

FINAL-MY2 Monitoring Report

Seniard Creek Mitigation Site

Henderson County
French Broad River Basin
Cataloging Unit # 06010105

NCDMS Project No. 100017

NCDMS Contract No. 7189

DMS RFP No. 16-006991

USACE Action ID: SAW-2017-01571 DWR# 20171160

Data Collected: April 2022- January 2023



Prepared for:

North Carolina Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh N C 27699-1652



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Harry Tsomides
Project Manager
NCDEQ-DMS
Asheville Regional Office
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Subject: Draft MY2 Monitoring Report
Seniard Creek Site, Henderson County
French Broad River CU 06010105
DMS Project ID No. 100017 / DEQ Contract #7189

Mr. Tsomides

On February 20, 2023 EWS received comments on the Seniard Creek Site Draft MY2 Monitoring Report. The following are DMS comments and responses by EWS (**in RED**).

Report Comments

- The stream visual assessment tables indicate 100% performance across the site for all visual monitoring metrics on all reaches. Can EWS confirm this is the case for 2022/MY2? If not then please update these tables accordingly. **The final MY2 visual assessment (Sept 28 and Oct 6) indicated 100 percent performance of all stream visual metrics.**
- Monitoring providers are responsible for annually checking and reporting on the easement integrity across the project site for encroachments, missing markers, adequate signage, fence breaks, etc. Please provide a section in future years reports indicating that the boundary was checked in its entirety and what the results were. **Visual assessments were conducted on April 6-8th during the initial site assessment, again on Sept 28, and finished on October 6th 2023. Text included with visual assessment discussion in report text.**
- DMS appreciates that some measures were taken in 2022 to try and address the violations however some of the problem areas have not disappeared. For example, along the left floodplain pasture on Seniard Creek Reach 1A, scalloping was still noticed in 2022 after seeing and noting it in 2021. Please show sections of encroachment on the CCPVs (either as a polygon or callout) and indicate what EWS's plan is for rectifying these areas, including landowner outreach. **Easement violations will be more closely screened for going further. Edits to both the CCPV and Table 5 have been made. EWS will reach-out to the landowner/lessee regarding easement integrity. Markers will be replaced/installed as needed and in potential/identified problem areas.**
- Please indicate in the text that the Duke powerline right-of-way encroachment across Whitaker Branch is being addressed separately with Duke Power; DMS is attempting to work with Duke to have them move the line however please note that this reach may have credit loss, including a re-analysis with the buffer tool, if the line is not eventually moved. **EWS understands the potential**

credit loss and need for buffer reevaluation. Additional text has been added to the MY2 document.

- Please briefly discuss and summarize the fish sampling (included in an Appendix) in the narrative; what does the data suggest about the site, if anything? **Additional discussion regarding the fishery was added to the text.** Does the population being observed reflect a typical reference-like population for this area, or is it still transitioning to reference-like conditions? **The shift appears to align with the fisheries assemblage found in similar size and structured streams. The increase in habitat heterogeneity through restoration is reflected in the fish assemblage data.**
- EWS indicates that stream data were collected January 2023. Data collection for each year should be limited to the calendar year for which it is reporting, unless there are previously-approved extenuating circumstances. **EWS makes a full faith effort to collect, process, and report data within an acceptable timeframe. Unforeseen and irreconcilable circumstances were present during MY3 such that pre-approval could not be planned for or requested.**
- Supplemental Planting has been mapped on the CCPVs and the plant list is included in Appendix F; please also indicate whether or not the species planted are all from the IRT-approved mitigation plan. **Species were selected based on the IRT approved plan.**
- The supplemental planting quantities are not listed. Can EWS provide a planting area and quantities of each species? This would be helpful to know a) the area across the site that got planted relative to the total planted area, and b) an idea of the proportional amounts of each species (e.g., that it wasn't 90% one species and 10% all the rest). **The supplemental planting was conducted following identification and flagging of existing stems. The planting re-established an approximate 6' center of woody stems in encroachment and low stem density areas. A bulk order was placed for use in numerous projects. As such, EWS is unable to provide a specific number of stems planted at the Seniard Project but can provide an approximate species distribution of approved species based upon that bulk order.**
- Thank you for providing the culvert photos for one of the Sitton Branch culverts. Please provide photos on all the project culverts to show if there are any ongoing concerns such as debris jamming, siltation, perching, etc. If this is not possible for this years report please begin tracking these in 2023. In addition, ideally, project-installed culverts should be shown on the CCPVs. **Noted, crossing photos will be adjusted to address the above potential concerns starting in MY3.**
- Where continuous stage recorders are being used to monitor consecutive days of stream flow, please show on the graphs the maximum number of consecutive days where surface flow was present. **Added and will be included in future submittals.**
- EWS indicates that *“The two areas along Lee and Sitton Creek identified in MY1 as problem areas, Lee Branch at Station 300+25 and Sitton Creek at Station 211+25, have stabilized.”* Can EWS clarify further how these areas have stabilized to the point they are no longer considered problematic? **Clarifying text has been added to the document including comparison photos.**



