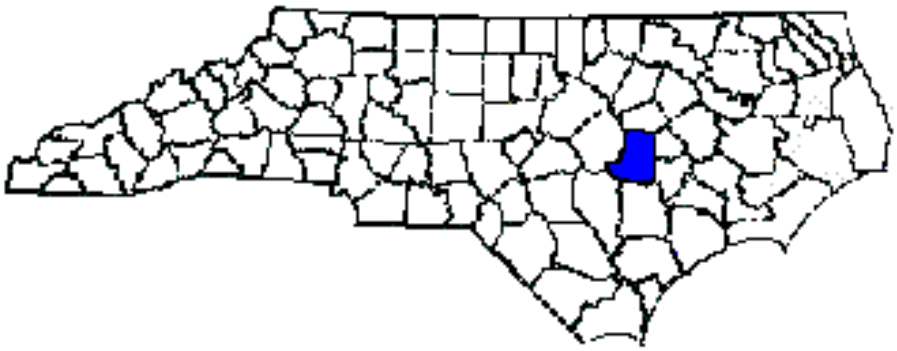
ANNUAL REPORT FOR 2007



Jeffreys Warehouse Wetland Mitigation Site
Wayne County
TIP No. R-1030AA

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

The following report summarizes the wetland monitoring activities conducted during 2007 at the Jeffreys Warehouse Mitigation Site. The site, situated on US 117 in Goldsboro, was designed and constructed during 2006 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 R-1030AA. This report provides the monitoring results for the first formal year of monitoring (Year 2007). The site must be demonstrate hydrologic and vegetation success for a minimum of five years or until the site is deemed successful.

Site hydrology is monitored with ten groundwater gauges and one surface water gauge. Groundwater gauges nine and ten were installed at the end of the growing season and were not monitored for the first formal year of monitoring. Four of the eight original groundwater gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season). The surface water gauge was installed at the end of the growing season and will be monitored during the 2008 monitoring period.

Eight vegetation plots were established to monitor the trees planted in the 26.3 acre site. The 2007 vegetation monitoring of the site revealed an average tree density of 548 trees per acre. This average is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the Jeffreys Warehouse Mitigation Site in 2008.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the wetland monitoring activities that have occurred during 2007 at the Jeffreys Warehouse Mitigation Site. The site is located adjacent to US 117 in Goldsboro (Figure 1). The site was constructed to provide mitigation for wetland impacts associated with (TIP) number R-1030AA in Wayne County. The 87.7 acre site provides 3.66 acres of riverine wetland restoration, 23.02 acres of non-riverine wetland restoration, and 12.36 acres of non-riverine wetland preservation. The site also provides 7.26 acres of Neuse Buffer restoration.

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five years or until success criteria are satisfied. Success criteria are based on federal guidelines for wetland mitigation. Criteria for hydrologic conditions and vegetation survival are included in these documents. The following report describes the results of the hydrologic and vegetation monitoring during the 2007-growing season at the Jeffreys Warehouse Mitigation Site.

1.3 Project History

March/April 2006	Site Planted and Live Staked
March 2007	Site Replanted
March-November 2007	Hydrologic Monitoring (Year 1)
August 2007	Vegetation Monitoring (Year 1)

