

ANNUAL REPORT FOR 2003



Crescent Road Mitigation Site

Lenoir County

Project No. 8.2200101

TIP No. R-2719BA



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North Carolina Department of Transportation
December 2003

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SUMMARY

The following report summarizes the monitoring activities that have occurred in 2003 at the Crescent Road Mitigation Site. The 2003-year concludes the first year of hydrology and vegetation monitoring following construction of the site. The site must be monitored for five consecutive years or until the site is deemed successful.

Site hydrology is monitored with three groundwater gauges, three surface water gauges, and one onsite rain gauge. Three vegetation-monitoring plots were established to monitor the 3.35 acres planted in trees on the site.

Initial results for hydrologic monitoring indicate that the site has experienced varying saturation levels during the first year of monitoring. Two of the three groundwater-monitoring gauges met the jurisdictional criteria for more than 12.5% of the growing season. One of the gauges reported saturation for 9.4% of the growing season. All three surface water gauges showed periods of inundation during the 2003 monitoring year.

The three vegetation plots revealed an average tree density of 586 trees per acre, which is well above the minimum success criteria of 320 trees per acre. The stream was visually inspected and the streambanks appear to be stable as vegetation establishes throughout the site.

NCDOT will continue to monitor vegetation and hydrology on the Crescent Road Mitigation Site.

1.0 INTRODUCTION

1.1 Project Description

The Crescent Road Mitigation Site provides approximately 0.58-acres of riverine wetland and 1,706 linear feet of stream restoration. The site serves as onsite mitigation for part of the impacts associated with the construction of Crescent Road (Figure 1).

1.2 Purpose

In order to demonstrate successful mitigation, the site must be monitored for a minimum of five years or until success criteria are achieved. Success criteria are based on federal guidelines for wetland mitigation. Criteria for both hydrologic conditions and vegetation survival are included in these documents. The following report describes the results of the hydrologic and vegetation monitoring during the 2003-growing season at the Crescent Road Mitigation Site. Included in this report are analyses of both hydrologic and vegetative monitoring results, as well as local climate conditions throughout the growing season. Current conditions of the restored stream channel are also presented.

