

**Monitoring Report
Hofler Property
Monitoring Year 7**
DMS Project ID #: 95355
DMS Contract #: 004628
USACE AID# SAW-2012-01393
Gates County, North Carolina
Submitted February 2022



NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

Submitted by:
ALBEMARLE RESTORATIONS, LLC
P.O. Box 176
Fairfield, NC 27826
(252) 333-0249

February 25, 2022

Lindsay Crocker
Eastern Regional Supervisor
NC DEQ Division of Mitigation Services
217 West Jones St.
Raleigh, NC 27603

RE: Hofler Monitoring Year 7 Report

Dear Ms. Crocker,

Ecotone, Inc. has addressed the comments made on December 15, 2021 by DMS for the above referenced project. The following is a point-by-point response addressing those comments. Additionally, an updated copy of the MY7 Report will be submitted.

- 1. Please provide narrative or show on map exactly where the ditch plugs were lowered*
Ecotone Response: Locations of where ditch plugs were lowered are now depicted on the CCPV on Page 12.
- 2. Provide list of tree species planted (number and %). Please notate which oaks were planted instead of describing a “mix of oaks.” Describe or show exactly which areas of the site were planted.*
Ecotone Response: Tree species types, numbers and percentages as well as a description of the areas planted have been added to Page 5 of the Report.
- 3. Provide date of planting, method, nursery, and tree type (bare root, gallon, etc.) in report.*
Ecotone Response: All trees planted were hand-planted bare root seedlings. Nurseries and tree types are included on Page 5.
- 4. Table 2. Add the date that ditch plugs were modified. Provide before and after pictures with date stamp.*
Ecotone Response: Ditch plugs were modified on November 24, 2020. This is included in Table 2, page 9 of the report.
- 5. In MY5, vegetation plots ranged from 0-364 stems per acre; with an average of 162. The adaptive management plan indicates that Abermarle planted 6,000 over 23 acres, which is about 260 stems per acre if the site was planted uniformly. In MY7, vegetation plots ranged from 0-445; with an average of 200 stems per acre. In the early part of the growing season in MY7, gauges are showing no hydrology, which would give the trees time to establish. Please provide an explanation of lack of survival for these trees if possible.*
Ecotone Response: While hydrology was more favorable to tree survival after the additional 6,000 trees were planted in April 2021, competition with herbaceous vegetation was not favorable to success of trees. Because herbaceous vegetation had

several years to become fully established without competition from trees, the height and density of the herbaceous vegetation likely hindered establishment of trees. Tree species and planting spacing could also play a role in overall counts. At the request of COE, species other than cypress were planted but survival was not as successful as cypress plantings. Additionally, some areas of the project were planted at 12x12 foot spacing while others were planted at 15x15 foot spacing.

6. *The visual assessment table shows 12.79 acres as bare areas. Show these areas as a shapefile on your CCPV.*

Ecotone Response: Table 5 on page 13 shows 0.00 acres of bare areas and 12.79 acres of low stem density areas. These areas have been marked on the CCPV, included on page 12 of the report.

7. *Page 16, pictures in the report are from MY6. Update for MY7. It is suggested that Abermarle include photos of Adaptive Management work and current conditions.*

Ecotone Response: Photos of each vegetation plot have been added to the photo section with time stamps from August 2021.

8. *Adaptive Management plan called for 10-15 additional random 10x10m vegetation plots. Provide this data in report or explain why this did not occur.*

Ecotone Response: The additional 10-15 vegetation plots were not surveyed, which is an oversight. The monitoring work was conducted by a subcontractor and the additional 10 plots were not indicated in the agreement. This can be added to the monitoring plan for 2022.

9. *Update bottom section of Table 1 to the non-riparian wetland column.*

Ecotone Response: This table has been updated to reflect the correct acreage of non-riparian wetland.

Electronic Comments:

1. *Please include a figure representing the low stem density areas and areas of poor growth rates or vigor and include these features in the CCPV.*

Ecotone Response: The areas of low stem density (12.79 acres) and the 23 acres of poor growth/vigor are indicated on the CCPV included on page 12 of the report.

2. *The start of growing season line for gauge 1 is misplaced. Also, please include the start of growing season date in all groundwater gauge figures.*

Ecotone Response: Start of growing season line for gauge 1 has been fixed. Start of growing season dates have been provided for all groundwater gauge figures.

3. *Please review the reported consecutive days for wetland gauge data. Gauge 7, for example, appears to show only 40 consecutive days after 9/24.*

Ecotone Response: Maximum consecutive hydroperiods have been reviewed for all gauges and updated in Table 8. Gauge 7 now shows a period of 61 days and Gauge 9 shows a period of 87 days.

Thank you for your consideration of these monitoring report comments. We appreciate your assistance with our project thus far, and we look forward to working with you to complete the review process. Feel free to contact us at 410-420-2600.

Page 3 of 3

Sincerely,

A handwritten signature in cursive script that reads "Laura S. Calvert". The signature is written in black ink and is positioned above the printed name.

Laura S. Calvert
Ecologist
Ecotone, LLC

Table of Contents

1.0: Project Summary.....	3
1.1: Project Objectives.....	3
1.2: Project Success Criteria.....	3
1.3: Project Setting.....	4
1.4: Mitigation Components.....	4
1.5: Project Timeline.....	4
1.6: Design Approach.....	4
1.7: Project Performance.....	4
1.8: Methods and References.....	5
Vicinity Map.....	6
Appendix A: Background Tables (1-4).....	7
Appendix B: CCPV, Veg. Condition Assessment Table, Site Photos.....	11
Appendix C: Vegetation Plot Data (Table 6), Natural Stems Count (Table 7).....	32
Appendix E: Hydrologic Data.....	37
Appendix F: Comments and Responses, COE Permitting Determination.....	50

1.0: PROJECT SUMMARY

1.1: Project Objectives

The project objectives of the Hofler property per the approved mitigation plan are as follows:

- Enhance water quality by providing shading from forest cover, which will reduce thermal impacts associated with excess algae growth and decreased dissolved oxygen concentrations
- Slow runoff rates and provide storage and desynchronization of overland flow before it reaches Lassiter Swamp, located directly north of the project, by restoring the wetland complex
- Provide nutrient attenuation and uptake by restoring dense vegetation interspersed with shallow diffuse flows, thus improving downstream habitat
- Provide minimal earthwork and disturbance, as determined through preliminary site analyses, to the area to accomplish designed wetland topography
- Impact existing ecological communities as little as possible. No remnant wetland communities exist on site and no impacts to wetlands or riparian buffers will occur due to the restoration project.

1.2: Project Success Criteria

Wetland hydrology data must consistently document the appropriate hydroperiod has been restored for all areas proposed for wetland mitigation. The targeted hydroperiod for the Hofler Property is 6% or greater. Planted vegetation will be considered successful if at least 320 three-year-old planted stems/acre are present after year three. At year five, density must be no less than 260 five-year-old planted stems/acre. At year 7, density must be no less than 210 seven-year-old planted stems/acre. Additionally, planted vegetation must average 10 feet in height in each plot at year 7. Per the recommendations of the NCIRT, the following understory species were incorporated in the planting schedule on the condition they be exempted from the minimum 10-foot height criterion and exempted from the calculation of average height as a measure of that success criterion: Button bush (*C. occidentalis*), Sweet Bay (*M. virginiana*), Wax myrtle (*M. cerifera*), and Laurel oak (*Q. laurifolia*). These species will be included in the calculations for the survival criterion. All vegetative monitoring will follow CVS-EEP Protocol for Recording Vegetation-Version 4.0.

Additionally, the project will strive to establish a variety of hydrologic regimes ranging from shallow inundated areas to intermittently saturated conditions, restoring diffuse flow patterns through what will ultimately be a forested wetland. The successful establishment of these conditions, mimicking nearby reference wetlands will help determine the overall success of the project.

1.3: Project Setting

The Hofler property consists of +/- 345 acres, of which 27 acres have been designated for this project. The site consisted of a rectangular tract of land primarily being used for cotton and small grain production. The prior converted wetlands on the site had been extensively ditched and drained, lowering the local water table and diminishing aquatic habitat and water quality. The site drained from south to north to an unnamed tributary of Lassiter Swamp and Bennets Creek upstream of Merchants Mill Pond. The project site along with the surrounding areas has undergone expansive hydrologic alterations and excessive sediment and nutrient inputs from agricultural production resulting in overall water quality degradation. The vicinity map is included with the CCPV in Appendix B. Table 4 in Appendix A contains additional information regarding the project's location and attributes.

1.4: Mitigation Components

The mitigation components are 23 acres of non-riparian wetland restoration with a credit ratio of 1:1 (Restoration:WMU), please refer to Table 1 for more information.

1.5: Project Timeline

Construction commenced on August 12th, 2014 with the installation of recommended erosion control practices and was completed on Oct. 14th, 2014. Planting was officially concluded on May 6th, 2015 (Table 2). Refer to Table 2 in Appendix A for the Project History and Reporting Timeline.

1.6: Design Approach

A natural design approach focused on mimicking nearby wetlands, including non-riparian hardwood flats and swamp forests both in hydrologic regime and vegetative diversity. Grading was specifically formulated to provide storage for overland flow while creating densely vegetated plots interspersed with shallow diffuse flows. All of these features contribute to nutrient and sediment attenuation, improving downstream habitat and promoting diversity of ecological communities. The reference area for this project is a nearby mature hardwood flat with the same soils and topography and similar hydrologic function. The reference area is within Merchant's Millpond State Park.

1.7: Project Performance

Hydrology was successful over the entire project site. Monitoring in year 7 shows that the site closely followed the hydrology of the reference site. The hydrology charts are included in Appendix E.

Rainfall was lower than normal during early spring (March-May) and fall (September and October) and higher than normal throughout the summer months due to storm activity (June-August).

In this, year seven of monitoring, tree survival was found to be higher than in year 6. Ten of the eighteen permanent plots showed a survival number of planted stems that did not meet the year 7 success criteria, down from fourteen of eighteen in year 6. The overall average survival for the site was 200 planted stems per acre. However, the count of natural plus planted stems averaged to 523 stems per acre, which is the highest count to date and indicates that the site is making progress towards being an established forested wetland. The oaks continue to struggle against the very heavy herbaceous vegetation. The cycle of resprout, dieback and resprout continues to take its toll. The cypress stem count seems to have stabilized, with only a few stems lost. Their shade tolerant nature has helped them overcome the dense vegetation.

Per the recently approved adaptive management plan (see Appendix F), 6,000 trees were planted during the 2021 planting season on April 8, 2021. The majority were cypress (66%, 4,000 count), since they are able to survive the harsh competition. The cypress trees were sourced from ArborGen's Coastal Plain nursery. The remaining 2,000 included 1,000 willow oak (16.7%) and 1,000 swamp white oak (16.7%). The oaks were sourced from the Virginia Department of Forestry nursery. All trees planted were bare root seedlings and were hand planted. 13.8 acres of the southern region of the site, encompassing plots 1-3, 11-16 and 18, were planted with 3,800 cypress at 12 ft spacing. 3.8 acres of the northwestern region of the site, encompassing plots 4-7, were planted with 200 cypress and a mix of 500 willow and swamp white oaks at 15 ft spacing. 5.1 acres of the northeastern region of the site, encompassing plots 8-10 and 17, were planted with a mix of 1500 willow and swamp white oaks at 12 ft spacing.

Also, per the approved plan, the ditch plugs were lowered to promote drainage from the site. The goal is to create a slightly drier environment which will help lessen the stress on the trees.

1.8: Methods and References

Monitoring methodology did not differ from the approved Mitigation Plan. Vegetation assessment was done according to the level 2 protocol specified by the Carolina Vegetation Survey. Hydrology monitoring wells were installed per ERDC TN-WRAP-00-02 "Installing Monitoring Wells/Piezometers in Wetlands" dated 2000. Groundwater levels were recorded using the U20-001-01 water level data loggers manufactured by Onset Computer. The loggers were installed in the wells per the manufacturer's instructions.