Initial concerns regarding the two problem areas were identified during MY1. Lee Branch has maintained thalweg, bed, and bank (referencing cross-section data) and has substantial riparian herbaceous regrowth. Sitton Creek, following the addition of livestakes, had appeared to begin to entrain sediment and organic debris in MY2. Additionally, livestake survival was high and herbaceous vegetation was re-establishing.

Please submit two final hard copies, in addition to a flash drive or CD with a PDF of the report and all digital support files (addressing any comments) in the correct file structure. Please include a copy of your response letter, inserted inside the front cover of each hard copy report (and included in the final PDF). **Packaged accordingly.**

Sincerely,

A handwritten signature in black ink that reads 'Danvey Walsh'.

Danvey Walsh

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Prepared for:



37 Haywood Street, Suite 100
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Prepared by:



EQUINOX

balance through proper planning

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1.0 PROJECT SUMMARY

1.1. Project Setting and Background

The Seniard Creek Mitigation Site (Seniard Mitigation Site) is located in the French Broad River Basin (CU 06010105). The Seniard Mitigation Site also lies within the North Fork Mills River Watershed (HUC 060101050403) which is identified as a Targeted Local Watershed (TLW) according to the 2009 French Broad River Basin Restoration Priorities (RBRP) Plan. Project work at the Seniard Site was completed in late February 2021 including construction and monitoring feature installation; bare root and live stake installation was completed in February 2021.

Historic land use at the Seniard Mitigation Site consisted of forestry and agricultural use for at least 65 years, according to historic aerial photos. Historic agricultural practices, relocation of the Seniard and Sitton Creeks had functionally removed the streams' connectivity with the floodplain. One poorly functioning culvert on Seniard Creek has degraded the ecological connectivity of the stream at the head of the Seniard Mitigation Site. The lack of deep-rooted vegetation and unstable channel characteristics have contributed to the degradation of the streambanks on both sides of the project. Ecological function has been restored to the existing streams, wetlands, and riparian corridor by returning the stream channels to a stable condition. The relocation of Seniard and Sitton Creeks to the historic floodplain has restored proper floodplain connectivity. The restoration of the upper Seniard Creek reach addressed a perched culvert by raising the bed elevation. In the mid and downstream reaches of Seniard Creek, the profile of the channel was raised, shifted, and proper channel dimensions were restored. The restoration of the upper Sitton Creek reach focused on realigning the channel, reestablishing dimension, and floodplain connectivity. Additional measures that promoted functional uplift included stabilizing and revegetating disturbed areas, restoring floodplain connectivity and wetland hydrology, reestablishing wooded riparian areas. These measures contribute to reduced downstream sediment and nutrient loads, as well as improving aquatic and terrestrial habitat.

This project is protected by an 11.68-acre conservation easement and is located approximately 3.7 miles northwest of Mills River, NC in Henderson County at 35.409056° N, -82.627667° W. The Seniard Mitigation Site is bounded by agricultural and residential properties.

