Mitigation Project Name	Sandy Bridge Farm	County	Rutherford	USACE Action ID	2015-00827
DMS ID	96920	Date Project Instituted	4/10/2015	NCDWR Permit No	2015-0414
River Basin	Broad	Date Prepared	5/22/2018		
Cataloging Unit	03050105				

Credit Release Milestone	Stream Credits						Wetland Credits							
	Scheduled Releases (Stream)	Warm	Cool	Cold	Anticipated Release Year (Stream)	Actual Release Date (Stream)	Scheduled Releases (Forested)	Riparian Riverine	Riparian Non-riverine	Non-riparian	Scheduled Releases (Coastal)	Coastal	Anticipated Release Year (Wetland)	Actual Release Date (Wetland)
Potential Credits (Mitigation Plan)			1,626.000						6.740					
Potential Credits (As-Built Survey)			1,626.000						6.653					
1 (Site Establishment)	N/A				N/A	N/A	N/A				N/A		N/A	N/A
2 (Year 0 / As-Built)	30%		487.800		2017	5/19/2017	30%		1.996		30%		2017	5/19/2017
3 (Year 1 Monitoring)	10%		162.600		2018	4/25/2018	10%		0.665		10%		2018	4/25/2018
4 (Year 2 Monitoring)	10%				2019		10%				15%		2019	
5 (Year 3 Monitoring)	10%				2020		10%				20%		2020	
6 (Year 4 Monitoring)	5%				2021		10%				10%		2021	
7 (Year 5 Monitoring)	10%				2022		10%				15%		2022	
8 (Year 6 Monitoring)	5%				2023		10%				N/A		2023	
9 (Year 7 Monitoring)	10%				2024		10%				N/A		2024	
Stream Bankfull Standard	10%						N/A				N/A			
Total Credits Released to Date			650.400						2.661					

DEBITS (released credits only)

Ratios			1	1.5	2.5	5	1.02961	3	2	5	1	3	2	5	1	3	2	5
			Stream Restoration	Stream Enhancement I	Stream Enhancement II	Stream Preservation	Riparian Restoration	Riparian Creation	Riparian Enhancement	Riparian Preservation	Nonriparian Restoration	Nonriparian Creation	Nonriparian Enhancement	Nonriparian Preservation	Coastal Marsh Restoration	Coastal Marsh Creation	Coastal Marsh Enhancement	Coastal Marsh Preservation
As-Built Amounts (feet and acres)			1,626.000				6.850											
As-Built Amounts (mitigation credits)			1,626.000				6.653											
Percentage Released			40.000%				40.000%											
Released Amounts (feet / acres)			650.400				2.740											
Released Amounts (credits)			650.400				2.661											
NCDWR Permit	USACE Action ID	Project Name																
2009-1301		Kings Mountain Quarry Expansion					2.055											
2009-1301		Kings Mountain Quarry Expansion					0.685											
Remaining Amounts (feet / acres)			650.400				0.000											
Remaining Amounts (credits)			650.400				0.000											

Contingencies (if any): None

Signature of Wilmington District Official Approving Credit Release

9/6/18
Date

1 - For NCDMS, no credits are released during the first milestone
2 - For NCDMS projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCDMS Portal, provided the following criteria have been met:
1) Approval of the final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
4) Reciept of necessary DA permit authorization or written DA approval for porjects where DA permit issuance is not required

3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

Monitoring Report MY02

Sandy Bridge Restoration Site
DMS Contract 6400
DMS Project Number 96920

DWR #: 15-0414
USACE Action ID: 201500827
Rutherford County, North Carolina

Prepared for:
NCDMS, 1652 Mail Service Center, Raleigh, NC 27699-1652

Monitoring Data Collected: September 2018
Date Submitted: December 2018

Monitoring and Design Firm

Prepared by:

KCI Associates of North Carolina, PC
4505 Falls of Neuse Road
Suite 400
Raleigh, NC 27609
(919) 783-9214

Project Contact: Tim Morris
Email: tim.morris@kci.com

December 2018

KCI ASSOCIATES OF NC

ISO 9001:2008 CERTIFIED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

4505 Falls of Neuse Road, Suite 400 • Raleigh, NC 27609

January 11, 2018

Mr. Harry Tsomides
Project Manager
North Carolina Division of Mitigation Services
5 Ravenscroft Dr. #102
Asheville, NC 28801

Re: Response to Sandy Bridge Farm MY02 Report Comments

Dear Mr. Tsomides,

KCI has reviewed the comments prepared by the DMS for the Sandy Bridge Farm MY02 Report and has prepared the following responses:

1. There were multiple loose tubular steel gates around a relict beaver dam near the upstream end of the project. One is becoming embedded into the stream bank.
   KCI Response: An attempt was made to remove these gates by hand in 2018, but only one was able to be removed. The others had become so embedded in the stream that it was not possible to remove them with just shovels. KCI plans to remove these gates in 2019 when there is equipment on site to repair the eroding stream at the downstream end of the project.
2. Please indicate whether KCI has fixed the sign posts at the lower end of the project that had easement signage on either side of the same post. Easement signage should only be evident when looking into the easement.
   KCI Response: This issue has been corrected.
3. Please note the location of the eroding stream on the CCPV (Problem Area photos 3 and 4).
   KCI Response: This has been added to the CCPV.

Please contact me if you have any questions or would like clarification concerning these responses.

Sincerely,

Adam Spiller
Project Manager

TABLE OF CONTENTS

Appendix A – Background Tables

Appendix B – Visual Assessment Data

Appendix C – Vegetation Plot Data

Appendix D – Stream Measurement and Geomorphology Data

Appendix E – Hydrologic Data

PROJECT SUMMARY

The Sandy Bridge Farm Restoration Site (SBFRS) was completed in March 2017 and restored a total of 6.85 acres of riparian wetland (1.29 acres of wetland rehabilitation and 5.56 acres of wetland reestablishment) and 1,626 linear feet of stream. The SBFRS is a riparian system located in the Broad River Basin (03050105 8-digit cataloging unit) in Rutherford County, North Carolina that had been substantially modified to maximize the use of the area for grazing. The completed project will restore impacted agricultural lands to a functioning stream and wetland ecosystem with enhanced water quality, restored hydrology, and improved fish and wildlife habitat.

The SBFRS is protected by a 9.5 acre permanent conservation easement, held by the State of North Carolina. The site is located off of Rock Road, approximately 3 miles north of Rutherfordton, North Carolina. The project site is bounded by interspersed pastureland and forested land to the east, agricultural land and Rock Road to the north-northwest, and Catheys Creek to the southwest.

The North Carolina Ecosystem Enhancement Program's (NCEEP) publication in 2009 identified HUC 03050105070020 (Catheys Creek) as a Targeted Local Watershed (TLW). The goals and priorities for SBRFS are based on the information presented in the Broad River Basin Restoration Priorities: to restore wetland and stream functions, to maintain and enhance water quality, to restore hydrology, and to improve fish and wildlife habitat (NCEEP 2009). The project goals, which reflect those from the approved Mitigation Plan, are in line with the following basin priorities:

- Reduce sources of sediment and nutrients by restoring riparian buffer vegetation, excluding livestock, and restoring natural geomorphology.
- Prioritize project implementation in the Catheys Creek local watershed planning area.

The goals for the project are to:

- Restore a channelized stream to a meandering C-type channel with a floodplain.
- Buffer and reduce sediment impacts to the project stream.
- Restore a Piedmont Alluvial Forest Community.
- Restore a wetland hydroperiod to drained and livestock-impacted land.

The project goals will be addressed through the following objectives:

- Relocate a channelized stream to its historic landscape position.
- Install an appropriately-sized channel cross-section.
- Install bedform diversity with pools, riffles, and habitat structures.
- Demarcate the project easement boundaries and fence out livestock.
- Plant the site with native trees and shrubs and an herbaceous seed mix that supports the development of a Piedmont Alluvial Forest.
- Fill field ditches and redevelop wetland microtopography to slow the flow of surface and subsurface drainage.

To restore the site, select ditches across the site were modified or filled and incoming surface inputs and seeps were integrated to create a stream/wetland complex. Additionally, Tributary 1 to Catheys Creek was improved with Priority 1 stream restoration to re-meander the stream and elevate the groundwater table. The entire site was planted as a Piedmont Alluvial Forest community (Schafale 2012). The site was constructed as designed with no modification from the design plan.

The majority of monitoring components were installed in March 2017. Nine groundwater monitoring wells were installed to evaluate the attainment of jurisdictional wetland hydrology. A stream gauge was installed on Tributary 1 to Catheys Creek to record the occurrence of bankfull events. To determine the success of the planted mitigation areas, eight 10 m x 10 m permanent vegetation monitoring plots were

established. The location of the planted stems relative to the origin within these plots, as well as the species, was recorded and planted stems were grouped into size categories (0-10 cm, 10-50 cm, 50-100 cm, >137 cm). Any volunteers found within the plots were also grouped into size categories by species, but separate from the planted stems. Six permanent photo reference points were established and will be taken annually. Four permanent cross-sections (two sets of coupled riffles and pools) were also established and a detailed longitudinal profile of the stream was taken. Wolman pebble counts were performed at both of the riffle cross-sections. The cross-section measurements will be repeated in future monitoring years, but the longitudinal profile will only be repeated if there are concerns about bed elevation adjustments. Reports will be submitted to DMS by the end of each monitoring year. On March 30, 2018 three additional groundwater monitoring wells were installed along the area of the filled, pre-construction stream channel. On September 10, 2018, two additional vegetation plots were installed near the southern end of the site.

Vegetative success criteria for the site is 320 woody stems/acre after three years, 260 woody stems/acre after five years, and 210 woody stems/acre after seven years. The baseline monitoring counted an average of 647 woody stems/acre. To meet the hydrologic success criteria, the upper 12 inches of the soil profile must have continuously saturated or inundated conditions for at least 10% of the growing season during normal weather conditions. The soil survey for Rutherford County estimates the growing season begins April 4 and ends November 6 (217 days), meaning the water table must be within 12 inches of the surface for at least 22 consecutive days during the growing season. A minimum of two bankfull events must also be recorded during the monitoring period. Bank height ratios should not exceed 1.2 and the entrenchment ratios should be 2.2 or greater. Visual assessments will also be used to identify problem areas.

MONITORING RESULTS

The site was planted in March 2017 with tree tube protection installed around many of the planted stems. The second-year monitoring was conducted September 10, 2018. The site averaged 551 planted stems/acre across all 10 plots. Seven of the 10 plots had greater than 320 planted stems/acre, with Plots 1, 7, and 8 not achieving the success criteria. Including volunteers, the site averaged 647 total stems/acre. The vegetation near the stream was significantly impacted by beavers during the second monitoring year. Although there is still a good quantity of woody stems in this area, many of the previously large and healthy stems have been chewed down to a smaller size or killed by beaver activity. Even with the beaver impacts, in general, the site is well vegetated, with widespread herbaceous coverage and many healthy planted stems. KCI is evaluating the need for supplemental planting in areas where the herbaceous vegetation is outcompeting the planted woody stems and where beaver damage is most severe.

Daily rainfall data were obtained from the NC State Climate Office for a local weather station in Rutherfordton, NC. In 2018 the months of April, May, July, September and October experienced above average rainfall, while February, March, June, and August experienced average rainfall. The month of January, experienced below average rainfall for the site. Overall, the area experienced above average rainfall during the 2018 growing season. During the site's second growing season, 9 of the 12 groundwater monitoring wells had continuous saturation within 12 inches of the ground surface for 10% (22 days) or more of the 217 day growing season (April 4 to November 6). Two of the unsuccessful gauges were from the three placed in the filled stream location. It is expected that that due to the fill material in the old stream, this specific part of the site may take longer to settle and establish soil conditions that will hold water as effectively as the undisturbed natural hydric soils throughout the rest of the site. The other wetland gauge that did not meet hydrology had a gauge malfunction.

The stream gauge has recorded multiple bankfull events in each year since construction, including 11 bankfull events in 2018. This large number of bankfull events is the desired outcome for this project. A component of the stream design was to provide regular recharging of the riparian wetlands from overbank

stream flows. In June 2018, several large beaver dams were discovered towards the lower half of the stream. These dams were removed in early August 2018. A second set of dams was discovered in October 2018 and were removed in early November 2018. KCI is actively trapping beavers on-site and monitoring for further signs of beaver activity. See Appendix B and Appendix E for more information.

The longitudinal profile was not repeated for the second-year survey as there were no concerns about bed elevation adjustments. The second-year cross-section survey found that the dimensions of the stream are as designed, with some variation as is typical for stream restoration projects. Cross-section 2 (pool) has shown a significant amount of aggradation, with a middle channel bar developing in the center of the stream. It is believed that this is a result of the beaver backwater activity, as well as the large amount of sediment input from the unbuffered portion of stream just upstream of the project reach. It is anticipated that much of this sediment will wash through now that the beaver dams have been removed.

The monitored cross-section data have been calculated by adjusting the bankfull elevation to maintain the baseline bankfull area for each cross-section. A total cross-sectional metric has been added to the cross-section data to indicate the cross-sectional area below the baseline bankfull elevation. In instances where there has been some lateral aggradation and narrowing (XS1) the data show the cross-section having a significantly higher bankfull width and higher width/depth ratio as compared to previous years. The comparison of cross-section plots between monitoring events illustrates that this change does not indicate a problematic change in cross-section condition. Future monitoring will determine if this is a trend or typical settling of the stream following construction.

The right bank of the stream that flows along the easement's southern boundary has been experiencing significant erosion due to several areas of obstruction in the center of this channel that are diverting water into the banks. Although this stream is not part of the project, and is located outside of the easement bounds, the erosion on the right bank has encroached into the easement. KCI is planning to repair and stabilize this area within the next year. This will involve removing the mid-channel obstructions and sloping back the eroding bank. See Appendix B for photos of this area.

