# MONITORING YEAR 6 ANNUAL REPORT
Final

## HOLMAN MILL MITIGATION SITE
Alamance County, NC
NCDEQ Contract 005795
DMS Project Number 96316
USACE Action ID Number 2015-00019
NCDWR Project Number 2014-0333

Data Collection Period: January - October 2021
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**PREPARED FOR:**

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## EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) completed a full delivery project at the Holman Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality Division of Mitigation Services (DMS) to restore and enhance a total of 8,717 linear feet (LF) of perennial and intermittent stream in Alamance County, NC. It is anticipated that the Site will generate 3,883.333 Stream Mitigation Units (SMUs) through the restoration and enhancement of six unnamed tributaries (UT to Pine Hill Branch, UT1, UT1A, UT2, UT2A, and UT2B). The project is located in the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002 (Cape Fear 02) near Snow Camp, NC (Figure 1) and is within the Cane Creek Targeted Local Watershed (TLW) (HUC 03030002050050). On-site streams flow into Cane Creek and eventually into the Haw River.

The Site is located within the Jordan Lake Water Supply Watershed, which has been designated as a Nutrient Sensitive Water. The TLW was identified in DMS's Cape Fear River Basin Restoration Priorities 2009 (RBRP) report. The RBRP plan identifies agricultural operations and degraded water quality based on "fair" and "good-fair" benthic ratings as the impairments in the Cane Creek watershed. The RBRP report also identifies the successful completion of a number of stream and wetland projects within the Cane Creek watershed. The Site fully supports the Cataloging Unit (CU)-wide functional objectives stated in the 2011 Request for Proposals to reduce and control nutrient inputs, reduce and control sediment inputs, and protect and augment Significant Natural Heritage Areas in the Cape Fear 02 River Basin.

The mitigation project is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Site project area; others, such as pollutant removal and improved aquatic and terrestrial habitat, have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established with careful consideration of the goals and objectives described in the RBRP and to meet the DMS's mitigation needs, while maximizing the ecological and water quality uplift within the watershed. The following project specific goals established in the mitigation plan (Wildlands, 2015) are to:

- Reduce fecal coliform, nitrogen, and phosphorous inputs by removing cattle from streams and establishing and augmenting a forested riparian corridor to intercept and process sediment and nutrients before they reach the channel during storm events;
- Reduce sediment loads by stabilizing eroding stream banks;
- Return a network of streams to a stable form that is capable of supporting biological functions;
- Install instream structures to improve bed and bank stability, create fish and macroinvertebrate habitat, and help oxygenate streamflows; and
- Protect existing high quality streams and forested buffers.

The project is helping meet the watershed goals and providing numerous ecological benefits within the Cape Fear River Basin. In addition, protected parcels downstream of the Site promote cumulative project benefits within the watershed.

The Site construction and as-built surveys were completed between January and April 2016. A conservation easement is in place on 32.4 acres of the riparian corridors to protect them in perpetuity.

Monitoring Year 6 (MY6) site visits and assessments were completed between the months of January and October 2021 to visually assess the conditions of the project and collect stream hydrology data. Per Interagency Review Team (IRT) guidelines, detailed monitoring and analysis of vegetation, substrate, and channel cross-sectional dimensions were not required during MY6. Visual observations, hydrology data, and management practices are included in this report. To preserve the clarity and continuity of

reporting structure, this report maintains section and appendix numbering from previous monitoring reports. Omitted sections are denoted in the table of contents.

Overall, Site performance for vegetation, stream geomorphology, and hydrology meet success criteria for MY6. Vegetation appears healthy and to be performing adequately to attain the final success criteria at the end of MY7. Herbaceous vegetation has created wildlife habitat and has been successful in providing streambank stabilization. The replanting of a small low growth area along UT to Pine Hill Branch that was identified in MY5 was deemed unnecessary. The cause of low growth in this area is due to natural competition from mature black walnut (*Juglans nigra*) trees. Soil amendments were used on a 0.36 low vigor area along UT2A that was discovered after the MY4 tree release. Successful increase in height has been noted through visual assessments and soil amendments will continued to be applied during MY7. An invasive vegetation treatment occurred in April 2021 to treat sporadic invasive species across the Site. A follow up treatment will happen during MY7. Visual observation indicated that stream channels have remained geomorphically stable and multiple bankfull events were recorded on all streams during MY6.

**HOLMAN MILL MITIGATION SITE**
Monitoring Year 6 Annual Report

## TABLE OF CONTENTS



## APPENDICES



*Content omitted from Monitoring Year 6 Report

# Section 1: PROJECT OVERVIEW

The Holman Mill Mitigation Site (Site) is located in southern Alamance County, southeast of Snow Camp off of Holman Mill Road (Figure 1). The Site is located within the Jordan Lake Water Supply Watershed (HUC 03030002050050) which has been designated as a Nutrient Sensitive Water. The Site is in in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998) and the project watershed consists primarily of agricultural and wooded land. The drainage area for the project site is 1,077 acres (1.68 square miles).

The project streams consist of six unnamed tributaries to Pine Hill Branch. Stream restoration reaches include UT1 (Reach 1 and 3), UT2 (Reach 3 and 4) and UT2A. Stream enhancement I (EI) and enhancement II (EII) reaches included UT1 (Reach 2 and 4), EII; UT2 (Reach 1), EII; UT2 (Reach 2), EI; UT2B, EII; UT1A, EII; and UT to Pine Hill Branch, EII. Mitigation work within the Site included restoration and enhancement of 8,717 linear feet (LF) of perennial and intermittent stream channels. The riparian areas were planted with native vegetation to improve habitat and protect water quality. The final mitigation plan was submitted and accepted by the DMS in May 2015. Construction activities were completed by Land Mechanic Designs, Inc. in March 2016. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in March 2016. Baseline monitoring (MY0) was conducted between January 2016 and April 2016. Annual monitoring will occur for seven years with the close-out anticipated to commence in 2023 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for the Site.

A conservation easement (32.4 ac; Deed Book 3472, Page 968; Deed Book 3472, Page 951) has been recorded and is in place along the stream riparian corridors to protect them in perpetuity within two tracts; a tract owned by the Russell B. Hadley Revocable Trust and a tract owned by the M. Darryl Lindley Revocable Trust, respectively. The project is expected to provide 3,883.333 SMU's by closeout.

A project vicinity map and directions are provided in Figure 1 and project components are illustrated in Figure 2.