1.2. Project Quantities and Credits

The Seniard Mitigation Site has restored a total of 3,637, enhanced 1,462 and preserved 128 linear feet of stream. The project is expected to generate a total of 3,645.949 SMU's (Seniard Stream and Wetland Mitigation Plan - May 27, 2020). Refer to Table 1 for the project components and mitigation credit information and Figure 1 for the Project Asset Map.

1.3. Monitoring Plan Components

A total of sixteen (16) cross-sections, three (3) groundwater monitoring gages, five (5) continuous stage recorders, and two (2) crest gages were installed within the restoration site to evaluate the stream and wetland components. Ten (10) permanent vegetation plots were installed to evaluate the planted areas within the site. Twelve (12) photo stations were established for visual representation of the site. An additional seven (7) photo stations were added in MY1 at the request of the NC Interagency Review Team.

Table 1. Seniard Creek Mitigation Site (100017) Project Mitigation Quantities and Credits.							
Component (Reach ID)	Mitigation Plan Footage (ft)	As-Built (ft)	Mitigation Category	Restoration Level	Mitigation Ratio (X:1)	Mitigation Plan Credits	+Comments
Seniard Creek 1A	376	376.509	Cold	R	1:1	376.000	
*Seniard Creek 1B	1213	1198.706	Cold	R	1:1	1213.000	Confluence with Sitton farther upstream than design
*Seniard Creek 2	176	187.521	Cold	R	1:1	176.000	Confluence with Sitton farther upstream than design
*Sitton Creek 1	1095	1070.019	Cold	R	1:1	1095.000	Confluence with Seniard farther upstream than design
*Lee Branch	212	209.48	Cold	R	1:1	212.000	Reduced sinuosity compared to design
David Branch 1A	132	128.298	Cold	P	10:1	13.200	Restoration on David 1B begins upstream compared to design
David Branch 1B	296	296.779	Cold	R	1:1	296.000	
David Branch 1C	226	220.522	Cold	R	1:1	226.000	Longer Non-Creditable section for culvert outfall
Whitaker Branch	416	415.749	Cold	EII	8:1	52.000	
Redmond Branch 1A	1046	1046.569	Cold	EII	7:1	149.429	
Redmond Branch 1B	76	78.036	Cold	R	1:1	76.000	Shorter Non-Creditable section for culvert outfall

*Deviations in As-Built vs. Design footage relate directly to reduction in sinuosity when calculated using As-Built centerline derived from surveyed top of bank.

+ No redlines were displayed on the As-built record drawing due to no significant deviations from the design (<1%).

Project Credits

Restoration Level	Stream (ft)			Wetlands (ac)		
	Warm	Cool	Cold	Riparian	Non-Riparian	Coastal
Restoration			3670.000			
Re-establishment						
Rehabilitation						
Enhancement						
Enhancement I						
Enhancement II			201.429			
Creation						
Preservation			13.200			
Totals^	0	0	3884.629	0	0	0

Wetland Mitigation Category

CM Coastal Marsh
R Riparian
NR Non-Riparian

Restoration Level

HQP High Quality Preservation
P Preservation
E Wetland Enhancement - Veg and Hydro
EII Stream Enhancement II
EI Stream Enhancement I
C Wetland Creation
RH Wetland Rehabilitation - Veg and Hydro
REE Wetland Re-establishment Veg and Hydro
R Restoration

Stream Credits

Total Baseline Credit		3884.629			
Credit Loss in Required Buffer		-441.360			
Credit Gained for Additional Buffer		202.680			
Net Change in Credit from Buffers		-238.680			
Total Project Credits^		3645.949			

Overall Asset Summary

Total Stream Credit	3,645.949
Total Wetland Credit	0.000

^These numbers are 2.701 SMUs less than the corresponding numbers in the Project Assets (Table 18A) of the approved mitigation plan.

This is the result of an error in the approved mitigation plan table. The credit sums in this table are correct.

