



**MONITORING YEAR 1  
ANNUAL BUFFER REPORT  
FINAL**

**CATFISH POND MITIGATION SITE**

Durham County, NC  
NCDEQ Contract No. 007424  
DMS Project No. 100039  
NCDWR Project No. 2018-0196  
RFP No. 16-007279

Neuse River Basin  
HUC 03020201

Data Collection Period: October 2020  
Draft Submission Date: December 2020  
Final Submission Date: February 2021

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**PREPARED FOR:**



**NC Department of Environmental Quality  
Division of Mitigation Services**  
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**CATFISH POND MITIGATION SITE**  
Monitoring Year 1 Buffer Report

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## Section 1: PROJECT OVERVIEW

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### 1.1 Project Summary

Wildlands Engineering, Inc. (Wildlands) implemented a full delivery project at the Catfish Pond Mitigation Site (Site) for the North Carolina Department of Environmental Quality Division of Mitigation Services (DMS). A total of 7,140 linear feet of perennial and intermittent streams were restored and enhanced in Durham County, NC. A conservation easement comprised of 20.73 acres along Catfish Creek and three unnamed tributaries in the Neuse River Basin are included in the project. A total of 18.22 acres (793,207 ft<sup>2</sup>) of riparian buffer have been restored or enhanced and are expected to generate 523,358.865 riparian buffer credits, with potential to convert some buffer credits to nutrient offset credits dependent on the need. The Site is located approximately 12 miles north of the City of Durham and approximately 3 miles east of the Orange County/Durham County border (Figure 1). The project resides within Hydrologic Unit Code 03020201020040 and North Carolina Department of Water Resources (NCDWR) Sub-basin 03-04-01. Two unnamed tributaries (UT1 and UT2) drain to Catfish Creek, which drains to Mountain Creek, and one unnamed tributary (Mountain Tributary) drains directly to Mountain Creek. Mountain Creek flows into Little River, the Eno River, and then Falls Lake. Falls Lake is classified as Water Supply Waters (WS-IV) and Nutrient Sensitive Waters (NSW).

Work at the Site was planned, designed, and constructed per the Catfish Pond Mitigation Site – Riparian Buffer Mitigation Plan (Wildlands, 2019) and the Consolidated Buffer Mitigation Rule 15A NCAC 02B .0295 (effective November 1, 2015). The purpose of the riparian buffer restoration is to provide riparian buffer credits to compensate for buffer impacts within the Hydrologic Unit Code 03020201 and the Falls Lake Watershed. The service area for the riparian buffer credits is depicted in Figure 2. The mitigation credits generated from the Site are included in Table 1 and illustrated in Figure 3 located in Appendix 1. With the addition of Catfish Pond II Mitigation Bank Parcel (Catfish Pond II, DWR Project Number 2018-0196v2), it is not necessary to deduct credits for lack of diffuse flow where Ditch D enters the DMS conservation easement. The Catfish Pond II conservation easement completely encompasses Ditch D allowing for diffuse flow through the riparian buffer. Fencing has been installed around Catfish Pond II (Appendix 1, Figure 4).

### 1.2 Project Goals and Objectives

Prior to construction, the primary degradation of Catfish Creek was the creation of Catfish Pond sometime between 1940 and 1955. Within the same period, extensive logging and farm road construction took place. Aerial photographs from 1972 suggest that UT1 had been straightened for agricultural purposes. Catfish Creek above and below the pond, UT2, and Mountain Tributary, showed few signs of channel manipulation.

The major goals of the riparian restoration project are to provide ecological and water quality enhancements to the Neuse River Watershed within the Falls Lake Water Supply Watershed by creating a functional riparian corridor and restoring the riparian area. The project supports specific goals identified in the 2010 Neuse River Basin Restoration Priorities (RBRP) for the Neuse River Targeted Local Watershed, which highlights the importance of riparian buffers for stream restoration projects (Breeding, 2010). Forested riparian areas immobilize and retain nutrients and suspended sediment. The RBRP also supports the Falls Lake Nutrient Management Strategy (NCDWR, 2011). Falls Lake is the receiving water supply water body downstream of the Site and is classified as WS-IV and NSW. Specific enhancements to water quality and ecological processes are outlined below:

- Exclude cattle from project streams – Fencing has been installed around project areas adjacent to cattle pastures.



- Decrease nutrient levels – Filtering runoff from the agricultural fields through restored native riparian zones. The off-site nutrient input is absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.
- Decrease water temperature and increase dissolved oxygen concentrations – Riparian areas will create additional long-term shading of the channel flow to reduce thermal pollution.
- Restore and enhance native floodplain vegetation – Planted native tree species in riparian zone where tree growth was insufficient.
- Permanently protect the project Site from harmful uses – Established a conservation easement on the site.

The 20.73-acre Site is protected with a permanent conservation easement. Of the 20.73 acres, Neuse riparian buffer credits were generated by restoring 5.92 acres and enhancing 12.30 acres. No buffer credit will be generated from the remaining 2.51 acres. In general, riparian buffer restoration area widths on streams extend out to 50 feet from top of bank on each side of the stream channel. Figure 3 and Table 1 in Appendix 1 detail the buffer credit generation.

### 1.3 Monitoring Year 1 Data Assessment

The Mitigation Plan (Wildlands, 2019) was submitted and accepted by DMS in July 2019. Construction activities by Main Stream Earthwork, Inc. and tree planting by Bruton Natural Systems, Inc. were both completed in March 2020. The baseline as-built survey was completed by Kee Mapping and Surveying in April 2020. Refer to Appendix 1 for detailed project activity, history, contact information, and watershed/site background information.

Vegetative performance for buffer restoration areas will be in accordance with 15A NCAC 02B .0295(n)(2)(B), and (n)(4) (effective November 1, 2015). To meet success criteria, areas generating buffer mitigation credits shall include a minimum of four native hardwood tree species, where no one species is greater than 50 percent of stems, and shall have a survival of at least 260 planted stems per acre at the end of the required five-year monitoring period. For monitoring to be completed and buffer credit to be awarded, NCDWR must provide written approval of successful revegetation of buffer restoration areas. Year 1 monitoring (MY1) was conducted to assess the condition of the vegetation in October 2020.

#### 1.3.1 Vegetative Assessment

The quantity of monitoring vegetation plots was determined in accordance with the Carolina Vegetative Sampling Protocol (Lee et al., 2008) such that at least 2 percent of the Site is encompassed in monitoring plots. A total of 7 vegetation plots (each 100 square meters) were established within the conservation easement boundaries. The plot corners have been marked and are recoverable either through field identification or with the use of a GPS unit. Reference photographs are taken at the origin looking diagonally across the plot to the opposite corner on an annual basis. Trees will be marked annually with flagging tape. Species composition, vigor, height, density, and survival rates will be evaluated by plot on an annual basis. The extent of invasive species coverage will also be monitored and controlled as necessary.