Vicinity Map



Appendix A: Background Tables

Table 1. Project Components and Mitigation Credits

Table 2. Project Activity and Reporting History

Table 3. Project Contacts

Table 4. Project Information and Attributes

Table 1. Project Components and Mitigation Credits								
Hofler Project #95355, Contract #004628								
Mitigation Credit Summations								
	Stream	Riparian Wetland	Non-riparian Wetland	Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset		
Overall Credit			23					
Project Components								
Project Component or Reach	Stationing	Existing Footage or Acreage	Restoration Footage or Acreage	Restoration Level	Restoration or Rest. Equiv.	Mitigation Ratio	Mitigation Credits	Notes
Wetland 1		23	23		Restoration	1:1	23	
Length and Area Summations								
Restoration Level	Stream (Linear Feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)		
		Riverine	Non-Riverine					
Restoration				23				
Enhancement								
Enhancement I								
Enhancement II								
Creation								
Preservation								
High Quality Preservation								
BMP Elements								
Element	Location	Purpose/Function			Notes			

Table 2. Project Activity and Reporting History Hofler Property Wetland Mitigation Project #95355		
Activity, Deliverable or Milestone	Data Collection Complete	Actual Completion or Delivery
Project Institution	N/A	May-12
Mitigation Plan	May 2014	July 2014
Permits Issued	May 2014	July 2014
Final Design Construction Plans	May 2014	July 2014
Construction	N/A	October 2014
Temporary S & E mix applied to entire project area	N/A	N/A
Permanent seed mix applied to entire project area	N/A	October 2014
Containerized and BR Planting over entire project area	N/A	May 2015
Baseline Monitoring Document (Year 0 Monitoring-baseline)	May 2015	Sept. 2015
Year 1 monitoring	November 2015	November 2015
Year 2 monitoring	November 2016	November 2016
Year 3 monitoring	November 2017	November 2017
Year 4 monitoring	November 2018	November 2018
Year 5 monitoring	November 2019	November 2019
Year 6 monitoring	November 2020	November 2020
Modification to ditch plugs: lowered per AMP guidelines	November 2020	November 2020
Supplemental planting over entire project area	April 2021	April 2021
Year 7 monitoring	November 2021	November 2021

Table 3. Project Contacts Hofler Property Wetland Mitigation Project #95355	
Designer Primary Project design POC	Ecotone, Inc. Scott McGill (410) 420-2600 2120 High Point Rd, Forest Hill, MD 21050
Construction Contractor Construction contractor POC	Jennings Land Development Rodney Jennings (252) 202-6954 156 Trotman Rd. Camden, NC 2791
Planting Contractor Planting contractor POC	Carolina Silvics, Inc. Mary-Margaret McKinney (252-482-8491) 908 Indian Trail Road Edenton, NC 27932
Seeding Contractor Seed planting contractor POC	Woods, Water and Wildlife, Inc. Ed Temple (252) 333-0249 P. O. Box 176, Fairfield, NC 27826
Seed mix sources	Earnst Conservation Seeds, LLP, Meadville, PA
Nursery stock suppliers	Carolina Silvics (from various sources)
Monitoring Performers Wetland and Vegetation POC	Axiom Environmental Phillip Perkinson (252) 908-1545 218 Snow Avenue Raleigh, NC 27603

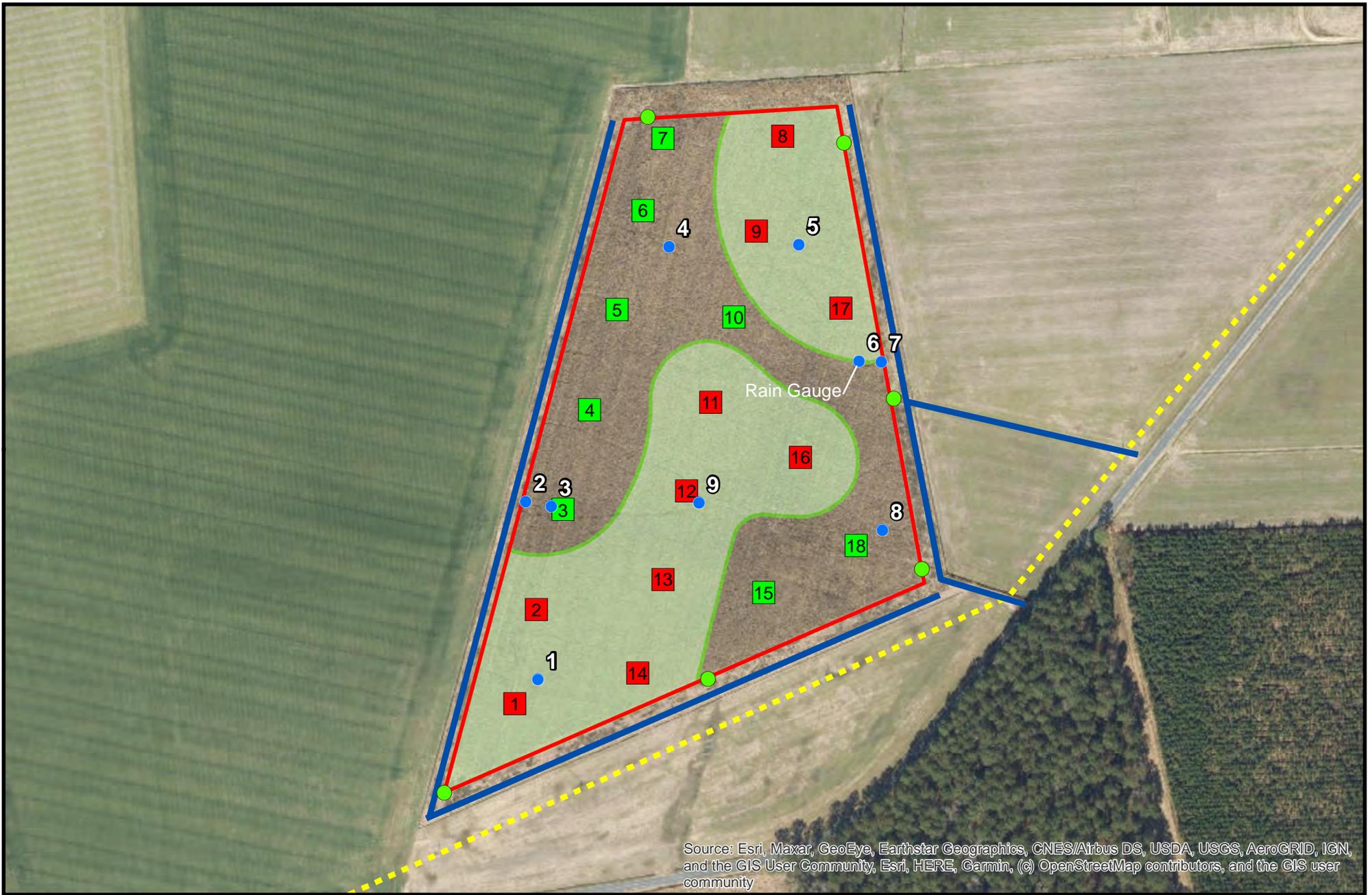
Table 4. Project Information and Attributes			
Project name		HOFLER PROPERTY	
County		GATES	
Project Area (ac)		27.0 AC	
Project Coordinates (Lat and Long)		+36° 25' 48.44", -76° 39' 10.91"	
4.1 Project Watershed Summary Information			
Physiographic province		INNER COASTAL PLAIN	
River basin		CHOWAN RIVER BASIN	
USGS Hydrologic Unit 8-digit	03010203	USGS Hydrologic Unit 14-digit	03010203040040
DWQ Sub-basin		BENNETTS CREEK LOCAL WATERSHED	
Project Drainage Area (acres)		103.8	
Project Drainage Area Percentage of Impervious Area		5%	
CGIA Land Use Classification		2.01.01.07 Annual Row Crop Rotation	
4.2 Wetland Summary Information			
Parameters	Wetland 1	Wetland 2	Wetland 3
Size of Wetland (acres)	23.0		
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Non-riparian		
Mapped Soil Series	BnA & PnA		
Drainage Class	Poorly drained & very poorly drained		
Soil Hydric Status	Hydric		
Source of Hydrology	Surface and Ground		
Hydrologic Impairment	44.8' to 155.2'		
Native Vegetation Community			
Percent Composition of Exotic Invasive Vegetation	N/A		
4.3 Regulatory Considerations			
Regulation	Applicable?	Resolved?	Supporting Documents
Waters of the United States – Section 404	N	N/A	Appendix F
Waters of the United States – Section 401	N	N/A	Appendix F
Endangered Species Act	N	Y	
Historic Preservation Act	N	Y	
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N	Y	
FEMA Floodplain Compliance	N	Y	
Essential Fisheries Habitat	N	Y	

Appendix B:

Current Condition Plan View

Table 5. Vegetation Condition Assessment Table

Site Photos



Hofler Restoration Project
Current Condition Plan View
 Project # 95355
 Feb. 2022

Legend	
	Easement Bndy / Area of Poor Growth Rate/Vigor
	Ditches
	Power Line
	Low Stem Density
	Well Location
	Plg Lowered

Veg Plots	Wetl Guages
	 Hydrology Met
	 Hydrology Not Met
	 Hydrology Part. Met

Table 5 **Vegetation Condition Assessment**
Planted Acreage¹ **23**

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	None	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	None	10	12.79	55.6%	
				Total	10	12.79	55.6%
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	None	0	23.00	100.0%	
				Cumulative Total	10	23.00	100.0%

Easement Acreage² **27**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern⁴	Areas or points (if too small to render as polygons at map scale).	1000 SF	None	0	0.00	0.0%
5. Easement Encroachment Areas³	Areas or points (if too small to render as polygons at map scale).	none	None	0	0.00	0.0%



View looking northeast across project



View looking north/northeast



View looking northeast. Footprint of old ditches still visible.



View looking east. Shows footprint of old ditches.



View looking south.



View looking northwest.

