



**MONITORING YEAR 2
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: September 2021
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CATFISH POND MITIGATION SITE
Monitoring Year 2 Buffer Report

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Section 1: PROJECT OVERVIEW

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 ft²) 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 2 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 2 monitoring (MY2) was conducted to assess the condition of the vegetation in September 2021.

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 2021 annual vegetation monitoring resulted in an average survival of 491 planted stems per acre, which exceeds the final requirement of 260 stems per acre at the end of Monitoring Year 5. Planted stem densities for each plot range from 405 to 567 stems per acre and each plot includes at least four planted species. Volunteer stems have begun to establish themselves and include desirable species such as American persimmon (*Diospyros virginiana*), tulip poplar (*Liriodendron tulipifera*), sycamore (*Platanus occidentalis*), and green ash (*Fraxinus pennsylvanica*). 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

Invasive species at Catfish Pond have been greatly reduced by past treatments throughout the site. However, Wildlands recognizes that multiple treatments are typically needed for effective invasive plant control. Scattered stems of Chinese Privet (*Ligustrum sinensis*), Princess tree (*Paulownia tomentosa*), and Tree of Heaven (*Ailanthus altissima*) were treated in September 2021. These areas will be monitored and retreated as necessary. Additionally, sporadic areas of re-sprouting multiflora rose (*Rosa multiflora*), Chinese privet (*Ligustrum sinense*), and Japanese honeysuckle (*Lonicera japonica*) will be addressed in MY3 using a combination of methods including mechanical removal as well as foliar and cut stump applications.

1.4 Monitoring Year 2 Summary

Vegetation across the Parcel is exceeding performance standards. Monitoring Year 2 data shows an average density of 491 planted stems per acre across vegetation plots. The Parcel is on track to achieve the final success criteria of 260 stems per acre at the end of Monitoring Year 5. In addition, desirable volunteer species such as American persimmon (*Diospyros virginiana*) and tulip poplar (*Liriodendron tulipifera*) are establishing themselves. Sporadic invasive vegetation was treated in September 2021 and follow up treatments are scheduled for Monitoring Year 3. To build on the success of previous herbicide ring sprays, additional ring sprays will be applied around the base of trees in areas of high competition with herbaceous vegetation in spring 2022.

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

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

- 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
- Lee, M.T., Peet, R.K., Roberts, S.D., & Wentworth, T.R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Accessed at: <http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-2.pdf>
- North Carolina Department of Environmental Quality, Division of Mitigation Services (NCDMS). 2017. Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template version 2.0 Accessed at:
https://files.nc.gov/ncdeq/Mitigation%20Services/Document%20Management%20Library/Guidance%20and%20Template%20Documents/RB_NO_Base_Mon_Template_2.0_2017_5.pdf
- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2000. 15A NCAC 02B .0233 Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Existing 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%20.0233.pdf>
- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2011. Falls Lake Nutrient Management Strategy. Accessed at: <https://deq.nc.gov/about/divisions/water-resources/water-planning/nonpoint-source-planning/falls-lake-nutrient-strategy>
- 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