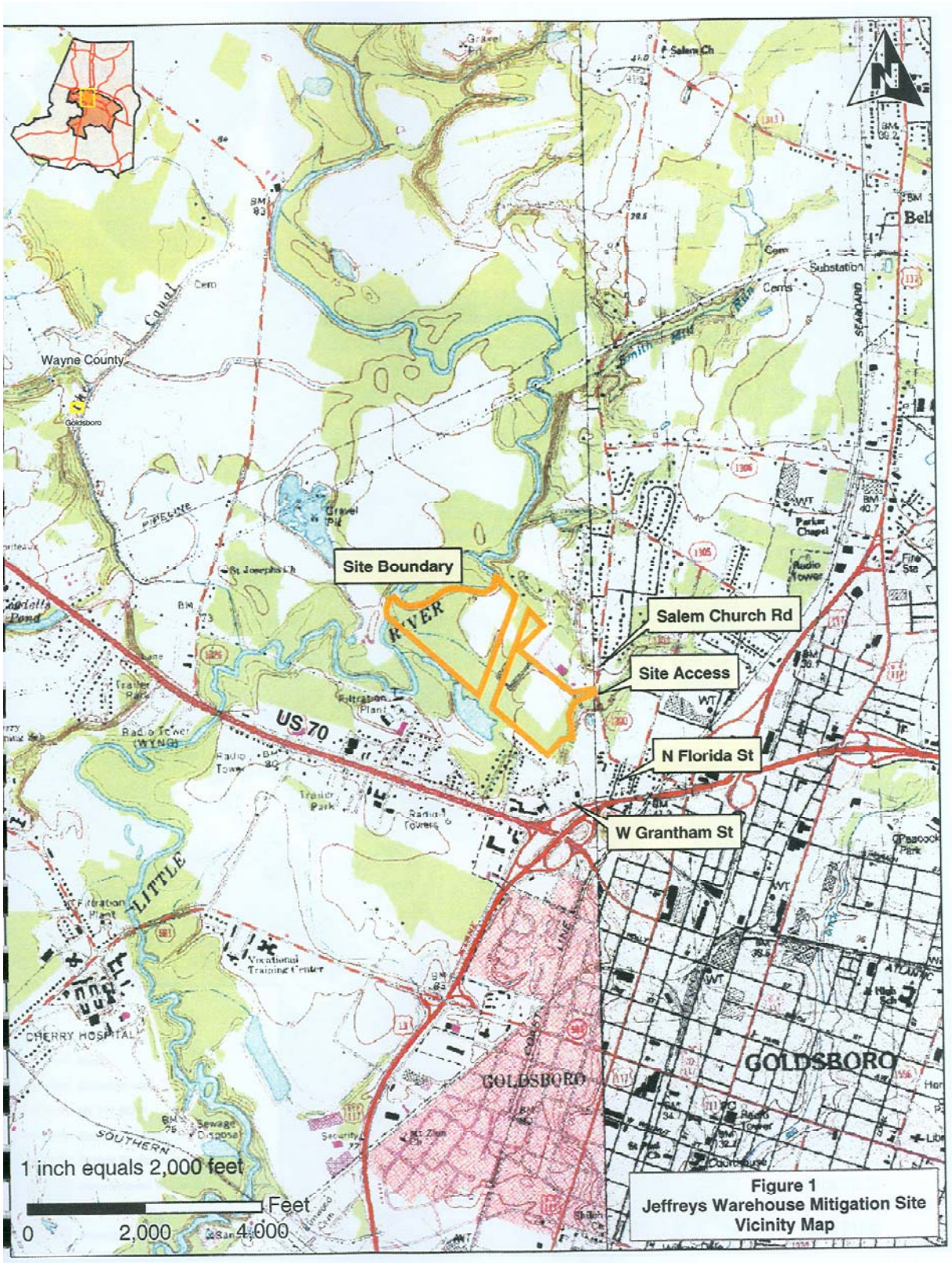


Figure 1. Site Location Map

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 inches of the surface) by surface or groundwater for at least a consecutive 12.5% of the growing season. Areas inundated less than 5% of the growing season are always classified as non-wetlands. Areas inundated between 5% and 12.5% of the growing season can be classified as wetlands depending upon factors such as the presence of hydrophytic vegetation and hydric soils.

The growing season in Wayne County begins on March 17 and ends November 14. These dates correspond to a 50% probability that temperatures will not drop to 28^0 F or lower after March 17 and before November 14. The growing season is 243 days; therefore hydrology for 12.5% of the growing season is at least 30 consecutive days, while 8.0% would be equivalent to 18 days. Local climate must represent average conditions for the area in order for the hydrologic data to be valid.

2.2 Hydrologic Description

Ten groundwater monitoring gauges and one surface water monitoring gauge are used to record site hydrologic data. Gauges nine and ten and the surface water gauge were not installed until the end of the growing season and will not be monitored until the 2008 monitoring year. The groundwater gauges are set to record daily water levels, while the surface water gauge is set to record at 3-hour intervals. 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 and surface water monitoring gauges for 2007. Precipitation events, provided by State Climate Office, are included on each groundwater graph as bars.