****Aerial photos from 2020 (MY6) See supporting documents for photos of vegetation plots.**



Ditch Plug 1
11/24/2020



Ditch Plug 2
11/24/2020



Ditch Plug 3
11/24/2020



Ditch Plug 4
11/24/2020



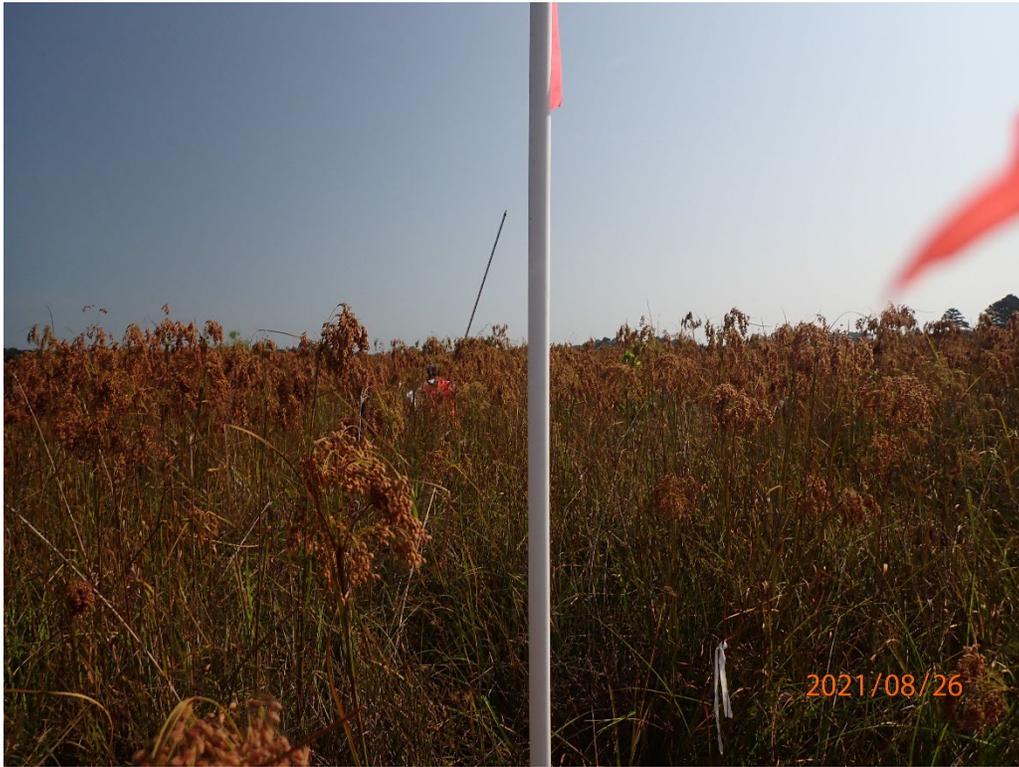
Ditch Plug 5
11/24/2020



Ditch Plug 6
11/24/2020



Vegetation Plot 1: August 26, 2021



Vegetation Plot 2: August 26, 2021



Vegetation Plot 3: August 26, 2021



Vegetation Plot 4: August 26, 2021



Vegetation Plot 5: August 26, 2021



Vegetation Plot 6: August 26, 2021



Vegetation Plot 7: August 26, 2021



Vegetation Plot 8: August 26, 2021



Vegetation Plot 9: August 26, 2021



Vegetation Plot 10: August 26, 2021



Vegetation Plot 11: August 26, 2021



Vegetation Plot 12: August 26, 2021



Vegetation Plot 13: August 26, 2021



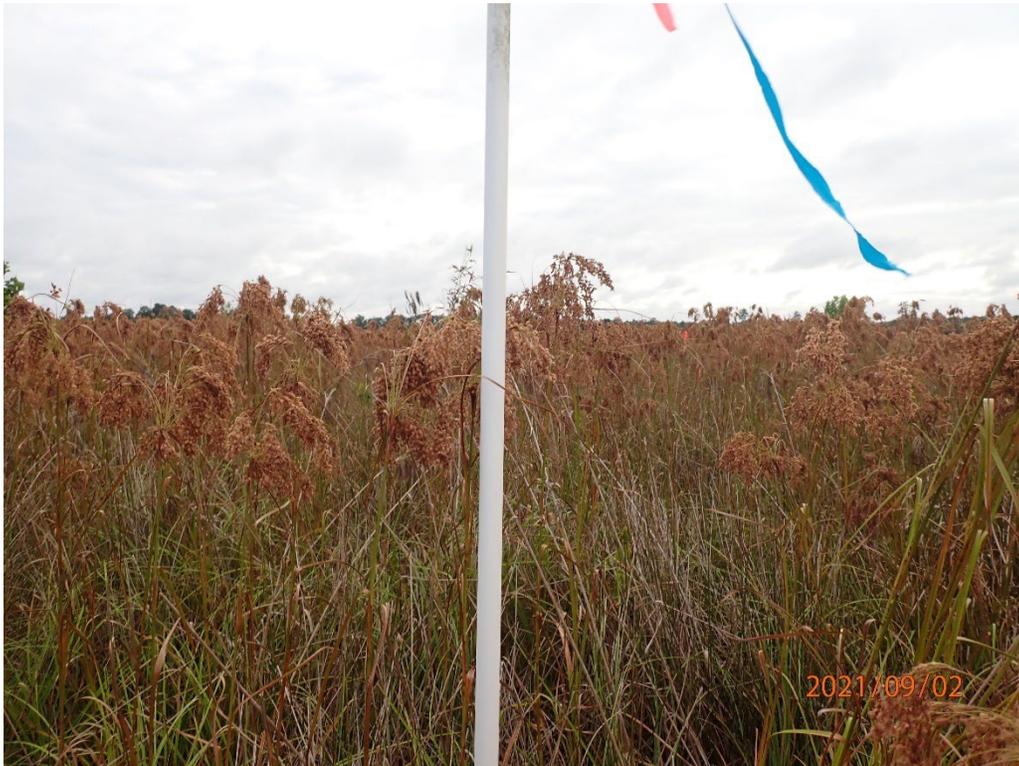
Vegetation Plot 14: August 26, 2021



Vegetation Plot 15: September 2, 2021



Vegetation Plot 16: September 2, 2021



Vegetation Plot 17: September 2, 2021



Vegetation Plot 18: September 2, 2021

Appendix C

Vegetation Plot Data

Table 6.

Project Code 95355. Project Name: Hofler			Current Plot Data (MY6 2021)																	
Scientific Name	Common Name	Species Type	95355-ab-0001			95355-ab-0002			95355-ab-0003			95355-ab-0004			95355-ab-0005			95355-ab-0006		
			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			7			8			13			22			5			3
Celtis occidentalis	common hackberry	Tree																		
Cephalanthus occidentalis	common buttonbush	Shrub										3	3	3	1	1	1	2	2	2
Magnolia virginiana	sweetbay	Tree										2	2	2	2	2	2	2	2	2
Morella	bayberry	shrub										1	1	1						
Morella cerifera	wax myrtle	shrub										1	1	1						
Myrica	sweetgale	shrub																		
Nyssa sylvatica	blackgum	Tree																		
Pinus taeda	loblolly pine	Tree												1						
Quercus bicolor	swamp white oak	Tree	1	1	1										1	1	1	1	1	1
Quercus laurifolia	laurel oak	Tree																		
Quercus michauxii	swamp chestnut oak	Tree	1	1	1				2	2	2	1	1	1				3	3	3
Quercus nigra	water oak	Tree																		
Quercus palustris	pin oak	Tree																		
Quercus phellos	willow oak	Tree													1	1	1			
Sambucus canadensis	Common Elderberry	Shrub																		
Taxodium distichum	bald cypress	Tree	1	1	1	4	4	4	4	4	4				1	1	1	3	3	3
Stem count			3	3	10	4	4	12	6	6	19	8	8	31	6	6	11	11	11	14
size (ares)			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			3	3	4	1	1	2	2	2	3	5	5	7	5	5	6	5	5	6
Stems per ACRE			121.4	121.4	404.7	161.9	161.9	485.6	242.8	242.8	768.9	323.7	323.7	1255	242.8	242.8	445.2	445.2	445.2	566.6

Table 6, continued.

Project Code 95355. Project Name: Hofler			Current Plot Data (MY6 2021)																	
Scientific Name	Common Name	Species Type	95355-ab-0007			95355-ab-0008			95355-ab-0009			95355-ab-0010			95355-ab-0011			95355-ab-0012		
			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			6			3			6			11			14			12
Celtis occidentalis	common hackberry	Tree																		
Cephalanthus occidentalis	common buttonbush	Shrub																1	1	1
Magnolia virginiana	sweetbay	Tree																		
Morella	bayberry	shrub																		
Morella cerifera	wax myrtle	shrub				1	1	1												
Myrica	sweetgale	shrub	2	2	2				1	1	1									
Nyssa sylvatica	blackgum	Tree																		
Pinus taeda	loblolly pine	Tree																		
Quercus bicolor	swamp white oak	Tree	1	1	1															
Quercus laurifolia	laurel oak	Tree																		
Quercus michauxii	swamp chestnut oak	Tree	1	1	1							3	3	3						
Quercus nigra	water oak	Tree				1	1	1												
Quercus palustris	pin oak	Tree																		
Quercus phellos	willow oak	Tree	3	3	3							1	1	1						
Sambucus canadensis	Common Elderberry	Shrub																		
Taxodium distichum	bald cypress	Tree	1	1	1	2	2	2	3	3	3	3	3	3				2	2	2
Stem count			8	8	14	4	4	7	4	4	10	7	7	18	0	0	14	3	3	15
size (ares)			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			5	5	6	3	3	4	2	2	3	3	3	4	0	0	1	2	2	3
Stems per ACRE			323.7	323.7	566.6	161.9	161.9	283.3	161.9	161.9	404.7	283.3	283.3	728.4	0	0	566.6	121.4	121.4	607

Table 6, continued.

Project Code 95355. Project Name: Hofler			Current Plot Data (MY6 2021)																	
Scientific Name	Common Name	Species Type	95355-ab-0013			95355-ab-0014			95355-ab-0015			95355-ab-0016			95355-ab-0017			95355-ab-0018		
			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			7			3			3			1			7			12
Celtis occidentalis	common hackberry	Tree																		
Cephalanthus occidentalis	common buttonbush	Shrub																		
Magnolia virginiana	sweetbay	Tree																		
Morella	bayberry	shrub																		
Morella cerifera	wax myrtle	shrub																		
Myrica	sweetgale	shrub																		
Nyssa sylvatica	blackgum	Tree							1	1	1									
Pinus taeda	loblolly pine	Tree																		
Quercus bicolor	swamp white oak	Tree																		
Quercus laurifolia	laurel oak	Tree																		
Quercus michauxii	swamp chestnut oak	Tree										1	1	1	2	2	2	4	4	4
Quercus nigra	water oak	Tree																		
Quercus palustris	pin oak	Tree							1	1	1									
Quercus phellos	willow oak	Tree																		
Sambucus canadensis	Common Elderberry	Shrub																		
Taxodium distichum	bald cypress	Tree	3	3	3	2	2	2	4	4	4	1	1	1	2	2	2	4	4	4
Stem count			3	3	10	2	2	5	6	6	9	2	2	3	4	4	11	8	8	20
size (ares)			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			1	1	2	1	1	2	3	3	4	2	2	3	2	2	3	2	2	3
Stems per ACRE			121.4	121.4	404.7	80.94	80.94	202.3	242.8	242.8	364.2	80.94	80.94	121.4	161.9	161.9	445.2	323.7	323.7	809.4

Table 6, continued.