REFERENCES

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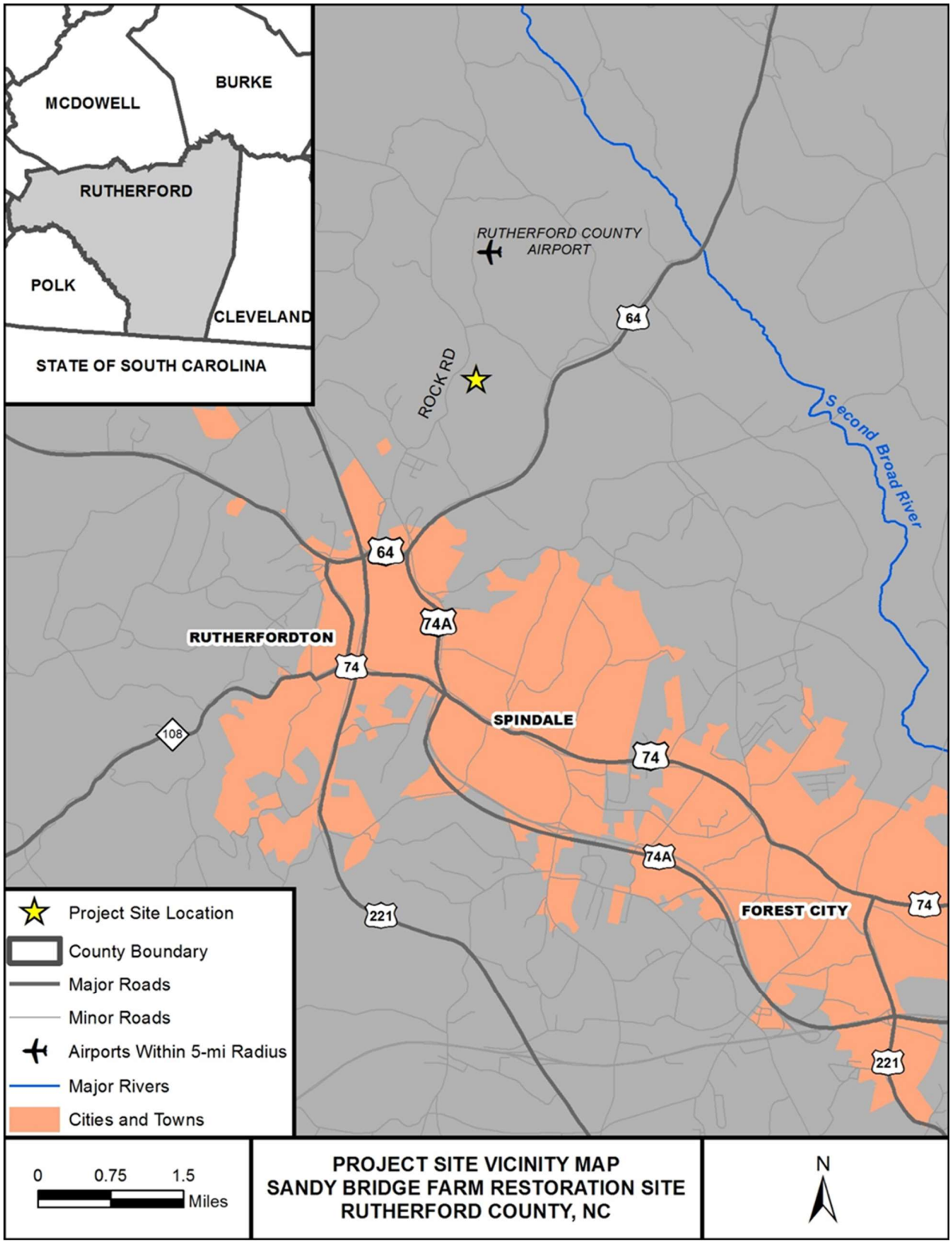
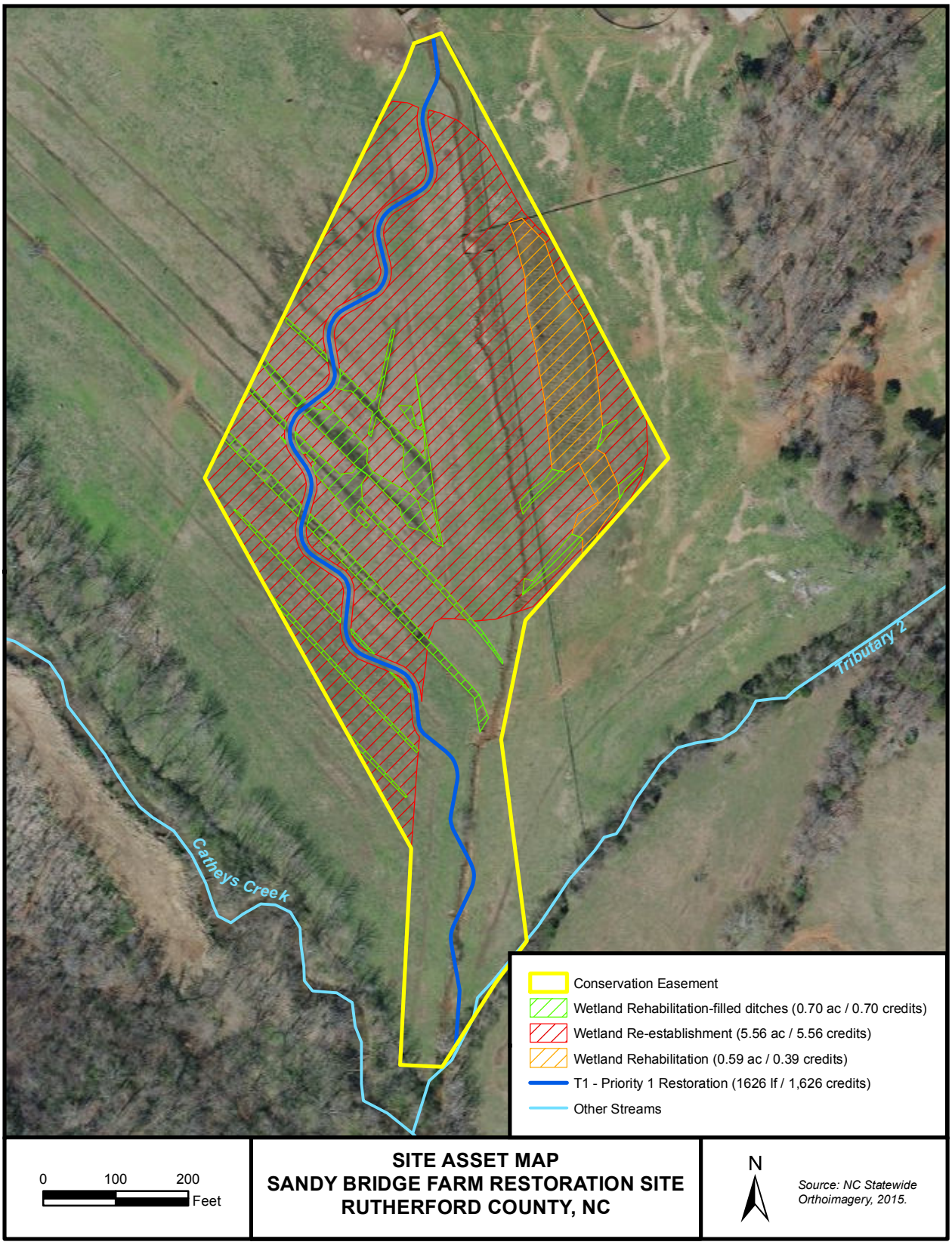

MCDOWELL
BURKE
RUTHERFORD
POLK
CLEVELAND
STATE OF SOUTH CAROLINA
RUTHERFORD COUNTY AIRPORT
ROCK RD
64
Second Broad River
RUTHERFORDTON
74A
74
SPINDALE
108
FOREST CITY
221
Project Site Location
County Boundary
Major Roads
Minor Roads
Airports Within 5-mi Radius
Major Rivers
Cities and Towns
0 0.75 1.5
Miles
PROJECT SITE VICINITY MAP
SANDY BRIDGE FARM RESTORATION SITE
RUTHERFORD COUNTY, NC
N



SITE ASSET MAP
SANDY BRIDGE FARM RESTORATION SITE
RUTHERFORD COUNTY, NC

Source: NC Statewide Orthoimagery, 2015.

APPENDIX A

Background Tables

Table 1. Project Components and Mitigation Credits
Sandy Bridge Farm Restoration Site, DMS Project #96920

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Credits	1,626		6.65						

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio	Credits
Tributary 1	10+00 to 26+26	1,470 lf	PI	Restoration	1,626 lf	1:1	1,626
Wetland Reestablishment				Restoration	5.56 ac	1:1	5.56
Wetland Rehabilitation*		0.79 ac		Restoration	0.70 ac	1:1	0.70
Wetland Rehabilitation		0.59 ac		Restoration	0.59 ac	1.5:1	0.39

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)		Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)
		Riverine	Non-Riverine			
Restoration	1,626 lf					
Reestablishment		5.56 ac				
Rehabilitation		1.29 ac				
Enhancement						
Creation						
Preservation						
High Quality Preservation						

R= Restoration RE= Restoration Equivalent of Creation or Enhancement
*=wetland rehabilitation associated with filled ditches

Table 2. Project Activity & Reporting History Sandy Bridge Farm Restoration Sites, DMS Project #96920		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		June 2016
Final Design - Construction Plans		June 2016
Construction Grading Completed		Aug 29, 2016
Planting Completed		March 11, 2017
Baseline Monitoring/Report	March 2017	April 2017
Vegetation Monitoring	*March 21, 2017*	
Stream Survey	*March 20, 2017*	
Year 1 Monitoring	November 2017	December 2017
Vegetation Monitoring	*October 26, 2017*	
Stream Survey	*November 6, 2017*	
Additional Groundwater Gauges Installed		March 30, 2018
Additional Vegetation Plots Installed		September 10, 2018
Year 2 Monitoring	September 2018	December 2018
Vegetation Monitoring	*September 10, 2018*	
Stream Survey	*XS1 and 2: June 28, 2018* *XS3 and 4: September 11, 2018*	

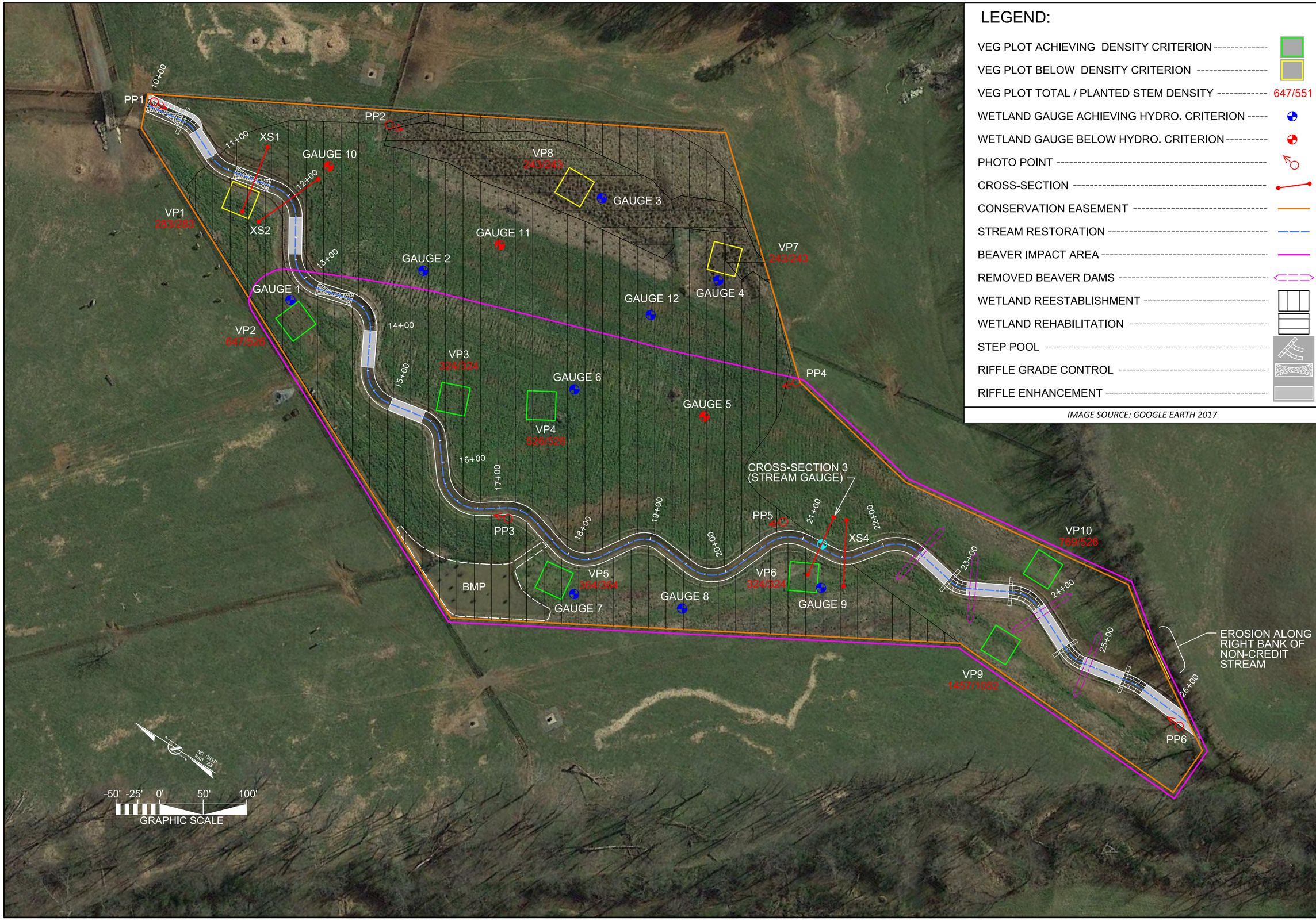
Table 3. Project Contacts Sandy Bridge Farm Restoration Sites, DMS Project #96920	
Design Firm	KCI Associates of North Carolina, PC 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	KCI Environmental Technologies and Construction 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512
Planting Contractor	Conservation Services Inc. 1620 N. Delphine Ave. Waynesboro, VA 22980 Contact: Mr. David Coleman Phone: (540) 941-0067
Monitoring Performers	KCI Associates of North Carolina, PC 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4. Project Information Sandy Bridge Farm Restoration Site, DMS Project #96920			
Project Name	Sandy Bridge Farm Restoration Site		
County	Rutherford County		
Project Area (acres)	9.45 acres		
Project Coordinates (lat. and long.)	35.407997° N, -81.937000° W		
Project Watershed Summary Information			
Physiographic Province	Piedmont		
River Basin	Broad		
USGS Hydrologic Unit 8-digit	03050105	**USGS Hydrologic Unit 14-digit**	03050105070020
DWQ Sub-basin	9-41-13-(0.5)		
Project Drainage Area (acres)	837 acres		
Project Drainage Area Percentage of Impervious Area	8%		
CGIA Land Use Classification	Mixed Hardwoods/Conifers 42% (350.0 ac), Managed Herbaceous Cover 39% (329.3 ac), Mountain Conifers 12% (99.5 ac), Mixed Shrubland 5% (43.5 ac), Low Intensity Developed 1% (11.0 ac)		
Existing Reach Summary Information			
Parameters	**T1**		
Length of reach (linear feet)	1,470 lf		
Valley classification	Valley Type VIII		
Drainage area (acres)	837 acres		
NCDWQ Water Quality Classification	WS-V (Water Supply – upstream)		
Morphological Description (stream type)	Ditched channel		
Evolutionary trend	Channelized		
Mapped Soil Series	Wehadkee-Chewacla Association		
Drainage class	Poorly drained; Somewhat poorly drained		
Soil Hydric status	Drained hydric		
Slope	0-1%		
FEMA classification	Zone AE		
Existing vegetation community	N/A (Pasture)		
Percent composition of exotic invasive vegetation	5%		
Existing Wetland Summary Information			
Parameters			
Size of Wetland (acres)	0.59 acres (Wetland Rehabilitation Area)		
Wetland Type	Headwater Seep		
Mapped Soil Series	Wehadkee-Chewacla Association		
Drainage class	Poorly drained; Somewhat poorly drained		
Soil Hydric Status	Drained Hydric		
Source of Hydrology	Seepage/ Precipitation		
Hydrologic Impairment	Ditching and Grazing		
Existing vegetation community	Emergent Wetland		
Percent composition of exotic invasive vegetation	5%		

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	DWR# 15-0414 USACE Action ID# 201500827	Jurisdictional Determination
Waters of the United States – Section 401	Yes	DWR# 15-0414 USACE Action ID# 201500827	Jurisdictional Determination
Endangered Species Act	No	N/A	N/A
Historic Preservation Act	No	N/A	N/A
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

APPENDIX B

Visual Assessment Data



LEGEND:

- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 647/551
- WETLAND GAUGE ACHIEVING HYDRO. CRITERION
- WETLAND GAUGE BELOW HYDRO. CRITERION
- PHOTO POINT
- CROSS-SECTION
- CONSERVATION EASEMENT
- STREAM RESTORATION
- BEAVER IMPACT AREA
- REMOVED BEAVER DAMS
- WETLAND REESTABLISHMENT
- WETLAND REHABILITATION
- STEP POOL
- RIFFLE GRADE CONTROL
- RIFFLE ENHANCEMENT

IMAGE SOURCE: GOOGLE EARTH 2017

REVISIONS

DATE	DESCRIPTION	STAL

NCDEQ DIVISION OF MITIGATION SERVICES

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4506 FALLS OF NEUSE RD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

SANDY BRIDGE FARM
STREAM AND RIPARIAN WETLAND SITE

DMS PROJECT #96920
RUTHERFORD COUNTY, NORTH CAROLINA
MONITORING YEAR 02

DATE: NOV 2018
SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

Table 5 **Visual Stream Morphology Stability Assessment**
Sandy Bridge Farm Stream Restoration Site, DMS Project#96920
Reach ID **Reach 1**
Assessed Length **1626**