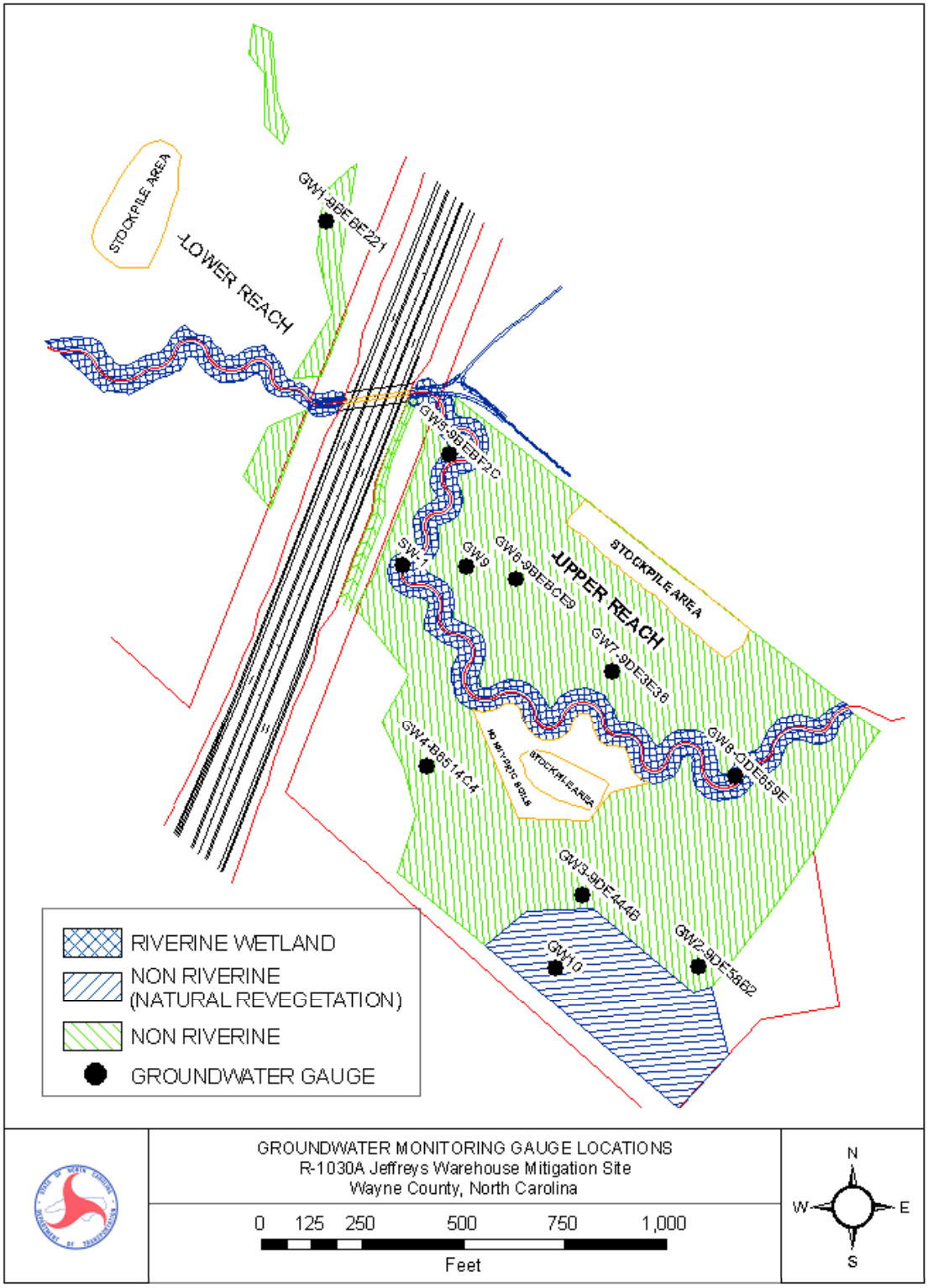


Figure 2. Monitoring Gauge Location Map

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 2007. Figure 3 is a graphical representation of the hydrologic monitoring results for 2007.