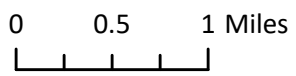
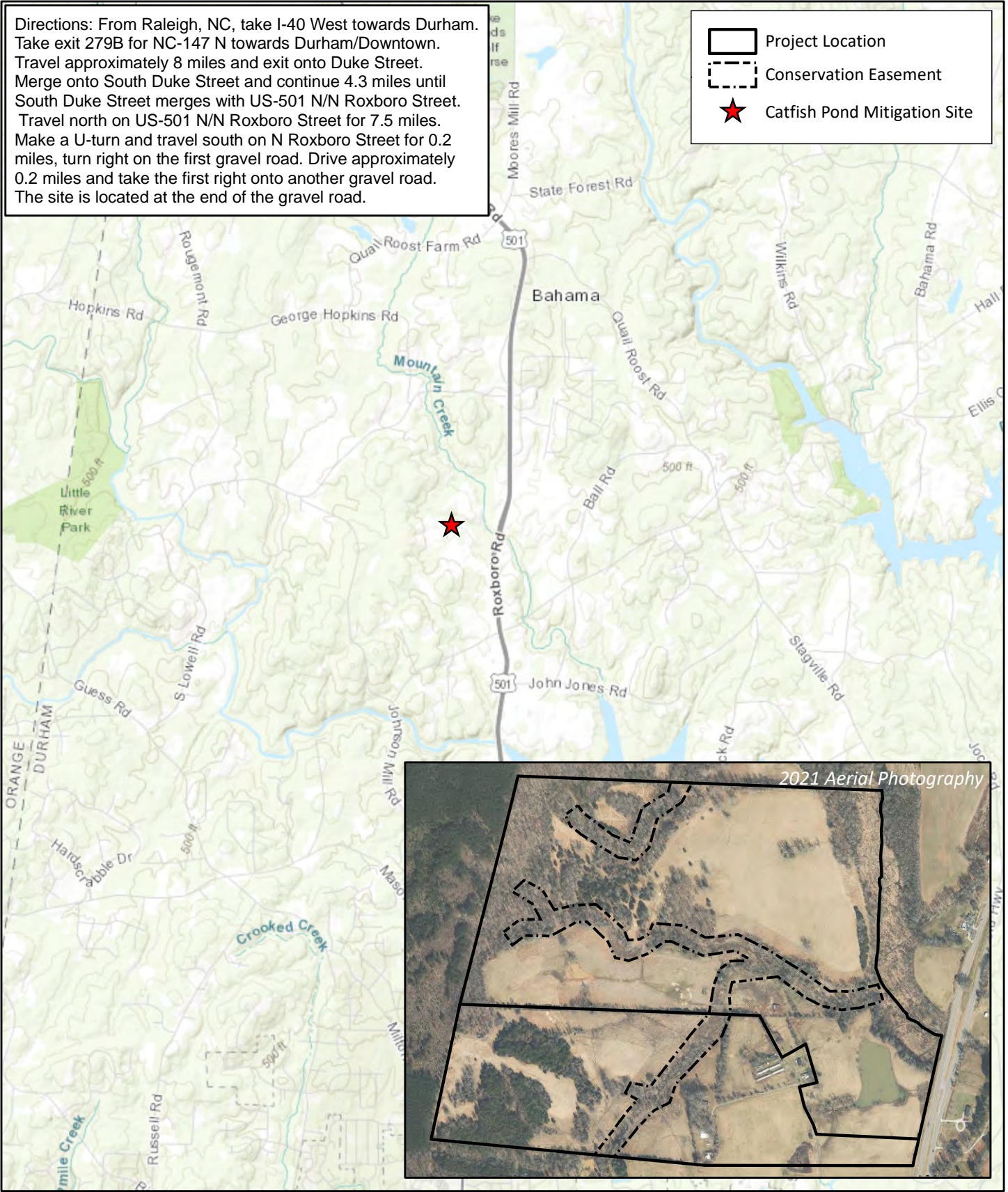
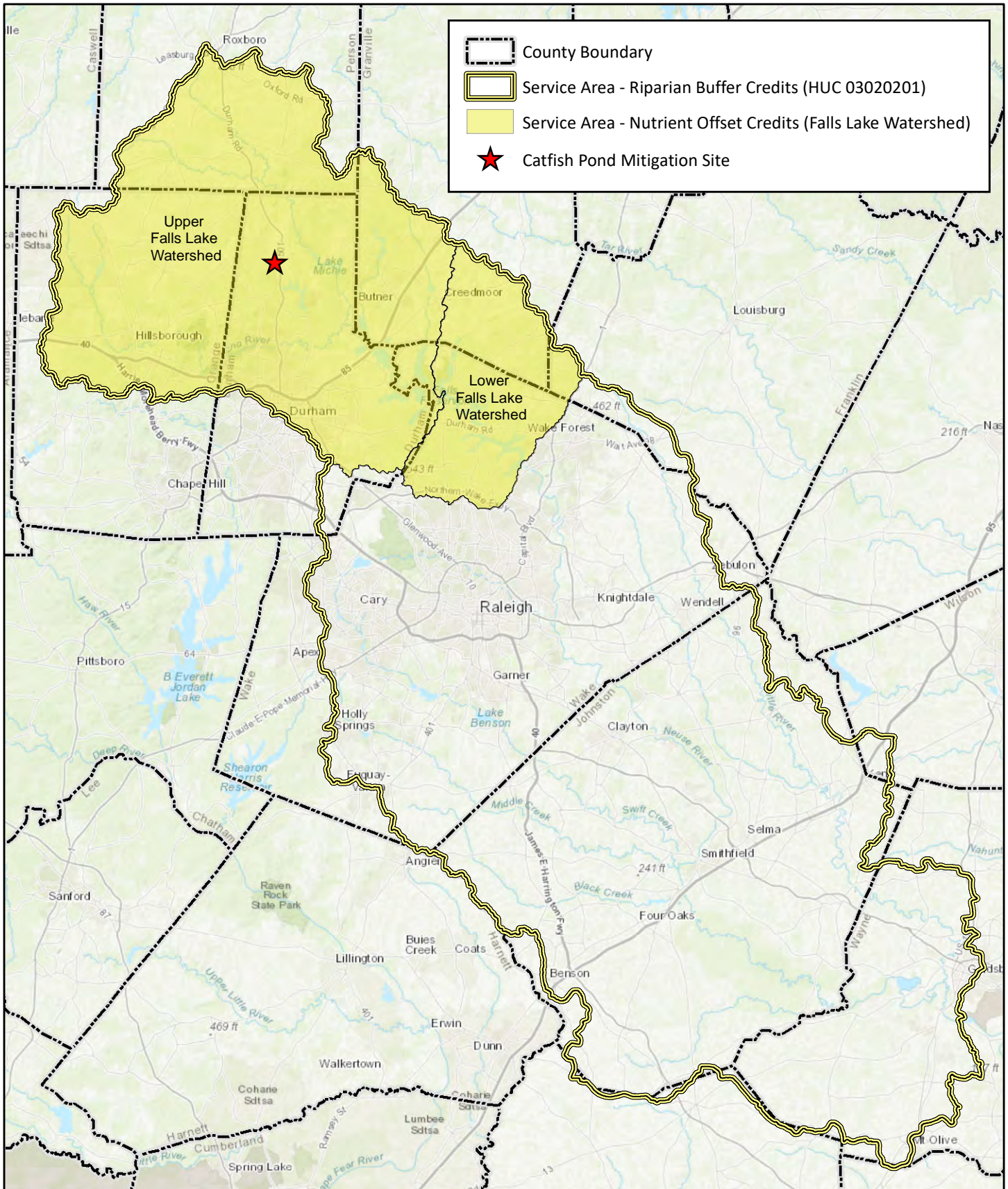