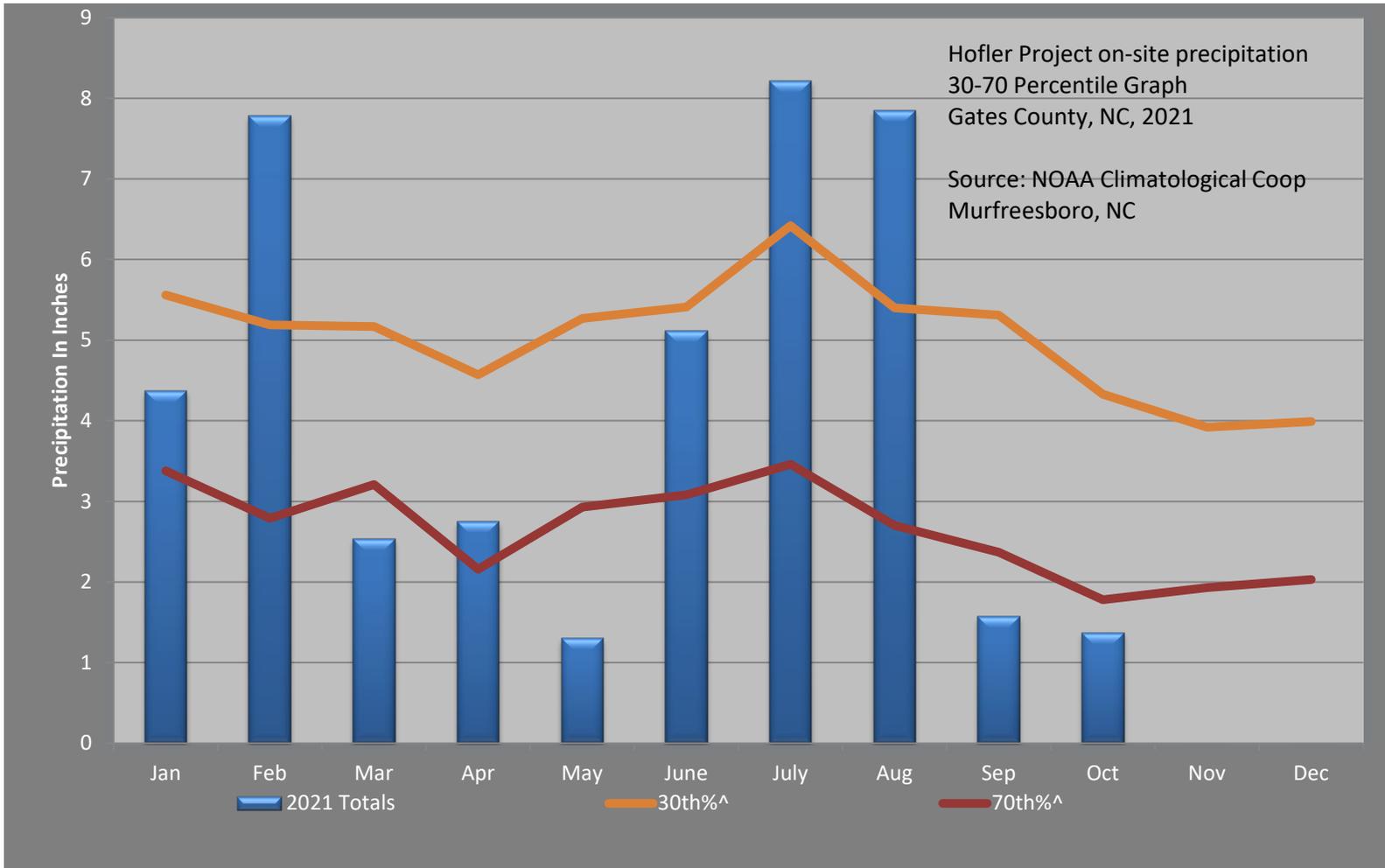
Project Code 95355. Project Name: Hofler			Annual Means																				
Scientific Name	Common Name	Species Type	MY7 (2021)			MY6 (2020)			MY4 (2019)			MY3 (2017)			MY2 (2016)			MY1 (2015)			MY0 (2015)		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree			143									7									
Celtis occidentalis	common hackberry	Tree																			1	1	1
Cephalanthus occidentalis	common buttonbush	Shrub	7	7	7	7	7	7	8	8	8	7	7	7	9	9	9	9	9	9	8	8	8
Magnolia virginiana	sweetbay	Tree	6	6	6	5	5	5	7	7	7	8	8	8	6	6	6	8	8	8	9	9	9
Morella	bayberry	shrub	1	1	1																		
Morella cerifera	wax myrtle	shrub	2	2	2																		
Myrica	sweetgale	shrub	3	3	3	6	6	6	6	6	6	10	10	10	9	9	9	15	15	15	15	15	15
Nyssa sylvatica	blackgum	Tree	1	1	1																		
Pinus taeda	loblolly pine	Tree			1																		
Quercus bicolor	swamp white oak	Tree	4	4	4	6	6	6	14	14	14	19	19	19	20	20	20	25	25	25	36	36	36
Quercus laurifolia	laurel oak	Tree										1	1	1	1	1	1	5	5	5	7	7	7
Quercus michauxii	swamp chestnut oak	Tree	18	18	18	15	15	15	37	37	37	67	67	67	35	35	35	49	49	49	55	55	55
Quercus nigra	water oak	Tree	1	1	1	1	1	1	9	9	9	12	12	12	13	13	13	23	23	23	34	34	34
Quercus palustris	pin oak	Tree	1	1	1																		
Quercus phellos	willow oak	Tree	5	5	5	5	5	5	13	13	13	19	19	19	18	18	18	26	26	26	30	30	30
Sambucus canadensis	Common Elderberry	Shrub																					
Taxodium distichum	bald cypress	Tree	40	40	40	27	27	27	28	28	28	29	29	29	31	31	31	31	31	31	35	35	35
Stem count			89	89	233	72	72	72	122	122	122	172	172	179	142	142	142	191	191	191	230	230	230
size (ares)			18			18			18			18			18			18			18		
size (ACRES)			0.44			0.44			0.44			0.44			0.44			0.44			0.44		
Species count			12	12	14	8	8	8	8	8	8	9	9	10	9	9	9	9	9	9	10	10	10
Stems per ACRE			200.1	200.1	523.8	161.9	161.9	161.9	274.3	274.3	274.3	386.7	386.7	402.4	319.3	319.3	319.3	429.4	429.4	429.4	517.1	517.1	517.1

