Mason Property Wetland Mitigation Project

Hyde County, NC

2014 Supplemental Monitoring Report – Post Closeout
Year 7

NCEEP Project Number D06001
Tar-Pamlico River Basin CU: 03020105

Submitted to
NCDENR/Ecosystem Enhancement Program
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Executive Summary

The Mason Property Wetland Mitigation Site went to closeout in the spring of 2013. Hydrology was more than adequate but tree survival was suffering due to the damage done by Hurricane Irene in 2011. As a result, the Interagency Review Team agreed with Albemarle Restorations recommendation that the site be replanted and monitored for an additional three years for vegetation success. The IRT suggested that one hydrology monitoring gauge be maintained for reference. Portions of the project area were disked to facilitate planting in September of 2013 and in November of 2014 the project area was replanted to varying densities as needed to bring stocking levels up.

The Mason Project is a riverine and non-riverine wetland restoration project located on U. S. Rt. 264 at Rose Bay in Hyde County, North Carolina. It was constructed by Albemarle Restorations, LLC, under contract with EEP to provide compensatory wetland mitigation credits in the Tar-Pamlico River Basin. Construction activities, in accordance with the approved restoration plan, began March 14, 2007, and were completed on May 14, 2007. The resulting features include a main swamp run and adjacent areas of lower elevation that retain flood water for extended periods.

Four vegetative monitoring plots are installed and permanently monumented. Due to the disking activities, the plots had to be re-installed but they are all at or very near their original locations which ensure an accurate sampling of the entire vegetative community. Each plot is a 10m X 10m square, as recommended by the CVS-EEP Protocol for recording vegetation sampling. In this sixth year of monitoring, all four plots met the Year 5 success criterion of 260 living planted stems per acre.

Table ES-1 shows the levels of success attained by each of the vegetation plots since monitoring began. Success criterion for the vegetation plots is 260 live stems per acre (the year 5 criterion for survival). Average stocking for the entire project at the end of 2014 was 392 stems per acre.

A hydrology gauge was left on site but malfunctioned sometime during the monitoring season and its data had not been recovered as of the submission of this report. As can be seen from the photos at the end of this report, hydrology as not changed and the site continues to be very wet.

Table ES 1.

	Stems per acre for these years:						
Plot	2008	2009	2010	2011	2012	2013	2014
1	364	445	454	412	0	412	371
2	324	445	371	330	206	495	454
3	243	405	495	495	41	412	412
4	40	405	371	330	82	330	330

I. Project Background

1.0 Project Objectives

The goal of the Mason Property Mitigation Project was to create both riverine and non-riverine wetland systems that will accomplish several goals. Primary among those goals is the establishment of functioning wetlands that will aid in flood attenuation and improve water quality on site and downstream. The project is to serve as compensation for wetland loss in the Tar-Pamlico River Basin. The restoration plan was developed and implemented to eliminate pattern drainage and restore topography and hydrology that more closely resembled that of similar undisturbed land. Construction resulted in the development of a broad, frequently flooded swamp run following the historical path as evidenced by aerial photographs and signature topography. Subsequent planting was designed to restore a wetland forest ecosystem that is typically found in the immediate area characteristic of similar soils, topography and hydrology.

The specific project goals and objectives include:

1) Provide floodflow attenuation.
2) Water quality improvement through sediment, toxicant, and nutrient retention and reduction.
3) Slow over bank flow rates and provide storage and desynchronization of flood waters.
4) Alleviate downstream flooding issues by lessening the effect of pulse or flashy flows.
5) Provide shading through forest cover to reduce algae growth and associated low dissolved oxygen levels in surface water moving through the site.
6) The production and export of food sources.
7) The creation of wildlife habitat and recreational opportunities.

2.0 Project Structure, Restoration Type, and Approach

Table I lists the estimated wetland acreage by community type to be restored on the Mason Property. The mitigation plan provides for the restoration of 16.0 acres of riverine wetlands and 20.0 acres of non-riverine wetlands. The 36.0 acre easement area is located within the boundaries of the larger Mason farm which has been used for row crop production. The project area was bisected by a deep drainage ditch that acted as a stream that ran from north to south through the property. Degradation to the channel and surrounding areas by past agricultural activities, including channel straightening and planting of row crops up to the channel edges had eliminated any significant natural habitat on the site and allowed excessive nutrient and sediment accumulation in the channel. Construction, in accordance with the approved restoration plan, began in March of 2007 and was completed in May of 2007. The resulting features and topography allow for frequent over bank flooding of the newly created swamp run, which in turn allows for adjacent areas that are lower in elevation to retain water even after stream flow returns to normal.