Figure 1. Project Vicinity Map
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)
 Durham County, NC

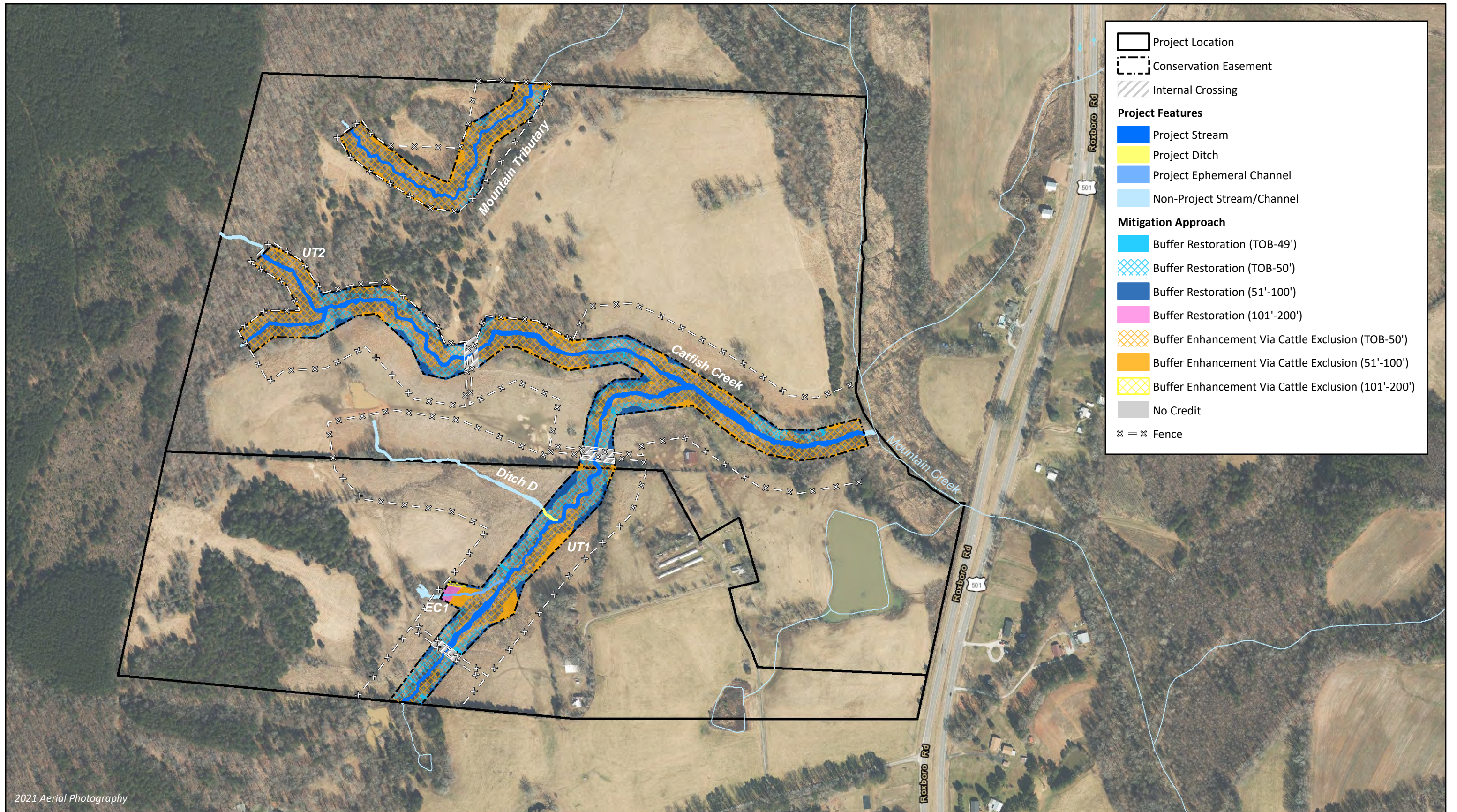


0 5 10 Miles



Figure 2. Service Area Map
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)

Durham County, NC



2021 Aerial Photography



