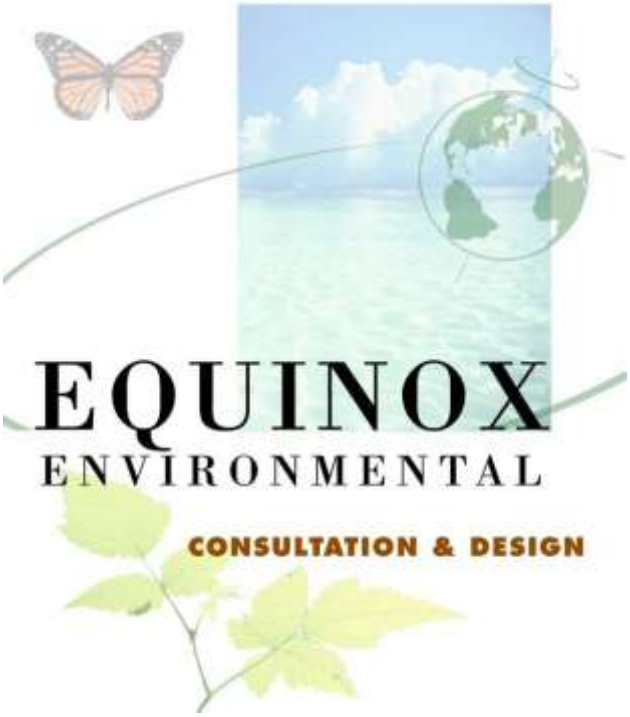
Cat Creek
Stream and Wetland Restoration
NCEEP Project Number: 71
Monitoring Contract Number: 004490
Monitoring Year 4
2013 Final Report

Submitted to
North Carolina Ecosystem Enhancement Program
North Carolina Department of Environment and Natural Resources
January 2014

1652 Mail Service Center
Raleigh, NC 27699

Monitoring Firm



37 Haywood Street, Suite 100
Asheville, North Carolina 28801
Phone: 828-253-6856

Project Contact: Hunter Terrell
Email: hunter@equinoxenvironmental.com

Cat Creek Stream and Wetland Restoration
2013 Monitoring Report (MY 4)

Table of Contents

Appendices

1.0 EXECUTIVE SUMMARY / PROJECT ABSTRACT

The goals and objectives stated in the Cat Creek Restoration Plan (NCEEP 2007) are as follows:

Project Goals:

- Provide a stable stream channel for the main channel and the unnamed tributaries to Cat Creek that neither aggrades nor degrades while maintaining their dimension, pattern, and profile with the capacity to transport their watershed's water and sediment load.
- Improve water quality and reduce erosion by stabilizing the stream banks for all streams by improving riparian vegetation.
- Improve aquatic habitat of the main channel and tributaries with the use of natural material stabilization structures such as root wads, rock vanes, woody debris, and a riparian buffer.
- Provide aesthetic value, wildlife habitat, and bank stability through the creation or enhancement of a riparian zone.
- Create contiguous wildlife corridor and provide diverse amphibian habitat with added topographic and wetland features.
- Provide shading and biomass input to the stream and mast for wildlife when vegetation is mature.
- Enhance wetland biochemical and geo-chemical processes over an extended area.

Project Objectives:

- Restore or enhance over 8,881 feet of Cat Creek and its tributaries.
- Restore a natural riparian buffer.
- Restore or enhance 7.97 acres of swamp forest bog complex wetlands.
- Plant native trees and shrubs throughout the site.

The monitoring year four (MY4) vegetation plot data indicates that the site averaged 393 stems/acre across all plots. Although no interim criteria is established for MY4, the average number of stems is well above the MY3 interim criteria of 320 stems/acre and is on track to meet the MY5 success criteria of 290 stems per acre. However, plots 2, 7, and 10 stems/acre were 202, 202, and 121, respectively, which fail to meet the MY5 success criteria. Of the planted stems recorded within the monitoring plots, nearly 10% were reported as dead or missing. When planted and natural stems are combined, the average stem density is 1,425 stems per acre, which is well above the minimum established criterion; of note, the additional stems were predominately alder (*Alnus serrulata)* and silky dogwood *(Cornus amomum).* The site includes a diverse assemblage of 16 planted species of native trees and shrubs. Planted species range from 2 to 7 per plot with 3 to 11 species observed when volunteers are included. An initial treatment of exotic invasive vegetation was performed in 2013, and isolated patches of high threat invasive plant species will be treated in winter/spring of 2014. Dominant invasive non-native plants include multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), privet (*Ligustrum sp*.), and kudzu (*Pueraria montana var. lobata*).

Stream longitudinal profiles have remained relatively stable among monitoring years. One area of bed scour and two areas of deposition were the only significant differences between MY3 and

MY4 longitudinal profiles. Deposition from high winter/spring flows in early 2013 affected several of the monitored cross-sections. Both XS-1 and XS-2 in the Swartwout reach showed deposition on the left and right descending banks, respectively, resulting in reduced bankfull widths and reduction in width/depth ratios and increased entrenchment ratios. Similarly, XS-2 on UT1 had large deposits on both the left and right descending banks, resulting in a reduced bankfull width. Stream issues identified during MY4 visual assessments were minimal and consisted of one area of degradation, one area of aggradation, one undercut area, one area of mass wasting, and seven bank erosion areas. These unstable areas represent less than two percent of the project and are, with the exception of UT4, located within enhancement reaches.

Automated groundwater gauges were downloaded and checked for proper function on a monthly basis during the growing season. Groundwater monitoring station data indicated that all 18 wells met and exceeded the eight percent hydroperiod success criteria during the MY4 growing season, including MW7 which failed to meet the success criteria the previous three years. During normal rainfall years all groundwater gauges are expected to meet criteria. Precipitation data, collected using an on-site rain gauge, indicated that June and July were above average rainfall months. Based on the presence of wrack lines and crest gauge monitoring, two bankfull events occurred in January, and one between April and August of MY4.

In December 2013, wetland boundary delineations were performed to confirm the boundary of wetland features on the project site. A Level-II Routine Determination method, as outlined in the USACE Wetlands Delineation Manual (1987), was used to identify wetland boundaries. Data points within wetlands were co-located with wetland gauges in order to provide relevant hydrology data. Using plant community and soil data characterized at data points, the interface of wetland and non-wetland plant communities and soils was identified and determined to be the wetland boundary. A total of 9.06 acres of wetlands were delineated within the project site, including 7.64 acres of restoration and 1.42 acres of enhancement. The MY4 wetland boundary delineation indicates a 1.09 acre expansion in total wetland area compared to the original baseline delineation of 7.97 acres. The shift in acreage is a result of a 0.04 acre and 0.02 acre loss on the Swartwout and Cat Creek Preserve tracts, respectively, and a 1.15 acre expansion on the Parker tract. The 0.04 acre loss on the Swartwout tract failed to meet the hydric soil field indicator. The 0.01 acre loss on the Cat Creek Preserve tract failed to meet hydrology success criteria 3 of the 4 monitoring years. Most of the expansion on the Parker tract was along the right and left descending banks on the upstream end of the tract, as well as several marginal areas along the periphery of previously delineated areas.

Summary information/data related to the occurrence of items such as beaver or easement encroachment, statistics related to performance of various project and monitoring elements, and data related to wetland boundary delineation can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the mitigation and restoration plan documents available on EEP's website. All raw data supporting tables and figures in the appendices is available from EEP upon request.

Additionally, due to inconsistencies with previous thalweg stationing, the baseline thalweg data and 2010 aerial imagery were utilized to apply the corrected stationing for the project site.

2.0 Methodology

The stream monitoring methodologies utilized in MY4 replicate those employed during the previous monitoring year and are based on standard guidance and procedures documents (Rosgen 1996 and USACE 2003). Vegetation monitoring data were collected following the standard CVS-EEP Protocol for Recording Vegetation, Level II (Lee et al. 2008). Wetland hydrology was considered established if groundwater monitoring data indicated saturated soils within 12 inches of the soil surface for 8% of the growing season. The growing season for the site was based on the Natural Resource Conservation Service (NRCS) data set for Macon County (NRCS 2011).

3.0 References

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. The University of North Carolina at Chapel Hill, Department of Biology.

NCEEP (North Carolina Ecosystem Enhancement Program). 2007. Cat Creek Stream and Wetland Restoration. Macon County, North Carolina. Restoration Plan. Raleigh.

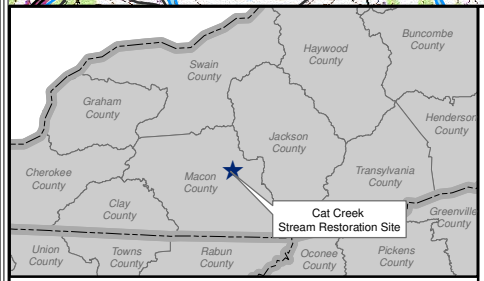
NRCS (Natural Resources Conservation Service). Accessed June 2012. Climate Analysis for Wetlands by County. http://www.wcc.nrcs.usda.gov/climate/wetlands.html

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

USACE (U.S. Army Corps of Engineers). 2003. Stream Mitigation Guidelines. USACOE, USEPA, NCWRC, NCDENR-DWQ. Wilmington District.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1.

Appendix A
Project Vicinity Map and Background Tables



Directions: From Raleigh, proceed west on I-40 towards Knoxville, TN. Merge onto US-74 (Exit 27) toward Waynesville. Follow US-74 to exit 81 US-23/US-441. Proceed south on US-441 for 17 miles to Cat Creek Road. Turn left onto Cat Creek Rd. and follow ~1 mile to Ferguson Road. Turn left on Ferguson and continue ~0.5 mile to the bridge crossing Cat Creek. The project site is upstream and downstream of the bridge.

Figure 1 - Vicinity Map

Cat Creek Stream &
Wetland Restoration Site
Project No. 71

Macon County, North Carolina

N

EQUINOX ENVIRONMENTAL
CONSULTATION & DESIGN

Ecosystem Enhancement PROGRAM

0 0.25 0.5 Miles

7.5 Minute Series Corbin Knob Quadrangle

Table 1a. Project Components
Cat Creek Stream & Wetland / Project No. 71

Project Component or Reach ID	Existing Feet/Acres	Restoration Level	Approach	Footage or Acreage[1]	Mitigation Ratio	Mitigation Units (SMUs/WMUs)	*Stationing	BMP Elements	Comment
Cat Creek - Upper Swartwout	900 lf	E2		900 lf	2.5:1	360.00	00+00 - 09+00		Livestock exclusion, buffer plantings, bank stabilization in 3 locations
Cat Creek - Lower Swartwout	770 lf	R	P1	818 lf	1:1	818.00	09+00 - 17+18		
Cat Creek - Upper Waldroup	1,438 lf	E2		1,439 lf	2.5:1	575.60	**17+49 - 32+13	Equipment crossing and watering stations	Livestock exclusion, buffer plantings
Cat Creek - Lower Waldroup	482 lf	E1		482 lf	1.5:1	321.33	34+37 - 39+19	Cattle crossing and watering stations	Livestock exclusion, buffer plantings, and structure to provide enhanced profile
Cat Creek - Parker	1,750 lf	R	P1	1,871 lf	1:1	1871.00	39+19 - 57+90		
Cat Creek Preserve	1,765 lf	E1		1,879 lf	1.5:1	1252.67	59+24 - 78+03		Grade control, turbulent riffles to add habitat, buffer plantings, and invasive species management
UT1	100 lf	E2		115 lf	2.5:1	46.00	100+00 - 101+15		Livestock exclusion, buffer plantings
UT1	363 lf	R	P1	458 lf	1:1	458.00	101+15 - 105+73		
UT2	210 lf	R	P1	381 lf	1:1	381.00	200+00 - 203+81		
UT3	165 lf	R	P1	294 lf	1:1	294.00	300+00 - 302+94		
UT4	110 lf	R	P1	244 lf	1:1	244.00	400+00 - 402+44		
Swartwout Wetlands		R		1.07	1:1	1.07			
		E		0.51	2:1	0.26			Livestock exclusion, removal of drain pipe, plantings
Parker Wetlands		R		5.88	1:1	5.88			
		E		0.25	2:1	0.13			
Preserve Wetlands		R		0.69	1:1	0.69			
		E		0.66	2:1	0.33			

=Non-Applicable
* See Appendix B Fig. 2. Stationing was Realigned in MY2 to Accurately Depict the Stream Reaches (See Executive Summary, Page 2)
** Stationing Includes a 25 Foot Crossing
[1]Acreage updated based on MY4 wetland boundary delineation

Table 1b. Component Summations
Cat Creek Stream & Wetland / Project No. 71

Restoration Level	Stream (lf)	Riparian Wetland (Ac)[1]		Non-Riparian (Ac)	Upland (Ac)	Buffer (Ac)	BMP
		Riverine	Non-Riverine				
Restoration	4,066		7.64				
Enhancement			1.42				
Enhancement I	2,361						1
Enhancement II	2,454						1
Creation							
Preservation							
HQ Preservation							
Length/Area Total	**8,881**	**9.06**		**0**	**0**	**0**	**2**
Mitigation Unit Total	**6,621.6**	**8.36**					

=Non-Applicable
[1]Acreage updated based on MY4 wetland boundary delineation

Table 2. Project Activity & Reporting History Cat Creek Stream and Wetland / Project No. 71 Elapsed Time Since Grading Complete: 3 Year 6 Months Number of Reporting Years: 4		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan	-	Jul-07
Final Design - Construction Plans	Jul-08	Jul-08
Construction	N/A	May-10
Temporary S&E mix applied	N/A	Jan-10
Permanent seed mix applied	N/A	Feb-10
Planting	N/A	Feb-10
Initial Wetland Monitoring Gauges & Rain Gauge Installed	N/A	Apr-10
Mitigation Plan / As-built (Year 0 Monitoring - Baseline)	Jun-10	Mar-11
Year 1 Monitoring	Dec-10	Mar-11
Year 2 Monitoring	Nov-11	Dec-11
Year 3 Monitoring	Nov-12	Dec-12
Year 4 Monitoring	Dec-13	Jan-14
Year 5 Monitoring		

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

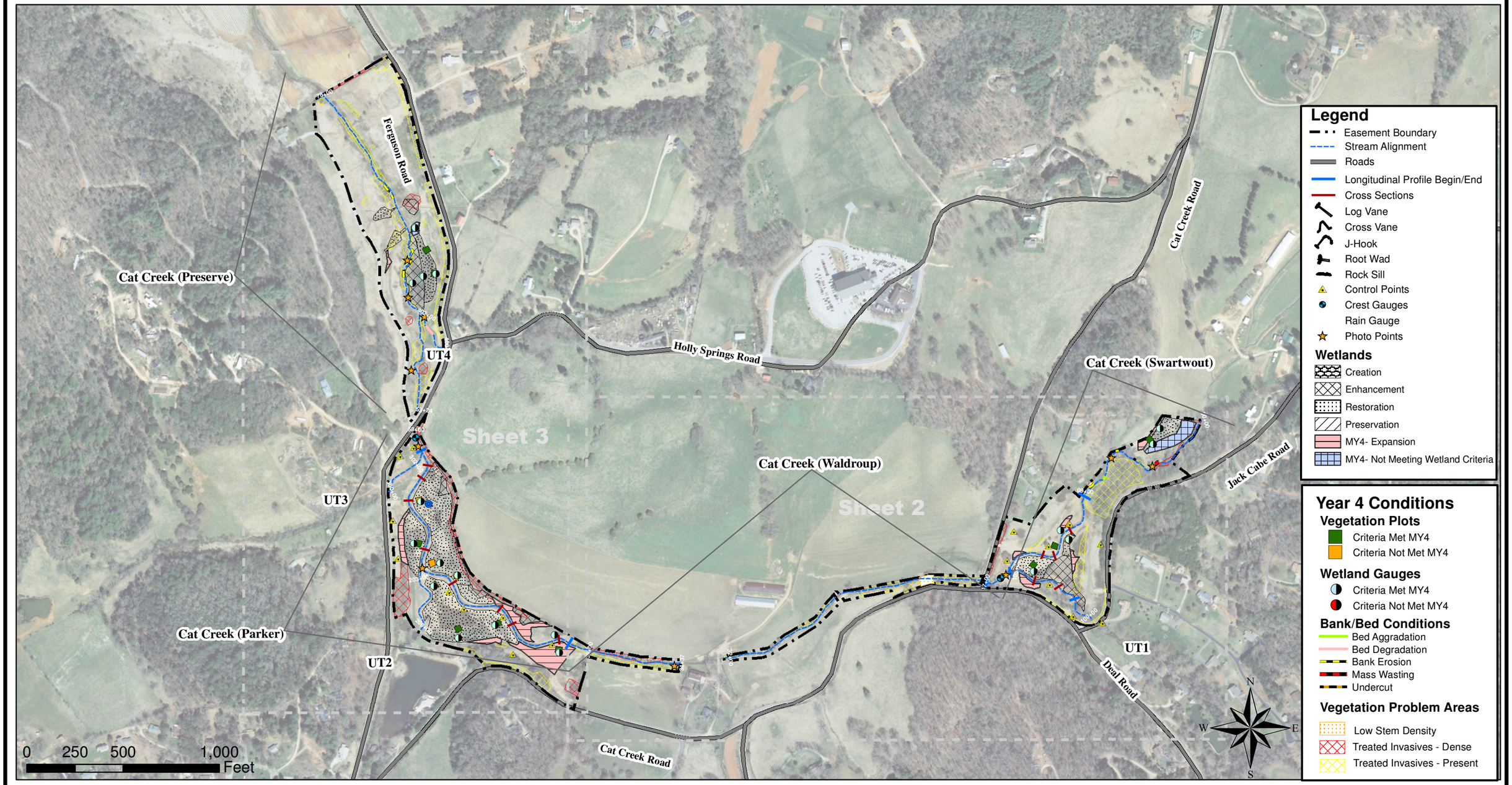
Table 3. Project Contacts Cat Creek Stream and Wetland / Project No. 71	
Designer	AECOM 701 Corporate Center Dr., Suite 475 Raleigh, NC 27607
Primary Project Design POC	Ron Johnson (919) 854-6210
Construction Contractor	Fluvial Solutions P.O. Box 28749 Raleigh, NC 27611
Construction Contractor POC	Peter Jelenevsky (919) 605-6134
Planting Contractor	Bruton Natural Systems, Inc P.O. Box 1197 Fremont, NC 27830
Planting Contractor POC	Charlie Bruton (919) 242-6555
Seeding Contractor	Fluvial Solutions P.O. Box 28749 Raleigh, NC 27611
Seeding Contractor POC	Peter Jelenevsky (919) 605-6134
Seed Mix Sources	Mellow Marsh Farm, Inc 1312 Woody Store Road Siler City, NC 27344 (919) 742-1200
Monitoring Performers (Y0) - 2010	AECOM 701 Corporate Center Dr., Suite 475 Raleigh, NC 27607
Stream Monitoring POC	Ron Johnson (919) 854-6210
Monitoring Performers (Y1) - 2010	AECOM 701 Corporate Center Dr., Suite 475 Raleigh, NC 27607
Stream Monitoring POC	Ron Johnson (919) 854-6210
Monitoring Performers (Y2) - 2011	Equinox Environmental Consultation & Design, Inc. 37 Haywood Street, Suite 100 Asheville, North Carolina 28801
Stream Monitoring POC	Steve Melton (828) 253-6856
Vegetation Monitoring POC	Kevin Mitchell (828) 253-6856
Wetland Monitoring POC	Win Taylor (828) 253-6856
Monitoring Performers (Y3)- 2012	Equinox Environmental Consultation & Design, Inc. 37 Haywood Street, Suite 100 Asheville, North Carolina 28801
Stream Monitoring POC	Steve Melton (828) 253-6856
Vegetation Monitoring POC	Kevin Mitchell (828) 253-6856
Wetland Monitoring POC	Kevin Mitchell (828) 253-6856
Monitoring Performers (Y4)- 2013	Equinox Environmental Consultation & Design, Inc. 37 Haywood Street, Suite 100 Asheville, North Carolina 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
Monitoring Performers (Y5)- 2014	
Stream Monitoring POC	
Vegetation Monitoring POC	
Wetland Monitoring POC	

Table 4. Project Attributes Cat Creek Stream and Wetland / Project No. 71					
Project County	Macon				
Physiographic Region	Blue Ridge				
Ecoregion	Blue Ridge Mountains - Broad Basins				
River Basin	Little Tennessee River				
USGS HUC	06010202040010				
NCDWQ Sub-Basin	04-04-01				
Within Extent of EEP Watershed Plan	Franklin to Fontana Planning Area				
WRC Class	Cold				
% of Project Easement Fenced or Demarcated	100%				
Beaver Activity Observed During Design Phase	Yes				
Restoration Component Attributes					
	Cat Creek	**UT1**	**UT2**	**UT3**	**UT4**
Drainage Area (sq.mi.)	3.6	0.9	0.5	0.2	0.2
Stream Order	Third	Second	Second	First	First
Restored Length (feet)	*7,389	573	381	294	244
Perennial or Intermittent	Perennial				
Watershed Type	Rural				
Watershed LULC Distribution					
Forest	70%	70%	50%	90%	20%
Pasture/Managed Herbaceous	30%	30%	50%	10%	80%
Other	0%	0%	0%	0%	0%
Watershed Impervious Cover	1%	1%	1%	1%	1%
NCDWQ AU/Index Number	2-23-4	2-23-4	2-23-4	2-23-4	2-23-4
NCDWQ Classification	C				
303d Listed	No				
Upstream of 303d Listed Segment	No				
Reasons for 303d Listing or Stressor	N/A				
Total Acreage of Easement	38.9				
Total Vegetated Acreage within Easement	38.9				
Total Planted Acreage as Part of Restoration	20				
Rosgen Classification of Pre-Existing	G4	Cb4	-	-	-
Rosgen Classification of As-Built	C4	C4	C	C	Cb
Valley Type	VII	VII	VII	VII	VII
Valley Slope	0.0062-0.015	0.023	0.013	0.013	0.048
Valley Side Slope Range	15-30%	15-30%	15-30%	15-30%	15-30%
Valley Toe Slope Range	2-3%	2-3%	2-3%	2-3%	2-3%
Cowardin Classification	-	-	-	-	-
Trout Waters Designation	No				
Species of Concern, Endangered, Etc.	No				
Dominant Soil Series and Characteristics					
Series	Nikwasi	Reddies	Nikwasi	Nikwasi	Udorthents
Depth	> 60 inches	> 60 inches	> 60 inches	> 60 inches	> 60 inches
Clay%	5-18%	1-18%	5-18%	5-18%	N/A
K	.05-.20	.05-.20	.05-.20	.05-.20	N/A
T	3	3	3	3.000	N/A

- Information unavailable.
N/A - Item does not apply.
* Stationing Includes a 25 Foot Crossing.

Appendix B
Visual Assessment Data

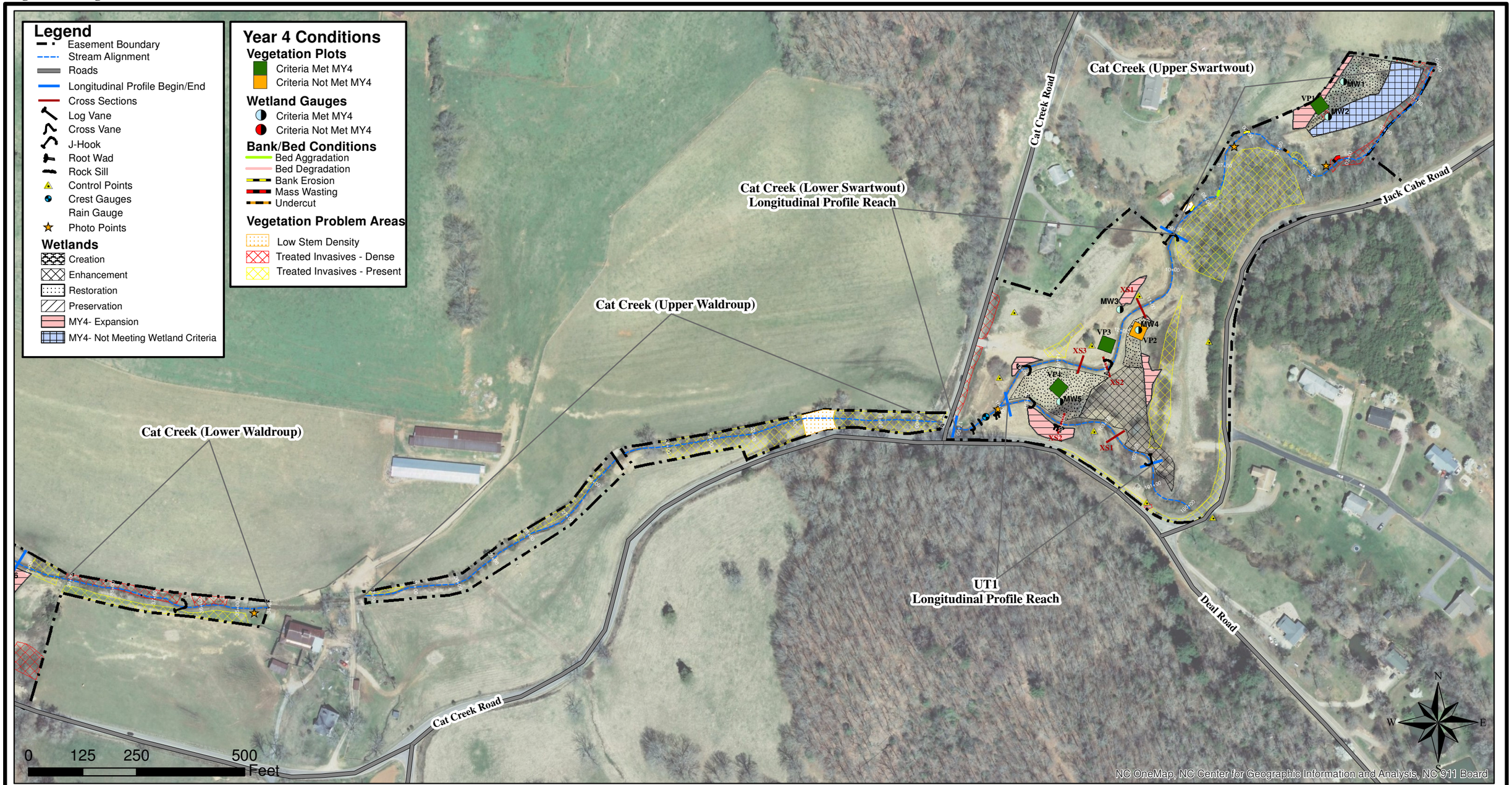
Figure 2. Integrated Current Condition Plan View Draft



Prepared for Ecosystem Enhancement Program	**Project:** Cat Creek Stream and Wetland Restoration Year 4 Monitoring Macon County, North Carolina	Notes: 1) 2010 Aerial Photo 2) Base Map Data Provided by AECOM. 3) Wetland boundaries updated using MY4 Wetland Boundary Delineation data
	Sheet 1 of 3	
	Date December 2013	Project Number NCEEP # 71

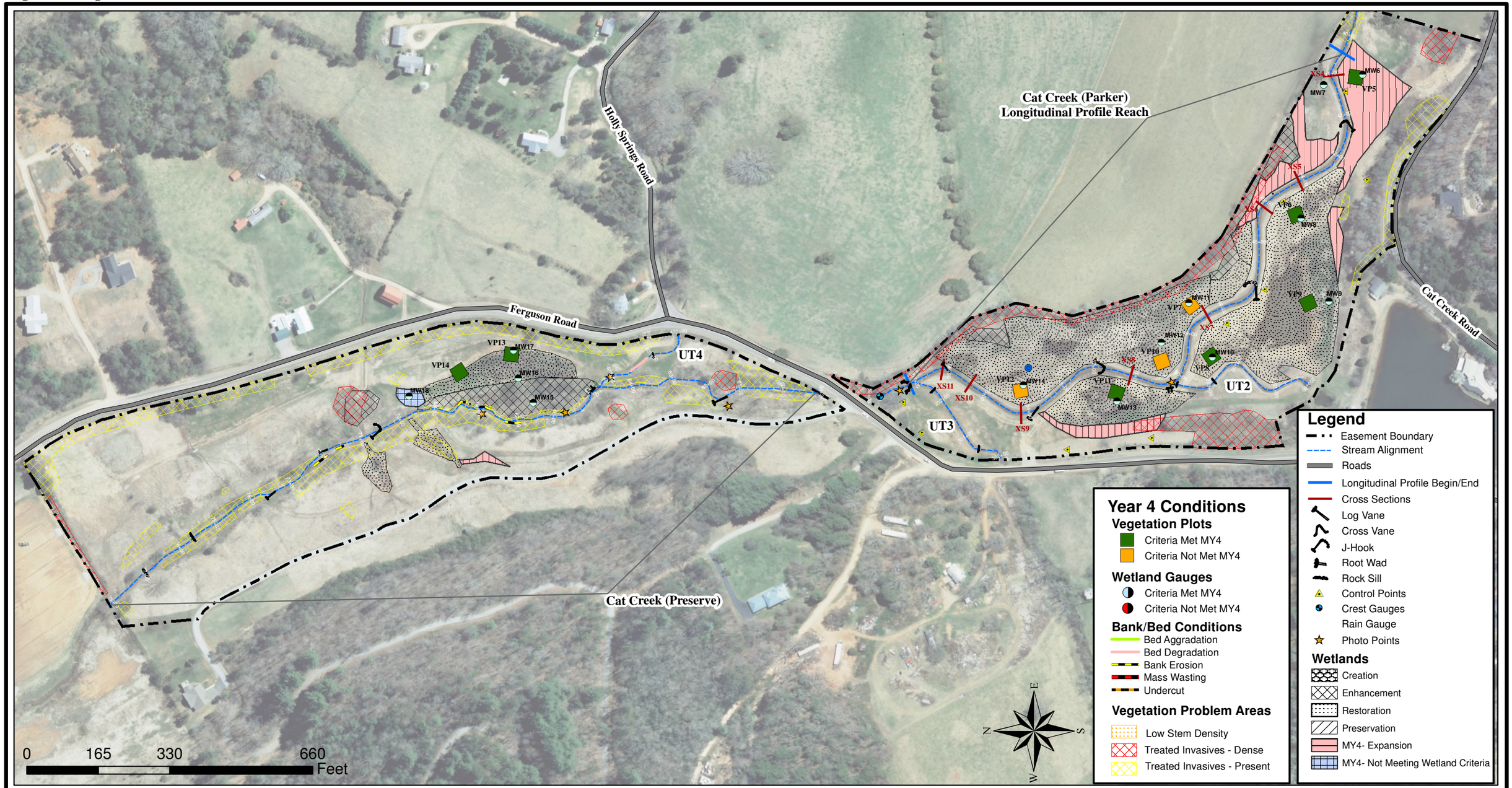
Prepared by
EQUINOX ENVIRONMENTAL CONSULTATION & DESIGN

Figure 2. Integrated Current Condition Plan View Draft



Prepared for			Prepared by
Ecosystem Enhancement Program	**Project:** Cat Creek Stream and Wetland Restoration Year 4 Monitoring Macon County, North Carolina	Notes: 1) 2010 Aerial Photo 2) Base Map Data Provided by AECOM. 3) Wetland boundaries updated using MY4 Wetland Boundary Delineation data	EQUINOX ENVIRONMENTAL CONSULTATION & DESIGN
	Sheet 2 of 3		
	Date	Project Number	
	December 2013	NCEEP # 71	

Figure 2. Integrated Current Condition Plan View Draft



Prepared for	**Project:**	Notes:	Prepared by
Ecosystem Enhancement Program	Cat Creek Stream and Wetland Restoration Year 4 Monitoring Macon County, North Carolina	1) 2010 Aerial Photo 2) Base Map Data Provided by AECOM. 3) Wetland boundaries updated using MY4 Wetland Boundary Delineation data	EQUINOX ENVIRONMENTAL CONSULTATION & DESIGN
	Sheet 3 of 3		
	Date	Project Number	
	December 2013	NCEEP # 71	

Table 5. Visual Stream Morphology Stability Assessment
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek
Assessed Length 7,389 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			1	11	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	43	43			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	42	42			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	42	42			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	42	42			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	42	42			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			7	194	99%	6	80	99%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			1	15	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			1	21	100%	N/A	N/A	N/A
				Totals	9	230	98%	6	80	99%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	21	21			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	13	13			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	18	18			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	17	17			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	14	14			100%			

N/A - Item does not apply.

Table 5. Visual Stream Morphology Stability Assessment
Cat Creek Stream & Wetland / Project No. 71 - UT1
Assessed Length 573 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	7	7			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	6	6			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	6	6			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	6	6			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	7	7			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	N/A	N/A	N/A
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	3	3			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 5. Visual Stream Morphology Stability Assessment
Cat Creek Stream & Wetland / Project No. 71 - UT2
Assessed Length 381 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	5	5			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	4	4			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	4	4			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	4	4			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	4	4			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	N/A	N/A	N/A
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

N/A - Item does not apply.

Table 5. Visual Stream Morphology Stability Assessment
Cat Creek Stream & Wetland / Project No. 71 - UT3
Assessed Length 294 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	4	4			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	3	3			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	3	3			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	3	3			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	3	3			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	N/A	N/A	N/A
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

N/A - Item does not apply.

Table 5. Visual Stream Morphology Stability Assessment
Cat Creek Stream & Wetland / Project No. 71 - UT4
Assessed Length 244 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			1	50	80%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	5	5			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	4	4			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	4	4			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	4	4			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	4	4			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	N/A	N/A	N/A
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	2	2			100%			

N/A - Item does not apply.

Table 6. Vegetation Condition Assessment Cat Creek Stream & Wetland / Project No. 71 Planted Acreage 20					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	N/A	0	0.00	0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	Stipple Orange Dots White Background	6	0.10	<1%
		Totals	6	0.10	<1%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	N/A	0	0.00	0%
		Cumulative Totals	6	0.10	<1%
Easement Acreage 38.9					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Easement Acreage**
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	Cross Hatch (Red - Dense/Yellow - Present)	43	6.76	17%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	Stipple Purple Dots White Background	0	0.00	0%

N/A - Item does not apply.

Cat Creek – Permanent Photo Station 1
Station 3+65 - Downstream

Cat Creek – Permanent Photo Station 2
Station 6+30 - Downstream

Cat Creek – Permanent Photo Station 3
Station 15+98 - Downstream

Cat Creek – Permanent Photo Station 4
Station 34+70 - Downstream

Cat Creek – Permanent Photo Station 5
Station 50+20 - Upstream

Cat Creek – Permanent Photo Station 6
Station 57+36 - Downstream

Cat Creek – Permanent Photo Station 7
Station 61+43 - Downstream

UT4 – Permanent Photo Station 8
Station 402+08 - Upstream

Cat Creek – Permanent Photo Station 9
Station 65+80 - Downstream

Cat Creek – Permanent Photo Station 10
Station 67+88 - Downstream

Appendix C
Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment Cat Creek / Project No. 71		
Vegetation Plot ID	**Vegetation Survival Threshold Met?**	**Tract Mean**
1	Yes	71%
2	No	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	No	
8	Yes	
9	Yes	
10	No	
11	Yes	
12	No	
13	Yes	
14	Yes	

Vegetation Monitoring Plot 1
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 2
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 3
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 4
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 5
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 6
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 7
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 8
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 9
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 10
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 11
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 12
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 13
Monitoring Year 4 – August 20, 2013

Vegetation Monitoring Plot 14
Monitoring Year 4 – August 20, 2013

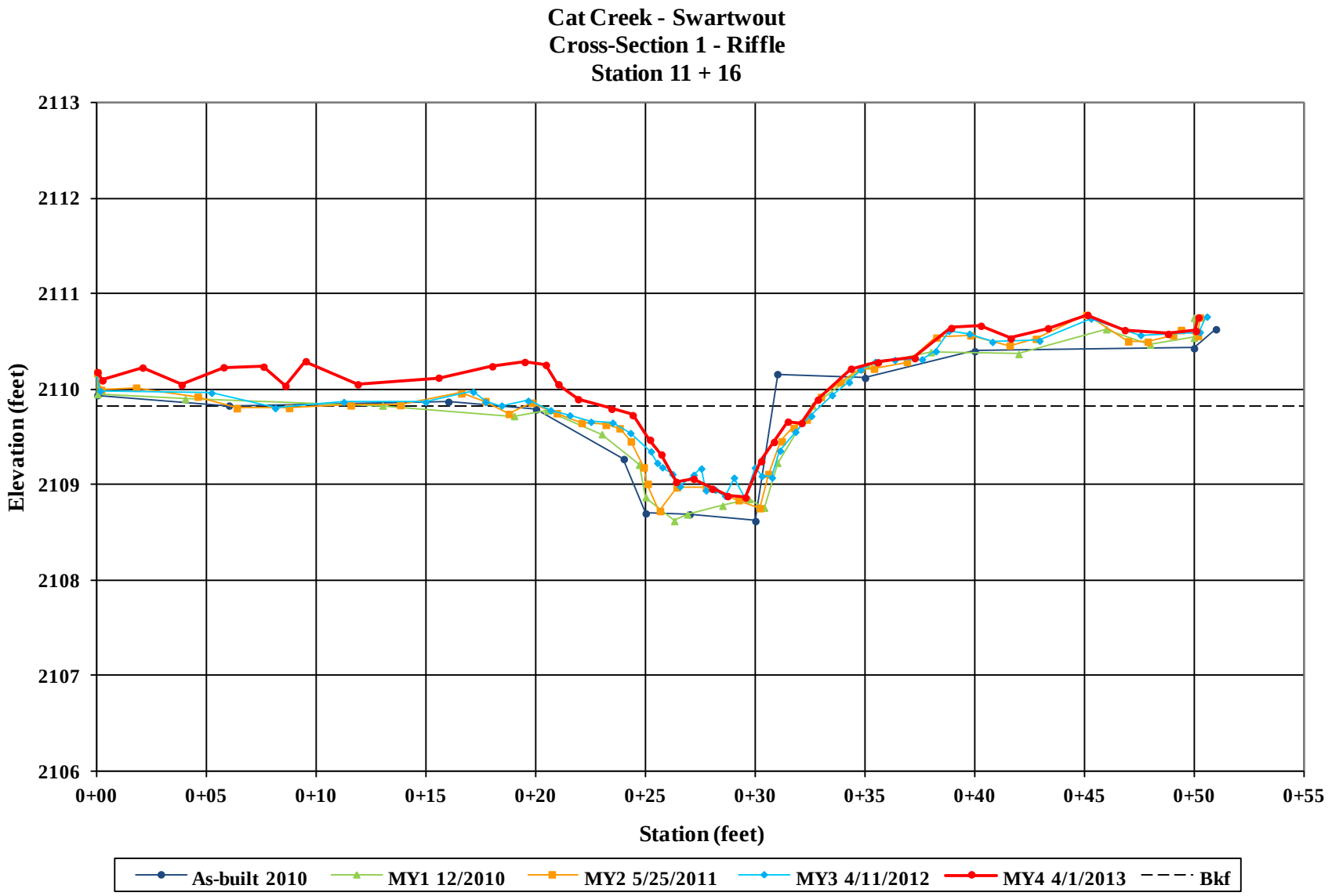
Table 8. CVS Vegetation Plot Metadata Cat Creek / Project No. 71	
Report Prepared By	Hunter Terrell
Date Prepared	11/5/2013 9:24
Database Name	Equinox-2013-A-CatCreek-MY4.mdb
Database Location	Z:\ES\NRI&M\EEP Monitoring\Cat Creek\CC-MY4-2013\Data\Veg
Computer Name	FIELDTECH2-PC
File Size	56651776
DESCRIPTION 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	71
project Name	Cat Creek
Description	
River Basin	Little Tennessee
Length(ft)	
Stream-to-Edge Width (ft)	
Area (sq m)	
Required Plots (calculated)	
Sampled Plots	14

Table 9. Planted and Total Stem Counts (Species by Plot with Annual Means)
EEP Project Code 71. Project Name: Cat Creek