The 2020 annual vegetation monitoring resulted in an average survival of 555 planted stems per acre, which exceeds the final requirement of 260 stems per acre, but is approximately 1% less than the baseline density recorded (561 planted stems per acre) in March 2020. The average number of stems per plot remained the same from MY0 to MY1 at 13 stems per plot. The Site is on track to meet the final success criteria. Refer to Appendix 2 for the vegetation condition assessment table, monitoring plan view maps, vegetation plot and overview photographs. Appendix 3 contains vegetation plot criteria attainment data, CVS vegetation plot metadata, and vegetation summary tables.





### 1.3.2 Vegetation Areas of Concern

Before construction, the Site had sporadic areas of multiflora rose (*Rosa multiflora*), Chinese privet (*Ligustrum sinense*), and Japanese honeysuckle (*Lonicera japonica*). There were also areas of sporadic princess tree (*Paulownia tomentosa*) and tree of heaven (*Ailanthus altissima*). Multiflora rose was treated across the Site in May 2020 using a foliar application of triclopyr. The scattered princess tree and tree of heaven individuals were treated in September 2020 using a stem injection of imazapyr. The remaining Chinese privet on the Site will be treated during the winter of 2020/2021 using a combination of methods including foliar and cut stump applications. While invasive species have been greatly reduced, Wildlands recognizes that multiple treatments are typically needed for effective invasive plant control and will follow up on these treatments in subsequent monitoring years as necessary. Herbicide application for Japanese honeysuckle is also scheduled for MY2.

Areas along the edge of the livestock pastures were dominated by pasture grasses such as tall fescue (*Festuca arundinacea*). Some areas with dense tall fescue received a broadcast application of glyphosate and were seeded with the permanent native seed mix prior to planting. Wildlands completed ring sprays around the bases of trees in most of the remaining areas dominated by tall fescue. These ring sprays were completed soon after tree planting and significantly reduced tall fescue cover in an 18"-30" radius around each tree. A few small areas were left untreated by ring sprays for comparison.

### 1.4 Monitoring Year 1 Summary

Overall, the Site has met the required vegetation success criteria for MY1. Sporadic invasive vegetation was treated in May and September 2020 and follow up treatments are scheduled for winter 2020/2021. Wildlands will continue to monitor areas where invasive species have been removed. Stems planted in areas of competition with tall fescue are being observed closely. No additional treatment is necessary at this time.

Summary information/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 (Wildlands, 2019) 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

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Planted woody vegetation was monitored in accordance with the guidelines and procedures developed by the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008). A total of six standard 10-meter by 10-meter vegetation plots and one 5-meter by 20-meter vegetation plot were established within the Site conservation easement area.



## Section 3: REFERENCES

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- Breeding, R. 2010. Neuse River Basin Restoration Priorities. North Carolina Ecosystem Enhancement Program. Accessed at:  
[https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed\\_Planning/Neuse\\_River\\_Basin/FINAL%20ORBRP%20Neuse%202010\\_%2020111207%20CORRECTED.pdf](https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Neuse_River_Basin/FINAL%20ORBRP%20Neuse%202010_%2020111207%20CORRECTED.pdf)
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- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2015. 15A NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers. Accessed at: <http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20b/15a%20ncac%2002b%20.0295.pdf>
- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2011. Surface Water Classifications. Accessed at: <https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications#DWRPrimaryClassification>
- Wildlands Engineering, Inc. 2019. Catfish Pond Mitigation Site – Riparian Buffer Mitigation Plan. North Carolina Department of Environmental Quality, Division of Mitigation Services (NCDMS), Raleigh, NC.



## **APPENDIX 1. General Figures and Tables**



Directions: From Raleigh, NC, take I-40 West towards Durham. Take exit 279B for NC-147 N towards Durham/Downtown. Travel approximately 8 miles and exit onto Duke Street. Merge onto South Duke Street and continue 4.3 miles until South Duke Street merges with US-501 N/N Roxboro Street. Travel north on US-501 N/N Roxboro Street for 7.5 miles. Make a U-turn and travel south on N Roxboro Street for 0.2 miles, turn right on the first gravel road. Drive approximately 0.2 miles and take the first right onto another gravel road. The Site is located at the end of the gravel road.

