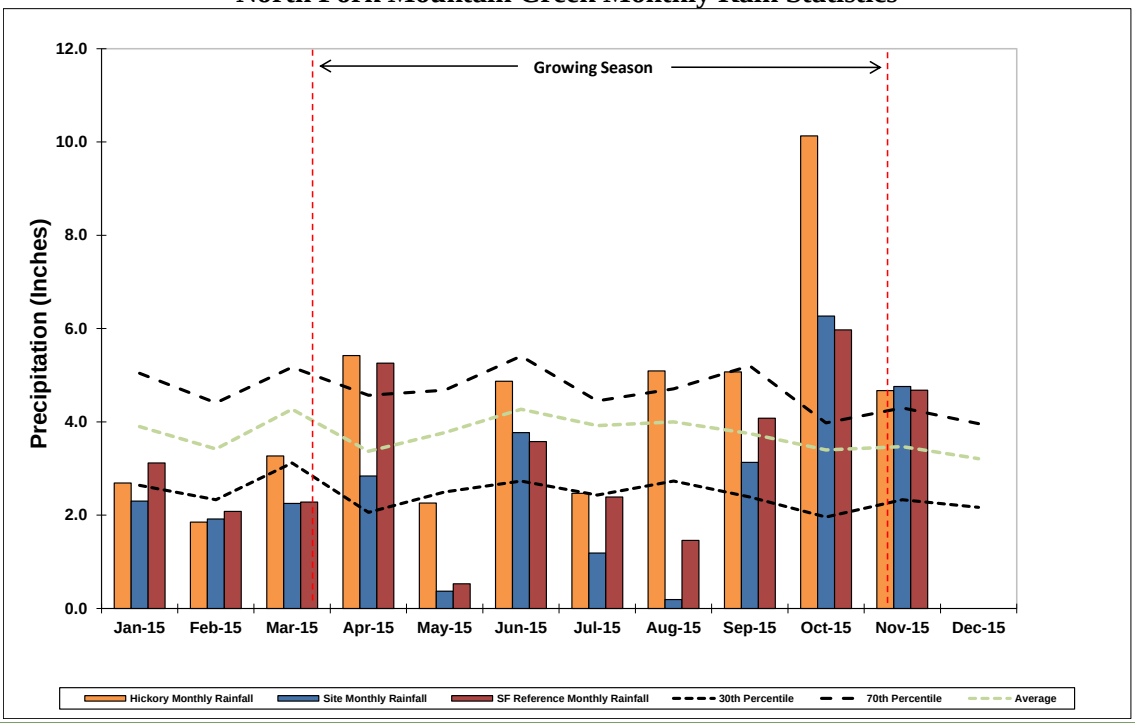
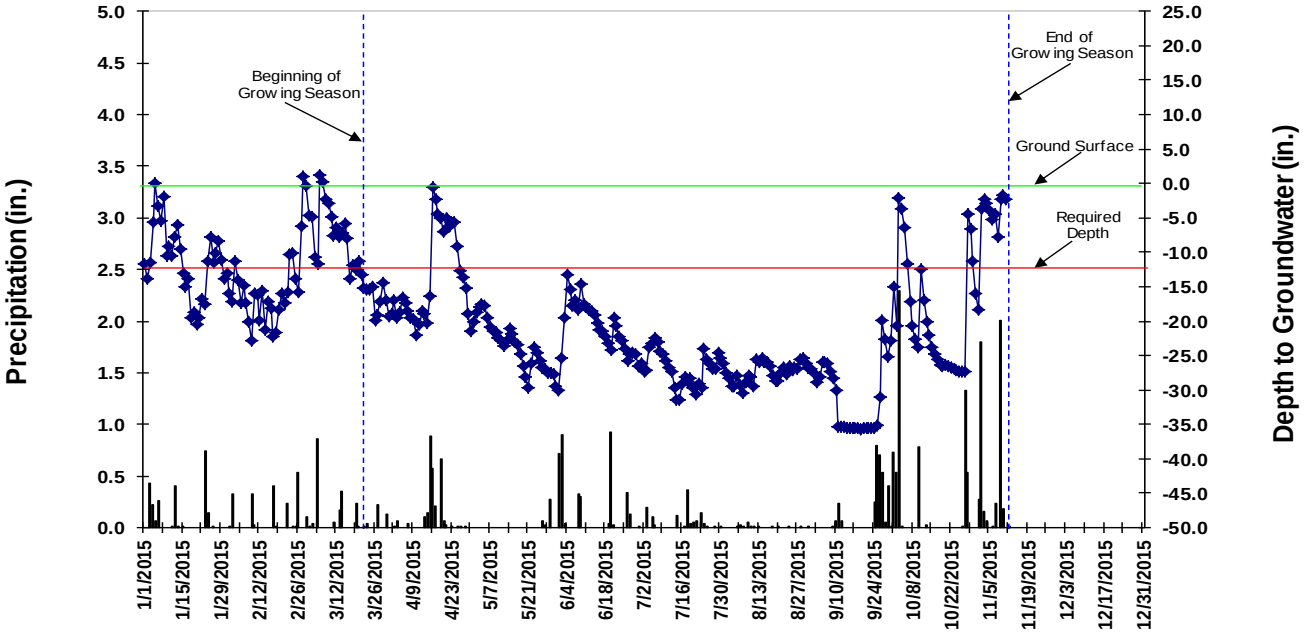