Table 1. 2007 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5-12.5%	>12.5%	Actual %	Dates of Success
JWGW-1		✕		8.6	
JWGW-2		✕		6.6	
JWGW-3	✕			3.3	
JWGW-4			✕	29.6	March 17 - May 27 June 27 - August 1
JWGW-5			✕	59.3	March 17 – August 7
JWGW-6		✕		6.2	
JWGW-7		✕		6.6	
JWGW-8			✕	58.0	March 21 – August 8

2.3.2 Climatic Data

Figure 4 is a comparison of monthly rainfall for the period of January through November 2007 to historical precipitation (collected between 1975 and 2007) for Goldsboro, North Carolina. This comparison gives an indication of how 2007 relates to historical data in terms of climate conditions. The NC State Climate Office provided all of the local rainfall information.

For the 2007-year, only October experienced above average rainfall. The months of January, February, March, May, June, August, September and November recorded below average rainfall for the site. The months of April and July experienced average rainfall. Overall, 2007 experienced a below average rainfall year.

2.4 Conclusions

The 2007-year represents the first full growing season that hydrologic data has been collected on the Jeffreys Warehouse Mitigation Site. Three of the original eight groundwater-monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season), while four groundwater gauges met between 5% and 12.5% of the growing season. NCDOT will continue to monitor the hydrology at the Jeffrey's Warehouse Mitigation Site in 2008.