Appendix E

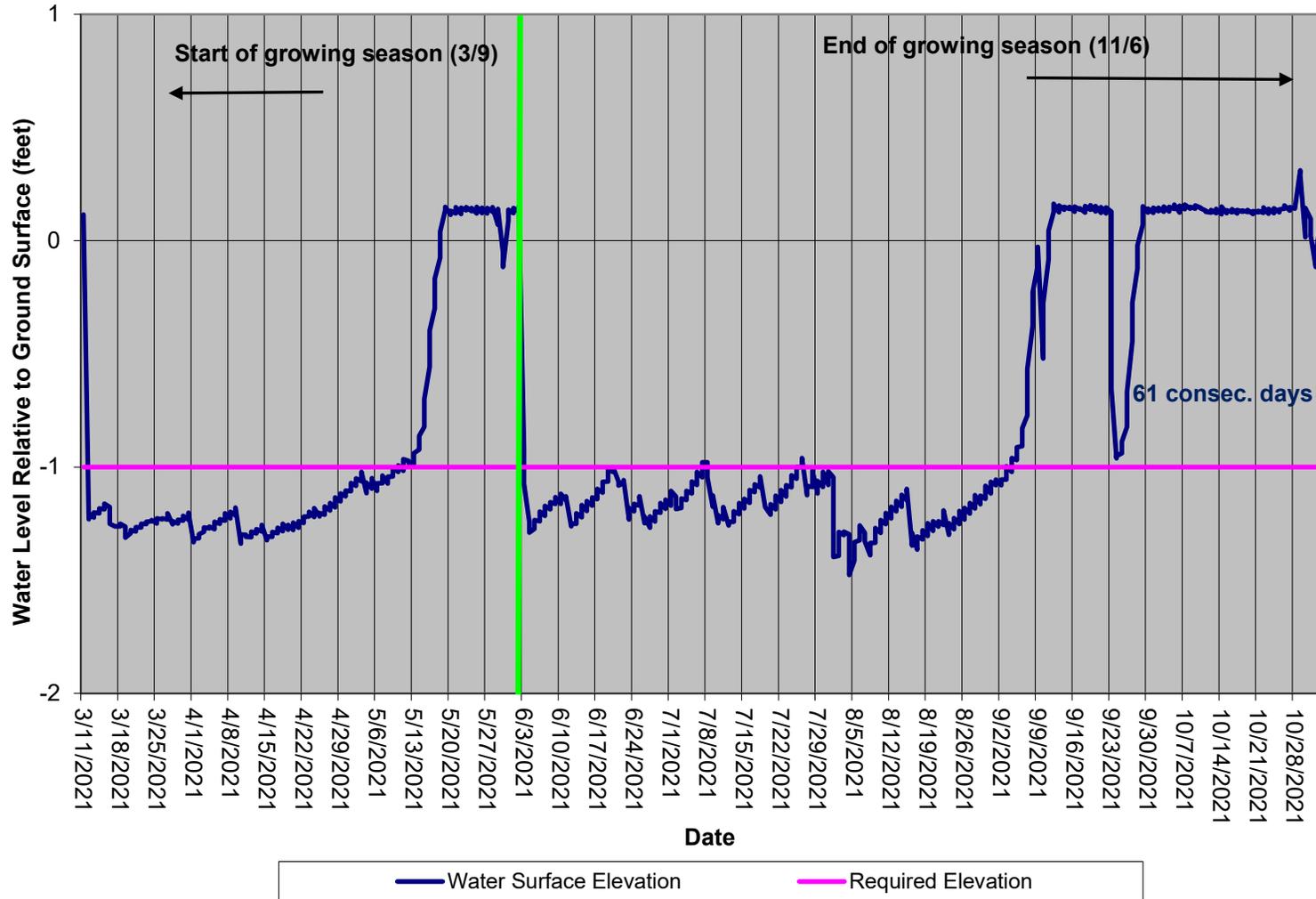
Precipitation Records

Hydrographs

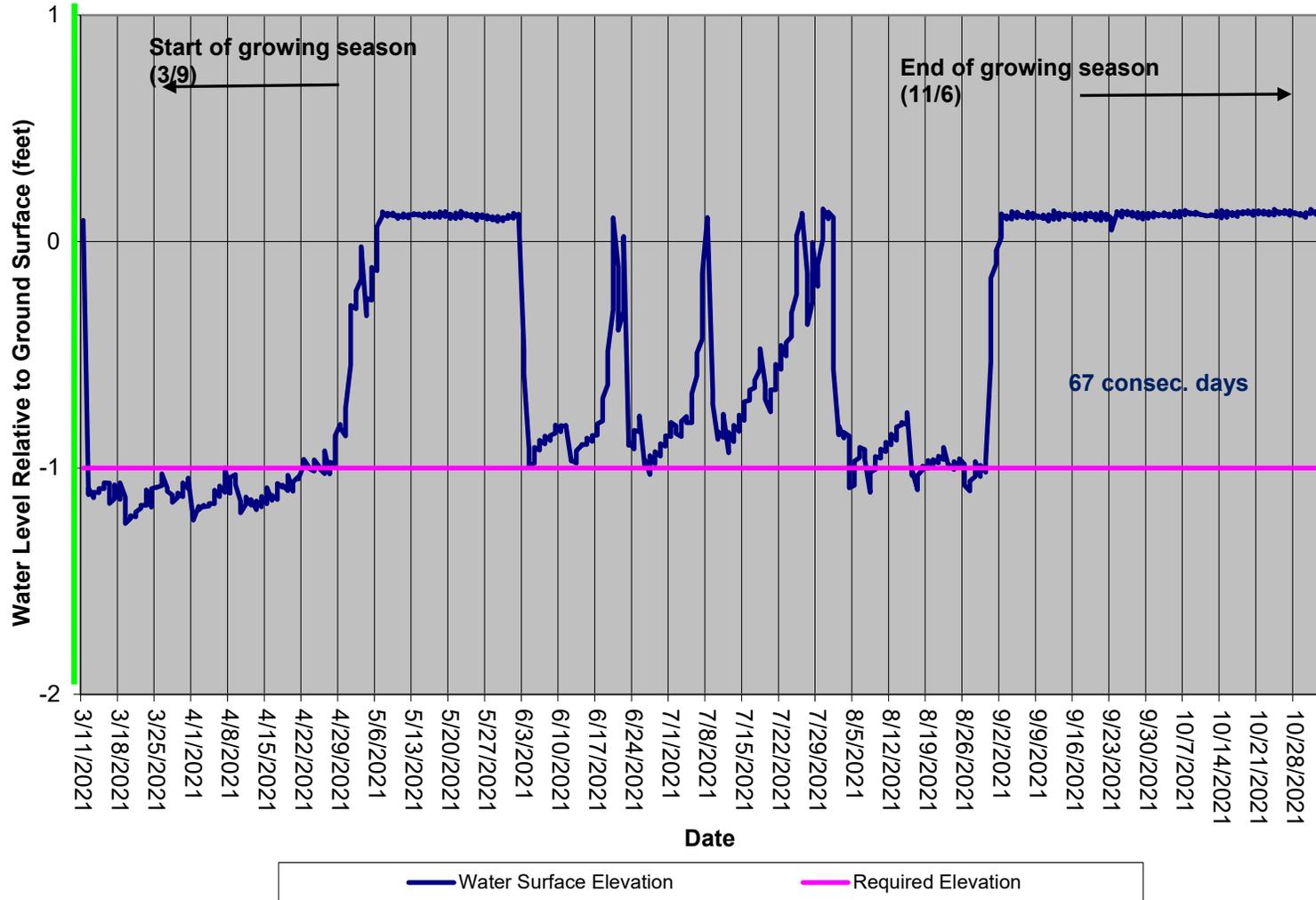
Table 8. Hydroperiod Summary Table



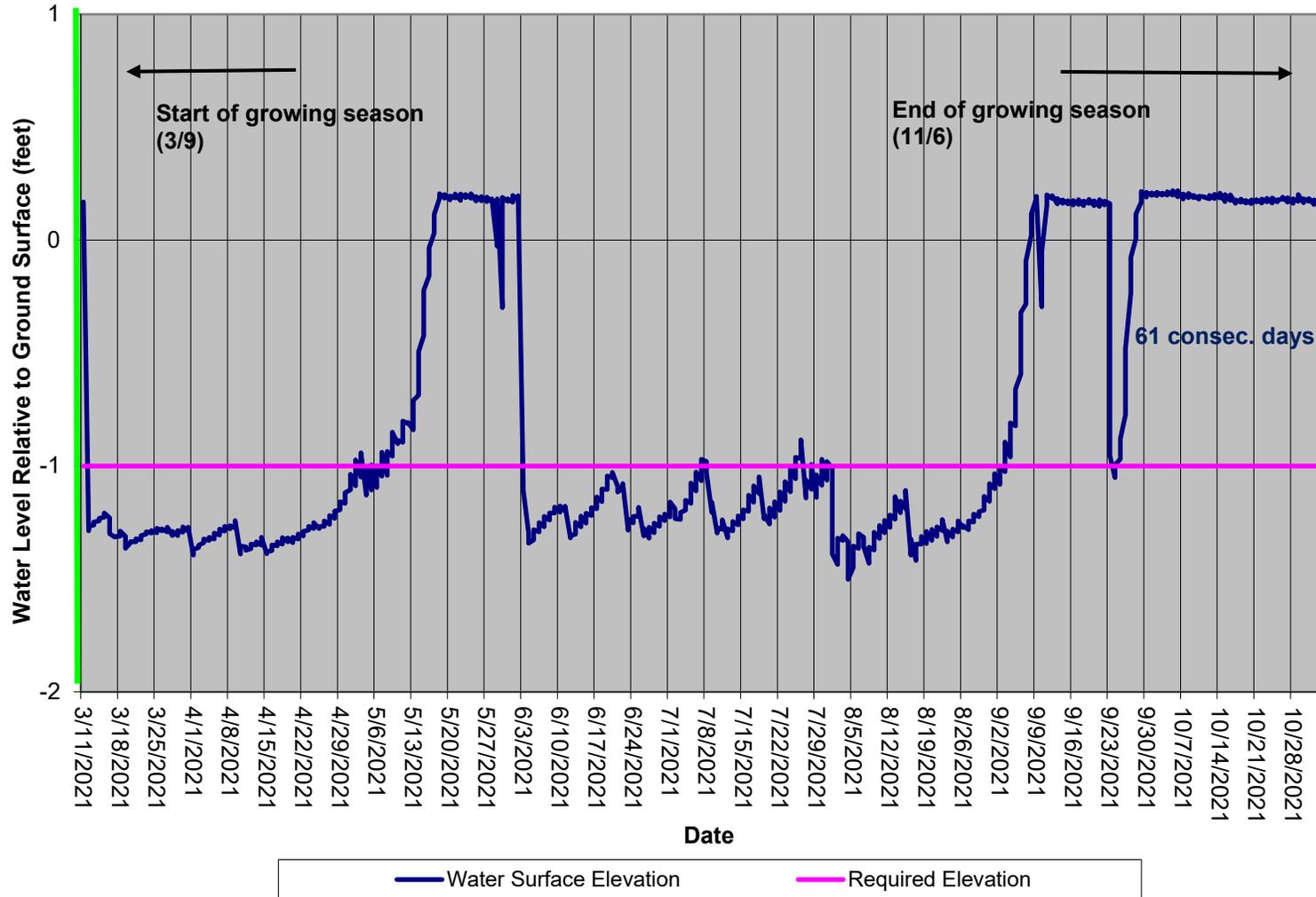
Hofler Monitoring Gauge #1 (20962824)



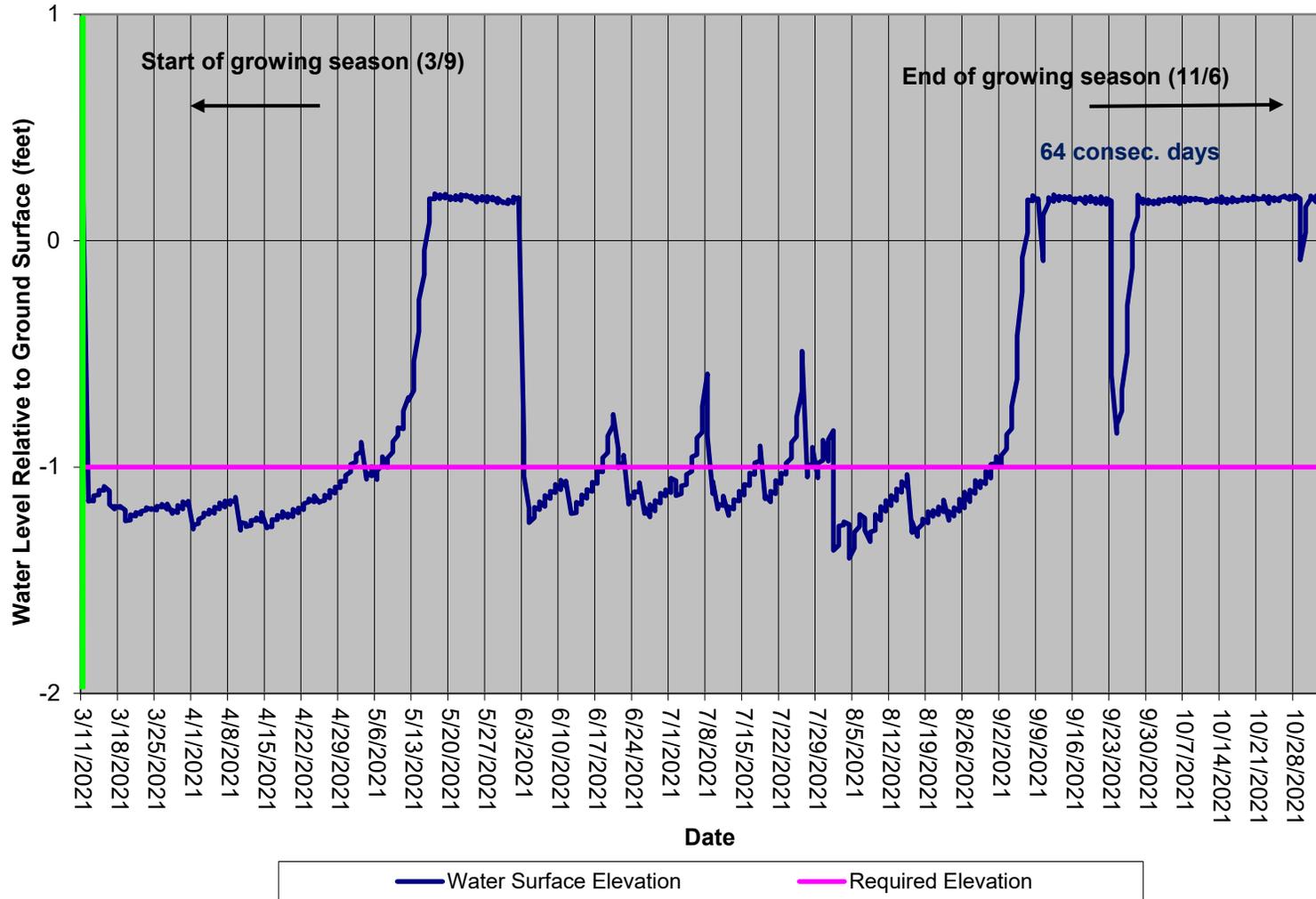
Hofler Monitoring Gauge #2 (21048571)



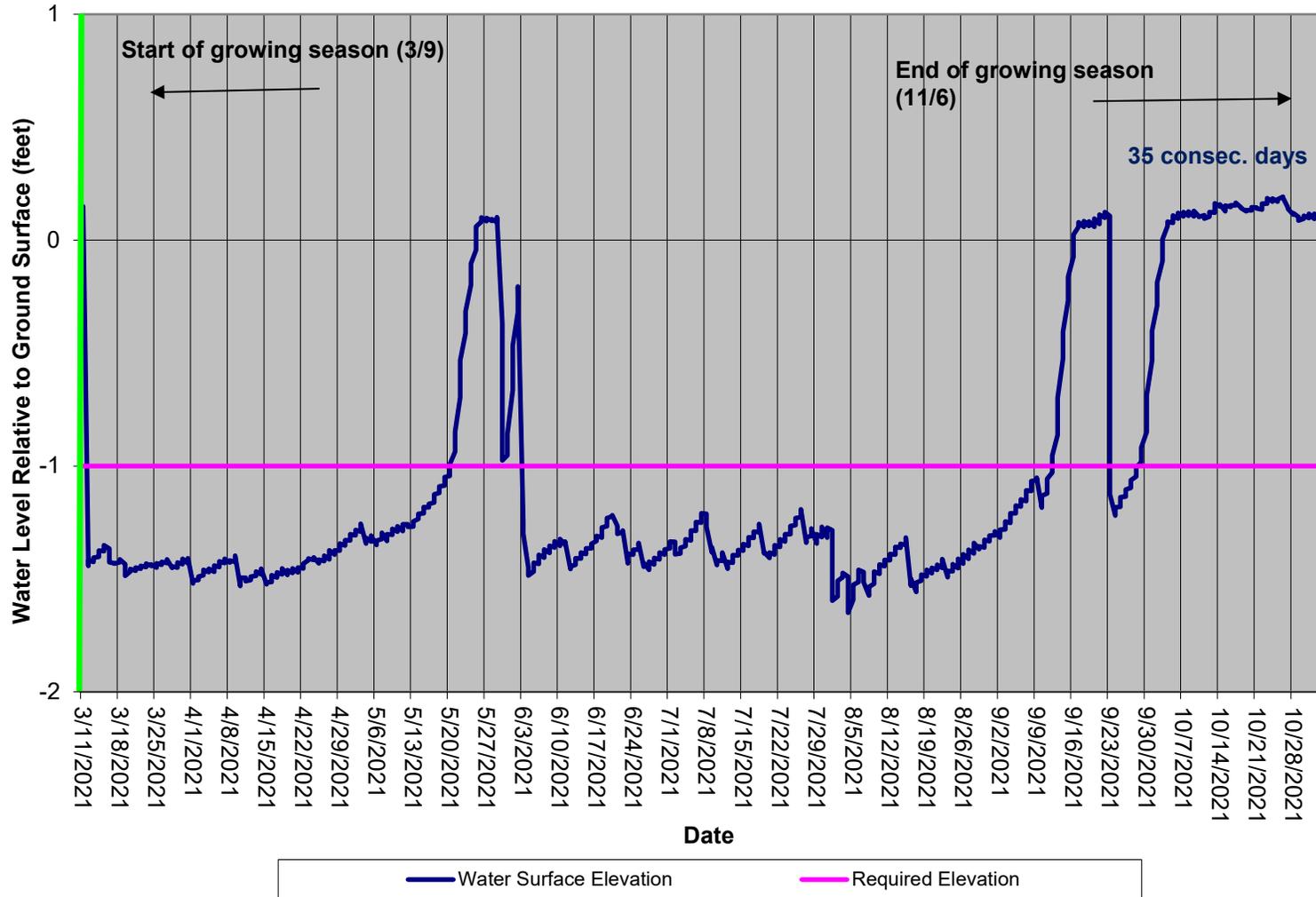
Hofler Monitoring Gauge #3 (20962764)