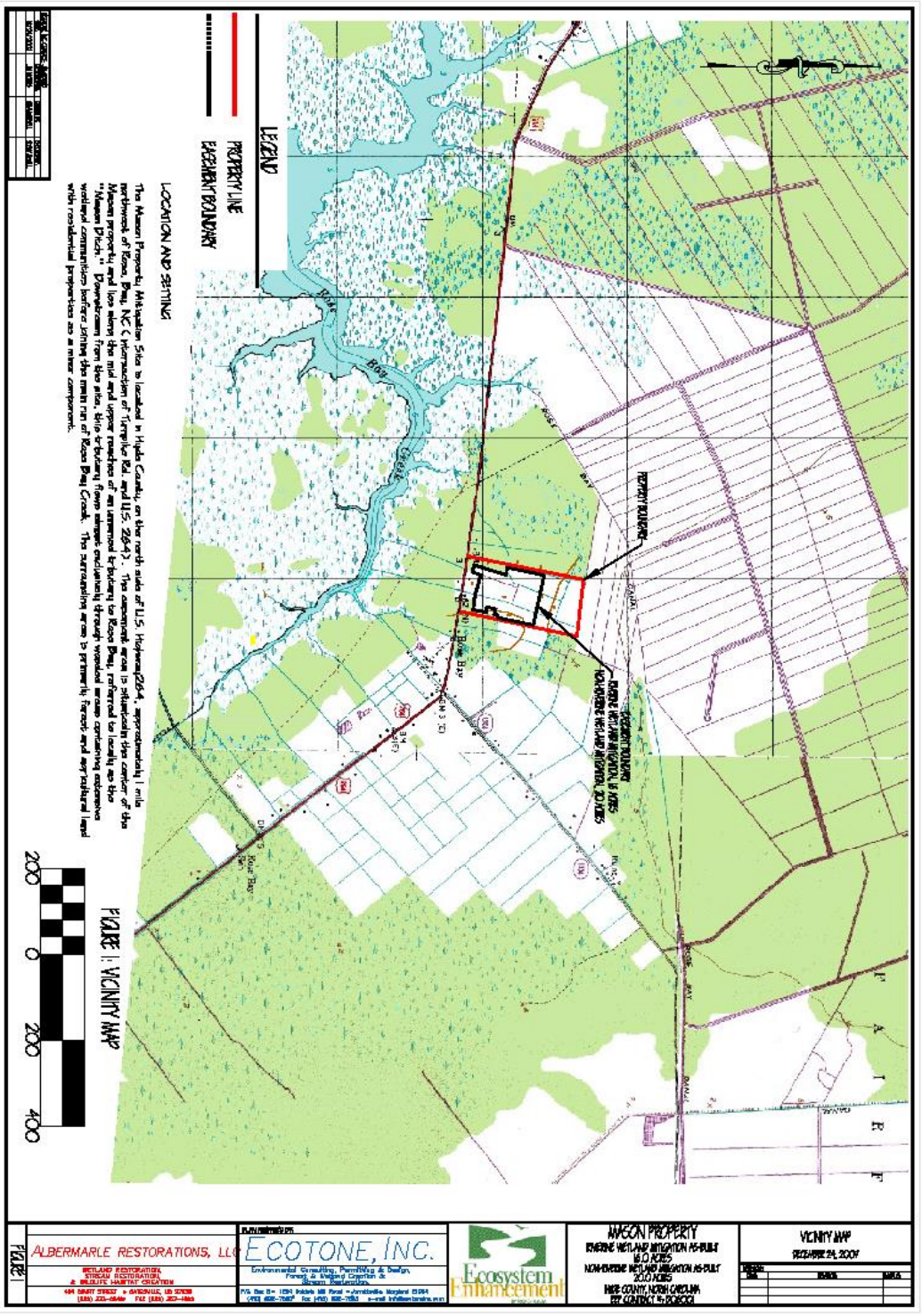
Table I. Project Restoration Components Mason Property Wetland Mitigation Site/EEP #D06001				
Community Type	**Pre-Existing Acreage**	**Post Construction Acreage**	**Credit Ratio (Restoration WMU)**	**Mitigation Units**
Riverine Wetland	0.0	16.0	1:1	16.0
Non-Riverine Wetland	0.0	20.0	1:1	20.0
			Total	36.0

3.0 Location and Setting

The Mason Property Mitigation Site is located in Hyde County, on the north side of U.S. Highway 264, approximately 1 mile northwest of Rose Bay, NC (intersection of Turnpike Rd. and U.S. 264). The easement area is situated in the center of the Mason property and lies along the mid and upper reaches of an unnamed tributary to Rose Bay, referred to locally as the "Mason Ditch." Downstream from this site, the tributary flows almost exclusively through wooded areas containing extensive wetland communities before joining the main run of Rose Bay Creek. The surrounding area is primarily forest and agricultural land with residential properties as a minor component.