			Current Plot Data (MY4 2013)																																							Annual Means								
			E071-01-0001			E071-01-0002			E071-01-0003			E071-01-0004			E071-01-0005			E071-01-0006			E071-01-0007			E071-01-0008			E071-01-0009			E071-01-0010			E071-01-0011			E071-01-0012			E071-01-0013			E071-01-0014			MY4 (2013)			MY3 (2012)			MY2 (2011)		
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	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	red maple	Tree			12			2			17			35			10			2			9			1						1			1			11			1			4			106			30			14
Alnus serrulata	hazel alder	Shrub				2	2	9	5	5	9			10	1	1	2	5	5	6	1	1	20	3	3	4	2	2	5	2	2	3	4	4	6	1	1	4				2	2	2	28	28	80	28	28	53	27	27	29
Aronia																		2	2	2																								2	2	2	2	2	3	2	2	2
Aronia arbutifolia	Red Chokeberry	Shrub																																								3	3	3	3	3	3	3	3	3	3	3	3
Betula nigra	river birch	Tree			1	2	2	2				2	2	2	2	2	2	2	2	2				4	4	4	1	1	1				3	3	3	1	1	1	2	2	3				19	19	21	19	19	20	19	19	19
Carpinus caroliniana	American hornbeam	Tree	1	1	1				3	3	3	5	5	5	1	1	1							5	5	5	1	1	1	1	1	1				3	3	3				1	1	1	21	21	21	20	20	23	20	20	21
Celtis occidentalis	common hackberry	Tree																									2	2	2															2	2	2	2	2	2			
Cephalanthus occidentalis	common buttonbush	Shrub																									1	1	1															1	1	1	2	2	2			
Cornus amomum	silky dogwood	Shrub															39			14			6						4			26						10	1	1	1			1	1	1	101	1	1	95	1	1	42
Diospyros virginiana	common persimmon	Tree												2																																	2			2			1
Fagus grandifolia	American beech	Tree																1	1	1																			2	2	2	3	3	3	6	6	6	6	6	6	6	6	6
Fraxinus pennsylvanica	green ash	Tree						2	1	1	1	1	1	1	3	3	3	1	1	1				2	2	2							3	3	3				4	4	4	1	1	2	16	16	19	16	16	17	16	16	16
Ilex verticillata	common winterberry	Shrub																											1															1			1					
Juglans nigra	black walnut	Tree			8									2																														10			7			11
Liriodendron tulipifera	tuliptree	Tree			1			1															1																					3			6			6	6	6
Liriodendron tulipifera var. t	Tulip-tree, Yellow Popl	Tree							3	3	3				2	2	2	1	1	1																								6	6	6	6	6	7			
Nyssa sylvatica	blackgum	Tree	3	3	3																																									3	3	3	3	3	3	4	4	5
Pinus virginiana	Virginia pine	Tree																					1																					1			2					
Platanus occidentalis	American sycamore	Tree			2															1																		2			15			31			51					
Platanus occidentalis var. oc	Sycamore, Plane-tree	Tree	5	5	5													1	1	1																					1	1	1	7	7	7	7	7	42	7	7	20
Prunus serotina	black cherry	Tree												1																															1						1
Quercus montana		Tree						1																																					1						
Quercus phellos	willow oak	Tree				1	1	1				2	2	2	1	1	1	5	5	5	4	4	4	2	2	2	1	1	1				1	1	1	2	2	2							19	19	19	21	21	23	24	24	24
Rosa palustris	swamp rose	Shrub									3																											6									9			18			1
Salix nigra	black willow	Tree												5															1											5						11			17			7
Sambucus canadensis	Common Elderberry	Shrub																																								1	1	1	1	1	1	1	1	1	2	2	2
Ulmus rubra	slippery elm	Tree													1	1	1																												1	1	1	1	1	1			
Unknown		Shrub or Tree																																																3	3	3
		Stem count	9	9	33	5	5	18	12	12	36	10	10	65	11	11	61	18	18	36	5	5	41	16	16	18	8	8	17	3	3	31	11	11	14	7	7	39	9	9	31	12	12	53	136	136	493	138	138	375	140	140	233
		size (ares)	1			1			1			1			1			1			1			1			1			1			1			1			1			1			14			14			14		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.35			0.35			0.35		
		Species count	3	3	8	3	3	7	4	4	6	4	4	10	7	7	9	8	8	11	2	2	6	5	5	6	6	6	9	2	2	4	4	4	5	4	4	8	4	4	7	7	7	12	16	16	27	16	16	21	14	14	20
		Stems per ACRE	364.2	364.2	1335	202.3	202.3	728.4	485.6	485.6	1457	404.7	404.7	2630	445.2	445.2	2469	728.4	728.4	1457	202.3	202.3	1659	647.5	647.5	728.4	323.7	323.7	688	121.4	121.4	1255	445.2	445.2	566.6	283.3	283.3	1578	364.2	364.2	1255	485.6	485.6	2145	393.1	393.1	1425	398.9	398.9	1084	404.7	404.7	673.5

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 Survey Data

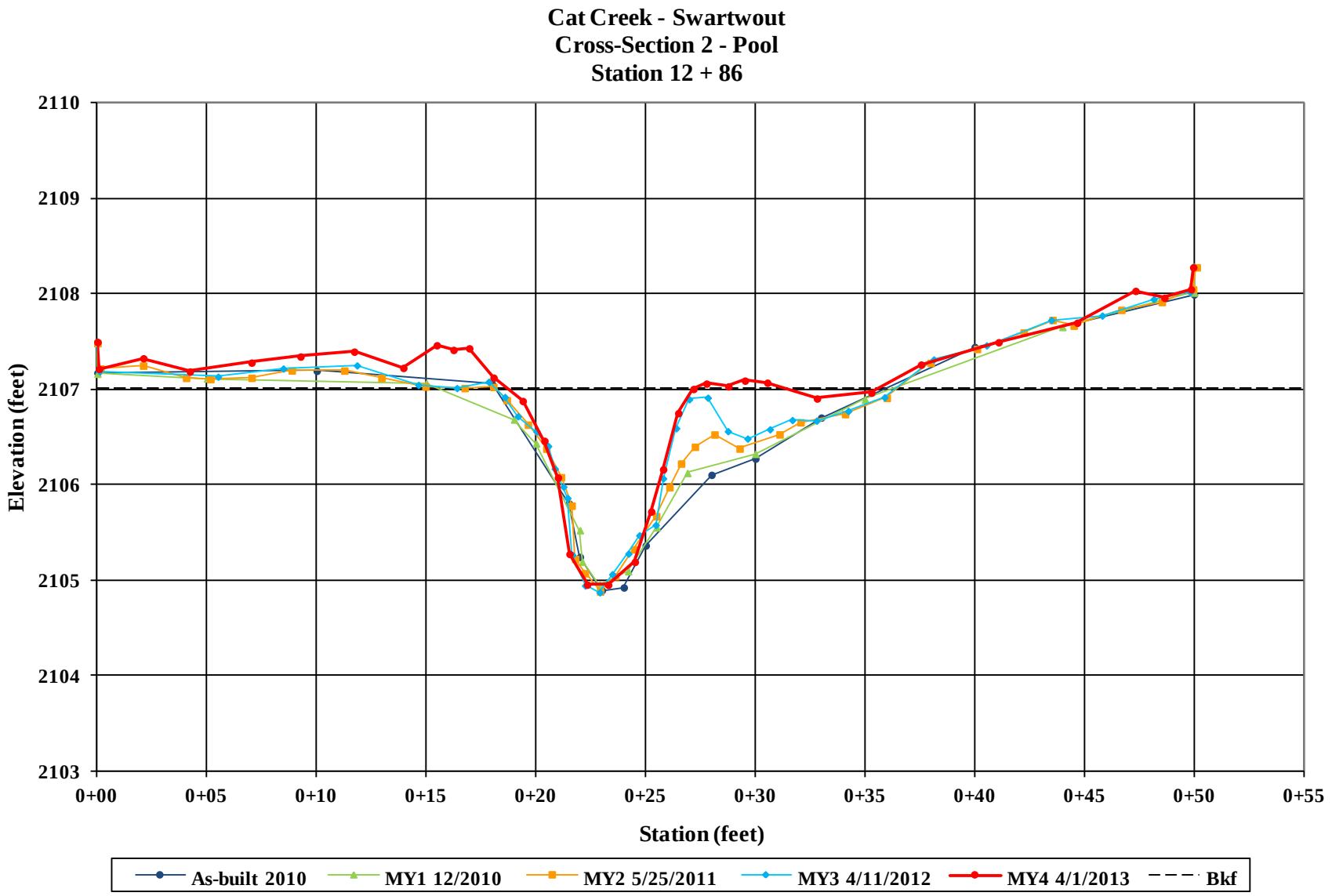

Cat Creek - Swartwout
Cross-Section 1 - Riffle
Station 11 + 16
Elevation (feet)
2113
2112
2111
2110
2109
2108
2107
2106
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 1 – Riffle
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 1 – Riffle
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 1 – Riffle
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 1 – Riffle
Upstream
Monitoring Year 4 – April 1, 2013

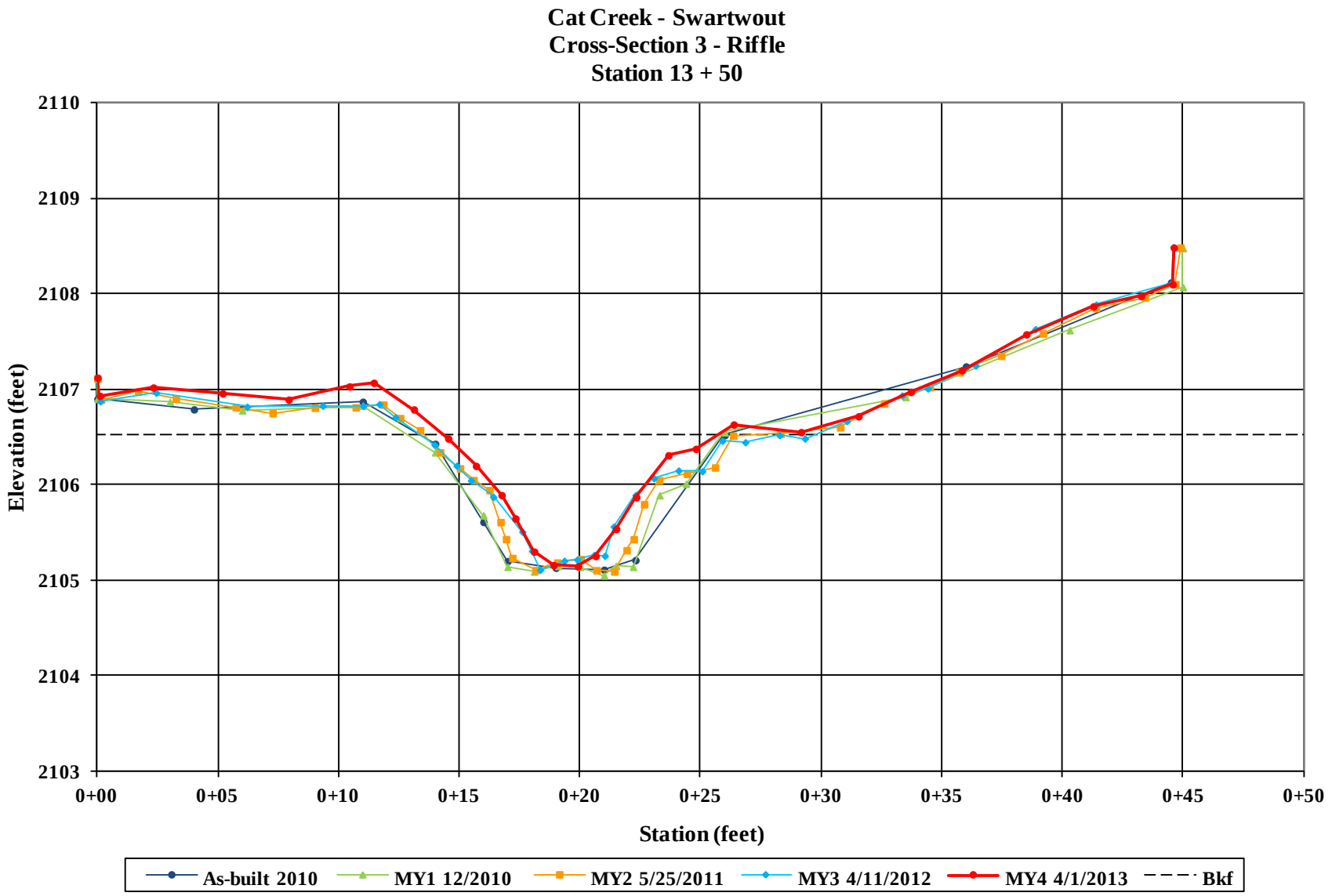

Cat Creek - Swartwout
Cross-Section 2 - Pool
Station 12 + 86
Elevation (feet)
2110
2109
2108
2107
2106
2105
2104
2103
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 2 – Pool
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 2 – Pool
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 2 – Pool
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 2 – Pool
Upstream
Monitoring Year 4 – April 1, 2013

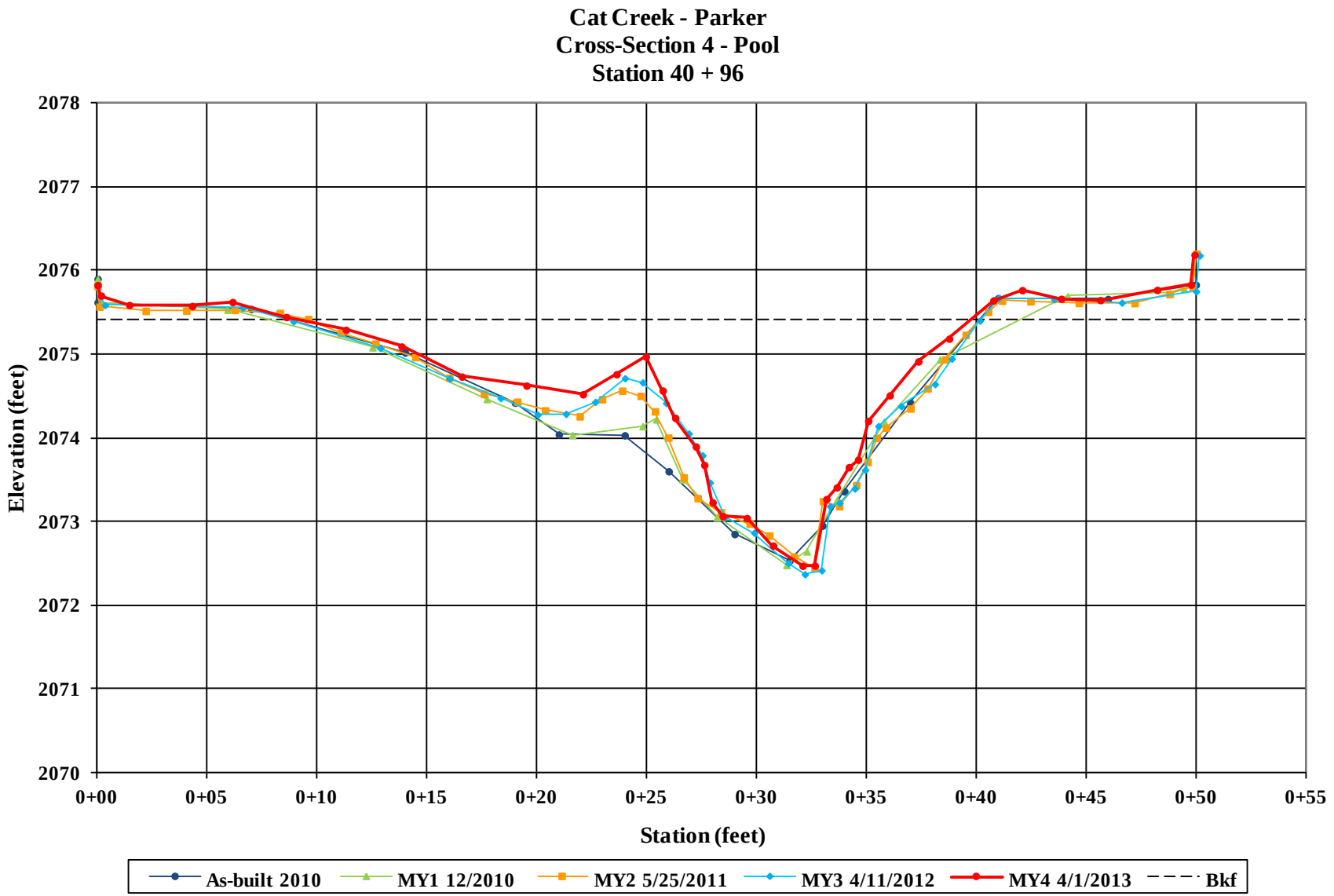

Cat Creek - Swartwout
Cross-Section 3 - Riffle
Station 13 + 50
Elevation (feet)
2110
2109
2108
2107
2106
2105
2104
2103
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 3 – Riffle
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 3 – Riffle
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 3 – Riffle
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 3 – Riffle
Upstream
Monitoring Year 4 – April 1, 2013

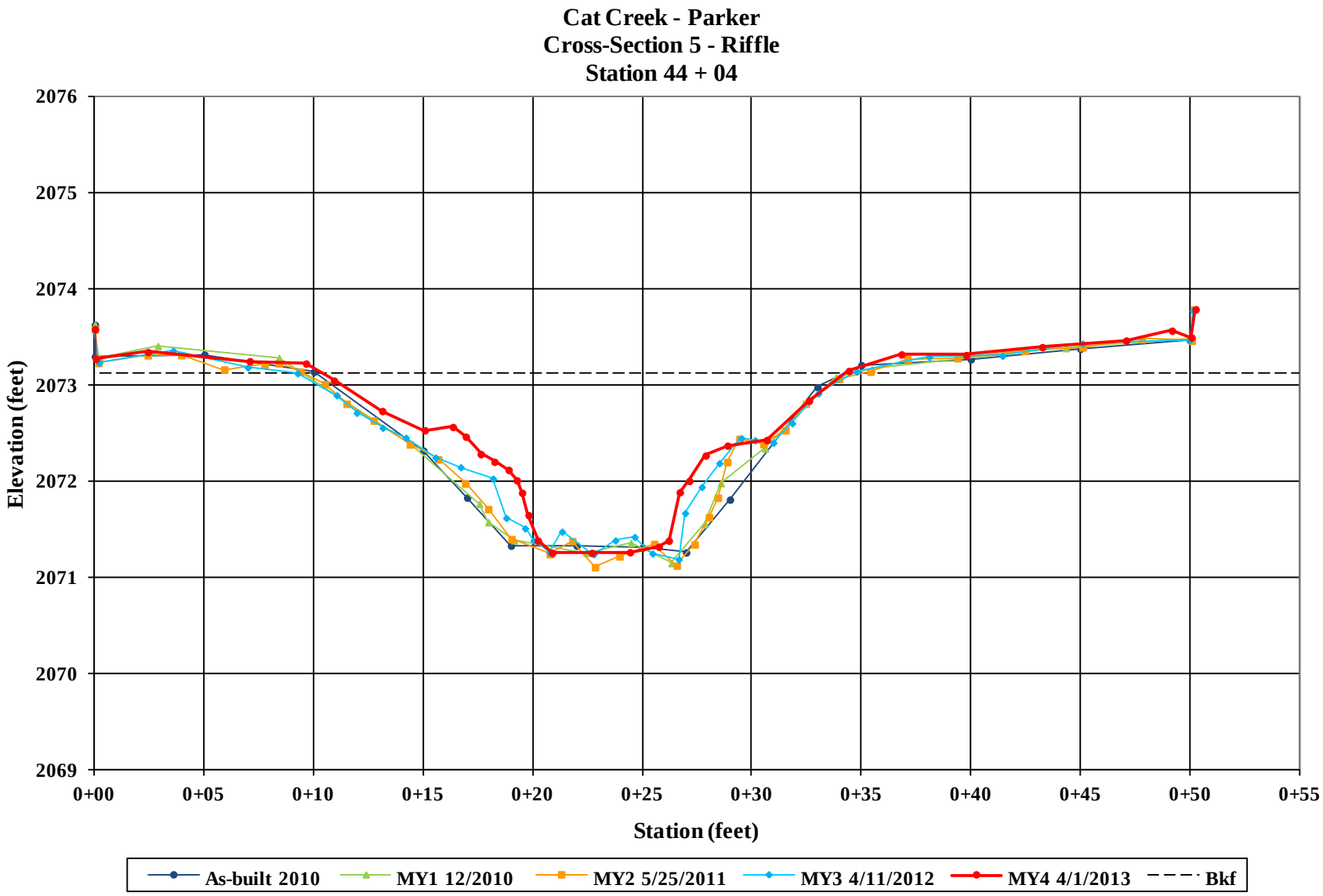

Cat Creek - Parker
Cross-Section 4 - Pool
Station 40 + 96
Elevation (feet)
2078
2077
2076
2075
2074
2073
2072
2071
2070
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 4 – Pool
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 4 – Pool
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 4 – Pool
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 4 – Pool
Upstream
Monitoring Year 4 – April 1, 2013

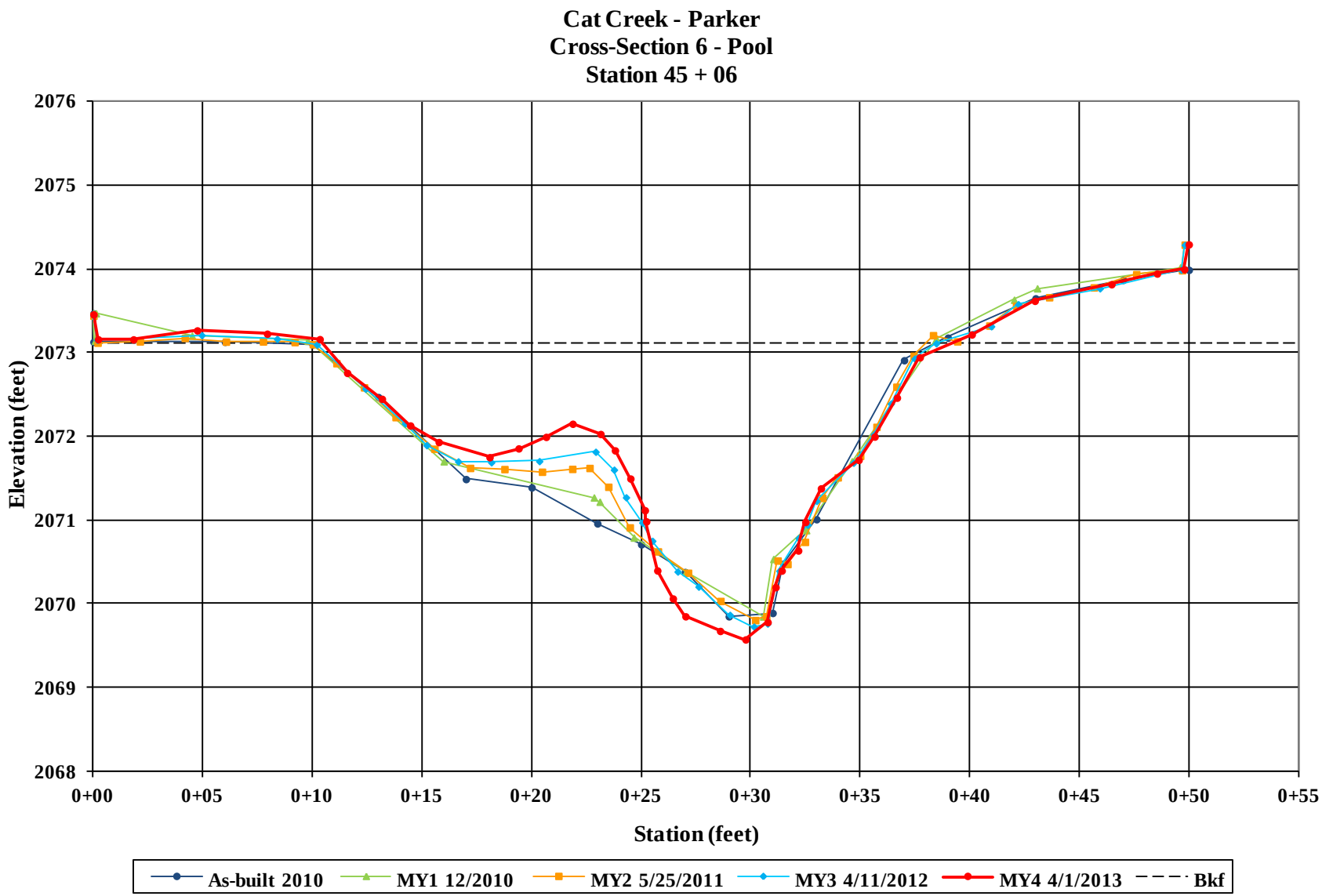

Cat Creek - Parker
Cross-Section 5 - Riffle
Station 44 + 04
Elevation (feet)
2076
2075
2074
2073
2072
2071
2070
2069
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 5 – Riffle
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 5 – Riffle
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 5 – Riffle
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 5 – Riffle
Upstream
Monitoring Year 4 – April 1, 2013

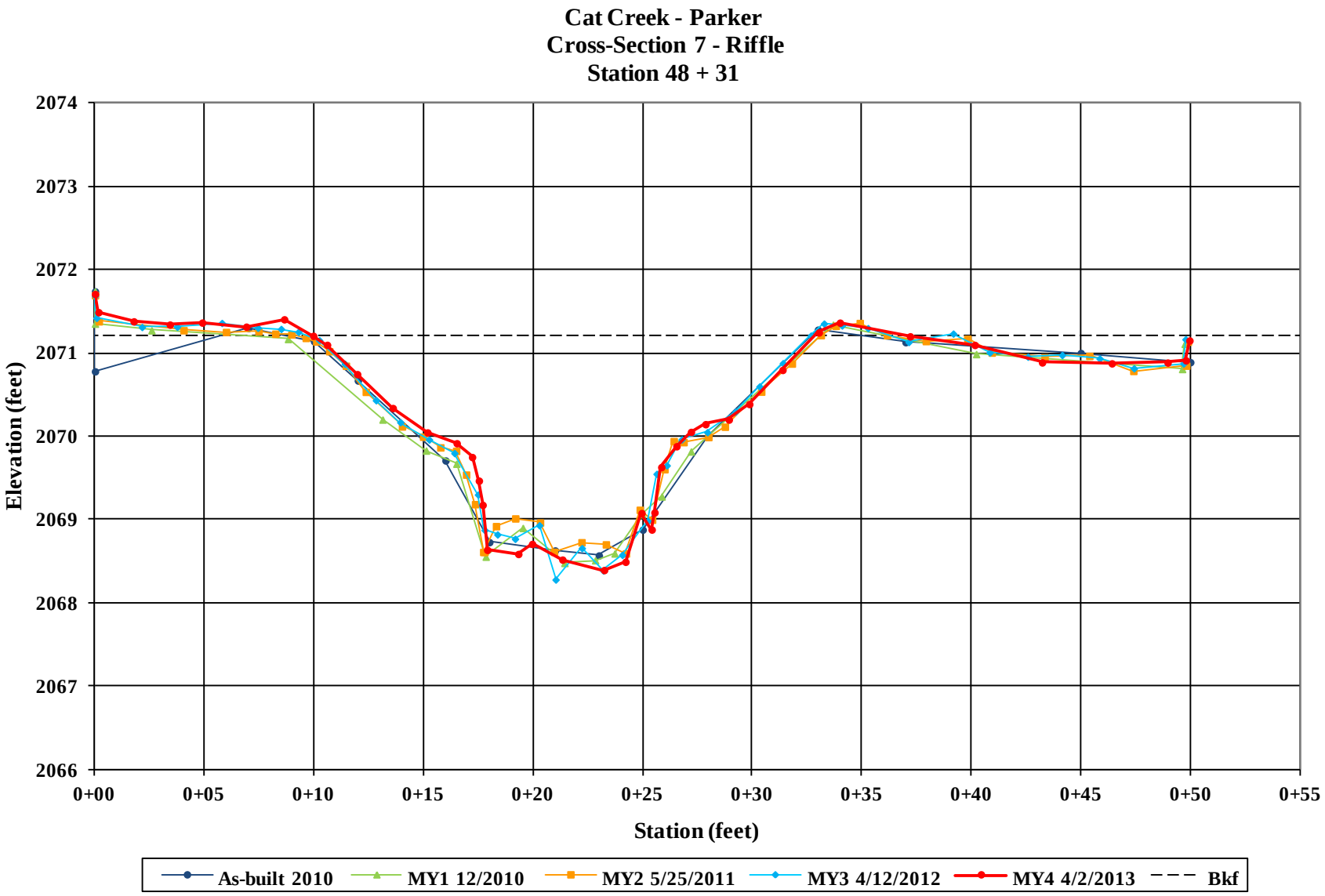

Cat Creek - Parker
Cross-Section 6 - Pool
Station 45 + 06
Elevation (feet)
2076
2075
2074
2073
2072
2071
2070
2069
2068
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

Cross-Section 6 – Pool
Left Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 6 – Pool
Right Bank Descending
Monitoring Year 4 – April 1, 2013

Cross-Section 6 – Pool
Downstream
Monitoring Year 4 – April 1, 2013

Cross-Section 6 – Pool
Upstream
Monitoring Year 4 – April 1, 2013

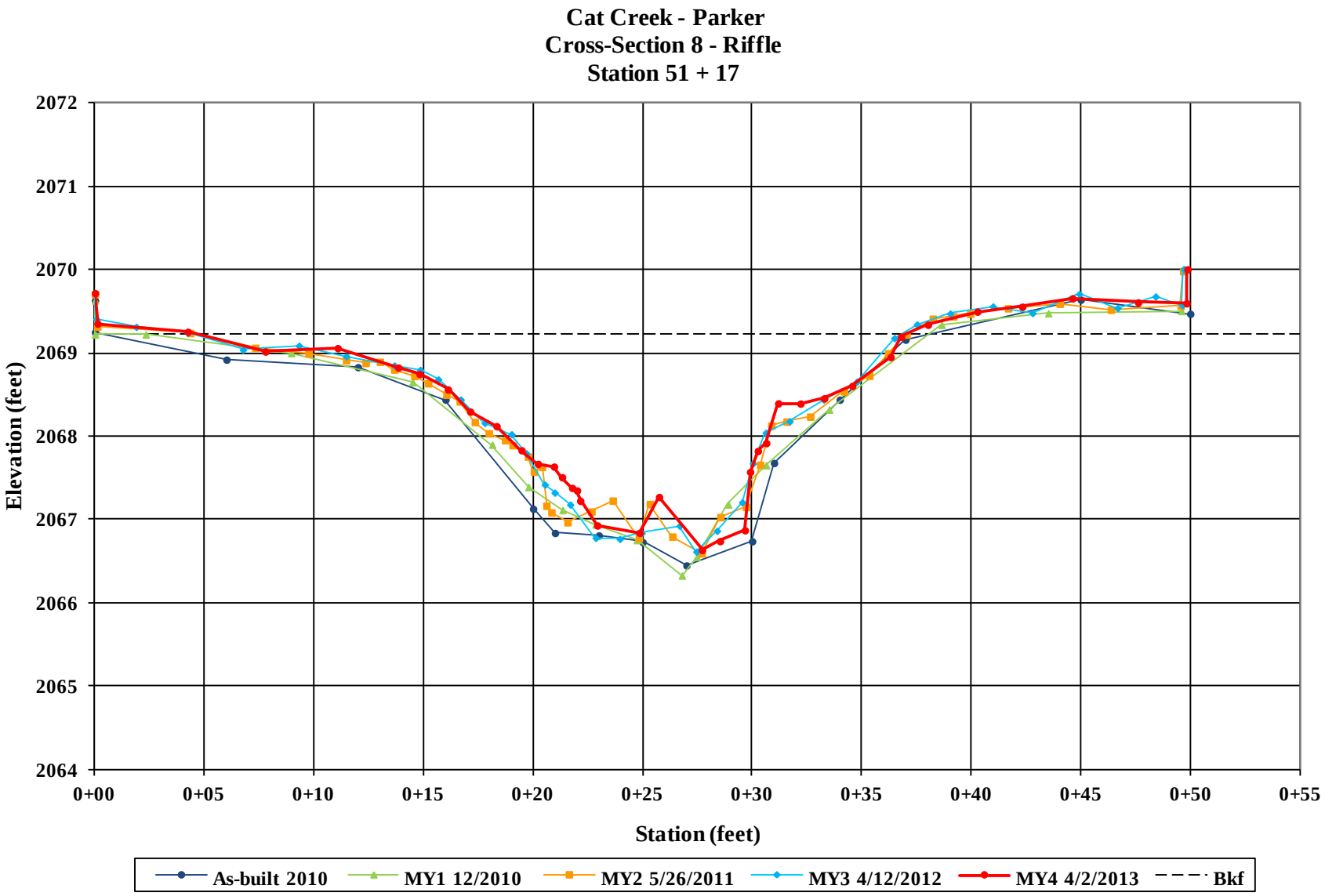

Cat Creek - Parker
Cross-Section 7 - Riffle
Station 48 + 31
Elevation (feet)
2074
2073
2072
2071
2070
2069
2068
2067
2066
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/12/2012
MY4 4/2/2013
Bkf

Cross-Section 7 – Riffle
Left Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 7 – Riffle
Right Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 7 – Riffle
Downstream
Monitoring Year 4 – April 2, 2013

Cross-Section 7 – Riffle
Upstream
Monitoring Year 4 – April 2, 2013

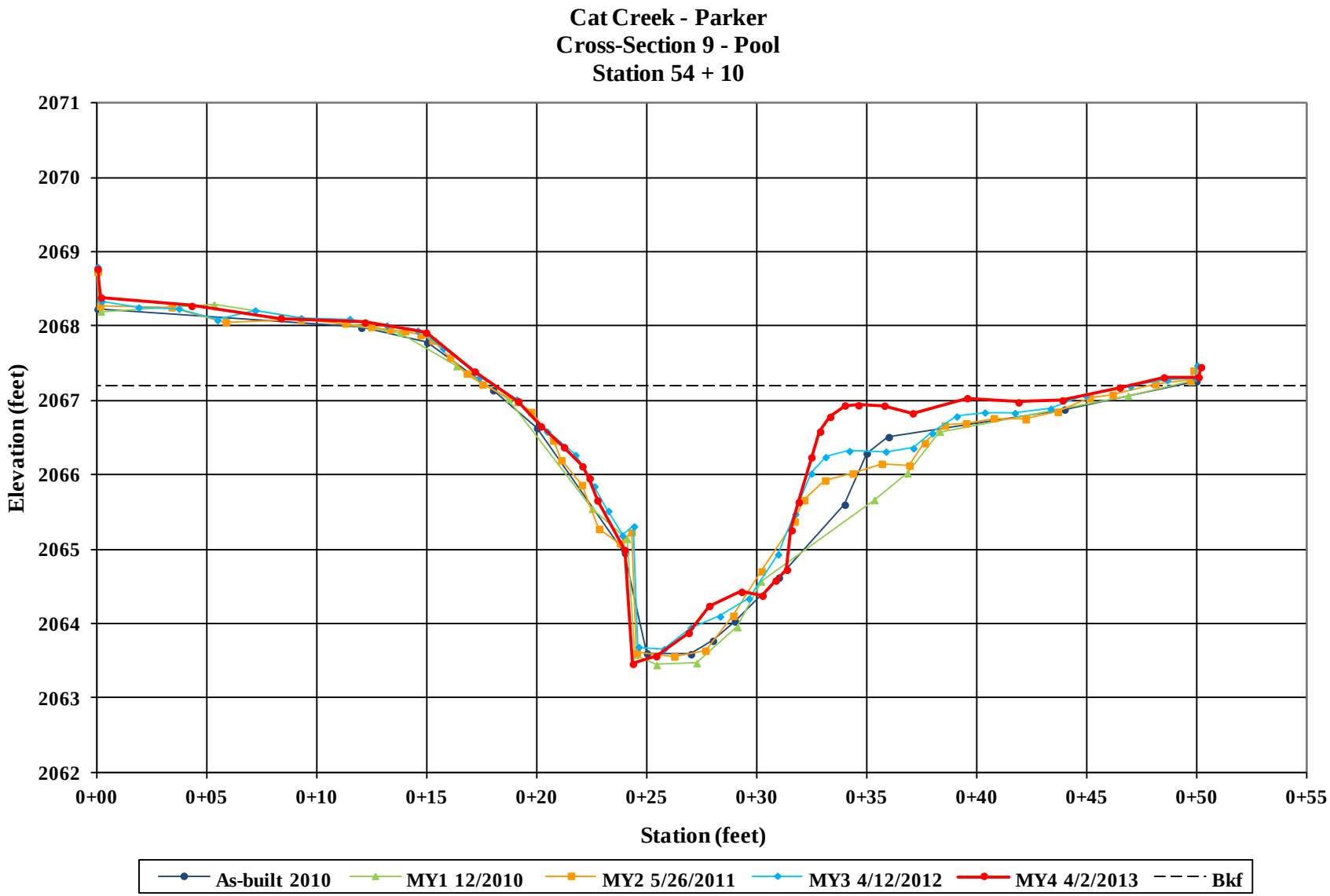

Cat Creek - Parker
Cross-Section 8 - Riffle
Station 51 + 17
Elevation (feet)
2072
2071
2070
2069
2068
2067
2066
2065
2064
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/26/2011
MY3 4/12/2012
MY4 4/2/2013
Bkf

Cross-Section 8 – Riffle
Left Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 8 – Riffle
Right Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 8 – Riffle
Downstream
Monitoring Year 4 – April 2, 2013

Cross-Section 8 – Riffle
Upstream
Monitoring Year 4 – April 2, 2013

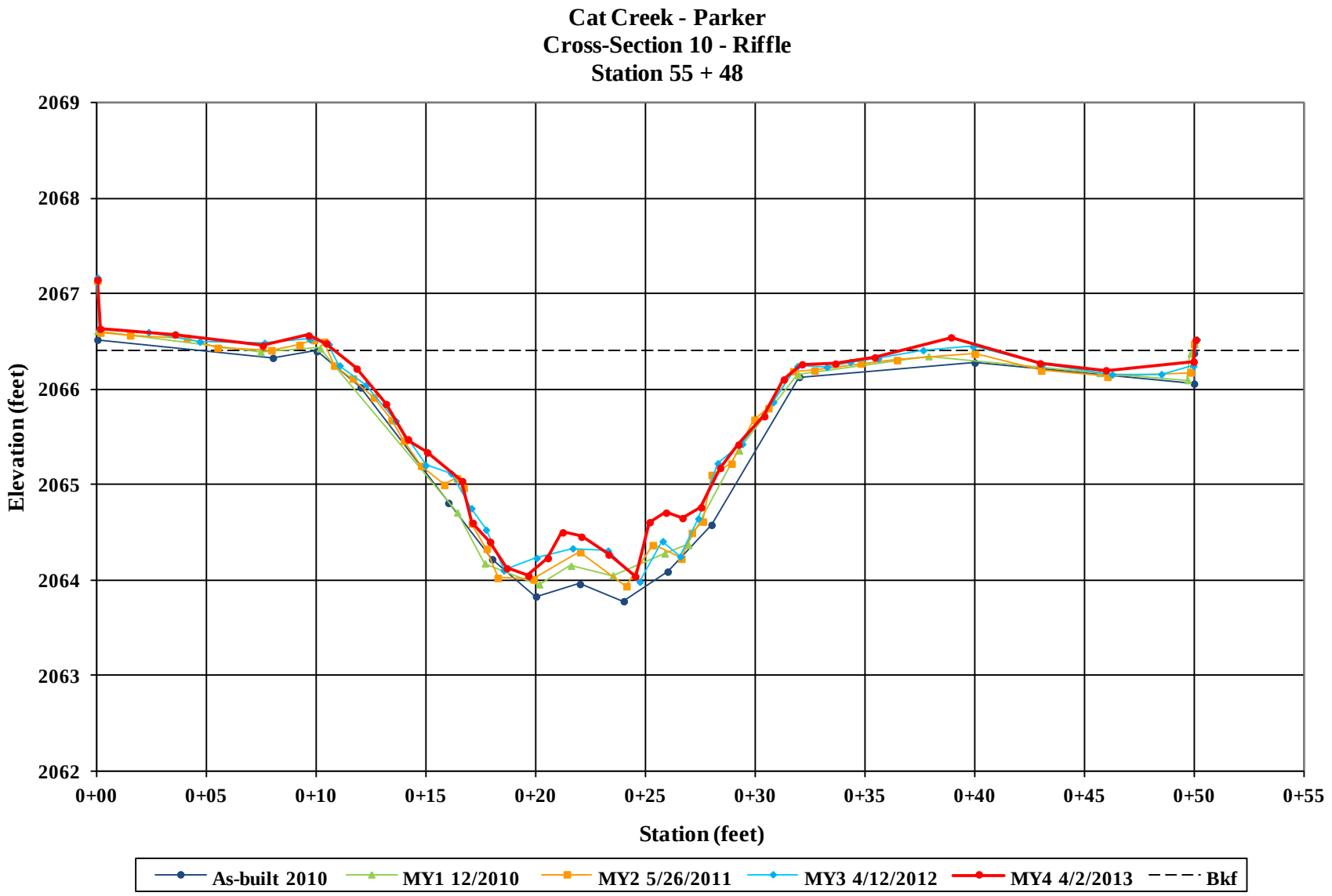

Cat Creek - Parker
Cross-Section 9 - Pool
Station 54 + 10
Elevation (feet)
2071
2070
2069
2068
2067
2066
2065
2064
2063
2062
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/26/2011
MY3 4/12/2012
MY4 4/2/2013
Bkf

Cross-Section 9 – Pool
Left Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 9 – Pool
Right Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 9 – Pool
Downstream
Monitoring Year 4 – April 2, 2013

