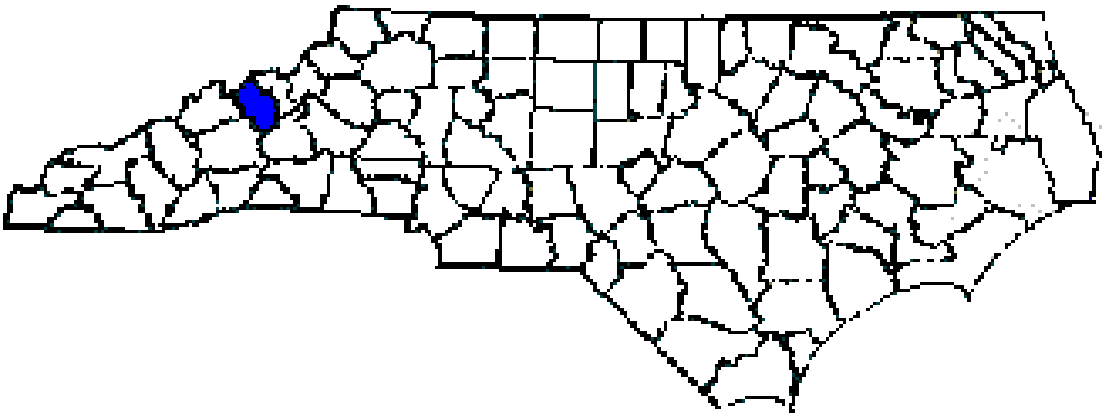
ANNUAL REPORT FOR 2015



UT to Bald Creek (Hydro Site) Permit Site #7
Mitigation Site
Yancey County
TIP No. R-2518B
COE Action ID: SAW-2007-2197-357/300
DWR #: 20071134

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SUMMARY

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the UT to Bald Creek (Hydro Site) Mitigation Site in Yancey County. The North Carolina Department of Transportation (NCDOT) completed this project in April 2009. This report provides the monitoring results for the sixth formal year of monitoring (Year 2015). The Year 2015 monitoring period was the sixth of five scheduled years of monitoring on the UT to Bald Creek (Hydro Site) Mitigation Site (See Success Criteria Section 2.1).

Based on the overall conclusions of monitoring at UT to Bald Creek (Hydro Site), it has met the required monitoring protocols for the sixth formal year of monitoring on the stream and fourth formal year of monitoring on the planted vegetation. The ACOE and NCDWR agreed with NCDOT on emails sent on April 2, 2012 to discontinue the longitudinal profile survey for the remainder of the five year monitoring period due to heavy vegetation within the channel. Also, it was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that all surveying could be discontinued. In lieu of doing the stream survey, visual inspection of the channel stability throughout the reach and photo documentation at the permanent photo point locations would be completed. All other monitoring activities will continue to be completed throughout the monitoring period. The channel throughout the stream relocation site is stable at this time. The streambank and buffer areas were planted in March 2012 with live stakes and bareroot seedlings. The planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream monitoring and vegetation monitoring at the UT to Bald Creek (Hydro Site) Mitigation Site in 2016.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the UT to Bald Creek (Hydro Site) Mitigation Site. The Hydro Site is located on US 19 in Yancey County at Sta. 133+40 to Sta. 134+80 -L- (Figure 1). The UT to Bald Creek (Hydro Site) was constructed to provide mitigation for stream impacts associated with Transportation Improvement Program (TIP) number R-2518B in Yancey County.

The mitigation site provided approximately 443 linear feet of stream relocation. Construction was completed during April 2009 by the NCDOT. Stream relocation involved excavation of a floodplain and channel. In-stream cross vane structures were used to stabilize the channel pattern. The riparian buffer zone was also planted.

1.2 Purpose

In order for a mitigation site to be considered successful, the site must meet the success criteria. This report details the monitoring in 2015 at the UT to Bald Creek (Hydro Site) Mitigation Site. Hydrologic monitoring was not required for this site.