0 400 800 Feet



Figure 3. Project Component/Asset Map
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)
 Durham County, NC

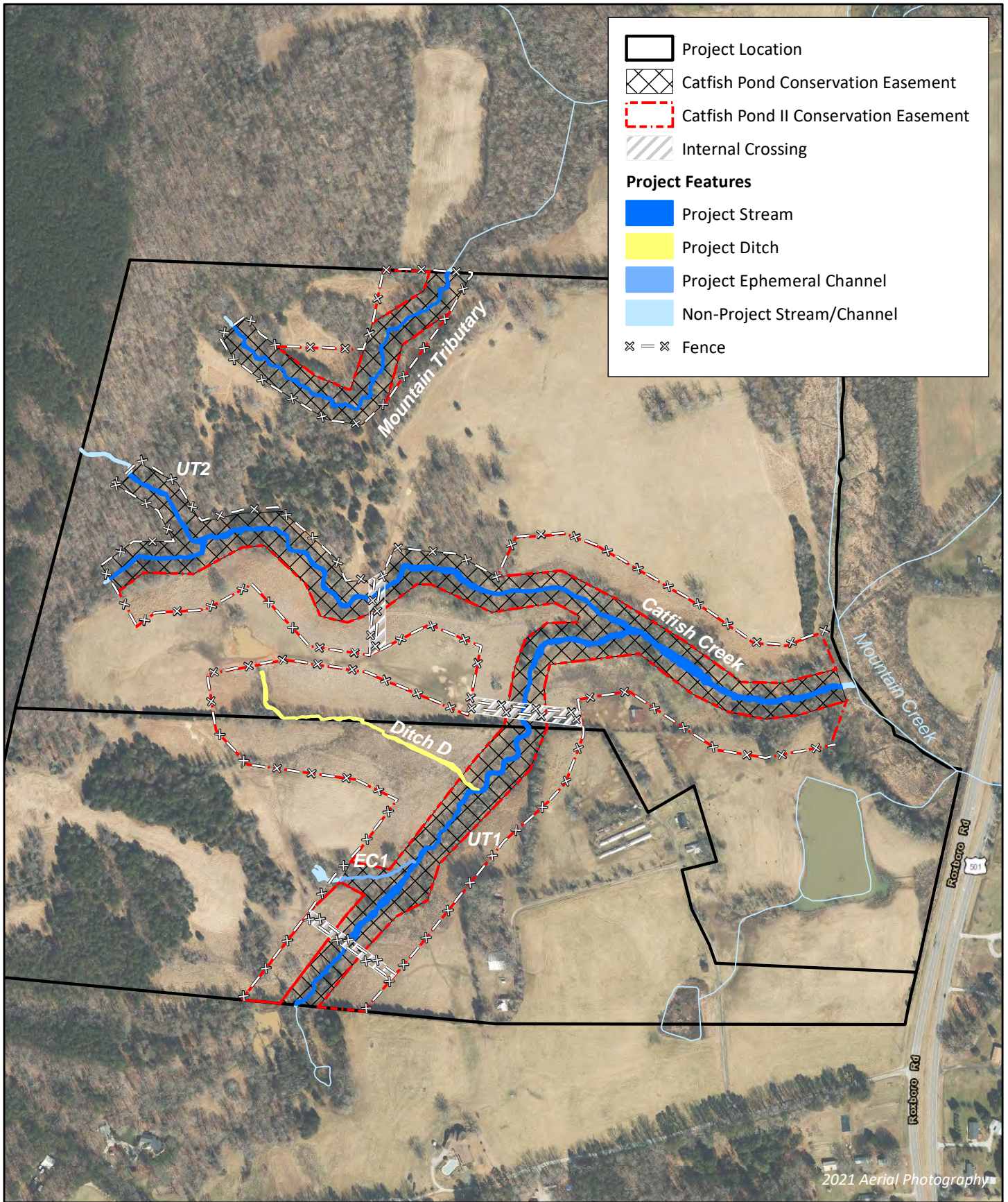


Figure 4. Catfish Pond II Mitigation Bank Parcel Site Map
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)