## 1.1 Project Goals and Objectives

Prior to construction activities, the streams and vegetative communities on the Site had been severely impacted due to direct livestock access to the streams and riparian zones. Table 4 in Appendix 1 and Tables 10a through 10c in Appendix 4 of the MY5 Report present the pre-restoration conditions in detail.

This Site is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Site, others such as pollutant removal and reduced sediment loading have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established with careful consideration of goals and objectives that were described in the RBRP and to meet the DMS mitigation needs while maximizing the ecological and water quality uplift within the watershed.

The following project goals and related objectives established in the mitigation plan (Wildlands, 2015) included:

The primary project goals will be:

- Reduce fecal coliform, nitrogen, and phosphorous inputs by removing cattle from streams and establishing and augmenting a forested riparian corridor to intercept and process sediment and nutrients before they reach the channel during storm events;
- Reduce sediment loads by stabilizing eroding stream banks;

- Return a network of streams to a stable form that is capable of supporting biological functions;
- Install instream structures to improve bed and bank stability, create fish and macroinvertebrate habitat, and help oxygenate streamflows; and
- Protect existing high-quality streams and forested buffers.

Secondary project objectives are expected to include:

- Improving instream nutrient cycling by incorporating woody debris into constructed riffles and bank stabilization measures;
- Reducing thermal loadings through establishment of riparian shading;
- Reconnecting channels with floodplains to raise the local water table; and
- Create and implement a stream and riparian area restoration design that is both natural and aesthetically pleasing.

## 1.2 Monitoring Year 6 Data Assessment

Annual monitoring and quarterly site visits were conducted during MY6 to assess the condition of the project. The vegetation and stream success criteria for the Site follows the approved success criteria presented in the Holman Mill Mitigation Project Mitigation Plan (Wildlands, 2015).

### 1.2.1 Vegetative Assessment

Detailed vegetation inventory and analysis is not required during MY6. Visual assessment during MY6 indicated that vegetation is healthy and performing adequately to attain terminal success criteria of 210 planted stems per acre and averaging ten feet in height. Along with a successful early successional canopy starting to develop, the herbaceous vegetation is dense and providing appropriate streambank stabilization and wildlife habitat.

### 1.2.2 Vegetation Areas of Concern

A 0.14-acre area of low stem density that was noted during MY5 along UT to Pine Hill Branch was further assessed to determine that the poor growth rate is not due to herbaceous competition but instead to mature black walnut (*Juglans nigra*) trees releasing toxins into the soil preventing other trees from establishing. Since this is a natural native process, it was determined that another tree planting would not be necessary.

A tree release was completed during MY4, removing blackberry (*Rubus occidentalis*) and Japanese honeysuckle (*Lonicera japonica*) across the Site in 2019. After the tree release, stem density and vigor were better assessed without outcompeting vegetation. One area of low vigor, totaling 0.36 acres, was recorded and treated during MY6 (Figure 3.2). Soil amendments were added in March 2021 with positive results. While the height and vigor of the trees are comparatively smaller to the rest of the Site, Wildlands has visually assessed increase height and vigor over the years. Wildlands plans to continue to add soil amendments during MY7.

Sporadic populations of non-native invasive species were treated throughout the Site in April 2021. A follow up invasive vegetation treatment will occur during MY7 to check for resprouts.

### 1.2.3 Stream Assessment

Detailed dimensional survey and analysis is not required for MY6. Visual monitoring indicated that the stream channel is performing as desired. No deposition or erosion exceeding approximate natural levels was observed. See Appendix 2 for stream photographs and visual assessment data.

### 1.2.4 Stream Areas of Concern

No stream areas of concern were identified during MY6.

### 1.2.5 Hydrology Assessment

At the end of the seven-year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. At least one bankfull event was recorded on all restoration reaches during MY6 and multiple bankfull events were recorded on each reach during MY1, MY2, MY3, MY4, and MY5 resulting in attainment of the stream hydrology assessment criteria. Refer to Appendix 5 for hydrologic data.

### 1.2.6 Maintenance Plan

Soil amendments will continue to be applied during MY7 on the low vigor area to encourage tree growth before closeout.

Another non-native invasive vegetation treatment will occur during MY7 to thoroughly check for resprouts and other species that may have been missed during the invasive treatment that occurred in April 2021.

## 1.3 Monitoring Year 6 Summary

Visual assessment indicated that all project streams are geomorphically stable and functioning as designed. Visual assessment indicated that vegetation is healthy and on track to meet final success criteria. Stream bank stabilization and wildlife habitat have improved with the increase of dense herbaceous vegetation. The low growth area identified during MY5 was not replanted due to native competition and the unlikely success of future replanting. After a tree release in MY4, a low vigor area was discovered and treated with soil amendments in MY6. In April 2021, an invasive vegetation treatment occurred across the Site to treat small sporadic populations of invasive species. During MY7, the Site will continue to receive soil amendments for the low vigor area and receive another invasive vegetation treatment. Hydrology criteria has been successful completed for the duration of the project and at least one bankfull event was recorded on each stream during MY6.

Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

# Section 2: METHODOLOGY

Geomorphic data was collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All Integrated Current Condition Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Crest gages and pressure transducers were installed in surveyed riffle cross sections and monitored quarterly. Hydrologic monitoring instrument installation and monitoring methods are in accordance with the United States Army Corps of Engineers (USACE, 2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008).

## Section 3: REFERENCES


Doll, B.A., Grabow, G.L., Hall, K.A., Halley, J., Harman, W.A., Jennings, G.D., and Wise, D.E. 2003. Stream Restoration A Natural Channel Design Handbook.

Harrelson, C.C., Rawlins, C.L., Potyondy, J.P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique.* Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

Lee, M.T., Peet, R.K., S.D., Wentworth, T.R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Retrieved from http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-5.pdf.