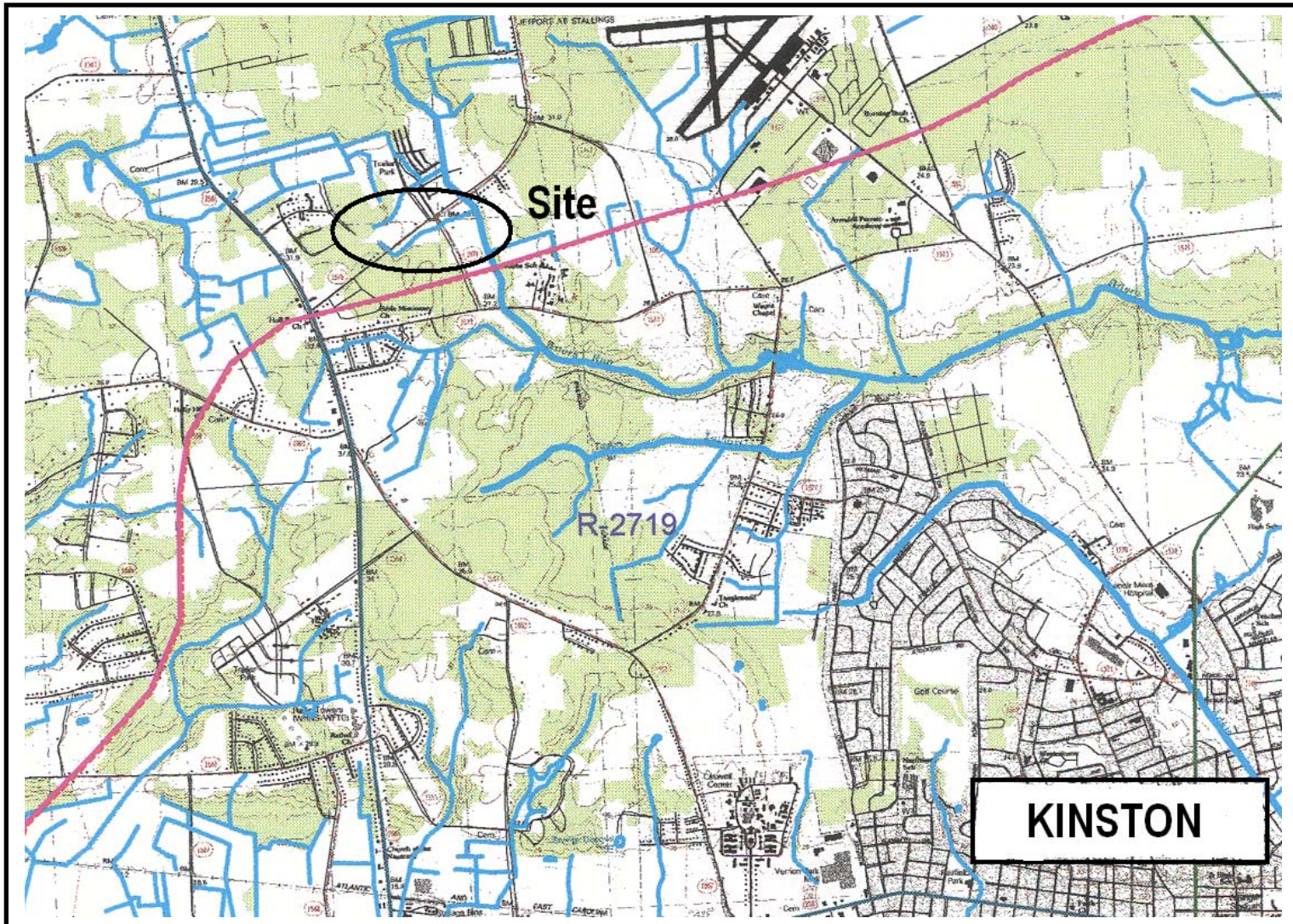
1.3 Project History

Spring 2002	Site Construction
May 2002	Hydrologic Monitoring Gauges Installed
March 2002	Site Planted
May- November 2002	Hydrologic Monitoring (Incomplete Year)
March- November 2003	Hydrologic Monitoring (Year 1)
June 2003	Vegetation Monitoring (Year 1)

1.4 Debit Ledger

The Crescent Road Mitigation Site serves as onsite mitigation for the construction of Crescent Road, R-2719. Additional wetland acreage and stream footage were added during construction of the project. NCDOT is investigating these changes to the original plan. The regulatory agencies will be informed of these changes once documentation is completed.

Figure 1. Site Location Map



2.0 HYDROLOGY

2.1 Success Criteria

In accordance with federal guidelines for wetland mitigation, the success criteria for hydrology state 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.

According to the Soil Conservation Service, the growing season in Lenoir County extends from March 17-November 15 (approximately 244 days). A consecutive 12.5% of the growing season for Crescent Road would equal 31 days; a consecutive 8% would be equivalent to 20 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 and three surface water-monitoring gauges are used to record site hydrologic data. The groundwater gauges are set to record daily water levels, while the surface water gauges are set to record at 3-hour intervals. A rain gauge is also located on the site in order to get accurate site rainfall measurements. The hydrologic response (groundwater) to rainfall events is evaluated using this data.

Appendix A contains a plot of the water depth for each of the groundwater and surface water monitoring gauges for 2003. Precipitation events, measured by the onsite rain gauge, are included on each groundwater gauge graph as bars.