Table 12. Wetland Gauge Attainment Data Summary of Groundwater Monitoring Results North Fork Mountain Creek Stream & Wetland / Project No. 94151					
Gauge ID	Success Criteria Achieved/Max Consecutive Days During Growing Season Percent				
	Year 1 (2012)	Year 2 (2013)	Year 3 (2014)	Year 4 (2015)	Year 5 (2016)
NFMC 1	No/4 1.7 Percent	Yes/32 13.6 Percent	Yes/43 18.2 Percent	No/10 4.2 Percent	
NFMC 2	Yes/86 36.4 Percent	Yes/67 28.4 Percent	Yes/67 28.4 Percent	Yes/52 22 Percent	
NFMC 3	Yes/57 24.2 Percent	Yes/127 53.8 Percent	Yes/91 38.6 Percent	Yes/60 25.4 Percent	
NFMC 4	No/5 2.1 Percent	No/10 4.2 Percent	No/5 2.1 Percent	No/10 4.2 Percent	
NFMC 5	No/1 0.4 Percent	No/4 1.7 Percent	No/2 0.8 Percent	No/3 1.3 Percent	
NFMC 6	Yes/87 36.9 Percent	Yes/127 53.8 Percent	Yes/67 28.4 Percent	Yes/51 21.6 Percent	
NFMC 7	Yes/171 72.5 Percent	Yes/127 53.8 Percent	Yes/119 50.4 Percent	Yes/89 37.7 Percent	
NFMC 8	Yes/57 24.2 Percent	Yes/127 53.8 Percent	Yes/68 28.8 Percent	Yes/59 25 Percent	
NFMC 9	Yes/102 43.2 Percent	Yes/127 53.8 Percent	Yes/92 39.0 Percent	Yes/60 25.4 Percent	
NFMC 10	No/12 5.1 Percent	Yes/36 15.3 Percent	Yes/43 18.2 Percent	No/15 6.4 Percent	
NFMC S1	N/A	N/A	Yes/39 16.5 Percent	No/15 6.4 Percent	
NFMC S2	N/A	N/A	Yes/21 8.9 Percent	No/12 5.1 Percent	
NFMC S3	N/A	N/A	Yes/30 12.7 Percent	Yes/26 11.0 Percent	
NFMC S4	N/A	N/A	Yes/99 41.9 Percent	Yes/75 31.8 Percent	
NFMC S5	N/A	N/A	N/A	Yes/59 25.0 Percent	
NFMC S6	N/A	N/A	N/A	Yes/235 99.6 Percent	
SF Reference	N/A	N/A	N/A	Yes/111 47.0 Percent	

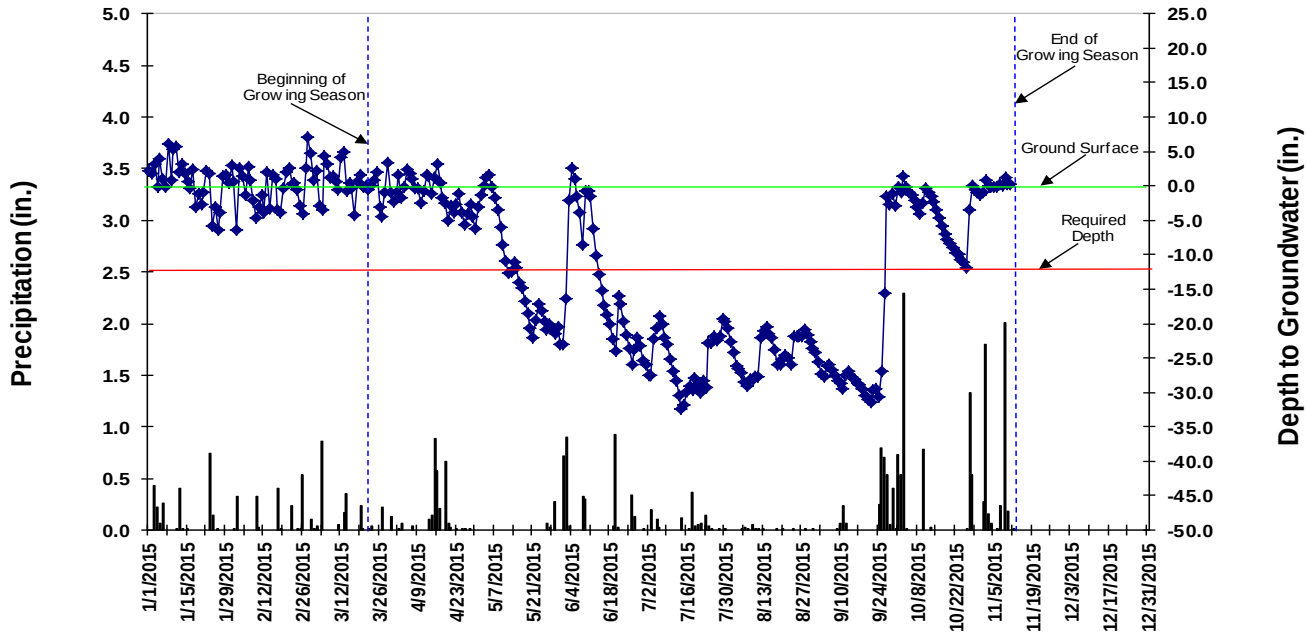
N/A - Information does not apply.

Hydrology Success Criteria = 8%

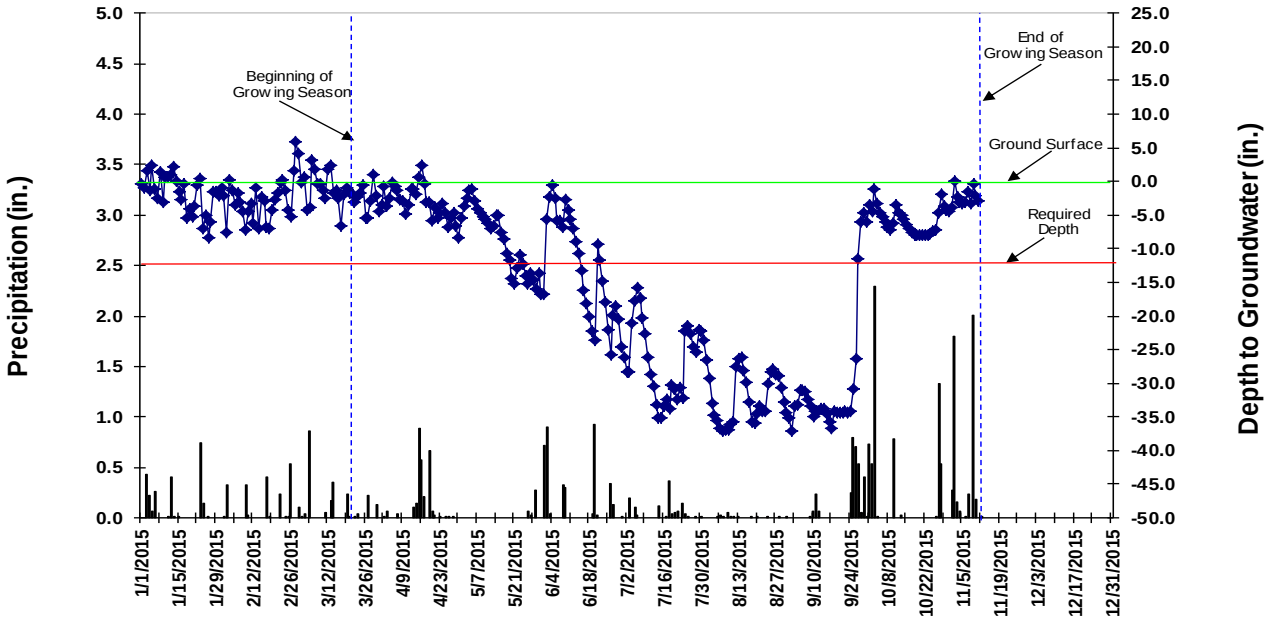
Gauge ID: **NFMC 1**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **10**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **4.2%**