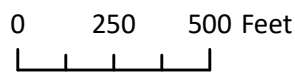


Table 1. Buffer Project Areas and Assets

Catfish Pond Mitigation Site
 DMS Project No. 100039
 Monitoring Year 2 - 2021

Project Area						N Credit Conversion Ratio (ft ² /pound)												
Neuse 03020201 - Upper Falls Lake						19.16394												
						297.54099												
Credit Type	Location	Subject? (enter NO if ephemeral or ditch ¹)	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft ²)	Total (Creditable) Area of Buffer Mitigation (ft ²)	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	0-100	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	—	—		
Totals:							793,207	793,207										

Enter Preservation Credits Below

Eligible for Preservation (ft ²):								Total (Creditable) Area for Buffer Mitigation (ft ²)				
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							—	
Preservation Area Subtotal (ft²):							0					
Preservation as % Total Area of Buffer Mitigation:							0.0%					
Ephemeral Reaches as % Total Area of Buffer Mitigation:							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
Total Riparian Buffer:	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 2 - 2021

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 ¹	March 2020	March 2020
Permanent seed mix applied to reach/segments ¹	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 ²		April-May 2020
Invasive Vegetation Treatment		May & September 2020
Year 1 Monitoring	October 2020	December 2020
Invasive Vegetation Treatment		September 2021
Year 2 Monitoring	September 2021	December 2021
Year 3 Monitoring	2022	December 2022
Year 4 Monitoring	2023	December 2023
Year 5 Monitoring	2024	December 2024

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

²Herbicide ring sprays around the base of planted stems.

Table 3. Project Contact Table

Catfish Pond Mitigation Site
DMS Project No. 100039
Monitoring Year 2 - 2021

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

Table 4. Project Information and Attributes

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 2 - 2021

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 2 - 2021

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

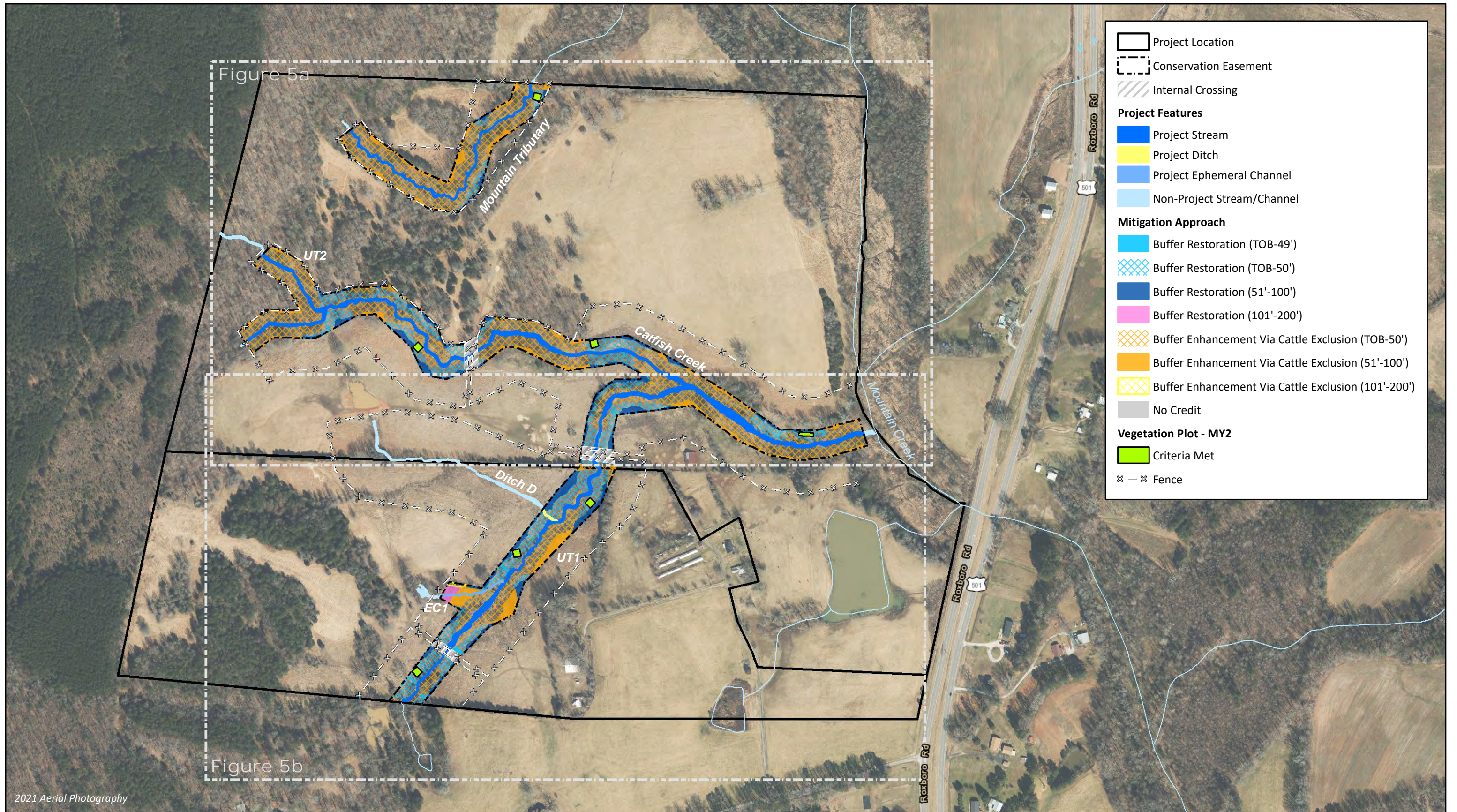
Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 2 - 2021