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
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
		2. Degradation - Evidence of downcutting			0	0
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	20	20		
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	20	20		
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	20	20		
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	20	20		
		2. Thalweg centering at downstream of meander (Glide)	20	20		
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0
	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
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0
				Totals	0	0
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	8	8		
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8		
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	5	5		
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	6	6		
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	5	5		

Table 6 **Vegetation Condition Assessment**

Sandy Bridge Farm Stream Restoration Site, DMS Project# 96920

Planted Acreage **9.5**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
Easement Acreage	**9.5**					
Vegetation Category	**Definitions**	**Mapping Threshold**	**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).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%
6. Beaver Impacted Area	Area where beavers have chewed down many trees, or where flooding occurred	none	Pattern and Color	1	6.30	66.3%

Photo Reference Photos

PP1 – MY-00 – 3/21/17

PP1 – MY-02 – 11/8/18

PP2 – MY-00 – 3/21/17

PP2 – MY-02 – 11/8/18

PP3 – MY-00 – 3/21/17

PP3 – MY-02 – 11/8/18

PP4 – MY-00 – 3/21/17

PP4 – MY-02 – 11/8/18

PP5– MY-00 – 3/21/17

PP5– MY-02 – 11/8/18

PP6– MY-00 – 3/21/17

PP6– MY-02 – 11/8/18

Vegetation Monitoring Plot Photos

Vegetation Plot 1 – MY-00 – 3/21/17

Vegetation Plot 1 – MY-02 – 9/10/18

Vegetation Plot 2 – MY-00 – 3/21/17

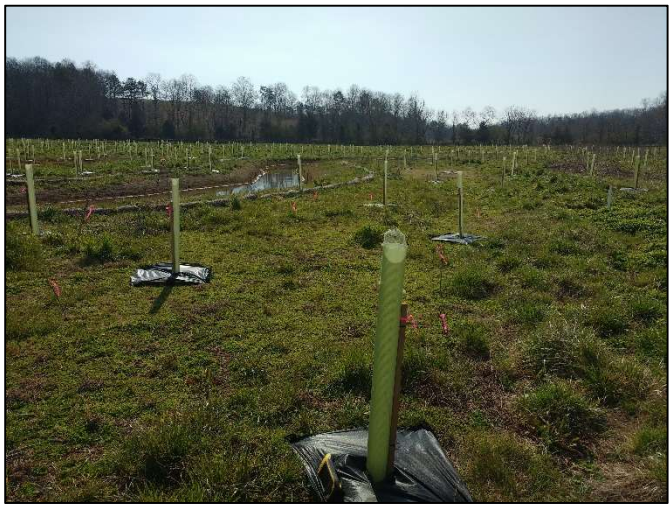
Vegetation Plot 2 – MY-02 – 9/10/18

Vegetation Plot 3 – MY-00 – 3/21/17

Vegetation Plot 3 – MY-02 – 9/10/18

Vegetation Plot 4 – MY-00 – 3/21/17

Vegetation Plot 4 – MY-02 – 9/10/18



Vegetation Plot 5 – MY-00 – 3/21/17

Vegetation Plot 5 – MY-02 – 9/10/18

Vegetation Plot 6 – MY-00 – 3/21/17

Vegetation Plot 6 – MY-02 – 9/10/18

Vegetation Plot 7 – MY-00 – 3/21/17

Vegetation Plot 7 – MY-02 – 9/10/18

Vegetation Plot 8 – MY-00 – 3/21/17

Vegetation Plot 8 – MY-02 – 9/10/18

Vegetation Plot 9– MY-02 – 9/10/18

Vegetation Plot 10 – MY-02 – 9/10/18

Problem Area Photos

Photo 1. One of the beaver dams onsite (has been removed), 6/28/18

Photo 2. Floodplain flooding due to beaver dams, 6/28/18

Photo 3. Eroding stream bank that is encroaching into easement, 8/29/2018

Photo 4. View along easement boundary where stream bank is eroding, 8/29/2018

APPENDIX C

Vegetation Plot Data

Table 7. Stem Count by Plot and Species
Sandy Bridge Farm Restoration Site, DMS Project #96920

	Current Plot Data (MY01 2017)															
	Plot 01		Plot 02		Plot 03		Plot 04		Plot 05		Plot 06		Plot 07		Plot 08	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Elm (Ulmus americana)							2	2			2	2				
Black Walnut (Juglans nigra)																
Black Willow (Salix nigra)				1												
Box Elder (Acer negundo)																
Buttonbush (Cephalanthus occidentalis)	3	3	1	1									4	4		
Eastern Cottonwood (Populus deltoides)					2	2			2	2	3	3	1	1	1	1
Greem Ash (Fraxinus pennsylvanica)															1	1
Oak (Quercus sp.)																
Persimmon (Diospyros virginiana)			1	1												
Pin Oak (Quercus palustris)							2	2								
Red Chokeberry (Aronia arbutifolia)																
Red Maple (Acer rubrum)			1	1			4	4							1	1
River Birch (Betula nigra)	1	1	2	3	4	4	3	3					1	1		
Silky Dogwood (Cornus amomum)	3	3	7	7					5	5	1	1				
Smooth Sumac (Rhus glabra)																
Sugarberry (Celtis laevigata)							1	1	1	1	1	1				
Swamp Chestnut Oak (Quercus michauxii)							1	1								
Sycamore (Platanus occidentalis)			1	2					1	1						
Tulip Poplar (Liriodendron tulipifera)																
Willow Oak (Quercus phellos)					2	2					1	1			3	3
Witch Hazel (Hamamelis virginiana)																
Unknown																
Stem count	7	7	13	16	8	8	13	13	9	9	8	8	6	6	6	6
size (ares)	1		1		1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025	
Species count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stems per ACRE	283	283	526	647	324	324	526	526	364	364	324	324	243	243	243	243

Table 7. Stem Count by Plot and Species										
Sandy Bridge Farm Restoration Site, DMS Project #96920										
	Current Plot Data (MY02 2018)				**Annual Means**					
	Plot 09		**Plot 10**		**MY02 (2018)**		**MY01 (2017)**		**MY00 (2017)**	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Elm (Ulmus americana)			2	2	6	6	7	7		
Black Walnut (Juglans nigra)							1	1		
Black Willow (Salix nigra)						1				
Box Elder (Acer negundo)		3		5		8		1		
Buttonbush (Cephalanthus occidentalis)					8	8	9	9		
Eastern Cottonwood (Populus deltoides)					9	9	16	16		
Greem Ash (Fraxinus pennsylvanica)	11	11	1	1	13	13				
Oak (Quercus sp.)									4	4
Persimmon (Diospyros virginiana)					1	1				
Pin Oak (Quercus palustris)					2	2	2	2		
Red Chokeberry (Aronia arbutifolia)	6	6			6	6	2	2		
Red Maple (Acer rubrum)					6	6	9	9		
River Birch (Betula nigra)					11	12	11	11		
Silky Dogwood (Cornus amomum)	4	5	1	1	21	22	13	13		
Smooth Sumac (Rhus glabra)							1	2		
Sugarberry (Celtis laevigata)				1	3	4	4	4		
Swamp Chestnut Oak (Quercus michauxii)	3	3	6	6	10	10	3	3		
Sycamore (Platanus occidentalis)	1	7	2	2	5	12	3	5		
Tulip Poplar (Liriodendron tulipifera)			1	1	1	1	6	6	1	1
Willow Oak (Quercus phellos)	1	1			7	7	6	6		
Witch Hazel (Hamamelis virginiana)							1	1		
Unknown							3	3	139	139
Stem count	26	36	13	19	109	128	97	101	144	144
size (ares)	1		1		8		8		8	
size (ACRES)	0.025		0.025		0.20		0.20		0.20	
Species count	6	7	6	8	15	17	17	18	3	3
Stems per ACRE	1052	1457	526	769	551	647	491	511	728	728

APPENDIX D

Stream Measurement and Geomorphology Data

Table 8. Baseline Stream Data Summary
Sandy Bridge Farm Stream Restoration Site, DMS Project #96920

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design	As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Proposed	Min	Mean	Max	n
Bankfull Width (ft)	31.5	32.9	33.0	34.0	4	14.8	16.7		18.6	2	15.0	15.4	17.2	18.9	2
Floodprone Width (ft)	60.9	72.9	69.3	92.0	4	>40	>47		>55	2	>38	>60	>68	>70	2
Bankfull Mean Depth (ft)	2.1	2.2	2.2	2.5	4	1.3	1.5		1.7	2	0.9	0.7	0.8	0.9	2
Bankfull Max Depth (ft)	3.1	3.4	3.4	3.7	4	1.9	2.2		2.4	2	1.3	1.5	1.5	1.5	2
Bankfull Cross-Sectional Area (ft^2)	66.6	73.2	71.2	84.0	4	25.0	25.1		25.1	2	12.7	13.2	13.5	13.8	2
Width/Depth Ratio	13.5	14.8	14.9	16.0	4	8.8	11.3		13.8	2	17.7	17.3	22.1	27.0	2
Entrenchment Ratio	1.9	2.2	2.2	2.7	4	>2.5	>2.5		>2.5	2	>2.5	3.8	4.0	4.1	2
Bank Height Ratio	1.1	1.4	1.3	1.7	4	1.2	1.4		1.5	2	1.0	1.0	1.0	1.0	2
Pattern															
Channel Beltwidth (ft)	*					60				1	35-60	35		60	2
Radius of Curvature (ft)	*					16			87	1	30-50	30		50	2
Rc:Bankfull width (ft/ft)	*					0.9			5.9	1	2.0-3.3	2.0		3.3	2
Meander Wavelength (ft)	*					66			191	1	134-160	134		160	2
Meander Width Ratio	*					4.1				1	8.9-10.7	8.9		10.7	2
Profile															
Riffle Length (ft)												23	40	56	20
Riffle Slope (ft/ft)	0.000			0.010	2	0.013			0.035	2	0.002-0.008	0.000	0.006	0.014	20
Pool Length (ft)	*					14			33	2	17-55	11	22	39	20
Pool Spacing (ft)	*					50			105	2	55-90	25.9	78.3	102.2	19
Substrate and Transport Parameters															
SC% / Sa% / G% / C% / B% / Be%	18%/39%/43%/1%/0%/0%											66%/2%/22%/10%/1%/0%			
d16 / d35 / d50 / d84 / d95 (mm)	0.076/1.2/3.3/5.2/9.4/18											0.062/0.5/17.5/25.5/40/90			
Channel length (ft)	1,470										1,626	1,626			
Drainage Area (SM)	1.31					1.49					1.31	1.31			
Rosgen Classification	E4-G4					C4					C4	C4			
Sinuosity	1.0					1.3					1.2	1.2			
Water Surface Slope (ft/ft)	0.0043					0.0050					0.0038	0.0027			

*No data shown due to channelization/lack of bed diversity

Table 9. Cross-Section Morphology Data Tables
Sandy Bridge Farm Stream Restoration Site, DMS Project #96920

Dimension and Substrate	Cross-Section 1 (Riffle) Station 14+75							Cross-Section 2 (Pool) Station 16+40						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation	866.72	866.85	867.2					866.66	866.70	867.2				
Bankfull Width (ft)	15.4	24.7	23.0					18.8	23.4	36.0				
Floodprone Width (ft)	>60	>60	80.3					-	-	-				
Bankfull Mean Depth (ft)	0.9	0.6	0.6					1.4	1.1	0.7				
Bankfull Max Depth (ft)	1.5	1.6	1.9					2.7	2.7	2.0				
Bankfull Cross-Sectional Area (ft^2)	13.8	13.8	13.8					26.8	26.8	26.8				
Total Cross-Sectional Area (ft^2)	13.8	10.9	7.2					26.8	26.1	12.9				
Bankfull Width/Depth Ratio	17.3	44.2	38.3					-	-	-				
Bankfull Entrenchment Ratio	4.1	2.4	3.5					-	-	-				
Bankfull Bank Height Ratio	1.0	0.9	0.9					-	-	-				
d50 (mm)	35	26	0.7					-	-	-				

	Cross-Section 3 (Riffle) Station 101+73							Cross-Section 4 (Pool) Station 105+67						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation	865.34	865.29	865.2					865.26	865.16	865.1				
Bankfull Width (ft)	15.7	17.3	15.4					18.7	18.1	17.1				
Floodprone Width (ft)	>70	>70	72.4					-	-	-				
Bankfull Mean Depth (ft)	0.8	0.8	0.9					1.5	1.6	1.7				
Bankfull Max Depth (ft)	1.5	1.6	1.6					3.0	3.1	3.0				
Bankfull Cross-Sectional Area (ft^2)	13.1	13.1	13.1					28.8	28.8	28.8				
Total Cross-Sectional Area (ft^2)	13.1	12.4	15.1					28.8	30.7	32.1				
Bankfull Width/Depth Ratio	18.8	22.8	18.0					-	-	-				
Bankfull Entrenchment Ratio	4.6	4.2	4.7					-	-	-				
Bankfull Bank Height Ratio	1.0	1.0	1.0					-	-	-				
d50 (mm)	0.062	0.062	0.062					-	-	-				

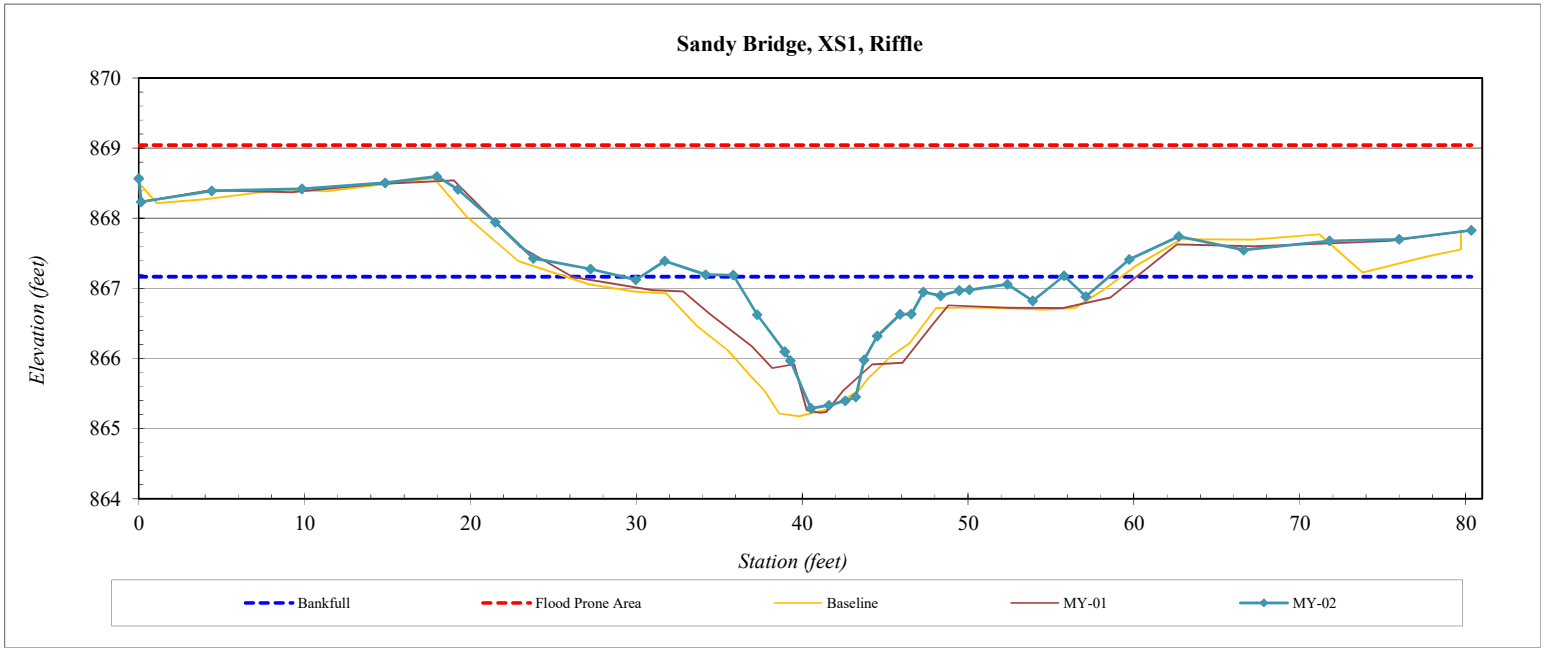
Calculations are based on a fixed bankfull area and the resulting bankfull elevation. Total Cross-Sectional Area represents the cross-sectional area measured from the baseline bankfull elevation.