Cross-Section 9 – Pool
Upstream
Monitoring Year 4 – April 2, 2013

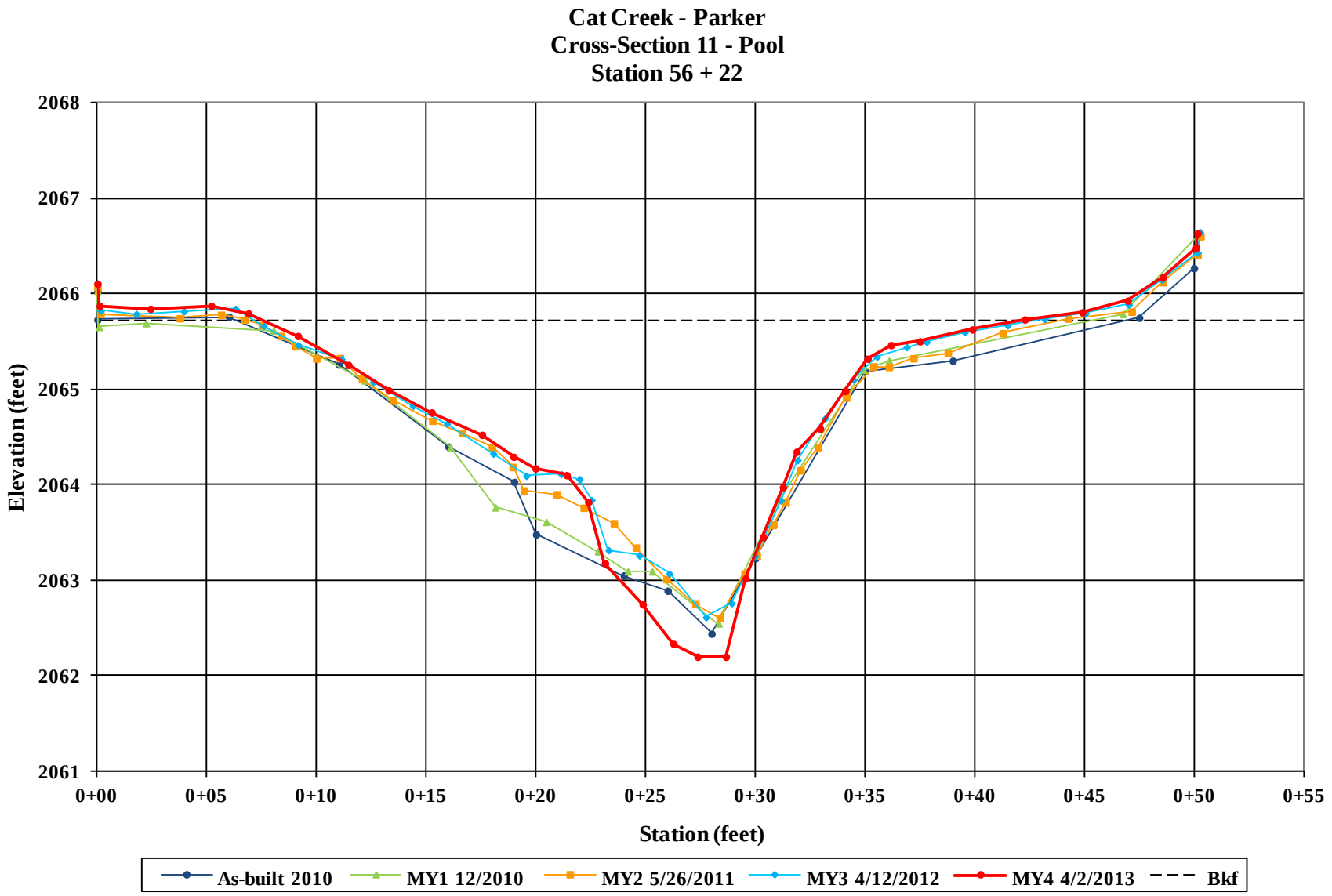

Cat Creek - Parker
Cross-Section 10 - Riffle
Station 55 + 48
Elevation (feet)
2069
2068
2067
2066
2065
2064
2063
2062
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/26/2011
MY3 4/12/2012
MY4 4/2/2013
Bkf

Cross-Section 10 – Riffle
Left Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 10 – Riffle
Right Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 10 – Riffle
Downstream
Monitoring Year 4 – April 2, 2013

Cross-Section 10 – Riffle
Upstream
Monitoring Year 4 – April 2, 2013

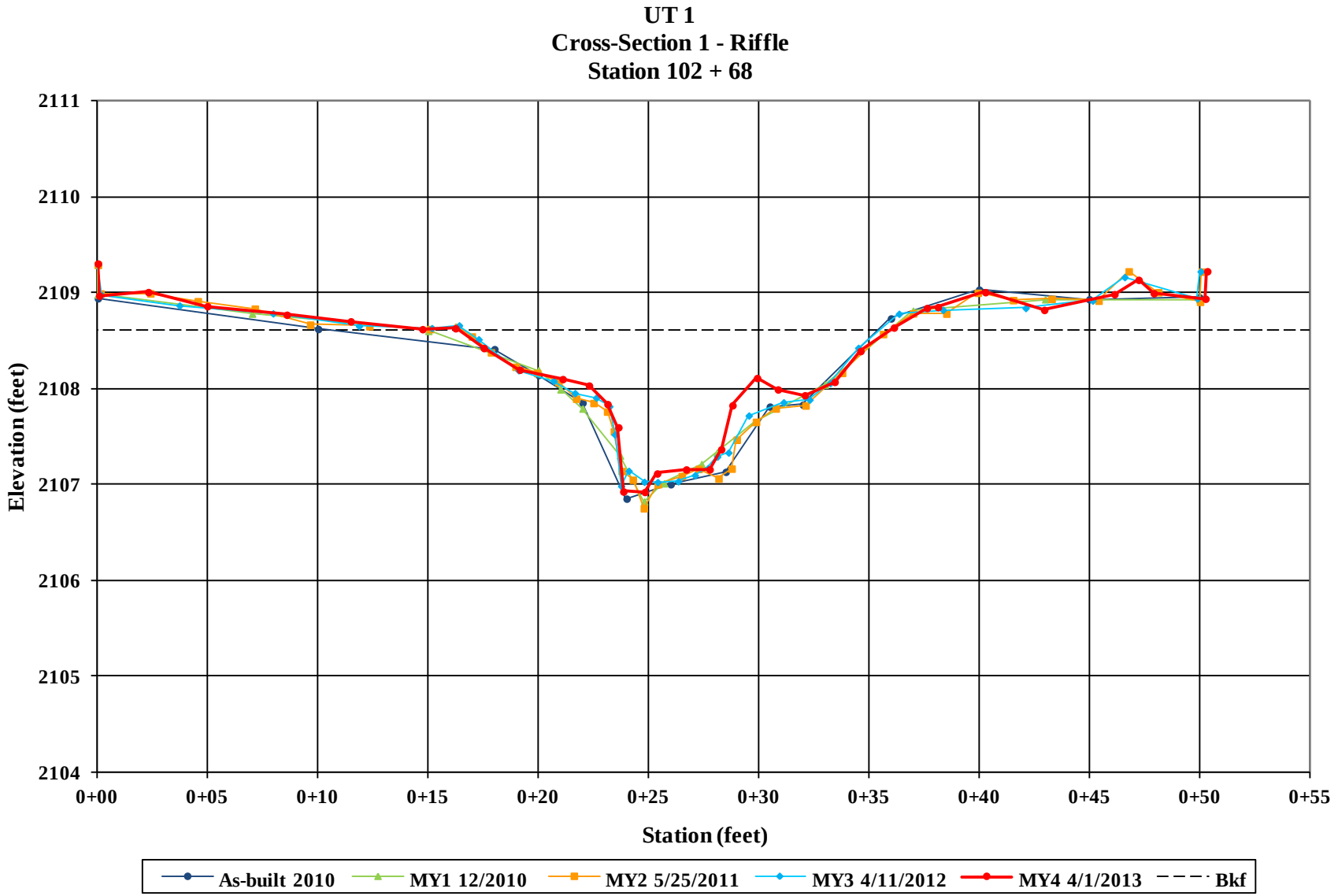

Cat Creek - Parker
Cross-Section 11 - Pool
Station 56 + 22
Elevation (feet)
2068
2067
2066
2065
2064
2063
2062
2061
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/26/2011
MY3 4/12/2012
MY4 4/2/2013
Bkf

Cross-Section 11 – Pool
Left Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 11 – Pool
Right Bank Descending
Monitoring Year 4 – April 2, 2013

Cross-Section 11 – Pool
Downstream
Monitoring Year 4 – April 2, 2013

Cross-Section 11 – Pool
Upstream
Monitoring Year 4 – April 2, 2013

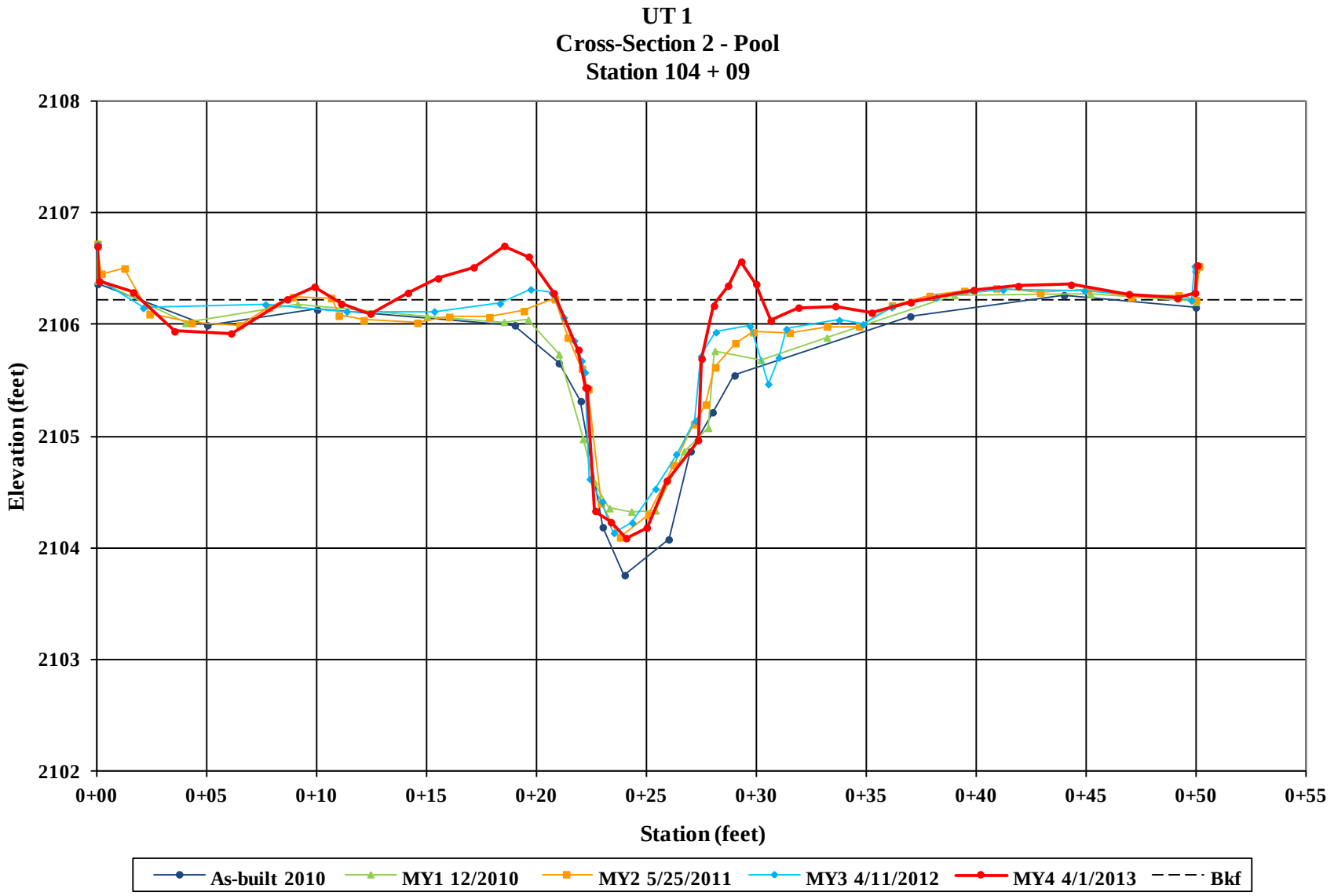

UT 1
Cross-Section 1 - Riffle
Station 102 + 68
Elevation (feet)
2111
2110
2109
2108
2107
2106
2105
2104
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

UT 1 Cross-Section 1 – Riffle
Left Bank Descending
Monitoring Year 4 – April 1, 2013

UT1 Cross-Section 1 – Riffle
Right Bank Descending
Monitoring Year 4 – April 1, 2013

UT1 Cross-Section 1 – Riffle
Downstream
Monitoring Year 4 – April 1, 2013

UT1 Cross-Section 1 – Riffle
Upstream
Monitoring Year 4 – April 1, 2013


UT 1
Cross-Section 2 - Pool
Station 104 + 09
Elevation (feet)
2108
2107
2106
2105
2104
2103
2102
0+00
0+05
0+10
0+15
0+20
0+25
0+30
0+35
0+40
0+45
0+50
0+55
Station (feet)
As-built 2010
MY1 12/2010
MY2 5/25/2011
MY3 4/11/2012
MY4 4/1/2013
Bkf

UT1 Cross-Section 2 – Pool
Left Bank Descending
Monitoring Year 4 – April 1, 2013

UT1 Cross-Section 2 – Pool
Right Bank Descending
Monitoring Year 4 – April 1, 2013

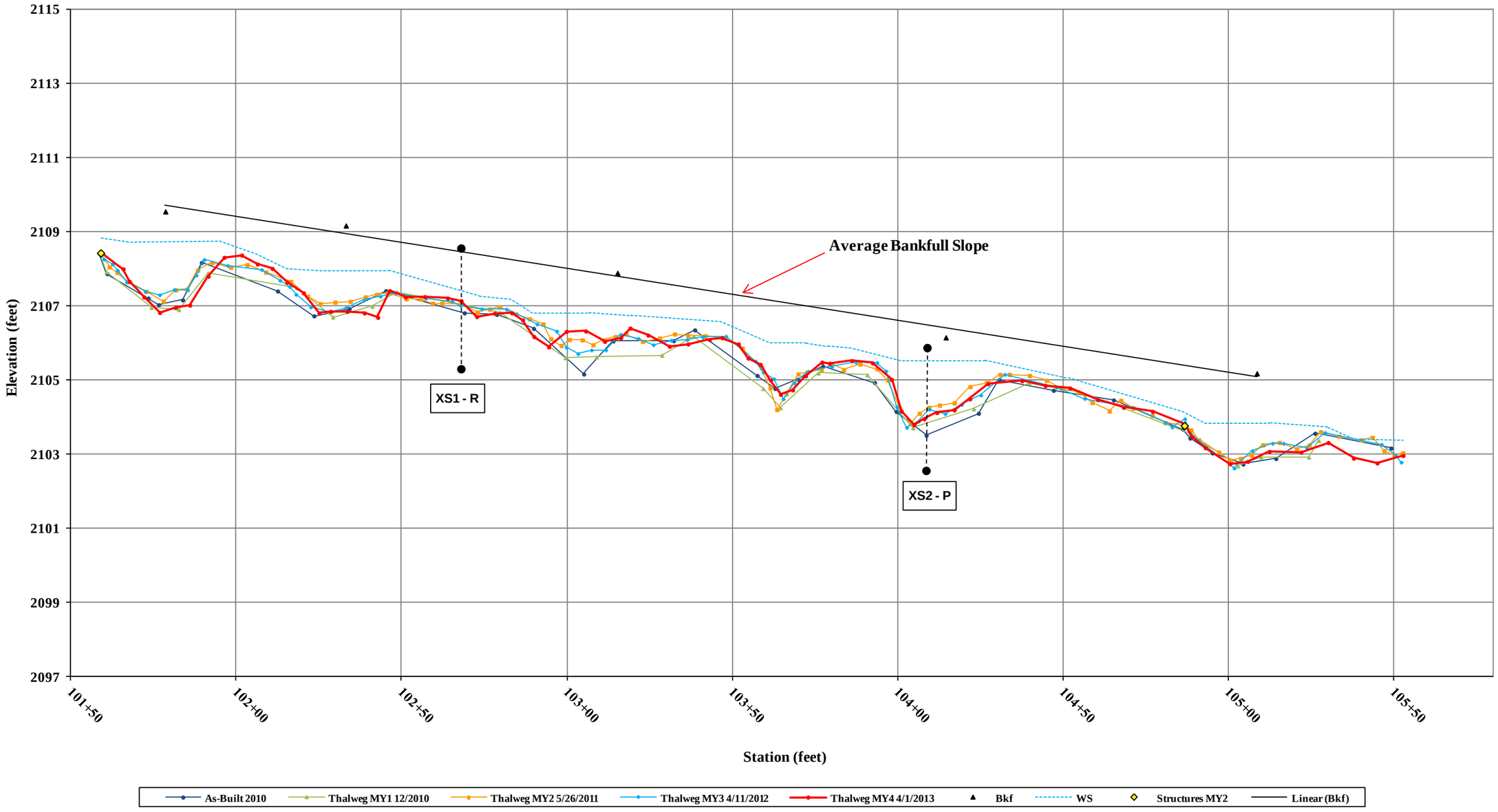
UT1 Cross-Section 2 – Pool
Downstream
Monitoring Year 4 – April 1, 2013

UT1 Cross-Section 2 – Pool
Upstream
Monitoring Year 4 – April 1, 2013

Cat Creek - Swartwout
Longitudinal Profile
Stationing 09+04 - 17+23

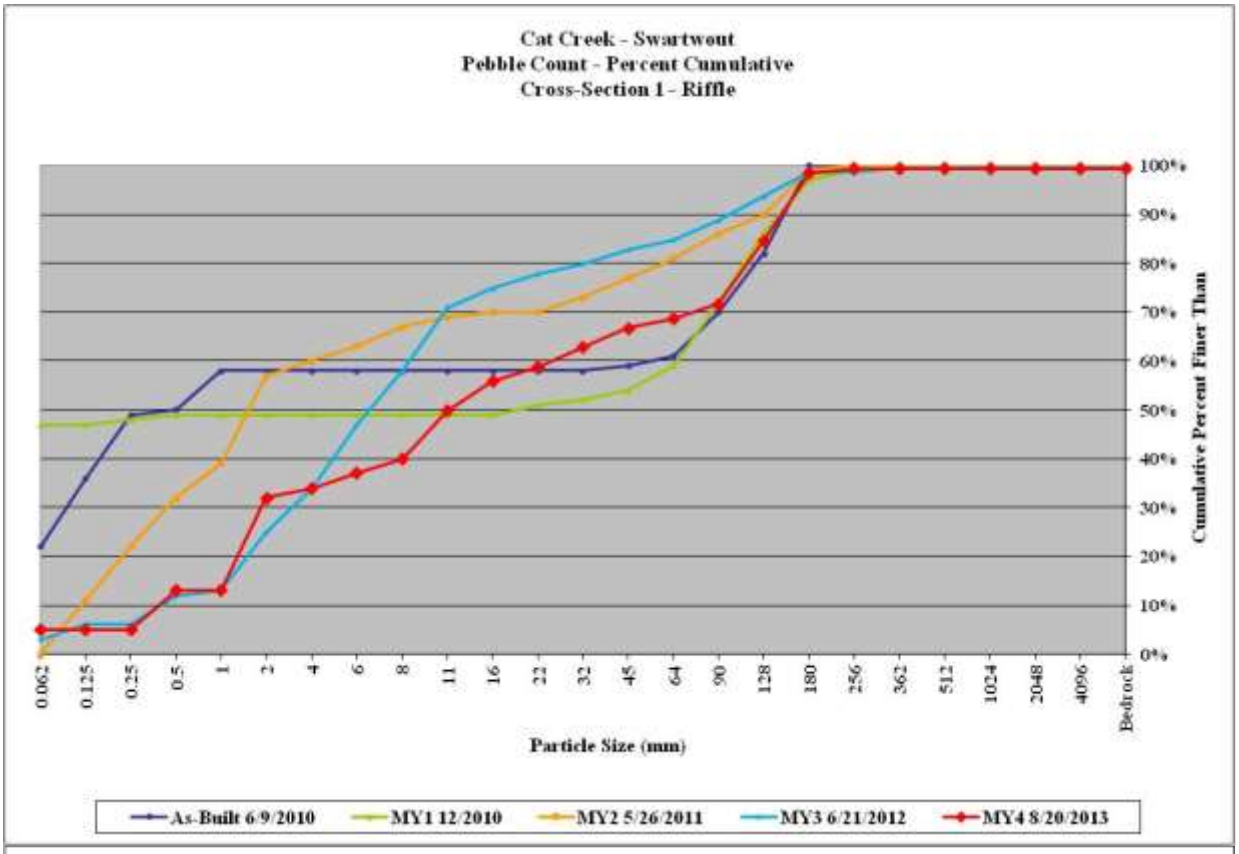
Cat Creek - Parker
Longitudinal Profile
Stationing 40+35 - 57+07

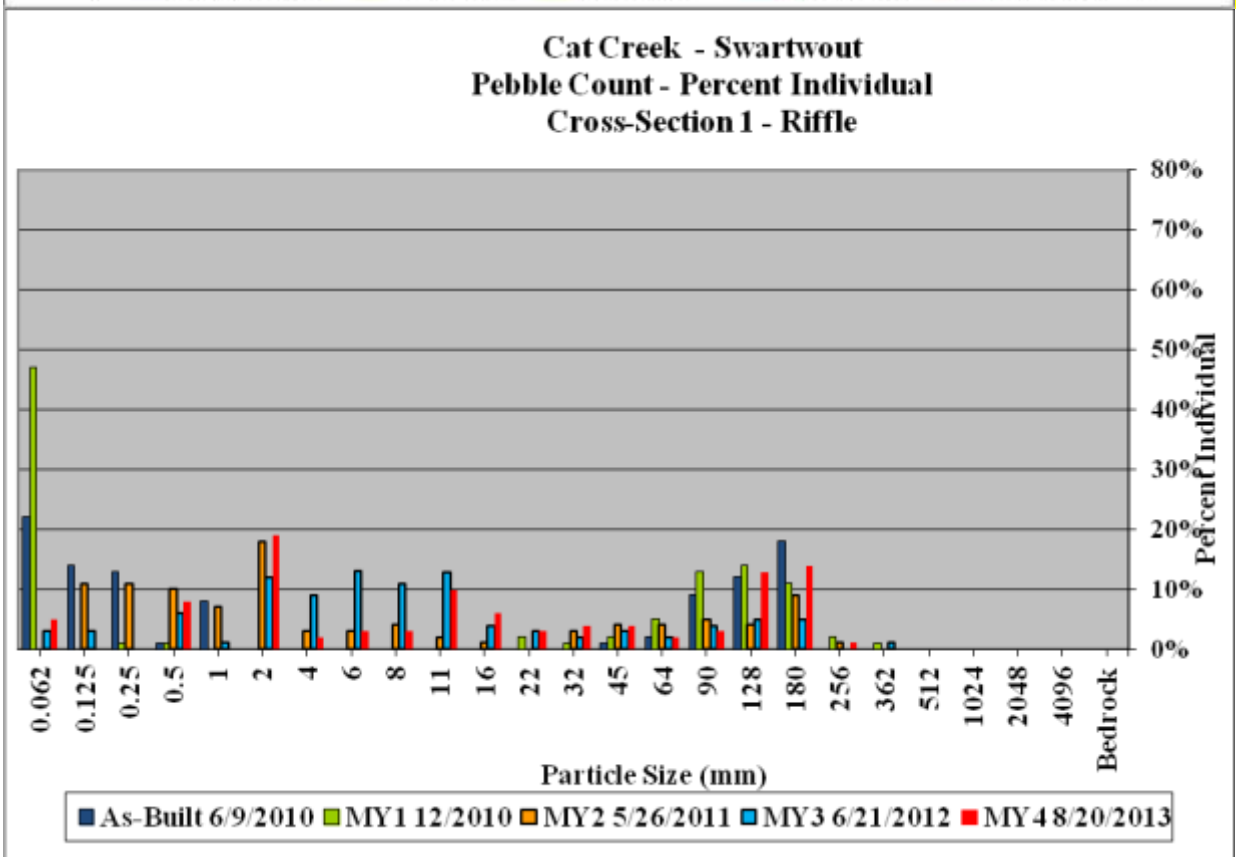
UT1
Longitudinal Profile
Stationing 101+59 - 105+53



Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Swartwout - Cross-Section 1 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	5	5.0%	5%
Sand	very fine sand	0.125	0	0.0%	5%
	fine sand	0.25	0	0.0%	5%
	medium sand	0.50	8	8.0%	13%
	coarse sand	1.00	0	0.0%	13%
	very coarse sand	2.00	19	19.0%	32%
Gravel	very fine gravel	4.0	2	2.0%	34%
	fine gravel	5.7	3	3.0%	37%
	fine gravel	8.0	3	3.0%	40%
	medium gravel	11.3	10	9.9%	50%
	medium gravel	16.0	6	5.9%	56%
	coarse gravel	22.3	3	3.0%	59%
	coarse gravel	32	4	4.0%	63%
	very coarse gravel	45	4	4.0%	67%
	very coarse gravel	64	2	2.0%	69%
Cobble	small cobble	90	3	3.0%	72%
	medium cobble	128	13	12.9%	85%
	large cobble	180	14	13.9%	98%
	very large cobble	256	1	1.0%	99%
Boulder	small boulder	362	0	0.0%	99%
	small boulder	512	0	0.0%	99%
	medium boulder	1024	0	0.0%	99%
	large boulder	2048	0	0.0%	99%
	very large boulder	4096	0	0.0%	99%
Bedrock	bedrock	>4096	0	0.0%	99%
TOTALS			100	100%	99%

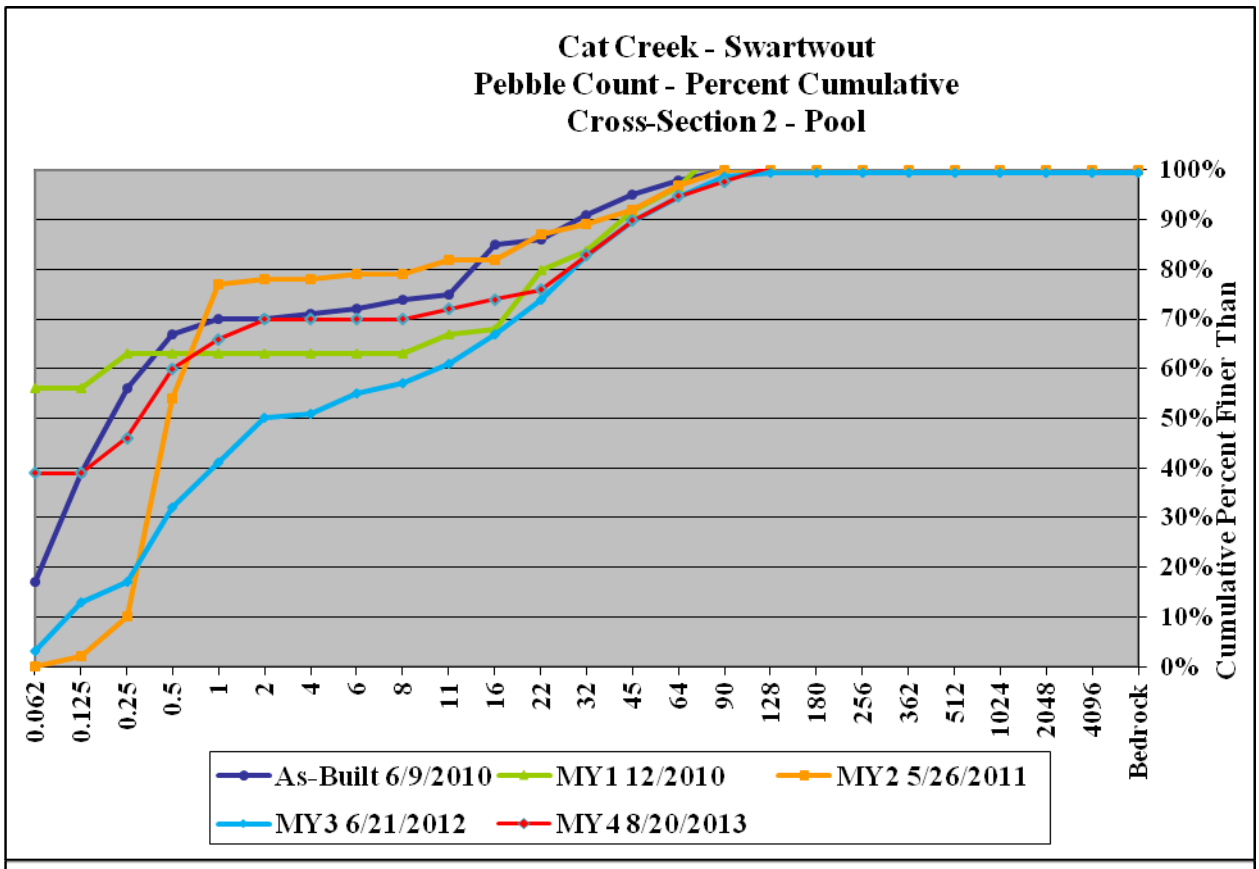
Summary Data	
D50	11
D84	120
D95	160

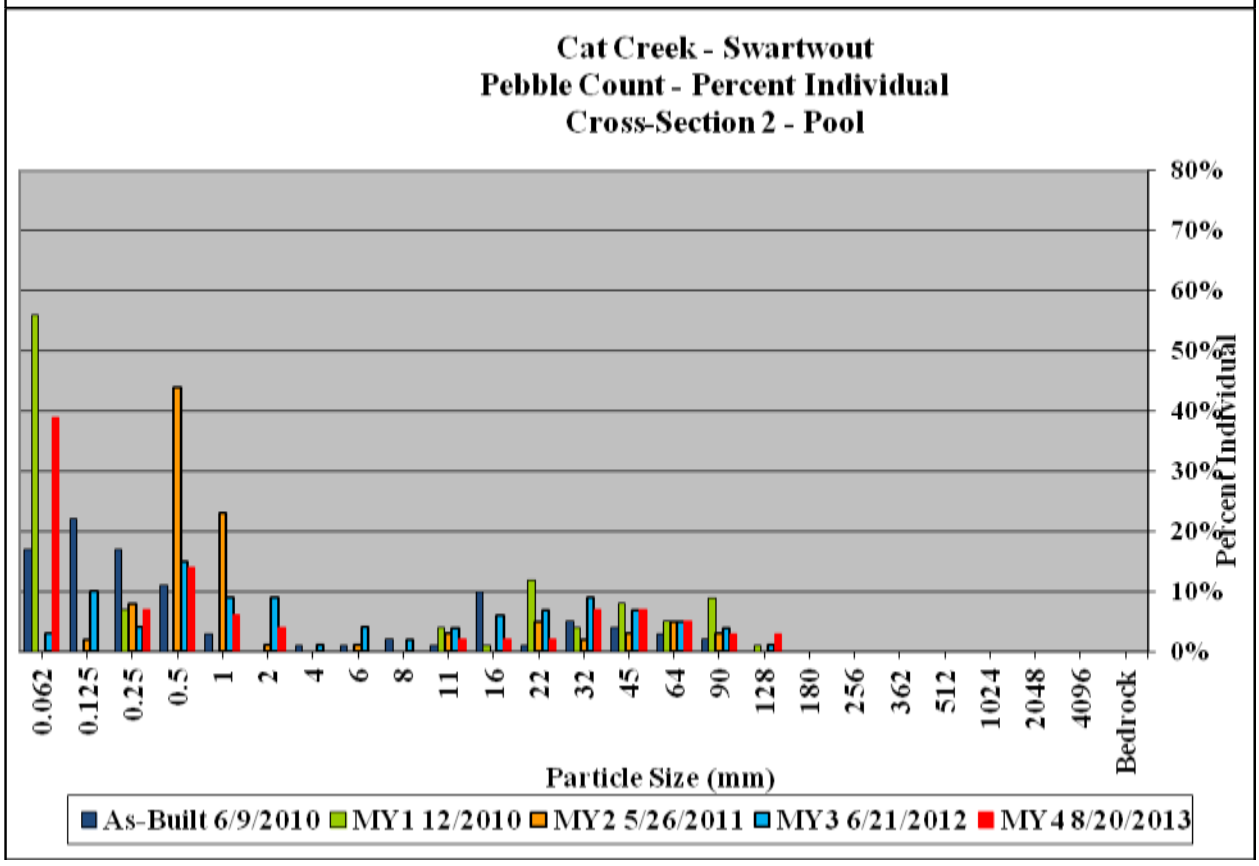

Cat Creek - Swartwout
Pebble Count - Percent Cumulative
Cross-Section 1 - Riffle
Cumulative Percent Finer Than
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013


Cat Creek - Swartwout
Pebble Count - Percent Individual
Cross-Section 1 - Riffle
Percent Individual
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Swartwout - Cross-Section 2 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	39	39.0%	39%
Sand	very fine sand	0.125	0	0.0%	39%
	fine sand	0.25	7	7.0%	46%
	medium sand	0.50	14	14.0%	60%
	coarse sand	1.00	6	6.0%	66%
	very coarse sand	2.00	4	4.0%	70%
Gravel	very fine gravel	4.0	0	0.0%	70%
	fine gravel	5.7	0	0.0%	70%
	fine gravel	8.0	0	0.0%	70%
	medium gravel	11.3	2	2.0%	72%
	medium gravel	16.0	2	2.0%	74%
	coarse gravel	22.3	2	2.0%	76%
	coarse gravel	32	7	6.9%	83%
	very coarse gravel	45	7	6.9%	90%
	very coarse gravel	64	5	5.0%	95%
Cobble	small cobble	90	3	3.0%	98%
	medium cobble	128	3	3.0%	101%
	large cobble	180	0	0.0%	101%
	very large cobble	256	0	0.0%	101%
Boulder	small boulder	362	0	0.0%	101%
	small boulder	512	0	0.0%	101%
	medium boulder	1024	0	0.0%	101%
	large boulder	2048	0	0.0%	101%
	very large boulder	4096	0	0.0%	101%
Bedrock	bedrock	>4096	0	0.0%	101%
TOTALS			101	101%	101%

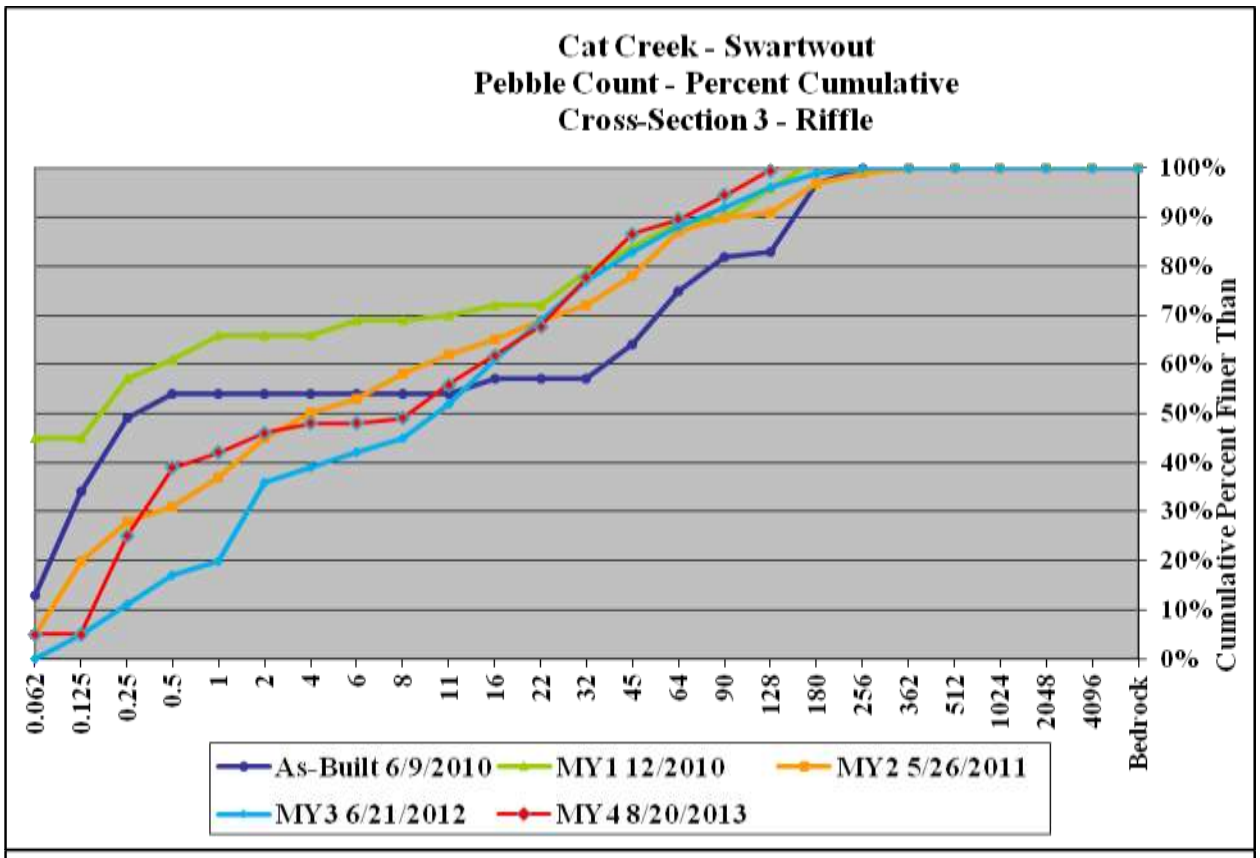
Summary Data	
D50	0.062
D84	35
D95	71

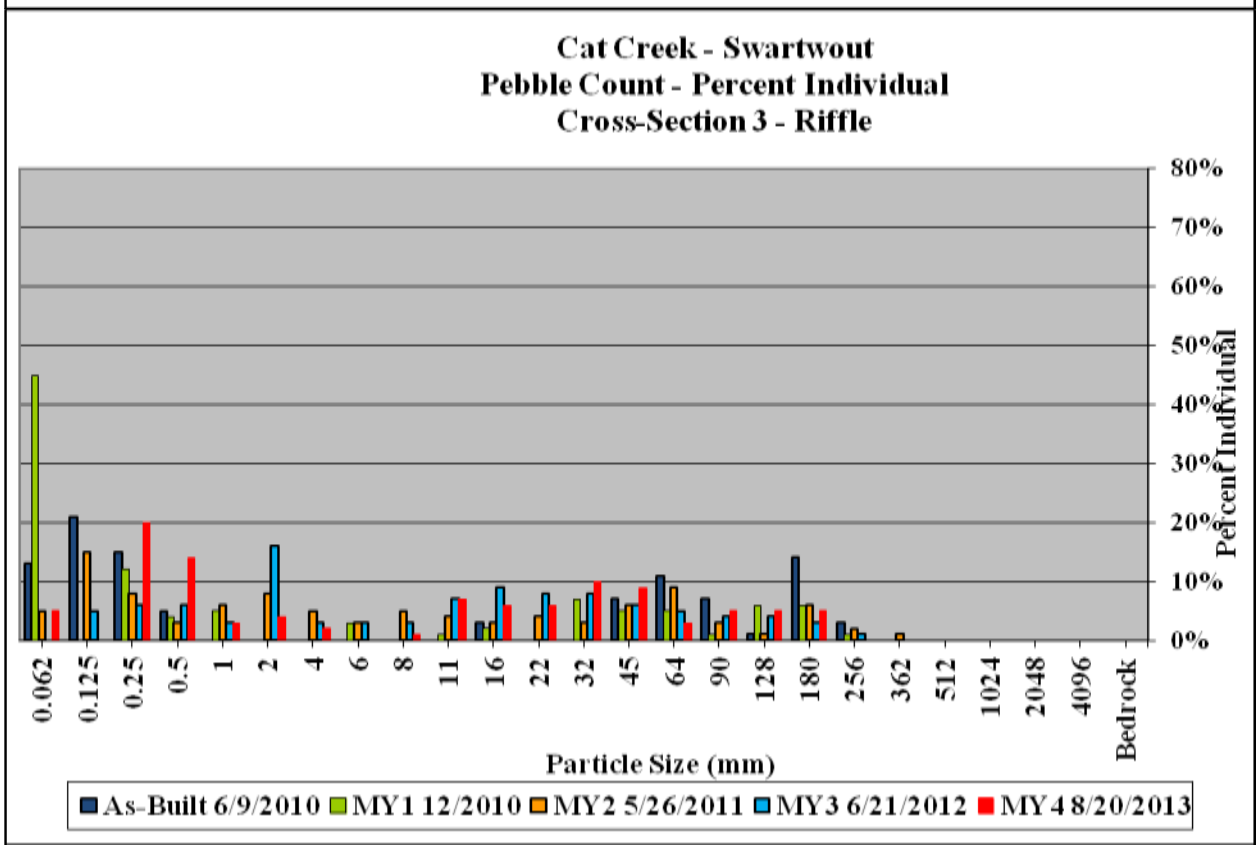

Cat Creek - Swartwout
Pebble Count - Percent Cumulative
Cross-Section 2 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013


Cat Creek - Swartwout
Pebble Count - Percent Individual
Cross-Section 2 - Pool
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Swartwout - Cross-Section 3 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	5	5.0%	5%
Sand	very fine sand	0.125	0	0.0%	5%
	fine sand	0.25	20	20.0%	25%
	medium sand	0.50	14	14.0%	39%
	coarse sand	1.00	3	3.0%	42%
	very coarse sand	2.00	4	4.0%	46%
Gravel	very fine gravel	4.0	2	2.0%	48%
	fine gravel	5.7	0	0.0%	48%
	fine gravel	8.0	1	1.0%	49%
	medium gravel	11.3	7	6.9%	56%
	medium gravel	16.0	6	5.9%	62%
	coarse gravel	22.3	6	5.9%	68%
	coarse gravel	32	10	9.9%	78%
	very coarse gravel	45	9	8.9%	87%
	very coarse gravel	64	3	3.0%	90%
Cobble	small cobble	90	5	5.0%	95%
	medium cobble	128	5	5.0%	99%
	large cobble	180	5	5.0%	104%
	very large cobble	256	0	0.0%	104%
Boulder	small boulder	362	0	0.0%	104%
	small boulder	512	0	0.0%	104%
	medium boulder	1024	0	0.0%	104%
	large boulder	2048	0	0.0%	104%
	very large boulder	4096	0	0.0%	104%
Bedrock	bedrock	>4096	0	0.0%	104%
TOTALS			105	105%	104%