 Project Location  
 Conservation Easement  
 Catfish Pond Mitigation Site

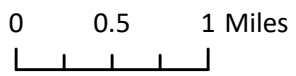
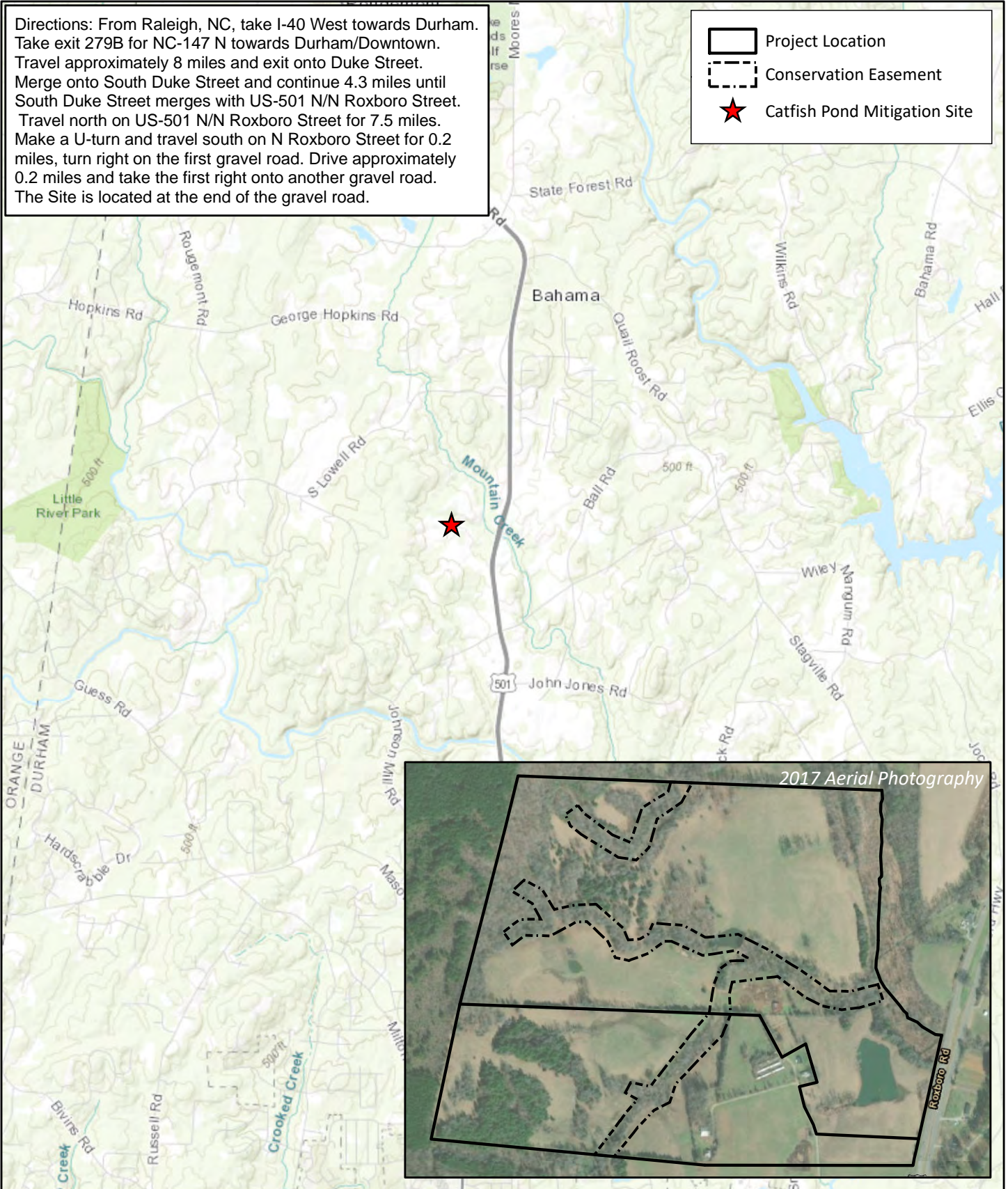
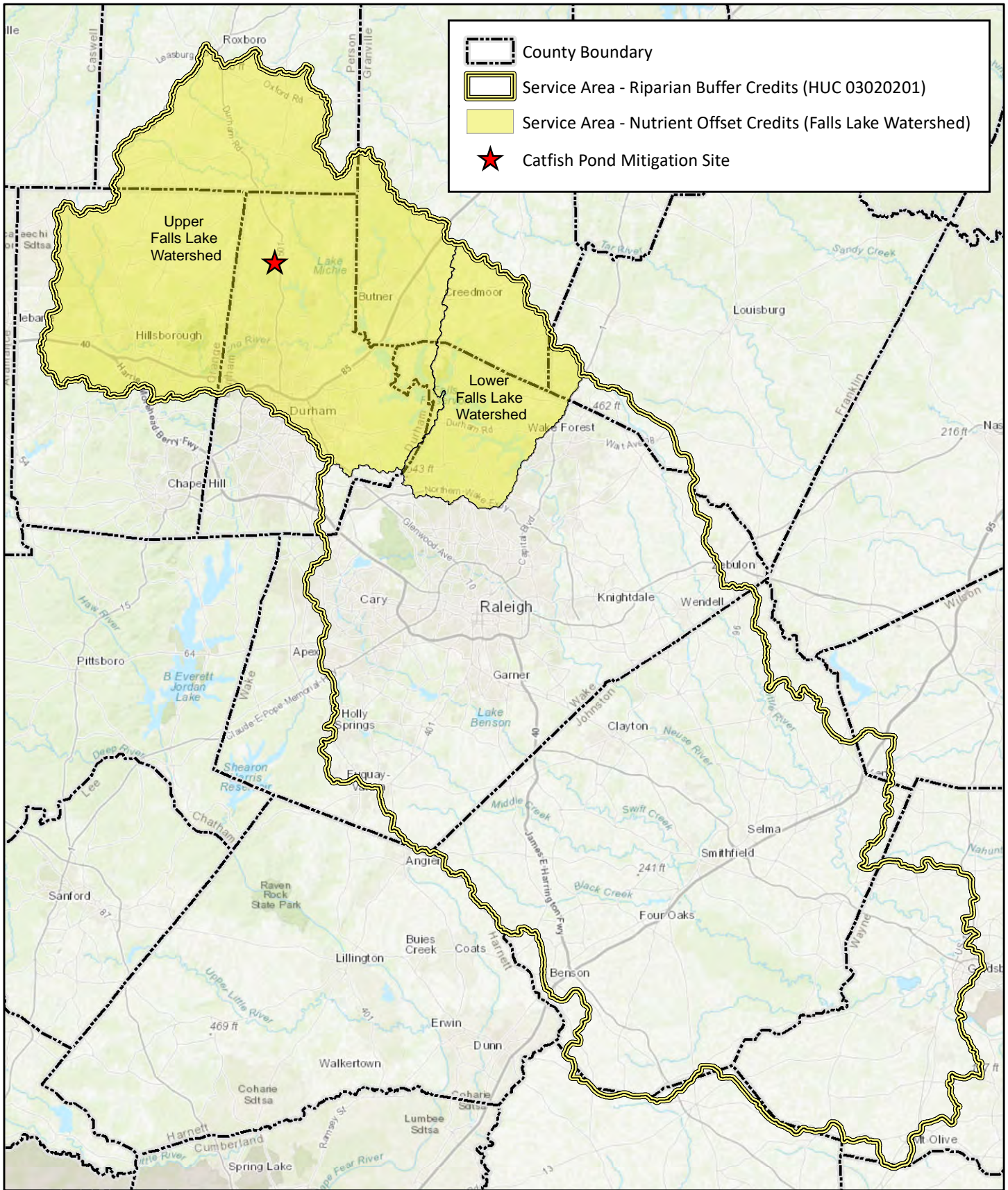


Figure 1. Project Vicinity Map  
 Catfish Pond Mitigation Site  
 Monitoring Year 1 – 2020  
 Neuse River Basin (03020201)  
 Durham County, NC





0 5 10 Miles



Figure 2. Service Area Map  
 Catfish Pond Mitigation Site  
 Monitoring Year 1 – 2020  
 Neuse River Basin (03020201)