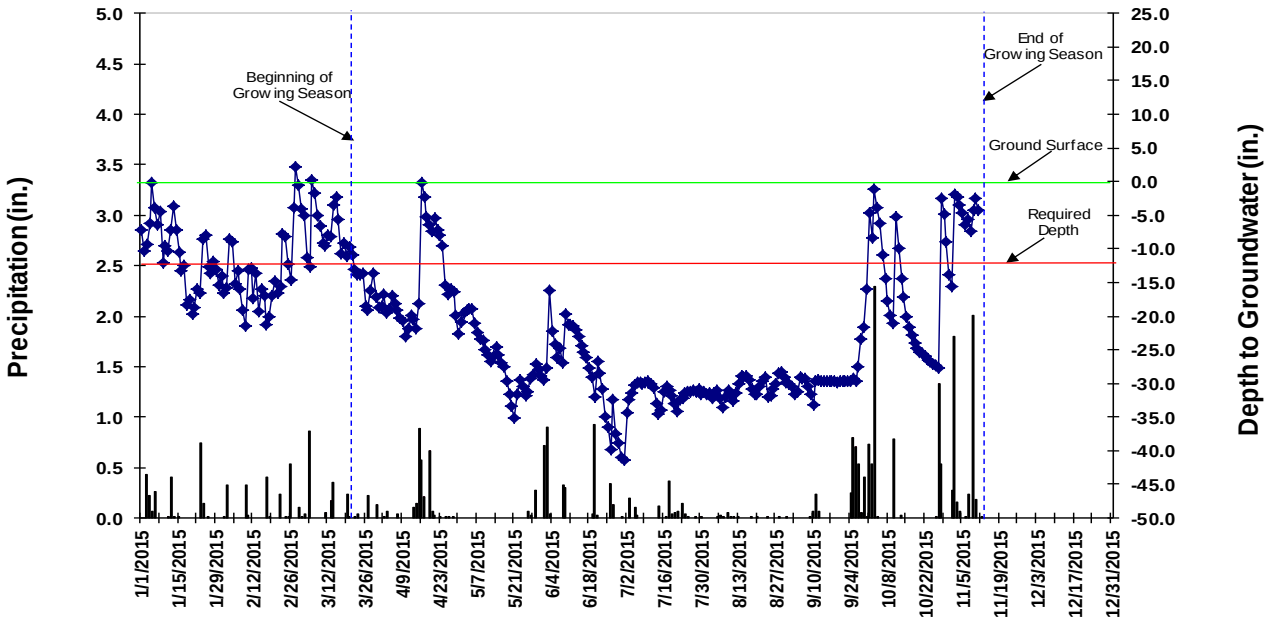
Gauge ID: **NFMC 2**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **52**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **22%**



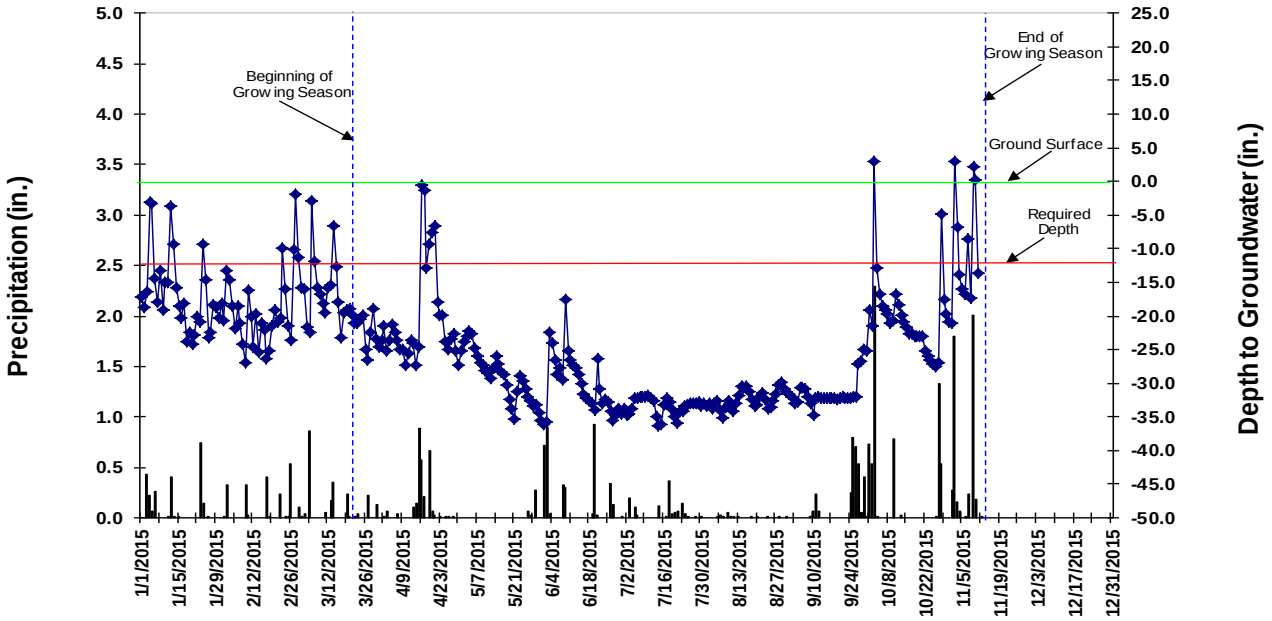
Gauge ID: **NFMC 3**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **60**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **25%**