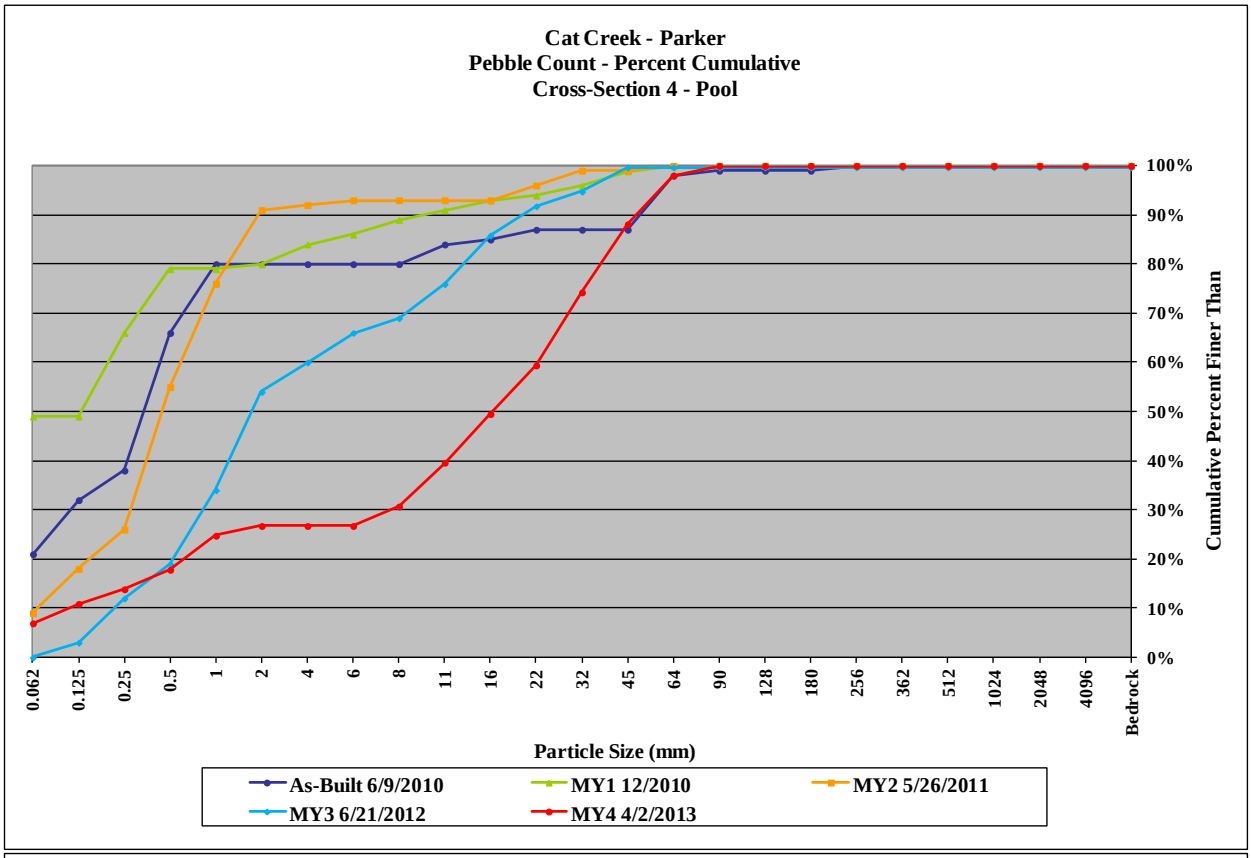
Summary Data	
D50	8.7
D84	56
D95	130

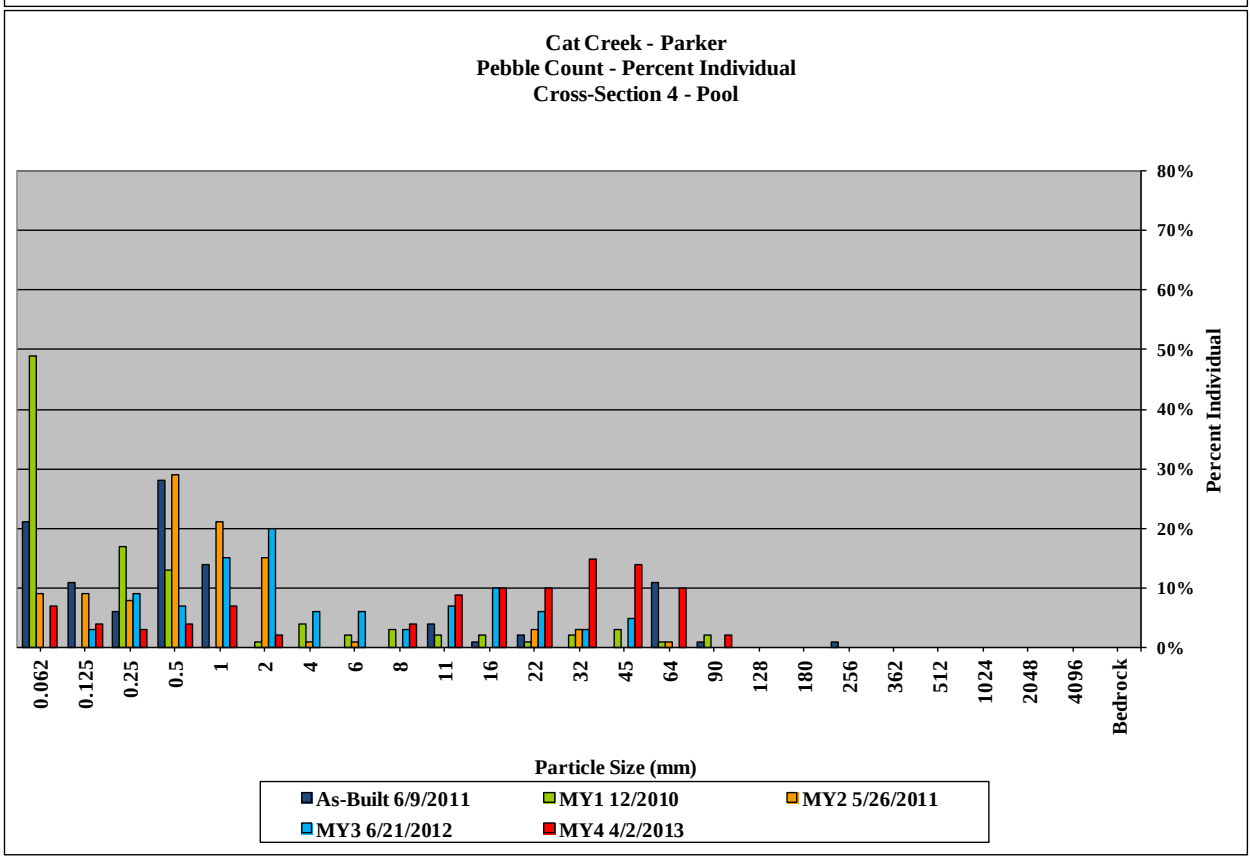

Cat Creek - Swartwout
Pebble Count - Percent Cumulative
Cross-Section 3 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013


Cat Creek - Swartwout
Pebble Count - Percent Individual
Cross-Section 3 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 4 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	7	7%	7%
Sand	very fine sand	0.125	4	4%	11%
	fine sand	0.25	3	3%	14%
	medium sand	0.50	4	4%	18%
	coarse sand	1.00	7	7%	25%
	very coarse sand	2.00	2	2%	27%
Gravel	very fine gravel	4.0	0	0%	27%
	fine gravel	5.7	0	0%	27%
	fine gravel	8.0	4	4%	31%
	medium gravel	11.3	9	9%	40%
	medium gravel	16.0	10	10%	50%
	coarse gravel	22.3	10	10%	59%
	coarse gravel	32	15	15%	74%
	very coarse gravel	45	14	14%	88%
	very coarse gravel	64	10	10%	98%
Cobble	small cobble	90	2	2%	100%
	medium cobble	128	0	0%	100%
	large cobble	180	0	0%	100%
	very large cobble	256	0	0%	100%
Boulder	small boulder	362	0	0%	100%
	small boulder	512	0	0%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			101	100%	100%

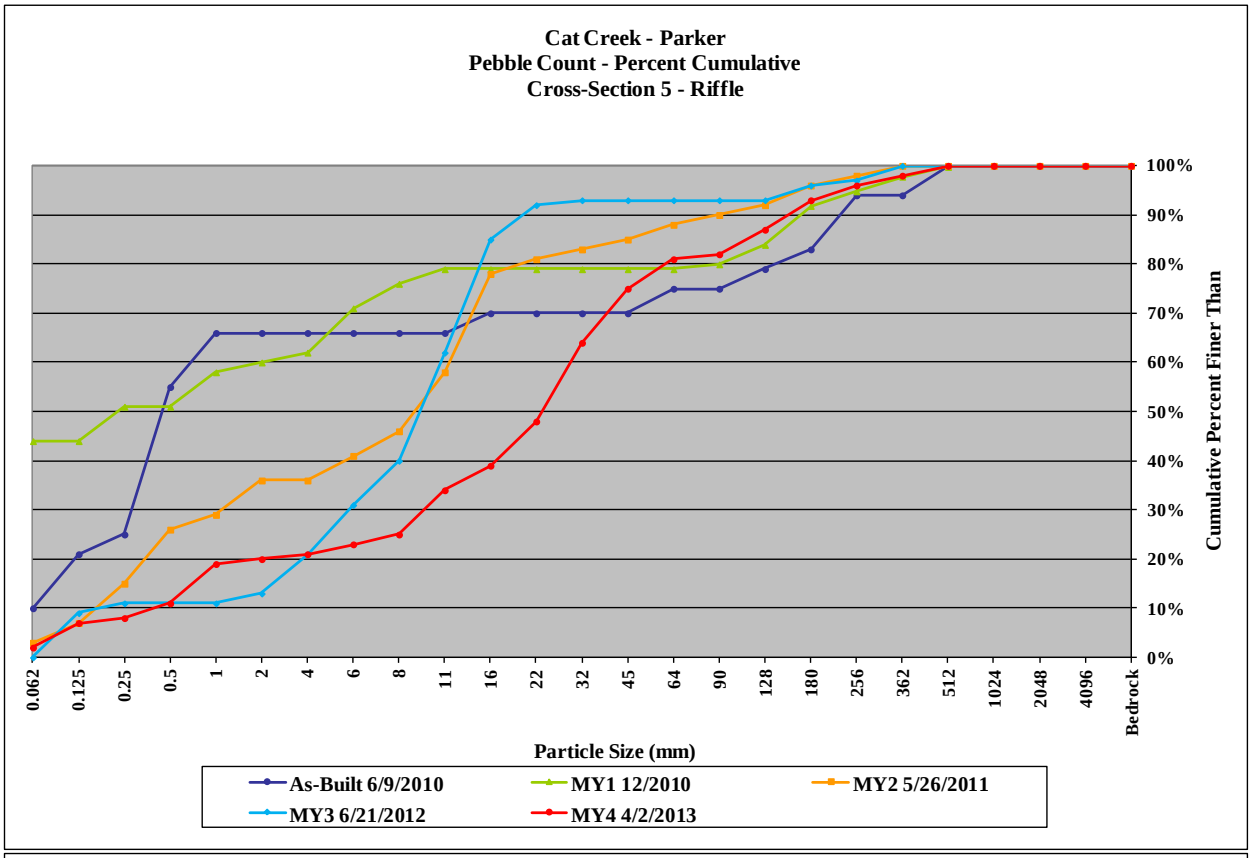
Summary Data	
D50	16
D84	41
D95	57

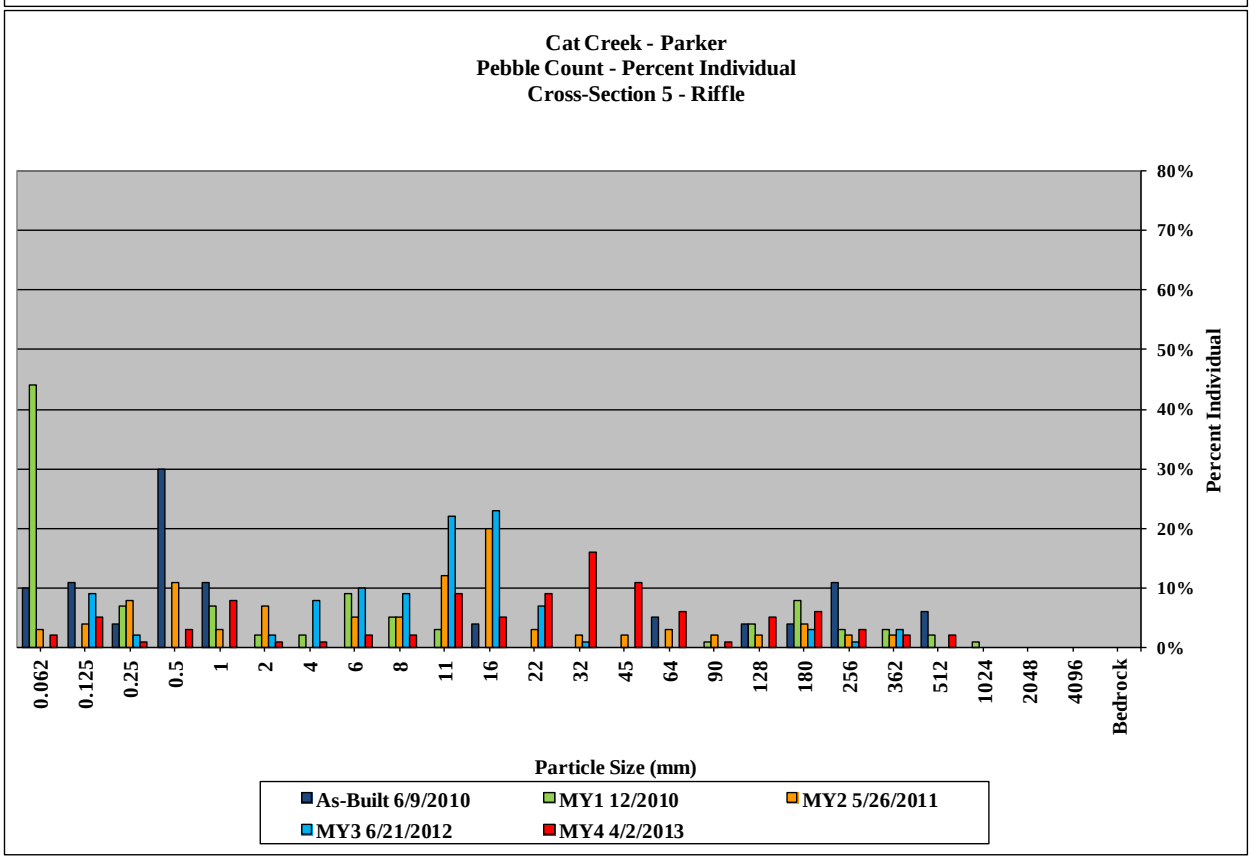

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 4 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 4 - Pool
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2011
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 5 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	2	2%	2%
Sand	very fine sand	0.125	5	5%	7%
	fine sand	0.25	1	1%	8%
	medium sand	0.50	3	3%	11%
	coarse sand	1.00	8	8%	19%
	very coarse sand	2.00	1	1%	20%
Gravel	very fine gravel	4.0	1	1%	21%
	fine gravel	5.7	2	2%	23%
	fine gravel	8.0	2	2%	25%
	medium gravel	11.3	9	9%	34%
	medium gravel	16.0	5	5%	39%
	coarse gravel	22.3	9	9%	48%
	coarse gravel	32	16	16%	64%
	very coarse gravel	45	11	11%	75%
	very coarse gravel	64	6	6%	81%
Cobble	small cobble	90	1	1%	82%
	medium cobble	128	5	5%	87%
	large cobble	180	6	6%	93%
	very large cobble	256	3	3%	96%
Boulder	small boulder	362	2	2%	98%
	small boulder	512	2	2%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

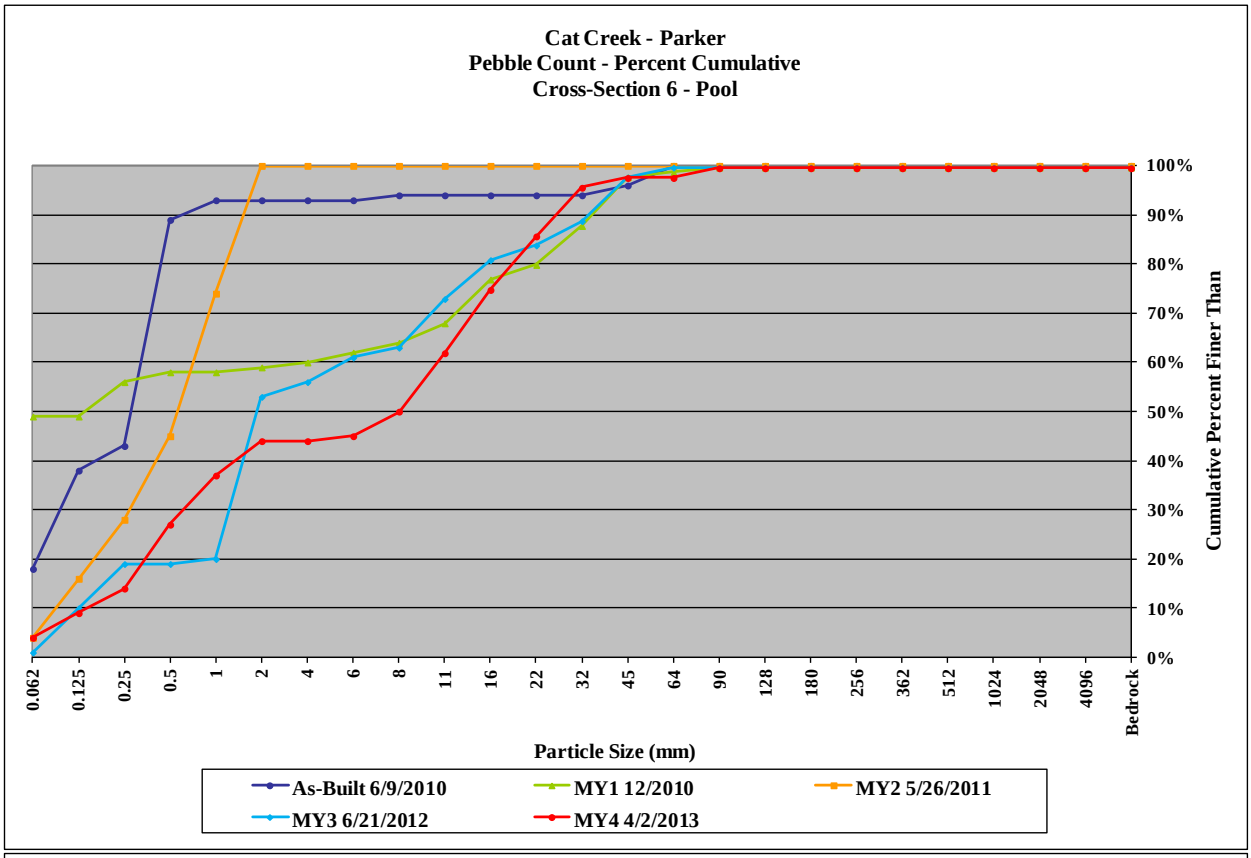
Summary Data	
D50	23
D84	100
D95	230

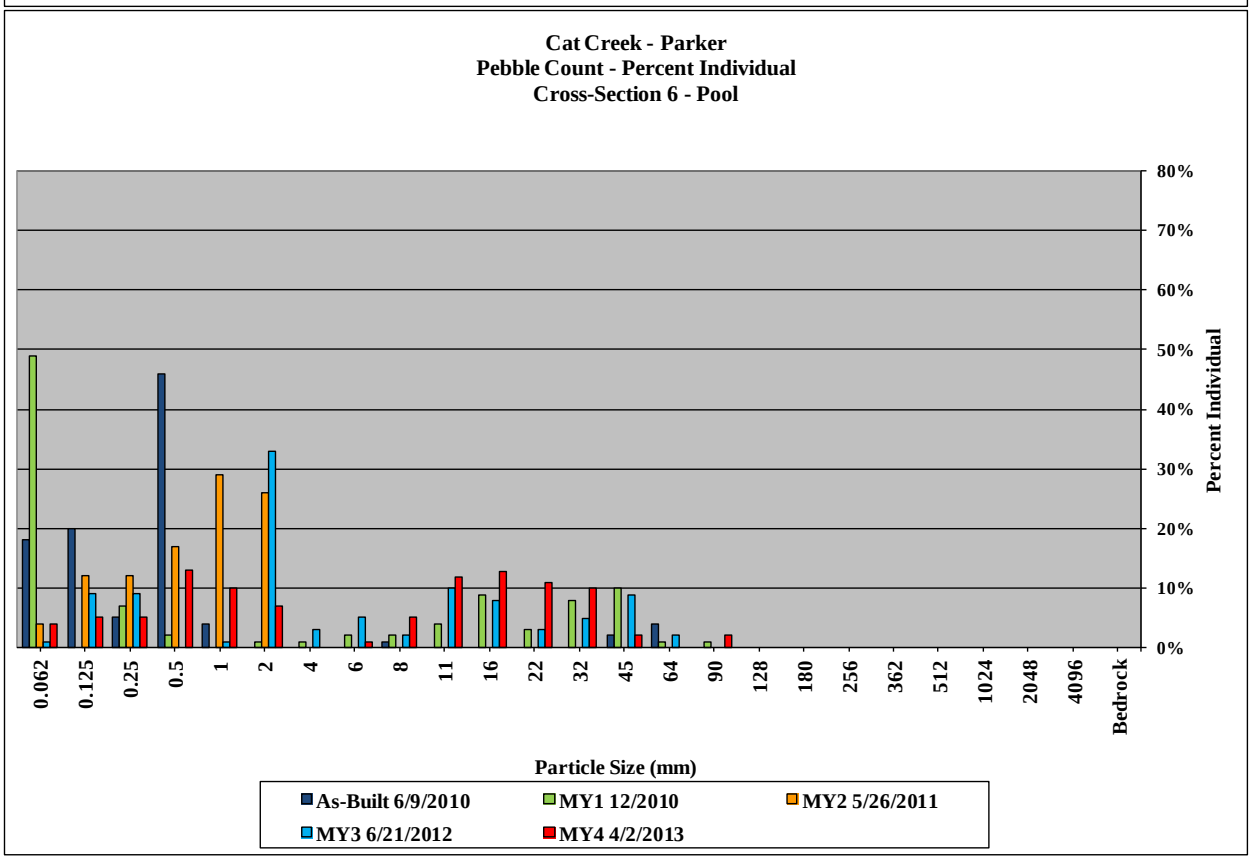

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 5 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 5 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 6 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	4	4%	4%
Sand	very fine sand	0.125	5	5%	9%
	fine sand	0.25	5	5%	14%
	medium sand	0.50	13	13%	27%
	coarse sand	1.00	10	10%	37%
	very coarse sand	2.00	7	7%	44%
Gravel	very fine gravel	4.0	0	0%	44%
	fine gravel	5.7	1	1%	45%
	fine gravel	8.0	5	5%	50%
	medium gravel	11.3	12	12%	62%
	medium gravel	16.0	13	13%	75%
	coarse gravel	22.3	11	11%	86%
	coarse gravel	32	10	10%	96%
	very coarse gravel	45	2	2%	98%
	very coarse gravel	64	0	0%	98%
Cobble	small cobble	90	2	2%	100%
	medium cobble	128	0	0%	100%
	large cobble	180	0	0%	100%
	very large cobble	256	0	0%	100%
Boulder	small boulder	362	0	0%	100%
	small boulder	512	0	0%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

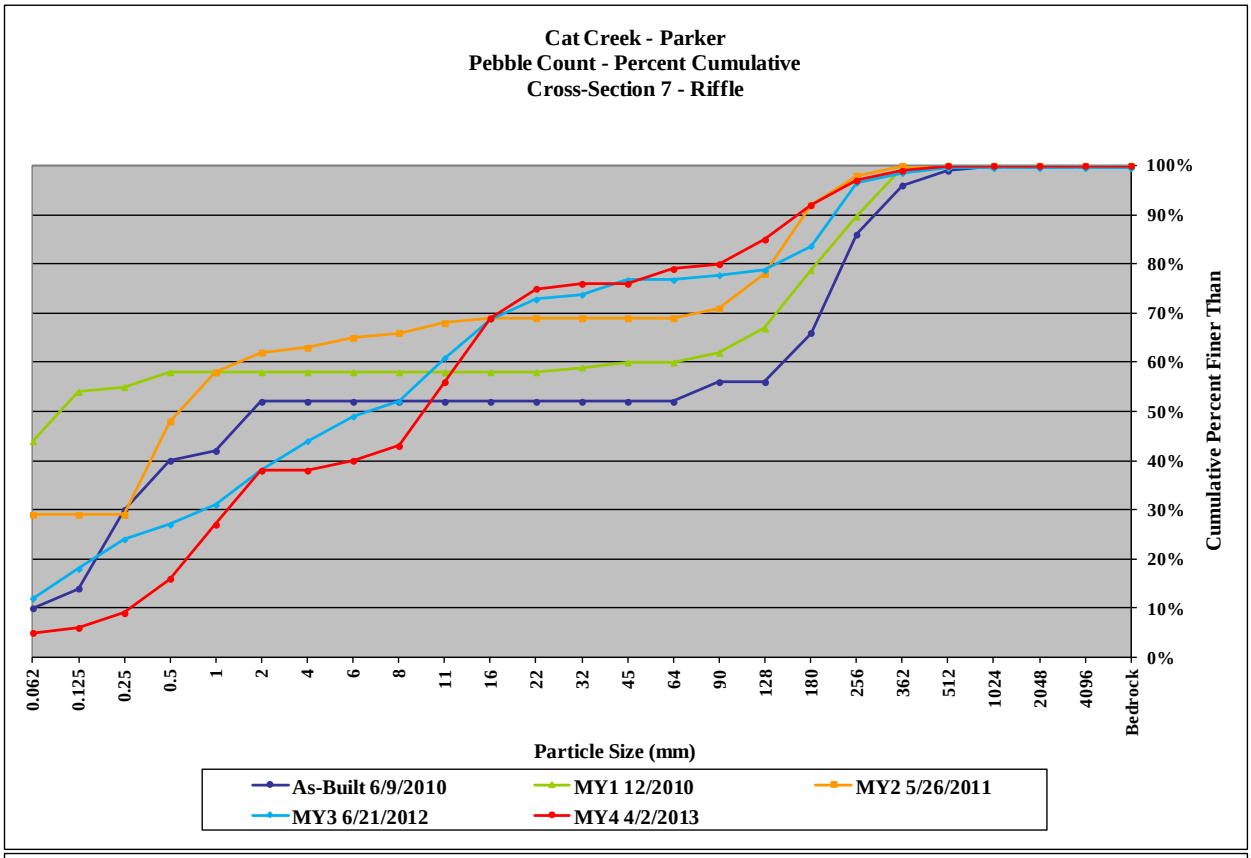
Summary Data	
D50	8
D84	21
D95	31

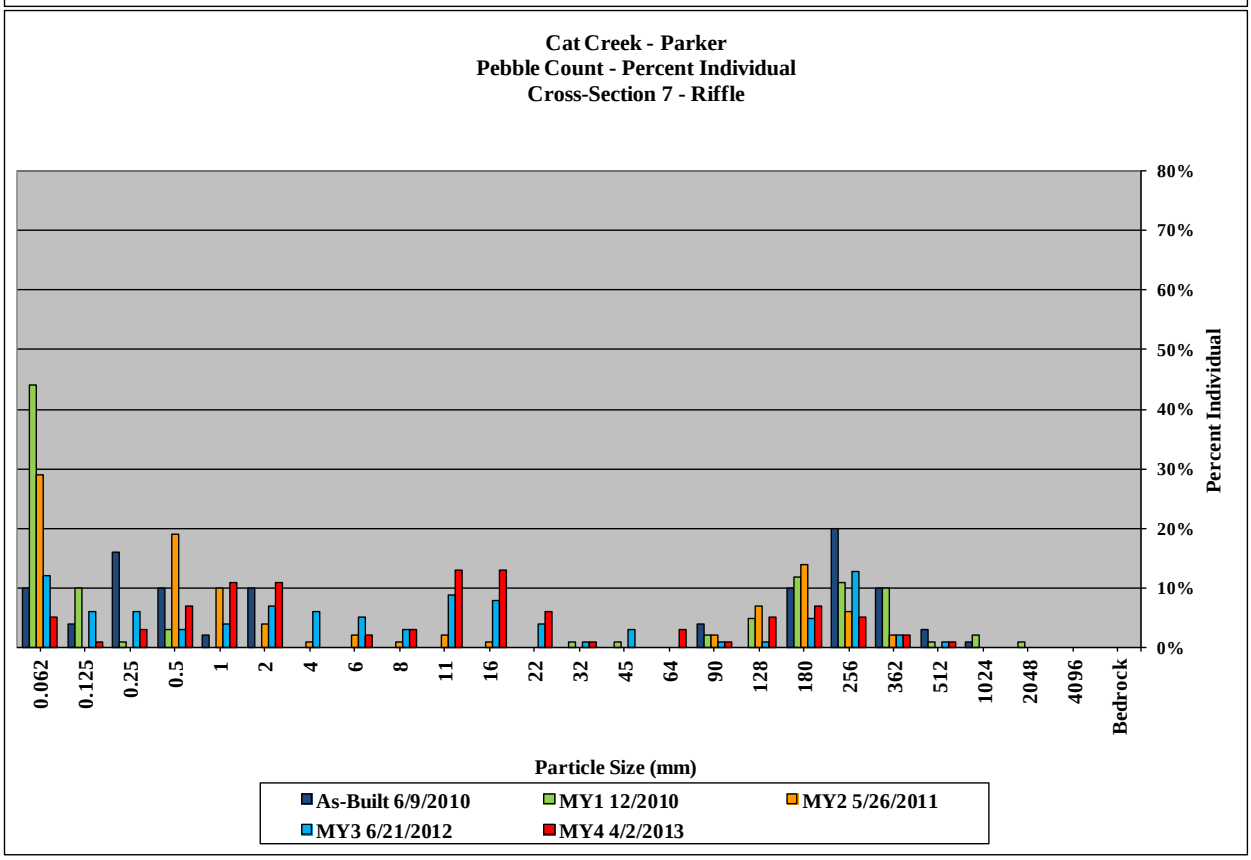

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 6 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 6 - Pool
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 7 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	5	5%	5%
Sand	very fine sand	0.125	1	1%	6%
	fine sand	0.25	3	3%	9%
	medium sand	0.50	7	7%	16%
	coarse sand	1.00	11	11%	27%
	very coarse sand	2.00	11	11%	38%
Gravel	very fine gravel	4.0	0	0%	38%
	fine gravel	5.7	2	2%	40%
	fine gravel	8.0	3	3%	43%
	medium gravel	11.3	13	13%	56%
	medium gravel	16.0	13	13%	69%
	coarse gravel	22.3	6	6%	75%
	coarse gravel	32	1	1%	76%
	very coarse gravel	45	0	0%	76%
	very coarse gravel	64	3	3%	79%
Cobble	small cobble	90	1	1%	80%
	medium cobble	128	5	5%	85%
	large cobble	180	7	7%	92%
	very large cobble	256	5	5%	97%
Boulder	small boulder	362	2	2%	99%
	small boulder	512	1	1%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

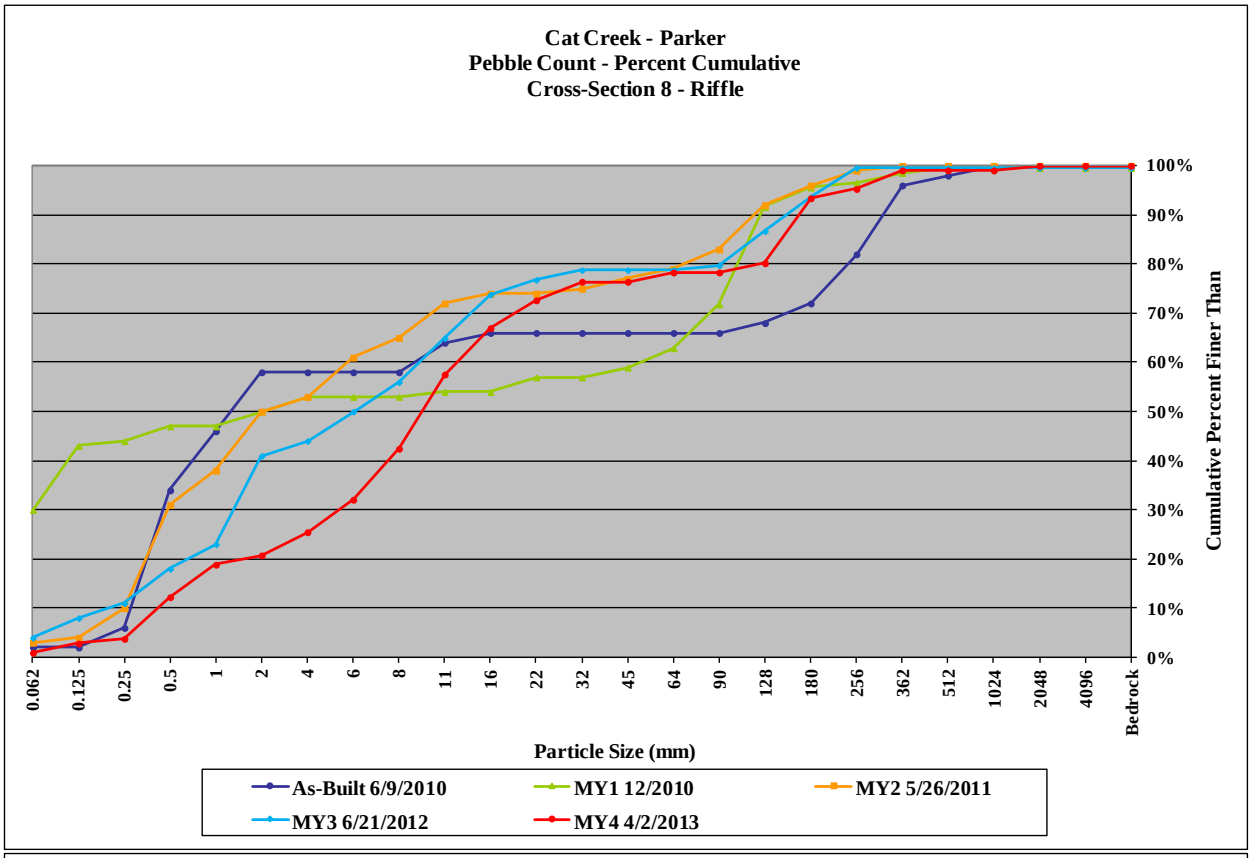
Summary Data	
D50	9.5
D84	120
D95	220

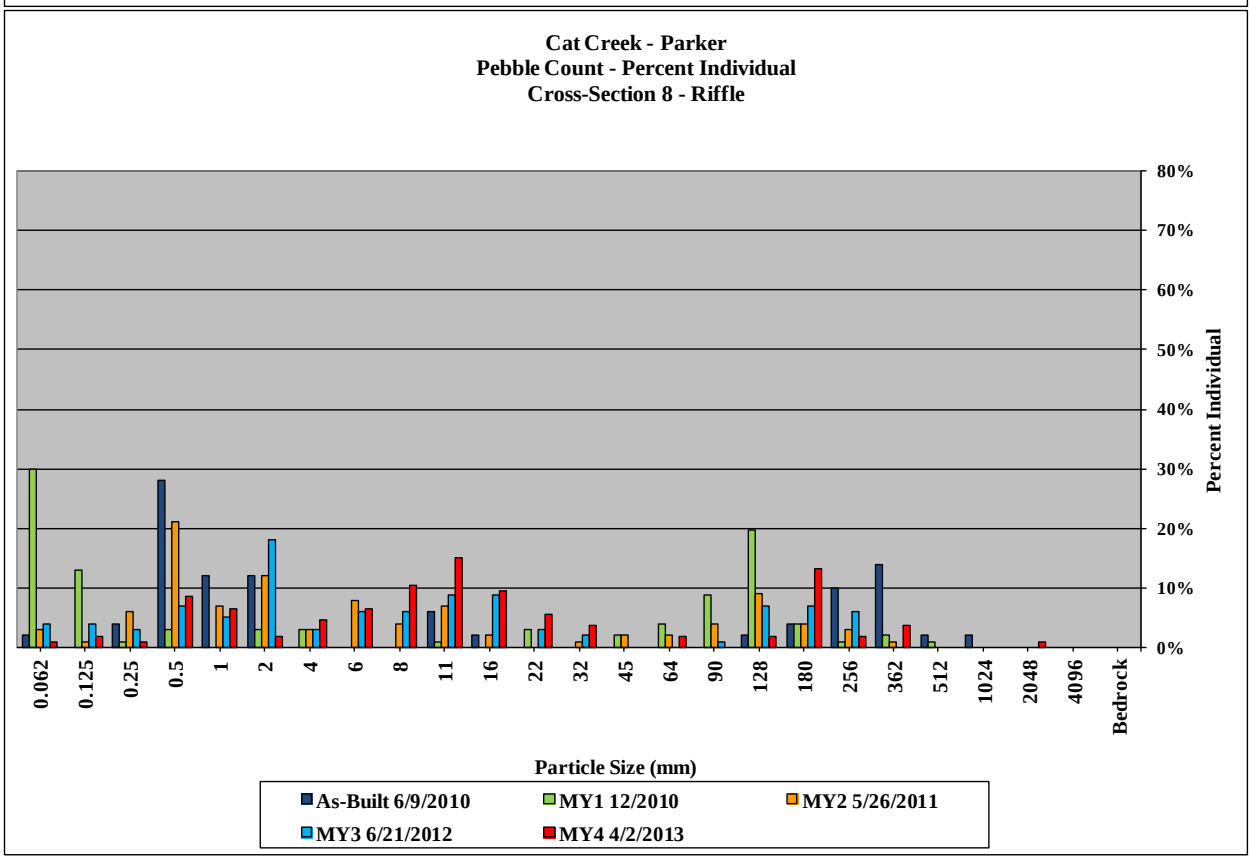

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 7 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 7 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 8 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	1	1%	1%
Sand	very fine sand	0.125	2	2%	3%
	fine sand	0.25	1	1%	4%
	medium sand	0.50	9	8%	12%
	coarse sand	1.00	7	7%	19%
	very coarse sand	2.00	2	2%	21%
Gravel	very fine gravel	4.0	5	5%	25%
	fine gravel	5.7	7	7%	32%
	fine gravel	8.0	11	10%	42%
	medium gravel	11.3	16	15%	58%
	medium gravel	16.0	10	9%	67%
	coarse gravel	22.3	6	6%	73%
	coarse gravel	32	4	4%	76%
	very coarse gravel	45	0	0%	76%
	very coarse gravel	64	2	2%	78%
Cobble	small cobble	90	0	0%	78%
	medium cobble	128	2	2%	80%
	large cobble	180	14	13%	93%
	very large cobble	256	2	2%	95%
Boulder	small boulder	362	4	4%	99%
	small boulder	512	0	0%	99%
	medium boulder	1024	0	0%	99%
	large boulder	2048	1	1%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			106	100%	100%