Cross-Section Plots

River Basin:	Broad
Site:	Sandy Bridge
XS ID	XS1
Drainage Area:	837 acres
Date:	6/28/2018
Field Crew:	T. Seelinger, D. Rosso

Station	Elevation
0.00	868.57
0.15	868.23
4.41	868.39
9.85	868.42
14.86	868.51
17.97	868.60
19.25	868.41
21.50	867.94
23.80	867.43
27.24	867.28
29.97	867.12
31.71	867.39
34.18	867.20
35.85	867.19
37.30	866.63
38.95	866.10
39.29	865.97
40.53	865.29
41.62	865.33
42.60	865.40
43.23	865.45
43.73	865.98
44.53	866.32
45.91	866.63
46.58	866.64
47.31	866.95
48.35	866.90
49.47	866.97
50.09	866.98
52.38	867.06
53.90	866.82
55.79	867.18
57.10	866.88
59.72	867.41
62.71	867.74
66.63	867.55
71.80	867.68
76.00	867.70
80.34	867.83

SUMMARY DATA	
Current Bankfull Elevation:	867.17
Bankfull Cross-Sectional Area:	14.0
Total Cross-Sectional Area:	7.2
Bankfull Width:	23.5
Flood Prone Area Elevation:	869.0
Flood Prone Width:	80.3
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	0.6
W / D Ratio:	39.4
Entrenchment Ratio:	3.4
Bank Height Ratio:	0.9

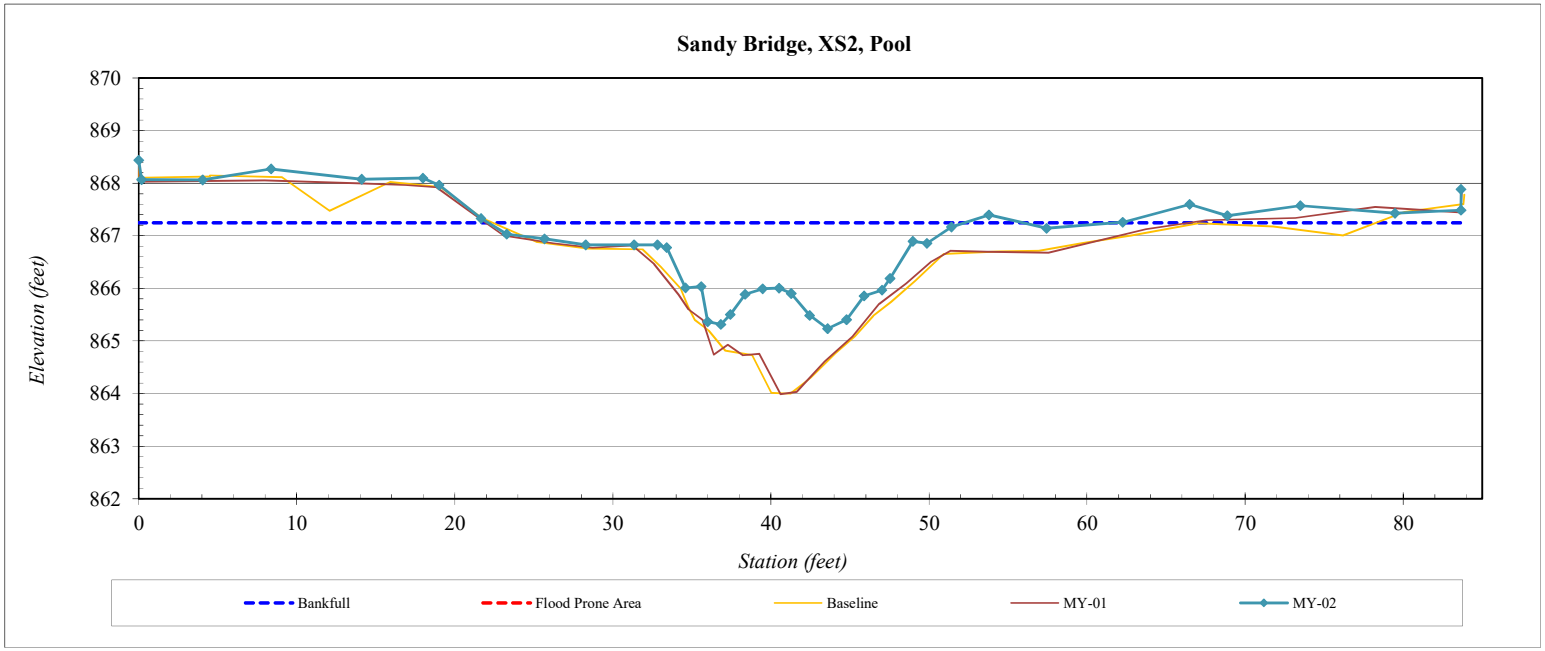


Cross-Section Plots

River Basin:	Broad
Site:	Sandy Bridge
XS ID	XS2
Drainage Area:	837 acres
Date:	6/28/2018
Field Crew:	T. Seelinger, D. Rosso

Station	Elevation
0.00	868.44
0.19	868.07
4.04	868.06
8.38	868.27
14.10	868.08
17.99	868.10
19.00	867.96
21.66	867.33
23.28	867.03
25.68	866.94
28.28	866.83
31.35	866.83
32.83	866.83
33.41	866.78
34.60	866.01
35.59	866.04
36.00	865.37
36.84	865.32
37.44	865.50
38.37	865.89
39.47	865.99
40.53	866.01
41.28	865.90
42.45	865.49
43.58	865.23
44.78	865.41
45.89	865.86
47.03	865.97
47.53	866.19
48.98	866.89
49.88	866.86
51.42	867.17
53.79	867.40
57.44	867.14
62.27	867.26
66.50	867.60
68.88	867.38
73.50	867.57
79.48	867.43
83.66	867.49
83.67	867.88

SUMMARY DATA	
Current Bankfull Elevation:	867.25
Bankfull Cross-Sectional Area:	26.8
Total Cross-Sectional Area:	12.9
Bankfull Width:	36.0
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	0.7
W / D Ratio:	48.4
Entrenchment Ratio:	-
Bank Height Ratio:	-

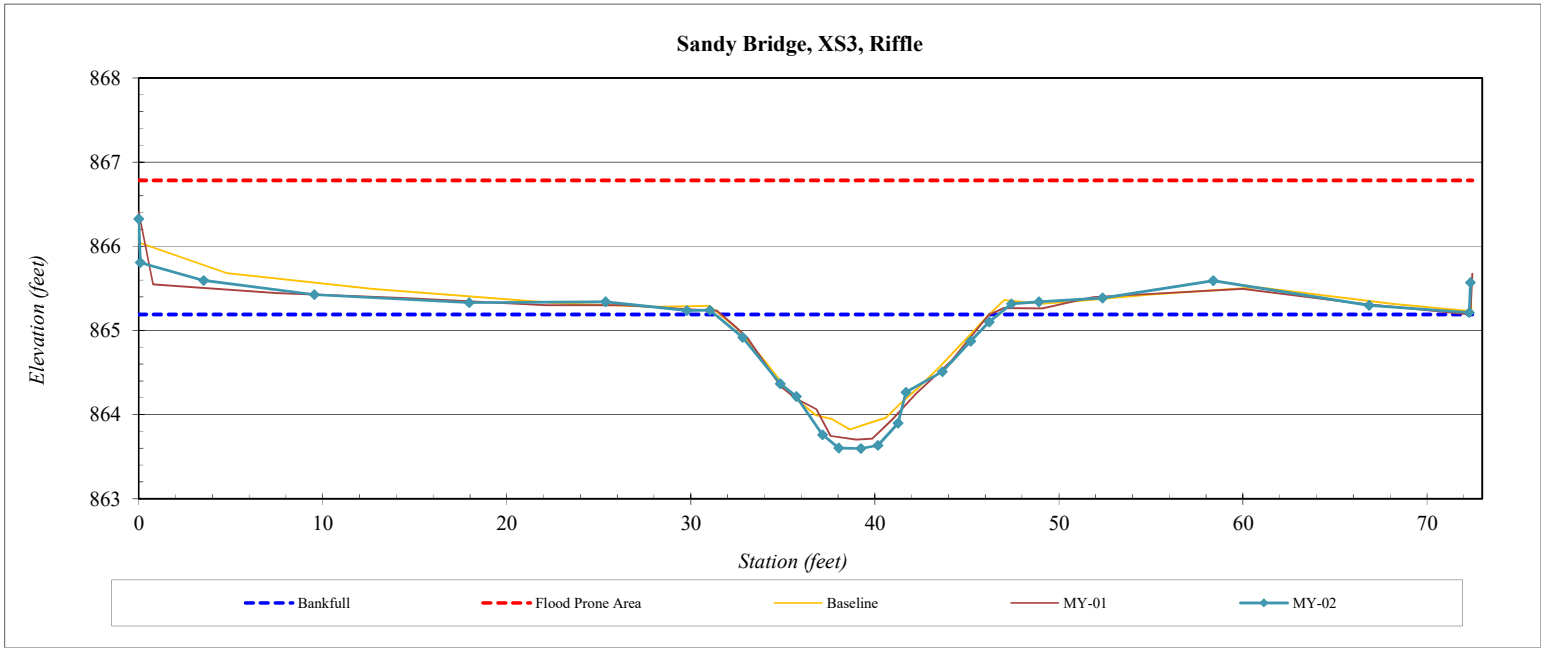


Cross-Section Plots

River Basin:	Broad
Site:	Sandy Bridge
XS ID	XS3
Drainage Area:	837 acres
Date:	9/11/2018
Field Crew:	T. Seelinger, K. O'Briant

Station	Elevation
0.00	866.33
0.09	865.81
3.53	865.59
9.55	865.43
17.96	865.33
25.36	865.34
29.78	865.24
31.04	865.24
32.82	864.92
34.87	864.37
35.74	864.21
37.16	863.76
38.03	863.60
39.24	863.60
40.16	863.64
41.26	863.90
41.69	864.27
43.68	864.51
45.21	864.87
46.21	865.10
47.42	865.32
48.92	865.34
52.38	865.39
58.39	865.59
66.87	865.30
72.30	865.21
72.37	865.57

SUMMARY DATA	
Current Bankfull Elevation:	865.19
Bankfull Cross-Sectional Area:	13.1
Total Cross-Sectional Area:	15.1
Bankfull Width:	15.4
Flood Prone Area Elevation:	866.8
Flood Prone Width:	72.4
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.9
W / D Ratio:	18.0
Entrenchment Ratio:	4.7
Bank Height Ratio:	1.0

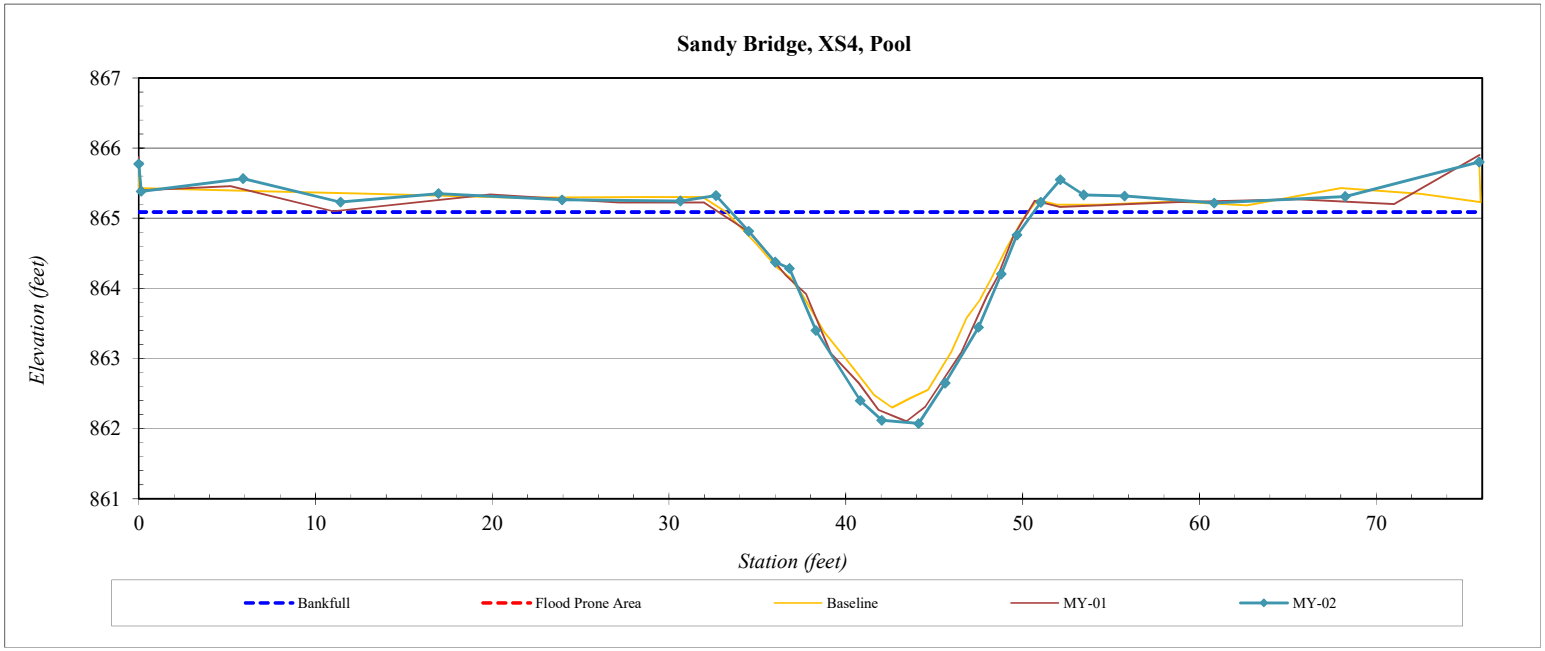


Cross-Section Plots

River Basin:	Broad
Site:	Sandy Bridge
XS ID	XS4
Drainage Area:	837 acres
Date:	9/11/2018
Field Crew:	T. Seelinger, K. O'Briant