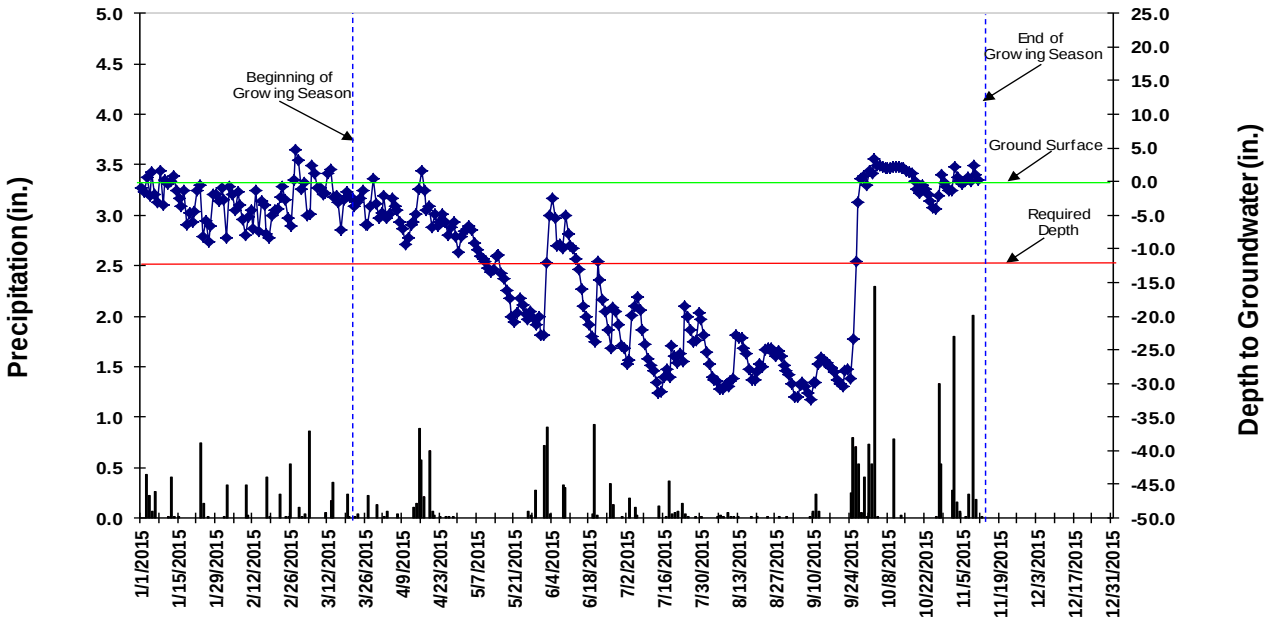
Gauge ID: **NFMC 4**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **10**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **4%**



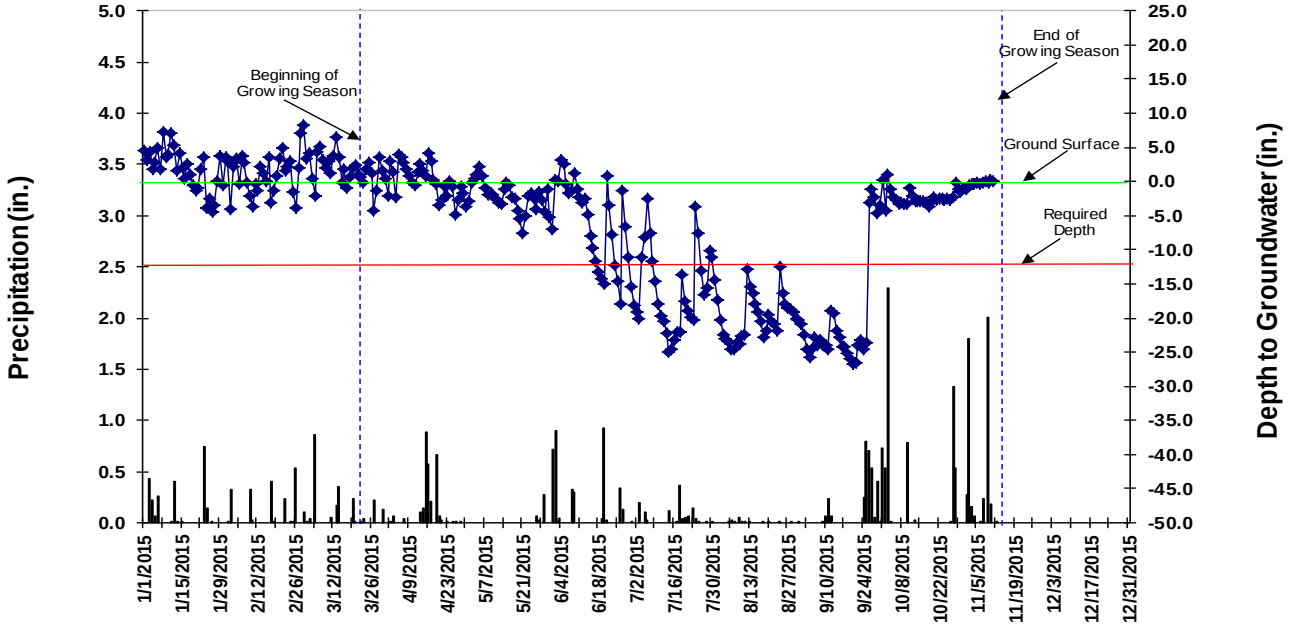
Gauge ID: **NFMC 5**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **3**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **1%**