Durham County, NC



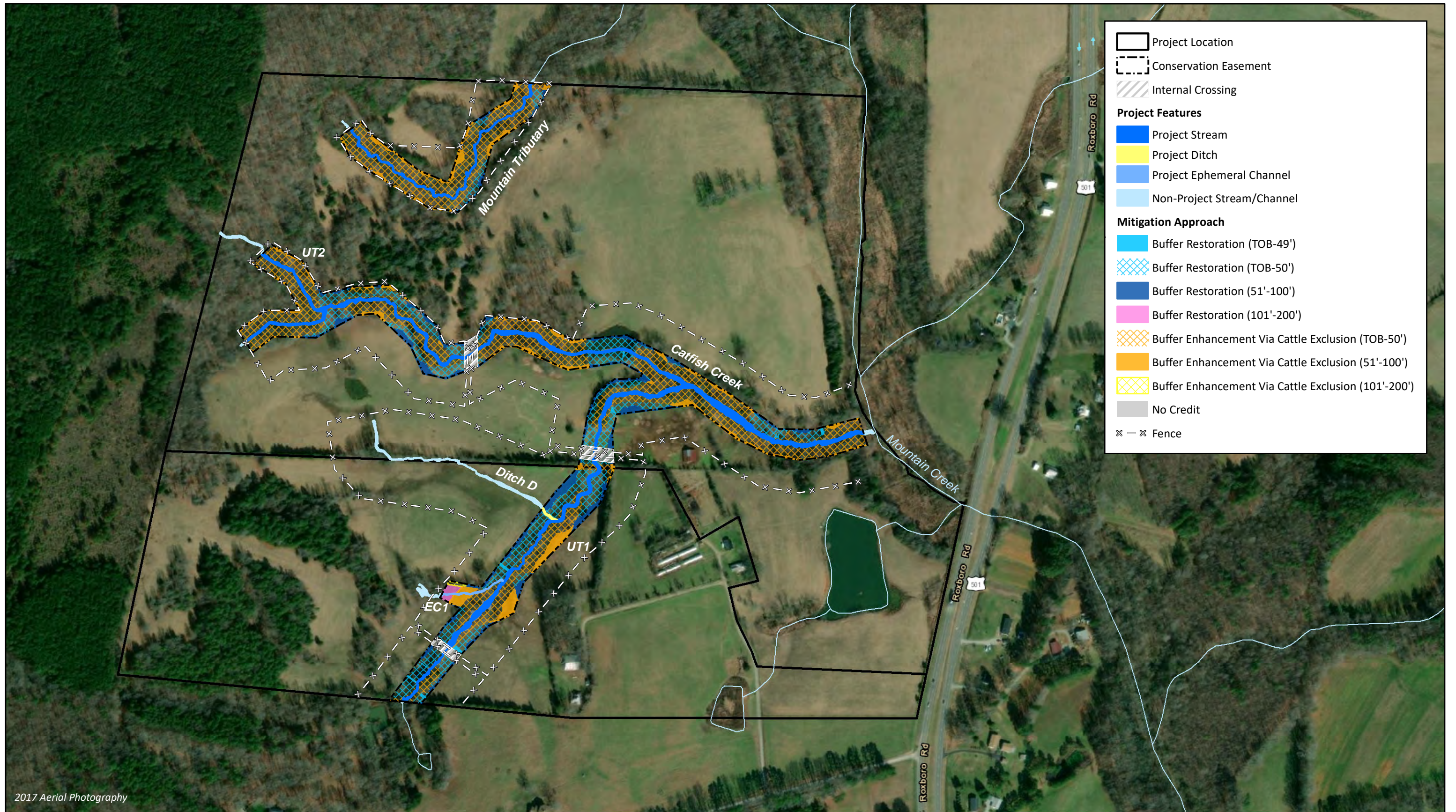


Figure 3. Project Component/Asset Map  
 Catfish Pond Mitigation Site  
 Monitoring Year 1 – 2020  
 Neuse River Basin (03020201)  
 Durham County, NC



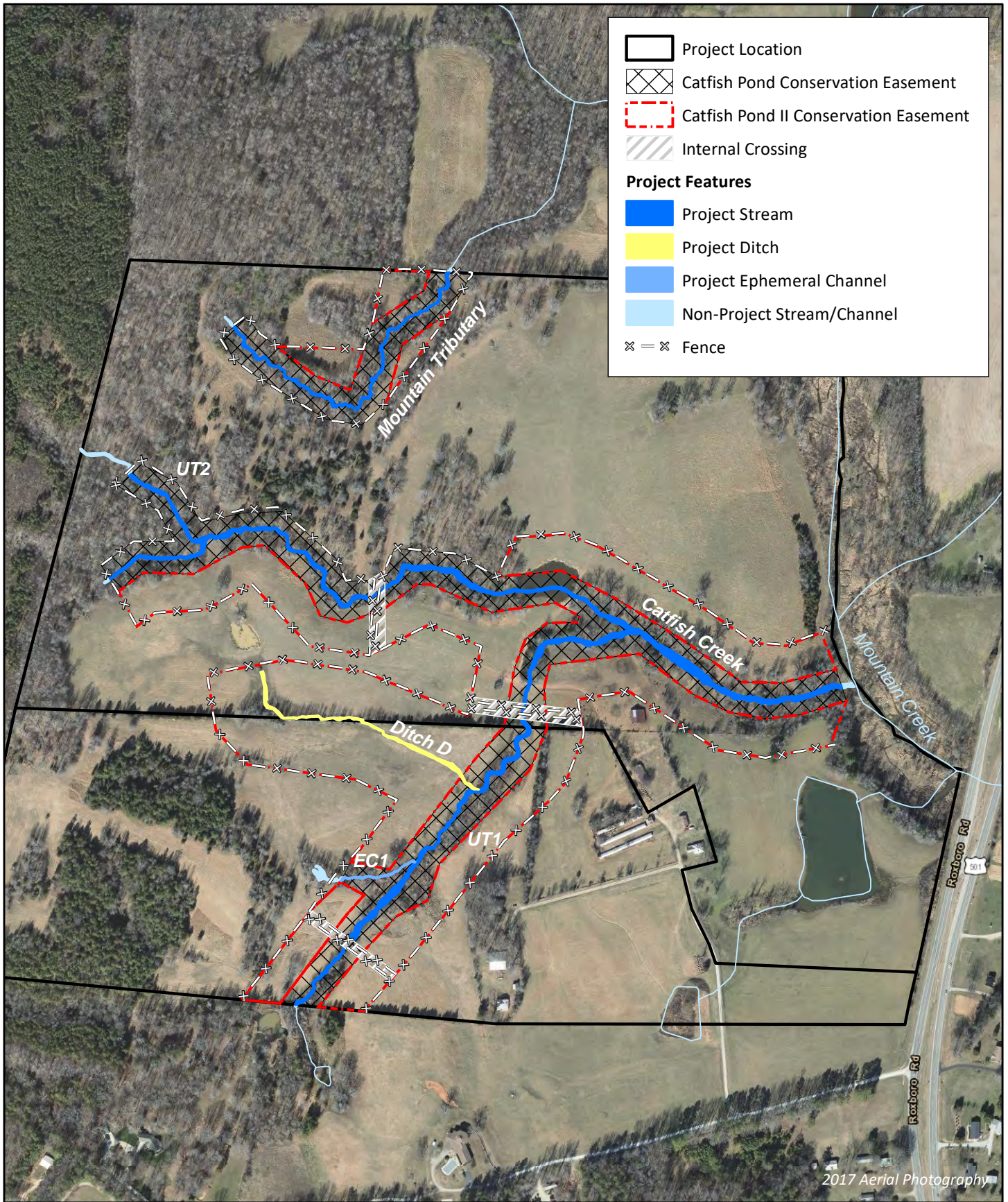
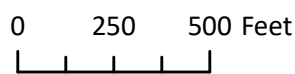


