ANNUAL REPORT FOR 2013

Daniel's Street Extension Wetland Mitigation Site
Edgecombe County
TIP No. U-3826
COE Action ID: SAW 2009-00101
DWQ: 20090134

Prepared By:
Natural Environment Section & Roadside Environmental Unit
North Carolina Department of Transportation
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SUMMARY

The following report summarizes the wetland monitoring activities conducted during 2013 at the Daniel's Street Extension mitigation site. This site, located adjacent to the SR 1537 Daniel's Street Extension from Baker Street (SR 1518) to US 258 near Tarboro, was designed and constructed during 2011 by the North Carolina Department of Transportation (NCDOT) in order to provide mitigation for wetland impacts associated with the construction of Transportation Improvement Program (TIP) number U-3826. This report provides the monitoring results for the second formal year of monitoring (Year 2013). The site must demonstrate hydrologic and vegetation success for a minimum of seven years or until the site is deemed successful.

The site hydrology is monitored with three groundwater gauges including two gauges in the restoration area and one reference gauge in the adjacent wetland area. Only one (DSGW-2) of the three groundwater gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) in 2013.

One vegetation plot was established to monitor the trees planted in the 0.864 acre restoration site. The 2013 vegetation monitoring revealed an average density of 637 trees per acre, which is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the Daniel's Street Extension mitigation site in 2014.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the wetland monitoring activities that have occurred during 2013 at the Daniel's Street Extension mitigation site. The site is located adjacent to the SR 1537 Daniel's Street Extension from Baker Street (SR 1518) to US 258 near Tarboro (Figure 1). The site was constructed to provide mitigation for wetland impacts associated with U-3826 in Edgecombe County. This site provides 0.864 acre of riverine wetland restoration.

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of seven years or until success criteria are satisfied. Success criteria are based on guidelines for wetland mitigation as stated in the mitigation plan. Criteria for hydrologic conditions and vegetation survival are included in these documents. The following report details the results of hydrologic and vegetation monitoring during the 2013-growing season at the Daniel's Street Extension mitigation site.

1.3 Project History

June 2011	Site Constructed
February 2012	Gauges Installed
February 2012	Site Planted
March-November 2012	Hydrologic Monitoring (Year 1)
August 2012	Vegetation Monitoring (Year 1)
March-November 2013	Hydrologic Monitoring (Year 2)
June 2013	Vegetation Monitoring (Year 2)

1.4 Debit Ledger

The entire Daniel's Street Extension mitigation site was used for the U-3826 project to compensate for unavoidable wetland impacts.