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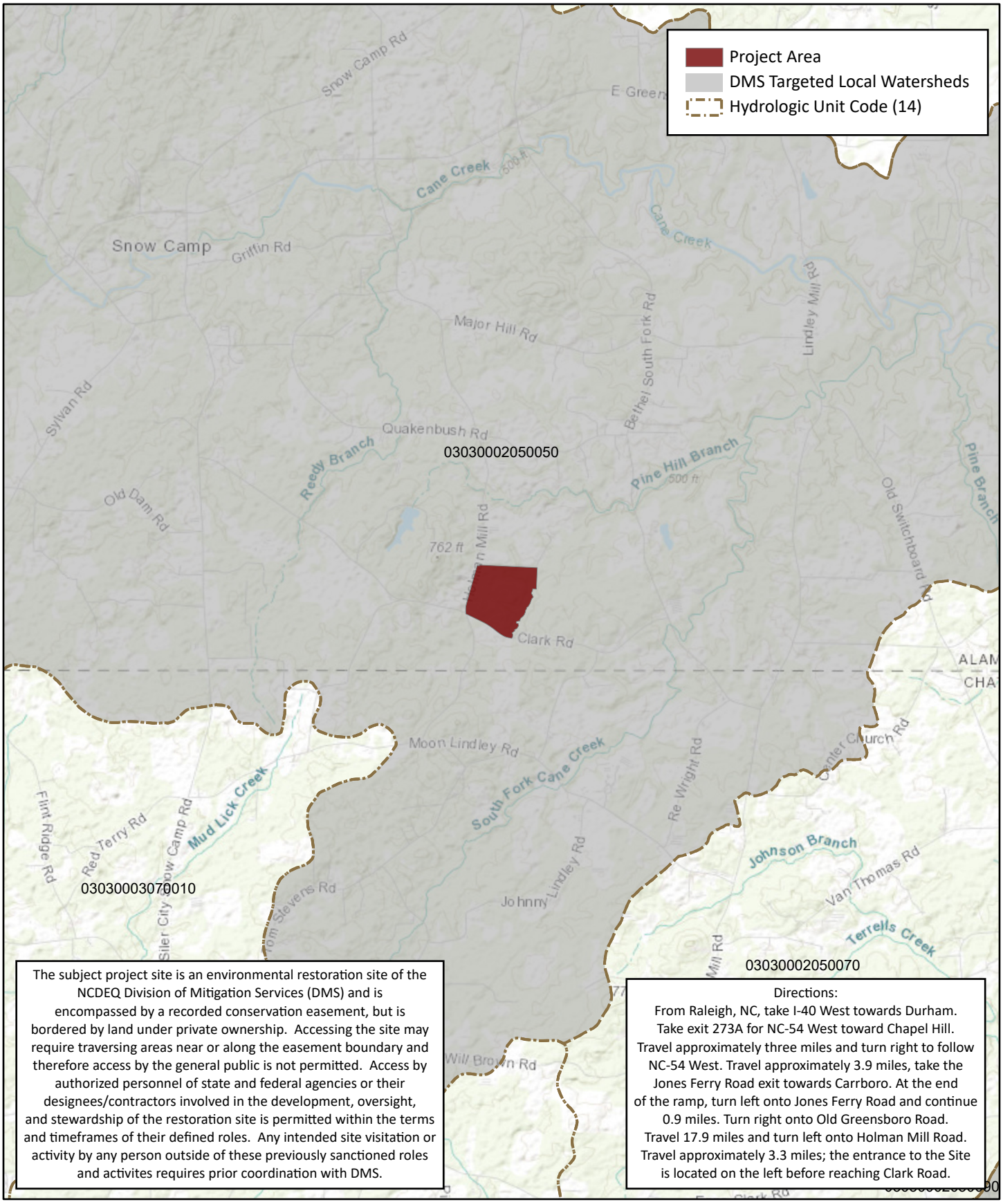
United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

United States Geological Survey. 1998. North Carolina Geology. http://www.geology.enr.state.nc.us/usgs/carolina.htm

Wildlands Engineering, Inc. 2016. Holman Mill Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. DMS, Raleigh, NC.

Wildlands Engineering, Inc. 2015. Holman Mill Mitigation Project Mitigation Plan. DMS, Raleigh, NC.