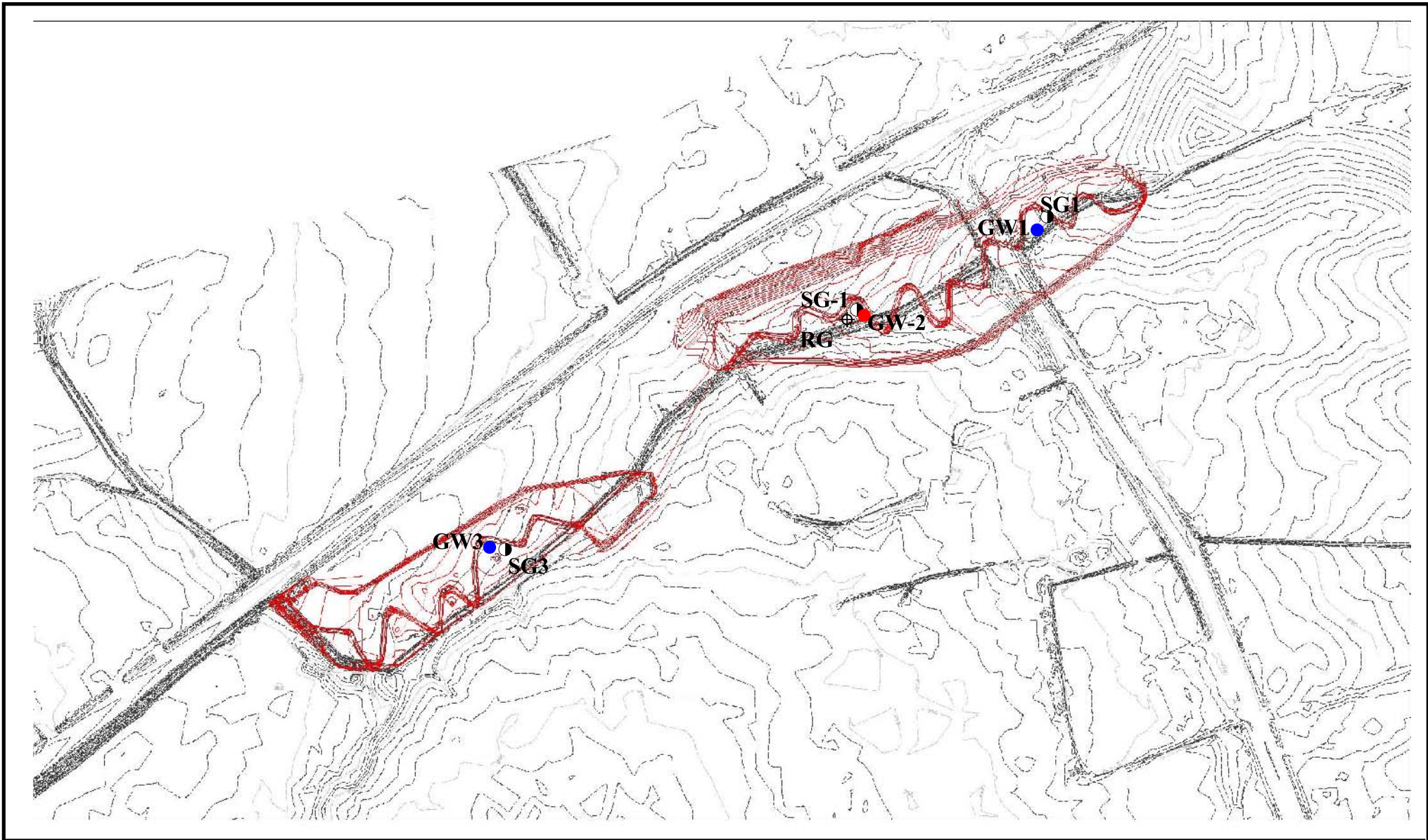


Figure 2. Gauge Location Map



Not to Scale

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 2003. Figure 3 is a graphical representation of the hydrologic monitoring results for 2003.

Table 1. 2003 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5-8%	8-12.5%	>12.5%	Actual %	Dates of Saturation
CRGW-1+				×	19.3	March 17-May 2
CRGW-2			×		9.4	Aug 4-Aug 26
CRGW-3				×	24.2	Sept 18-Nov 15

+ Gauge met success criterion during an average rainfall month (March, June, and August).