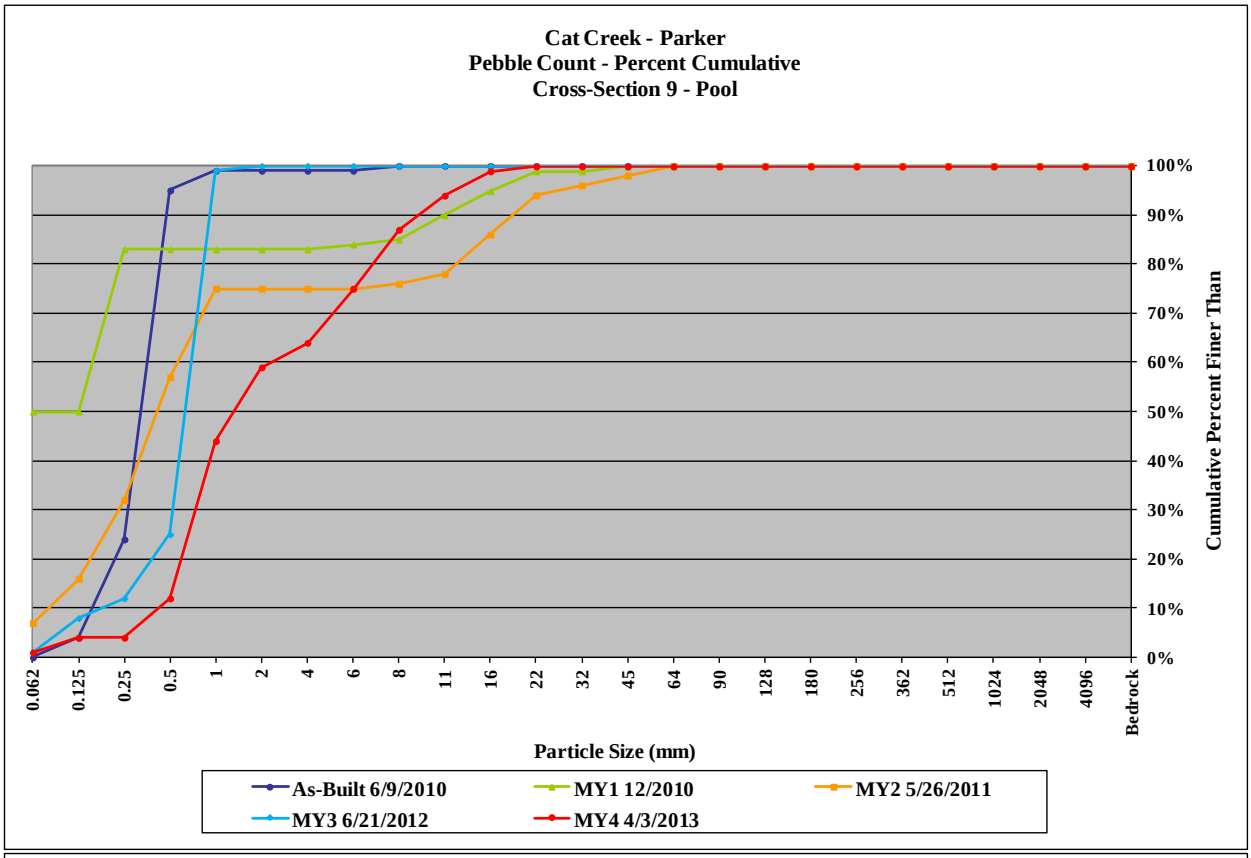
Summary Data	
D50	9.4
D84	140
D95	240

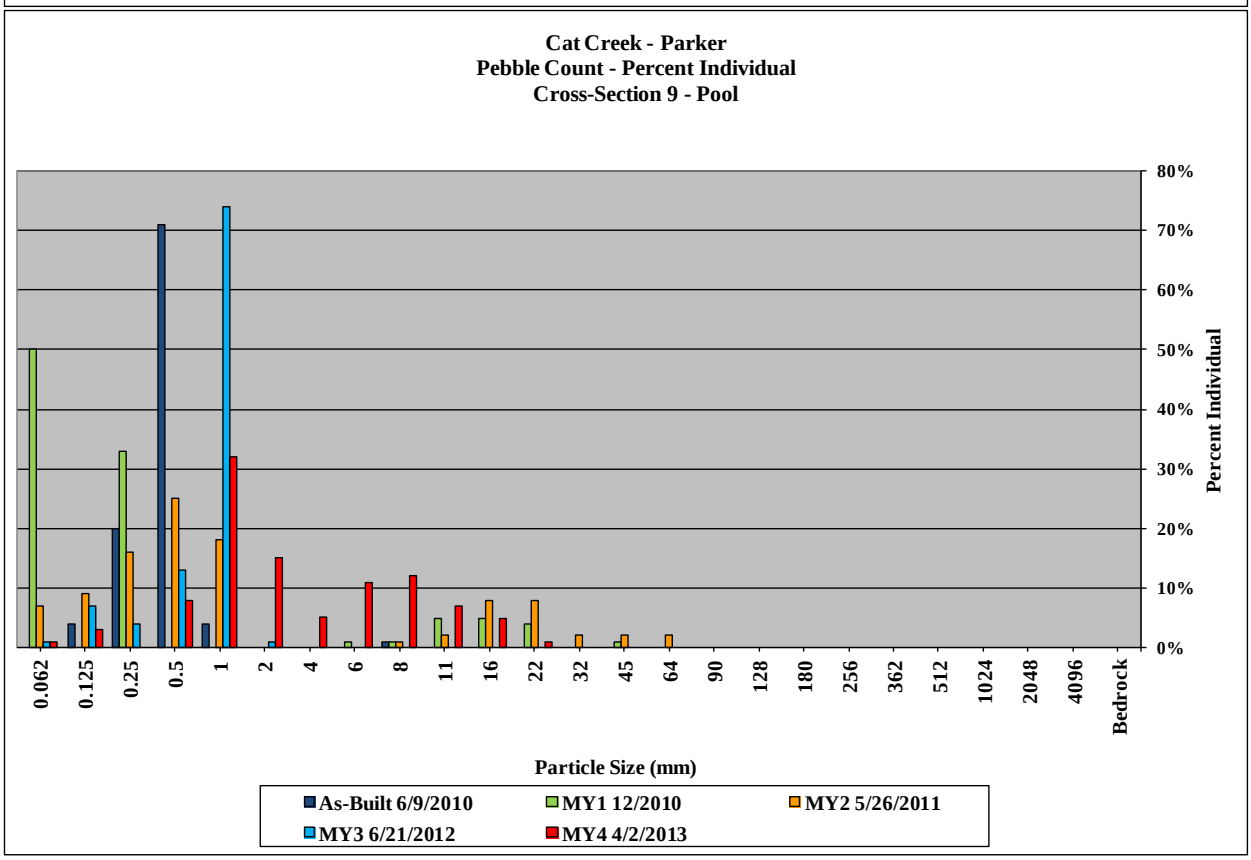

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 8 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 8 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 9 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	1	1%	1%
Sand	very fine sand	0.125	3	3%	4%
	fine sand	0.25	0	0%	4%
	medium sand	0.50	8	8%	12%
	coarse sand	1.00	32	32%	44%
	very coarse sand	2.00	15	15%	59%
Gravel	very fine gravel	4.0	5	5%	64%
	fine gravel	5.7	11	11%	75%
	fine gravel	8.0	12	12%	87%
	medium gravel	11.3	7	7%	94%
	medium gravel	16.0	5	5%	99%
	coarse gravel	22.3	1	1%	100%
	coarse gravel	32	0	0%	100%
	very coarse gravel	45	0	0%	100%
	very coarse gravel	64	0	0%	100%
Cobble	small cobble	90	0	0%	100%
	medium cobble	128	0	0%	100%
	large cobble	180	0	0%	100%
	very large cobble	256	0	0%	100%
Boulder	small boulder	362	0	0%	100%
	small boulder	512	0	0%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

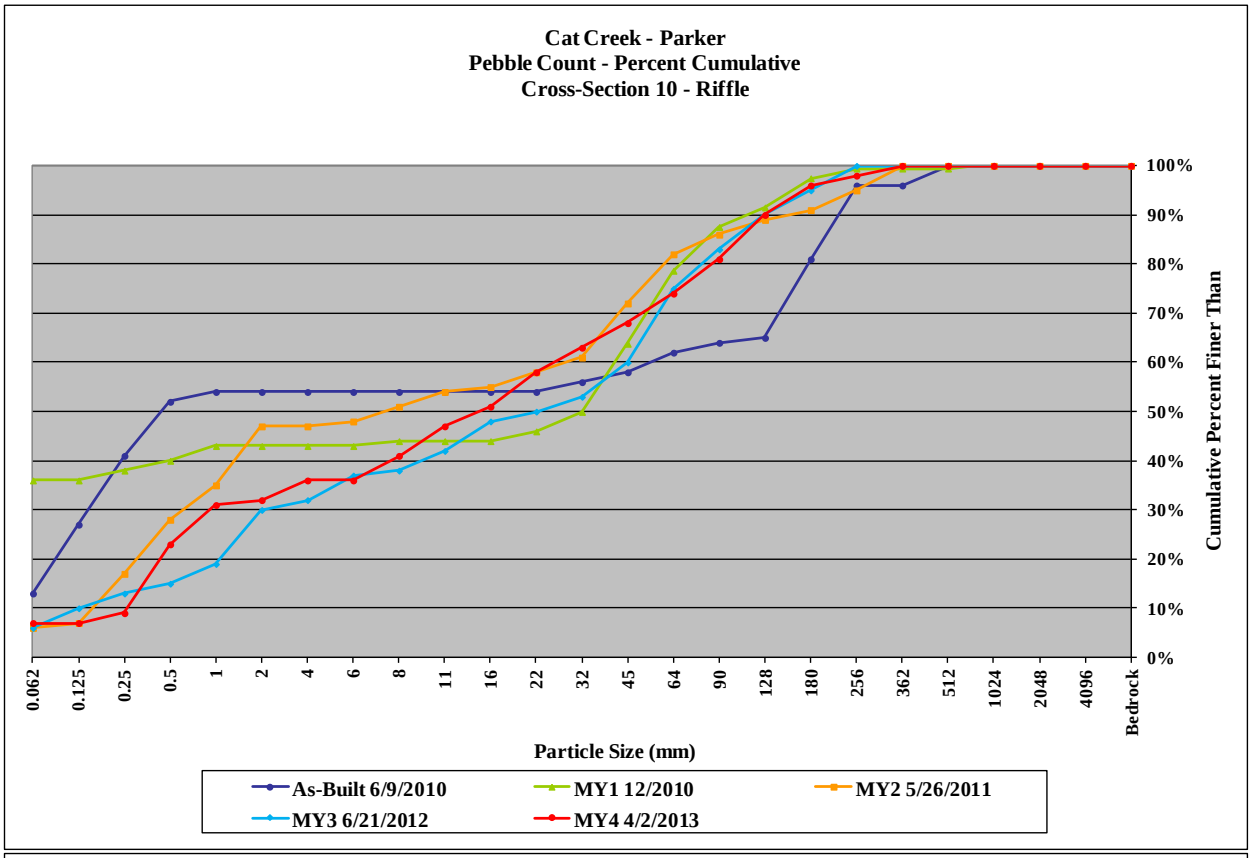
Summary Data	
D50	1.3
D84	7.4
D95	12

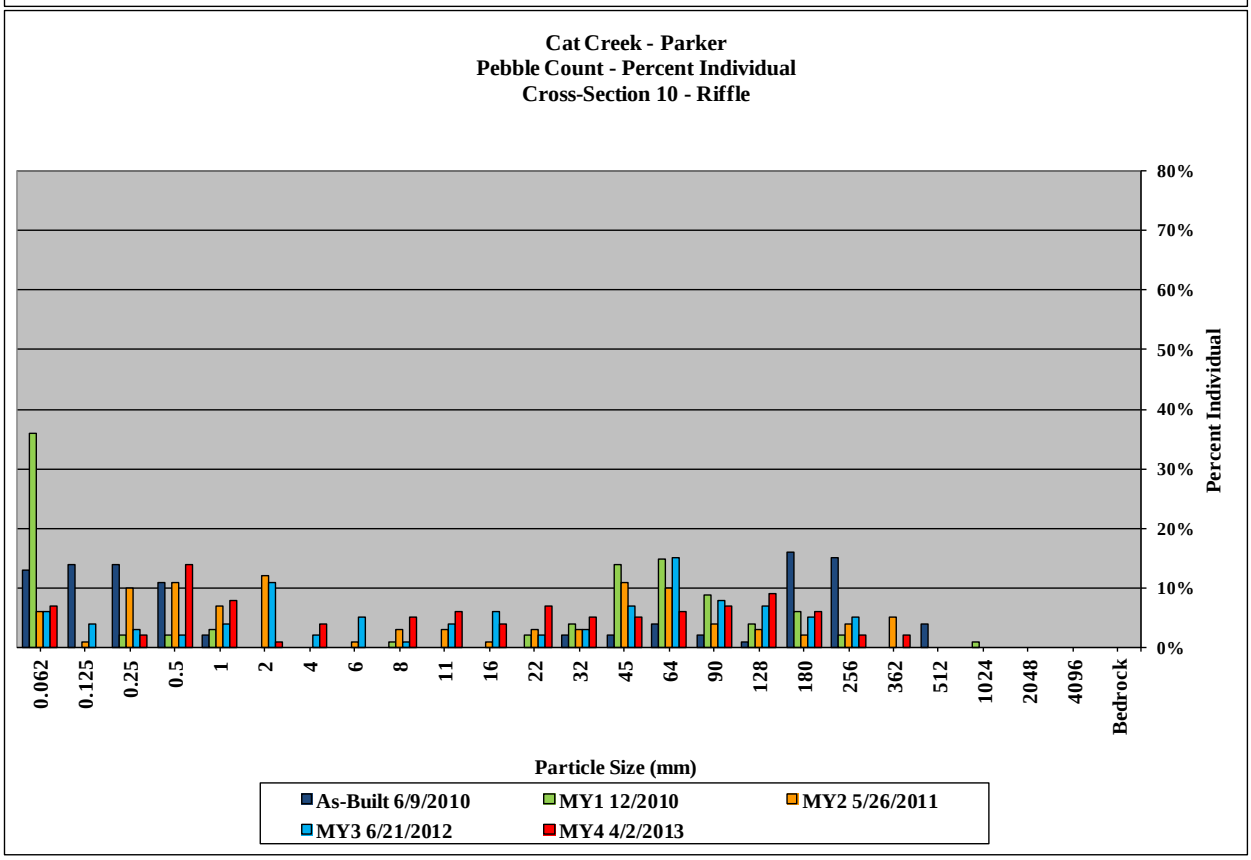

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 9 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/3/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 9 - Pool
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 10 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	7	7%	7%
Sand	very fine sand	0.125	0	0%	7%
	fine sand	0.25	2	2%	9%
	medium sand	0.50	14	14%	23%
	coarse sand	1.00	8	8%	31%
	very coarse sand	2.00	1	1%	32%
Gravel	very fine gravel	4.0	4	4%	36%
	fine gravel	5.7	0	0%	36%
	fine gravel	8.0	5	5%	41%
	medium gravel	11.3	6	6%	47%
	medium gravel	16.0	4	4%	51%
	coarse gravel	22.3	7	7%	58%
	coarse gravel	32	5	5%	63%
	very coarse gravel	45	5	5%	68%
	very coarse gravel	64	6	6%	74%
Cobble	small cobble	90	7	7%	81%
	medium cobble	128	9	9%	90%
	large cobble	180	6	6%	96%
	very large cobble	256	2	2%	98%
Boulder	small boulder	362	2	2%	100%
	small boulder	512	0	0%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

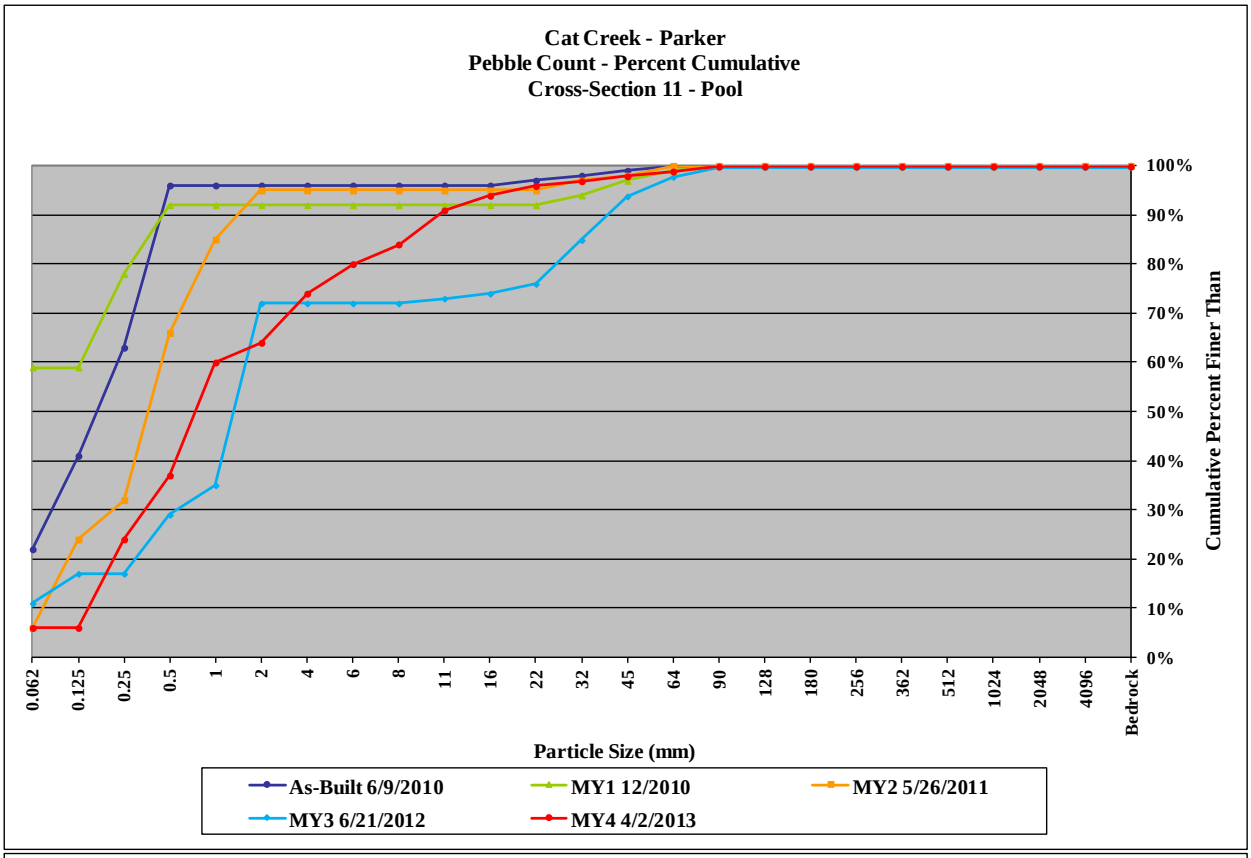
Summary Data	
D50	15
D84	100
D95	170

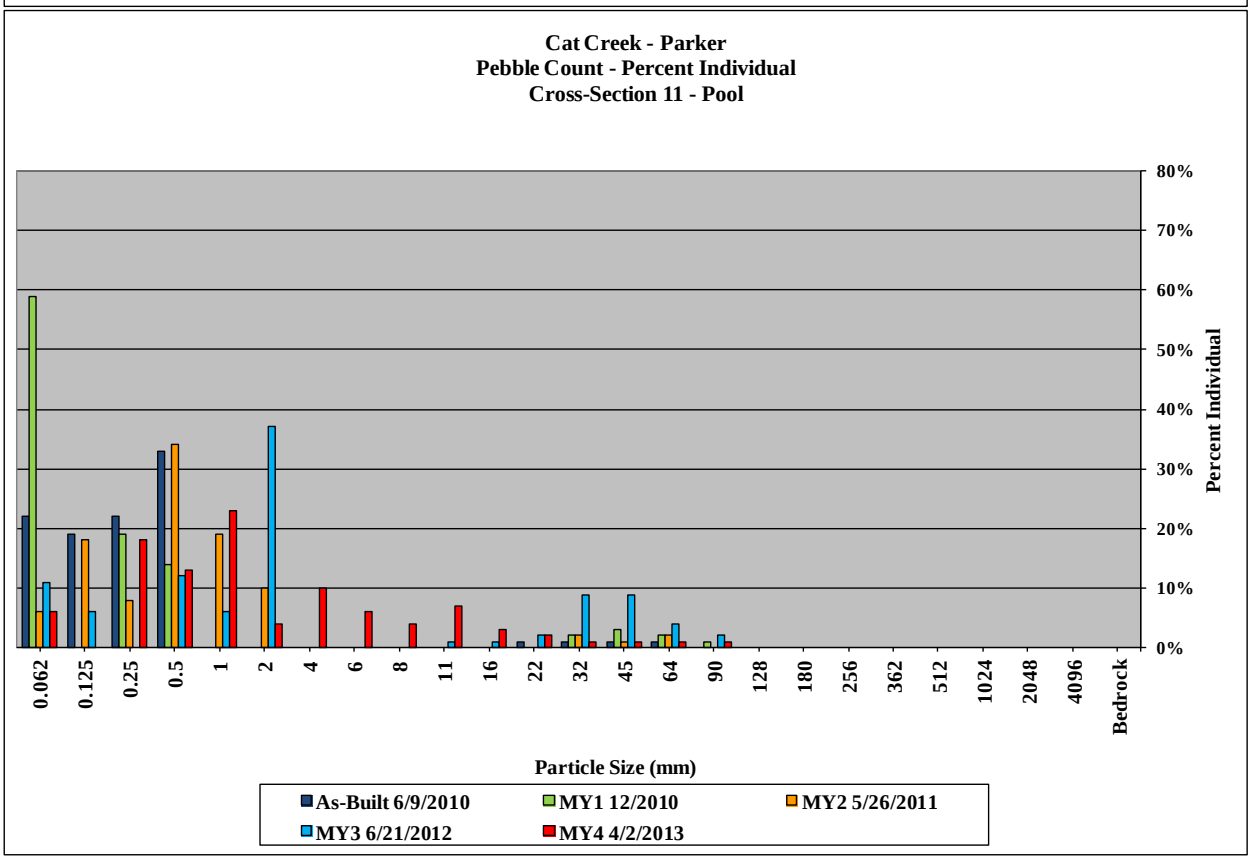

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 10 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 10 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 Cat Creek - Parker - Cross-Section 11 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	6	6%	6%
Sand	very fine sand	0.125	0	0%	6%
	fine sand	0.25	18	18%	24%
	medium sand	0.50	13	13%	37%
	coarse sand	1.00	23	23%	60%
	very coarse sand	2.00	4	4%	64%
Gravel	very fine gravel	4.0	10	10%	74%
	fine gravel	5.7	6	6%	80%
	fine gravel	8.0	4	4%	84%
	medium gravel	11.3	7	7%	91%
	medium gravel	16.0	3	3%	94%
	coarse gravel	22.3	2	2%	96%
	coarse gravel	32	1	1%	97%
	very coarse gravel	45	1	1%	98%
	very coarse gravel	64	1	1%	99%
Cobble	small cobble	90	1	1%	100%
	medium cobble	128	0	0%	100%
	large cobble	180	0	0%	100%
	very large cobble	256	0	0%	100%
Boulder	small boulder	362	0	0%	100%
	small boulder	512	0	0%	100%
	medium boulder	1024	0	0%	100%
	large boulder	2048	0	0%	100%
	very large boulder	4096	0	0%	100%
Bedrock	bedrock	>4096	0	0%	100%
TOTALS			100	100%	100%

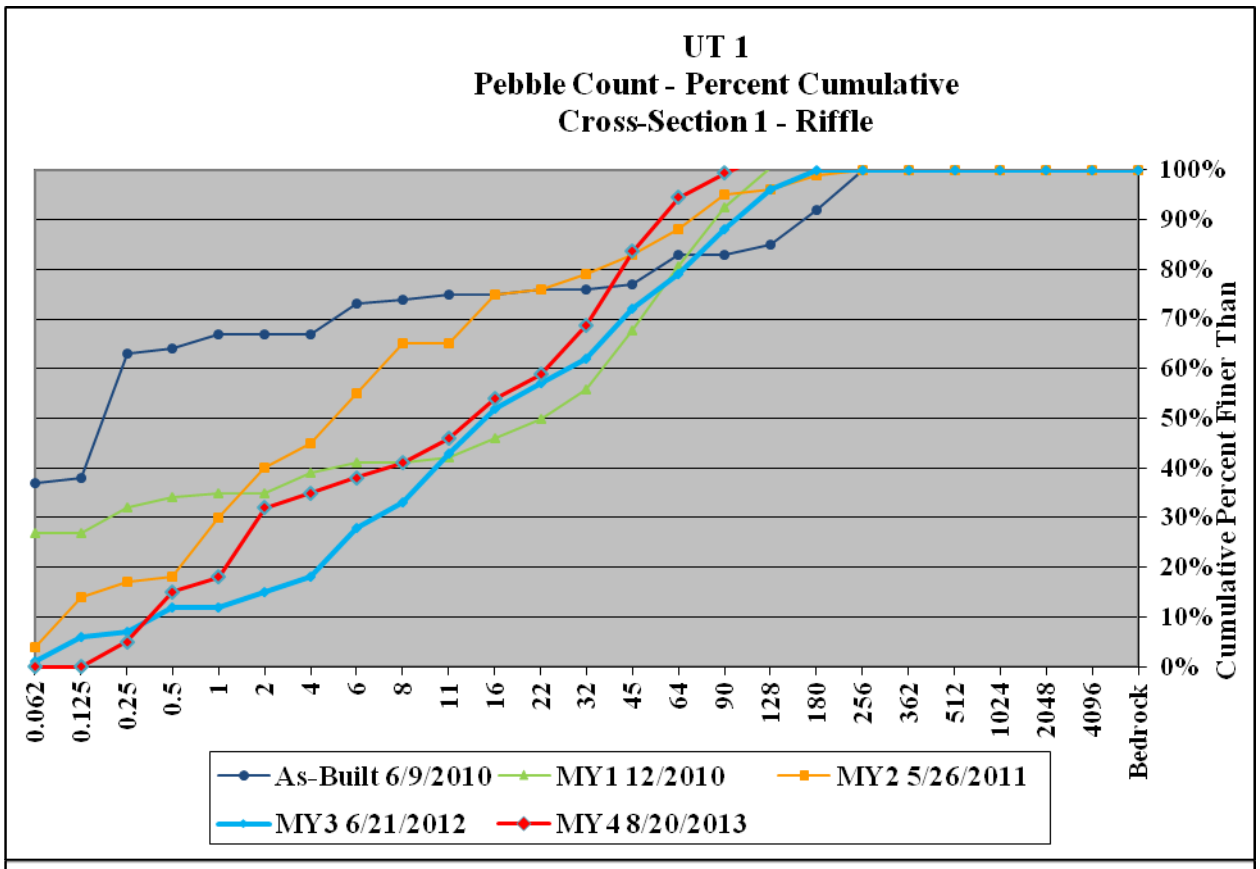
Summary Data	
D50	0.74
D84	8
D95	19

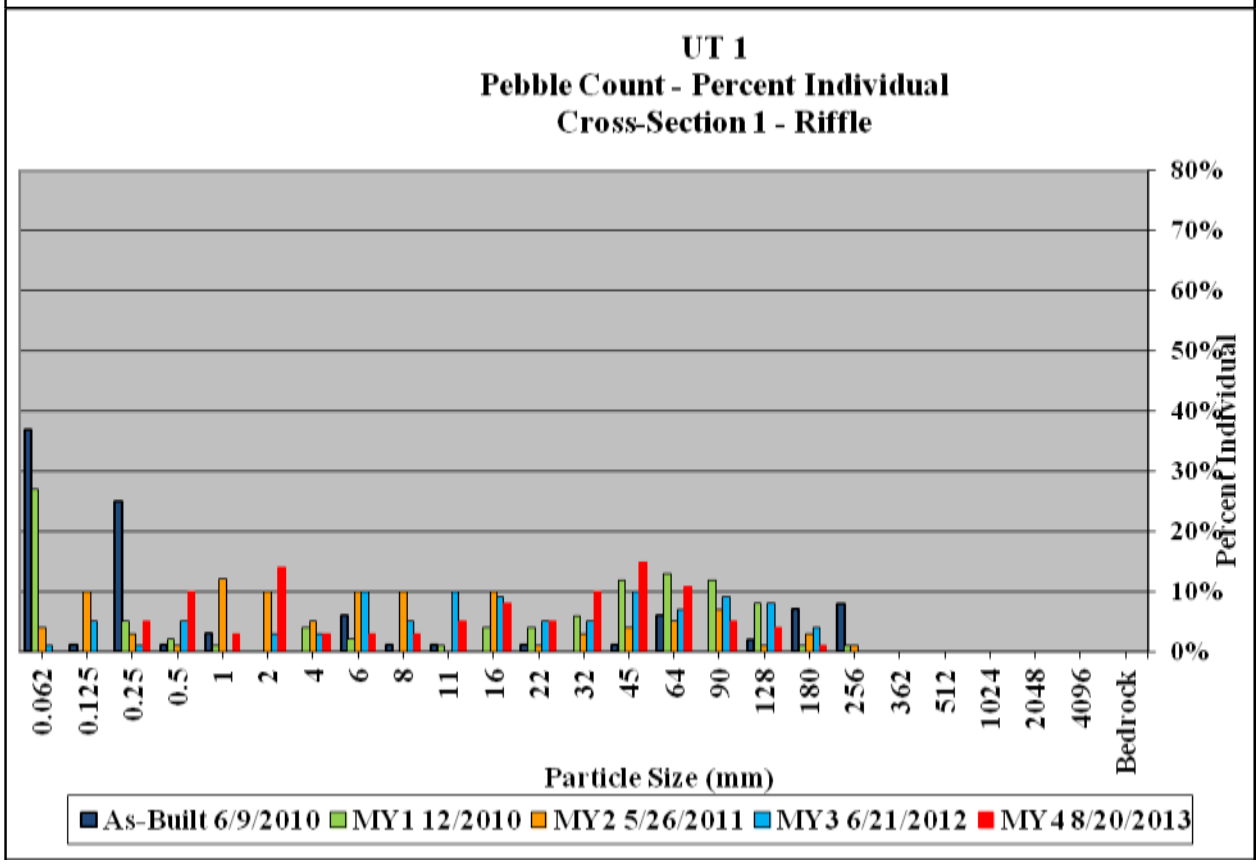

Cat Creek - Parker
Pebble Count - Percent Cumulative
Cross-Section 11 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013


Cat Creek - Parker
Pebble Count - Percent Individual
Cross-Section 11 - Pool
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 4/2/2013

Cat Creek Stream & Wetland / Project No. 71 UT 1 - Cross-Section 1 - Riffle Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	0	0.0%	0%
Sand	very fine sand	0.125	0	0.0%	0%
	fine sand	0.25	5	5.0%	5%
	medium sand	0.50	10	10.0%	15%
	coarse sand	1.00	3	3.0%	18%
	very coarse sand	2.00	14	14.0%	32%
Gravel	very fine gravel	4.0	3	3.0%	35%
	fine gravel	5.7	3	3.0%	38%
	fine gravel	8.0	3	3.0%	41%
	medium gravel	11.3	5	5.0%	46%
	medium gravel	16.0	8	7.9%	54%
	coarse gravel	22.3	5	5.0%	59%
	coarse gravel	32	10	9.9%	69%
	very coarse gravel	45	15	14.9%	84%
	very coarse gravel	64	11	10.9%	94%
Cobble	small cobble	90	5	5.0%	99%
	medium cobble	128	4	4.0%	103%
	large cobble	180	1	1.0%	104%
	very large cobble	256	0	0.0%	104%
Boulder	small boulder	362	0	0.0%	104%
	small boulder	512	0	0.0%	104%
	medium boulder	1024	0	0.0%	104%
	large boulder	2048	0	0.0%	104%
	very large boulder	4096	0	0.0%	104%
Bedrock	bedrock	>4096	0	0.0%	104%
TOTALS			105	105%	104%

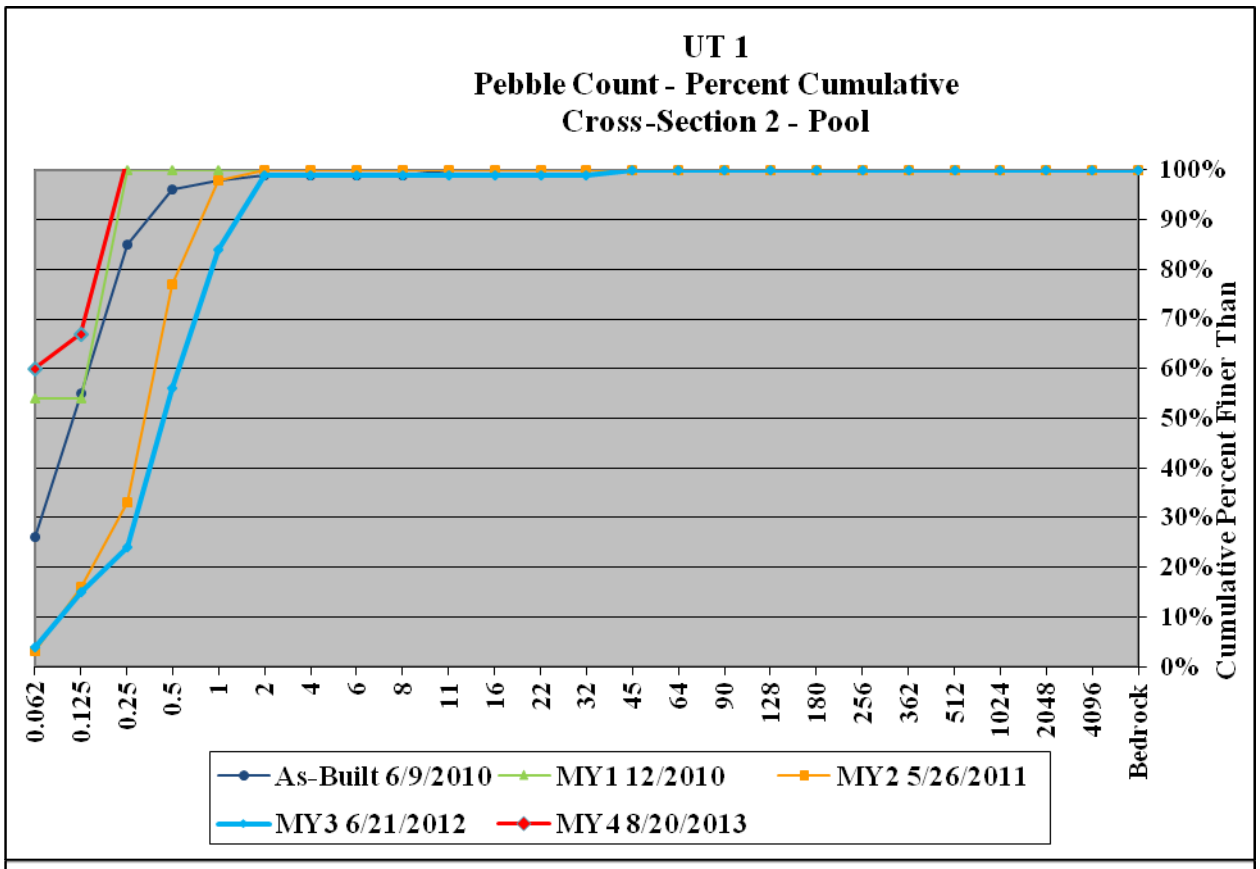
Summary Data	
D50	15
D84	51
D95	88


UT 1
Pebble Count - Percent Cumulative
Cross-Section 1 - Riffle
Cumulative Percent Finer Than
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013


UT 1
Pebble Count - Percent Individual
Cross-Section 1 - Riffle
Percent Individual
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

Cat Creek Stream & Wetland / Project No. 71 UT 1 - Cross-Section 2 - Pool Pebble Count Summary					
			Monitoring Year 4		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0.062	60	60.0%	60%
Sand	very fine sand	0.125	7	7.0%	67%
	fine sand	0.25	35	35.0%	102%
	medium sand	0.50	3	3.0%	105%
	coarse sand	1.00	0	0.0%	105%
	very coarse sand	2.00	0	0.0%	105%
Gravel	very fine gravel	4.0	0	0.0%	105%
	fine gravel	5.7	0	0.0%	105%
	fine gravel	8.0	0	0.0%	105%
	medium gravel	11.3	0	0.0%	105%
	medium gravel	16.0	0	0.0%	105%
	coarse gravel	22.3	0	0.0%	105%
	coarse gravel	32	0	0.0%	105%
	very coarse gravel	45	0	0.0%	105%
	very coarse gravel	64	0	0.0%	105%
Cobble	small cobble	90	0	0.0%	105%
	medium cobble	128	0	0.0%	105%
	large cobble	180	0	0.0%	105%
	very large cobble	256	0	0.0%	105%
Boulder	small boulder	362	0	0.0%	105%
	small boulder	512	0	0.0%	105%
	medium boulder	1024	0	0.0%	105%
	large boulder	2048	0	0.0%	105%
	very large boulder	4096	0	0.0%	105%
Bedrock	bedrock	>4096	0	0.0%	105%
TOTALS			105	105%	105%

Summary Data	
D50	0.062
D84	0.062
D95	0.062


UT 1
Pebble Count - Percent Cumulative
Cross-Section 2 - Pool
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Percent Finer Than
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

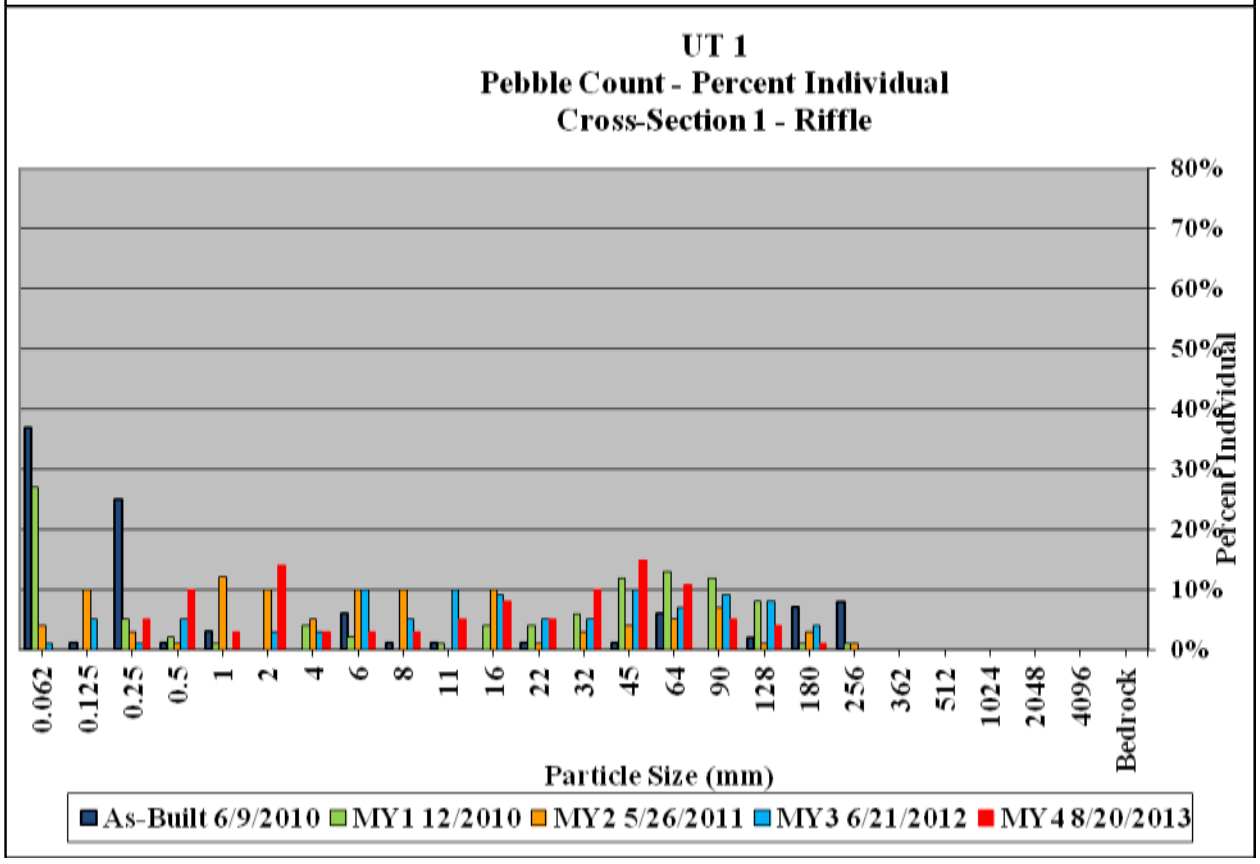

UT 1
Pebble Count - Percent Individual
Cross-Section 1 - Riffle
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Individual
0.062
0.125
0.25
0.5
1
2
4
6
8
11
16
22
32
45
64
90
128
180
256
362
512
1024
2048
4096
Bedrock
Particle Size (mm)
As-Built 6/9/2010
MY1 12/2010
MY2 5/26/2011
MY3 6/21/2012
MY4 8/20/2013

Table 10. Baseline Stream Data Summary
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Swartwout (926 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			Monitoring Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	-	17.5	19.7	-	22.9	-	-	-	11.8	-	-	-	-	-	16.2	-	10.8	11.7	-	12.6	-	-
Floodprone Width (ft)				-	-	-	-	-	-	-	332.0	-	-	-	-	-	>36.0	-	45.0	46.0	-	47.0	-	-
Bankfull Mean Depth (ft)	-	-	-	0.8	1.4	-	2.2	-	-	-	1.3	-	-	-	-	-	1.4	-	0.7	0.8	-	0.9	-	-
Bankfull Max Depth (ft)				2.0	2.8	-	3.8	-	-	-	2.1	-	-	-	-	-	2.0	-	1.2	1.3	-	1.4	-	-
Bankfull Cross Sectional Area (ft^2)	-			16.7	28.3	-	40.3	-	-	-	15.3	-	-	-	-	-	22.4	-	7.9	9.9	-	11.8	-	-
Width/Depth Ratio				8.4	15.9	-	23.7	-	-	-	9.1	-	-	-	-	-	11.8	-	13.4	14.1	-	14.7	-	-
Entrenchment Ratio				1.6	4.3	-	6.9	-	-	-	28.1	-	-	-	-	-	>2.2	-	-	3.9	-	-	-	-
Bank Height Ratio				1.3	1.4	-	1.5	-	-	1.0	1.0	-	1.1	-	-	-	1.0	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61.0	74.2	-	94.9	-	-
Riffle Slope (ft/ft)				0.006	0.016	-	0.030	-	-	0.011	0.017	-	0.021	-	-	0.011	0.017	0.020	0.013	0.019	-	0.024	-	-
Pool Length (ft)				5.7	23.7	-	46.7	-	-	13.0	18.0	-	20.9	-	-	29.7	43.3	50.2	26.7	39.8	-	57.1	-	-
Pool Max Depth (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	-	2.1	2.5	-	3.0	-	-
Pool Spacing (ft)				25.4	59.5	-	108.9	-	-	79.5	88.2	-	97.0	-	-	110.0	126.0	134.0	76.4	106.9	-	141.1	-	-
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	22.0	37.2	-	57.1	-	-	30.0	51.0	78.0	60.0	75.0	-	100.0	-	-
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	25.0	-	42.8	-	-	24.0	34.0	58.0	-	-	-	-	-	-
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	1.5	2.1	-	3.6	-	-	-	2.1	-	-	-	-	-	-	-
Meander Wavelength (ft)				-	-	-	-	-	-	78.6	107.1	-	149.9	-	-	107.0	145.0	205.0	200.0	254.0	-	340.0	-	-
Meander Width Ratio				-	-	-	-	-	-	1.9	3.2	-	4.8	-	-	1.9	3.2	4.8	5.6	6.4	-	7.9	-	-
Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2					-						-						-			-				
Max Part Size (mm) Mobilized at Bankfull					-						-						-			-				
Stream Power (Transport Capacity) W/m^2					-						-						-			-				
Additional Reach Parameters																								
Rosgen Classification					C4 - G4						E4						C4			C				
Bankfull Velocity (fps)	-				-						-						-			-				
Bankfull Discharge (cfs)	-				-						-						-			-				
Valley Length (ft)					-						200						690			682				
Channel Thalweg Length (ft)					-						288						832			926				
Sinuosity					1.01 - 1.06						1.44						1.20			1.36				
Water Surface Slope (Channel) (ft/ft)					0.006 - 0.015						0.012						0.012			0.014				
Bankfull Slope (ft/ft)					-						-						-			0.013				
Bankfull Floodplain Area (acres)																								
% of Reach with Eroding Banks																								
Channel Stability or Habitat Metric																								
Channel Stability or Habitat Metric																								
Biological or Other																								

- Information unavailable.
Non-Applicable.