1.3 Project History

April 2009	Construction Completed
October 2009	As-Built Survey Completed
February 2010	Site Planted (Type I only)
November 2010	Stream Channel Monitoring (Year 1)
November 2011	Stream Channel Monitoring (Year 2)
March 2012	Site Planted (Type I and II)
September 2012	Vegetation Monitoring (Year 1)
November 2012	Stream Channel Monitoring (Year 3)
March 2013	Bankfull Monitoring Gauge Installed
August 2013	Vegetation Monitoring (Year 2)
November 2013	Stream Channel Monitoring (Year 4)
July 2014	Vegetation Monitoring (Year 3)
July 2014	Herbicide Application on Japanese Knotweed
November 2014	Stream Channel Monitoring (Year 5)
July 2015	Vegetation Monitoring (Year 4)
July 2015	Herbicide Application on Japanese Knotweed
November 2015	Visual Stream Channel Monitoring (Year 6)

1.4 Debit Ledger

The entire UT to Bald Creek (Hydro Site) stream mitigation site was used for the R-2518B project to compensate for unavoidable stream impacts.

Figure 1. Vicinity Map

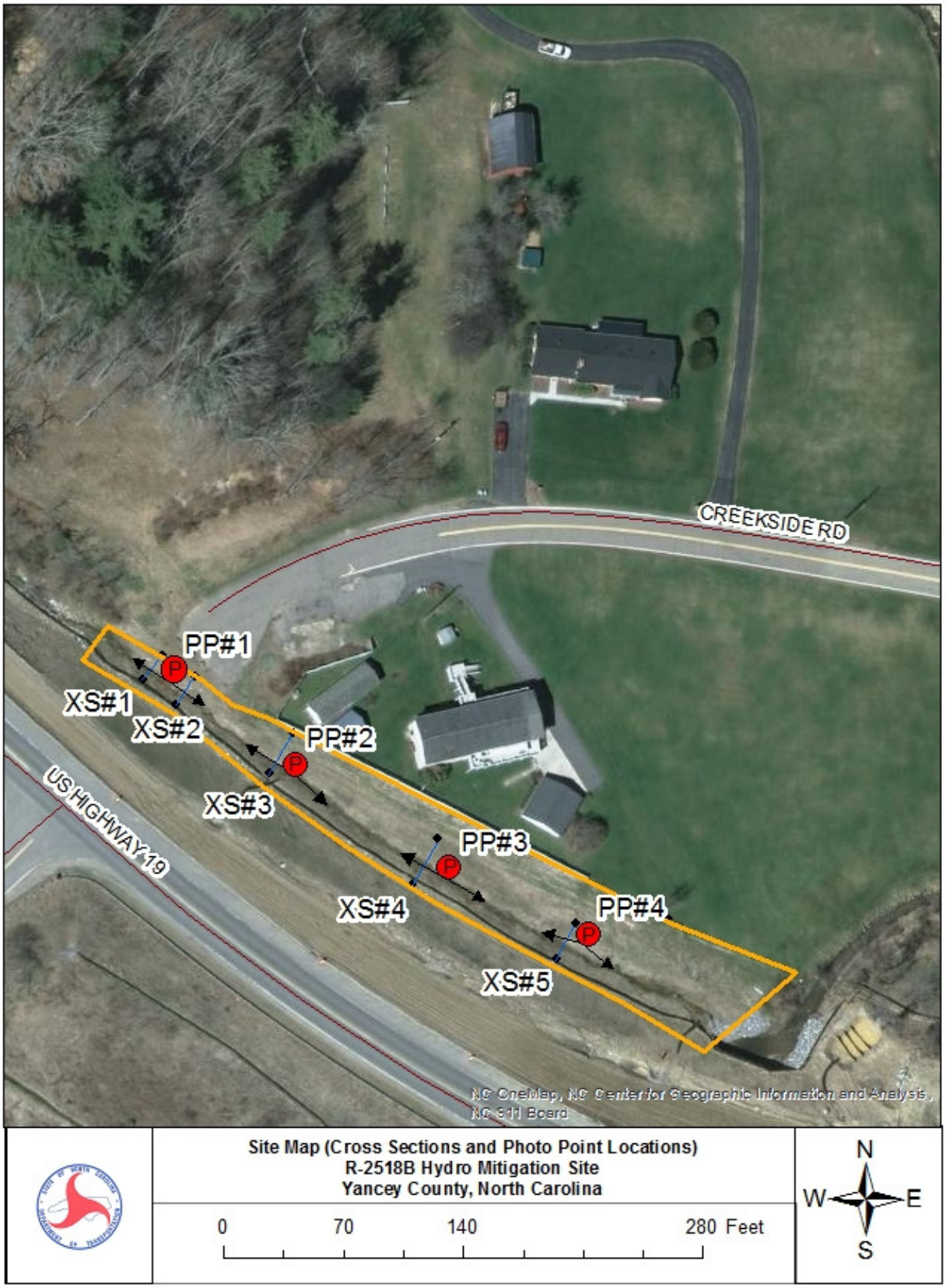
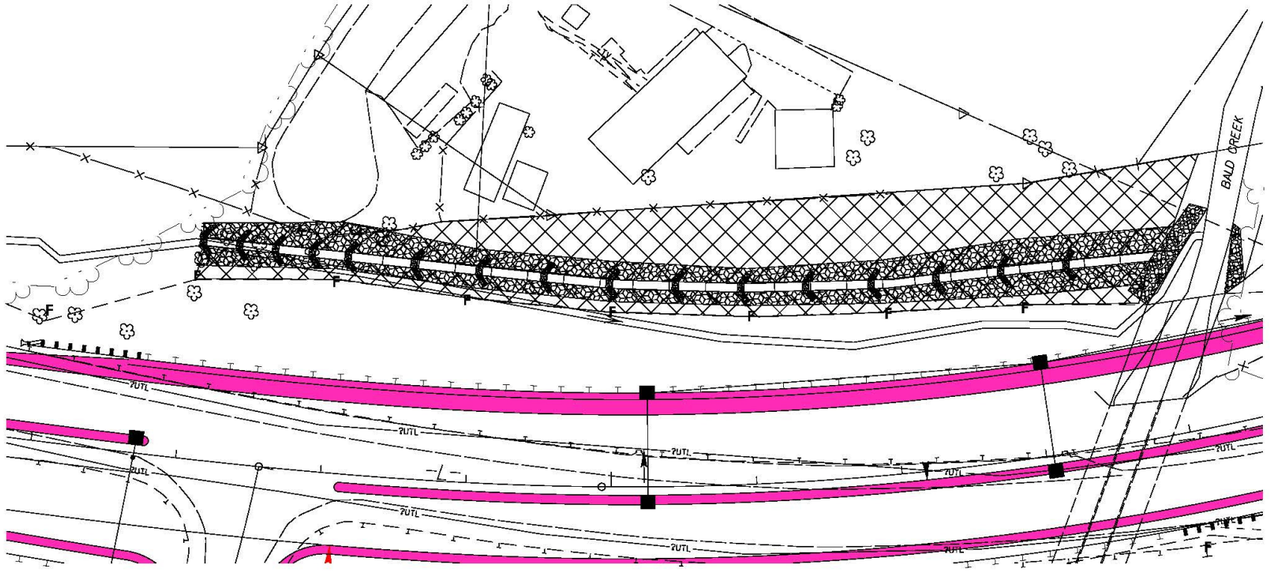