1.4. Project Performance Standards

The stream restoration performance standards for the project will follow accepted and approved criteria in Table 2 and based on the Final Mitigation Plan - Seniard Creek Mitigation Site (May 27, 2020). Annual monitoring reports will follow the DMS Stream and Wetland Mitigation Plan Template and Guidance (October 2020). Performance criteria will be evaluated throughout the seven-year monitoring period.

Table 2. Seniard Creek Mitigation Site (100017) Summary Goals, Performance, and Results.

Goal	Objective/Treatment	Likely Functional Uplift	Performance Standard	Measurement	Cumulative Monitoring Results
Provide a stream with natural, stable forms that supports proper stream function.	Construct stream channels that will maintain proper dimension, pattern and profile.	Reduced erosion, increased habitat heterogeneity, and floodplain connection	<ul style="list-style-type: none"> □ Riffle section W/D ratios should remain within the range of the appropriate stream type. □ BHR should not exceed 1.2. BHR should not change more than 10% in any given monitoring interval. Changes that do occur should indicate a trend toward stability. □ Entrenchment Ratios should be ≥ 2.2 for C/E channels and ≥ 1.4 for B Channels. □ Document nearly continuous surface flow. 	10-Cross sections, visual assessment and 5-continuous stage recorders.	Both Width-Depth and Entrenchment ratios within specifications or are similar to As-Built for all constructed streams. Surface flow sufficient during MY2.
Improve groundwater hydrology to support recovery of native riparian vegetation.	Construct streams with proper bankfull to floodplain relationship.	Increased landscape connectivity, water transport and storage.	Four bankfull events or greater, in separate years, will be documented during the monitoring period.	2-Crest gauges, 5-continuous stage recorders, and debris lines.	Three bankfull events documented on Seniard Cr, two on Sitton Cr, five on Lee Br, and a minimum of four on David Br since project completion.
Reduce sediment inputs from eroding stream banks to reduce fine sediment loads and percentage of fines in the bed-material load.	Construct streams that provide naturally stable dimensions and stabilize constructed banks with appropriate bioengineering.	Reduced erosion, increased sediment transport and storage.	Channel banks should generally remain stable. Where bank migration does occur, it should not exceed 10% of the previous monitored bankfull width and 20% of the original design bankfull width.	Visual assessment and bank pin monitoring as necessary.	No evidence of instability within fixed cross-sections.
Restore proper sediment transport to support channel stability and bedform diversity.	Construct streams that maintain an appropriate sediment transport balance with the sediment that is supplied by the watershed so that the overall stream profile neither aggrades nor degrades over time.	Reduced erosion, increased sediment transport and storage.	Profile adjustments should not indicate significant aggradation or degradation. BHR requirements as stated above.	Longitudinal profile if visual assessment indicates potential instability.	
	Create and improve stream bedform diversity by constructing pools of varied depths and riffles of varied slopes.		Profile should maintain a diversity of depths expressed in riffle/pool forms.	Visual assessment	
Improve substrate quality to facilitate hyporheic flow and support aquatic communities.	Construct stable riffles that provide an improved diversity of bed material clast and a reduction in fines relative to existing conditions.		Substrate material should progress towards or maintain coarser material in riffles and runs with finer material present in pools and glides.	8-Pebble counts at established cross-sections.	Criteria abandoned per Technical Working Group policy change on 9/29/2021
Improve quantity, quality, and diversity of habitats to support healthy aquatic communities.	Construct in-stream habitat features from native material to provide a diversity of habitats.	Improved natural communities and landscape connectivity.	In-stream habitat structures should remain intact and functional.	Visual assessment	