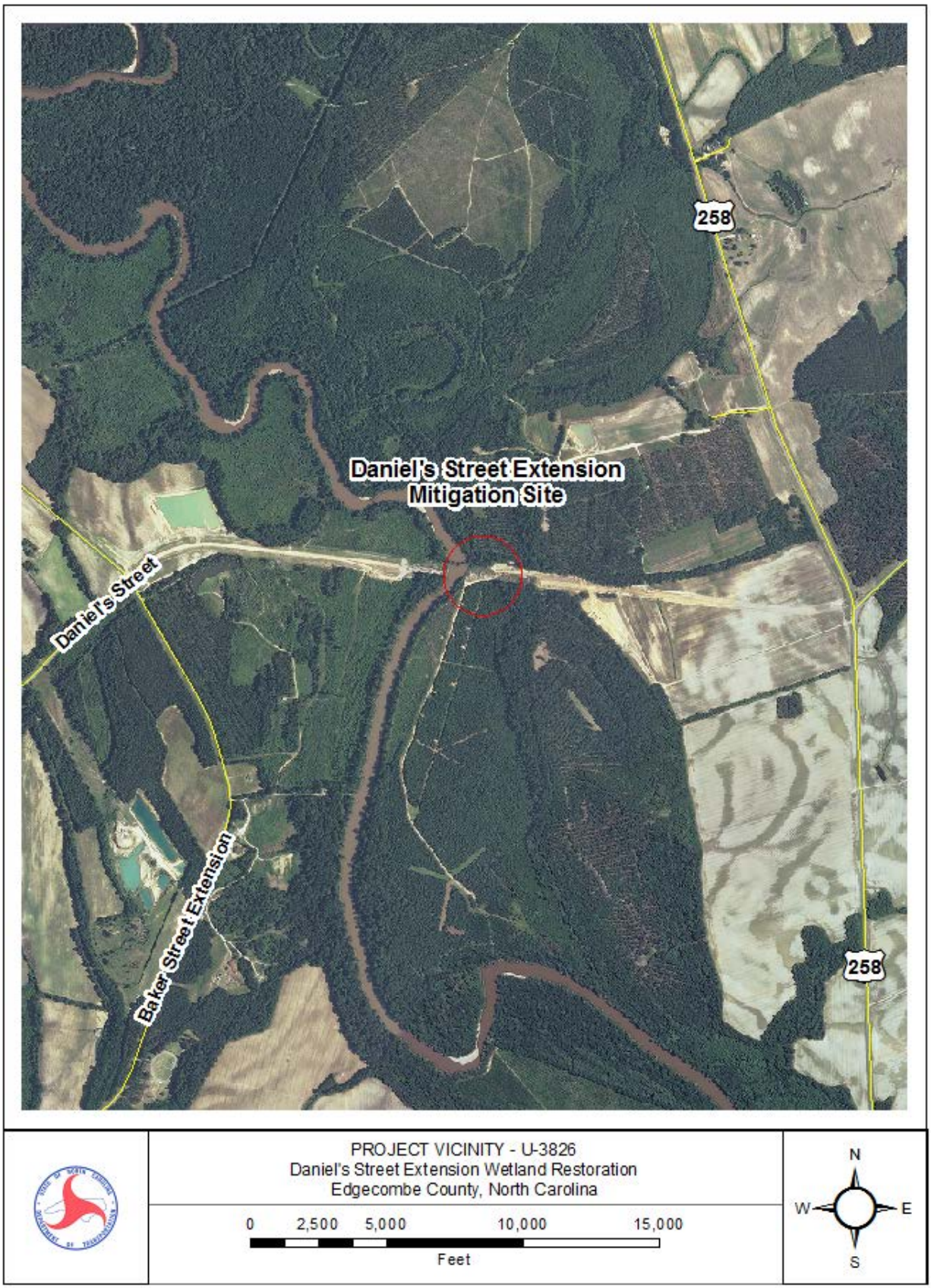

Figure 1. Site Location Map

2.0 HYDROLOGY

2.1 Success Criteria

In accordance with the mitigation plan and permit for wetland mitigation, the success criteria for hydrology states that the area must be inundated or saturated (within 12" of the surface) by surface or ground water for at least a consecutive 12.5% of the growing season. Areas inundated less that 5% of the growing season are classified as non-wetlands. Areas inundated between 5% and 12.5% of the growing season can be classified as wetland depending upon factors such as the presence of hydrophytic vegetation and hydric soils.

The growing season in Edgecombe County begins March 21 and ends November 10. These dates correspond to a 50% probability that temperatures will remain above 28° F or higher after March 21 and before November 10. The growing season is 233 days; therefore hydrology for 12.5% of the growing season is at least 29 consecutive days. Local climate must represent average conditions for the area in order for the hydrologic data to be valid.

2.2 Hydrologic Description

Three groundwater monitoring gauges are used to record site hydrologic data including two in the restoration area and one reference gauge in the adjacent wetland area. The groundwater gauges are set to record daily water levels. The hydrologic response (groundwater) to rainfall events is evaluated using data provided by the North Carolina State Climate Office.

Appendix A contains a plot of the water depth for each of the groundwater monitoring gauges for 2013. Precipitation events, provided by the State Climate Office, are included on each groundwater graph as bars.

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

The total number of consecutive days that the groundwater was within twelve inches of the surface was determined for each groundwater monitoring gauge. This number was converted into a percentage of the growing season. Table 1 presents the hydrologic results for 2013. Figure 2 is a graphical representation of the hydrologic monitoring results for 2013.