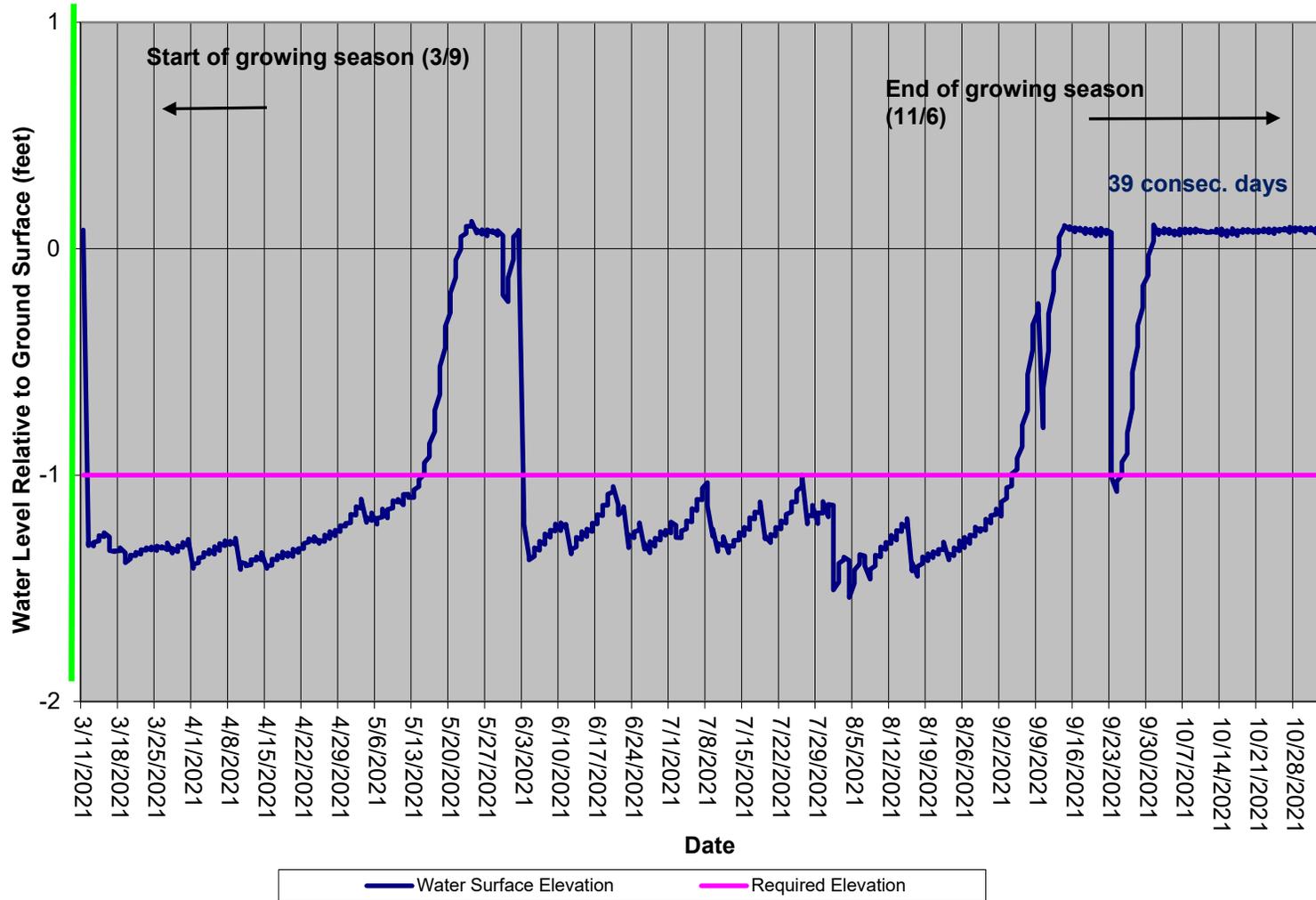
Hofler Monitoring Gauge #4 (10065547)



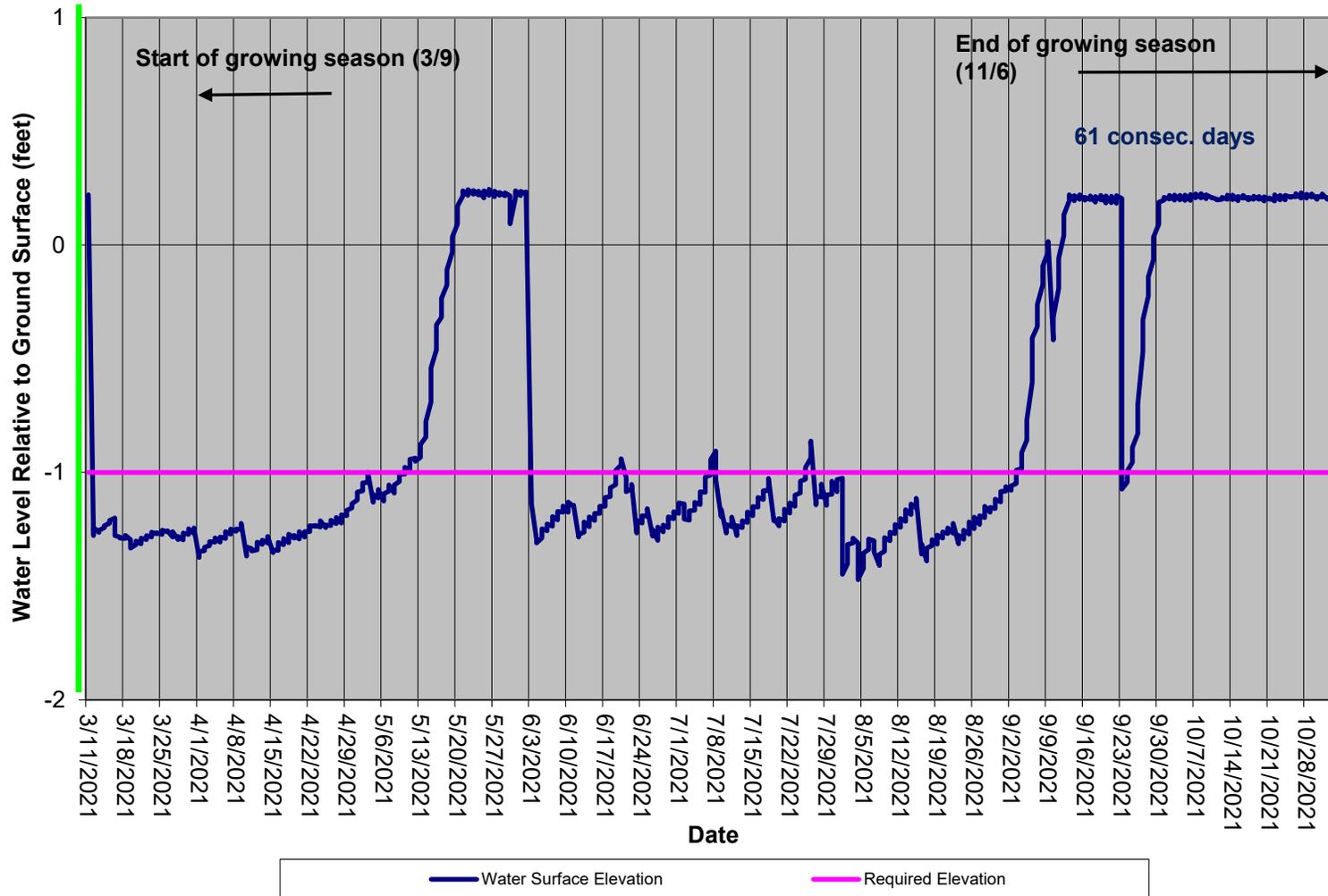
Hofler Monitoring Gauge #5 (10065546)



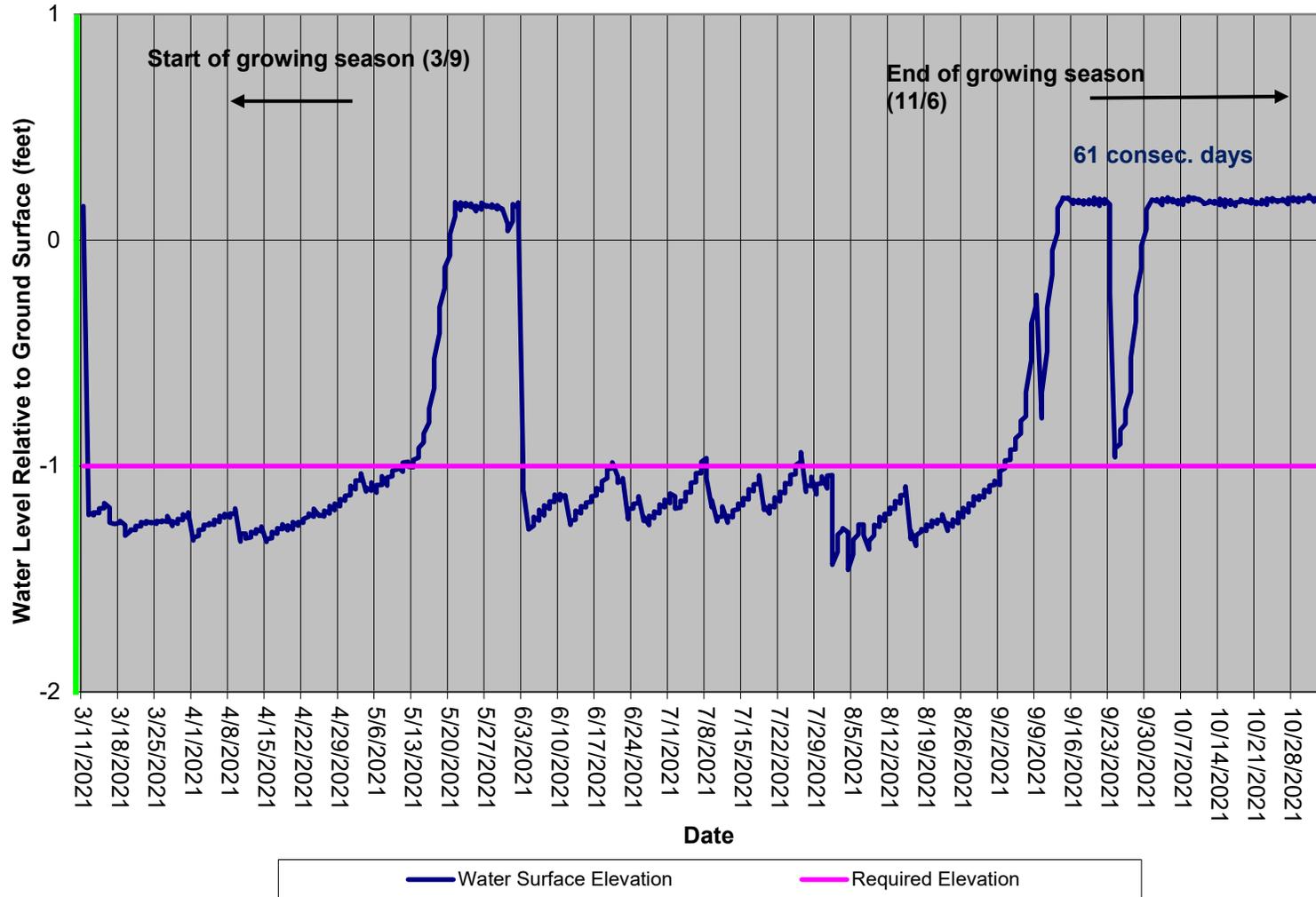
Hofler Monitoring Gauge #6 (1272313)