Figure 2. Hydro Site Map

PROJECT REFERENCE NO.	SHEET NO.
R-2518B	EC-54A/CONST.9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

0.17 HECTARE STREAMBANK REFORESTATION

STA. 115+00 to STA. 117+55



SEE RF–2, RF–3 AND PROJECT SPECIAL PROVISIONS

Figure 3. Hydro Site Reforestation Plan

2.0 STREAM ASSESSMENT

2.1 Success Criteria

The permittee shall monitor the restoration and enhancement mitigation sites following the Level 1 protocols outlined in the "Stream Mitigation Guidelines," dated April 2003 with the following exceptions:

1. Pebble counts shall not be conducted.

2. Two cross sections shall be conducted for streams less than 500 linear feet and five (5) cross sections shall be conducted for streams greater than 500 linear feet.

3. Riparian success shall be by visual inspection of plant survival. Photos will be taken and comments noted on plant survival.

The permittee shall monitor the preservation sites by visual inspection. Photos will be taken and comments noted on plant survival. The monitoring shall be conducted annually for a minimum of five (5) years after final planting. The monitoring results shall be submitted to DWR in a final report within sixty (60) days after completing monitoring. After 5 years the NCDOT shall contact the DWR to schedule a site visit to "close out" the mitigation site.

2.2 Stream Description

2.2.1 Post-Construction Conditions

The relocation of UT to Bald Creek (Hydro Site) Mitigation Site involved excavation of a floodplain and channel. In-stream cross vane structures were used to stabilize the channel pattern. The riparian buffer zone was also planted.

2.2.2 Monitoring Conditions

The objective of the UT to Bald Creek (Hydro Site) stream relocation was to restore a B stream as identified in Rosgen's Applied River Morphology. A total of five cross sections (three in a riffle and two in a pool) were surveyed. For this report, only cross sections containing riffles were used in the comparison of channel morphology. Morphology table comparison can be found in the 2010 to 2014 monitoring reports.