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Table 1. 2013 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5 – 12.5%	> 12.5%	Actual %	Dates of Success
DSGW-1	**X**			7.7	
DSGW-2			**X**	45.9	March 21 – May 31; June 5-September 19
DSREF-1	**X**			8.2	

*DSREF-1 is the reference gauge located in the adjacent wetland area.
*Appendix A contains plots of surface and groundwater data during 2013.

2.3.2 Climatic Data

Figure 4 is a comparison of monthly rainfall for the period of January 2013 through November 2013 to historical precipitation (collected between 1983 and 2012) for the Upper Coastal Plain Research Station in Edgecombe County. This comparison gives an indication of how 2013 relates to historical data in terms of climate conditions. The NC State Climate Office provided all local rainfall information.

For the 2013-year, January, April, May, July, August, September, October and November experienced average rainfall. March recorded below average rainfall while February and June recorded above average rainfall. Overall 2013 experienced an average rainfall year.

2.4 Conclusions

The 2013 year represents the first full growing season that hydrologic data has been collected on the Daniel's Street Extension mitigation site. Only one (DSGW-2) of the three groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) for the 2013 monitoring year.

NCDOT will continue to monitor the hydrology at the Daniel's Street Extension mitigation site in 2014.

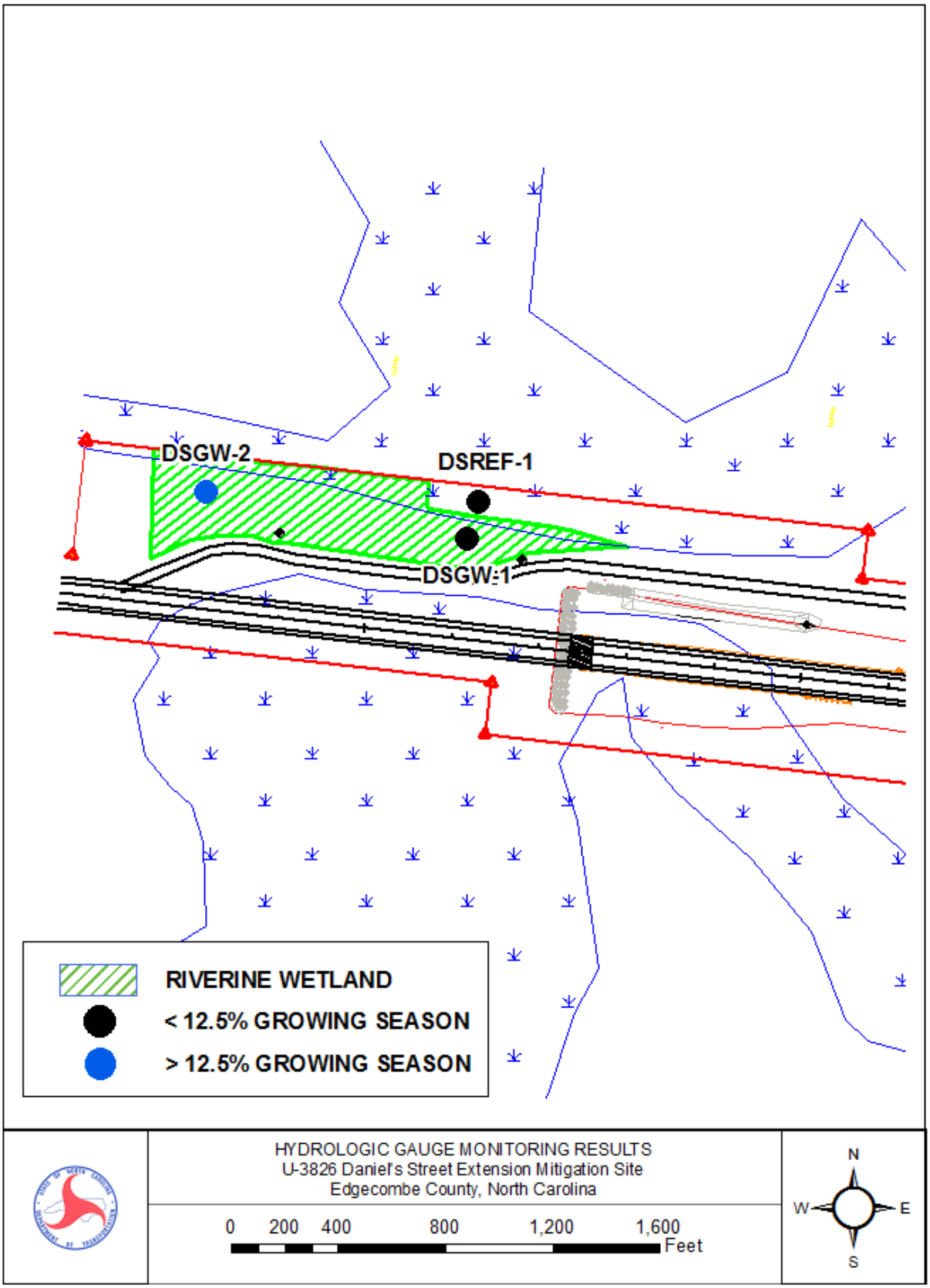


Figure 2. 2013 Hydrologic Monitoring Results

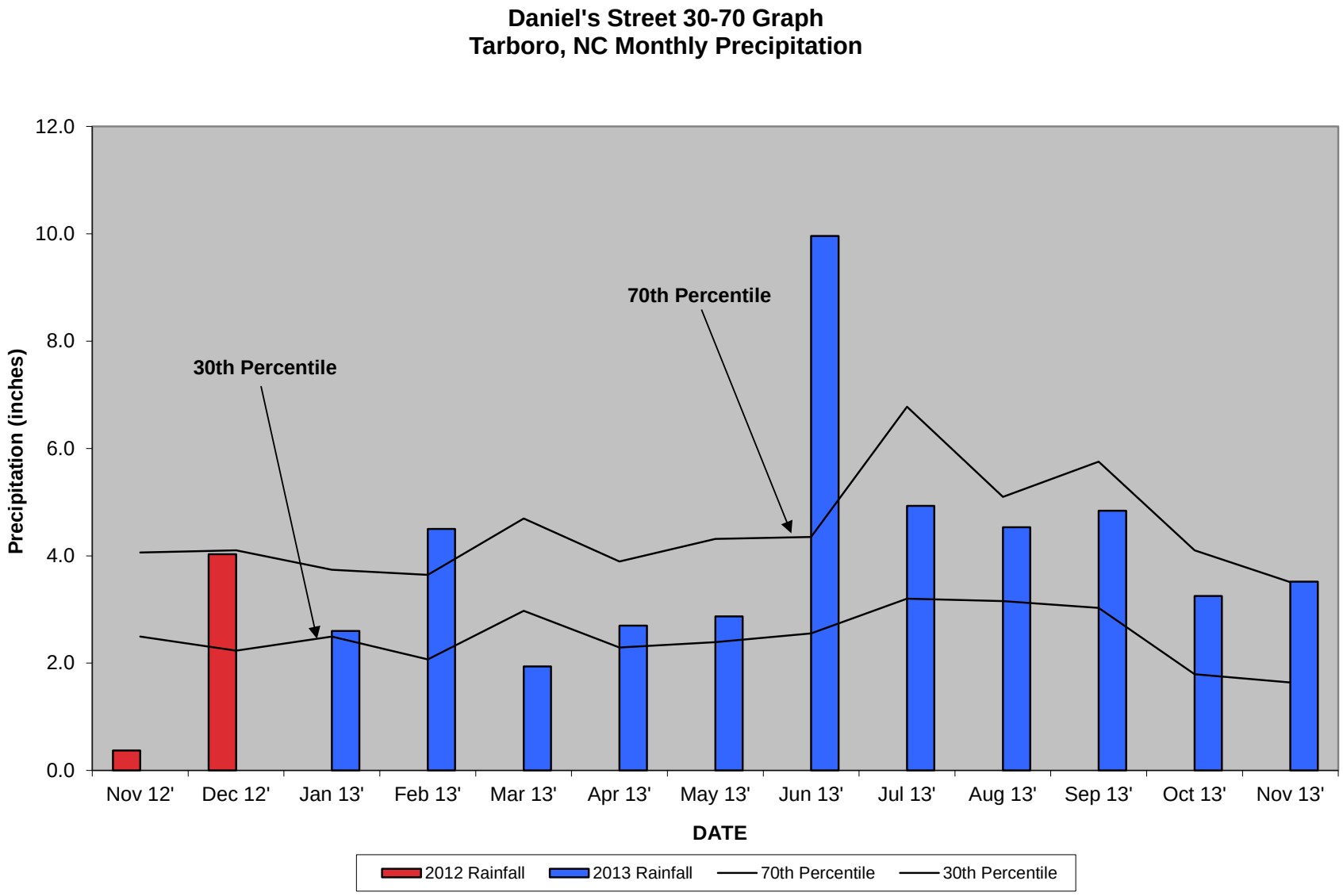


Figure 3. 30-70 Percentile Graph 2013

3.0 VEGETATION: DANIEL'S STREET EXTENSION MITIGATION SITE (YEAR 2 MONITORING)

3.1 Success Criteria

ACOE success criteria states that tree species composition shall be based on reference wetlands adjacent to the project site. Vegetation success shall be measured by survivability over a 7-year period. Survivability shall be based on 260 planted stems/acre after seven years.

NCDWQ success criteria states that vegetation success shall be measured by survivability over a 3-year monitoring period. Survivability will be based on 320 stems/acre after three (3) years. A survey of vegetation during the growing season shall be conducted annually over the three-year monitoring period and submitted to the NC Division of Water Quality. If the surviving vegetation densities are below the required thresholds after three-year monitoring period, the site may still be declared successful at the discretion of and with written approval from the NC Division of Water Quality.

3.2 Description of Species

The following tree species were planted in the Wetland Restoration Area:

Taxodium distichum, Baldcypress

Betula nigra, River Birch

Nyssa aquatica, Water Tupelo

Quercus nigra, Water Oak

3.3 Results of Vegetation Monitoring

Table 2. Vegetation Monitoring Statistics

Plot #	Baldcypress	Water Tupelo	Water Oak	River Birch	Total (Year 2)	Total (at planting)	Density (Trees/Acre)
1	13	12	5	8	38	39	663
2	21	6	1	16	44	49	611
Average Density (Trees/Acre)							637

Site Notes: Vegetation Plot #2 had standing water measuring up to two feet at the time of monitoring. Other species noted onsite included cattail, sweetgum, fennel, black willow, sycamore, baccharis, soft rush, stinkweed, wax myrtle, pine, *Scirpus* sp., red maple, lespedeza, and various grasses.

3.4 Conclusions

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2013 vegetation monitoring of the site revealed an average tree density of 637 trees per acre. This average is well above the minimum success criteria of 320 trees per acre for year two.

NCDOT proposes to continue monitoring vegetation at the Daniel Street mitigation site.

4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

The 2013 year represents the second year that hydrologic data has been collected on the Daniel's Street Extension mitigation site. Only one (DSGW-2) of the three groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) during the 2013 growing season.

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2013 vegetation monitoring revealed an average density of 637 trees per acre, which is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the Daniel's Street Extension mitigation site in 2014.