Figure 1 is a location map for the project area. Directions to the site are as follows: travel west from Rose Bay on U.S. Hwy. 264 approximately 1 mile and turn right (north) onto the property. Access to the site is via a farm path.

Figure 1. Composite Vicinity Map



4.0 Project History and Background

Table II provides the history of data collection and actual completion of various milestones of the Mason Property Wetland Mitigation Site.

Table II. Project Activity and Reporting History Mason Property Wetland Mitigation Project/EEP #D06001		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan	June 2006	November 2006
Final Design -90%	June 2006	November 2006
Construction	N/A	May 2007
Temporary S & E mix applied to entire project area	N/A	May 2007
Permanent seed mix applied to entire project area	N/A	May 2007
Containerized and Bare Root Planting	N/A	May 2007
Mitigation Plan/As-built (Year 1 monitoring - baseline)	Oct. 07/Sept. 08	December 2008
Year 2 monitoring	September 2009	January 2010
Year 3 monitoring	September 2010	December 2010
Year 4 monitoring	September 2011	September 2011
Year 5 monitoring	September 2012	December 2012
Year 6 monitoring (post closeout)	November 2013	November 2013
Year 7 monitoring (post closeout)	December 2014	December 2014

Figure 2 provides a plan view of the site showing the location of the four vegetation monitoring plots and the location of the rain gauge and single hydrologic gauge.


Figure 2 – Plot Locations
Plot 3
Rain Gauge and Hydrology Gauge
Plot 2
45
Plot 1
Plot 4

II. Project Condition and Monitoring Results

1.0 Vegetation Assessment

The vegetation success criterion was developed in accordance with the CVS-EEP protocol. The Mason project was planned to include various topographies and a contiguous plant community consistent with those found naturally occurring along swamp runs and associated broad hardwood flats. The original species mix was based on the vegetation noted at the reference site. At the end of the 2012 growing season only Plot 4 had a significant number of live stems. Mortality in 2012 across the site was due to salt water intrusion caused by high tides during Hurricane Irene.

In September of 2013 portions of the site were disked to reduce the heavy cattail cover and facilitate planting. In November of 2013 6,000 containerized bald cypress (*T. distichum*) were planted. Bald cypress was chosen as it has proven to be the best suited species for the site given the frequency and duration of high water and the possibility of future salt water intrusion. The disking prior to replant appears to have enhanced the survival of the replant material. On average, the trees range in height from four to five feet and stocking levels across the site are still very good at an average 392 stems per acre at the end of 2014.

Appendix A

Vegetation Data Tables

Site Photos

Table 1. Project Summary

Report Prepared By	Ashby Brown
Date Prepared	12/08/14
DESCRIPTION OF WORKSHEETS	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY	
Project Code	D06001
Project Name	Mason Riverine
Description	Mason Riverine wetland project in Hyde county, NC
River Basin	Tar-Pamlico
Sampled Plots	4

Table 2. Vigor by Species

	Species	CommonName	4	3	2	1	0	Missing	Unknown
	Taxodium distichum	bald cypress	28	10				12	
TOT:	**1**	**1**	**28**	**10**				**12**	

Table 3. Damage by Species

	Species	CommonName	Count of Damage Categories	(no damage)
	Taxodium distichum	bald cypress	0	50
TOT:	**1**	**1**	**0**	**50**