Figure 4. Catfish Pond II Mitigation Bank Parcel Site Map  
 Catfish Pond Mitigation Site  
 Monitoring Year 1 – 2020  
 Neuse River Basin (03020201)

Durham County, NC





**Table 1. Buffer Project Areas and Assets**

Catfish Pond Mitigation Site  
 DMS Project No. 100039  
 Monitoring Year 1 - 2020

Project Area						N Credit Conversion Ratio (ft <sup>2</sup> /pound)										
Neuse 03020201 - Upper Falls Lake						19.16394										
						297.54099										
Credit Type	Location	Subject? (enter NO if ephemeral or ditch <sup>1</sup> )	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft <sup>2</sup> )	Total (Creditable) Area of Buffer Mitigation (ft <sup>2</sup> )	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-50	Catfish Creek, UT1	4,369	4,369	1	100%	1.00000	Yes	4,369.000	No	—	—
Buffer	Rural	Yes	I / P	Restoration	51-100	Catfish Creek, UT1, UT2, Mountain Trib	252,086	252,086	1	100%	1.00000	Yes	252,086.000	Yes	13,154.184	847.231
Buffer	Rural	Yes	I / P	Restoration	101-200	UT1	1,063	1,063	1	33%	3.03030	Yes	350.790	Yes	55.469	3.573
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-100	Catfish Creek, UT1, UT2, Mountain Trib	531,834	531,834	2	100%	2.00000	Yes	265,917.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	101-200	UT1	3,855	3,855	2	33%	6.06061	Yes	636.075	No	—	—
<b>Totals:</b>							793,207	793,207								

Enter Preservation Credits Below

Eligible for Preservation (ft <sup>2</sup> ):								Total (Creditable) Area for Buffer Mitigation (ft <sup>2</sup> )			
Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
Buffer				Preservation							—
<b>Preservation Area Subtotal (ft<sup>2</sup>):</b>							0				
<b>Preservation as % Total Area of Buffer Mitigation:</b>							0.0%				
<b>Ephemeral Reaches as % Total Area of Buffer Mitigation:</b>							0.0%				

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	Square Feet	Credits
Restoration:	257,518	256,805.790
Enhancement:	535,689	266,553.075
Preservation:	0	0.000
<b>Total Riparian Buffer:</b>	793,207	523,358.865
TOTAL NUTRIENT OFFSET MITIGATION		
Mitigation Totals	Square Feet	Credits
Nutrient	Nitrogen:	0
Offset:	Phosphorus:	0.000

last updated 01/17/2020

**Table 2. Project Activity and Reporting History**

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 1 - 2020

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	July 2019	July 2019
Final Design - Construction Plans	August 2019	August 2019
Construction	February-March 2020	March 2020
Temporary S&E mix applied to entire project area <sup>1</sup>	March 2020	March 2020
Permanent seed mix applied to reach/segments <sup>1</sup>	April 2020	April 2020
Bare root and live stake plantings for reach/segments	March 2020	March 2020
Baseline Monitoring Document (Year 0)	March 2020	June 2020
Competitive Vegetation Treatment <sup>2</sup>		April-May 2020
Invasive Vegetation Treatment		May & September 2020
Year 1 Monitoring	October 2020	December 2020
Year 2 Monitoring	2021	December 2021
Year 3 Monitoring	2022	December 2022
Year 4 Monitoring	2023	December 2023
Year 5 Monitoring	2024	December 2024

<sup>1</sup>Seed and mulch is added as each section of construction is completed.

<sup>2</sup>Herbicide ring sprays around the base of planted stems.

**Table 3. Project Contact Table**

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 1 - 2020

<b>Designer</b> Daniel Johnson, PE	<b>Wildlands Engineering, Inc.</b> 497 Bramson Ct, Suite 104 Mt. Pleasant, SC 29464 843.277.6221
<b>Construction Crew</b>	<b>Main Stream Earthwork, Inc.</b> 631 Camp Dan Valley Rd Reidsville, NC 27320
<b>Planting Contractor</b>	<b>Bruton Natural Systems, Inc</b> P. O. Box 1197 Fremont, NC 27830
<b>Seeding Contractor</b>	<b>Canady's Landscaping &amp; Erosion</b> 256 Fairview Acres Rd Lexington, NC 27295
<b>Seed Mix Sources</b>	<b>Garrett Wildflower Seed Farm</b> 1591 Cleveland Rd Smithfield, NC 27577
	<b>Ernst Conservation Seeds, Inc.</b> 8884 Mercer Pike Meadville, PA 16335
<b>Nursery Stock Suppliers</b> <b>Bare Roots</b>	<b>Dykes and Sons Nursery and Greenhouse</b> 825 Maude Etter Rd McMinnville, TN 37110
<b>Live Stakes</b>	<b>Bruton Natural Systems, Inc</b>
	<b>Foggy Mountain Nursery</b> 797 Helton Creek Rd Lansing, NC 28643
<b>Monitoring Performers</b> Monitoring, POC	<b>Wildlands Engineering, Inc.</b> Jason Lorch 919.851.9986



**Table 4. Project Information and Attributes**

Catfish Pond Mitigation Site  
DMS Project No. 100039  
**Monitoring Year 1 - 2020**

PROJECT INFORMATION	
Project Name	Catfish Pond Mitigation Site
County	Durham County
Project Coordinates (latitude and longitude)	36° 9' 48.03" N, 78° 54' 37.66" W
Project Area (acres)	20.73
Planted Acreage (acres of woody stems planted)	8.00
PROJECT WATERSHED SUMMARY INFORMATION	
Physiographic Province	Carolina Slate Belt of the Piedmont Physiographic Province
River Basin	Neuse River
USGS Hydrologic Unit 8-digit	03020201
USGS Hydrologic Unit 14-digit	03020201020040
DWR Sub-basin	03-04-01
Project Drainage Area (acres)	227 (Catfish Creek - 197, Mountain Tributary - 30)
Project Drainage Area Percentage of Impervious Area	0.0%
CGIA Land Use Classification	45.6% forested, 54.2% cultivated, 0.2% wetland