Table 10. Baseline Stream Data Summary
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Parker (1,820 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			Monitoring Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	-	-	18.5	-	-	-	-	-	26.0	-	-	-	-	-	21.5	-	18.0	21.4	-	24.4	-	-
Floodprone Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140.0	200.0	-	280.0	-	-
Bankfull Mean Depth (ft)	-	-	-	-	2.2	-	-	-	-	-	2.5	-	-	-	-	-	1.8	-	1.2	1.3	-	1.5	-	-
Bankfull Max Depth (ft)				-	3.8	-	-	-	-	-	-	-	-	-	-	-	2.6	-	1.9	2.2	-	2.6	-	-
Bankfull Cross Sectional Area (ft^2)	-			-	40.3	-	-	-	-	-	65.0	-	-	-	-	-	39.0	-	22.3	28.5	-	33.0	-	-
Width/Depth Ratio				-	8.5	-	-	-	-	-	10.4	-	-	-	-	-	11.9	-	13.9	16.3	-	21.3	-	-
Entrenchment Ratio				-	5.7	-	-	-	-	-	5.0	-	-	-	-	-	>2.2	-	6.8	9.4	-	10.7	-	-
Bank Height Ratio				-	1.4	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31.8	62.9	-	116.8	-	-
Riffle Slope (ft/ft)				0.009	0.007	-	0.016	-	-	0.009	0.010	-	0.010	-	-	0.005	0.007	0.009	0.011	0.017	-	0.035	-	-
Pool Length (ft)				17.7	29.2	-	40.7	-	-	53.9	90.5	-	158.1	-	-	39.4	57.4	66.7	44.8	82.1	-	112.1	-	-
Pool Max Depth (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	-	2.6	3.6	-	4.7	-	-
Pool Spacing (ft)				54.3	72.3	-	90.2	-	-	-	158.1	-	-	-	-	147.0	167.0	178.0	99.0	168.0	-	230.0	-	-
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	71.0	91.3	-	118.0	-	-	40.0	68.0	104.0	53.0	88.0	-	125.0	-	-
Radius of Curvature (ft)				-	-	-	-	-	-	23.6	48.3	-	73.0	-	-	32.7	45.6	77.8	-	-	-	-	-	-
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	0.9	1.9	-	2.9	-	-	-	2.1	-	-	-	-	-	-	-
Meander Wavelength (ft)				-	-	-	-	-	-	82.0	205.0	-	484.0	-	-	143.0	194.0	273.0	185.0	259.0	-	345.0	-	-
Meander Width Ratio				-	-	-	-	-	-	2.7	3.5	-	4.5	-	-	6.7	9.0	12.7	2.9	4.1	-	5.1	-	-
Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2							-						-				-					-		
Max Part Size (mm) Mobilized at Bankfull							-						-				-					-		
Stream Power (Transport Capacity) W/m^2							-						-				-					-		
Additional Reach Parameters																								
Rosgen Classification							G4						C4				C4					C		
Bankfull Velocity (fps)	-						-						-				-					-		
Bankfull Discharge (cfs)	-						-						-				-					-		
Valley Length (ft)							2,150						142				1,480					1,120		
Channel Thalweg Length (ft)							2,280						271				1,809					1,820		
Sinuosity							1.06						1.90				1.22					1.63		
Water Surface Slope (Channel) (ft/ft)							0.006						0.010				0.005					0.006		
Bankfull Slope (ft/ft)							-						-				-					0.007		
Bankfull Floodplain Area (acres)																								
% of Reach with Eroding Banks																								
Channel Stability or Habitat Metric																								
Channel Stability or Habitat Metric																								
Biological or Other																								

- Information unavailable.
Non-Applicable.

Table 10. Baseline Stream Data Summary
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek UT1 (457 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			Monitoring Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	-	-	16.0	-	-	-	-	-	11.8	-	-	-	-	-	15.0	-	-	16.6	-	-	-	-
Floodprone Width (ft)				-	54.0	-	-	-	-	-	332.0	-	-	-	-	-	>33.0	-	-	85.0	-	-	-	-
Bankfull Mean Depth (ft)	-	-	-	-	1.3	-	-	-	-	-	1.3	-	-	-	-	-	1.3	-	-	0.8	-	-	-	-
Bankfull Max Depth (ft)				-	2.2	-	-	-	-	-	2.1	-	-	-	-	-	1.8	-	-	1.6	-	-	-	-
Bankfull Cross Sectional Area (ft^2)	-			-	20.2	-	-	-	-	-	15.3	-	-	-	-	-	18.9	-	-	13.1	-	-	-	-
Width/Depth Ratio				-	12.7	-	-	-	-	-	9.1	-	-	-	-	-	11.9	-	-	21.0	-	-	-	-
Entrenchment Ratio				-	3.4	-	-	-	-	-	28.1	-	-	-	-	-	>2.2	-	-	5.1	-	-	-	-
Bank Height Ratio				-	1.4	-	-	-	-	1.0	1.0	-	1.1	-	-	-	1.0	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.0	29.0	-	45.1	-	-
Riffle Slope (ft/ft)				0.009	0.040	-	0.100	-	-	0.011	0.017	-	0.021	-	-	0.011	0.018	0.021	0.017	0.029	-	0.048	-	-
Pool Length (ft)				9.9	13.0	-	16.2	-	-	13.0	18.0	-	20.9	-	-	27.5	40.1	46.5	19.3	33.0	-	49.1	-	-
Pool Max Depth (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	-	2.1	2.3	-	2.7	-	-
Pool Spacing (ft)				43.4	68.8	-	91.7	-	-	79.5	88.2	-	97.0	-	-	102.0	117.0	124.0	45.1	65.3	-	95.6	-	-
Pattern																								
Channel Belt Width (ft)										22.0	37.2	-	57.1	-	-	28.0	47.0	72.0	35.0	49.0	-	55.0	-	-
Radius of Curvature (ft)										18.0	25.0	-	42.8	-	-	22.8	135.2	54.3	-	-	-	-	-	-
Rc: Bankfull Width (ft/ft)										1.5	2.1	-	3.6	-	-	-	9.0	-	-	-	-	-	-	-
Meander Wavelength (ft)										78.6	107.1	-	149.9	-	-	99.0	131.0	190.0	129.0	155.0	-	180.0	-	-
Meander Width Ratio										1.9	3.2	-	4.8	-	-	1.9	3.2	4.8	-	3.0	-	-	-	-
Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2				-						-						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						-						-			-					
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Rosgen Classification				Cb4						E4						Cb4			C					
Bankfull Velocity (fps)	-			-						-						-			-					
Bankfull Discharge (cfs)	-			-						-						-			-					
Valley Length (ft)				440						200						490			400					
Channel Thalweg Length (ft)				470						288						581			457					
Sinuosity				1.06						1.40						1.20			1.14					
Water Surface Slope (Channel) (ft/ft)				0.021						0.012						0.013			-					
Bankfull Slope (ft/ft)				-						-						-			0.015					
Bankfull Floodplain Area (acres)																								
% of Reach with Eroding Banks																								
Channel Stability or Habitat Metric																								
Channel Stability or Habitat Metric																								
Biological or Other																								

- Information unavailable.
Non-Applicable.

Table 11a. Monitoring Data - Dimensional Morphology Summary

(Dimensional Parameters - Cross-Sections)

Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Swartwout (810 feet)

	*Cross-Section 1 Riffle						*Cross-Section 2 Pool						*Cross-Section 3 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2109.5	2109.5	2109.8	2109.8	2109.8		2106.8	2106.8	2107.0	2107.0	2107.0		2107.6	2107.6	2106.5	2106.5	2106.5	
Bankfull Width (ft)	10.8	12.0	12.7	12.9	9.8		18.3	22.0	18.6	18.4	8.6		12.6	13.3	12.7	14.9	11.2	
Floodprone Width (ft)	45.0	45.0	>100.0	>100.0	>100.0		60.0	60.0	>100.0	>100.0	>100.0		45.0	45.0	>100.0	>100.0	>100.0	
Bankfull Mean Depth (ft)	0.7	0.6	0.6	0.5	0.5		0.9	0.8	0.8	0.7	1.1		0.9	0.9	0.8	0.6	0.7	
Bankfull Max Depth (ft)	1.2	1.2	1.1	1.0	1.0		2.2	2.7	2.1	2.2	2.1		1.4	1.5	1.4	1.4	1.4	
Bankfull Cross Sectional Area (ft^2)	7.9	7.6	7.0	5.9	4.9		17.0	16.9	14.2	12.8	9.7		11.8	12.0	10.4	9.1	7.9	
Bankfull Width/Depth Ratio	14.7	18.7	23.1	28.3	19.8		19.7	28.6	24.3	26.6	7.6		13.4	14.8	15.6	24.3	15.8	
Bankfull Entrenchment Ratio	4.2	3.8	>7.9	>7.7	>10.2		3.3	2.7	>5.4	>5.4	>11.6		3.6	3.4	>7.8	>6.7	>8.9	
Bankfull Bank Height Ratio	-	-	1.0	1.1	1.1		-	-	1.0	1.0	1.0		-	-	1.0	1.0	1.0	
Cross Sectional Area between End Pins (ft^2)	-	-	7.2	6.0	4.9		-	-	14.2	12.8	9.7		-	-	10.4	9.2	7.9	
d50 (mm)	0.50	19.30	1.50	6.50	11.00		0.21	0.06	0.47	2.00	0.06		0.30	0.19	4.00	7.40	8.70	

- Information unavailable.

*Elevation data was offset to match MY2 data

Table 11a. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Parker (1,672 feet)

	Cross-Section 4 Pool						Cross-Section 5 Riffle						Cross-Section 6 Pool						Cross-Section 7 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	2075.0	2075.0	2075.5	2075.5	2075.5		2073.1	2073.1	2073.1	2073.1	2073.1		2073.1	2073.1	2073.1	2073.1	2073.1		2071.1	2071.2	2071.2	2071.2	2071.2	
Bankfull Width (ft)	24.9	26.0	31.3	32.2	31.4		24.4	24.1	26.0	25.5	24.1		28.4	28.6	27.9	28.2	28.5		22.5	24.0	23.0	23.1	23.1	
Floodprone Width (ft)	80.0	80.0	>200.0	>200.0	>200.0		180.0	180.0	>200.0	>200.0	>200.0		160.0	160.0	>200.0	>200.0	>200.0		240.0	270.0	>200.0	>200.0	>200.0	
Bankfull Mean Depth (ft)	1.2	1.1	1.2	1.2	1.0		1.2	1.1	1.1	1.0	0.9		1.7	1.7	1.6	1.6	1.5		1.5	1.5	1.4	1.4	1.5	
Bankfull Max Depth (ft)	2.5	2.5	3.0	3.1	3.0		1.9	1.9	2.0	2.0	1.9		3.3	3.3	3.3	3.4	3.5		2.6	2.7	2.6	2.9	2.8	
Bankfull Cross Sectional Area (ft^2)	28.9	28.2	38.2	37.6	32.6		28.2	26.6	27.8	25.8	22.7		47.9	48.0	45.5	44.5	43.9		33.0	34.8	33.3	33.5	33.5	
Bankfull Width/Depth Ratio	21.5	23.8	25.6	27.6	30.3		21.3	21.7	24.3	25.3	25.6		16.8	17.0	17.1	17.9	18.6		15.3	16.5	16.0	16.0	15.9	
Bankfull Entrenchment Ratio	3.2	3.1	>6.4	>6.2	>6.4		7.4	7.5	>7.7	>7.8	>8.3		5.6	5.6	>7.2	>7.1	>7.0		10.7	11.3	>8.7	>8.7	>8.7	
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	
Cross Sectional Area between End Pins (ft^2)	-	-	38.2	37.6	32.6		-	-	27.8	25.8	22.7		-	-	45.5	44.5	43.9		-	-	36.4	36.5	33.5	
d50 (mm)	0.36	0.14	0.44	1.70	16.00		0.46	0.24	8.90	9.20	23.00		0.29	0.14	0.56	1.90	8.00		1.80	0.11	0.06	6.60	9.50	

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

Table 11a. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Parker (1,672 feet)

	Cross-Section 8 Riffle						Cross-Section 9 Pool						Cross-Section 10 Riffle						*Cross-Section 11 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**
Record Elevation (datum) Used	2068.4	2068.7	2069.2	2069.2	2069.2		2066.5	2066.5	2067.2	2067.2	2067.2		2066.1	2066.2	2066.4	2066.4	2066.4		2065.2	2065.2	2065.7	2065.7	2065.7	
Bankfull Width (ft)	18.0	20.7	32.6	32.4	32.5		15.7	18.5	30.6	29.7	28.5		20.6	23.6	25.9	26.7	25.7		23.6	23.7	37.3	35.9	34.7	
Floodprone Width (ft)	170.0	170.0	>200.0	>200.0	>200.0		260.0	260.0	>200.0	>200.0	>200.0		140.0	140.0	>200.0	>200.0	>200.0		140.0	140.0	>200.0	>200.0	>200.0	
Bankfull Mean Depth (ft)	1.2	1.2	1.1	1.1	1.0		1.6	1.6	1.3	1.2	1.2		1.5	1.2	1.3	1.2	1.2		1.4	1.4	1.2	1.2	1.3	
Bankfull Max Depth (ft)	2.0	2.3	2.6	2.6	2.6		2.9	3.1	3.7	3.6	3.8		2.4	2.2	2.5	2.4	2.4		2.8	2.7	3.1	3.1	3.5	
Bankfull Cross Sectional Area (ft^2)	22.3	23.8	35.5	34.7	33.9		25.7	29.7	40.8	36.9	34.0		30.4	28.8	33.2	31.5	30.1		33.0	32.4	45.0	42.7	44.7	
Bankfull Width/Depth Ratio	14.5	18.0	29.9	30.3	31.2		9.7	11.5	23.0	23.9	23.9		13.9	19.4	20.3	22.6	21.8		16.9	17.3	31.0	30.2	27.0	
Bankfull Entrenchment Ratio	9.4	8.2	>6.1	>6.2	>6.2		16.6	14.1	>6.5	>6.7	>7.0		6.8	5.9	>7.7	>7.5	>7.8		5.9	5.9	>5.4	>5.6	>5.8	
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)	-	-	35.5	34.7	33.9		-	-	40.8	36.9	34.0		-	-	35.4	33.1	30.1		-	-	45.0	42.7	44.7	
d50 (mm)	1.33	2.00	2.00	6.00	9.40		0.34	0.26	0.41	0.63	1.30		0.45	32.45	7.30	22.00	15.00		0.18	0.05	0.36	1.30	0.74	

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

Table 11a. Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross-Sections)
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek UT1 (396 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	2107.9	2107.9	2108.6	2108.6	2108.6		2105.8	2105.8	2106.2	2106.2	2106.2	
Bankfull Width (ft)	16.6	20.9	19.5	18.9	19.7		16.6	17.9	16.3	16.8	7.3	
Floodprone Width (ft)	85.0	85.0	>100.0	>100.0	>100.0		200.0	200.0	>100.0	>100.0	>100.0	
Bankfull Mean Depth (ft)	0.8	0.8	0.8	0.8	0.7		0.8	0.6	0.7	0.7	1.3	
Bankfull Max Depth (ft)	1.6	1.8	1.9	1.6	1.7		2.2	1.7	2.1	2.1	2.1	
Bankfull Cross Sectional Area (ft^2)	13.1	15.8	16.3	15.4	14.3		12.1	11.1	12.0	11.5	9.8	
Bankfull Width/Depth Ratio	21.0	27.5	23.3	23.2	27.1		21.8	28.9	22.2	24.4	5.5	
Bankfull Entrenchment Ratio	5.1	4.1	>5.1	>5.3	>5.1		12.1	11.2	>6.1	>6.0	>13.6	
Bankfull Bank Height Ratio	-	-	1.0	1.0	1.0		-	-	1.0	1.0	1.0	
Cross Sectional Area between End Pins (ft^2)	-	-	16.3	15.4	14.3		-	-	14.5	12.7	9.8	
d50 (mm)	0.19	24.95	4.90	15.00	15.00		0.11	0.06	0.33	0.44	0.06	

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

Table 11b. Monitoring Data - Stream Reach Data Summary
Cat Creek Stream & Wetland / Project No.71 - Cat Creek Swartwout (810 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	10.8	11.7	-	12.6	-	-	12.0	17.0	-	22.0	-	-	12.7	12.7	12.7	12.7	N/A	2	12.9	13.9	13.9	14.9	N/A	2	9.8	10.6	10.6	11.4	N/A	2						
Floodprone Width (ft)	45.0	46.0	-	47.0	-	-	45.0	45.0	-	45.0	-	-	>100.0	>100.0	>100.0	>100.0	N/A	2	>100.0	>100.0	>100.0	>100.0	N/A	2	>100.0	>100.0	>100.0	>100.0	N/A	2						
Bankfull Mean Depth (ft)	0.7	0.8	-	0.9	-	-	0.6	0.8	-	0.9	-	-	0.6	0.7	0.7	0.8	N/A	2	0.5	0.6	0.6	0.6	N/A	2	0.5	0.6	0.6	0.7	N/A	2						
Bankfull Max Depth (ft)	1.2	1.3	-	1.4	-	-	1.2	1.3	-	1.5	-	-	1.1	1.3	1.3	1.4	N/A	2	1.0	1.2	1.2	1.4	N/A	2	1.0	1.2	1.2	1.4	N/A	2						
Bankfull Cross-Sectional Area (ft^2)	7.9	9.9	-	11.8	-	-	7.6	9.8	-	12.0	-	-	7.0	8.7	8.7	10.4	N/A	2	5.9	7.5	7.5	9.1	N/A	2	4.9	6.4	6.4	7.9	N/A	2						
Width/Depth Ratio	13.4	14.1	-	14.7	-	-	14.8	16.7	-	18.7	-	-	15.6	19.4	19.4	23.1	N/A	2	24.3	26.3	26.3	28.3	N/A	2	16.4	18.1	18.1	19.8	N/A	2						
Entrenchment Ratio	-	3.9	-	-	-	-	3.4	3.6	-	3.8	-	-	>7.8	>7.9	>7.9	>7.9	N/A	2	>6.7	>7.2	>7.2	>7.7	N/A	2	>8.8	>9.5	>9.5	>10.2	N/A	2						
Bank Height Ratio	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0	1.0	1.0	N/A	2	1.1	1.1	1.1	1.1	N/A	2	1.0	1.1	1.1	1.1	N/A	2						
Profile																																				
Riffle Length (ft)	61.0	74.2	-	94.9	-	-	27.5	85.7	-	150.2	-	-	16.2	48.4	53.4	81.1	20.9	9	13.9	47.1	50.8	78.1	21.8	9	12.0	50.6	50.4	79.0	23.6	9						
Riffle Slope (ft/ft)	0.013	0.019	-	0.024	-	-	0.010	0.017	-	0.025	-	-	0.008	0.021	0.021	0.033	0.009	9	0.010	0.023	0.020	0.040	0.011	9	0.010	0.021	0.021	0.046	0.011	9						
Pool Length (ft)	26.7	39.8	-	57.1	-	-	27.5	46.5	-	83.8	-	-	12.6	18.8	18.0	27.5	5.1	8	12.0	19.4	18.8	28.1	5.2	8	12.7	17.3	16.7	22.8	3.6	8						
Pool Max Depth (ft)	2.1	2.5	-	3.0	-	-	1.9	2.3	-	2.6	-	-	1.5	2.2	2.2	2.9	0.5	8	1.8	2.1	2.0	2.8	0.4	8	1.8	2.6	2.6	3.0	0.4	8						
Pool Spacing (ft)	76.4	106.9	-	141.1	-	-	105.5	133.0	-	186.0	-	-	46.4	100.6	109.3	118.8	25.4	7	39.4	100.4	107.1	129.5	28.9	7	44.0	100.1	105.5	133.4	27.6	7						
Pattern																																				
Channel Belt Width (ft)	60.0	75.0	-	100.0	-	-							50.0	76.3	83.5	88.0	17.9	4																		
Radius of Curvature (ft)	-	-	-	-	-	-							45.0	49.5	50.5	52.0	3.3	4																		
Rc: Bankfull Width (ft/ft)	-	-	-	-	-	-							3.6	3.9	4.0	3.9	0.1	4																		
Meander Wavelength (ft)	200.0	254.0	-	340.0	-	-							198.0	261.8	244.5	360.0	69.3	4																		
Meander Width Ratio	-	6.4	-	-	-	-							3.7	5.7	6.6	6.5	1.3	4																		
Additional Reach Parameters																																				
Rosgen Classification	C						-						C5						C4						C4											
Channel Thalweg Length (ft)	926						-						810						806						808											
Sinuosity (ft)	1.36						-						1.15						1.14						1.15											
Water Surface Slope (Channel) (ft/ft)	0.0138						-						0.0145						0.0147						0.0144											
Bankfull Slope (ft/ft)	0.0129						-						0.0147						0.0147						0.0145											
Ri% / Ru% / P% / G% / S%													57%	13%	20%	10%	0%		55%	10%	20%	15%	0%		58%	15%	18%	10%	0%							
SC% / SA% / G% / C% / B% / Be%*													2%	58%	28%	11%	0%	0%	2%	35%	52%	10%	0%	0%	16%	32%	35%	17%	0%	0%						
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks													0%						0%						0%											
Channel Stability or Habitat Metric													N/A						N/A						N/A											
Biological or Other													N/A						N/A						N/A											

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
*Percentages based on riffle and pool pebble counts.
- Information unavailable

Table 11b. Monitoring Data - Stream Reach Data Summary
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek Parker (1,672 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	18.0	21.4	-	24.4	-	-	20.7	23.1	-	24.1	-	-	23.0	26.9	26.0	32.6	4.1	4	23.1	26.9	26.1	32.4	3.9	4	23.1	26.4	24.9	32.5	4.2	4						
Floodprone Width (ft)	140.0	200.0	-	280.0	-	-	140.0	200.0	-	280.0	-	-	>200.0	>200.0	>200.0	>200.0	0.0	4	>200.0	>200.0	>200.0	>200.0	0.0	4	>200.0	>200.0	>200.0	>200.0	0.0	4						
Bankfull Mean Depth (ft)	1.2	1.3	-	1.5	-	-	1.1	1.2	-	1.5	-	-	1.1	1.2	1.2	1.4	0.2	4	1.0	1.2	1.2	1.4	0.2	4	0.9	1.2	1.1	1.5	0.3	4						
Bankfull Max Depth (ft)	1.9	2.2	-	2.6	-	-	1.9	2.3	-	2.7	-	-	2.0	2.4	2.6	2.6	0.3	4	2.0	2.5	2.5	2.9	0.4	4	1.9	2.4	2.5	2.8	0.4	4						
Bankfull Cross-Sectional Area (ft^2)	22.3	28.5	-	33.0	-	-	23.8	28.5	-	34.8	-	-	27.8	32.5	33.3	35.5	3.3	4	25.8	31.4	32.5	34.7	3.9	4	22.7	30.1	31.8	33.9	5.2	4						
Width/Depth Ratio	13.9	16.3	-	21.3	-	-	16.5	18.9	-	21.7	-	-	16.0	22.6	22.3	29.9	5.9	4	16.0	23.6	24.0	30.3	6.0	4	15.9	23.6	23.7	31.2	6.4	4						
Entrenchment Ratio	6.8	9.4	-	10.7	-	-	5.9	8.2	-	11.3	-	-	>6.1	>7.5	>7.7	>8.7	1.1	4	>6.2	>7.6	>7.7	>8.7	1.0	4	>6.2	>7.8	>8.1	>8.7	1.1	4						
Bank Height Ratio	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	4	1.0	1.0	1.0	1.0	0.0	4	1.0	1.0	1.0	1.0	0.0	4						
Profile																																				
Riffle Length (ft)	31.8	62.9	-	116.8	-	-	38.1	76.6	-	135.4	-	-	16.3	55.3	52.2	104.4	30.4	12	15.7	53.3	44.5	104.7	30.1	13	31.4	61.9	60.3	94.1	23.8	11						
Riffle Slope (ft/ft)	0.011	0.017	-	0.035	-	-	0.007	0.014	-	0.032	-	-	0.004	0.014	0.013	0.030	0.007	13	0.006	0.014	0.013	0.031	0.007	13	0.007	0.013	0.013	0.023	0.004	11						
Pool Length (ft)	44.8	82.1	-	112.1	-	-	38.1	71.3	-	112.4	-	-	33.1	51.2	46.6	109.9	22.3	10	34.3	51.7	47.4	101.7	19.8	10	29.3	46.3	40.2	72.4	15.5	11						
Pool Max Depth (ft)	2.6	3.6	-	4.7	-	-	2.8	3.5	-	4.5	-	-	2.9	3.6	3.4	4.7	0.6	9	2.8	3.6	3.6	4.7	0.6	9	2.8	3.5	3.5	4.7	0.5	10						
Pool Spacing (ft)	99.0	168.0	-	230.0	-	-	106.0	168.0	-	232.0	-	-	104.0	168.6	174.1	227.7	38.3	9	104.6	168.5	181.6	229.0	39.5	9	64.9	152.3	155.1	222.2	49.6	10						
Pattern																																				
Channel Belt Width (ft)	53.0	88.0	-	125.0	-	-							53.0	101.4	108.5	114.0	20.2	8																		
Radius of Curvature (ft)	-	-	-	-	-	-							50.0	74.1	74.0	122.0	24.0	8																		
Rc: Bankfull Width (ft/ft)	-	-	-	-	-	-							1.9	2.8	2.8	4.5	0.9	8																		
Meander Wavelength (ft)	185.0	259.0	-	345.0	-	-							255.0	308.7	314.0	357.0	46.8	7																		
Meander Width Ratio	-	4.1	-	-	-	-							2.0	3.8	4.0	4.2	0.8	8																		
Additional Reach Parameters																																				
Rosgen Classification	C						C						C5						C5						C4											
Channel Thalweg Length (ft)	1,820						1,820						1,672						1,669						1,664											
Sinuosity (ft)	1.63						1.63						1.16						1.15						1.15											
Water Surface Slope (Channel) (ft/ft)	0.0062						0.0062						0.0064						0.0063						0.0064											
Bankfull Slope (ft/ft)	0.0066						0.0066						0.0066						0.0066						0.0064											
Ri% / Ru% / P% / G% / S%													40%	13%	31%	17%	0%		42%	12%	31%	14%	0%		41%	12%	31%	16%	0%							
SC% / SA% / G% / C% / B% / Be%*													8%	61%	20%	9%	1%	0%	4%	46%	40%	9%	1%	0%	4%	34%	50%	10%	2%	0%						
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks													0%						0%						0%											
Channel Stability or Habitat Metric													N/A						N/A						N/A											
Biological or Other													N/A						N/A						N/A											

Table 11b. Monitoring Data - Stream Reach Data Summary
Cat Creek Stream & Wetland / Project No. 71 - Cat Creek - UT1 (396 feet)

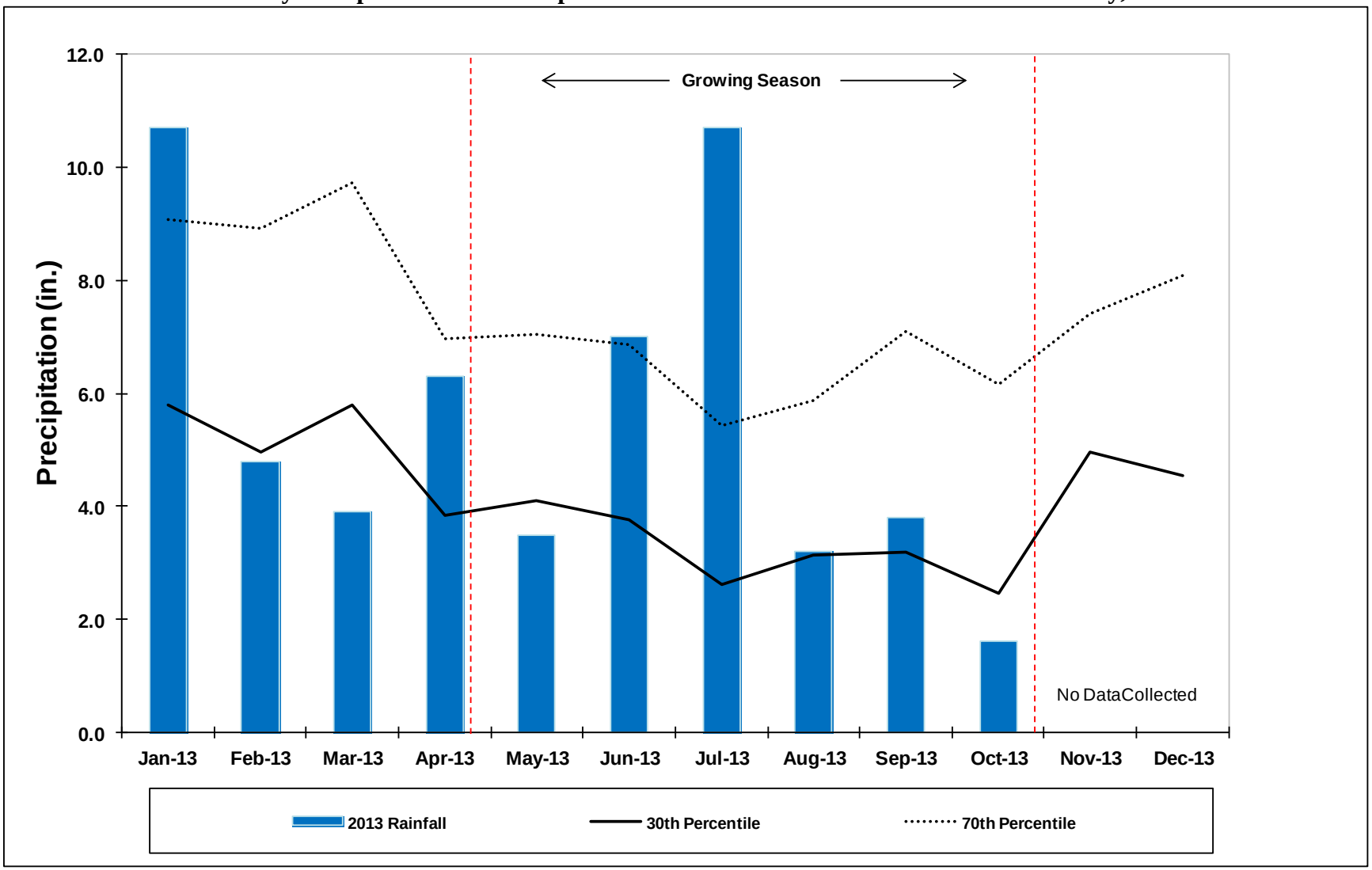
Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	16.6	16.6	16.6	16.6	N/A	1	20.9	20.9	20.9	20.9	N/A	1	19.5	19.5	19.5	19.5	N/A	1	18.9	18.9	18.9	18.9	N/A	1	19.7	19.7	19.7	19.7	N/A	1						
Floodprone Width (ft)	85.0	85.0	85.0	85.0	N/A	1	85.0	85.0	85.0	85.0	N/A	1	>100.0	>100.0	>100.0	>100.0	N/A	1	>100.0	>100.0	>100.0	>100.0	N/A	1	>100.0	>100.0	>100.0	>100.0	N/A	1						
Bankfull Mean Depth (ft)	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.7	0.7	0.7	0.7	N/A	1						
Bankfull Max Depth (ft)	1.6	1.6	1.6	1.6	N/A	1	1.8	1.8	1.8	1.8	N/A	1	1.9	1.9	1.9	1.9	N/A	1	1.6	1.6	1.6	1.6	N/A	1	1.7	1.7	1.7	1.7	N/A	1						
Bankfull Cross-Sectional Area (ft^2)	13.1	13.1	13.1	13.1	N/A	1	15.8	15.8	15.8	15.8	N/A	1	16.3	16.3	16.3	16.3	N/A	1	15.4	15.4	15.4	15.4	N/A	1	14.3	14.3	14.3	14.3	N/A	1						
Width/Depth Ratio	21.0	21.0	21.0	21.0	N/A	1	27.5	27.5	27.5	27.5	N/A	1	23.3	23.3	23.3	23.3	N/A	1	23.2	23.2	23.2	23.2	N/A	1	27.1	27.1	27.1	27.1	N/A	1						
Entrenchment Ratio	5.1	5.1	5.1	5.1	N/A	1	4.1	4.1	4.1	4.1	N/A	1	>5.1	>5.1	>5.1	>5.1	N/A	1	>5.3	>5.3	>5.3	>5.3	N/A	1	>5.1	>5.1	>5.1	>5.1	N/A	1						
Bank Height Ratio	-	-	-	-	-	-	-	-	-	-	-	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1						
Profile																																				
Riffle Length (ft)	19.0	29.0	-	45.1	-	-	13.8	28.4	-	48.0	-	-	9.2	24.1	21.3	45.6	13.6	6	8.9	23.7	19.2	47.4	14.5	6	14.1	25.6	24.5	48.8	12.8	6						
Riffle Slope (ft/ft)	0.0170	0.0290	-	0.0480	-	-	0.0090	0.0210	-	0.0460	-	-	0.018	0.025	0.025	0.032	0.006	6	0.017	0.029	0.024	0.045	0.011	6	0.007	0.023	0.025	0.040	0.011	6						
Pool Length (ft)	19.3	33.0	-	49.1	-	-	26.9	35.1	-	42.9	-	-	14.9	21.5	21.2	32.0	5.9	6	15.5	23.1	22.4	33.7	6.0	6	11.9	22.0	22.5	30.3	6.0	6						
Pool Max Depth (ft)	2.06	2.3	-	2.7	-	-	1.6	2.1	-	2.6	-	-	1.6	2.4	2.4	3.0	0.6	6	1.7	2.1	2.1	2.4	0.3	6	2.1	2.4	2.5	2.8	0.3	5						
Pool Spacing (ft)	45.1	65.3	-	95.6	-	-	40.0	63.9	-	97.0	-	-	40.5	64.3	65.0	96.3	22.2	5	37.4	65.0	62.1	99.0	23.5	5	40.5	64.8	65.6	95.7	20.9	5						
Pattern																																				
Channel Belt Width (ft)	35.0	49.0	-	55.0	-	-							43.1	47.2	47.3	51.3	4.6	4																		
Radius of Curvature (ft)	-	-	-	-	-	-							26.0	30.4	30.8	34.0	3.8	4																		
Rc: Bankfull Width (ft/ft)	-	-	-	-	-	-							1.3	1.6	1.6	1.7	0.2	4																		
Meander Wavelength (ft)	129.0	155.0	-	180.0	-	-							124.0	157.7	166.0	183.0	30.4	3																		
Meander Width Ratio	-	3.0	-	-	-	-							2.2	2.4	2.4	2.6	0.2	4																		
Additional Reach Parameters																																				
Rosgen Classification	C						C						C5						C5						C5											
Channel Thalweg Length (ft)	457						457						396						393						394											
Sinuosity (ft)	1.14						1.14						1.07						1.07						1.07											
Water Surface Slope (Channel) (ft/ft)	-						-						0.0136						0.0138						0.0147											
Bankfull Slope (ft/ft)	0.0145						0.0145						0.0139						0.0138						0.0139											
Ri% / Ru% / P% / G% / S%													37%	10%	33%	19%	2%		36%	8%	35%	19%	1%		39%	12%	33%	15%	0%							
SC% / SA% / G% / C% / B% / Be%*													4%	67%	24%	6%	0%	0%	3%	55%	33%	11%	0%	0%	29%	37%	30%	5%	0%	0%						
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks													0%						0%						0%											
Channel Stability or Habitat Metric													N/A						N/A						N/A											
Biological or Other													N/A						N/A						N/A											

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
*Percentages based on riffle and pool pebble counts.
- Information unavailable

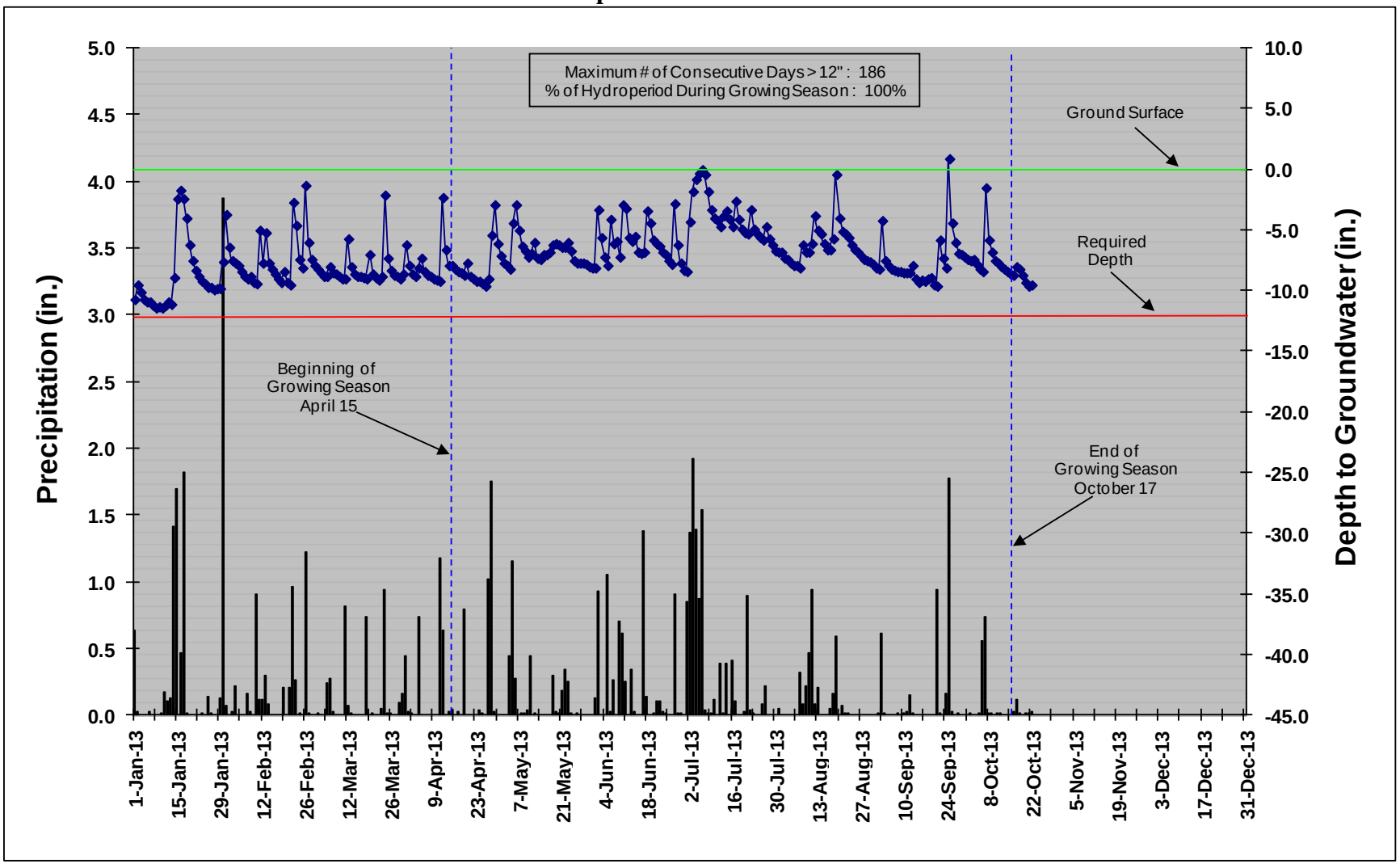
Appendix E
Hydrologic Data

Table 12. Verification of Bankfull Events Cat Creek Stream & Wetland / Project No.71			
Date of Data Collection	**Date of Occurrence**	**Method**	**Photo # (if available)**
No Events in 2010			
No Events in 2011			
3/29/2012	11/28/2011	Crest gauge & wrack lines	
1/23/2013	1/17/2013	Crest gauge & wrack lines	
4/2/2013	1/30/2013	Crest gauge & wrack lines	
8/20/2013	Unknown	Crest gauge & wrack lines	