# APPENDIX 1. General Tables and Figures

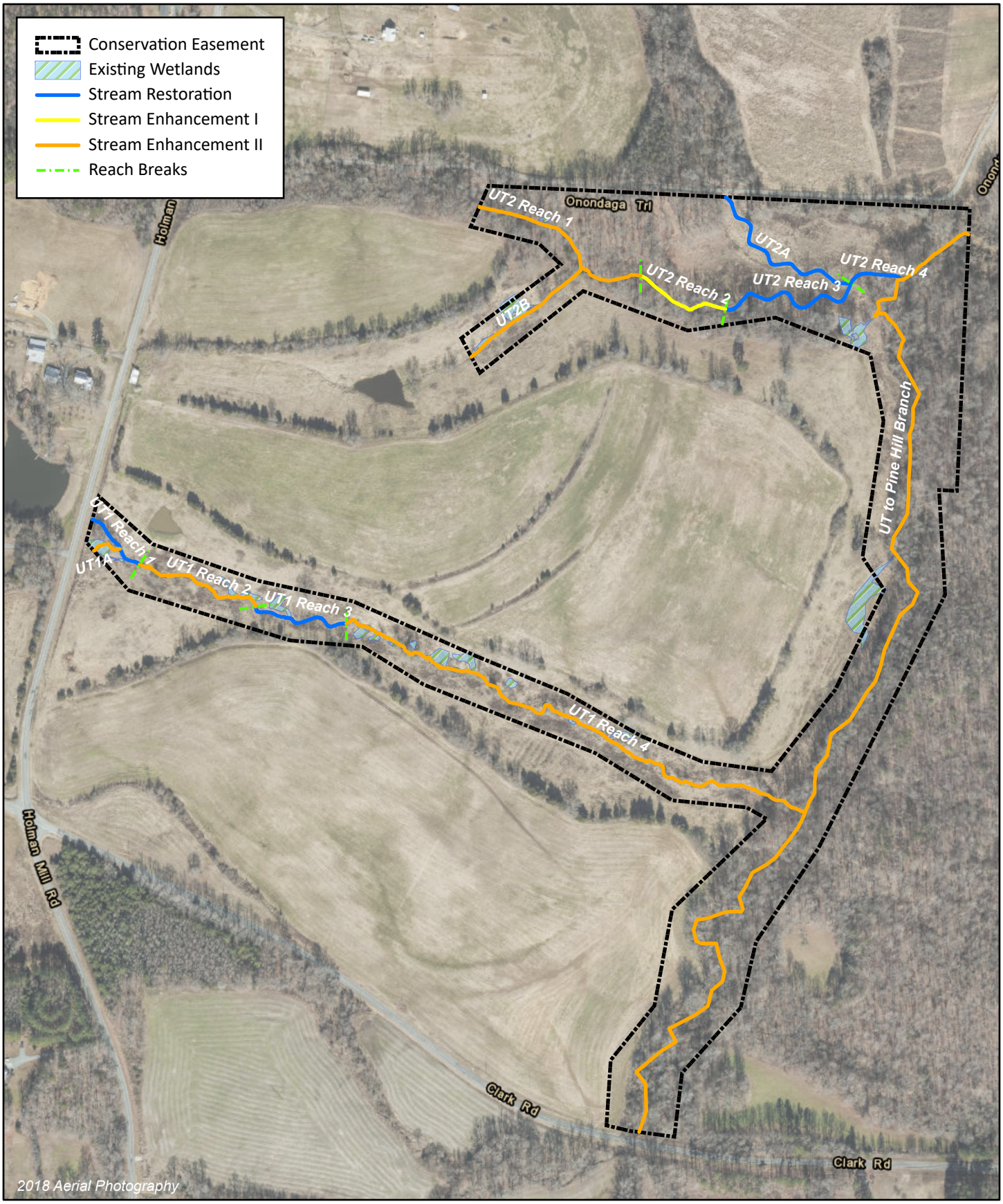



WILDLANDS ENGINEERING

0 0.5 1 Miles

N

Figure 1 Project Vicinity Map
Holman Mill Mitigation Site
DMS Project No. 96316
Monitoring Year 6 - 2021
*Alamance County, NC*




WILDLANDS ENGINEERING

0 200 400 Feet

Figure 2 Project Component / Asset Map
Holman Mill Mitigation Site
DMS Project No. 96316
Monitoring Year 6 - 2021
*Alamance County, NC*

**Table 1. Project Components and Mitigation Credits**
Holman Mill Mitigation Site
DMS Project No. 96316
**Monitoring Year 6 - 2021**

| MITIGATION CREDITS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Stream | | Riparian Wetland | | Non-Riparian Wetland | | Buffer | Nitrogen Nutrient Offset | Phosphorous Nutrient Offset |
| Type | R | RE | R | RE | R | RE | | | |
| Totals | 3,883.333 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| PROJECT COMPONENTS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Reach ID | As-Built Stationing / Location | Existing Footage / Acreage | Approach | Restoration or Restoration Equivalent | Restoration Footage / Acreage | Mitigation Ratio | Credits (SMU / WMU) |
| STREAMS | | | | | | | |
| UT to Pine Hill Branch | 600+00 - 635+26 | 3,526 | EII | Restoration | 3,526 | 5 | 705.200 |
| UT1 Reach 1 | 100+00 - 102+08 | 215 | P1 | Restoration | 208 | 1 | 208.000 |
| UT1 Reach 2 | 102+08 - 106+31 | 433 | EII | Restoration | 423 | 2.5 | 169.200 |
| UT1 Reach 3 | 106+31 - 109+40 | 331 | P1 | Restoration | 309 | 1 | 309.000 |
| UT1 Reach 4 | 109+40 - 125+98 | 1,687 | EII | Restoration | 1,658 | 2.5 | 663.200 |
| UT1A | 400+00 - 400+94 | 84 | EII | Restoration | 94 | 2.5 | 37.600 |
| UT2A | 300+00 - 305+40 | 468 | P1 | Restoration | 540 | 1 | 540.000 |
| UT2 Reach 1 | 200+00 - 205+88 | 588 | EII | Restoration | 588 | 2.5 | 235.200 |
| UT2 Reach 2 | 205+88 - 208+81 | 298 | E1 | Restoration | 293 | 1.5 | 195.333 |
| UT2 Reach 3 | 208+81 - 213+63 | 396 | P1 | Restoration | 482 | 1 | 482.000 |
| UT2 Reach 4 | 213+63 - 215+30 | 242 | P1 | Restoration | 167 | 1 | 167.000 |
| UT2B | 500+00 - 504+29 | 429 | EII | Restoration | 429 | 2.5 | 171.600 |

| COMPONENT SUMMATION | | | | | | |
|---|---|---|---|---|---|---|
| Restoration Level | Stream (LF) | Riparian Wetland (acres) | | Non-Riparian Wetland (acres) | Buffer (acres) | Upland (acres) |
| | | Riverine | Non-Riverine | | | |
| Restoration | 1,706 | - | - | - | - | - |
| Enhancement | | - | - | - | - | - |
| Enhancement I | 293 | | | | | |
| Enhancement II | 6,718 | | | | | |
| Creation | | - | - | - | | |
| Preservation | - | - | - | - | | - |
| High Quality Preservation | - | - | - | - | | - |

**Table 2. Project Activity and Reporting History**
Holman Mill Mitigation Site
DMS Project No. 96316
**Monitoring Year 6 - 2021**

| Activity or Report | | Date Collection Complete | Completion or Scheduled Delivery |
|---|---|---|---|
| Mitigation Plan | | April 2014 - April 2015 | May 2015 |
| Final Design - Construction Plans | | May 2015 - October 2015 | October 2015 |
| Construction | | January 2016 - March 2016 | March 2016 |
| Temporary S&E mix applied to entire project area[1] | | March 2016 | March 2016 |
| Permanent seed mix applied to reach/segments[1] | | March 2016 | March 2016 |
| Bare root and live stake plantings for reach/segments | | March 2016 | March 2016 |
| Baseline Monitoring Document (Year 0) | Stream Survey | March 2016 | May 2016 |
| | Vegetation Survey | March 2016 | |
| Year 1 Monitoring | Stream Survey | September 2016 | December 2016 |
| | Vegetation Survey | September 2016 | |
| Year 2 Monitoring | Stream Survey | March 2017 | December 2017 |
| | Vegetation Survey | August 2017 | |
| Year 3 Monitoring | Stream Survey | March 2018 | December 2018 |
| | Vegetation Survey | August 2018 | |
| Replanting | | | December 2018 |
| Sweetgum Removal | | | April 2019 |
| Tree Release | | | April 2019 |
| Fence Repaired | | | August 2019 |
| Easement Encroachment | | | December 2019 |
| Year 4 Monitoring | | | December 2019 |
| Replanting | | | February 2020 |
| Stream Repair | | | May 2020 |
| Year 5 Monitoring | Stream Survey | March 2020 | December 2020 |
| | Vegetation Survey | August 2020 | |
| Soil Amendments | | | March 2021 |
| Invasive Vegetation Treatment | | | April 2021 |
| Year 6 Monitoring | | | December 2021 |
| Year 7 Monitoring | Stream Survey | 2022 | December 2022 |
| | Vegetation Survey | 2022 | |

[1]Seed and mulch is added as each section of construction is completed.