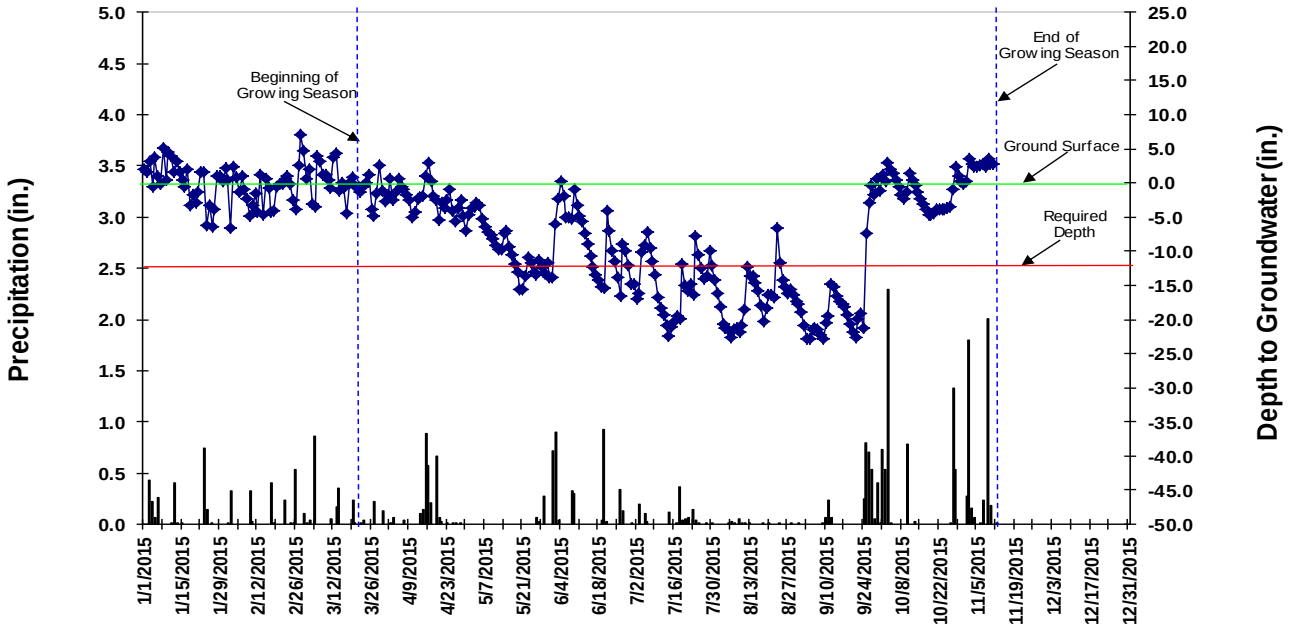
Gauge ID: **NFMC 6**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **51**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **22%**



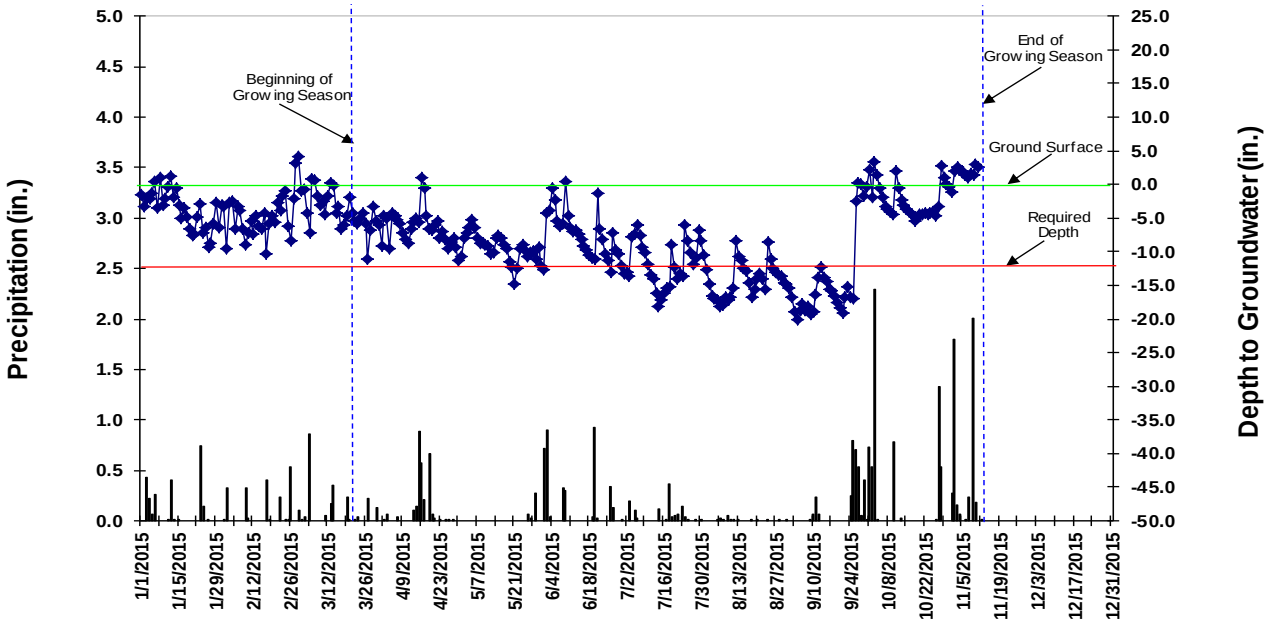
Gauge ID: **NFMC 7**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **89**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **38%**