2.3.2 Climatic Data

Figure 4 is a comparison of monthly rainfall for the period of November 2002 through August 2003 to historical precipitation (collected between 1972 and 2003) for Kinston, North Carolina. This comparison gives an indication of how 2003 relates to historical data in terms of climate conditions. The NC State Climate Office provided all of the local rainfall information.

For the 2003-year, November (02'), February, April, May, July, September, and October experienced above average rainfall. The months of January and November recorded below average rainfall for the site. December (02'), March, June, and August experienced average rainfall. Overall, 2003 experienced an average to above average rainfall year.

2.4 Conclusions

The 2003-year represents the first full growing season that hydrologic data has been collected on the Crescent Road Mitigation Site. Two of the three groundwater-monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season). One of the gauges reported saturation within 12" of the surface for 9.4% of the growing season. All three of the surface water gauges indicated periods of inundation during the 2003-monitoring year.

NCDOT will continue to monitor hydrology on the Crescent Road Mitigation Site.

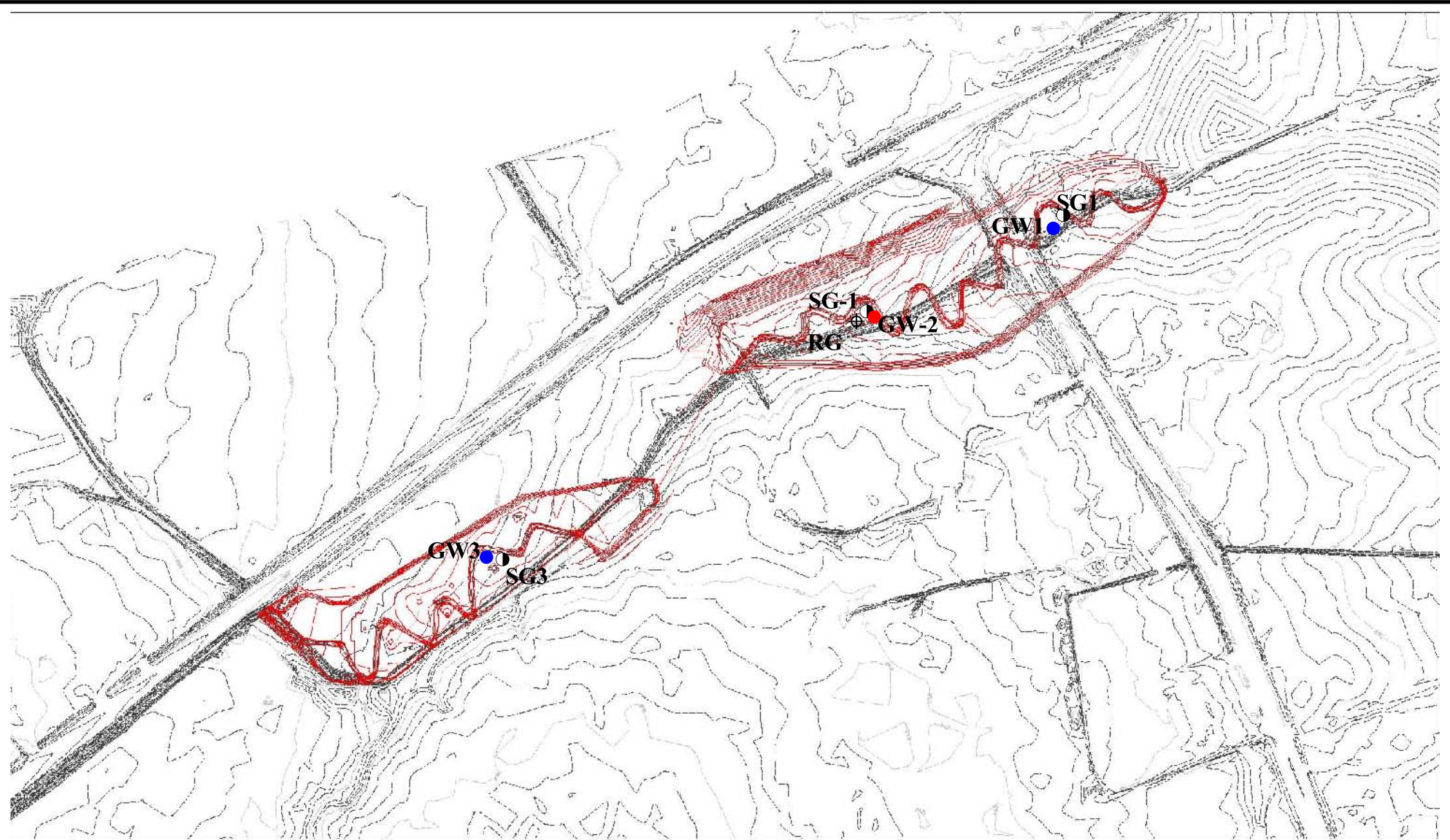


Figure 3. 2003 Monitoring Gauge Results

Hydrology Results

- > 5%
- 5 - 8%
- 8 - 12.5%
- > 12.5%

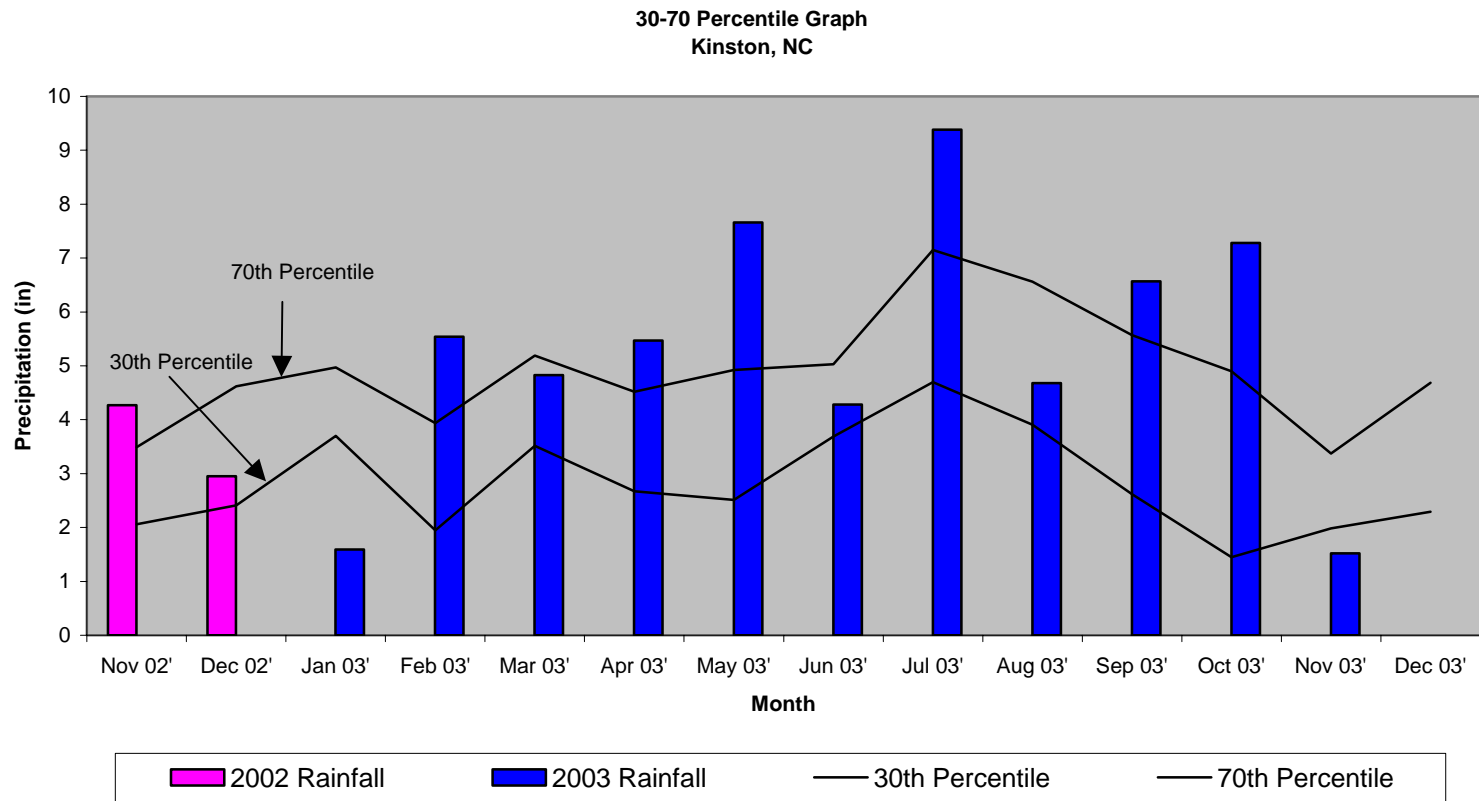