2.3 Results of the Stream Assessment

2.3.1 Site Data

The assessment included the survey of five cross sections of the UT to Bald Creek (Hydro Site) established by NCDOT after construction. Five cross sections were established during the as-built monitoring year. Cross section locations were subsequently based on the stationing of the longitudinal profile and are presented below. The locations of the cross sections are shown in the 2010 to 2014 monitoring reports Appendix A.

UT to Bald Creek (Hydro Site) Cross-Sections:

- Cross-Section #1: Hydro Site, Station 43+00, midpoint of riffle
- Cross-Section #2: Hydro Site, Station 67+00, midpoint of pool
- Cross-Section #3: Hydro Site, Station 135+00, midpoint of riffle
- Cross-Section #4: Hydro Site, Station 240+00, midpoint of pool
- Cross-Section #5: Hydro Site, Station 335+00, midpoint of riffle

Based on comparisons of the as-built to the monitoring data, all of the cross sections appear stable with little or no active bank erosion. Graphs of the cross sections are presented in the 2010 to 2014 monitoring reports Appendix A.

The ACOE and NCDWR agreed with NCDOT on emails sent on April 2, 2012 to discontinue the longitudinal profile survey for the remainder of the five year monitoring period due to heavy vegetation within the channel. Also, it was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that all surveying could be discontinued. In lieu of doing the stream survey, visual inspection of the channel stability throughout the reach and photo documentation at the permanent photo point locations would be completed. All other monitoring activities will continue to be completed throughout the monitoring period.

Photo points 1 through 4 showed an extensive growth of herbaceous and woody vegetation. The channel bed is stable throughout the stream site at this time. A beaver dam was noted downstream of photo point #4. USDA will be contacted to remove the dam and beavers. Pebble counts were not required per the permit conditions and therefore were not completed. Four bankfull events were documented by a surface water gauge at the Hydro Site during the 2014 monitoring year.

3.0 VEGETATION: UT to BALD CREEK (HYDRO SITE)

3.1 Description of Species

The following tree species were planted on the streambank:

Salix nigra, Black Willow

Cornus amomum, Silky Dogwood

The following tree species were planted in the buffer area:

Liriodendron tulipifera, Yellow Poplar

Platanus occidentalis, Sycamore

Fraxinus pennsylvanica, Green Ash

Quercus alba, White Oak

3.2 Results of Vegetation Monitoring

Streambank & Buffer Vegetation: The streambank reforestation was completed in March 2012. The Year 4 vegetation monitoring evaluation noted: Type I: Black Willow, Silky Dogwood and Type II: Sycamore, White Oak, and Green Ash were surviving at the time of monitoring evaluation. An area of Japanese Knotweed was sprayed with an herbicide application in July 2015.

3.3 Conclusions

NCDOT will continue to monitor the planted vegetation and spraying the Japanese Knotweed as needed in 2016.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The UT to Bald Creek (Hydro Site) Mitigation Site has met the required monitoring protocols for the sixth formal year of monitoring on the stream and the fourth formal year of monitoring on the planted vegetation. The channel throughout the stream relocation site is stable and the planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream and vegetation monitoring at the UT to Bald Creek (Hydro Site) Mitigation Site in 2016.

5.0 REFERENCES

Stream Mitigation Plan, US Highway 19, R-2518B On-Site Mitigation Yancey County, North Carolina, February 2007.

Stream Mitigation Plan Sheets for R-2518B, US 19 from east of the Madison County line to SR 1336, Stream Mitigation (Preservation, Enhancement, and Restoration), Buck Engineering.

North Carolina Department of Transportation (NCDOT), April 29, 2008. 404 and 401 Individual Permits for R-2518A and R-2518B (ACOE Permit No. 2007-2197-357/300 and DWR Project No. 20071134, Individual Certification No. 3706).

Rosgen, D.L, 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.

US Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines. Prepared with cooperation from the US Environmental Protection Agency, NC Wildlife Resources Commission, and the NC Division of Water Quality.

APPENDIX A

SITE PHOTOGRAPHS

Hydro Site

Photo Point #1 (Upstream)

Photo Point #1 (Downstream)

Photo Point #2 (Upstream)

Photo Point #2 (Downstream)

Photo Point #3 (Upstream)

Photo Point #3 (Downstream)

November 2015

Hydro Site

Photo Point #4 (Upstream)

Photo Point #4 (Downstream)

Beaver dam downstream of Photo Point #4
November 2015

Hydro Site

Vegetation Overview Photo

July 2015