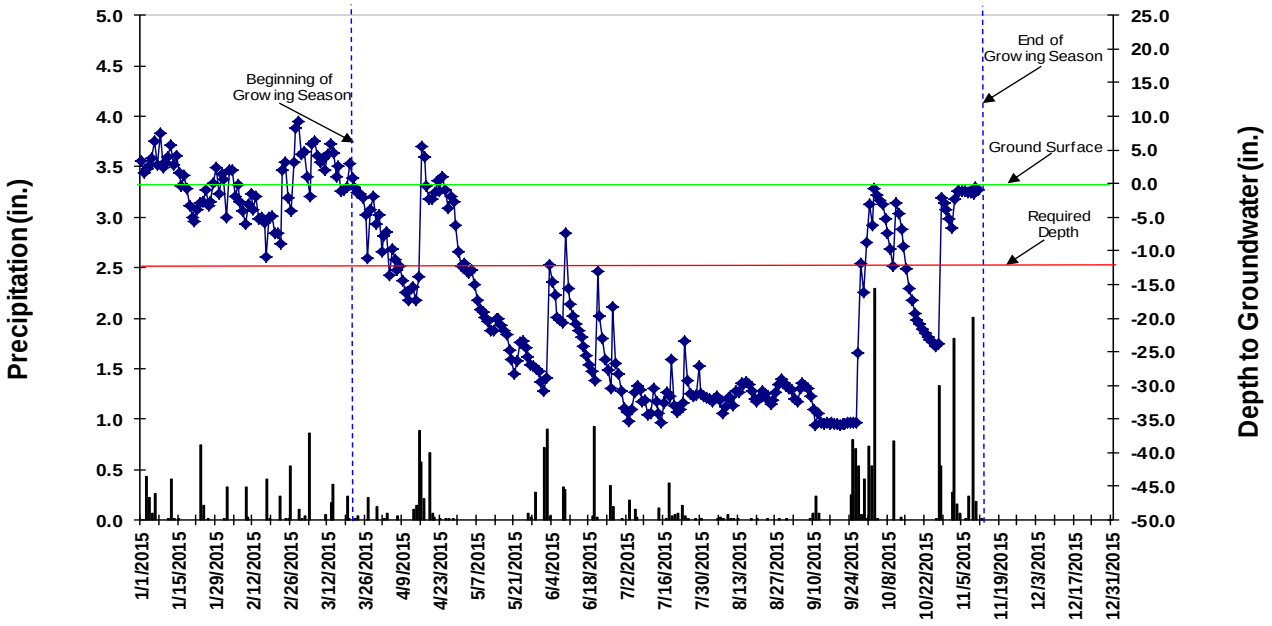
Gauge ID: **NFMC 8**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **59**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **25%**



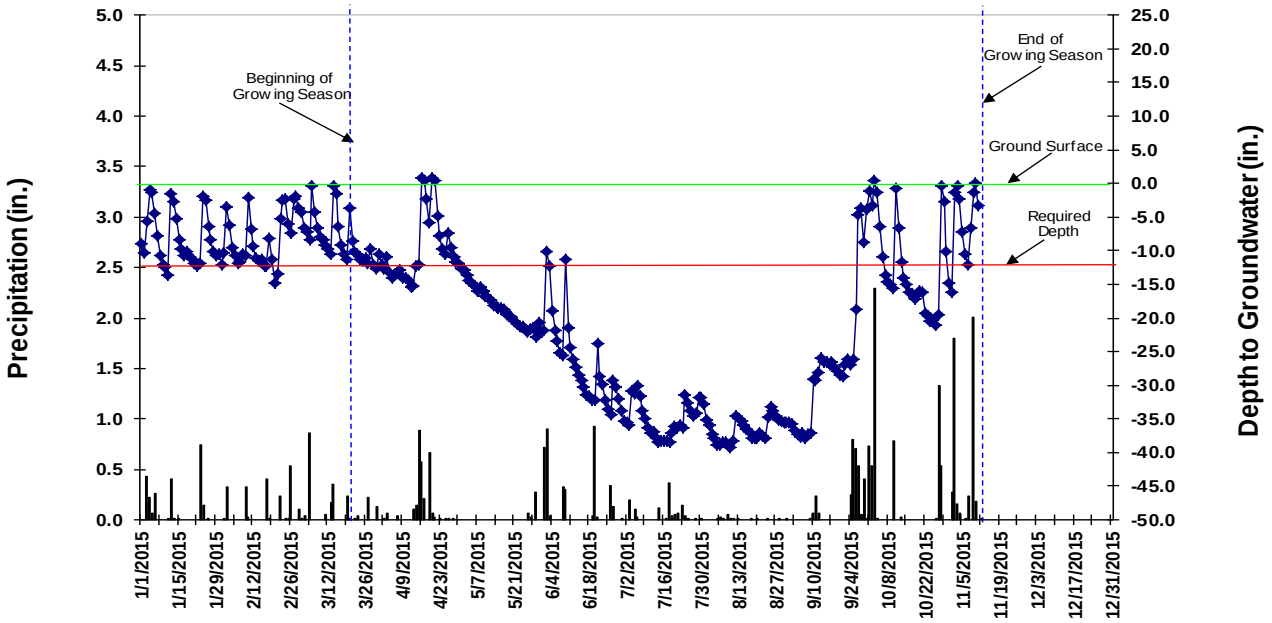
Gauge ID: **NFMC 9**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **60**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **25%**



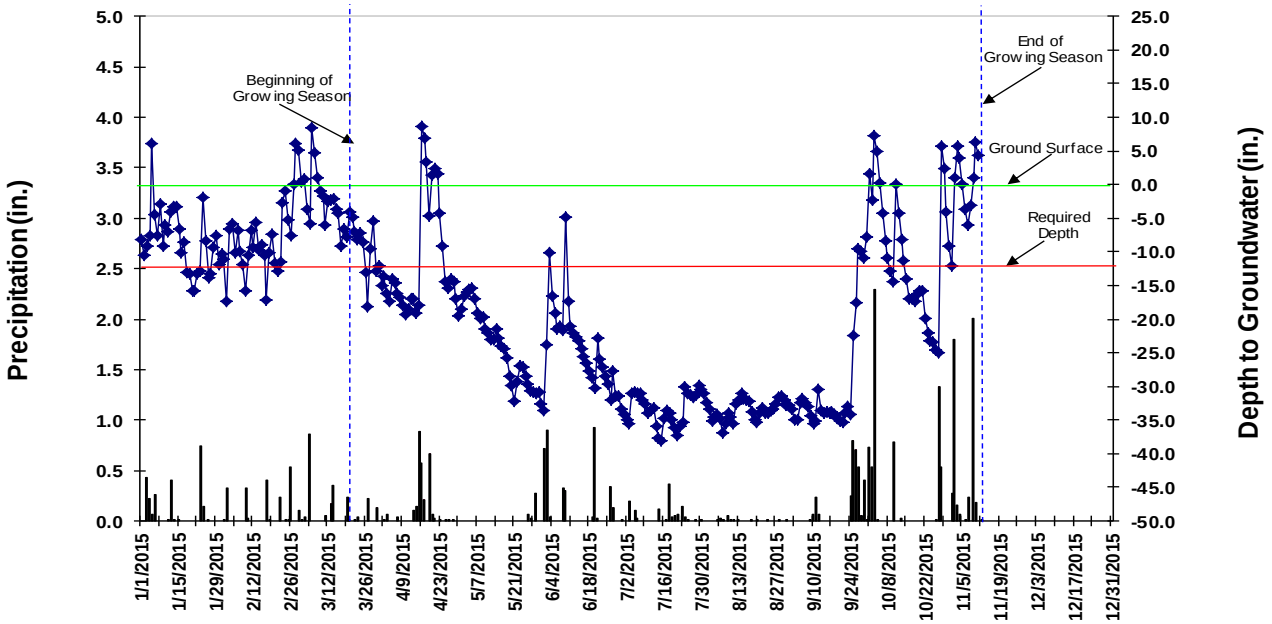
Gauge ID: **NFMC 10**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **15**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **6%**