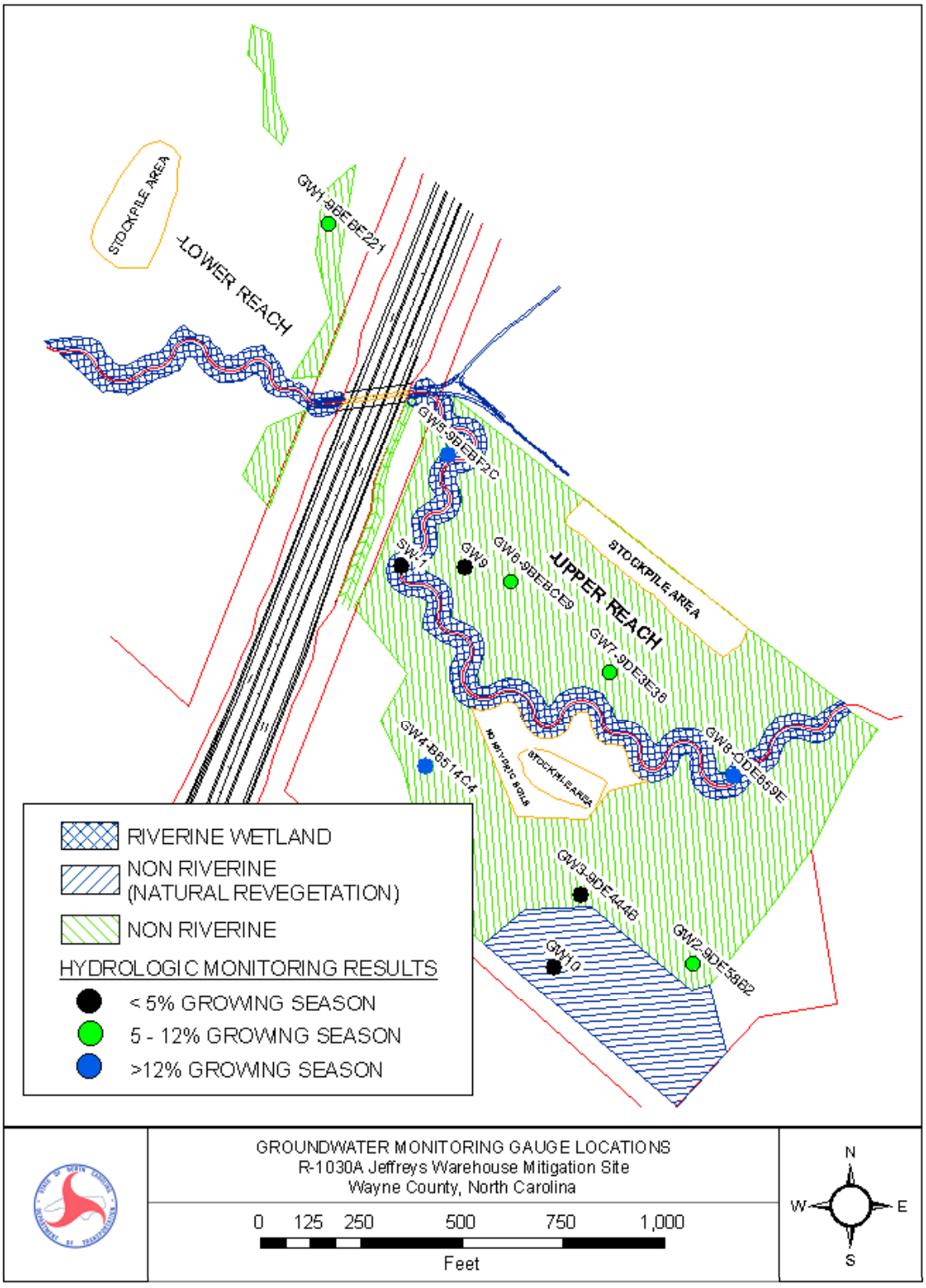
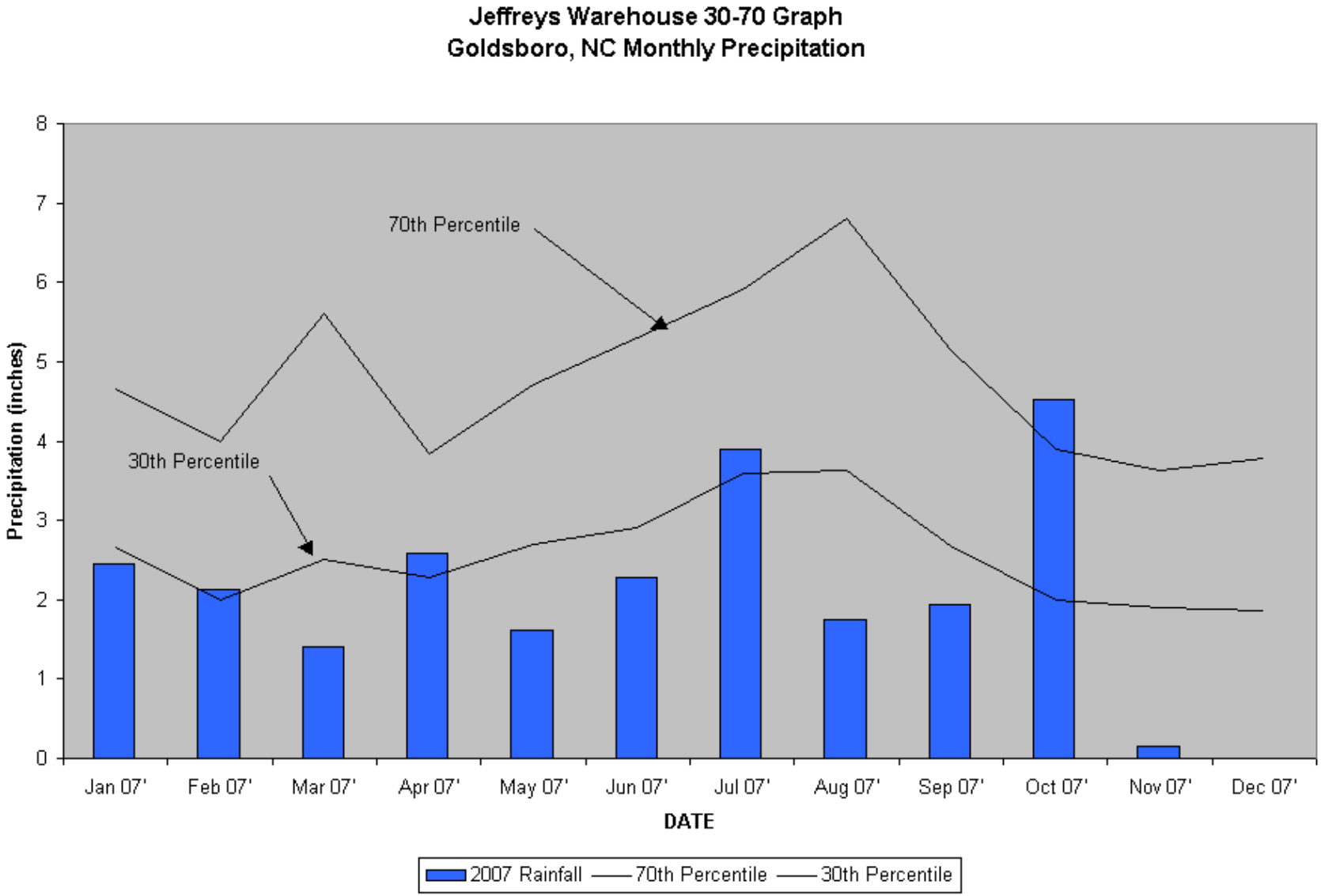