**Table 3. Project Contact Table**
Holman Mill Mitigation Site
DMS Project No. 96316
**Monitoring Year 6 - 2021**

| | |
|---|---|
| **Designer**<br>Angela Allen, PE | **Wildlands Engineering, Inc.**<br>312 West Millbrook Road, Suite 225<br>Raleigh, NC 27609<br>919.851.9986, ext. 106 |
| **Construction Contractor** | **Land Mechanic Designs, Inc.**<br>126 Circle G Lane<br>Willow Spring, NC 27592 |
| **Planting Contractor** | **Bruton Natural Systems, Inc**<br>P.O. Box 1197<br>Fremont, NC 27830 |
| **Seeding Contractor** | **Land Mechanic Designs, Inc.**<br>126 Circle G Lane<br>Willow Spring, NC 27592 |
| **Seed Mix Sources** | **Green Resource, LLC** |
| **Nursery Stock Suppliers**<br>Bare Roots | **Dykes and Son Nursery** |
| **Live Stakes** | **Bruton Natural Systems, Inc** |
| **Monitoring Performers**<br>Monitoring, POC | **Wildlands Engineering, Inc.**<br>Jason Lorch<br>919.851.9986, ext. 107 |

**Table 4. Project Information and Attributes**

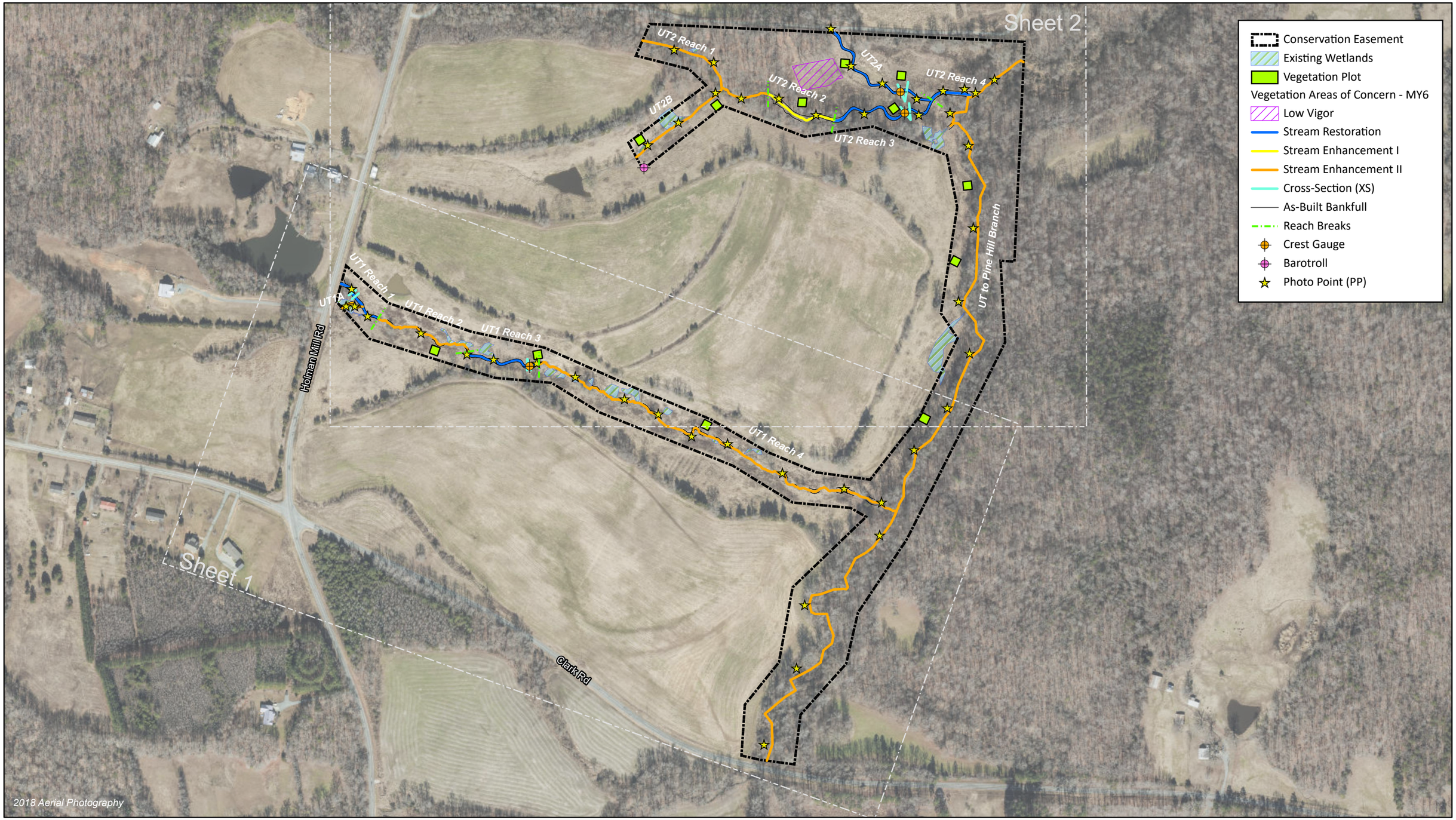
Holman Mill Mitigation Site

DMS Project No. 96316

**Monitoring Year 6 - 2021**

| PROJECT INFORMATION | | | | | | |
|---|---|---|---|---|---|---|
| Project Name | Holman Mill Mitigation Site | | | | | |
| County | Alamance County | | | | | |
| Project Area (acres) | 32.4 Acres | | | | | |
| Planted Area (acres) | 14.0 Acres | | | | | |
| Project Coordinates (latitude and longitude) | 35°51'310.12"N, 79°23'16.00"W | | | | | |
| **PROJECT WATERSHED SUMMARY INFORMATION** | | | | | | |
| Physiographic Province | Carolina Slate Belt of the Piedmont Physiographic Province | | | | | |
| River Basin | Cape Fear River | | | | | |
| USGS Hydrologic Unit 8-digit | 03030002 | | | | | |
| USGS Hydrologic Unit 14-digit | 03030002050050 | | | | | |
| DWR Sub-basin | 03-06-04 | | | | | |
| Project Drainage Area (acres) | 1,077 | | | | | |
| Project Drainage Area Percentage of Impervious Area | 3% | | | | | |
| CGIA Land Use Classification | 49% Forested/Scrubland, 42% Agriculture/Managed Herbaceous, 4% Pasture, 3% Watershed Impervious Cover, 2% Residential, <1% Open Water | | | | | |
| **REACH SUMMARY INFORMATION** | | | | | | |
| **Parameters** | **UT to Pine Hill Branch** | **UT1** | **UT1A** | **UT2** | **UT2A** | **UT2B** |
| Length of reach (linear feet) - Post-Restoration | 3,526 | 2,598 | 94 | 1,530 | 540 | 429 |
| Drainage area (acres) | 1,077 | 102 | 20 | 130 | 47 | 18 |
| NCDWR stream identification score | 44.5 | 33.5/30.5 | 25.5 | 35 | 36.75 | 26.5 |
| NCDWR Water Quality Classification | N/A | | | | | |
| Morphological Desription (stream type) | P | P | I | P | P | I |
| Evolutionary trend (Simon's Model) - Pre- Restoration | I | II | NA | III/IV | III/IV | NA |
| Underlying mapped soils | Georgeville silty clay loam, Local alluvial land, Herndon silt loam, Goldston Channery silt loam | | | | | |
| Drainage class | --- | --- | --- | --- | --- | --- |
| Soil Hydric status | --- | --- | --- | --- | --- | --- |
| Slope | --- | --- | --- | --- | --- | --- |
| FEMA classification | AE | AE | --- | AE | AE | --- |
| Native vegetation community | Piedmont bottomland forest, Bottomland hardwood forest | | | | | |
| Percent composition exotic invasive vegetation - Post-Restoration | 0% | | | | | |
| **REGULATORY CONSIDERATIONS** | | | | | | |
| **Regulation** | **Applicable?** | **Resolved?** | **Supporting Documentation** | | | |
| Waters of the United States - Section 404 | Yes | Yes | USACE Nationwide Permit No.27 and DWQ | | | |
| Waters of the United States - Section 401 | Yes | Yes | 401 Water Quality Certification No. 3885. | | | |
| Division of Land Quality (Dam Safety) | No | N/A | N/A | | | |
| Endangered Species Act | Yes | Yes | Holman Mill Mitigation Plan (2015); Wildlands determined "no effect" on Alamance County listed endangered species. | | | |
| Historic Preservation Act | Yes | Yes | No historic resources were found to be impacted (letter from SHPO dated 3/24/14). | | | |
| Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA) | No | N/A | N/A | | | |
| FEMA Floodplain Compliance | Yes | Yes | UT to Pine Hill Branch and portions of UT2 and UT2A are located within the floodway and flood fringe (FEMA Zone AE, FIRM panel 8786). | | | |
| Essential Fisheries Habitat | No | N/A | N/A | | | |

# APPENDIX 2. Visual Assessment Data




WILDLANDS ENGINEERING

0 350 700 Feet

N

Figure 3.0 Integrated Current Condition Plan View (Key)
Holman Mill Mitigation Site
DMS Project No. 96316
Monitoring Year 6 - 2021

*Alamance County, NC*


WILDLANDS ENGINEERING

0 180 360 Feet

Figure 3.1 Integrated Current Condition Plan View
Holman Mill Mitigation Site
DMS Project No. 96316
Monitoring Year 6 - 2021

*Alamance County, NC*


WILDLANDS ENGINEERING

0 180 360 Feet

N

Figure 3.2 Integrated Current Condition Plan View
Holman Mill Mitigation Site
DMS Project No. 96316
Monitoring Year 6 - 2021

*Alamance County, NC*

**Table 5a. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT1 - 2,598 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | 14 | 14 | | | 100% | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | 13 | 13 | | | 100% | | | |
| | | Length Appropriate | 13 | 13 | | | 100% | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | 12 | 12 | | | 100% | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | 13 | 13 | | | 100% | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | 10 | 10 | | | 100% | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | 10 | 10 | | | 100% | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | 10 | 10 | | | 100% | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | 10 | 10 | | | 100% | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 10 | 10 | | | 100% | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