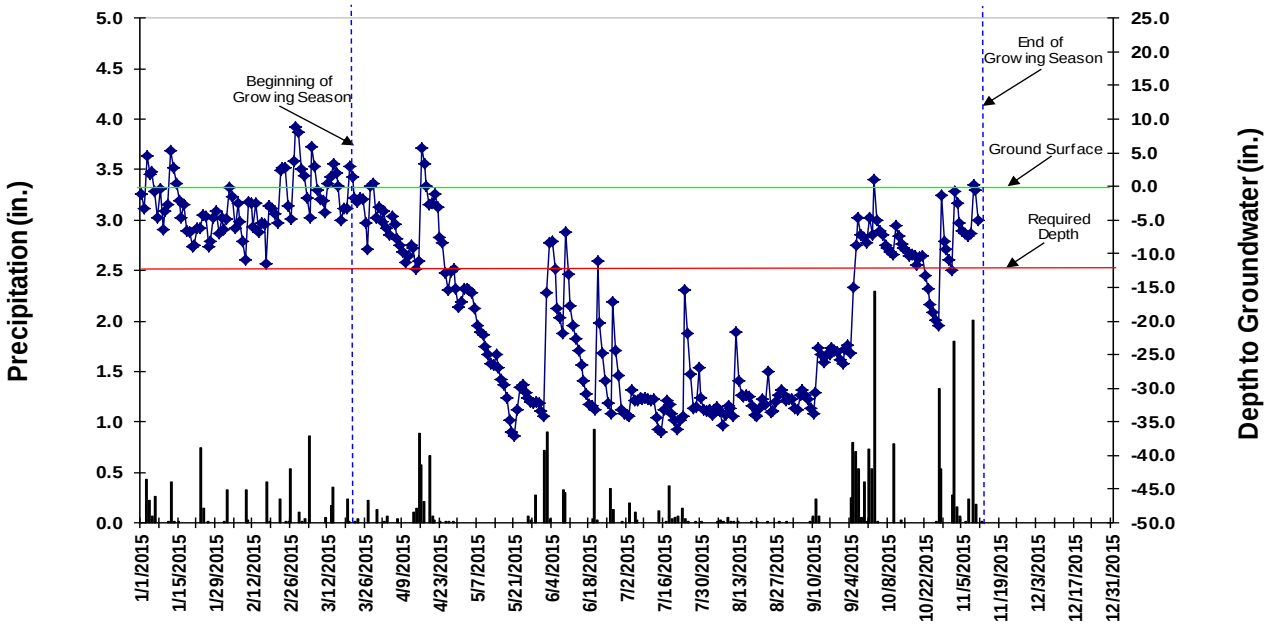
Gauge ID: **NFMC S1**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **15**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **6%**



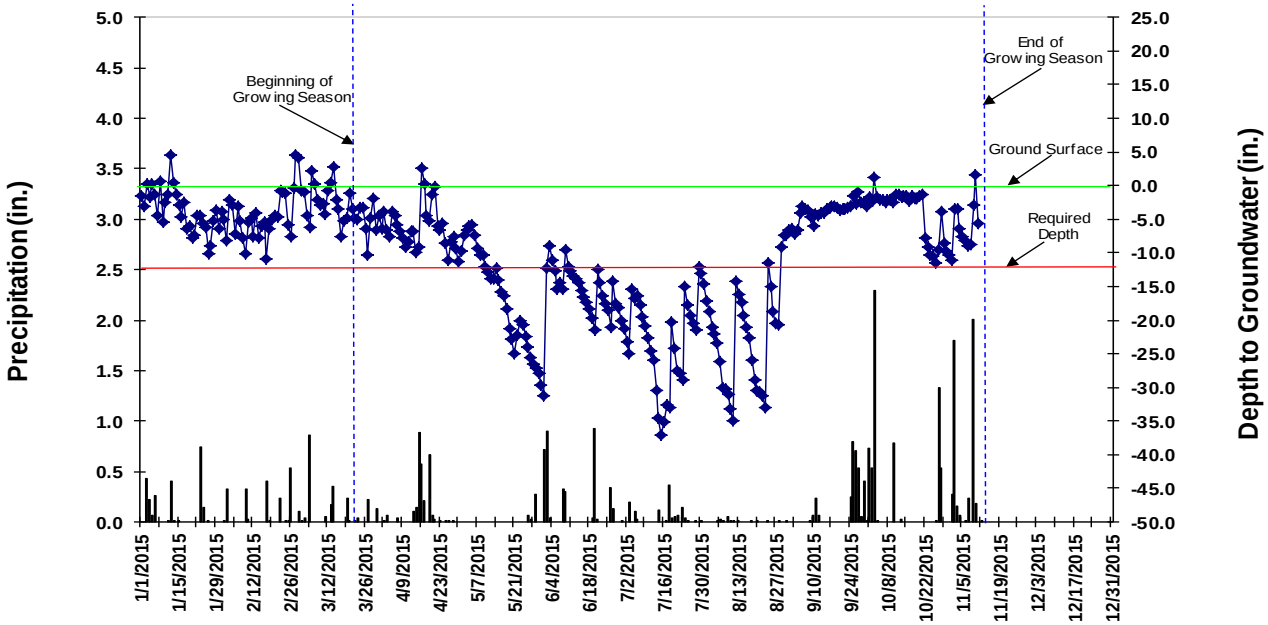
Gauge ID: **NFMC S2**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **12**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **5%**