Figure 3. 2007 Hydrologic Monitoring Results Map

Figure 4. 30-70 Percentile Graph



3.0 VEGETATION: JEFFREYS WAREHOUSE MITIGATION SITE (YEAR 1 MONITORING)

3.1 Success Criteria

Success Criteria states that there must be a minimum of 320 trees per acre living for at least three consecutive years. A minimum of 290 trees per acre must be living at year 4, and a minimum of 260 trees per acre must be living at year 5.

3.2 Description of Species

The following live stakes were planted on the streambanks:

Black Willow, *Salix nigra*

Silky Dogwood, *Cornus amomum*

The following tree species were planted in the Riverine - Bankfull Bench Area:

Laurel Oak, *Quercus laurifolia*

Overcup Oak, *Quercus lyrata*

Willow Oak, *Quercus phellos*

Water Oak, *Quercus nigra*

Swamp Chestnut Oak, *Quercus michauxii*

River Birch, *Betula nigra*

The following tree species were planted in the Non-Riverine - Wetland Area:

Laurel Oak, *Quercus laurifolia*

Willow Oak, *Quercus phellos*

Swamp Chestnut Oak, *Quercus michauxii*

Cherrybark Oak, *Quercus falcata* var. *pagodaefolia*

Water Tupelo, *Nyssa aquatica*

3.3 Results of Vegetation Monitoring

Table 2. Vegetation Monitoring Statistics

Plot #	Laurel Oak	Overcup Oak	Willow Oak	Water Oak	Swamp Chestnut Oak	River Birch	Cherrybark Oak	Water Tupelo	Total (1 Year)	Total (at planting)	Density (Tree/Acre)
1	14	3	4	3	5	4			33	37	606
2	4		9		13		13	8	47	47	680
3	5		2		19		10	1	37	40	629
4	10		6				23	1	40	45	604
5	13	1	7	2		8		1	32	33	659
6	1		1		2		4	2	10	42	162
7	1		4		2		14		21	39	366
8	1	14	6	3	5	5			34	34	680
	Average Tree Density										**548**

Site Notes: Other species noted: lespedeza, cattail, black willow, silky dogwood, ragweed, fennel, woolgrass, *Juncus* sp., sweetgum, goldenrod, wax myrtle, multi-flora rose, *Scirpus* sp., red maple, tear thumb, briars, alder, *Baccharis* sp., and various grasses. River birch was also noted volunteering in the Non-Riverine Wetland.

3.4 Conclusions

Approximately 26.3 acres of this site was planted in March and April 2006. Due to low survival counts from the 2006 planting, NCDOT replanted the site in March 2007. There were 8 vegetation monitoring plots established throughout the Riverine and Non-Riverine areas. The 2007 vegetation monitoring revealed an average density of 548 trees per acre, which is well above the minimum success criteria of 320 trees per acre. The area around plots 6 and 7 will be supplementally planted in 2008 to increase plant survivability in this area.

NCDOT will continue vegetation monitoring at the Jeffreys Warehouse Mitigation Site for 2008.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The 2007-year represents the first full growing season that hydrologic data has been collected on the Jeffreys Warehouse Mitigation Site. Three of the original eight groundwater-monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season), while four groundwater gauges met between 5% and 12.5% of the growing season.

There were 8 vegetation monitoring plots established throughout the Riverine and Non-Riverine areas. The 2007 vegetation monitoring revealed an average density of 548 trees per acre, which is well above the minimum success criteria of 320 trees per acre. The area around plots 6 and 7 will be supplementally planted in 2008 to increase plant survivability in this area.

NCDOT will continue hydrologic and vegetation monitoring at the Jeffreys Warehouse Mitigation Site in 2008.