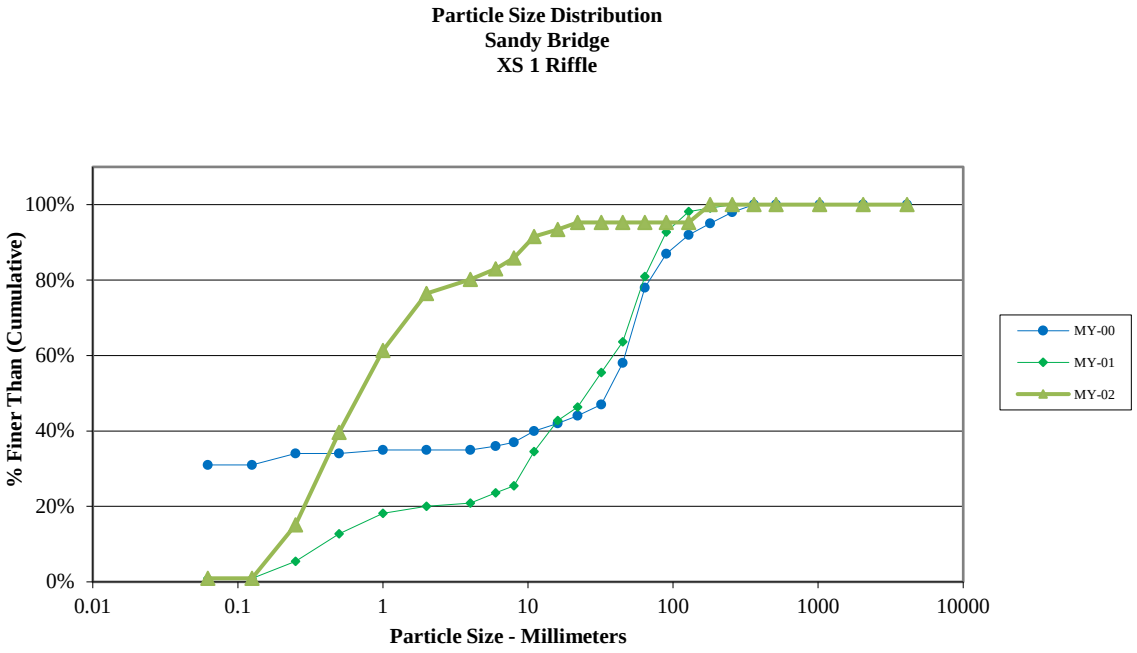
Station	Elevation
0.00	865.77
0.13	865.38
5.91	865.57
11.41	865.23
16.96	865.35
23.96	865.26
30.64	865.25
32.66	865.32
34.51	864.82
36.02	864.38
36.82	864.29
38.31	863.40
40.82	862.40
42.04	862.12
44.12	862.07
45.62	862.65
47.50	863.45
48.81	864.21
49.69	864.76
51.04	865.23
52.13	865.55
53.46	865.33
55.76	865.32
60.84	865.22
68.25	865.31
75.82	865.80

SUMMARY DATA	
Current Bankfull Elevation:	865.09
Bankfull Cross-Sectional Area:	28.8
Total Cross-Sectional Area:	32.1
Bankfull Width:	17.1
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.0
Mean Depth at Bankfull:	1.7
W / D Ratio:	10.2
Entrenchment Ratio:	-
Bank Height Ratio:	-



Cross-Section 1 Riffle - MY-02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	1
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	15
Medium	.25 - .50	N	26
Coarse	.50 - 1	D	23
Very Coarse	1 - 2	S	16
Very Fine	2 - 4		4
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	6
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	5
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	106

Note:



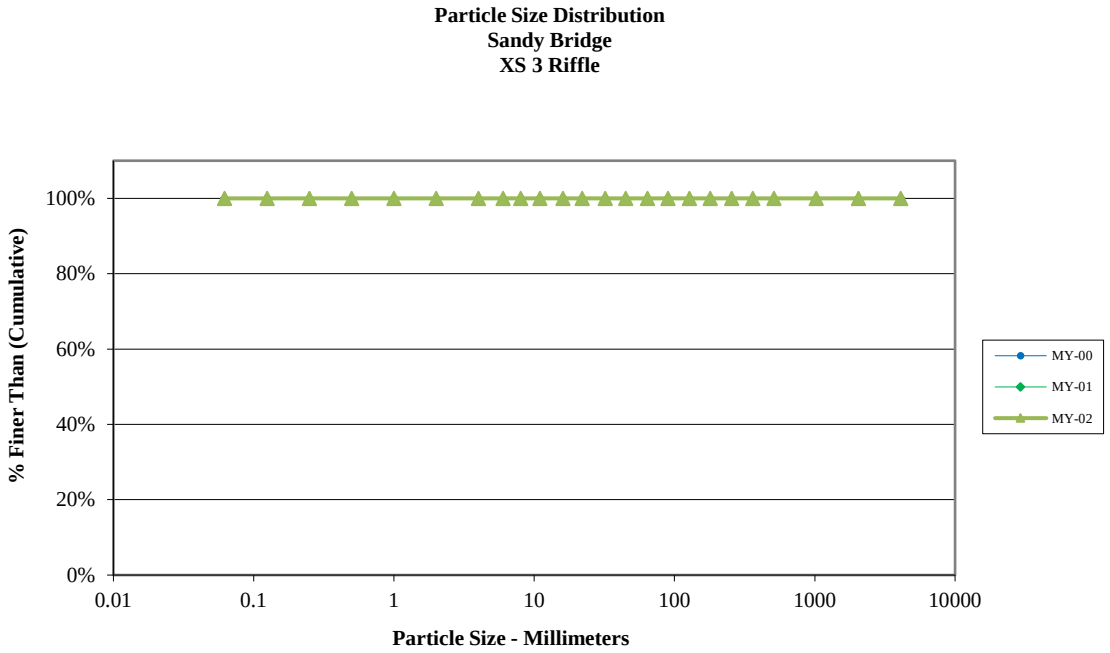
Size (mm)	
D16	0.26
D35	0.44
D50	0.7
D65	1.2
D84	6.6
D95	21

Size Distribution	
mean	1.3
dispersion	6.1
skewness	0.23

Type	
silt/clay	1%
sand	75%
gravel	19%
cobble	5%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 3 Riffle - MY-02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	100
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.062
D95	0.062

Size Distribution	
mean	0.1
dispersion	1.0
skewness	---

Type	
silt/clay	100%
sand	0%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

APPENDIX E

Hydrologic Data

Sandy Bridge Farm Restoration Site
30-70 Percentile Graph
WETS Station Name: Lake Lure 2, NC

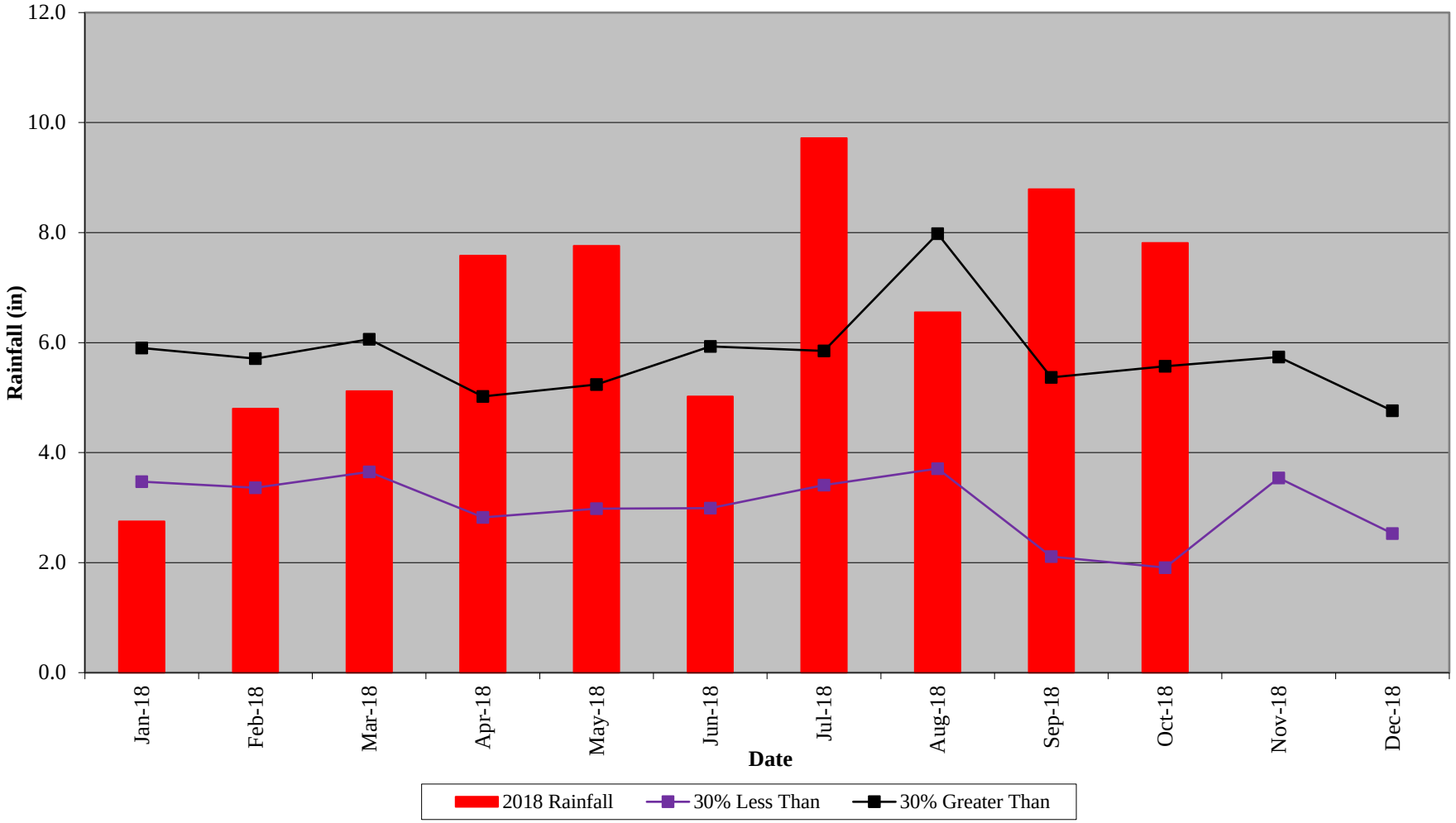


Table 10. Verification of Bankfull Events Sandy Bridge Farm Restoration Site, DMS Project #96920		
Date of Occurrence	**Method**	**Photo Number**
April 6, 2017	Onsite stream gauge	
April 24, 2017	Onsite stream gauge	
May 29, 2017	Onsite stream gauge	
August 3, 2017	Onsite stream gauge	
August 14, 2017	Onsite stream gauge	
August 15, 2017	Onsite stream gauge	
September 5, 2017	Onsite stream gauge	
October 23, 2017	Onsite stream gauge, photos taken on site	1
February 7, 2018	Onsite stream gauge, photos taken on site	2
February 11, 2018	Onsite stream gauge	
April 15, 2018	Onsite stream gauge	
April 24, 2018	Onsite stream gauge	
May 19, 2018	Onsite stream gauge	
May 30, 2018	Onsite stream gauge	
June 3 – August 20, 2018	Onsite stream gauge (beaver backwater)	
September 16, 2018	Onsite stream gauge	
October 11, 2018	Onsite stream gauge	
October 17 – November 6, 2018	Onsite stream gauge, photos taken on site (beaver backwater)	3

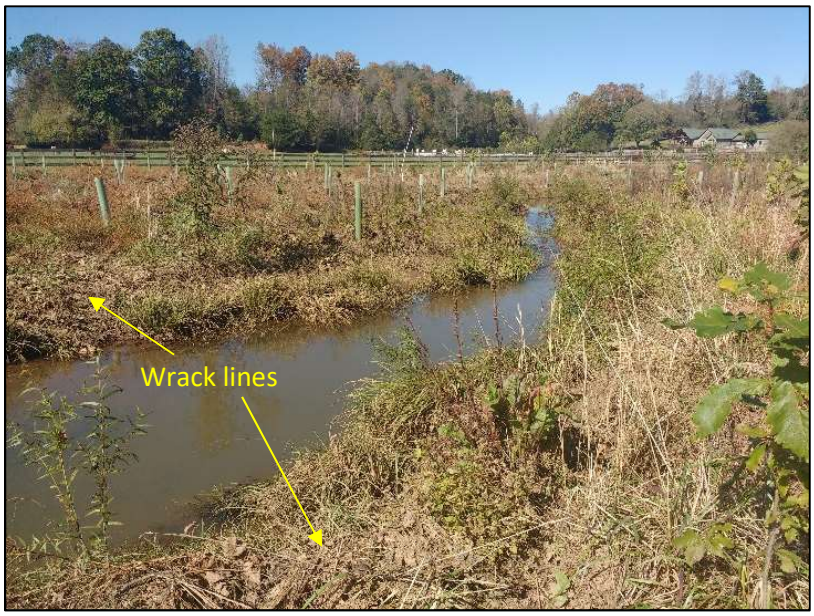
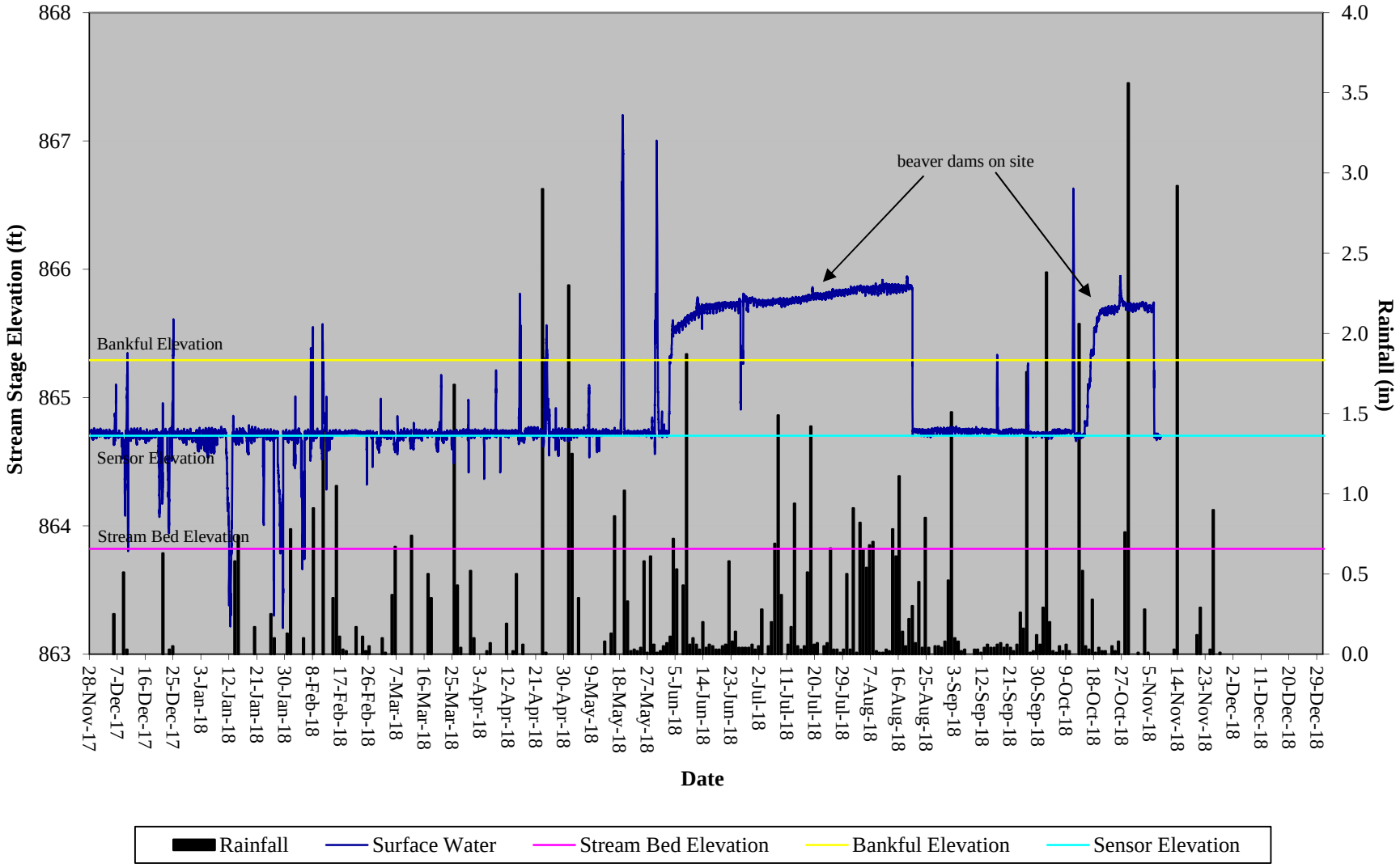