APPENDIX A

DEPTH TO GROUNDWATER CHARTS

APPENDIX B

SITE PHOTOS, PHOTO LOCATIONS, AND PLOT LOCATIONS MAP

Daniel’s Street Extension

Photo 1

Photo 2

Photo 3

Photo 4

Overview Photo

June 2013

U-3826 Mitigation As-Built Plans

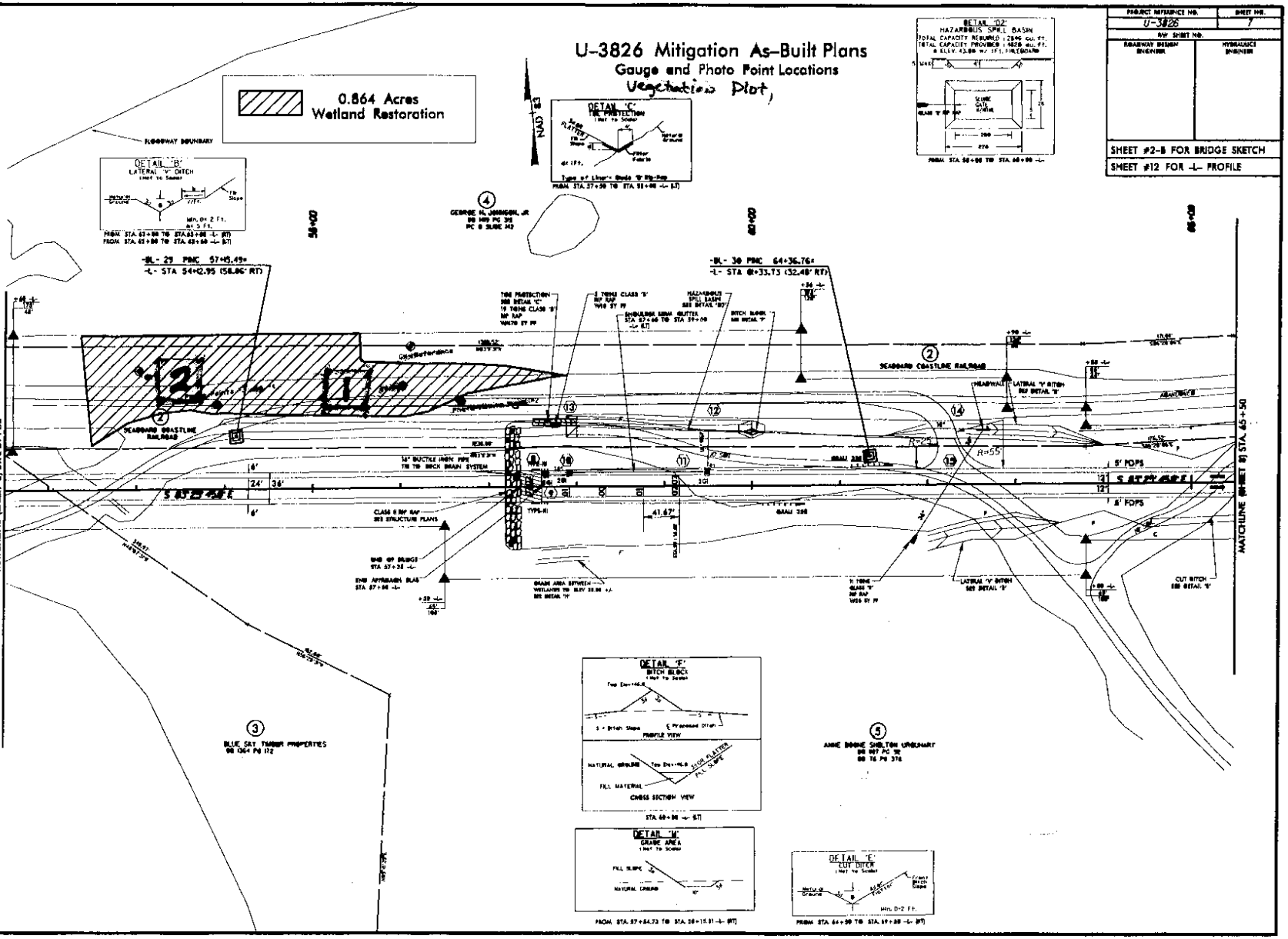
Gauge and Photo Point Locations

Vegetation Plot,

0.864 Acres
Wetland Restoration

NAD 1983

PROJECT REFERENCE NO.	SHEET NO.
U-3826	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SHEET #2-B FOR BRIDGE SKETCH

SHEET #12 FOR -L- PROFILE