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



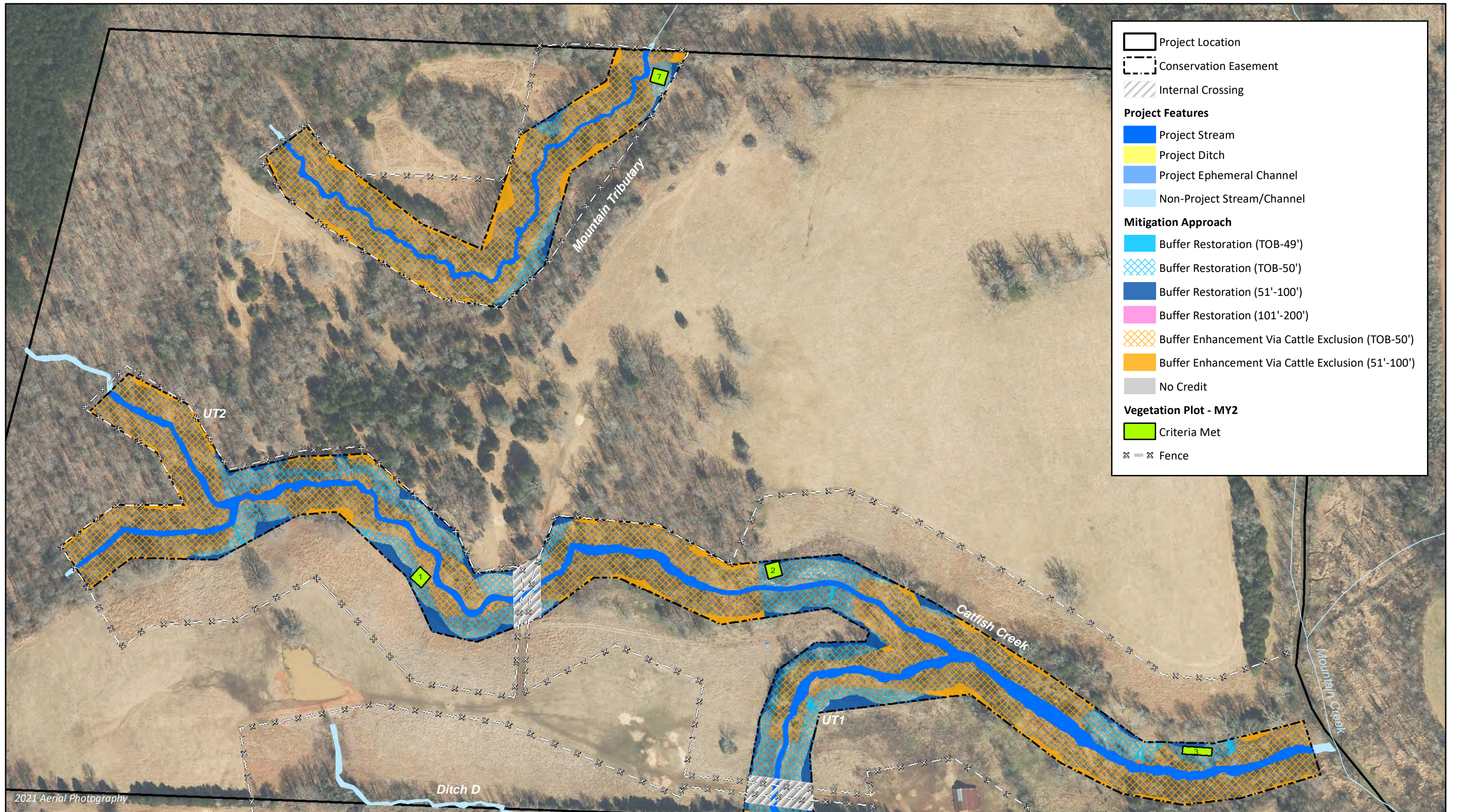
2021 Aerial Photography

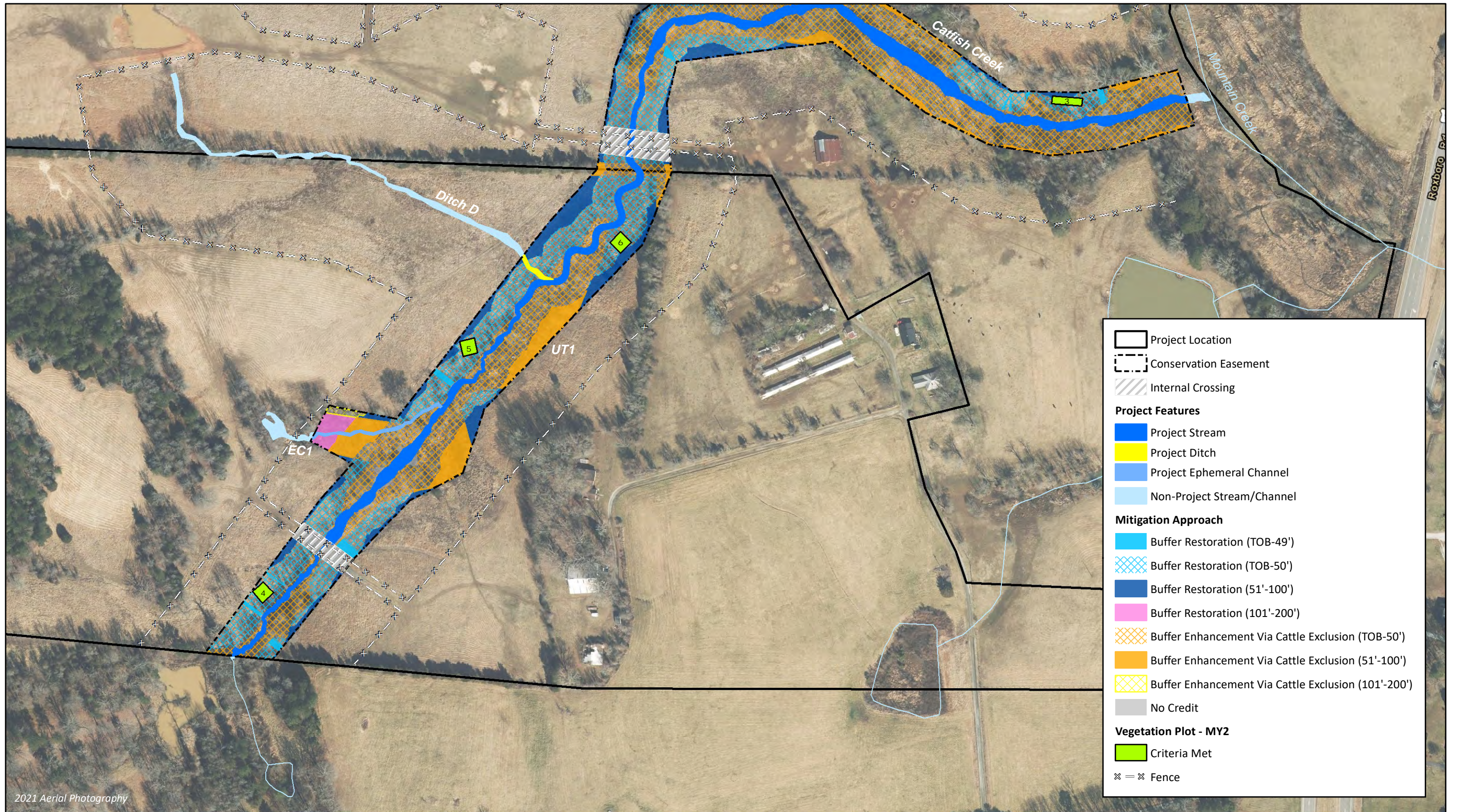


0 400 800 Feet



Figure 5. Monitoring Plan View Map Key
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)
 Durham County, NC





2021 Aerial Photography

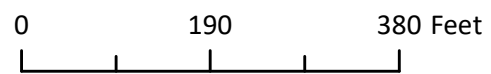


Figure 5b. Monitoring Plan View Map
 Catfish Pond Mitigation Site
 Monitoring Year 2 – 2021
 Neuse River Basin (03020201)
 Durham County, NC