Photo 1. Sediment on plants and wrack lines above bankfull, 10/26/2017

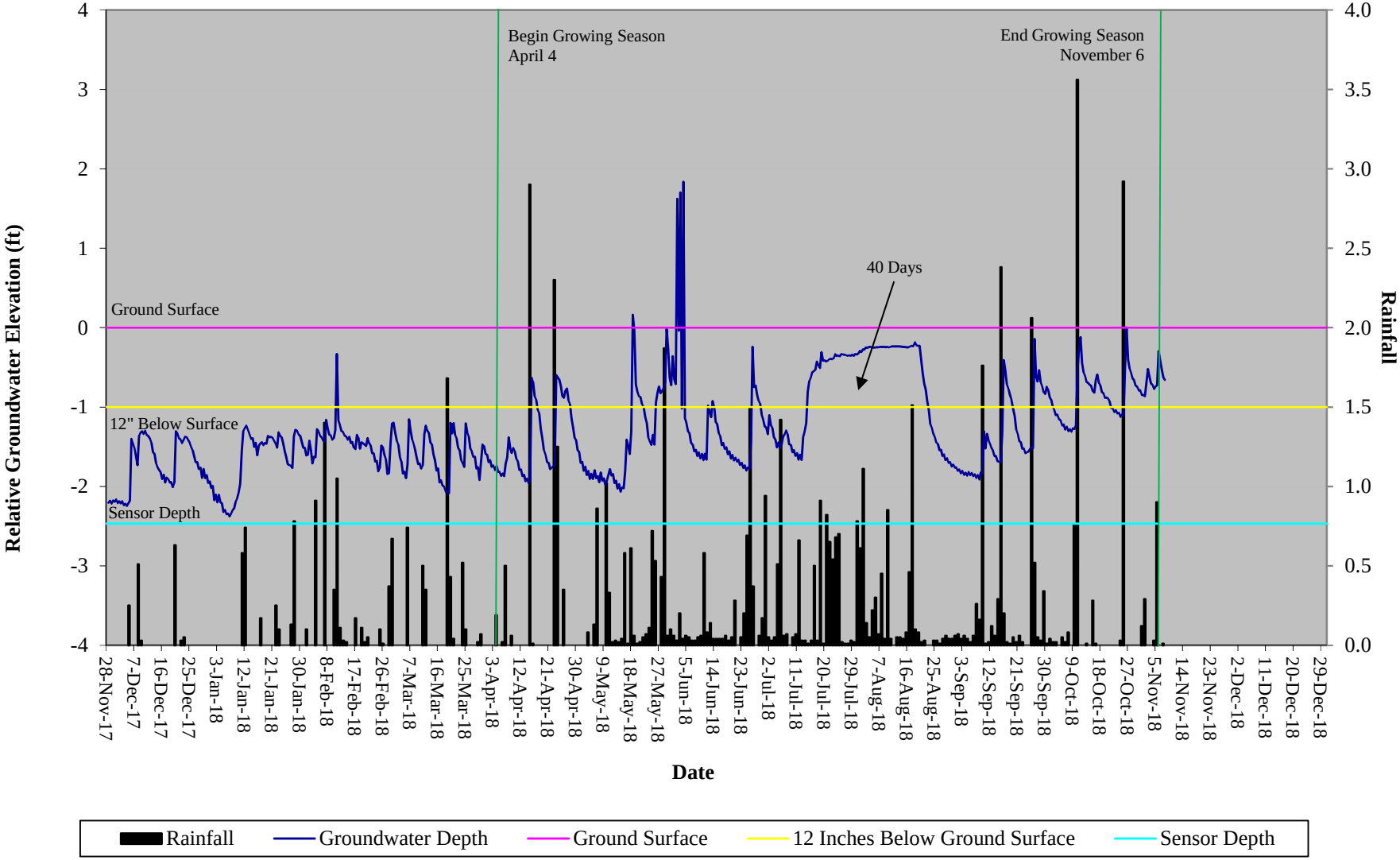
Photo 2. Bankfull event on site, 2/7/2018

Photo 3. Wrack lines above bankfull, 11/7/2018

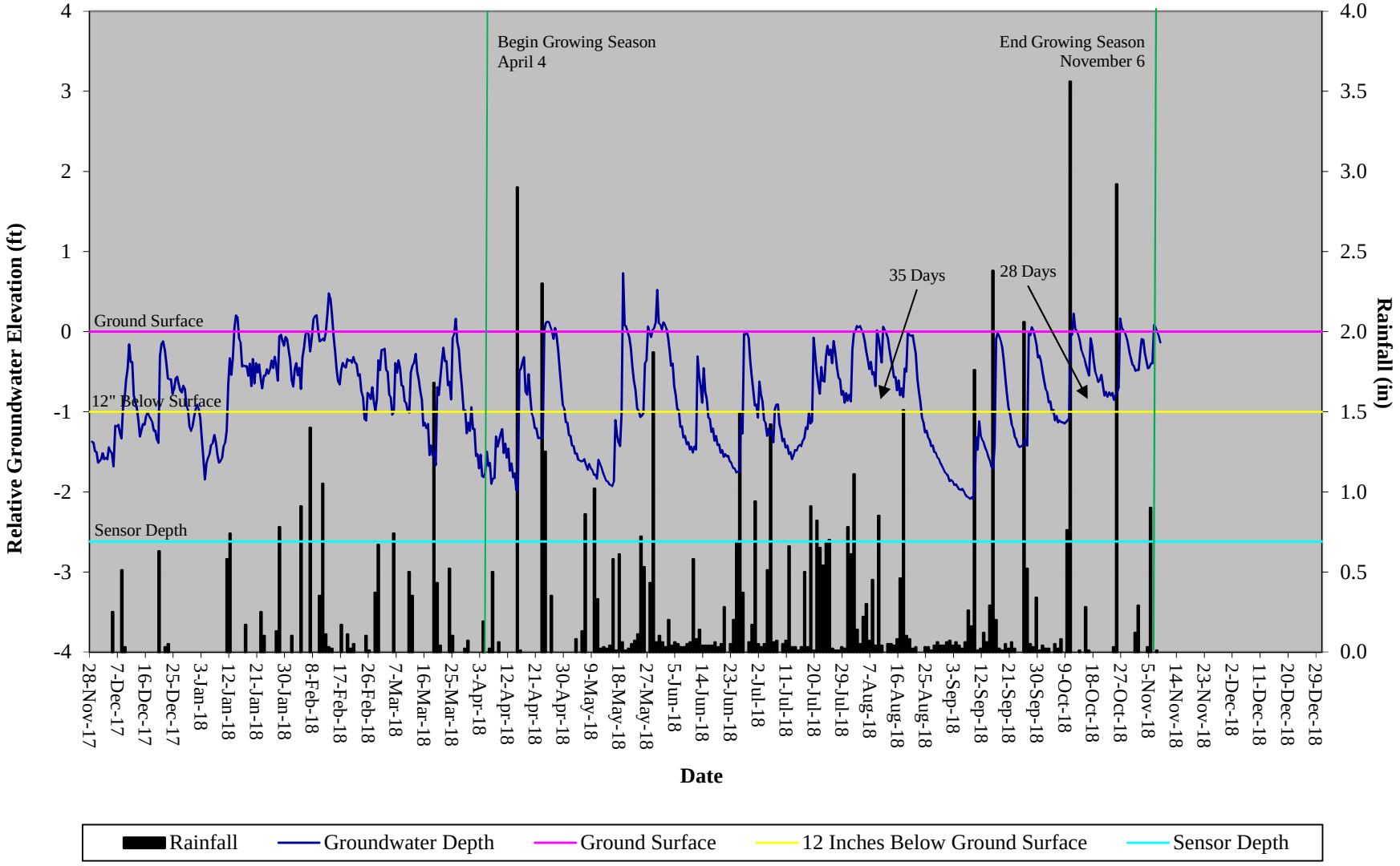
Sandy Bridge Farm Restoration Site
Hydrograph
Stream Gauge