APPENDIX A
GAUGE DATA GRAPHS

APPENDIX B

SITE PHOTOS AND PHOTO AND PLOT LOCATIONS MAP

Jeffreys Warehouse


Photo 1


Photo 2


Photo 3


Photo 4


Photo 5


Photo 6

August 2007

Jeffreys Warehouse


Photo 7


Photo 8


Photo 9


Photo 10


Photo 11

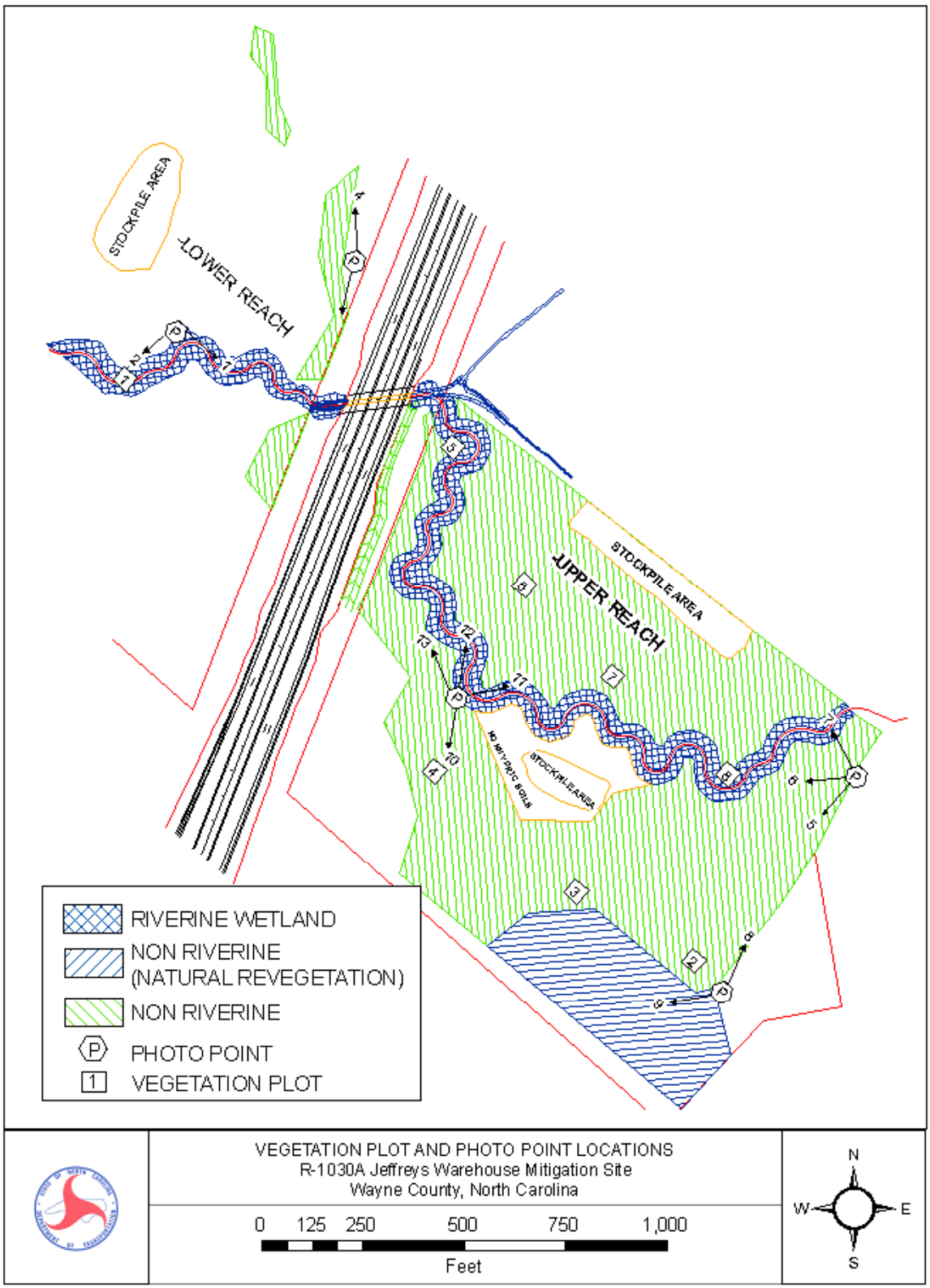

Photo 12

August 2007

Jeffreys Warehouse

Photo 13

August 2007



VEGETATION PLOT AND PHOTO POINT LOCATIONS
R-1030A Jeffreys Warehouse Mitigation Site
Wayne County, North Carolina

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Feet

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