**Table 5b. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT1A - 94 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | 3 | 3 | | | 100% | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | n/a | n/a | | | n/a | | | |
| | | Length Appropriate | n/a | n/a | | | n/a | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | n/a | n/a | | | n/a | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | n/a | n/a | | | n/a | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | n/a | n/a | | | n/a | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | n/a | n/a | | | n/a | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | n/a | n/a | | | n/a | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | n/a | n/a | | | n/a | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | n/a | n/a | | | n/a | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

**Table 5c. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT2 - 1,530 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | 14 | 14 | | | 100% | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | 10 | 10 | | | 100% | | | |
| | | Length Appropriate | 10 | 10 | | | 100% | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | 13 | 13 | | | 100% | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | 13 | 13 | | | 100% | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | 3 | 3 | | | 100% | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | 3 | 3 | | | 100% | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | 3 | 3 | | | 100% | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | 3 | 3 | | | 100% | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 3 | 3 | | | 100% | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

**Table 5d. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT2A - 540 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | 11 | 11 | | | 100% | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | 10 | 10 | | | 100% | | | |
| | | Length Appropriate | 10 | 10 | | | 100% | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | 11 | 11 | | | 100% | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | 10 | 10 | | | 100% | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | 2 | 2 | | | 100% | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | 2 | 2 | | | 100% | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | 2 | 2 | | | 100% | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | 2 | 2 | | | 100% | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 2 | 2 | | | 100% | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

**Table 5e. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT2B - 429 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | n/a | n/a | | | n/a | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | n/a | n/a | | | n/a | | | |
| | | Length Appropriate | n/a | n/a | | | n/a | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | n/a | n/a | | | n/a | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | n/a | n/a | | | n/a | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | n/a | n/a | | | n/a | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | n/a | n/a | | | n/a | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | n/a | n/a | | | n/a | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | n/a | n/a | | | n/a | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | n/a | n/a | | | n/a | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

**Table 5f. Visual Stream Morphology Stability Assessment Table**
Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**UT to Pine Hill Branch - 3,526 lf**

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Bed** | **1. Vertical Stability (Riffle and Run Units)** | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | **2. Riffle Condition** | Texture/Substrate | n/a | n/a | | | n/a | | | |
| | **3. Meander Pool Condition** | Depth Sufficient | n/a | n/a | | | n/a | | | |
| | | Length Appropriate | n/a | n/a | | | n/a | | | |
| | **4. Thalweg Position** | Thalweg centering at upstream of meander bend (Run) | n/a | n/a | | | n/a | | | |
| | | Thalweg centering at downstream of meander bend (Glide) | n/a | n/a | | | n/a | | | |
| | | | | | | | | | | |
| **2. Bank** | **1. Scoured/Eroded** | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **2. Undercut** | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | **3. Mass Wasting** | Bank slumping, caving, or collapse | | | 0 | 0 | 100% | n/a | n/a | n/a |
| | | | | **Totals** | 0 | 0 | 100% | n/a | n/a | n/a |
| **3. Engineered Structures**[1] | **1. Overall Integrity** | Structures physically intact with no dislodged boulders or logs. | n/a | n/a | | | n/a | | | |
| | **2. Grade Control** | Grade control structures exhibiting maintenance of grade across the sill. | n/a | n/a | | | n/a | | | |
| | **2a. Piping** | Structures lacking any substantial flow underneath sills or arms. | n/a | n/a | | | n/a | | | |
| | **3. Bank Protection** | Bank erosion within the structures extent of influence does not exceed 15%. | n/a | n/a | | | n/a | | | |
| | **4. Habitat** | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | n/a | n/a | | | n/a | | | |

[1]Excludes constructed riffles since they are evaluated in section 1.