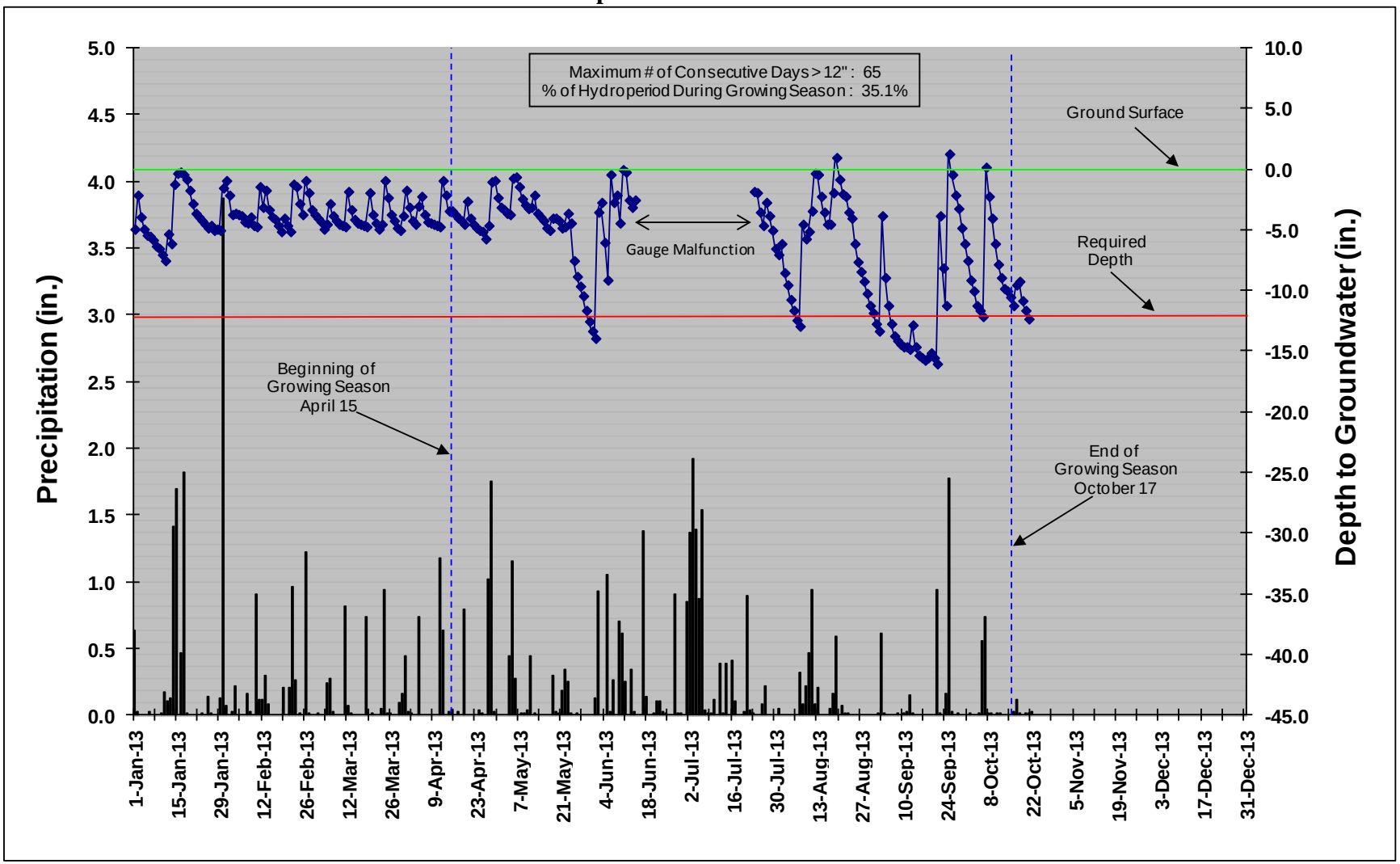
Monthly Precipitation Data Compared to 30th and 70th Percentiles for Macon County, NC



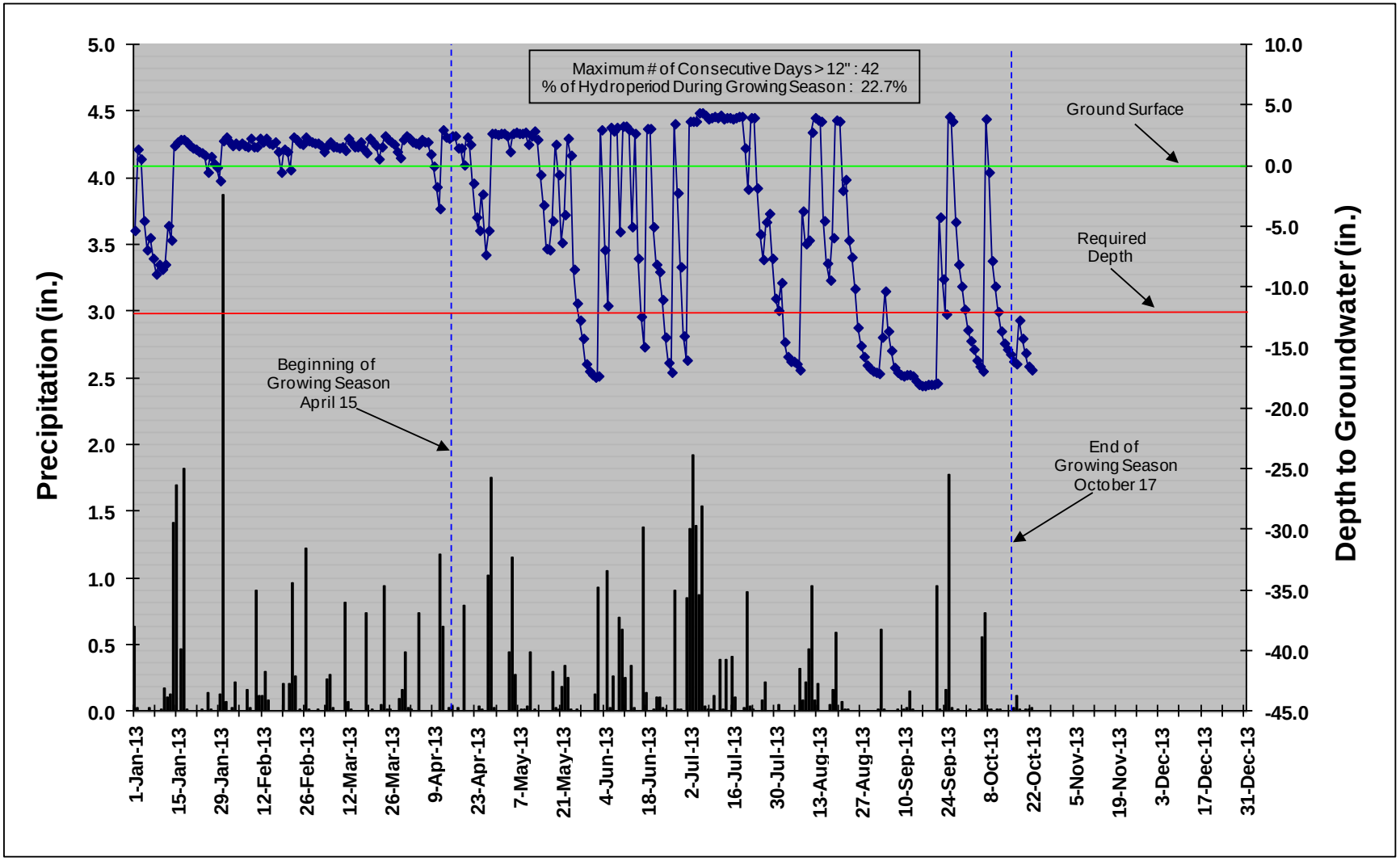
CC-1 Precipitation and Water Level Plot



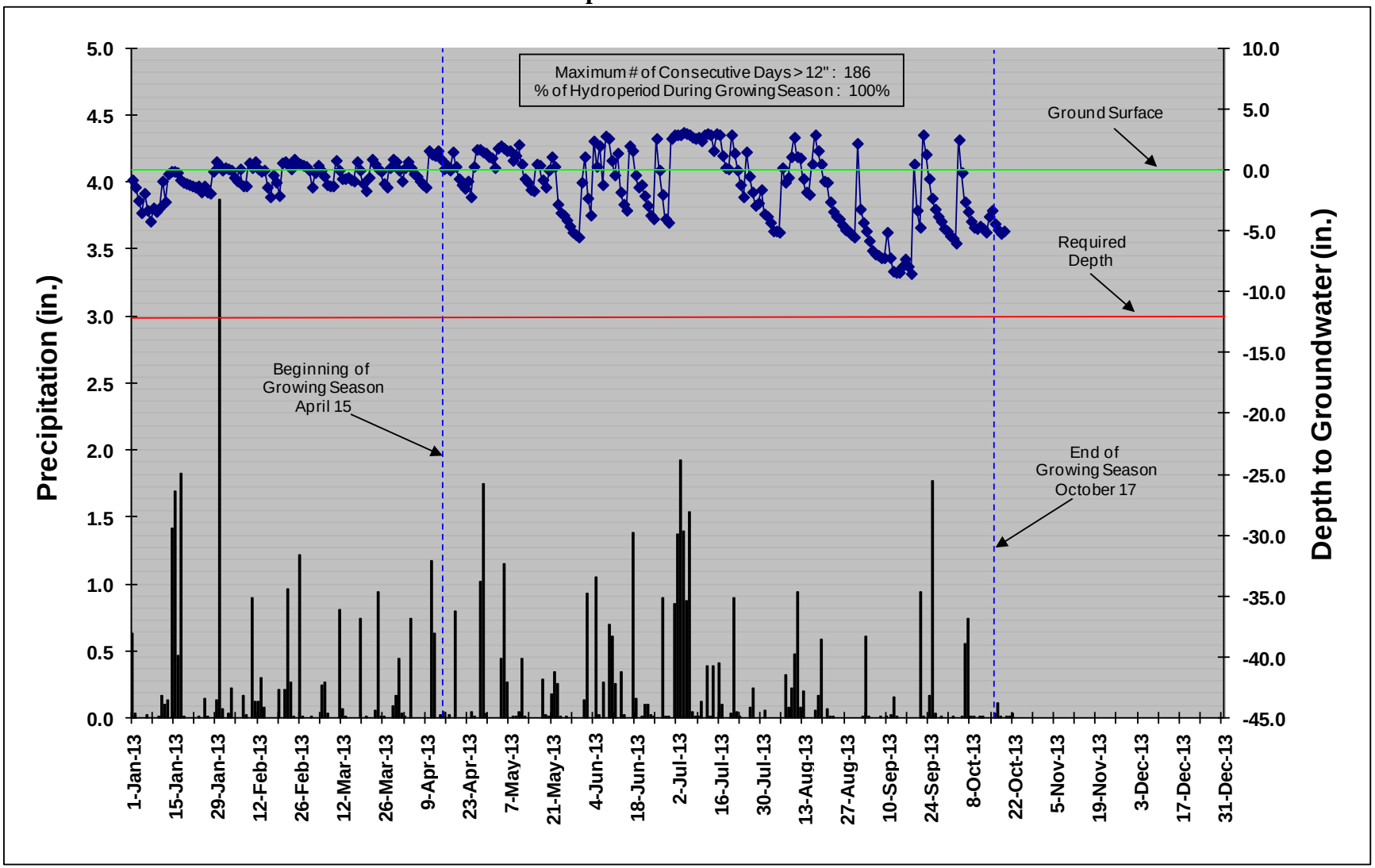
CC-2 Precipitation and Water Level Plot



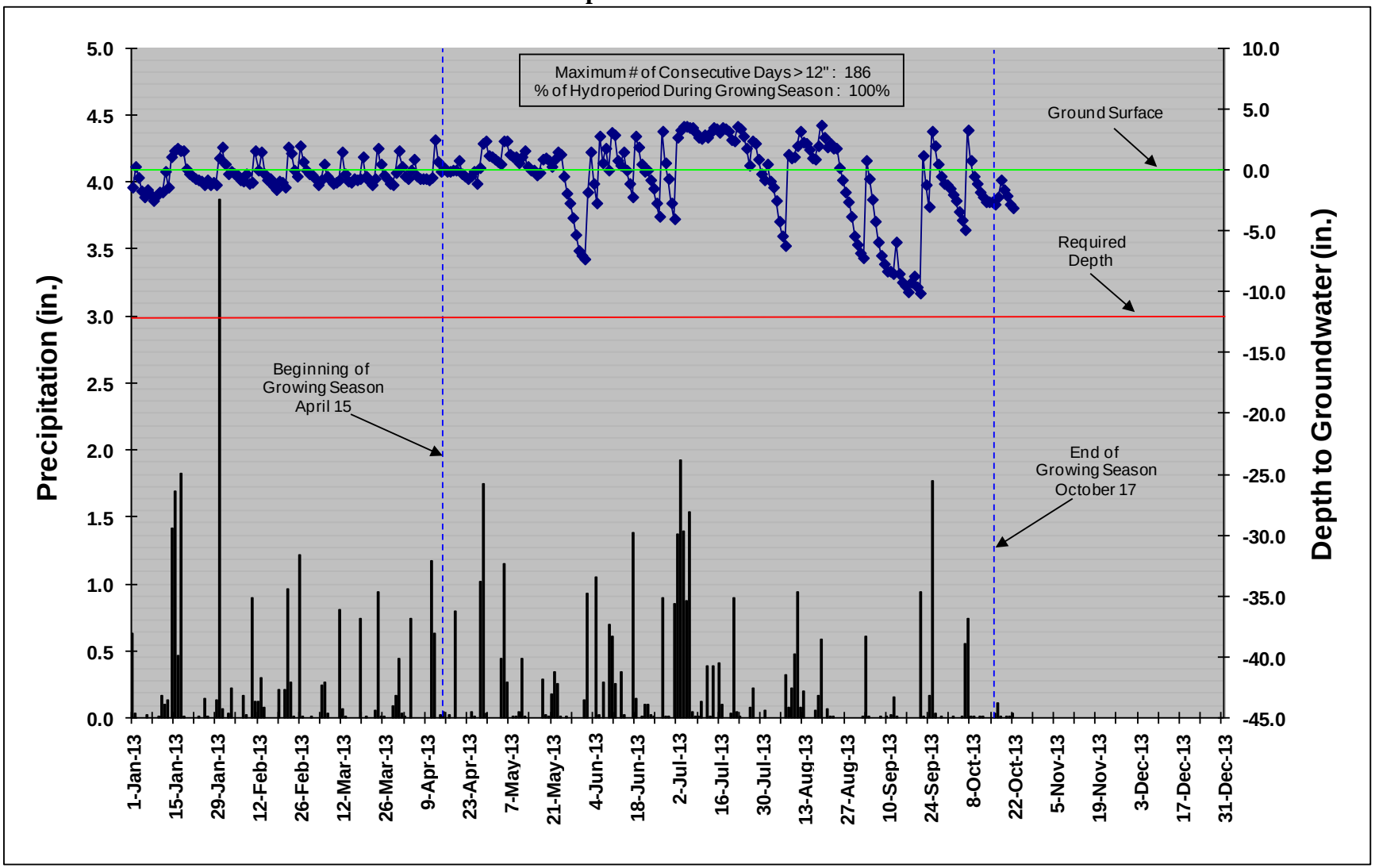
CC-3 Precipitation and Water Level Plot



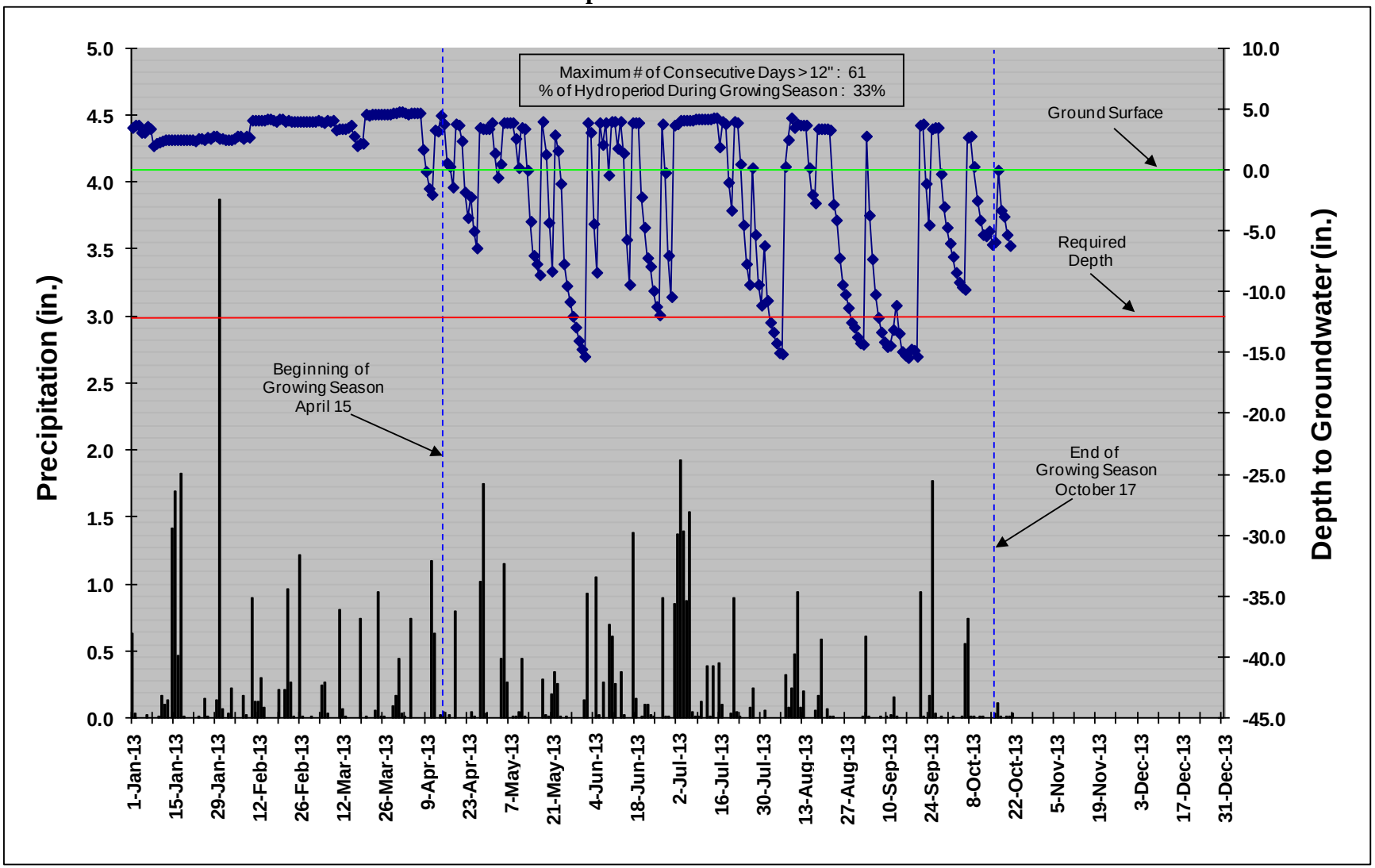
CC-4 Precipitation and Water Level Plot



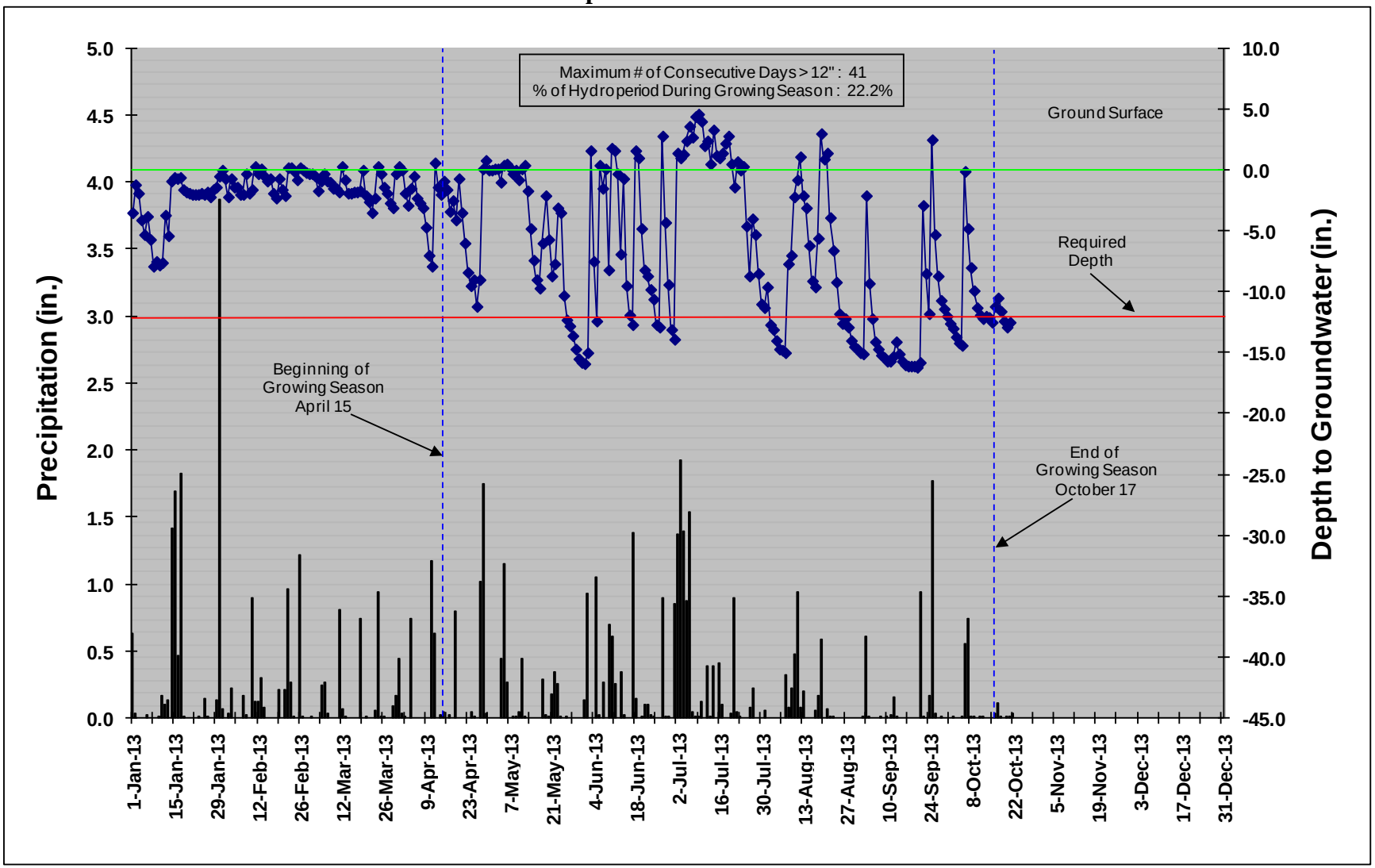
CC-5 Precipitation and Water Level Plot



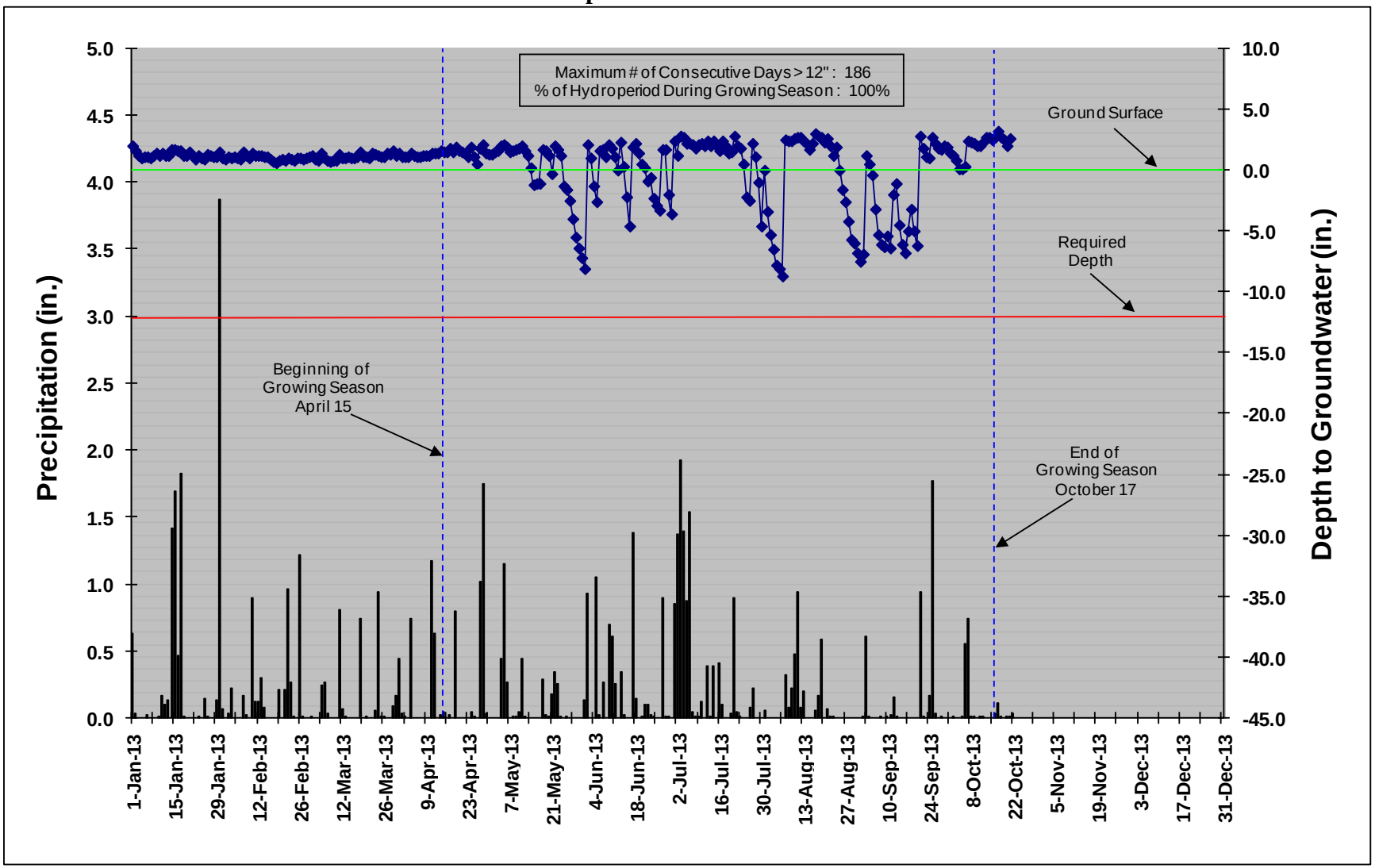
CC-6 Precipitation and Water Level Plot



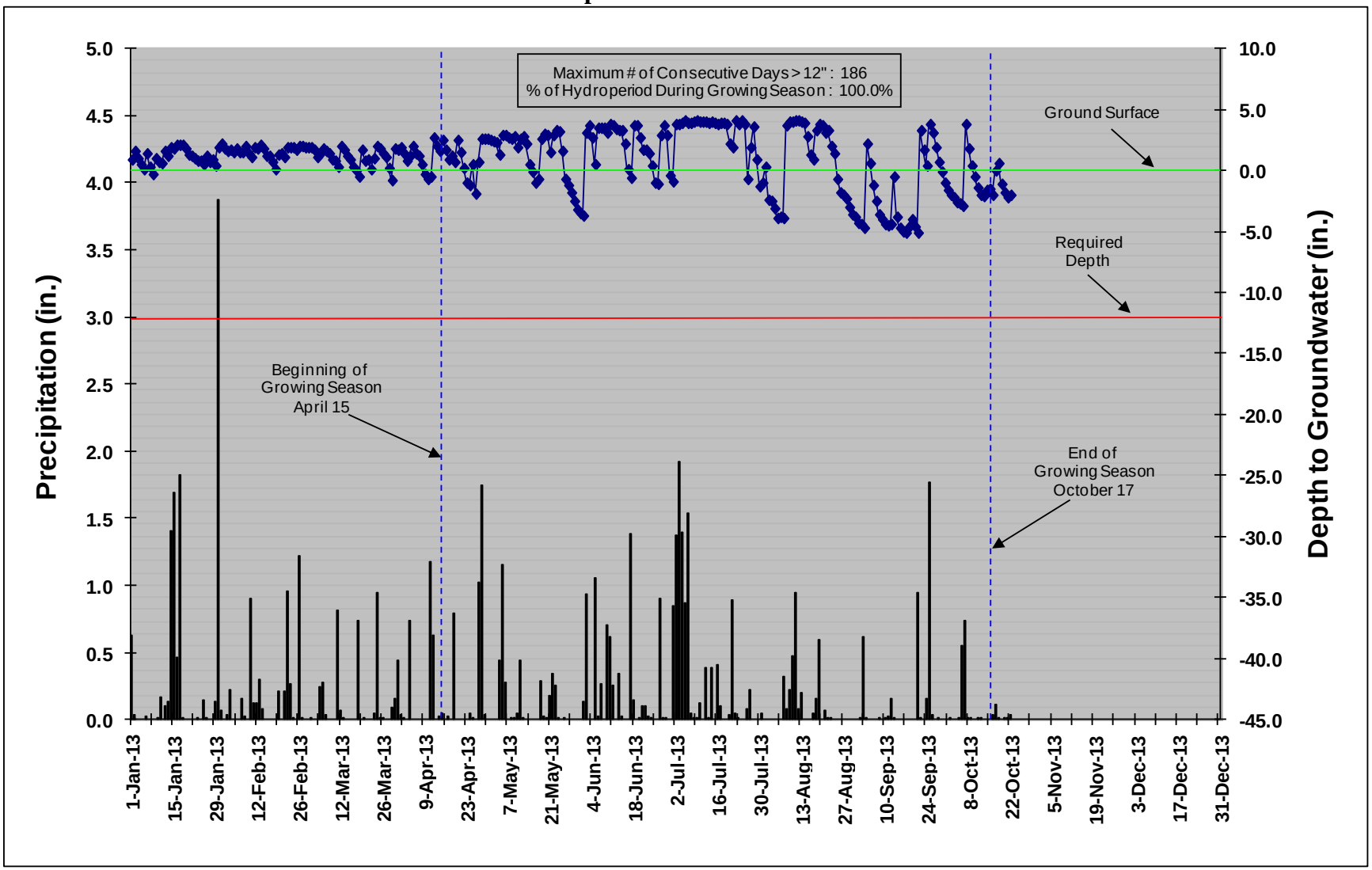
CC-7 Precipitation and Water Level Plot



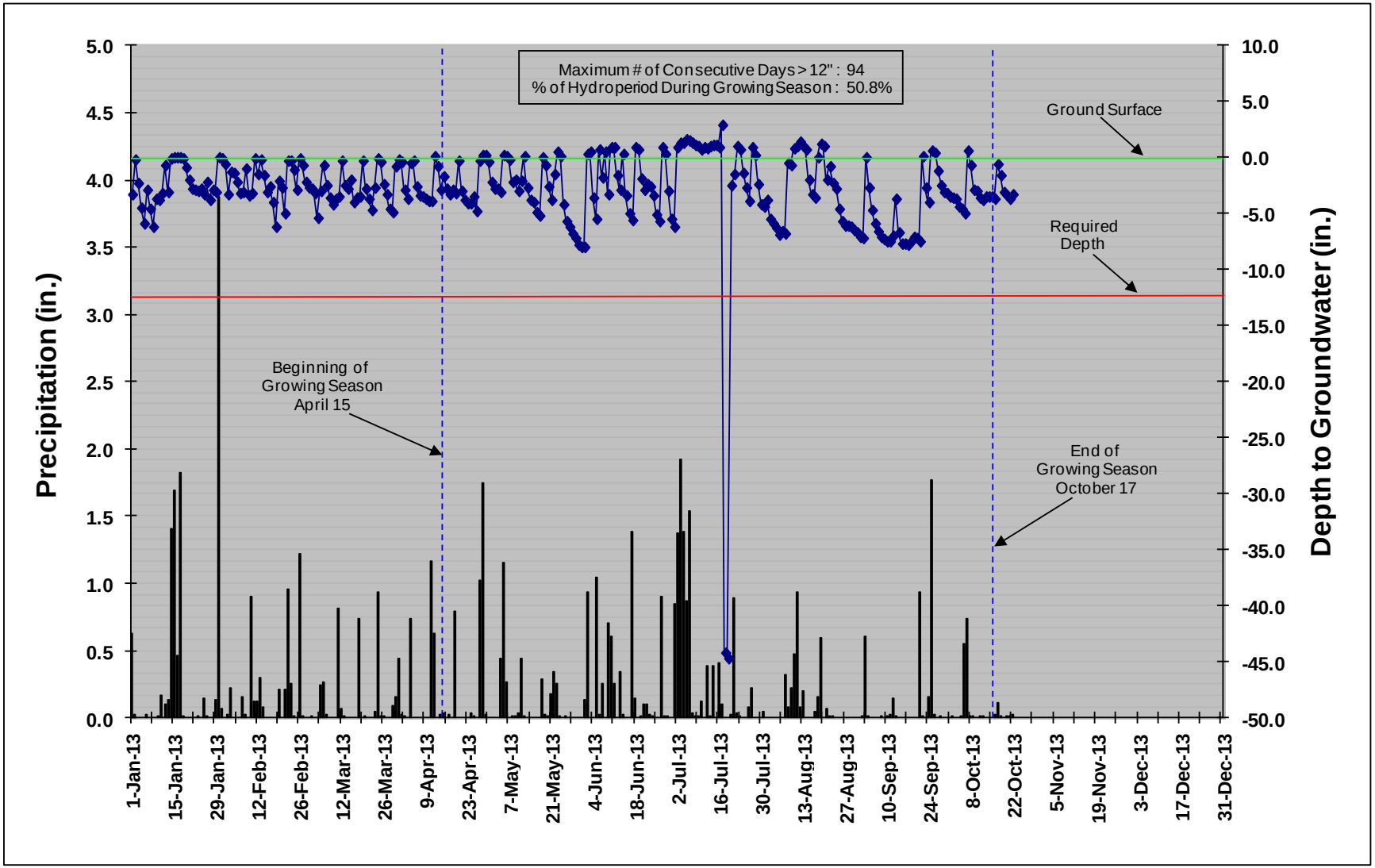
CC-8 Precipitation and Water Level Plot



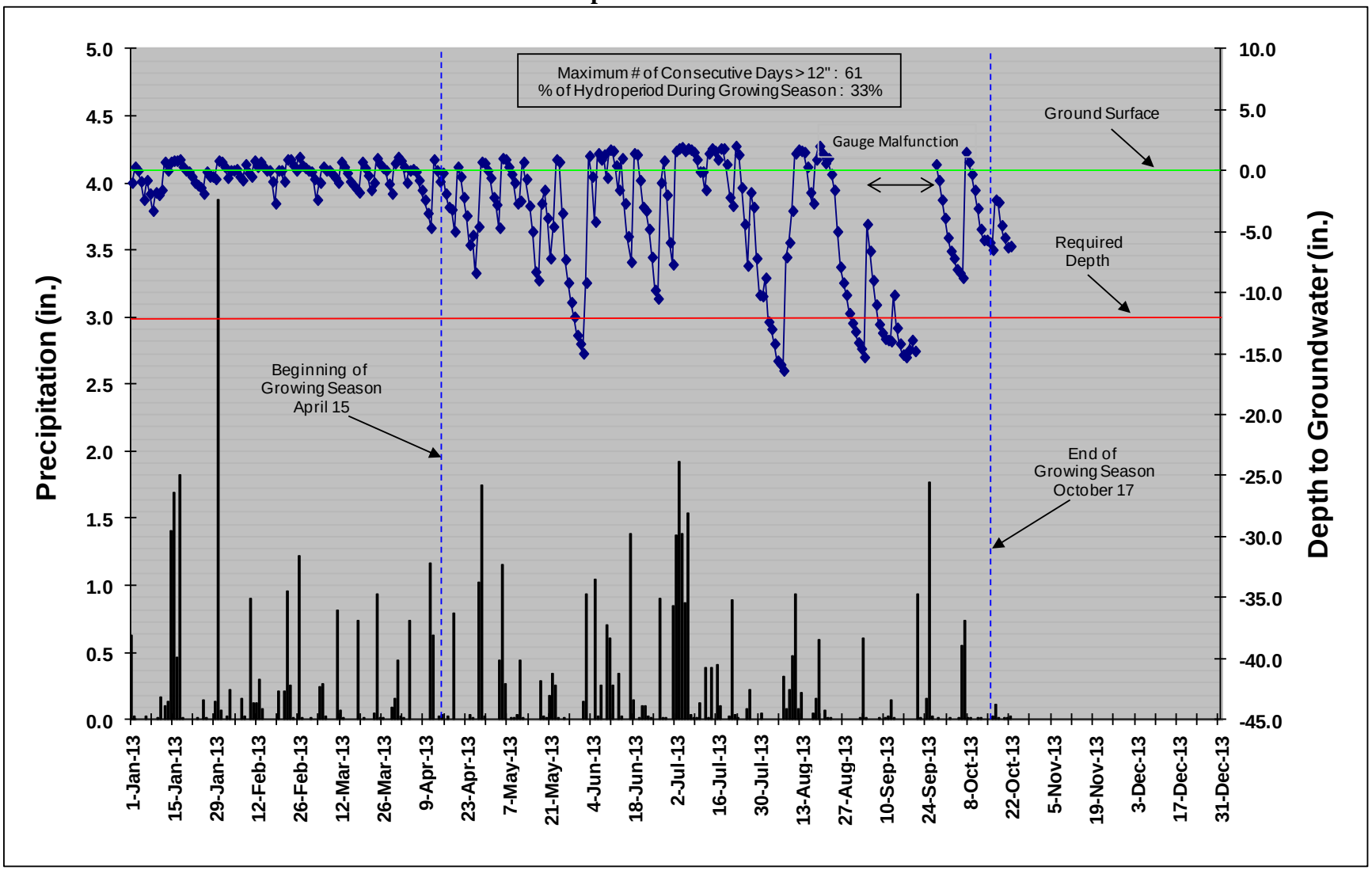
CC-9 Precipitation and Water Level Plot



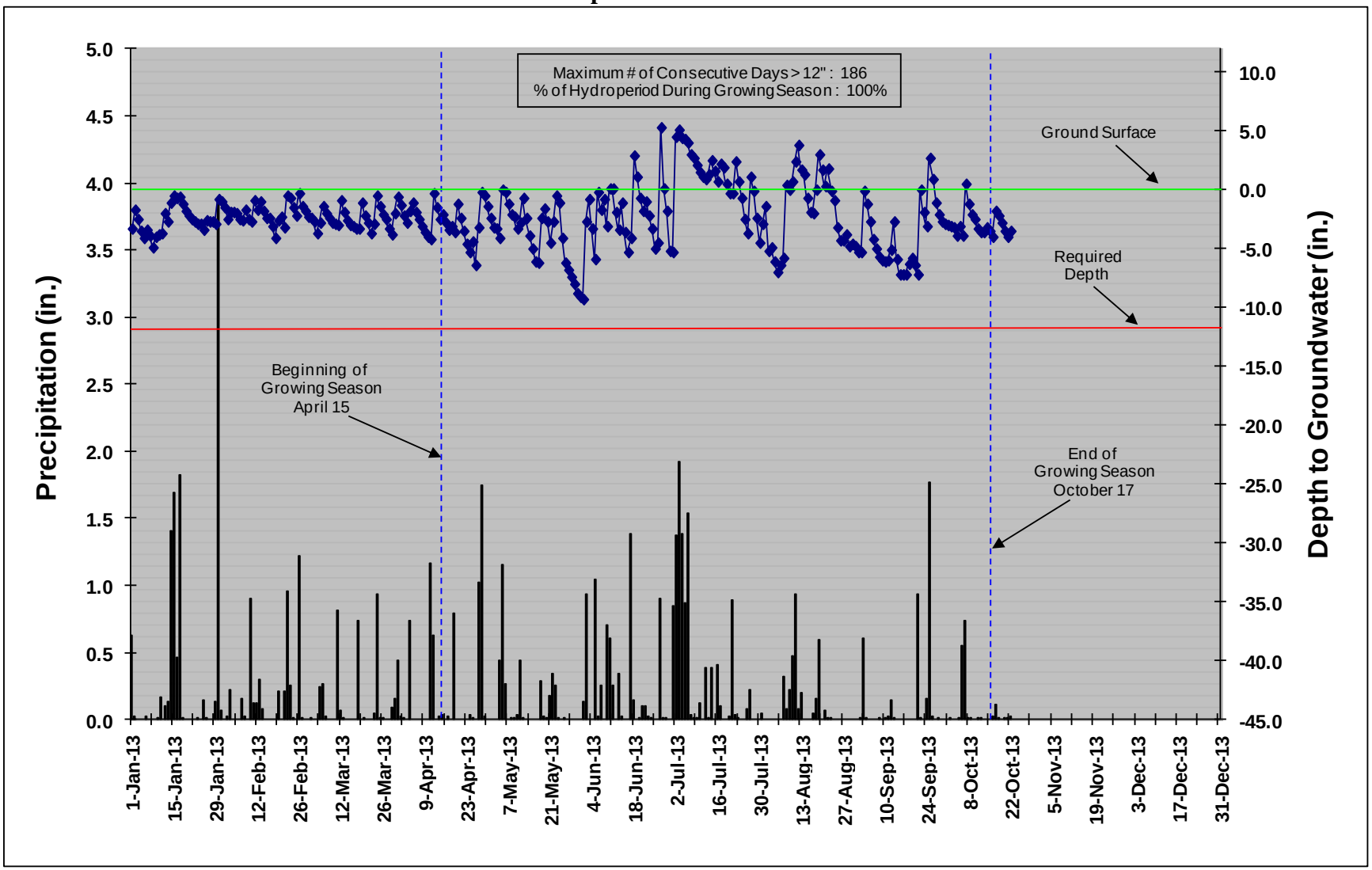
CC-10 Precipitation and Water Level Plot