Table 2. Seniard Creek Mitigation Site (100017) Summary Goals, Performance, and Results.					
Goal	Objective/Treatment	Likely Functional Uplift	Performance Standard	Measurement	Cumulative Monitoring Results
Restore continuity of the stream channel by removing barriers to migration.	Provide improved fish passage through previous upstream impediments.	Increased genetic transfer and species distribution.	No standards have been set, but results should present trends in increased fish passage.	Annual electrofishing surveys	Increased relative abundance in MY2 compared to MY1 and pre-construction.
Reduce pollutant inputs to the project stream (nitrogen, phosphorus) to restore a balance to proper nutrient cycles.	Provide a buffer from agricultural activities and row crops.	Reduced sediment and chemical inputs.	Record conservation easement prior to implementation.	Conservation Easement Compliance	
Improve riparian vegetation community to provide temperature regulation of the streams, provide a future source of organic inputs, and aid in long-term channel bank stability.	Plant native climax tree species and understory species in the riparian zone.	Improved natural communities and landscape connectivity.	At project initiation, a minimum of 680 stems/ac are to be planted. Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present, measuring 6ft at MY-5. Minimum of 210 stems/ac present, measuring 8ft at MY-7.	10-Vegetation plots	10 of 10 Permanent Vegetation plots meeting stem/ac criteria. 7 of 10 Permanent Vegetation plots meeting ALL criteria.
Restore former riparian areas so that the hydrology and soils will support native vegetative communities and wildlife.	Reconstruct stream channels that are properly connected to the riparian areas.	Increased water, sediment, and organic material transport and storage.	Bankfull elevations and profile should be consistent with valley grade.	Visual assessment	
	Re-grade topography to eliminate ditches and drainage features.	Increased water, sediment, transport and storage.	Floodplain topography should no longer contain lateral ditches or drainage features.	Visual assessment	
	Plant native wetland tree and shrub species.	Improved natural communities and landscape connectivity.	At project initiation, a minimum of 680 stems/ac are to be planted. Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present, measuring 6ft at MY-5. Minimum of 210 stems/ac present, measuring 8ft at MY-7.	10-Vegetation plots	10 of 10 Permanent Vegetation plots meeting stem/ac criteria. 7 of 10 Permanent Vegetation plots meeting ALL criteria.
Improve landscape connectivity that allows space for biotic and abiotic process and provides a source and sink for natural populations.	Establish a conservation easement that provides a minimum buffer from future activities in the adjacent watershed.	Improved natural communities and landscape connectivity.	Record conservation easement prior to implementation.	Conservation Easement Compliance	
Prevent future impacts to the site from development and agricultural uses.					

1.5. Restoration Type and Approach

In restoration reaches activities included excavation of the proposed channels, partial or complete backfilling of existing channels, and removal of spoil berms. Grading was designed to restore floodplain access and mimic natural contours.

In enhancement reaches, no in-channel work was performed. Invasive species were mechanically removed, or chemically treated, and woody stems and live stakes were planted to augment the existing vegetation structure.

1.6. Project Performance

1.6.1 Geomorphology

Visual assessment of the stream channel was performed to document easement integrity, signs of instability, such as eroding banks, structural instability, or excessive sedimentation. Visual assessments were conducted April 6-8 during the initial site assessment and again starting on September 28 and finishing on October 6, 2023.

The two areas along Lee and Sitton Creek identified in MY1 as problem areas, Lee Branch at Station 300+25 and Sitton Creek at Station 211+25, have stabilized. Lee branch experienced a pulse of sediment related to a heavy storm event during MY1. Cross-section data indicate that Lee branch has maintained thalweg, bed, and bank through MY2. The area of bank scour and slump noted at Sitton Creek Station 211+25 during MY1 has stabilized into MY2. Additional livetakes were installed in this area during re-planting efforts in MY2. No further erosion has taken place in this area following the addition and growth of livestakes. No additional areas of concern were identified in MY2.

Geomorphic data for MY2 was completed during January 2023. Summary tables and cross-section data plots related to stream morphology are located in Appendix C. Cross-sectional dimensions remained relatively stable between baseline conditions and MY2 monitoring efforts (Table 8, Cross-Section overlays, Appendix C). The site will continue to be monitored for signs of instability. The next site visit is planned for spring 2023.

Pebble counts were not conducted during MY2 citing The Technical Working Groups September 29, 2021 policy change. Pebble counts will not be performed as part of routine monitoring unless a need is identified.