### Table 6. Vegetation Condition Assessment Table

Holman Mill Mitigation Project
DMS Project No. 96316
**Monitoring Year 6 - 2021**

**Planted Acreage** **14**

| Vegetation Category | Definitions | Mapping Threshold (Ac) | Number of Polygons | Combined Acreage | % of Planted Acreage |
|---|---|---|---|---|---|
| **Bare Areas** | Very limited cover of both woody and herbaceous material | 0.1 | 0 | 0.0 | 0% |
| **Low Stem Density Areas** | Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria. | 0.1 | 0 | 0.0 | 0% |
| | | **Total** | **0** | **0.0** | **0%** |
| **Areas of Poor Growth Rates or Vigor** | Areas with woody stems of a size class that are obviously small given the monitoring year. | 0.25 Ac | 1 | 0.4 | 3% |
| | | **Cumulative Total** | **0** | **0.4** | **3%** |

**Easement Acreage** **32.4**

| Vegetation Category | Definitions | Mapping Threshold (SF) | Number of Polygons | Combined Acreage | % of Easement Acreage |
|---|---|---|---|---|---|
| **Invasive Areas of Concern** | Areas of points (if too small to render as polygons at map scale). | 1,000 | 0 | 0 | 0% |
| | | | | | |
| **Easement Encroachment Areas** | Areas of points (if too small to render as polygons at map scale). | none | 0 | 0.0 | 0% |

# Stream Photographs

| | |
|---|---|
|  |  |
| **PHOTO POINT 1 UT1A** – looking upstream (3/30/2021) | **PHOTO POINT 1 UT1A** – looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 2 UT1A** – looking upstream (3/30/2021) | **PHOTO POINT 2 UT1A** – looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 3 UT1** – looking upstream (3/30/2021) | **PHOTO POINT 3 UT1** – looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 4 UT1** – looking upstream (3/30/2021) | **PHOTO POINT 4 UT1** – looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 5 UT1** – looking upstream (3/30/2021) | **PHOTO POINT 5 UT1** – looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 6 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 6 UT1 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 7 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 7 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 8 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 8 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 9 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 9 UT1 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 10 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 10 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 11 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 11 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 12 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 12 UT1 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 13 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 13 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 14 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 14 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 15 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 15 UT1 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 16 UT1 –** looking upstream (3/30/2021) | **PHOTO POINT 16 UT1 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 17 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 17 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 18 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 18 UT - PHB –** looking downstream (3/30/2021) |

**PHOTO POINT 19 UT - PHB –** looking upstream (3/30/2021)

**PHOTO POINT 19 UT - PHB –** looking downstream (3/30/2021)

**PHOTO POINT 20 UT - PHB –** looking upstream (3/30/2021)

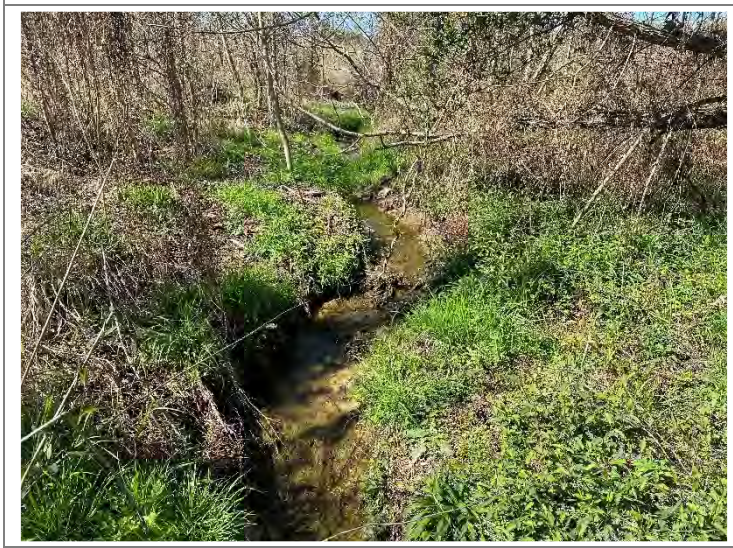
**PHOTO POINT 20 UT - PHB –** looking downstream (3/30/2021)

**PHOTO POINT 21 UT - PHB –** looking upstream (3/30/2021)

**PHOTO POINT 21 UT - PHB –** looking downstream (3/30/2021)

| | |
|---|---|
|  |  |
| **PHOTO POINT 22 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 22 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 23 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 23 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 24 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 24 UT - PHB –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 25 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 25 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 26 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 26 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 27 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 27 UT - PHB –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 28 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 28 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 29 UT - PHB –** looking upstream (3/30/2021) | **PHOTO POINT 29 UT - PHB –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 30 UT2B –** looking upstream (3/30/2021) | **PHOTO POINT 30 UT2B –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 31 UT2B –** looking upstream (3/30/2021) | **PHOTO POINT 31 UT2B –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 32 UT2B –** looking upstream (3/30/2021) | **PHOTO POINT 32 UT2B –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 33 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 33 UT2 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 34 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 34 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 35 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 35 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 36 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 36 UT2 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 37 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 37 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 38 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 38 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 39 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 39 UT2 –** looking downstream (3/30/2021) |

| | |
|---|---|
|  |  |
| **PHOTO POINT 40 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 40 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 41 UT2 –** looking upstream (3/30/2021) | **PHOTO POINT 41 UT2 –** looking downstream (3/30/2021) |
|  |  |
| **PHOTO POINT 42 UT2A –** looking upstream (3/30/2021) | **PHOTO POINT 42 UT2A –** looking downstream (3/30/2021) |