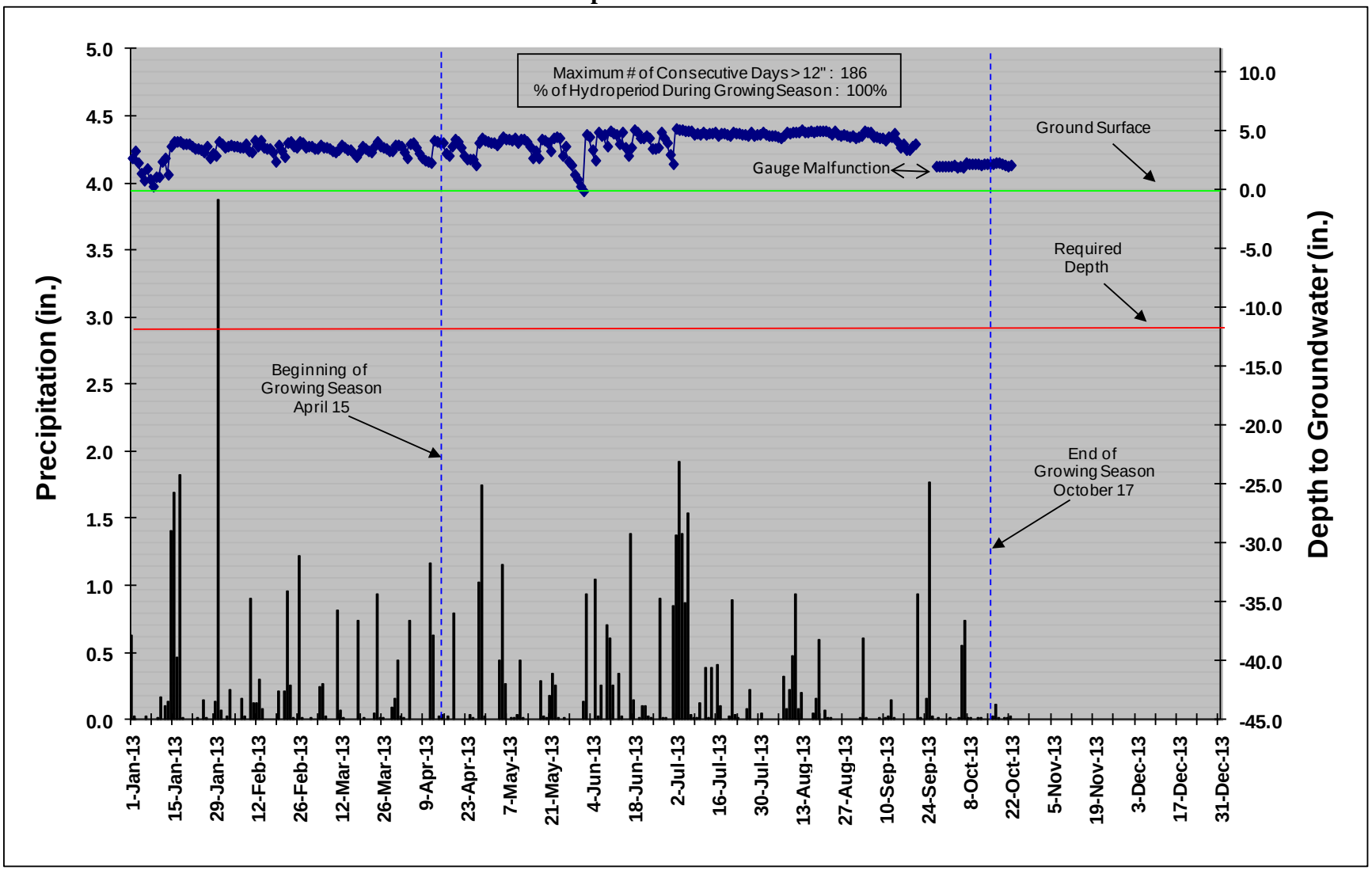
CC-11 Precipitation and Water Level Plot



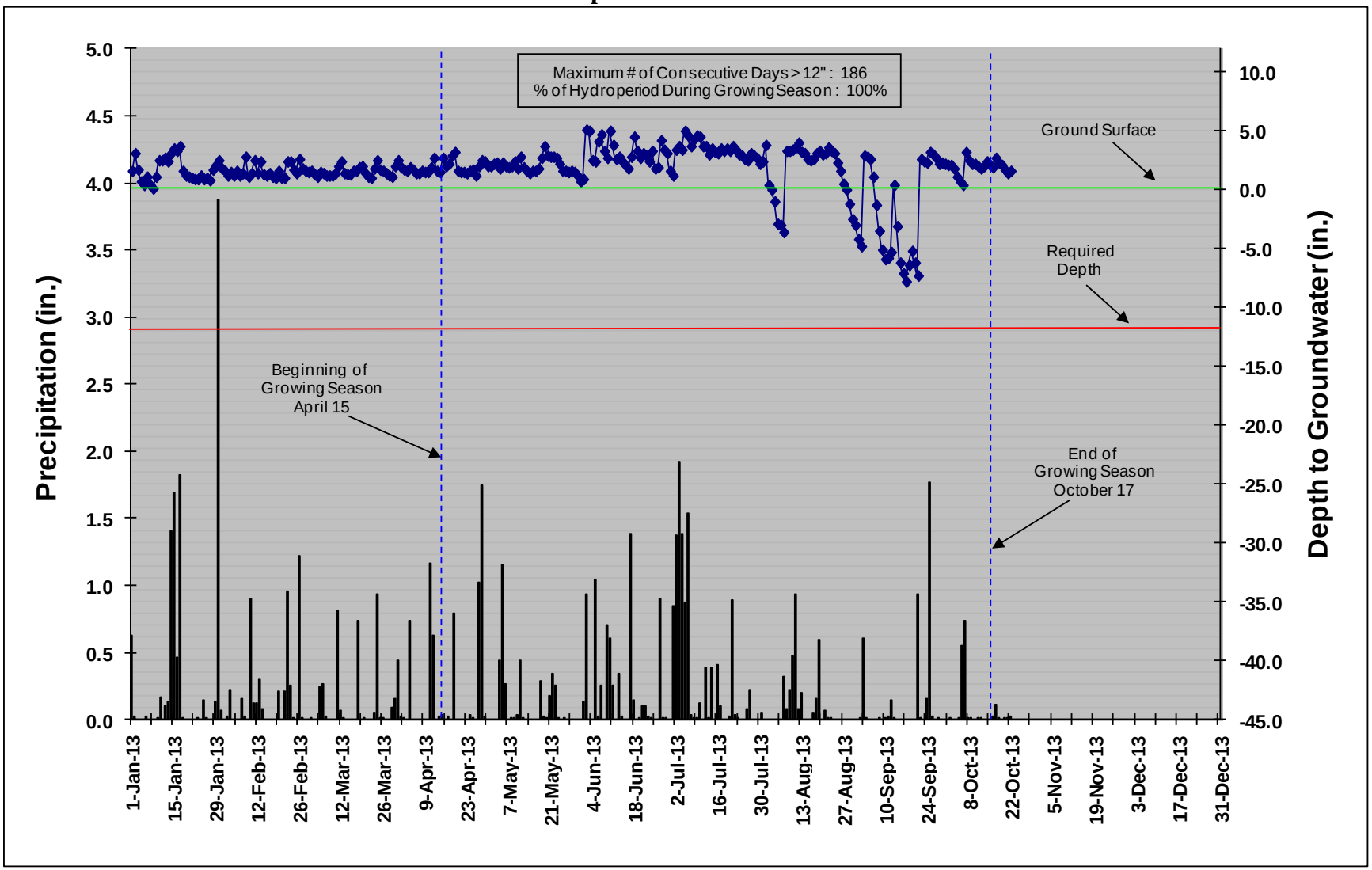
CC-12 Precipitation and Water Level Plot



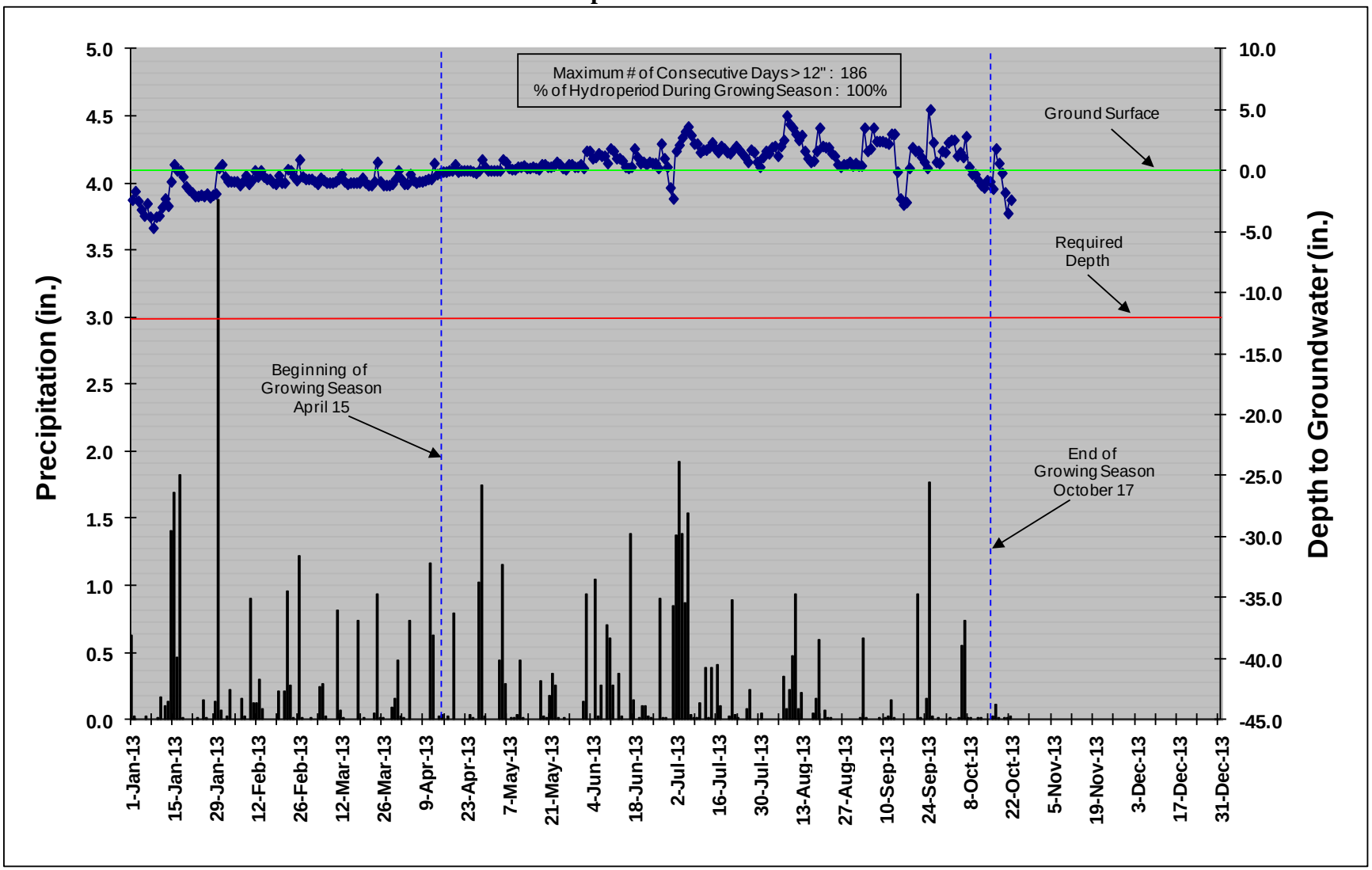
CC-13 Precipitation and Water Level Plot



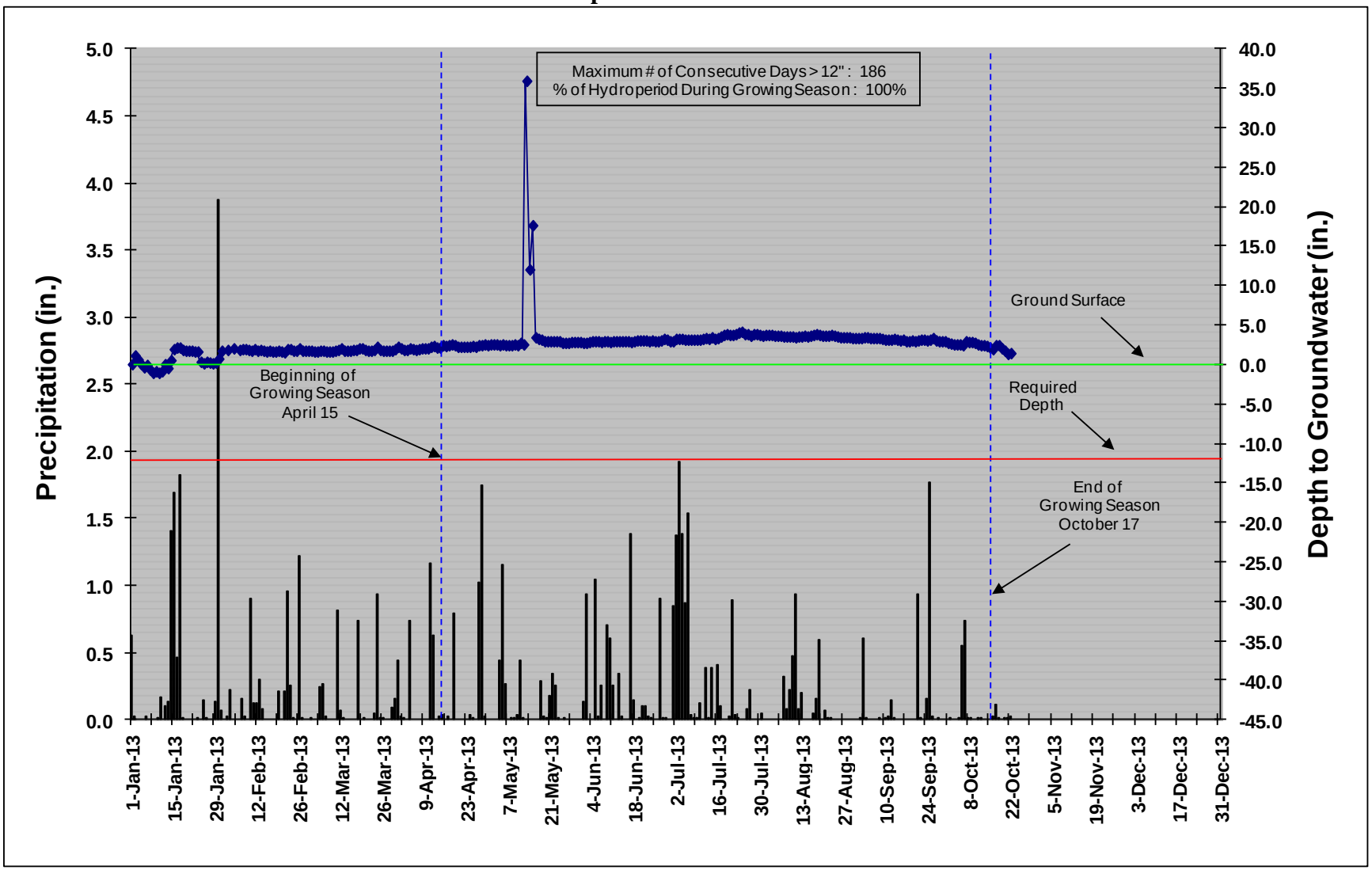
CC-14 Precipitation and Water Level Plot



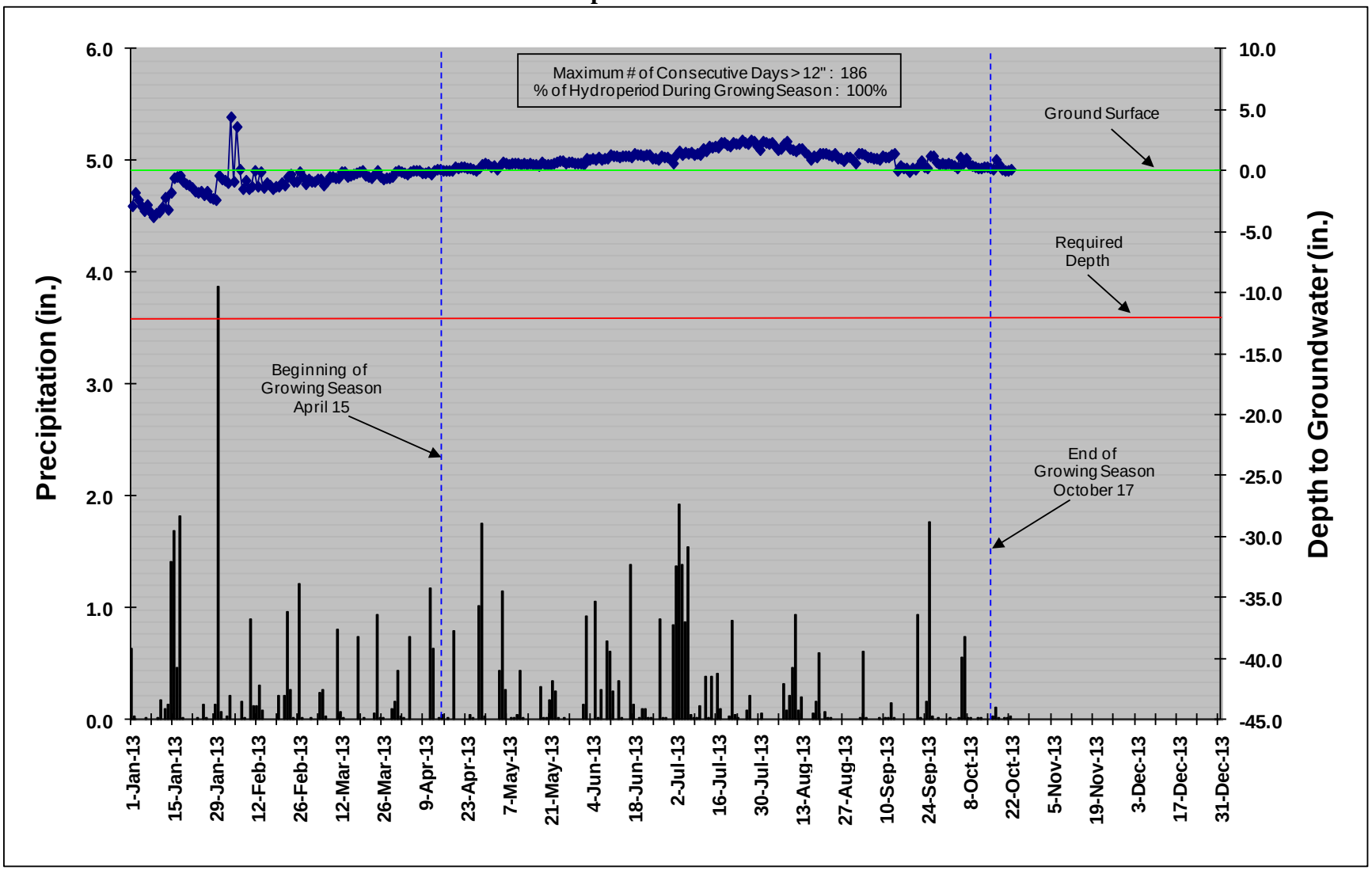
CC-15 Precipitation and Water Level Plot



CC-16 Precipitation and Water Level Plot



CC-17 Precipitation and Water Level Plot



CC-18 Precipitation and Water Level Plot

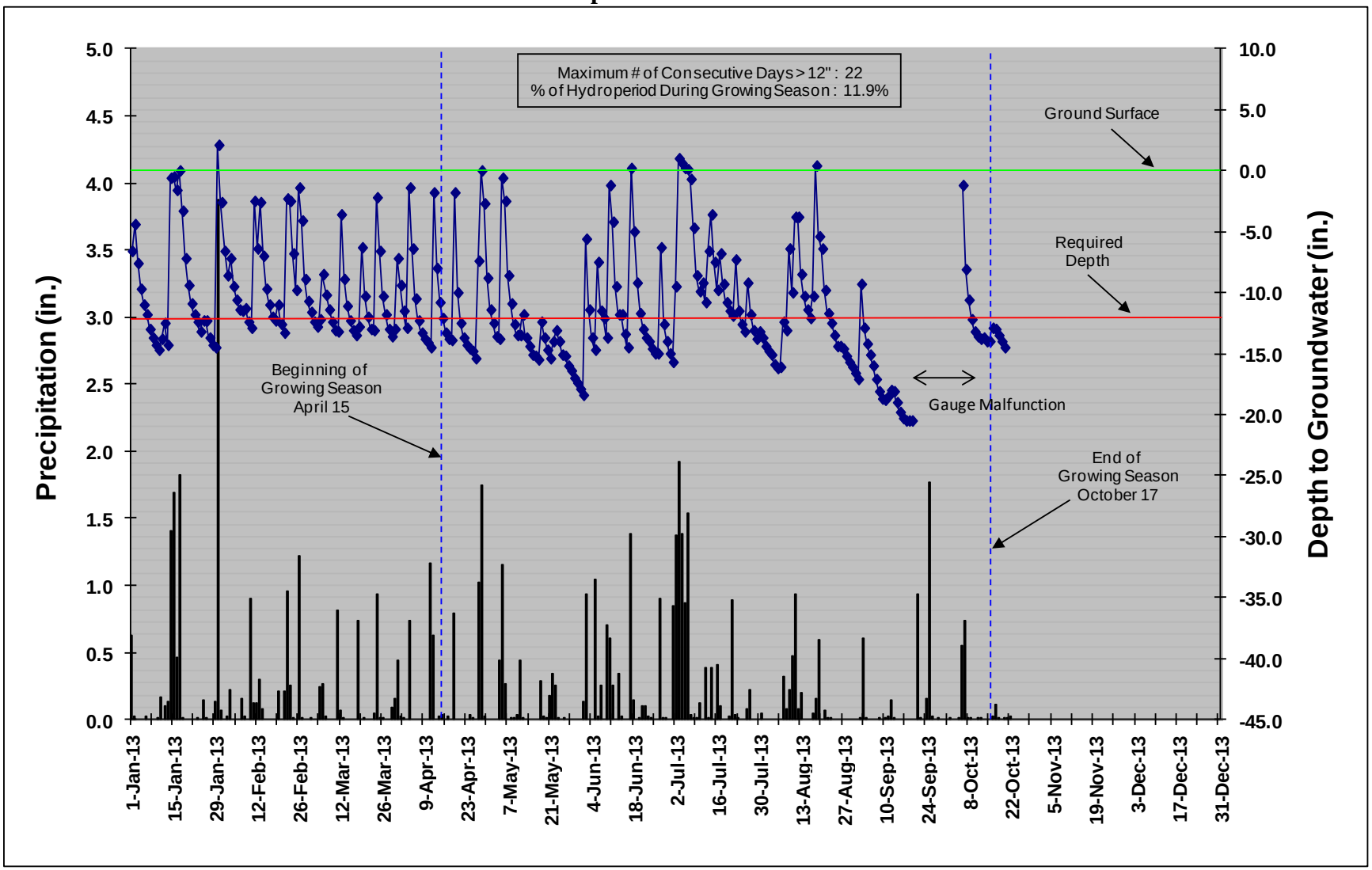


Table 13. Wetland Gauge Attainment Data Summary of Groundwater Gauge Results Cat Creek Stream & Wetland / Project No. 71					
Gauge ID	**Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)**				
	Year 1 (2010)	**Year 2 (2011)**	**Year 3 (2012)**	**Year 4 (2013)**	**Year 5 (2014)**
CC-1	Yes/ 35 Percent	Yes/31 16.8 Percent	Yes/42 22.6 Percent	Yes/186 100.0 Percent	
CC-2	Yes/ 16 Percent	Yes/37 20.0 Percent	Yes/26 14.0 Percent	Yes/65 35.1 Percent	
CC-3	Yes/ 8 Percent	Yes/24 13.0 Percent	No/13 7.0 Percent	Yes/42 22.7 Percent	
CC-4	Yes/ 35 Percent	Yes/88 47.6 Percent	Yes/64 34.4 Percent	Yes/186 100.0 Percent	
CC-5	Yes/ 32 Percent	Yes/50 27.0 Percent	Yes/52 28.0 Percent	Yes/186 100.0 Percent	
CC-6	No/ 2 Percent	Yes/25 13.5 Percent	Yes/18 9.7 Percent	Yes/61 33.0 Percent	
CC-7	No/ 0 Percent	No/12 6.5 Percent	No/12 6.5 Percent	Yes/41 22.2 Percent	
CC-8	Yes/ 33 Percent	Yes/39 21.1 Percent	Yes/65 34.9 Percent	Yes/186 100.0 Percent	
CC-9	Yes/ 22 Percent	Yes/186 100.0 Percent	Yes/186 100.0 Percent	Yes/186 100.0 Percent	
CC-10	Yes/ 9 Percent	Yes/97 52.4 Percent	Yes/72 38.7 Percent	Yes/94 50.8 Percent	
CC-11	Yes/ 11 Percent	Yes/27 14.6 Percent	Yes/40 21.5 Percent	Yes/61 33.0 Percent	
CC-12	Yes/ 41 Percent	Yes/50 27.0 Percent	Yes/46 24.7 Percent	Yes/186 100.0 Percent	
CC-13	N/A	Yes/118 63.8 Percent	Yes/186 100.0 Percent	Yes/186 100.0 Percent	
CC-14	Yes/ 30 Percent	Yes/26 14.1 Percent	Yes/65 34.9 Percent	Yes/186 100.0 Percent	
CC-15	Yes/ 33 Percent	Yes/88 47.6 Percent	Yes/73 39.2 Percent	Yes/186 100.0 Percent	
CC-16	Yes/ 100 Percent	Yes/139 75.1 Percent	Yes/186 100.0 Percent	Yes/186 100.0 Percent	
CC-17	N/A	Yes/117 63.2 Percent	Yes/186 100.0 Percent	Yes/186 100.0 Percent	
CC-18	No/ 3 Percent	Yes/23 12.4 Percent	No/4 2.2 Percent	Yes/22 11.9 Percent	

N/A - Information does not apply.

Hydrology Success Criteria = 8%

Appendix F
Wetland Boundary Delineation Data

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/17/13

Applicant/Owner: EEP State: NC Sampling Point: 01

Investigator(s): SJT Section, Township, Range:

Landform (hillslope, terrace, etc.): Creek Bottom Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA) LRR N Lat: 35.19624 Long: 83.8118 (spot) Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches): ____
Water Table Present?	Yes ____ No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X No ____	Depth (inches): 12

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

MW13 wetland hydrology success criteria last 4 years.

Remarks:

Sample located next to MW13

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 01

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula nigra	15	✓	FACW
2. Platanus occidentalis	10	✓	FACW
3. Salix nigra	10	✓	OBL
4. Fraxinus pennsylvanica	10	✓	FACW
5.			
6.			
7.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus serrulata	15	✓	OBL
2. Rubus spp.	5		
3. Rubus pergrinus	5	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	25 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	60	✓	FACW
2. Persicaria sp.	20	✓	FACW
3. Ludwigia alternifolia	5		FACW
4. Carex spp.	5		FACW
5. Sagittaria (sp.?)	10		OBL
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1. Weed			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10+15+10	x 1 =	35
FACW species	60+20+15+5+5+10	x 2 =	250
FAC species		x 3 =	
FACU species	5	x 4 =	20
UPL species		x 5 =	
Column Totals:	165 (A)		305 (B)

Prevalence Index = B/A = 1.85

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: D1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/6	100						
1-12	10YR 4/6	95	10YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/17/13

Applicant/Owner: EEP State: NC Sampling Point: UT2

Investigator(s): SHT Section, Township, Range:

Landform (hillslope, terrace, etc.): Creek Bottom Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.19604 Long: 83.54603 Datum: NAD83

Soil Map Unit Name: Nikwasi NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___
Water Table Present?	Yes X No ___	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

MW11 nearby, meets success criteria all 4 years

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus procumbens	25	✓	FACU
2. Alnus serrulata	15		OBL
3. Cornus amomum	15		FACW
4. Carpinus caroliniana	10		FAC
5. Fraxinus pennsylvanica	5		FACW
6.			
7.			
8.			
9.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	60	✓	FACW
2. Persicaria	15		FAC
3. Scirpus	15		OBL
4. Ludwigia alternifolia	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30')			
1. none			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15+15	x 1 =	30
FACW species	15+5+10+15+15	x 2 =	200
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species		x 5 =	
Column Totals:	135 (A)		360 (B)

Prevalence Index = B/A = 2.667

Hydrophytic Vegetation Indicators:

- ✓ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- __ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- __ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	95	10YR 4/6	5	C	PL		
8-16	10YR 4/1	95	10YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/17/12
Applicant/Owner: ESP State: NC Sampling Point: SP03
Investigator(s): SHT Section, Township, Range:
Landform (hillslope, terrace, etc.): Creek Bottom Local relief (concave, convex, none): Conc Slope (%): 0
Subregion (LRR or MLRA): LRR N Lat: 35.19508 Long: -83.58863 Datum: NAD83
Soil Map Unit Name: WnB NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Saturated area adjacent to stream. Sits @ toe of slope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Adjacent to MW3 which did not meet Hydro MY3; MY4?

Remarks:
Oxidized root spheres present; however, adjacent monitoring well has not met criteria 3 out of 4 monitoring years — Hydrology fails.

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula nigra	20	X	FACW
2. Salix nigra	20	X	OBL
3. Carpinus caroliniana	10		FAC
4. Fraxinus pennsylvanica	10		FACW
5. Alnus serrulata	10		OBL
6.			
7.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	20	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	60	X	FACW
2. Persicaria	10		FACW
3. ~~Rubus spp.~~			
4. Solidago spp.	10		FACW
5. Scirpus	20	X	OBL
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/2	95%	10YR 4/6	5	C	PL		
8 - 18	10YR 5/1	95	10YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes 1 No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/12/13
Applicant/Owner: EEP State: NC Sampling Point: SP64
Investigator(s): JHT Section, Township, Range:
Landform (hillslope, terrace, etc.): Creek Bottom Local relief (concave, convex, none): Mod Slope (%): 0
Subregion (LRR or MLRA): LRR N Lat: 35.19484 Long: -83.33855 Datum: NAD83
Soil Map Unit Name: Rawsi NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 0.5
Water Table Present?	Yes X	No	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Adjacent to MW6 – Meets success criteria

Remarks:

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alba	15	X	FACW
2. Salix alba	10	X	OBL
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	50	X	FACW
2. Salix sericata	10	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Herb Stratum (Plot size: 5')			
1. Typha latifolia	60	X	FACW
2. Solidago spp.	20	X	FACW
3. Scirpus	20	X	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/6	95	10YR 5/6	5	C	PL		
6-12	10YR 5/1	95	10YR 5/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/17/13
Applicant/Owner: EEP State: NC Sampling Point: SP05
Investigator(s): J.H.T Section, Township, Range:
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRR N Lat: 35.19569 Long: -83.341080 Datum: NAD83
Soil Map Unit Name: Nikwasi NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____
Are Vegetation N, Soil N or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes X No ____ Depth (inches): 7
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Adjacent to MW13 - Meets hydrology success criteria

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SPS

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Carpinus caroliniana	5	X	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	25	X	OBL
2. Betula nigra	5 10	X	FACW
3. Carpinus caroliniana	5		FAC
4. Fraxinus pennsylvanica	5		FACW
5.			
6.			
7.			
8.			
9.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Herb Stratum (Plot size: 5')			
1. Sedge	10		OBL
2. Juncus effusus	70	X	FACW
3. Peperomia	10		FACW
4. Ludwigia alternifolia	10		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	50	10YR 3/1	45	C	M		Manganese masses
0-4	10YR 4/3	45	" "					
4-8	10YR 4/2	95	10YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- X Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/18/13

Applicant/Owner: NCEEP State: NC Sampling Point: SP06

Investigator(s): JHT, DA Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.19606 Long: -83.35051 Datum: NAD83

Soil Map Unit Name: Reddies/N.kwasi NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___	
Water Table Present?	Yes X No ___	Depth (inches): 4	
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 0	Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP06

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 5		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix nigra	70	X	OBL
2. Cornus amomum	10		FACW
3. Alnus serrulata	30	X	OBL
4. Ligustrum sinense	10		FACU
5. ~~Rhus~~ Rubus pergamus	10		FACU
6.			
7.			
8.			
9.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	70	X	FACW
2. Persicaria	10		FACW
3. Aster spp	10		FACW
4. Carex spp	10		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

X

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 5/1	95	10YR 4/4	5				
3-16	10YR 4/1	100						Abundant organic matter

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Marion Sampling Date: 12/18/13

Applicant/Owner: NRCP State: NC Sampling Point: SP07

Investigator(s): JHT, DA Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.19622 Long: 83.33035 Datum: NAD83

Soil Map Unit Name: Nikwasi NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 2

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP 7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	5	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Sapling/Shrub Stratum (Plot size: 15')			
1. Q. phellos	10	X	FAC
2. Salix nigra	10	X	OBL
3. frpe	5		FACW
4. alnus serrulata	5		OBL
5. sambucus spp.	5		FACW
6.			
7.			
8.			
9.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		
Herb Stratum (Plot size: 5')			
1. aster sp.	20	X	FACW
2. juncus effusus	20	X	FACW
3. ludwigia alternifolia	5		FACW
4. scirpus (cyperus)	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	95	7.5YR 4/6	5	C	PL		
4-16	10YR 4/3	95	7.5YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: ~~SPB~~ 12/18/13

Applicant/Owner: NCEEP State: NC Sampling Point: SPB

Investigator(s): JHT, PMH Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): Lat: 35.19689 Long: -83.52990 Datum: NAD83

Soil Map Unit Name: Dewars! NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ~, Soil ~, or Hydrology ~ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ~, Soil ~, or Hydrology ~ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ___ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

SP adjacent to MW3; failed success criteria in MY3.

Remarks:

Sample point is ~5 yards from MW3 which has failed success criteria. MW3 may fail because it is located/surrounded by Alder & willow.

Open area adjacent passes due to oxidized rhizospheres.

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP8

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. salix nigra	30	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Sapling/Shrub Stratum (Plot size: 15')			
1. salix nigra	5		OBL
2. betula nigra	15	X	FACW
3. FRPE	10		FACW
4. cornus amomum	35	X	FACW
5. Rubus pergratus	10		FACU
6.			
7.			
8.			
9.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Herb Stratum (Plot size: 5')			
1. aster	10		FACW
2. juncus effusus	60	X	FACW
3. persicaria sp.	20	X	FACW
4. dichanthelium clandestinum	5		FAC
5. carex sp.	5		FACW
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	95	7.5YR 4/6	5	C	PL		
6-16	10YR 4/2	95	7.5YR 4/6	5	C	PL		abundant Mn

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes Y No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/18/13

Applicant/Owner: NCEEP State: NC Sampling Point: SP 9

Investigator(s): JHT, DMM Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): Lat: 35.19814 Long: 83.32838 Datum: NAD83

Soil Map Unit Name: Nikwasi NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No X Depth (inches):

Water Table Present? Yes X No Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes X No Depth (inches): 4

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

aligned to MW2.

Remarks:

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP9

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	X	OBL
2. acer rubrum	15	X	FAC
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		
Sapling/Shrub Stratum (Plot size: 15')			
1. FRPE	20	X	FACW
2. Betula Nigra	5		FACW
3. liquidambar styraciflua	1		FAC
4.			
5.			
6.			
7.			
8.			
9.			
	26 = Total Cover		
50% of total cover: 13	20% of total cover: 5.2		
Herb Stratum (Plot size: 5')			
1. aster	20	X	FACW
2. scirpus	5		OBL
3. juncus effusis	15		FACW
4. carex sp.	15		FACW
5. persicaria	40	X	FACW
6. toniger diagram			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30')			
1. lonicera japonica	15	X	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- __ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- __ 3 - Prevalence Index is ≤3.0[1]
- __ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- __ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	90	7.5YR 4/6	10	C	PL		
6-16	10YR 4/4	40	10YR 2/1	5	?	M		Mn masses ? F12
6-16	10YR 4/2	55						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- X Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/18/13

Applicant/Owner: NCEEP State: NC Sampling Point: SP10

Investigator(s): JMT, DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.193838 Long: 83.32785 Datum: NAD83

Soil Map Unit Name: NkF NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

in vicinity of well (15 yards)

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP10

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. FrPe	10	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Sapling/Shrub Stratum (Plot size: 15')			
1. FrPe	20	X	FACW
2. rubus pergratus	25	X	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Herb Stratum (Plot size: 5')			
1. aster sp	10	X	FACW
2. ~~lonicera~~			
3. dicanthelium clandestine	1		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	11 = Total Cover		
50% of total cover: 5.5	20% of total cover: 2.2		
Woody Vine Stratum (Plot size: 30')			
1. lojn (recently treated)	60	X	FAC
2.			
3.			
4.			
5.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/4	100						
4-12	10YR 4/2	90	7.5YR 4/6	5				
4-12			10YR 2/1	5	?	M		Mg masses

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Dopleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat creek City/County: Macon Sampling Date: 12/12/13

Applicant/Owner: NCEEP State: NC Sampling Point: SP11

Investigator(s): JHT, PAA Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.20071 Long: 83.34158 Datum: NAD83

Soil Map Unit Name: NkwaSi NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches): ____
Water Table Present?	Yes ____ No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Adjacent to MW18; failed success criteria 3 out of 4 years

Remarks:

Oxidized rhizospheres, but fails hydrology success criteria 3 of 4 years.

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP10

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover: ____	20% of total cover: ____		
Sapling/Shrub Stratum (Plot size: 15)			
1. Betula nigra	10	X	FACW
2. Cornus dmomum	10	X	FACW
3. Rubus pergrafis	10	X	FACU
4. Rosa sp.	10	X	OBL
5. Salix nigra	1		OBL
6.			
7.			
8.			
9.			
	41 = Total Cover		
50% of total cover: 20.5	20% of total cover: 8.2		
Herb Stratum (Plot size: 5')			
1. Alternanthera philoxeroides	10		FAC
2. Juncus effusus	30	X	FACW
3. Solidago sp.	10		FACU
4. Rudbeckia sp.	1		FACW
5. Mixed grass	5		
6.			
7.			
8.			
9.			
10.			
11.			
	56 = Total Cover		
50% of total cover: 28	20% of total cover: 11.2		
Woody Vine Stratum (Plot size: 30)			
1. Toxicodendron radicans	10	X	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	95	7.5YR 4/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/18/13

Applicant/Owner: NCEEP State: _____ Sampling Point: SP 12

Investigator(s): JHT, DMA Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR J Lat: 35.20097 Long: -83.34138 Datum: NAD83

Soil Map Unit Name: ncwaSt NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes Y No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ True Aquatic Plants (B14)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Stunted or Stressed Plants (D1)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ Microtopographic Relief (D4)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 2
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP12

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	15	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling/Shrub Stratum (Plot size:)			
1. Cornus amomum	10	X	FACW
2. Alnus serrulata	10	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size:)			
1. Swamp rose	5		OBL
2. Sedges	40	X	OBL
3. Juncus	10		FACW
4. Osmunda	15	X	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Woody Vine Stratum (Plot size:)			
1. Toxicodendron	10	X	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/1	97	7.5YR 4/6	3	C	PL		sulfur smell

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat Creek City/County: Macon Sampling Date: 12/18/13

Applicant/Owner: NCEEP State: NC Sampling Point: SP15

Investigator(s): JMT, CVMA Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 35.20053 Long: -83.34180 Datum: NAD83

Soil Map Unit Name: Nanthalla NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ____	Depth (inches): 6
Water Table Present?	Yes X No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SPB

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum (Plot size:)			
1. Cornus amomum	20	X	FACW
2. alnus serrulata	10	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		

Herb Stratum (Plot size:)			
1. juncus	30	X	FACW
2. scirpus	20	X	OBL
3. cat tail (typha latifolia)	40	X	OBL
4. asters	10		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	95	7.5YR 4/6	5				
6-12	10YR 4/4							mineral soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- Y Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Cat creek City/County: Macon Sampling Date: 12/18
Applicant/Owner: NCEEP State: NC Sampling Point: SP14
Investigator(s): JHT, DAA Section, Township, Range:
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRRN Lat: Long: Datum: NAD83
Soil Map Unit Name: NikwasI NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation n, Soil n, or Hydrology n significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation n, Soil n, or Hydrology n naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___	Is the Sampled Area within a Wetland?	Yes ___ No ___
Hydric Soil Present? Yes X No ___		
Wetland Hydrology Present? Yes X No ___		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes X No ___ Depth (inches): 0
Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers Eastern Mountains and Piedmont – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point:_____

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover: ____	20% of total cover: ____		
Sapling/Shrub Stratum (Plot size: 15)			
1. Cornus amomum	10	X	FACW
2. Alnus serrulata	10	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 5)			
1. Juncus effusus	30	X	FACW
2. Scirpus	30	X	OBL
3. aster	20	X	FACW
4. "Cat tail" (Typha latifolia)	10		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover: ____	20% of total cover: ____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0

SOIL Sampling Point: SP 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	95	7.5YR 4/6	5				
6-16	10YR 2/1	95	10YR 4/4	5				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

US Army Corps of Engineers — Eastern Mountains and Piedmont – Version 2.0