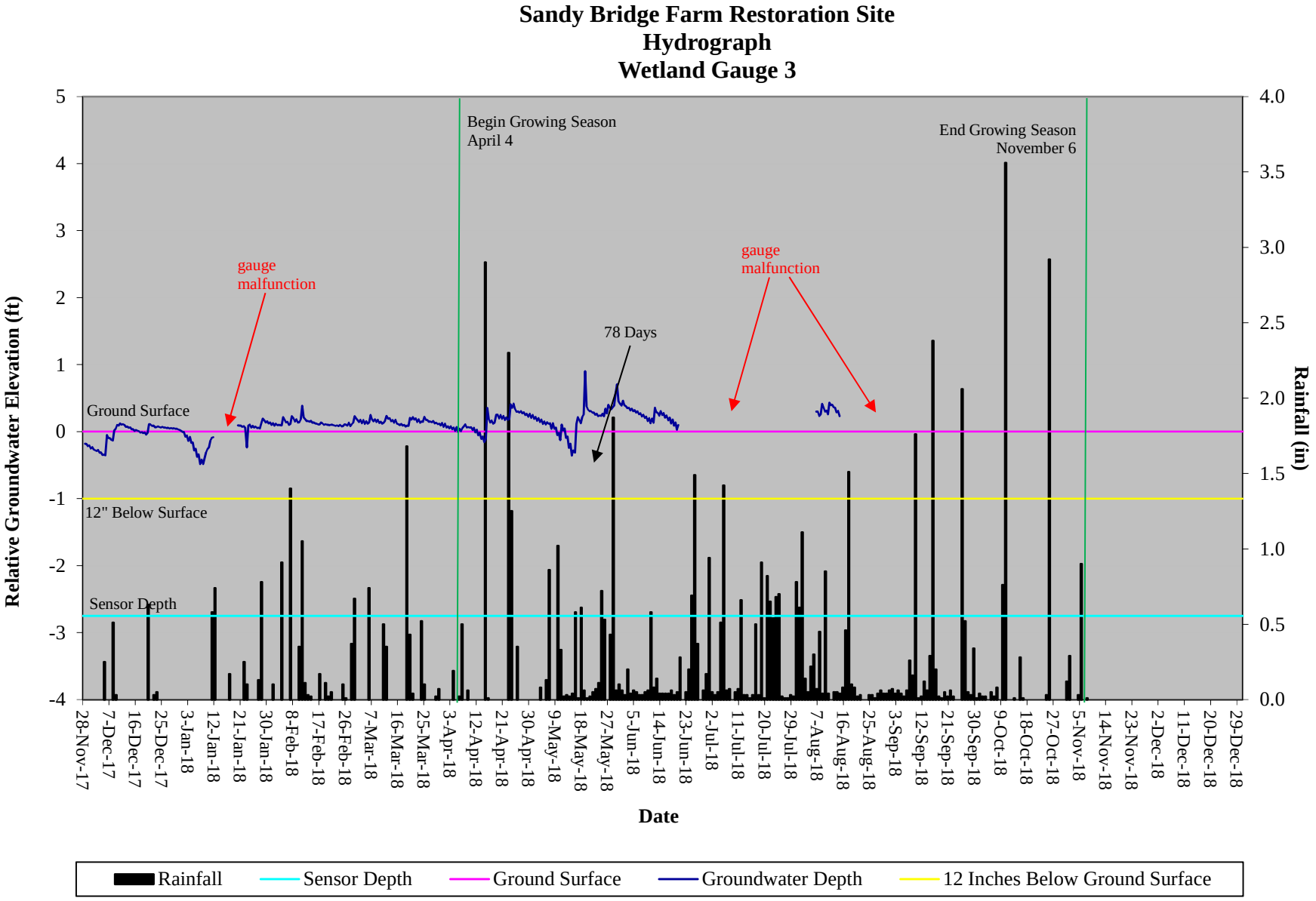


Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 1

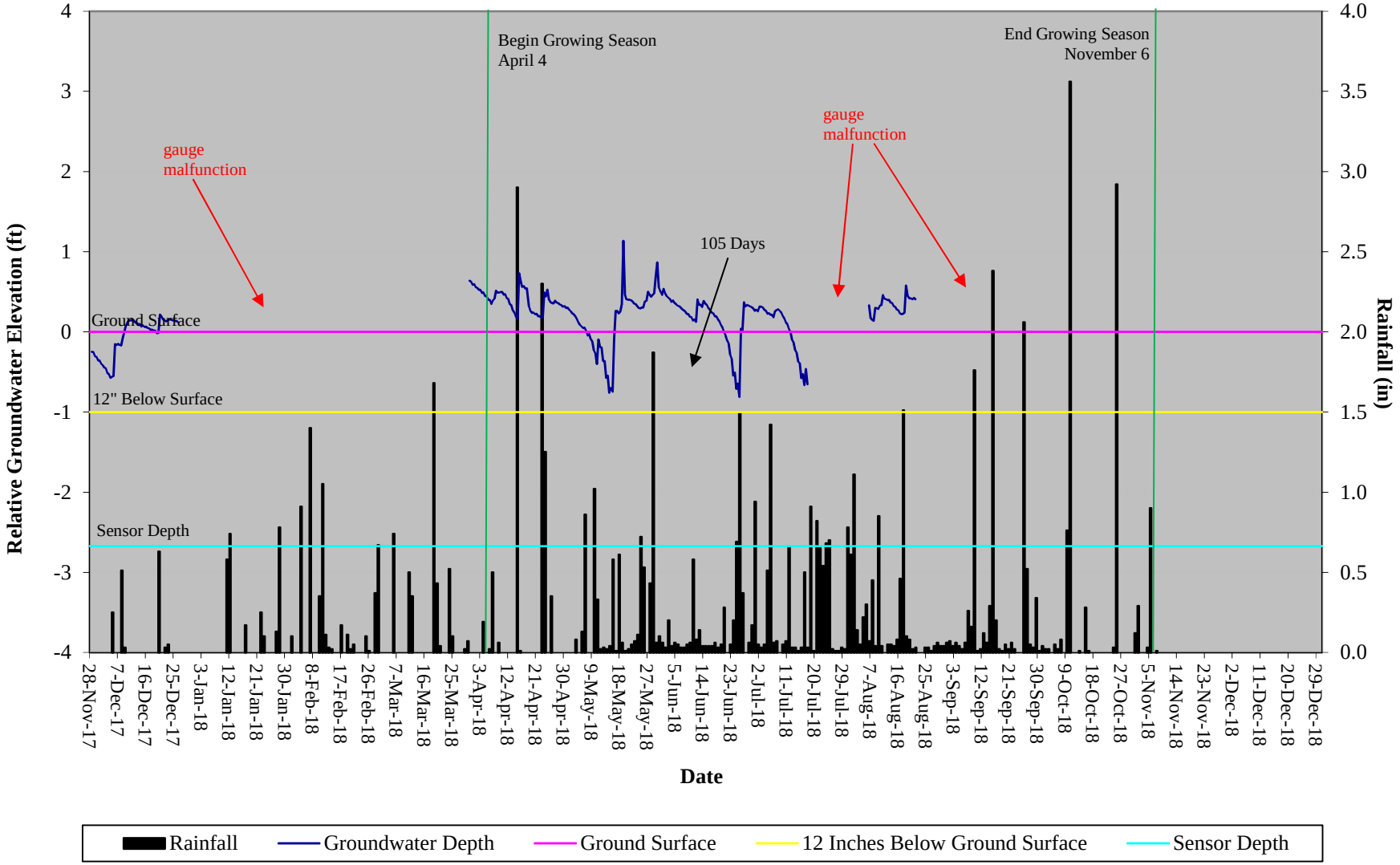


Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 2

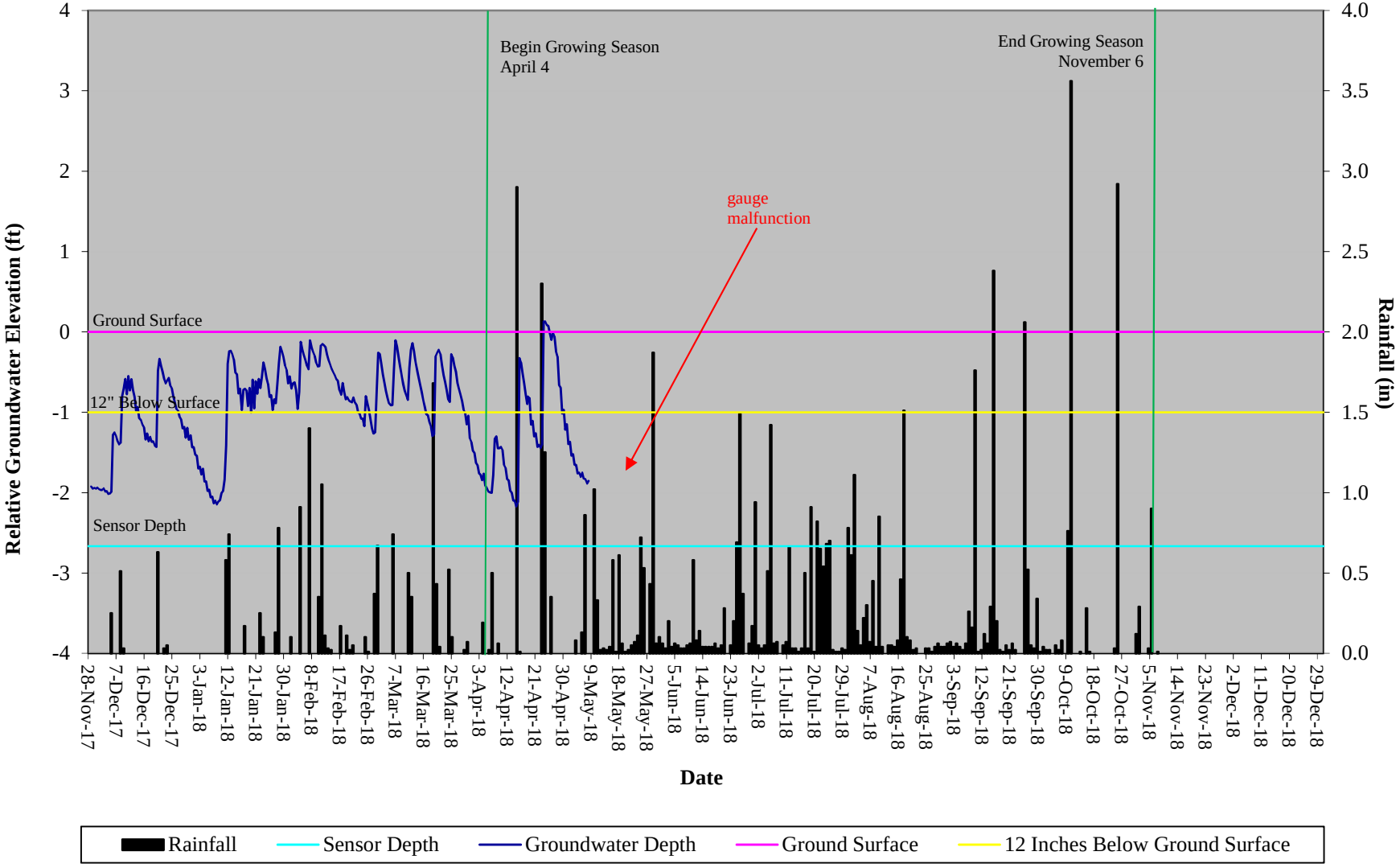


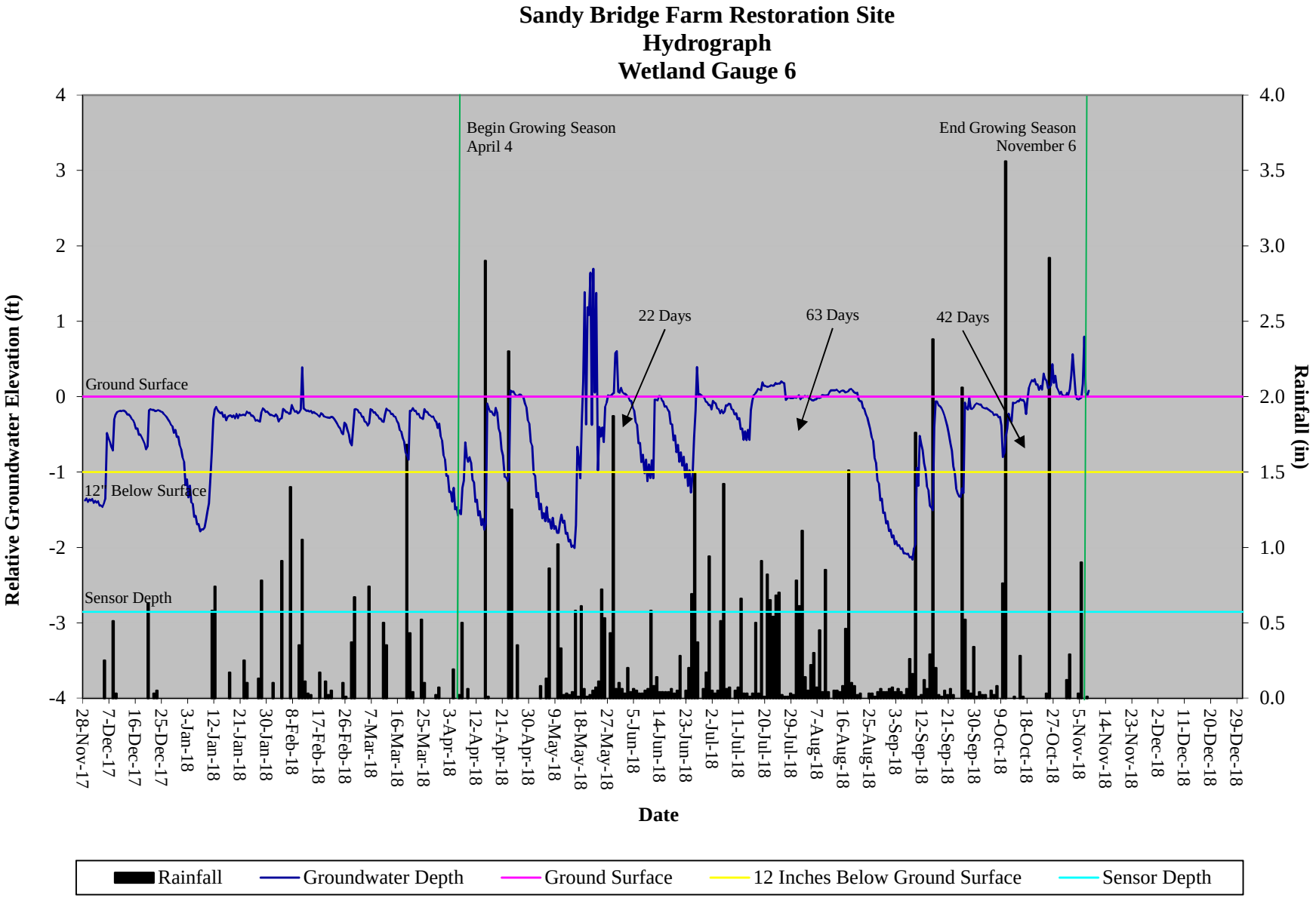

Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 3
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Begin Growing Season
April 4
End Growing Season
November 6
gauge
malfunction
gauge
malfunction
78 Days
Ground Surface
12" Below Surface
Sensor Depth
Rainfall
Sensor Depth
Ground Surface
Groundwater Depth
12 Inches Below Ground Surface

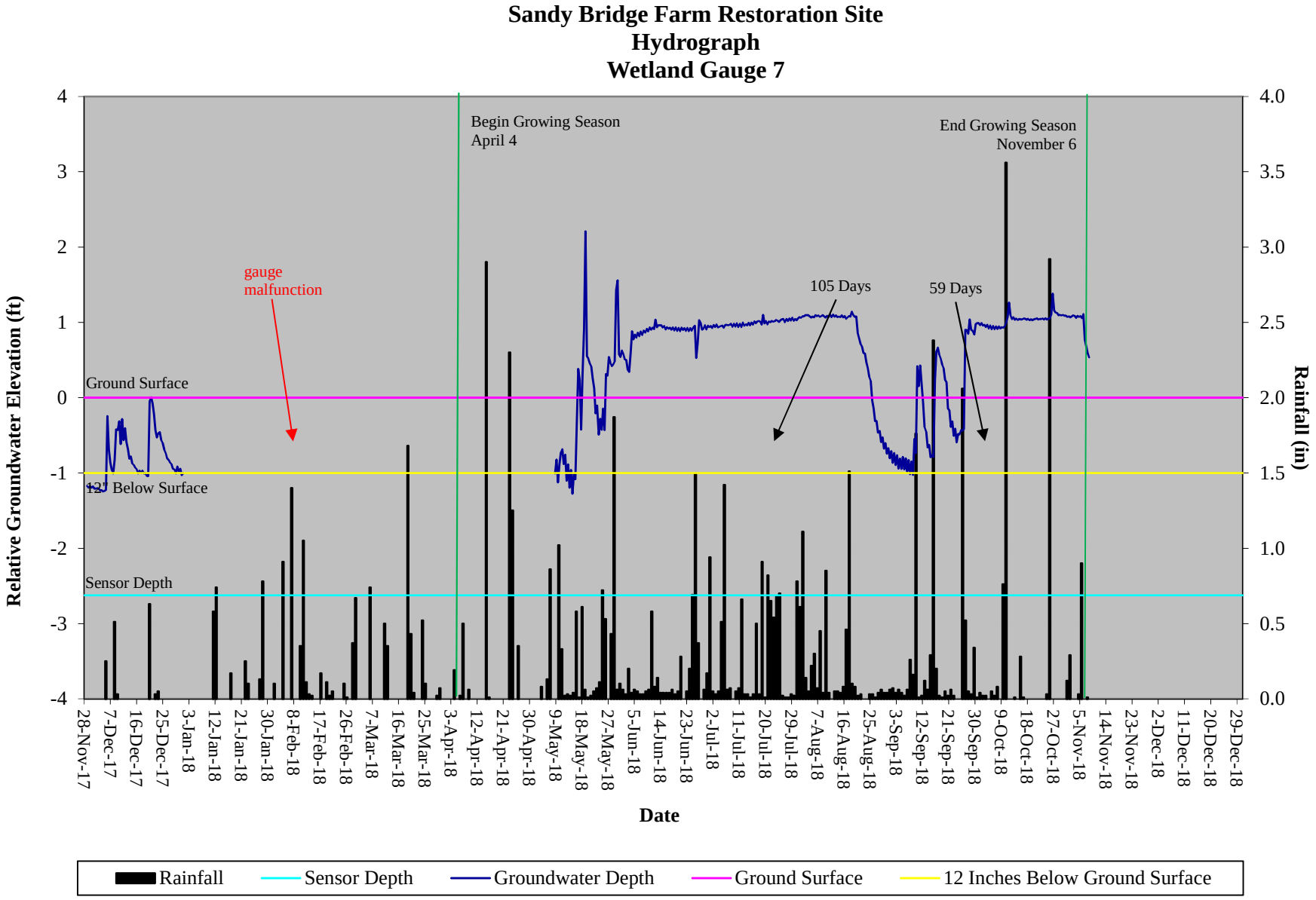
Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 4



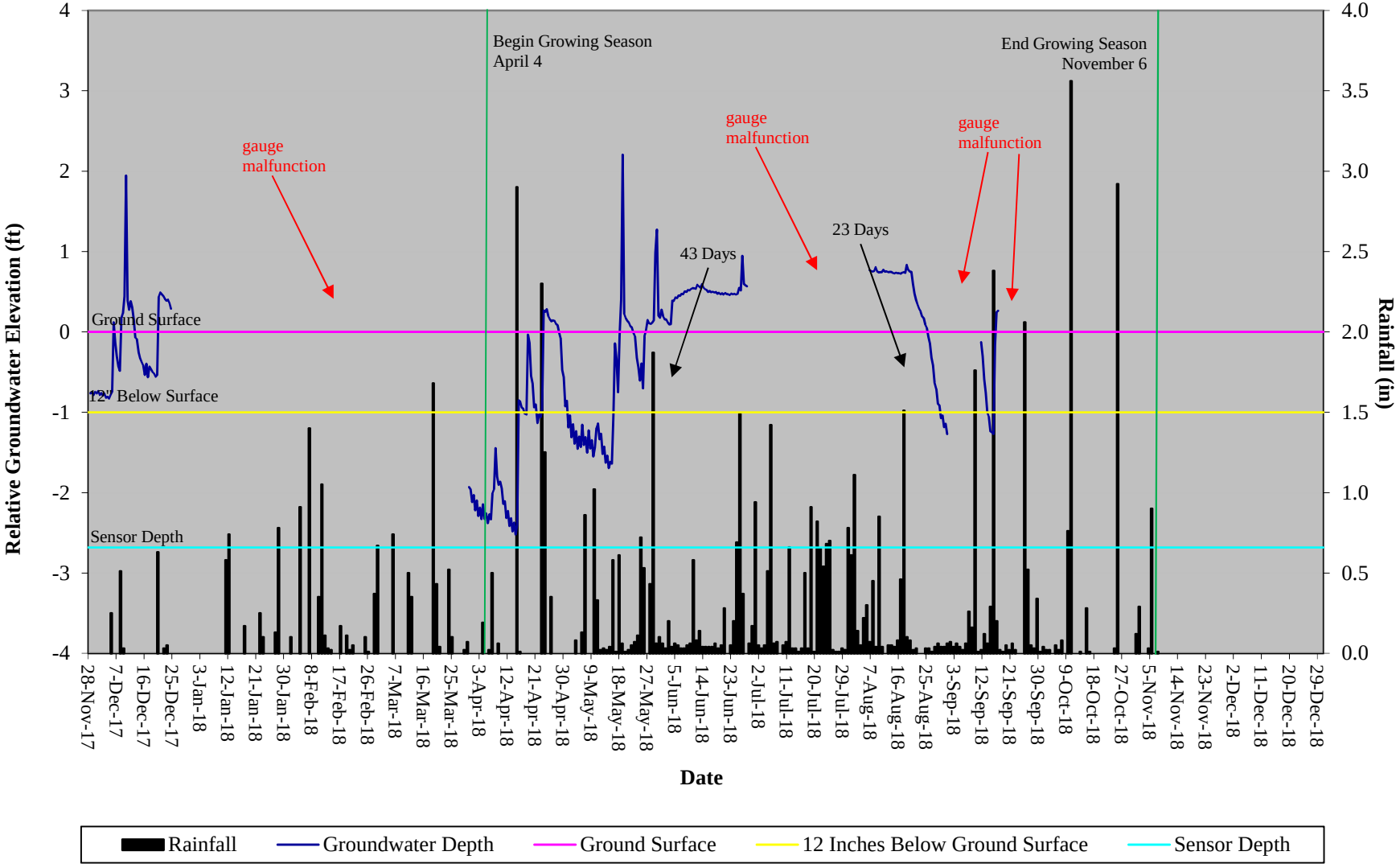
Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 5