Table 7. Vegetation Condition Assessment Table

Catfish Pond Mitigation Project

DMS Project No. 100039

Monitoring Year 2 - 2021

Planted Acreage 8.00

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%
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%
Total			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	0	0	0%
Cumulative Total			0	0.0	0%

Easement Acreage 20.73

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%

VEGETATION PLOT PHOTOGRAPHS



VEG PLOT 1 (09/23/2021)



VEG PLOT 2 (09/23/2021)



VEG PLOT 3 (09/23/2021)



VEG PLOT 4 (09/23/2021)



VEG PLOT 5 (09/23/2021)



VEG PLOT 6 (09/23/2021)





VEG PLOT 7 (09/23/2021)



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 2 - 2021

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 2 - 2021

Report Prepared By	Tasha King
Date Prepared	10/26/2021 10:23
Database Name	CatfishPond_MY2_cvs-v2.5.0.mdb
Database Location	F:\Monitoring\Catfish Pond\MY2 - 2021
Computer Name	CHARLOTTEINTERN
File Size	84144128
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Project Planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Project Total Stems	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.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and Spp	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.
PROJECT SUMMARY-----	
Project Code	100039
Project Name	Catfish Pond Mitigation Site
Description	Stream and Buffer Restoration Project
Sampled Plots	7

Table 10. Planted and Total Stem Counts

Catfish Pond Mitigation Site

DMS Project No. 100039

Monitoring Year 2 - 2021

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2021)														
			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>Acer rubrum</i>	Red Maple	Tree															
<i>Aesculus flava</i>	Yellow Buckeye	Shrub Tree	1	1	1												
<i>Alnus serrulata</i>	Tag Alder	Shrub Tree															
<i>Betula nigra</i>	River Birch	Tree							1	1	1						
<i>Diospyros virginiana</i>	American Persimmon	Tree									25			2			
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree				2	2	2						2	3	3	
<i>Ligustrum sinense</i>	Chinese Privet	Exotic			1												
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree											3			2	
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree			1												
<i>Platanus occidentalis</i>	Sycamore	Tree	4	4	7	6	6	6	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							1	1	1	1	1	1			
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree				1	1	1	2	2	2	1	1	1	3	3	3
<i>Quercus phellos</i>	Willow Oak	Tree	4	4	4				3	3	3	1	1	1	3	3	3
<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	1	1	1	2	2	2				1	1	1	2	2	2
<i>Salix nigra</i>	Black Willow	Tree															1
	Unknown Species	Tree															
Stem count			10	10	14	13	13	13	10	10	35	12	12	19	13	13	16
size (ares)			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02		
Species count			4	4	6	5	5	5	5	5	6	5	5	8	5	5	7
Stems per ACRE			405	405	567	526	526	526	405	405	1416	486	486	769	526	526	647

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 2 - 2021

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2021)						Annual Means								
			VP 6			VP 7			MY2 (2021)			MY1 (2020)			MY0 (2020)		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
<i>Acer rubrum</i>	Red Maple	Tree			1						1						
<i>Aesculus flava</i>	Yellow Buckeye	Shrub Tree							1	1	1	1	1	1	1	1	
<i>Alnus serrulata</i>	Tag Alder	Shrub Tree			1						1						
<i>Betula nigra</i>	River Birch	Tree				4	4	4	5	5	5	9	9	9	9	9	
<i>Diospyros virginiana</i>	American Persimmon	Tree						2			29			13			
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	1	1	1	1	1	1	7	7	9	7	7	8	7	7	
<i>Ligustrum sinense</i>	Chinese Privet	Exotic									1						
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree						21			26			2			
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree						1			2						
<i>Platanus occidentalis</i>	Sycamore	Tree	6	6	6	6	6	6	35	35	38	36	36	36	36	36	
<i>Quercus alba</i>	White Oak	Tree				1	1	1	3	3	3	3	3	3	3	3	
<i>Quercus lyrata</i>	Overcup Oak	Tree							2	2	2	3	3	3	3	3	
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	2	2	2				9	9	9	11	11	11	11	11	
<i>Quercus phellos</i>	Willow Oak	Tree	3	3	3				14	14	14	15	15	15	15	15	
<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	2	2	2	1	1	1	9	9	9	11	11	11	11	11	
<i>Salix nigra</i>	Black Willow	Tree			3						4						
	Unknown Species	Tree													1	1	
Stem count			14	14	19	13	13	37	85	85	153	96	96	112	97	97	
size (ares)			1			1			7			7			7		
size (ACRES)			0.02			0.02			0.17			0.17			0.17		
Species count			5	5	8	5	5	8	9	9	16	9	9	11	10	10	
Stems per ACRE			567	567	769	526	526	1497	491	491	885	555	555	647	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