Table 3. Seniard Creek Mitigation Site Attribute Table			
Project Name		Seniard Creek Mitigation Site	
County		Henderson	
Project Area (acres)		11.68	
Project Coordinates (latitude and longitude decimal)		35.409056° N, -82.627667° W	
Project Watershed Summary Information			
Physiographic Province		Blue Ridge Mountains	
River Basin		French Broad	
USGS Hydrologic Unit 8-digit	06010105	060101050403	
DWR Sub-basin		04-03-03	
Project Drainage Area (acres)		2310	
Project Drainage Area Percentage of Impervious Area		<1	
Land Use Classification		Cropland (Hayland)	
Reach Summary Information			
Parameters	Seniard Reach 1A	Seniard Reach 1B	Seniard Reach 2
Pre-project length (feet)	443	1272	422
Post-project (feet)	396	1274	176
Valley confinement (Confined, moderately confined,	Moderately Confined	Moderately Confined	Moderately Confined
Drainage area (acres)	826	858	1574
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (existing)	G/F	G	G
Dominant Stream Classification (proposed)	B	B	B
Dominant Evolutionary class (Simon) if applicable	N/A	N/A	N/A
Wetland Summary Information			
Parameters	Wetland 1	Wetland 2	Wetland 3
Pre-project (acres)	N/A	N/A	N/A
Post-project (acres)	N/A	N/A	N/A
Wetland Type (non-riparian, riparian)	N/A	N/A	N/A
Mapped Soil Series	N/A	N/A	N/A
Soil Hydric Status	N/A	N/A	N/A
Regulatory Considerations			
Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	Yes	Yes	SAW-2017-01571
Water of the United States - Section 401	Yes	Yes	DWR # 17-1160
Endangered Species Act	Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act	Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table			
Project Name		Seniard Creek Mitigation Site	
County		Henderson	
Project Area (acres)		11.68	
Project Coordinates (latitude and longitude decimal)		35.409056° N, -82.627667° W	
Project Watershed Summary Information			
Physiographic Province		Blue Ridge Mountains	
River Basin		French Broad	
USGS Hydrologic Unit 8-digit	06010105	060101050403	
DWR Sub-basin		04-03-03	
Project Drainage Area (acres)		2310	
Project Drainage Area Percentage of Impervious Area		<1	
Land Use Classification		Cropland (Hayland)	
Reach Summary Information			
Parameters	Sitton Creek Reach 1	Lee Branch Reach 1	Whitaker Branch Reach 1
Pre-project length (feet)	1105	129	426
Post-project (feet)	1236	226	426
Valley confinement (Confined, moderately confined,	Moderately Confined	Moderately Confined	Moderately Confined
Drainage area (acres)	633	13	26
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (existing)	G	G	B
Dominant Stream Classification (proposed)	B	B	B
Dominant Evolutionary class (Simon) if applicable	N/A	N/A	N/A
Wetland Summary Information			
Parameters	Wetland 1	Wetland 2	Wetland 3
Pre-project (acres)	N/A	N/A	N/A
Post-project (acres)	N/A	N/A	N/A
Wetland Type (non-riparian, riparian)	N/A	N/A	N/A
Mapped Soil Series	N/A	N/A	N/A
Soil Hydric Status	N/A	N/A	N/A
Regulatory Considerations			
Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	Yes	Yes	SAW-2017-01571
Water of the United States - Section 401	Yes	Yes	DWR # 17-1160
Endangered Species Act	Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act	Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table			
Project Name		Seniard Creek Mitigation Site	
County		Henderson	
Project Area (acres)		11.68	