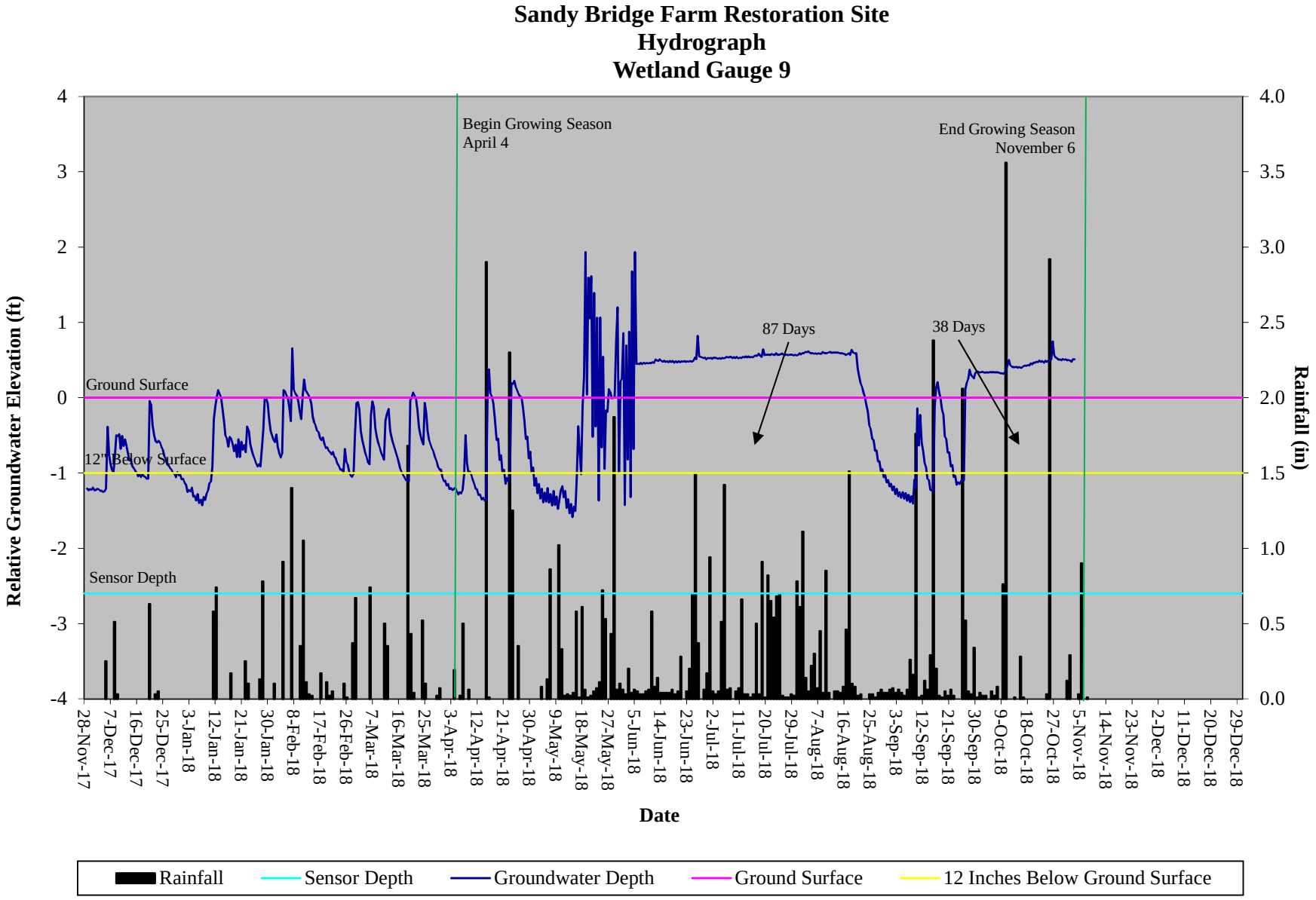



Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 6
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Begin Growing Season
April 4
End Growing Season
November 6
22 Days
63 Days
42 Days
Ground Surface
12" Below Surface
Sensor Depth
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

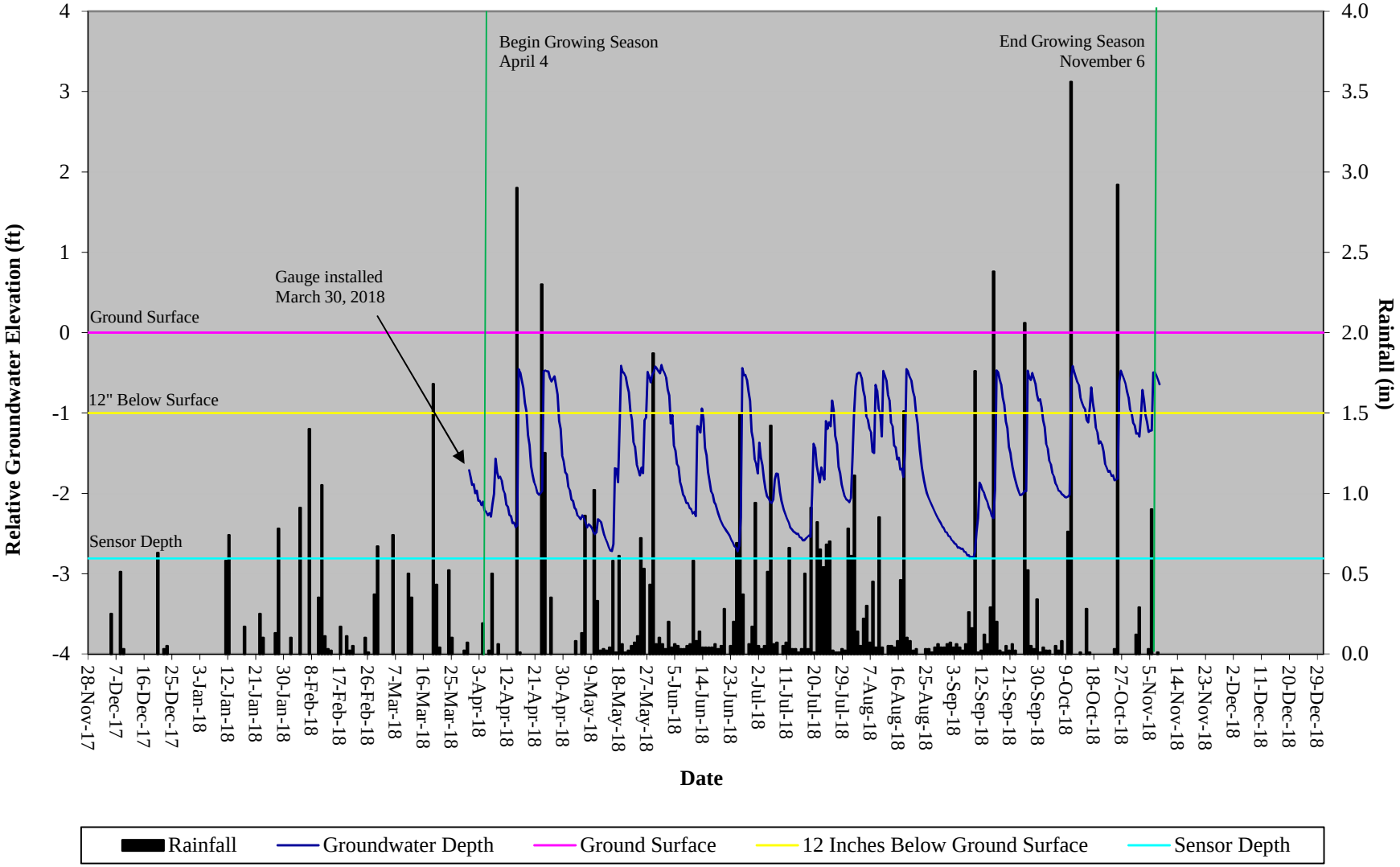

Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 7
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Begin Growing Season
April 4
End Growing Season
November 6
gauge
malfunction
105 Days
59 Days
Ground Surface
12" Below Surface
Sensor Depth
Rainfall
Sensor Depth
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface

Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 8

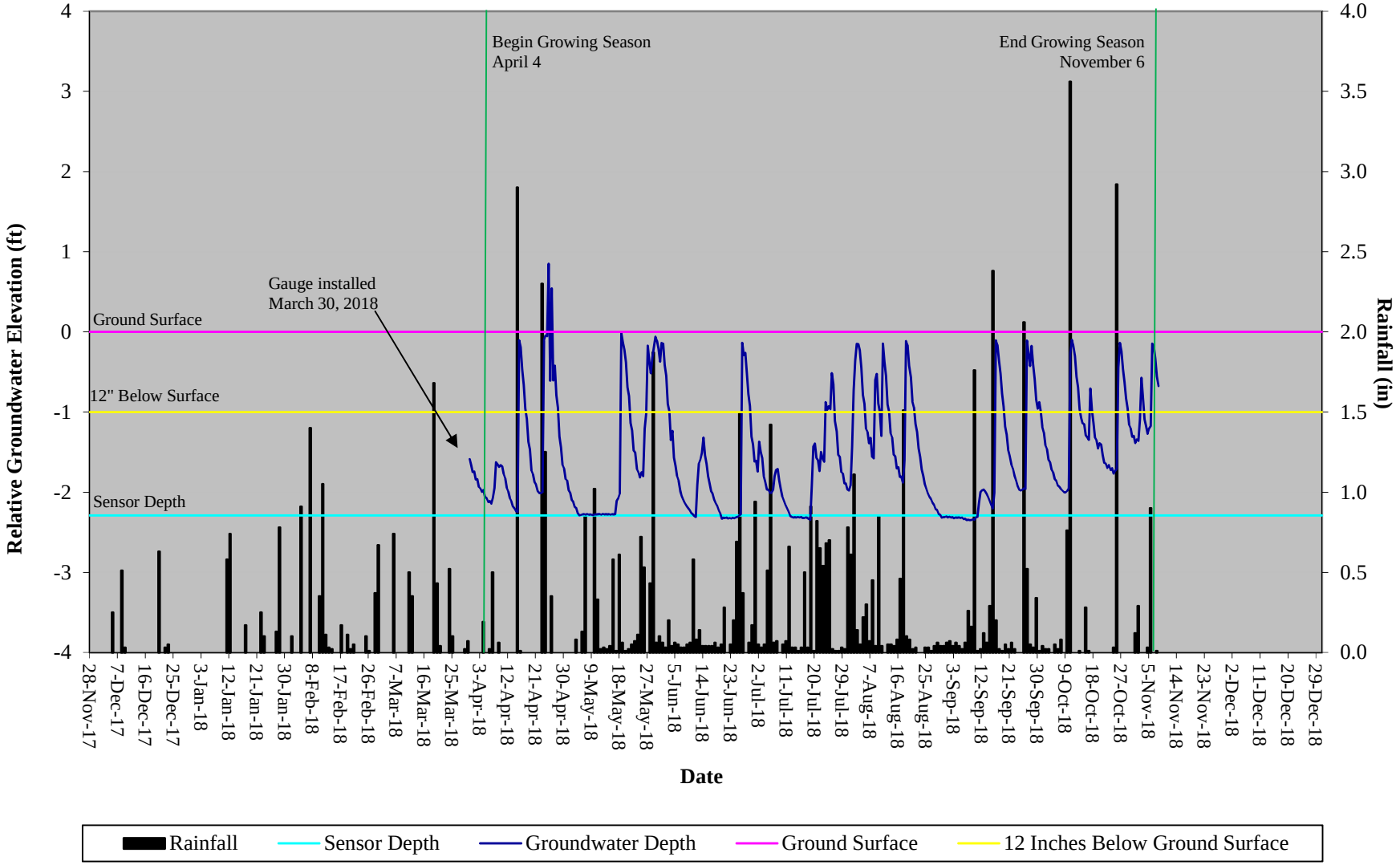



Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 9
Relative Groundwater Elevation (ft)
Rainfall (in)
Begin Growing Season
April 4
End Growing Season
November 6
87 Days
38 Days
Ground Surface
12" Below Surface
Sensor Depth
Date
Rainfall
Sensor Depth
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface

Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 10



Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 11



Sandy Bridge Farm Restoration Site
Hydrograph
Wetland Gauge 12

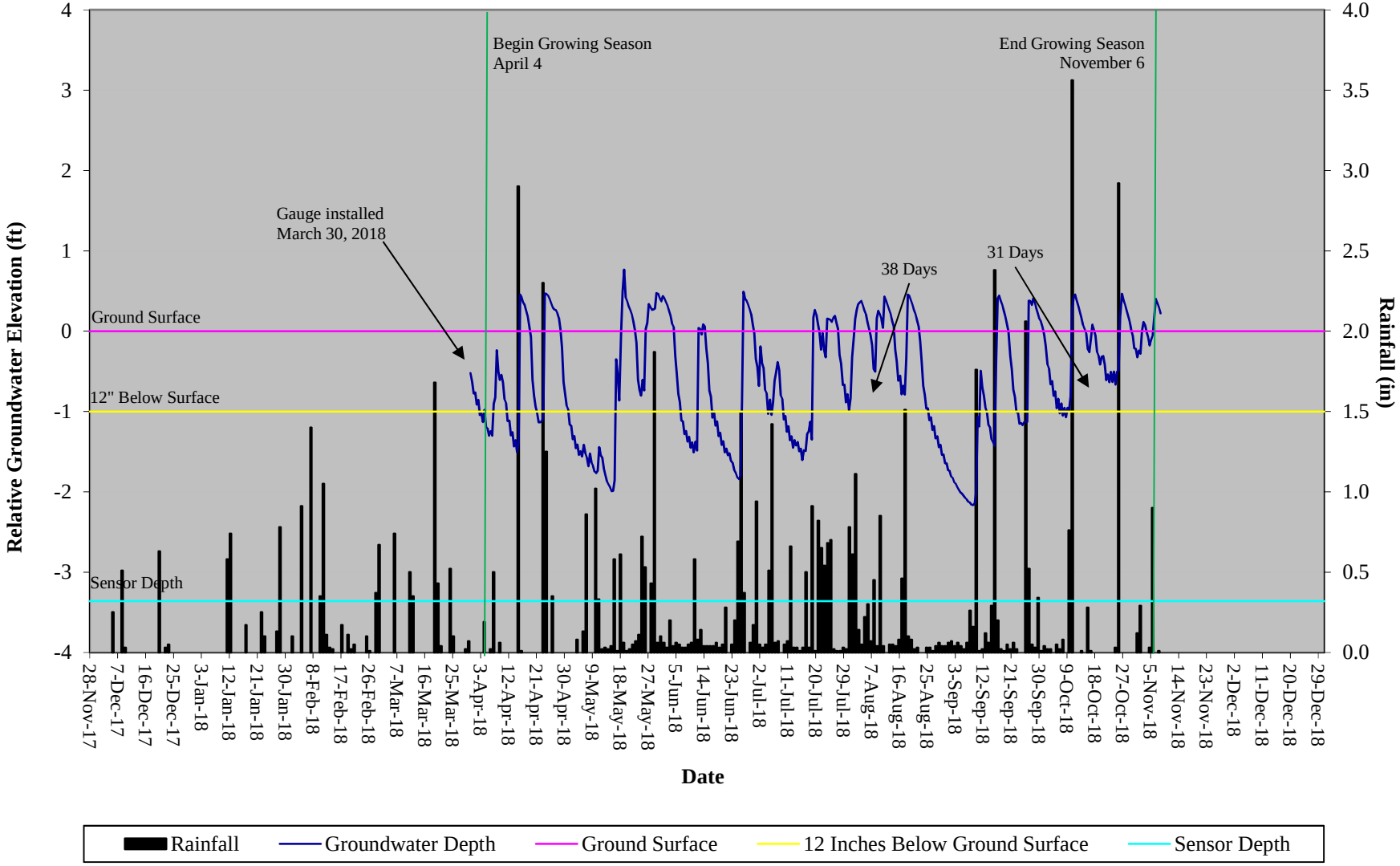


Table 11. Wetland Hydrology Criteria Attainment Sandy Bridge Farm Restoration Site, DMS Project #96920							
	Greater than 10% Continuous Saturation/Max Consecutive Days During Growing Season (Percentage)						
Gauge #	**MY-01 2017**	**MY-02 2018**	**MY-03 2019**	**MY-04 2020**	**MY-05 2021**	**MY-06 2022**	**MY-07 2023**
Gauge 1	Yes/30 (13.8%)	Yes/40 (18.4%)					
Gauge 2	No/11 (5.1%)	Yes/35 (16.1%)					
Gauge 3	Yes/110 (50.7%)	Yes/78 (35.9%)					
Gauge 4	Yes/47 (21.7%)	Yes/105 (48.4%)					
Gauge 5	No/11 (5.1%)	No**/6 (2.8%)					
Gauge 6	Yes/30 (13.8%)	Yes/63 (29.0%)					
Gauge 7	Yes/22 (10.1%)	Yes/105 (48.4%)					
Gauge 8	Yes/29 (13.4%)	Yes/43 (19.8%)					
Gauge 9	No/15 (6.9%)	Yes/87 (40.1%)					
Gauge 10*		No/8 (3.7%)					
Gauge 11*		No/8 (3.7%)					
Gauge 12*		Yes/38 (17.5%)					

*=Gauge installed March 30, 2018 **=Gauge malfunction, only recorded for first 35 days of growing season