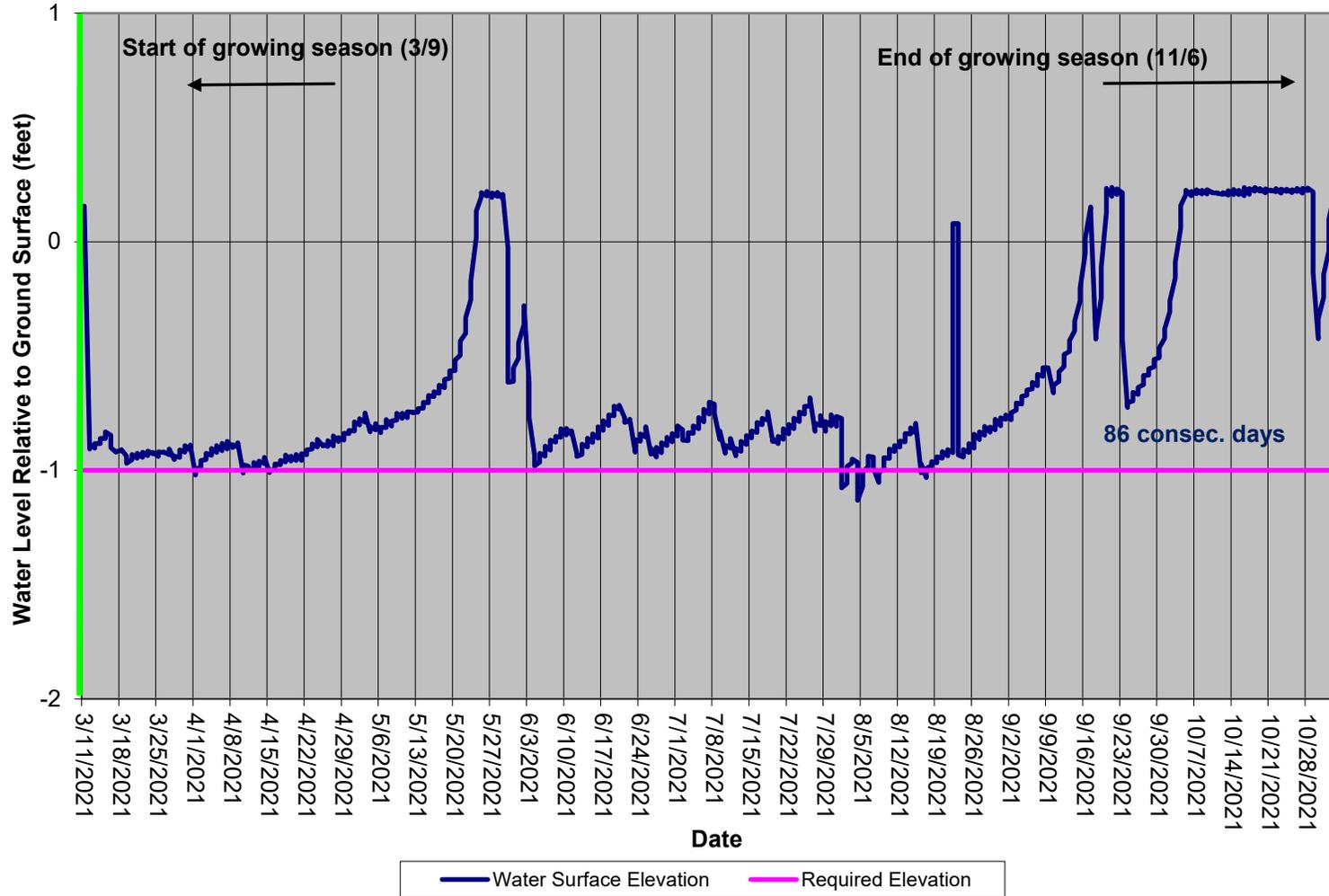
Hofler Monitoring Gauge #7 (20962765)



Hofler Monitoring Gauge #8 (20962823)



Hofler Monitoring Gauge #9 (10905996)



Hofler Monitoring Reference Gauge (20962760)

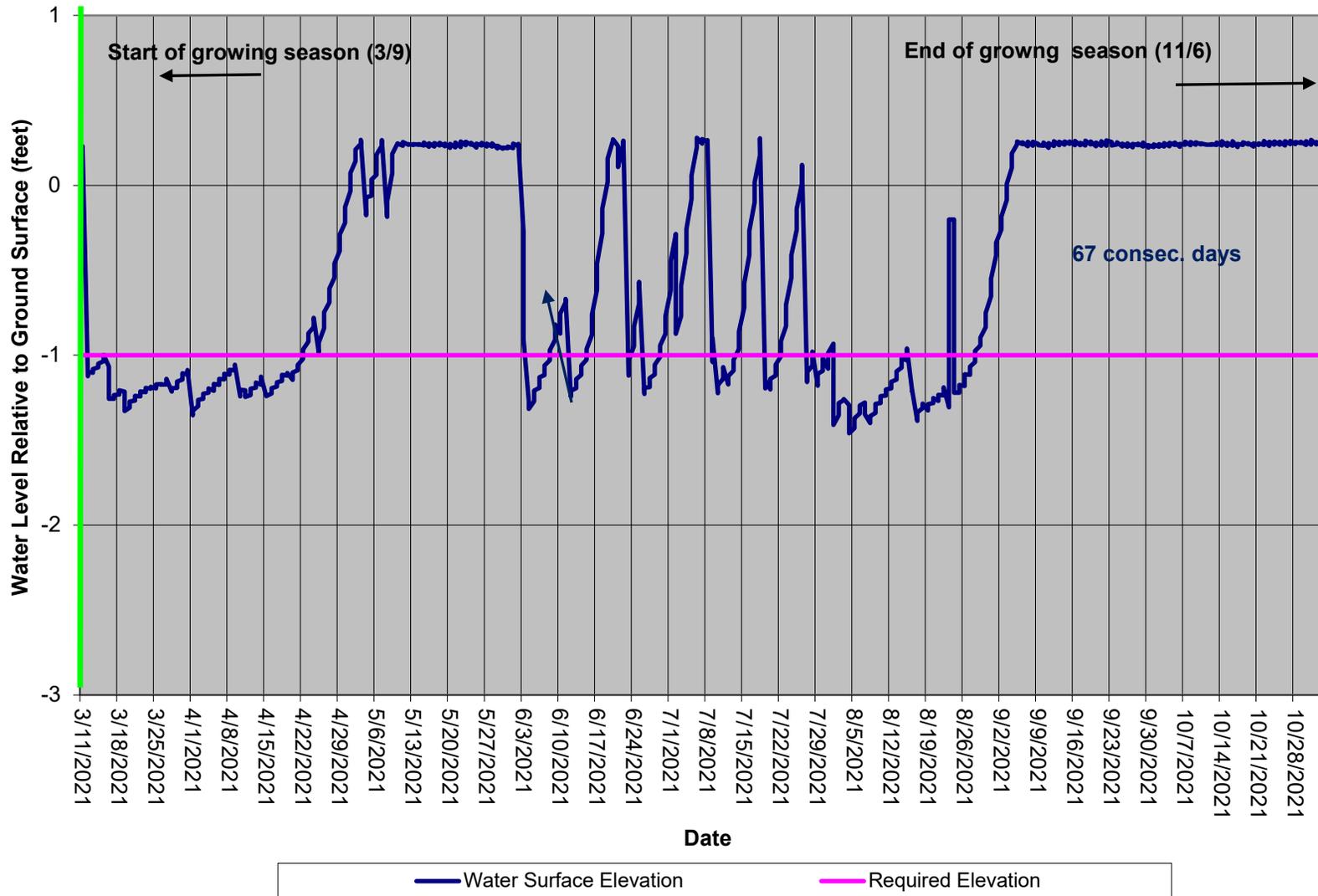


Table 8. Hydroperiod Summaries by Year

Monitoring Gauge Number	Max Consecutive Hydroperiod within 12" of Soil Surface: Percent of growing season and Date																						Mean Days				
	WETS table: Murfreesboro NC Growing Season 3/9 to 11/6 (243 days)																										
	2015	Dates	%G.S.	2016	Dates	%G.S.	2017	Dates	%G.S.	2018	Dates	%G.S.	2019	Dates	%G.S.	2020	Dates	%G.S.	2021	Dates	%G.S.						
1	14	4/11-5/14	5.8	97	3/9-6/13	39.9	103	3/14-6/26	42.4	101	3/9-6/17	41.6	75	3/9-5/23	30.9	120	3/9-7/5	49.2	61	9/3-11/3	25.1	81.6					
2	9.1	4/15-5/6	3.7	53	9/3-10/25	21.8	59	4/23-6/20	24.3	67	3/9-5/14	27.6	69	3/9-5/17	28.4	56	8/1-9/25	23	67	8/28-11/3	27.6	54.3					
3	12.8	6/25-7/25	5.2	64	9/1-11/3	26.3	103	3/14-6/24	42.4	99	3/9-6/15	40.7	74	3/9-5/22	30.5	97	3/9-6/12	39.8	61	9/3-11/3	25.1	73.0					
4	12.8	6/25-7/25	5.2	65	8/30-11/2	26.7	102	3/13-6/22	42	99	3/9-6/15	40.7	75	3/9-5/23	30.9	105	3/9-6/20	43	64	8/31-11/3	26.3	74.7					
5	24.7	6/4-8/2	10.2	99	3/9-6/15	40.7	120	3/9-7/6	49.4	127	3/9-7/11	52.3	77	3/9-5/25	31.7	91	3/9-6/6	37.3	35	9/29-11/3	14.4	82.0					
6	14	6/25-7/28	5.8	97	3/9-6/13	39.9	103	3/14-6/24	42.4	101	3/9-6/17	41.6	75	3/9-5/23	30.9	101	3/9-6/16	41.4	39	9/25-11/3	16.0	75.7					
7	23.5	6/2-7/28	9.7	98	3/9-6/14	40.3	110	3/9-6/26	45.3	100	3/9-6/16	41.2	77	3/9-5/25	31.7	104	3/9-6/19	42.6	61	9/3-11/3	25.1	81.9					
8	14	6/25-7/28	5.8	98	3/9-6/14	40.3	109	3/9-6/25	44.9	101	3/9-6/17	41.6	77	3/9-5/25	31.7	112	3/9-6/27	45.9	61	9/3-11/3	25.1	81.7					
9	11.5	4/15-5/12	4.7	98	3/9-6/14	40.3	113	3/9-6/29	46.5	182	3/9-9/6	74.9	78	3/9-5/26	32.1	107	3/9-6/22	43.9	86	8/9-11/3	35.4	96.5					
Reference	Reference site deemed unsuitable, data removed per DMS											29	3/9-4/6	12	32	4/4-5/5	13.2	64	3/9-5/12	26.3	31	3/9-4/7	12.7	67	8/28-11/3	27.6	44.6
Precip Total	30.02			63.84			54.86			34.04			46.21			64.04			42.86								
Within 30%/70% Range	Y			N			N			Y			Y			N			Y								
		Meets or exceeds success criteria																									
	N/A	Not available - Gage pulled or yet to be installed by this phase																									
	M	Malfunction, Data overwritten or Unretrievable																									

Appendix F

Year 6 Approved Adaptive Management Plan
USACE Permit Needs Determination

Hofler Property- Adaptive Management Plan, Revised 09/25/20

Albemarle Restorations, LLC, (AR) is proposing the following Adaptive Management Plan (AMP) for the Hofler Property (DMS Contract #004628) for the North Carolina Division of Mitigation Services (DMS) and Interagency Review Team (IRT) review and comment. This AMP has been revised based on the comments received from the IRT team on June 23, 2020, in which the IRT requested that a revised AMP be submitted that addressed the issue of excess hydrology that has stressed planted stock. As such AR is submitting the following AMP to address both the hydrologic stressor and planted vegetation performance:

1. Lowering the existing ditch plugs to an elevation of 33.7' or approximately 4" per plug. Per the approved as-built, the restored wetlands range in elevations from 33.91' to 33.71', with the average being 33.8' as designed. The ditch plugs were built to elevation 34.0' per design, approximately two tenths above the finish grade of the wetlands. We selected elevation 33.7' instead of 33.8' to try and reduce ponding in any isolated depressions. This remedial action should promote better off site drainage, helping to reduce inundation and ponding into the growing season, which will facilitate better tree survival and growth.
2. Conduct tree planting this winter (20/21) using bare root and/or containerized (based on availability) Bald cypress at a rate of 200 trees/ac or more to bring the stocking up to required levels in underperforming areas. These areas consist of the lower half of the project site, represented by plots 1, 2 and 11-18, as identified in the MY5 Monitoring Report (pg. 11). Additional tree planting across the entire site may occur based on seedling availability. Bald cypress was chosen because of its ability to grow in wet conditions, tolerance to competition, and past performance on site.
3. Conduct 10-15 additional vegetation plot (1/100th ac) surveys across the site this year. These will be randomly located outside of existing survey locations to better assess tree height, density, and survivorship.