Project Coordinates (latitude and longitude decimal)		35.409056° N, -82.627667° W	
Project Watershed Summary Information			
Physiographic Province		Blue Ridge Mountains	
River Basin		French Broad	
USGS Hydrologic Unit 8-digit	06010105	060101050403	
DWR Sub-basin		04-03-03	
Project Drainage Area (acres)		2310	
Project Drainage Area Percentage of Impervious Area		<1	
Land Use Classification		Cropland (Hayland)	
Reach Summary Information			
Parameters	David Branch 1A	David Branch 1B	David Branch 1C
Pre-project length (feet)	132	224	165
Post-project (feet)	132	335	273
Valley confinement (Confined, moderately confined, drainage area (acres)	Moderately Confined	Moderately Confined	Moderately Confined
Perennial, Intermittent, Ephemeral	6	6	26
NCDWR Water Quality Classification	Perennial	Perennial	Perennial
Dominant Stream Classification (existing)	WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (proposed)	B	G	G
Dominant Evolutionary class (Simon) if applicable	B	B	B
	N/A	N/A	N/A
Wetland Summary Information			
Parameters	Wetland 1	Wetland 2	Wetland 3
Pre-project (acres)	N/A	N/A	N/A
Post-project (acres)	N/A	N/A	N/A
Wetland Type (non-riparian, riparian)	N/A	N/A	N/A
Mapped Soil Series	N/A	N/A	N/A
Soil Hydric Status	N/A	N/A	N/A
Regulatory Considerations			
Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	Yes	Yes	SAW-2017-01571
Water of the United States - Section 401	Yes	Yes	DWR # 17-1160
Endangered Species Act	Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act	Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table				
Project Name		Seniard Creek Mitigation Site		
County		Henderson		
Project Area (acres)		11.68		
Project Coordinates (latitude and longitude decimal)		35.409056° N, -82.627667° W		
Project Watershed Summary Information				
Physiographic Province		Blue Ridge Mountains		
River Basin		French Broad		
USGS Hydrologic Unit 8-digit	06010105	060101050403		
DWR Sub-basin		04-03-03		
Project Drainage Area (acres)		2310		
Project Drainage Area Percentage of Impervious Area		<1		
Land Use Classification		Cropland (Hayland)		
Reach Summary Information				
Parameters		Redmond Branch 1A	Redmond Branch 1B	
Pre-project length (feet)		1066	40	
Post-project (feet)		1054	94	
Valley confinement (Confined, moderately confined,		Moderately Confined	Moderately Confined	
Drainage area (acres)		45	45	
Perennial, Intermittent, Ephemeral		Perennial	Perennial	
NCDWR Water Quality Classification		WSII, TR, HQW	WSII, TR, HQW	
Dominant Stream Classification (existing)		B	G	
Dominant Stream Classification (proposed)		N/A	B	
Dominant Evolutionary class (Simon) if applicable		N/A	N/A	
Wetland Summary Information				
Parameters		Wetland 1	Wetland 2	Wetland 3
Pre-project (acres)		N/A	N/A	N/A
Post-project (acres)		N/A	N/A	N/A
Wetland Type (non-riparian, riparian)		N/A	N/A	N/A
Mapped Soil Series		N/A	N/A	N/A
Soil Hydric Status		N/A	N/A	N/A
Regulatory Considerations				
Parameters		Applicable	Resolved?	Supporting Docs?
Water of the United States - Section 404		Yes	Yes	SAW-2017-01571
Water of the United States - Section 401		Yes	Yes	DWR # 17-1160
Endangered Species Act		Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act		Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)		No	N/A	N/A
Essential Fisheries Habitat		No	N/A	N/A