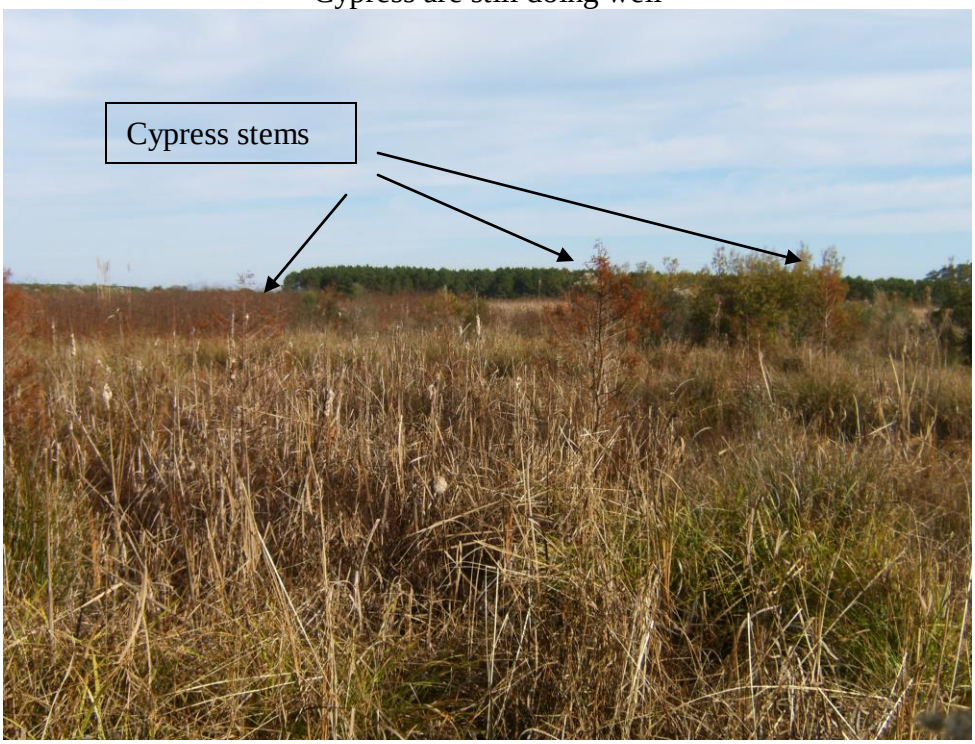
Table 4. Damage by Plot

	Plot	Count of Damage Categories	(no damage)
	D06001-ABET-0001-year:6	0	10
	D06001-ABET-0002-year:6	0	15
	D06001-ABET-0003-year:6	0	15
	D06001-ABET-0004-year:6	0	10
TOT:	**4**	**0**	**50**

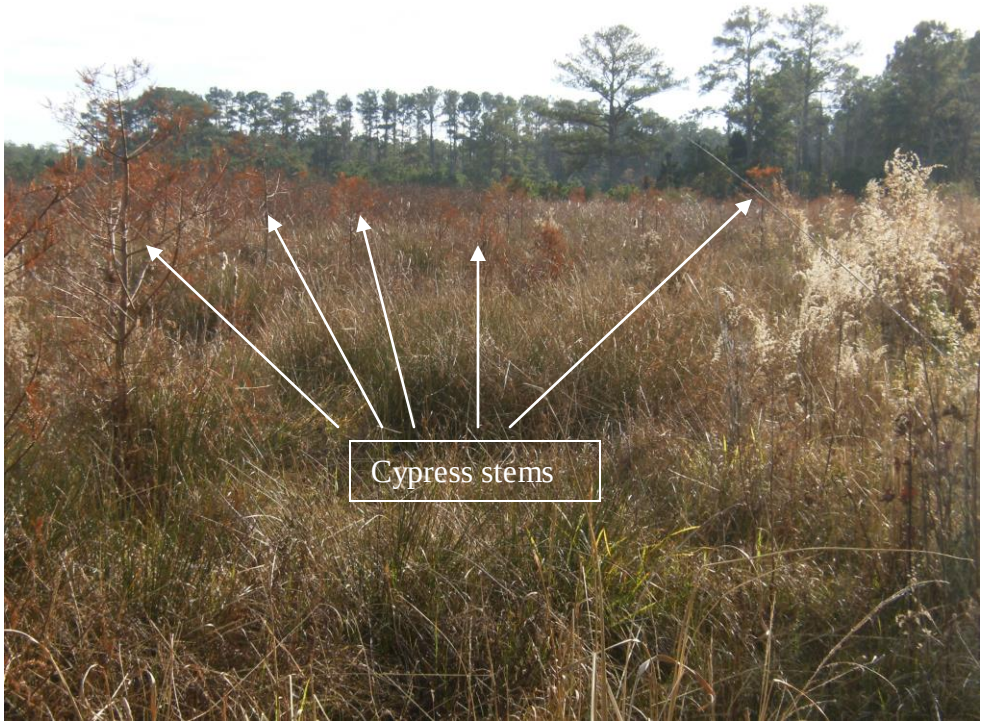
Table 5. Stem Count by Plot and Species

						Plot			
	Species	CommonName	Total Stems	# plots	avg# stems	1	2	3	4
	Taxodium distichum	bald cypress	38	4	9.5	9	11	10	8
TOT:	**1**	**1**	**38**	**1**		**9**	**11**	**10**	**8**
					Average per Acre	371	454	412	330

Cypress are still doing well



Another photo of cypress growth.



These two photos taken in December 2014, show that the hydrology has not been altered by the site prep and has not changed over time. The site is still extremely wet and standing water throughout the year is still common. Top photo is on the west side of the project. Bottom photo is of the swamp run at the outfall.