Continue Hydrologic and Vegetation monitoring for additional three (3) years (MY8, MY9 & MY10) to ensure achievement of success criteria.

Intent to Approve Revised Adaptive Management Plan/ NCDMS Hofler Site / Gates Co./ SAW-2012-01393

1 message

Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil> Fri, Oct 23, 2020 at 1:30 PM
To: "Tugwell, Todd J CIV USARMY CESAW (USA)" <Todd.J.Tugwell@usace.army.mil>, "Davis, Erin B" <erin.davis@ncdenr.gov>, "Wilson, Travis W." <travis.wilson@ncwildlife.org>, "Haywood, Casey M CIV (USA)" <Casey.M.Haywood@usace.army.mil>, "Bowers, Todd (bowers.todd@epa.gov)" <bowers.todd@epa.gov>, "Matthews, Kathryn (kathryn_matthews@fws.gov)" <kathryn_matthews@fws.gov>, "Wells, Emily" <emily_wells@fws.gov>, "Lekson, David M CIV USARMY CESAW (USA)" <David.M.Lekson@usace.army.mil>, "Barnes, Kyle W CIV USARMY CESAW (US)" <Kyle.W.Barnes@usace.army.mil>, "Smith, Ronnie D CIV USARMY CESAW (USA)" <Ronnie.D.Smith@usace.army.mil>, "McLendon, C S CIV USARMY CESAW (USA)" <Scott.C.McLendon@usace.army.mil>, "maria.dunn@ncwildlife.org" <maria.dunn@ncwildlife.org>
Cc: "Baumgartner, Tim" <tim.baumgartner@ncdenr.gov>, Ashby Brown <ashby.brown99@gmail.com>, "Allen, Melonie" <melonie.allen@ncdenr.gov>, Scott McGill <SMcGill@ecotoneinc.com>, Marie Brady <mbrady@ecotoneinc.com>, "Crocker, Lindsay" <Lindsay.Crocker@ncdenr.gov>

Good afternoon,

The 15-day comment review period for the NCDMS Hofler Mitigation Site Adaptive Management Plan (SAW-2012-01393) closed on October 22, 2020. Per Section 332.8(o)(9) of the 2008 Mitigation Rule, this review followed the streamlined review process. All comments received during the review process are below.

IRT Comments on the Hofler Site Adaptive Management Plan:

The proposed AMP aims to address previously mentioned concerns of excessive hydrology and resulting vegetative mortality. We concur that replanting, additional hydrology monitoring, and additional veg monitoring (MY8-10) may help meet performance standards. The IRT requests that a diversity of species be planted, rather than the proposed single species. The IRT agrees that if the excessive site hydrology is appropriately addressed, additional species should be suitable for this site. Please note that the original vegetative performance standard at MY7 was set for at least 210 stems per acre with an average height of 10 feet still applies. There is concern that this will be difficult to meet. Failure to meet this standard may lead to an adjustment of credit to account for vegetative density and vigor concerns.

It is our intent to approve this adaptive management plan provided you address IRT concerns listed above. Please contact the mitigation office if you have questions.

Respectfully,

Kim Browning

Mitigation Project Manager, Regulatory Division | U.S. Army Corps of Engineers



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

July 21, 2014

Regulatory Division

Re: NCIRT Review and USACE Approval of the Hofler Property Wetland Mitigation Site Plan; SAW-2012-01393; NCEEP Project # 95355

Mr. Tim Baumgartner
North Carolina Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Mr. Baumgartner:

The purpose of this letter is to provide the North Carolina Ecosystem Enhancement Program (NCEEP) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day comment period for the the Hofler Property Wetland Mitigation Site Plan, which was reposted and closed on April 5, 2014. These comments are attached for your review.

This mitigation plan was originally posted in January, 2014. Comments posted identified numerous concerns with the projects (see attached memo). Because of these comments, the plan was revised in March 2014, and reposted on March 6, 2014 for a second review. The deadline for comments was April 5, 2014. An initial review of the comments revealed that many of the comments from the first round of comments had not been addressed in the March mitigation plan revision.

Prior to making a determination as to whether to approve this project, a third copy of the mitigation plan, dated May 2014, was received on May 29, 2014. This plan has subsequently been reviewed in light of the comments provided by NCIRT members during the review. Most of the comments have been addressed in the recent version of the plan, including concerns regarding well placement, vegetation plots, appropriate hydroperiod, and the proposed species list for planting. Based on these modifications, we have determined that major concerns identified with the Draft Mitigation Plan have been addressed, and the mitigation plan is considered approved with this correspondence.

Nevertheless, we believe it is important to note that the location and method of construction at the proposed site are not preferred, and effort should be made to avoid this type of project in the future. As a general rule, we do not believe that building berms around a restored wetland is an appropriate way to reestablish hydrology on a site. To begin with, this is not true restoration as you are establishing an entirely new hydrology regime on the site. Water flow into and out of the wetland is severely restricted by the berms, and the outflow elevation for the entire site is controlled by "ditch plugs/check dams" (see discussion on page 23 of the mitigation plan dated May 2014). In addition, there is the potential that

berms may be breached in the future through natural or anthropogenic means, which could affect the hydrology of the entire site. Lastly, constructing a wetland site in the middle of an agricultural field is not ideal as it drastically limits the connection between the site and forested wetlands adjacent to or downstream from the project. In this case, water flowing from the site must travel through more than ¼ mile of ditch before it reaches the forested headwaters of Lassiter Swamp, limiting the benefit of the project and the ability of the site to fully achieve the stated goals of the mitigation plan.

The Final Mitigation Plan is to be submitted with the Preconstruction Notification (PCN) Application for Nationwide permit approval of the project along with a copy of this letter. All changes made to the Final Mitigation Plan should be summarized in an errata sheet included at the beginning of the document. As it was determined that the project does not contain jurisdictional waters of the U.S., construction for the project does not require a Department of the Army permit; however, you must still provide a copy of the Final Mitigation Plan, along with a copy of this letter, to the appropriate USACE field office at least 30 days in advance of beginning construction of the project. Please note that this approval does not preclude the inclusion of permit conditions in the permit authorization for the project. Additionally, this letter provides initial approval for the Mitigation Plan, but this does not guarantee that the project will generate the requested amount of mitigation credit. As you are aware, unforeseen issues may arise during construction or monitoring of the project that may require maintenance or reconstruction that may lead to reduced credit.

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please call me at 919-846-2564.

Sincerely,



Todd Tugwell
Special Projects Manager

TUGWELL.TODD.JASON.1048429293
2014.07.21 14:23:23 -04'00'

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List
NCEEP/Heather Smith
NCEEP/Lin Xu

Ed Temple

From: Smith, Heather [heather.c.smith@ncdenr.gov]
Sent: Monday, July 21, 2014 3:24 PM
To: edtemple@vol.com
Subject: FW: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Categories: Red Category

Ed,

Here is the clarification email.

Sincerely,

Heather Smith
Eastern Project Manager
Ecosystem Enhancement Program
919-707-8496
heather.c.smith@ncdenr.gov

Physical Address:
217 West Jones St., 3rd Floor, Suite 3000A, Raleigh, N.C. 27603

Mailing address:
1652 Mail Service Center, Raleigh, N.C. 27699-1652.

Parking and visitor access information is available on the EEP website.

Email correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties.

-----Original Message-----

From: Tugwell, Todd SAW [<mailto:Todd.Tugwell@usace.army.mil>]
Sent: Monday, July 21, 2014 3:17 PM
To: Baumgartner, Tim
Cc: Smith, Heather
Subject: RE: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

No, that was an oversight. No need for a PCN.

Todd

-----Original Message-----

From: Baumgartner, Tim [<mailto:tim.baumgartner@ncdenr.gov>]
Sent: Monday, July 21, 2014 3:02 PM
To: Tugwell, Todd SAW
Cc: Smith, Heather
Subject: [EXTERNAL] RE: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Todd,

Thanks for the letter. We are a little confused. The last paragraph of the letter says to submit a PCN. There is no PCN needed for the project because the site is not currently jurisdictional. Do they submit a PCN anyway or was this an oversight?

Thanks
Tim

=====

Tim Baumgartner, CPESC
Deputy Director of Operations
Ecosystem Enhancement Program
Department of Environment and Natural Resources

Office - 919-707-8543

Cell - 919-218-2557

From: Tugwell, Todd SAW [<mailto:Todd.Tugwell@usace.army.mil>]
Sent: Monday, July 21, 2014 2:43 PM
To: Baumgartner, Tim
Cc: Xu, Lin; Smith, Heather; Fritz Rohde (Fritz.Rohde@noaa.gov); Chapman, Amy; Baker, Virginia; Beter, Dale E SAW; Biddlecome, William J SAW; bowers.todd@epa.gov; Crumbley, Tyler SAW; Karoly, Cyndi; Cox, David R.; Hall, Dolores; Emily.Jernigan@fws.gov; Alsmeyer, Eric C SAW; Kulz, Eric; Gibby, Jean B SAW; Greer, Emily C SAW; Jones, Scott SAW; Higgins, Karen; Kathryn.Matthews@fws.gov; Marella Buncick (Marella.Buncick@fws.gov); McLendon, Scott C SAW; Gledhill-earley, Renee; Sollod, Steve; Wilson, Travis W.; Wheeler, Tracey L SAW; Wicker, Henry M JR SAW
Subject: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

Mr. Baumgartner,

Attached is the approval letter for the Draft Mitigation Plan for the Hofler Mitigation Project, along with all the comments that were generated during the IRT's review of the project on the Mitigation Plan Review Portal. Please note that this letter approves the Draft Mitigation Plan. The site was determined to have no waters of the U.S., so a permit is not required for construction; however, a copy of the final mitigation plan should be provided at least 30 days prior to construction on site. Also, please ensure that the Final Mitigation Plan is posted to NCEEP's documents portal so that all members of the IRT have access to the Final plan.

Please let me know if you have any questions about the process or the attached letter.

Todd Tugwell
Special Projects Manager
Regulatory Division
Wilmington District
U.S. Army Corps of Engineers
11405 Falls of Neuse Road
Wake Forest, NC 27587
(919) 846-2564

Classification: UNCLASSIFIED

Caveats: NONE

Classification: UNCLASSIFIED

Caveats: NONE