- ⊕ Rain Gauge
- Surface Gauge



Not to Scale



Figure 4. 30-70 Percentile Graph, Kinston, NC



3.0 VEGETATION: CRESCENT ROAD MITIGATION SITE (YEAR 1 MONITORING)

3.1 Success Criteria

Success criteria state that at least 320 stems per acre must survive after the completion of the third growing season and 260 stems per acre after the fifth growing season. If desired vegetation has not been established, NCDOT will notify the appropriate agencies and will implement corrective measures.

3.2 Description of Species

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

Fraxinus pennsylvanica, Green Ash
Betula nigra, River Birch
Nyssa sylvatica var. *biflora*, Swamp Blackgum
Quercus phellos, Willow Oak

3.3 Results of Vegetation Monitoring

Table 2. Vegetation Monitoring Statistics

Plot #	Green Ash	River Birch	Swamp Blackgum	Willow Oak	Total (1 year)	Total (at planting)	Density (Trees/Acre)
1	16	9	4	13	42	47	608
2	15	11	5	8	39	42	631
3	9	8	3	6	26	34	520
Average Density (Trees/Acre)							586

Site Notes:

Other species noted: dog fennel, trumpet creeper, wax myrtle, *Juncus* sp., black willow, and ragweed.

3.4 Conclusions

There were three vegetation-monitoring plots established for the 3.35-acre tree planting area. The 2003 vegetation monitoring of the site revealed an average density of 586 trees per acre. This average is well above the minimum success criteria of 320 trees per acre.

The stream channel was visually inspected during the annual vegetation monitoring of this site. The streambanks were mostly vegetated with herbaceous species and, in general, were stable throughout the site. Photos 7 through 15 depict and are representative of the stream condition.

NCDOT will continue vegetation and visual stream monitoring at the Crescent Road Mitigation Site.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The 2003-year represents the first full growing season that hydrologic data has been collected on the Crescent Road Mitigation Site. Two of the three groundwater-monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season). One of the gauges reported saturation within 12" of the surface for 9.4% of the growing season. All three of the surface water gauges indicated periods of inundation during the 2003-monitoring year.

The three vegetation plots revealed an average density of 586 trees per acre, which is well above the minimum success criteria of 320 trees per acre. The stream was visually inspected and the streambanks appear to be stable as vegetation establishes throughout the site.

NCDOT will continue to monitor hydrology and vegetation on the Crescent Road Mitigation Site.

APPENDIX A
GAUGE DATA GRAPHS

APPENDIX B

SITE PHOTOS

&

VEGETATION PLANTING PLAN

CRESCENT ROAD



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15

CRESCENT ROAD MITIGATION SITE