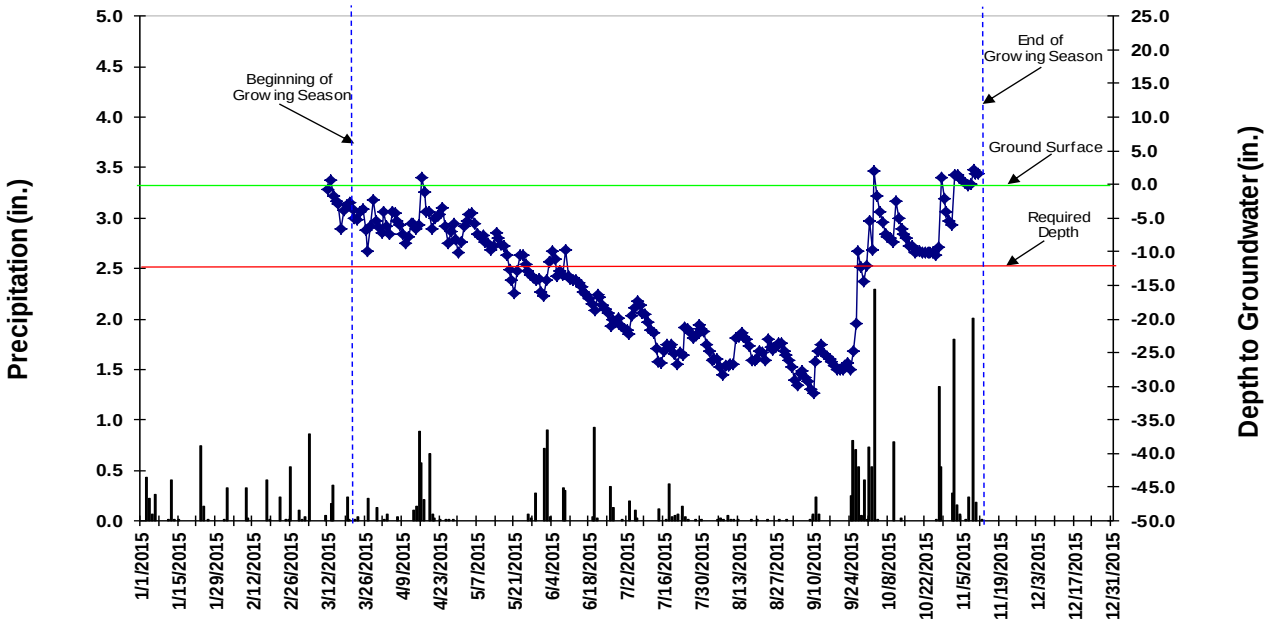
Gauge ID: **NFMC S3**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **26**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **11%**



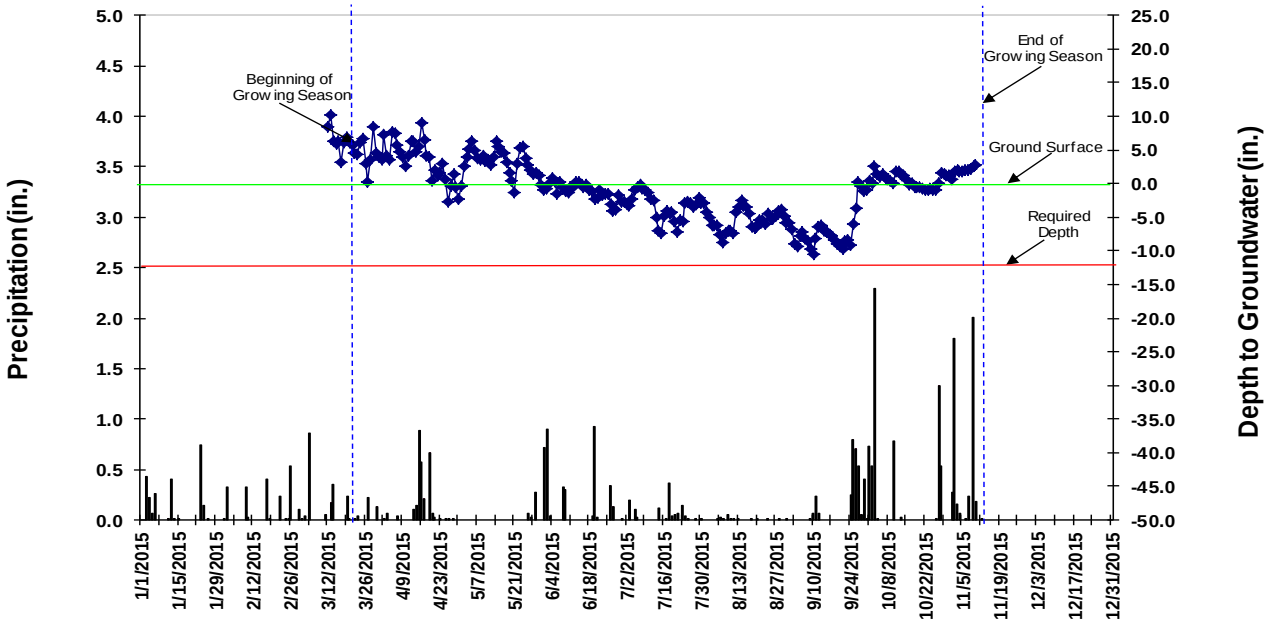
Gauge ID: **NFMC S4**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **75**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **32%**



Gauge ID: **NFMC S5**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **59**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **25%**



Gauge ID: **NFMC S6**
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **235**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **100%**



Gauge ID: **SF Reference**

Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **111**

Percentage of Growing Season Water Table within 12 inches of Soil Surface: **47%**