**Table 5. Adjacent Forested Areas Existing Tree and Shrub Species**

Catfish Pond Mitigation Site  
DMS Project No. 100039  
**Monitoring Year 1 - 2020**

Common Name	Scientific Name	Wetland Indicator Status
Black Willow	<i>Salix nigra</i>	OBL
Eastern Red Cedar	<i>Juniperus virginiana</i>	FACU
Green Ash	<i>Fraxinus pennsylvanica</i>	FACW
Hazel Alder	<i>Alnus serrulata</i>	OBL
Paw Paw	<i>Asimina triloba</i>	FAC
Red Maple	<i>Acer rubrum</i>	FAC
Sweet Gum	<i>Liquidambar styraciflua</i>	FAC
Sycamore	<i>Platanus occidentalis</i>	FACW
White Oak	<i>Quercus alba</i>	FACU
Yellow Poplar	<i>Liriodendron tulipifera</i>	FACU

**Table 6. Planted Tree Species**

Catfish Pond Mitigation Site  
DMS Project No. 100039  
**Monitoring Year 1 - 2020**

Common Name	Scientific Name	Number Planted	% of Total
Arrowwood Viburnum	<i>Viburnum dentatum</i>	55	1.0%
Green Ash	<i>Fraxinus pennsylvanica</i>	646	11.5%
Overcup Oak	<i>Quercus lyrata</i>	365	6.5%
River Birch	<i>Betula nigra</i>	927	16.5%
Shumard Oak	<i>Quercus shumardii</i>	646	11.5%
Smooth Serviceberry	<i>Amelanchier laevis</i>	55	1.0%
Swamp Chestnut Oak	<i>Quercus michauxii</i>	646	11.5%
Sycamore	<i>Platanus occidentalis</i>	1,207	21.5%
White Oak	<i>Quercus alba</i>	365	6.5%
Willow Oak	<i>Quercus phellos</i>	646	11.5%
Yellow Buckeye	<i>Aesculus flava</i>	55	1.0%