**PHOTO POINT 43 UT2A –** looking upstream (3/30/2021)

**PHOTO POINT 43 UT2A –** looking downstream (3/30/2021)

**PHOTO POINT 44 UT2A –** looking upstream (3/30/2021)

**PHOTO POINT 44 UT2A –** looking downstream (3/30/2021)

**PHOTO POINT 45 UT2A –** looking upstream (3/30/2021)

**PHOTO POINT 45 UT2A –** looking downstream (3/30/2021)

# Vegetation Photographs


**Vegetation Plot 1** *(08/11/2021)*

**Vegetation Plot 2** *(08/11/2021)*


**Vegetation Plot 3** *(08/11/2021)*


**Vegetation Plot 4** *(08/11/2021)*

**Vegetation Plot 5** *(08/11/2021)*


**Vegetation Plot 6** *(08/11/2021)*

| | |
|---|---|
|  |  |
| **Vegetation Plot 7** *(08/11/2021)* | **Vegetation Plot 8** *(08/11/2021)* |
|  |  |
| **Vegetation Plot 9** *(08/11/2021)* | **Vegetation Plot 10** *(08/11/2021)* |
|  |  |
| **Vegetation Plot 11** *(08/11/2021)* | **Vegetation Plot 12** *(08/11/2021)* |

# APPENDIX 3. Vegetation Plot Data

Vegetation inventory and analysis not required during MY6

# APPENDIX 4. Morphological Summary Data and Plots

Morphological survey and analysis not required during MY6

# APPENDIX 5. Hydrology Summary Data

### Table 13. Verification of Bankfull Events

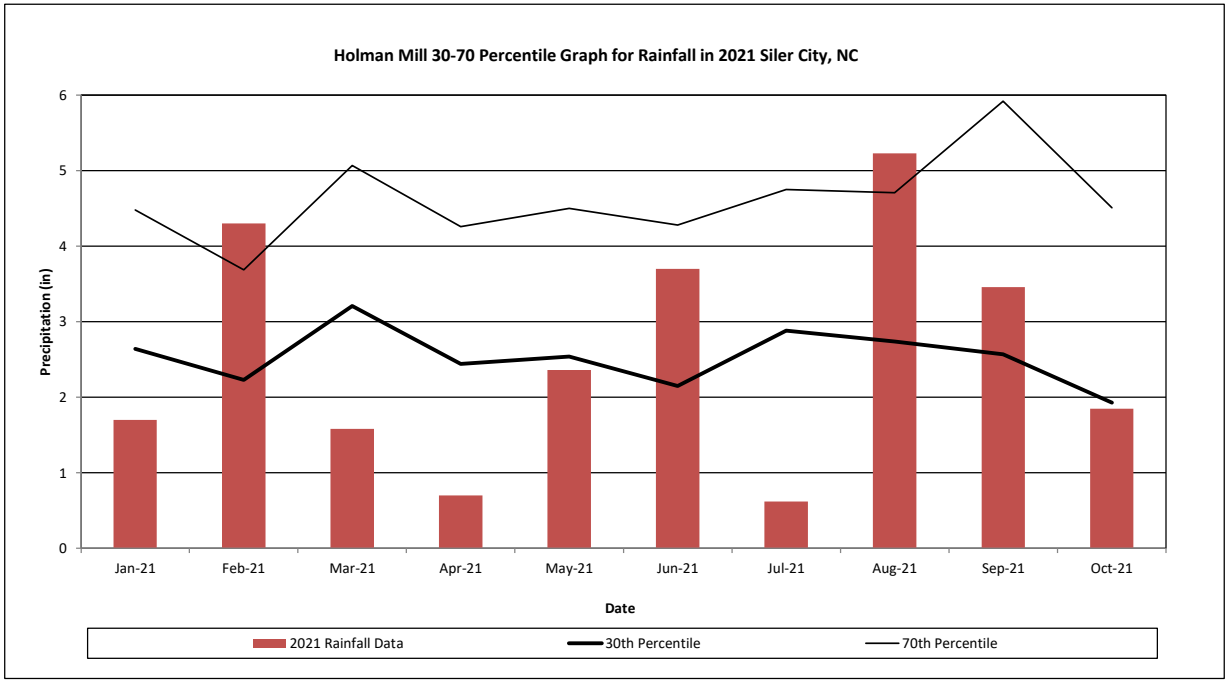
Holman Mill Mitigation Site
DMS Project No. 96316
**Monitoring Year 6 - 2021**

| Reach | MY1 | | MY2 | | MY3 | | MY4 | | MY5 | | MY6 | | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date of Data Collection | Date of Occurrence | Date of Data Collection | Date of Occurrence | Date of Data Collection | Date of Occurrence | Date of Data Collection | Date of Occurrence | Date of Data Collection | Date of Occurrence | Date of Data Collection | Date of Occurrence | |
| UT1 | 9/6/2016 | 7/31/2016 | 10/17/2017 | 4/24/2017 | 10/19/2018 | 8/8/2018 | 9/26/2019 | 3/21/2019 | 2/11/2020 | 2/6/2020 | 2/24/2021 | 1/3/2021 | Crest Gage/ Pressure Transducer |
| | 10/11/2016 | 10/8/2016 | | 6/20/2017 | | 9/17/2018* | | 4/13/2019 | 8/6/2020 | 6/11/2020 | | 2/15/2021 | |
| UT2 | 9/6/2016 | 7/31/2016 | 10/17/2017 | 4/24/2017 | 10/19/2018 | 8/8/2018 | 9/26/2019 | 3/21/2019 | 2/11/2020 | 2/6/2020 | 2/24/2021 | 1/10/2021 | |
| | 10/11/2016 | 10/8/2016 | | 6/20/2017 | | 9/17/2018* | | 4/13/2019 | 8/6/2020 | 6/11/2020 | | | |
| UT2A | 9/6/2016 | 7/31/2016 | 10/17/2017 | 4/24/2017 | 10/19/2018 | 8/8/2018 | 9/26/2019 | 3/21/2019 | 2/11/2020 | 2/6/2020 | 2/24/2021 | 1/30/2021 | |
| | 10/11/2016 | 10/8/2016 | | 6/20/2017 | | 9/17/2018* | | 4/13/2019 | 8/6/2020 | 6/11/2020 | | 2/4/2021 | |

*Hurricane Florence

### Monthly Rainfall Data

Holman Mill Mitigation Site
DMS Project No. 96316
**Monitoring Year 6 - 2021**




[1] 2021 monthly rainfall from USDA Station SILER CITY (317924)

[2] 30th and 70th percentile rainfall data collected from weather station Siler City 2 N, NC7924 (USDA, 2021).