## **APPENDIX 2. Visual Assessment Data**



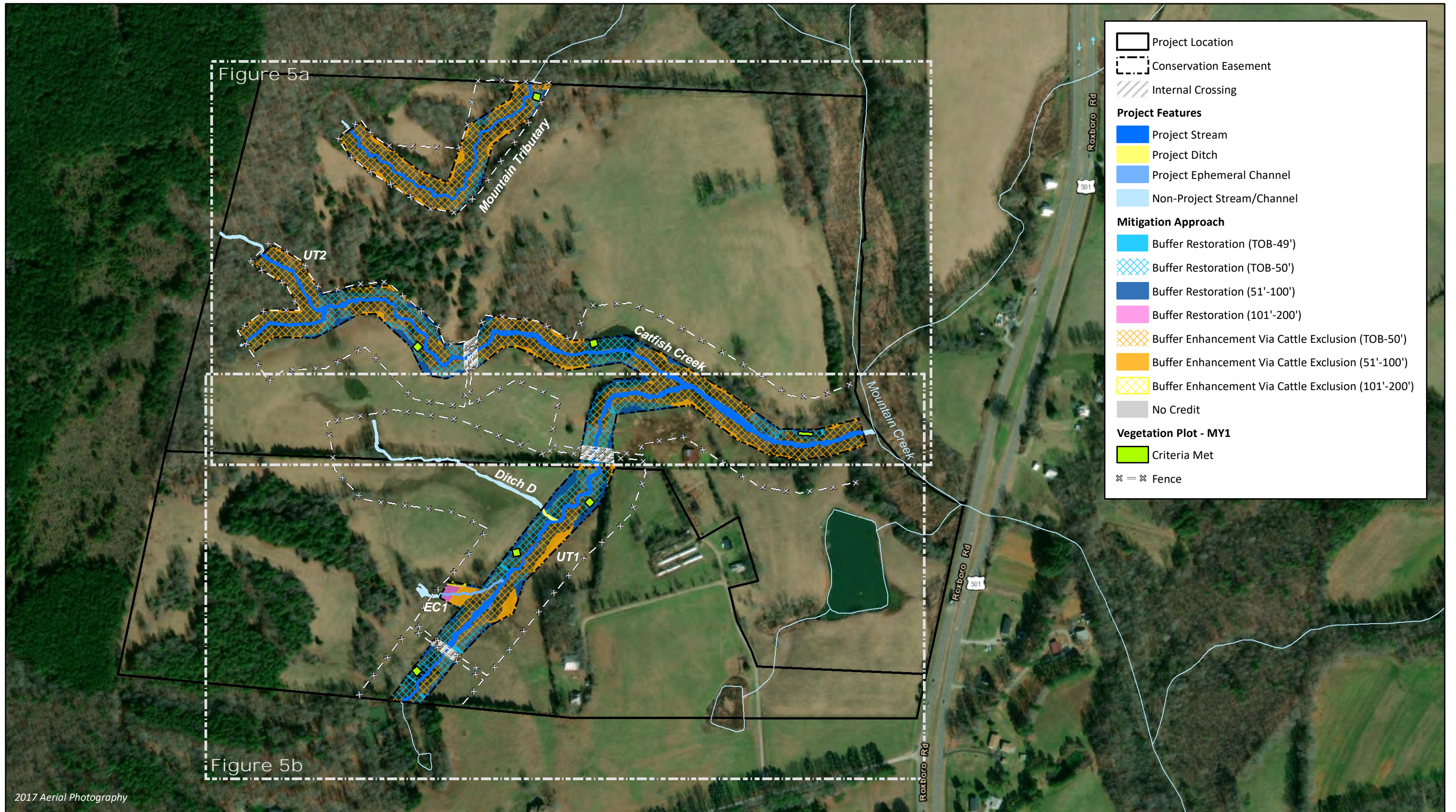
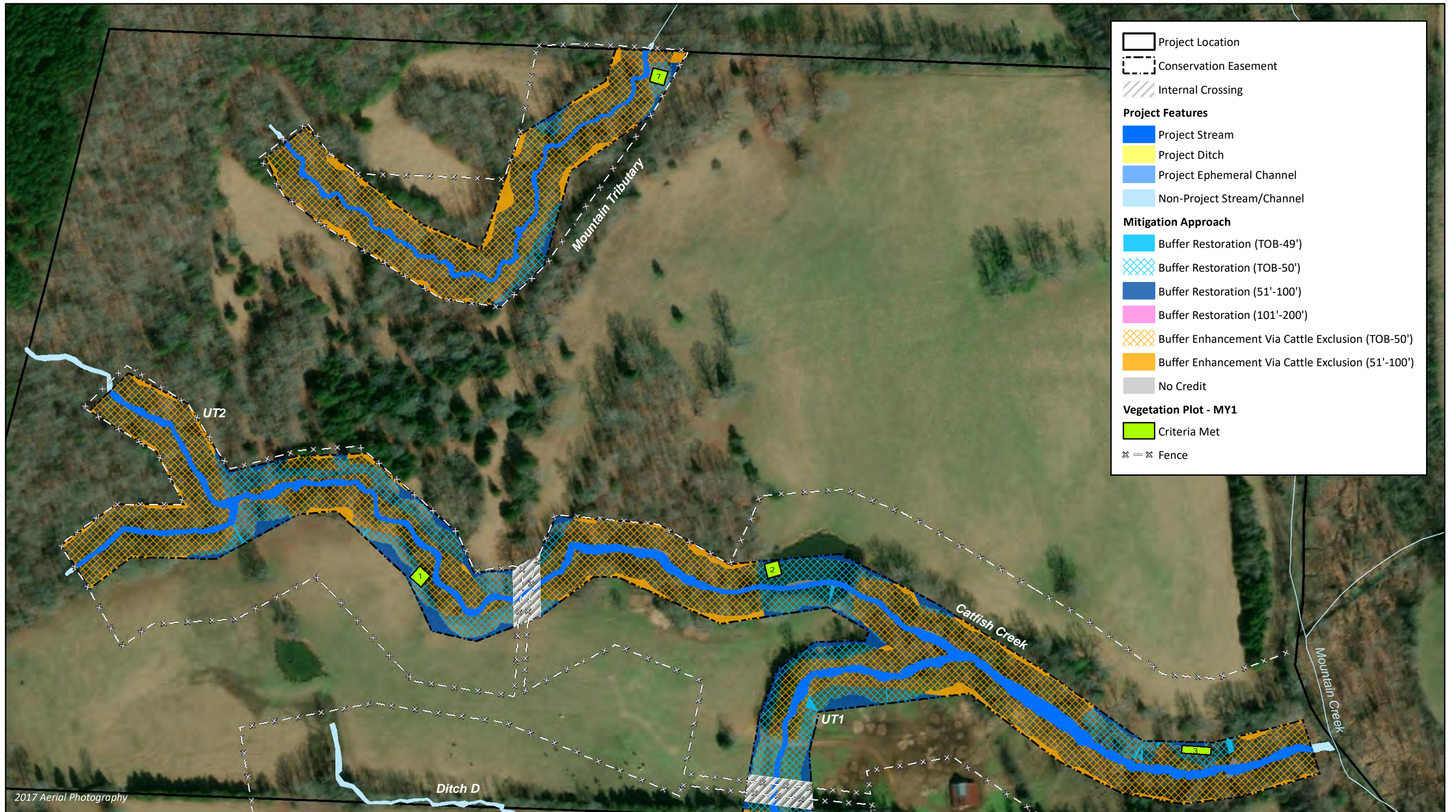
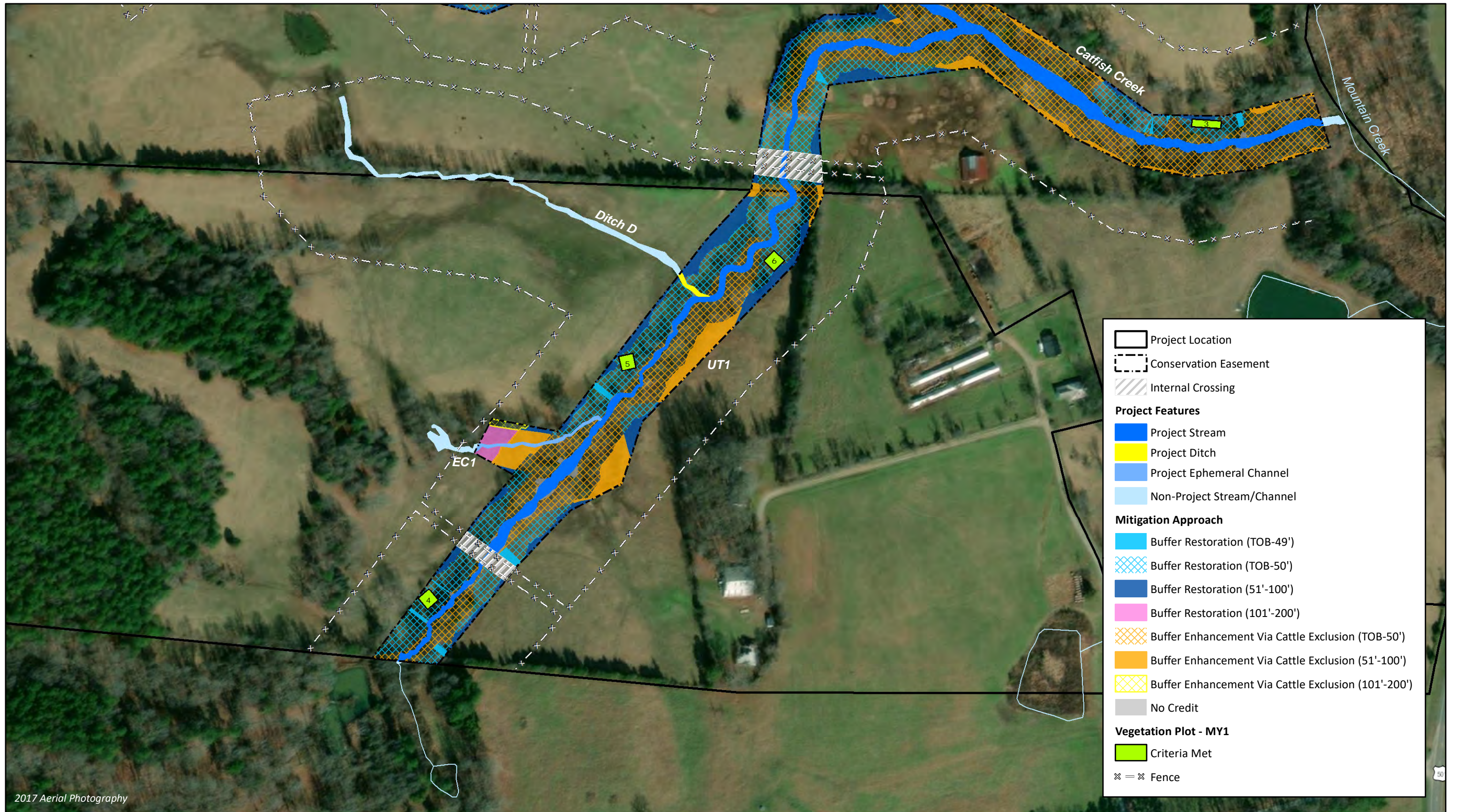


Figure 5. Monitoring Plan View Map Key  
 Catfish Pond Mitigation Site  
 Monitoring Year 1 – 2020  
 Neuse River Basin (03020201)  
 Durham County, NC











**Table 7. Vegetation Condition Assessment Table**

Catfish Pond Mitigation Project

DMS Project No. 100039

Monitoring Year 1 - 2020

**Planted Acreage 8.00**

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

**Easement Acreage 20.73**

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



**VEGETATION PLOT PHOTOGRAPHS**





**VEG PLOT 1** (10/06/2020)



**VEG PLOT 2** (10/06/2020)



**VEG PLOT 3** (10/06/2020)



**VEG PLOT 4** (10/06/2020)



**VEG PLOT 5** (10/06/2020)



**VEG PLOT 6** (10/06/2020)







**VEG PLOT 7** (10/06/2020)



## **OVERVIEW PHOTOGRAPHS**





**Catfish Pond Mitigation Site**

Appendix 2: Visual Assessment Data – Overview Photographs









**Catfish Pond Mitigation Site**

Appendix 2: Visual Assessment Data – Overview Photographs





**Catfish Pond Mitigation Site**

Appendix 2: Visual Assessment Data – Overview Photographs



### **APPENDIX 3. Vegetation Plot Data**

**Table 8. Vegetation Plot Criteria Attainment Table**

Catfish Pond Mitigation Site

DMS Project No. 100039

**Monitoring Year 1 - 2020**

Plot	Success Criteria Met*	Tract Mean
1	Yes	100%
2	Yes	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	

\*Based on the target stem density for MY5 of 260 planted stems per acre.

**Table 9. CVS Vegetation Tables - Metadata**

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 1 - 2020

<b>Report Prepared By</b>	Tasha King
<b>Date Prepared</b>	10/30/2020 9:37
<b>Database Name</b>	CatfishPond_MY1_cvs-v2.5.0.mdb
<b>Database Location</b>	F:\Monitoring\Catfish Pond\MY1 - 2020
<b>Computer Name</b>	CHARLOTTEINTERN
<b>File Size</b>	84144128
<b>DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----</b>	
<b>Metadata</b>	Description of database file, the report worksheets, and a summary of project(s) and project data.
<b>Project Planted</b>	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
<b>Project Total Stems</b>	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
<b>Plots</b>	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
<b>Vigor</b>	Frequency distribution of vigor classes for stems for all plots.
<b>Vigor by Spp</b>	Frequency distribution of vigor classes listed by species.
<b>Damage</b>	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
<b>Damage by Spp</b>	Damage values tallied by type for each species.
<b>Damage by Plot</b>	Damage values tallied by type for each plot.
<b>Planted Stems by Plot and Spp</b>	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
<b>ALL Stems by Plot and Spp</b>	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
<b>PROJECT SUMMARY-----</b>	
<b>Project Code</b>	100039
<b>Project Name</b>	Catfish Pond Mitigation Site
<b>Description</b>	Stream and Buffer Restoration Project
<b>Sampled Plots</b>	7

**Table 10. Planted and Total Stem Counts**

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 1 - 2020

Scientific Name	Common Name	Species Type	Current Plot Data (MY1 2020)														
			VP 1			VP 2			VP 3			VP 4			VP 5		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
<i>Aesculus flava</i>	Yellow Buckeye	Shrub Tree	1	1	1												
<i>Betula nigra</i>	River Birch	Tree				1	1	1	1	1	1						
<i>Diospyros virginiana</i>	American Persimmon	Tree									12						
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree				2	2	2					1		3	3	3
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree															
<i>Platanus occidentalis</i>	Sycamore	Tree	4	4	4	7	7	7	3	3	3	8	8	8	2	2	2
<i>Quercus alba</i>	White Oak	Tree				2	2	2									
<i>Quercus lyrata</i>	Overcup Oak	Tree							2	2	2	1	1	1			
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	2	2	2	1	1	1	2	2	2	1	1	1	3	3	3
<i>Quercus phellos</i>	Willow Oak	Tree	5	5	5				3	3	3	1	1	1	3	3	3
<i>Quercus shumardii</i>	Shumard Oak	Tree	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2
	Unknown Species	Tree															
<b>Stem count</b>			14	14	14	15	15	15	12	12	12	12	12	12	13	13	13
<b>size (ares)</b>			1			1			1			1			1		
<b>size (ACRES)</b>			0.02			0.02			0.02			0.02			0.02		
<b>Species count</b>			5	5	5	6	6	6	6	6	7	5	5	6	5	5	5
<b>Stems per ACRE</b>			567	567	567	607	607	607	486	486	486	486	486	486	526	526	526

**Color for Density**

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

**PnoLS** - Planted Stems Excluding Live Stakes

**P-all** - All Planted Stems

**T** - All Woody Stems



**Table 10. Planted and Total Stem Counts**

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 1 - 2020

Scientific Name	Common Name	Species Type	Current Plot Data (MY1 2020)						Annual Means					
			VP 6			VP 7			MY1 (2020)			MY0 (2020)		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
<i>Aesculus flava</i>	Yellow Buckeye	Shrub Tree							1	1	1	1	1	1
<i>Betula nigra</i>	River Birch	Tree				7	7	7	9	9	9	9	9	9
<i>Diospyros virginiana</i>	American Persimmon	Tree						1			13			
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	1	1	1	1	1	1	7	7	8	7	7	7
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree						2			2			
<i>Platanus occidentalis</i>	Sycamore	Tree	6	6	6	6	6	6	36	36	36	36	36	36
<i>Quercus alba</i>	White Oak	Tree				1	1	1	3	3	3	3	3	3
<i>Quercus lyrata</i>	Overcup Oak	Tree							3	3	3	3	3	3
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	2	2	2				11	11	11	11	11	11
<i>Quercus phellos</i>	Willow Oak	Tree	3	3	3				15	15	15	15	15	15
<i>Quercus shumardii</i>	Shumard Oak	Tree	2	2	2	1	1	1	11	11	11	11	11	11
	Unknown Species	Tree										1	1	1
	<b>Stem count</b>		14	14	14	16	16	16	96	96	96	97	97	97
	<b>size (ares)</b>		1			1			7			7		
	<b>size (ACRES)</b>		0.02			0.02			0.17			0.17		
	<b>Species count</b>		5	5	5	5	5	7	9	9	11	10	10	10
	<b>Stems per ACRE</b>		567	567	567	647	647	647	555	555	555	561	561	561

**Color for Density**

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

**PnoLS** - Planted Stems Excluding Live Stakes

**P-all** - All Planted Stems

**T** - All Woody Stems