1.6.2 Vegetation

Visual assessment of vegetation indicates that the herbaceous vegetation is well established throughout the project with one bare area noted. Monitoring of permanent (n=10) was completed in October 2022. MY2 stems/acre and ranged from 324 to 688 stems per acre. Eighteen species were documented within the vegetation monitoring plots. Summary tables and photographs associated with MY2 vegetation monitoring are located in Appendix B and Appendix C. MY2 monitoring data indicates that all permanent vegetation plots were meeting the MY3 interim success criteria of 320 planted stems per acre (Table 6 and 7, Appendix C). Two plots (Plot 6 and 10) contain dominant species percentages of greater than 50%. In both cases volunteer recruitment has surpassed planted stem density and survival resulting in the changes in species composition. Similarly, veg plots 6, 7, and 10 were identified as having low species counts. In the case of plot 6, standing surface water and soil saturation has limited stem survival to only the most hydrophytic species. Plot 7, has had a similar trend of poor survival of upland species. Veg plot 10 contains a stand of previously established alders which have shaded some

planted stems and allowed for increased establishment of volunteer alder seedlings. Plots will continue to be monitored for stem survival and growth throughout the life of the project.

Areas of exotic vegetation are depicted within the CCPV, Appendix A. Multiflora rose (*Rosa multiflora*), Oriental bittersweet (*Celastrus orbiculatus*) and English Ivy (*Hedera helix*) remain the dominant observed species. Invasive vegetation was identified in moderate density along Seniard Creek 1A and low density and in limited areas scattered throughout the site. The majority of Sitton Creek has few invasives. One stand of Cattail (*Typha latifolia*) was identified in moderate density in and around vegetation plot #6 which extends downstream and south-southeast. One invasive vegetation treatment was conducted in MY2, targeting the understory of both Whitaker and Redmond Branches. Location and general densities of invasive vegetation can be found in Table 5 and the CCPV, Appendix A.

A supplemental planting was conducted on February 25, 2022 to address areas of low stem density and easement violations identified in MY1. Species were selected from those listed in the approved mitigation plan. Additional live stakes were installed along the easement violation and bank scour along Sitton Creek. Bare root stems were installed at the easement violation along the right descending bank of Sitton Creek; the easement violation at Whitaker Branch; along David Branch 1C and 1B; and along Redmond Branch 1A. A map of the planted areas and a table listing the species and materials can be found in Appendix F.

1.6.3 Hydrology

The area between Stations 205+00 and 210+00 along Sitton Creek has been monitored for an increased hydrological influence since construction. This area was anticipated to form riparian wetland, thereby providing functional uplift. Of the three gages (GG1, GG2 and GG3) installed in this area, GG2 is currently exceeding the typical performance criteria of 12% (Groundwater gauges, Appendix D). The wetland area created between Lee Branch and Sitton Creek continues to have strong hydrology and wetland vegetation despite drought during portions of the 2022 monitoring period (Photo Stations and CCPV, Appendix A, and Drought.gov). These areas will continue to be monitored through photographic documentation and existing groundwater wells.

Three reaches, Lee, David 1B, and David 1C are being monitored for continuous surface flow using Onset Hobo water level loggers. The minimum detection depth for the pressure transducers deployed on site is 0.81 inches. The casing elevations were adjusted in early 2022 to maximize detectability at lower flow. Both David Branch 1B and Lee Branch maintained a measurable surface flow for 228 consecutive days and 334 consecutive days, respectively. David Branch 1C recorded flow for 103 consecutive days.

Since project completion in early 2021, seven bankfull events have been documented at the Seniard Creek Site. Based on precipitation and stage recorder data the events were recorded over 3 days in 2021; March 25, August 17, October 6; four events in 2022; April 12, May 6, July 3-5, and August 21 (Table 12, Appendix D). Three events were documented on Seniard, two on Sitton Creek, five on Lee Branch, and a minimum of four on David Branch. No bankfull events were recorded on Redmond Branch or Whitaker Branch during MY2.

1.6.4 Additional Information

MY2 marked the second year of post construction fish monitoring. Preconstruction data identified five fish species with very low abundance downstream of the perched culvert. The MY1 survey identified a similar number of fish species with a 3-fold increase in abundance. Showing a similar trend, the MY2 survey identified an additional three species with a two-fold increase in overall abundance. A similar trend was noted upstream of the culvert. Preconstruction data identified one individual fish above the

culvert. Five fish representing three species were collected in MY1 and seven fish representing six species in MY2, indicating increased connectivity across the culvert. A more detailed report on the MY2 fisheries survey is available in Appendix F.

During the MY1 monitoring period a previously unidentified utility easement was documented crossing Whitaker Branch. Currently, DMS is in negotiations with Duke Power regarding potential realignment of the overhead wire.

2.0 REFERENCES

Lee, Michael T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2 (<http://cvs.bio.unc.edu/methods.htm>).

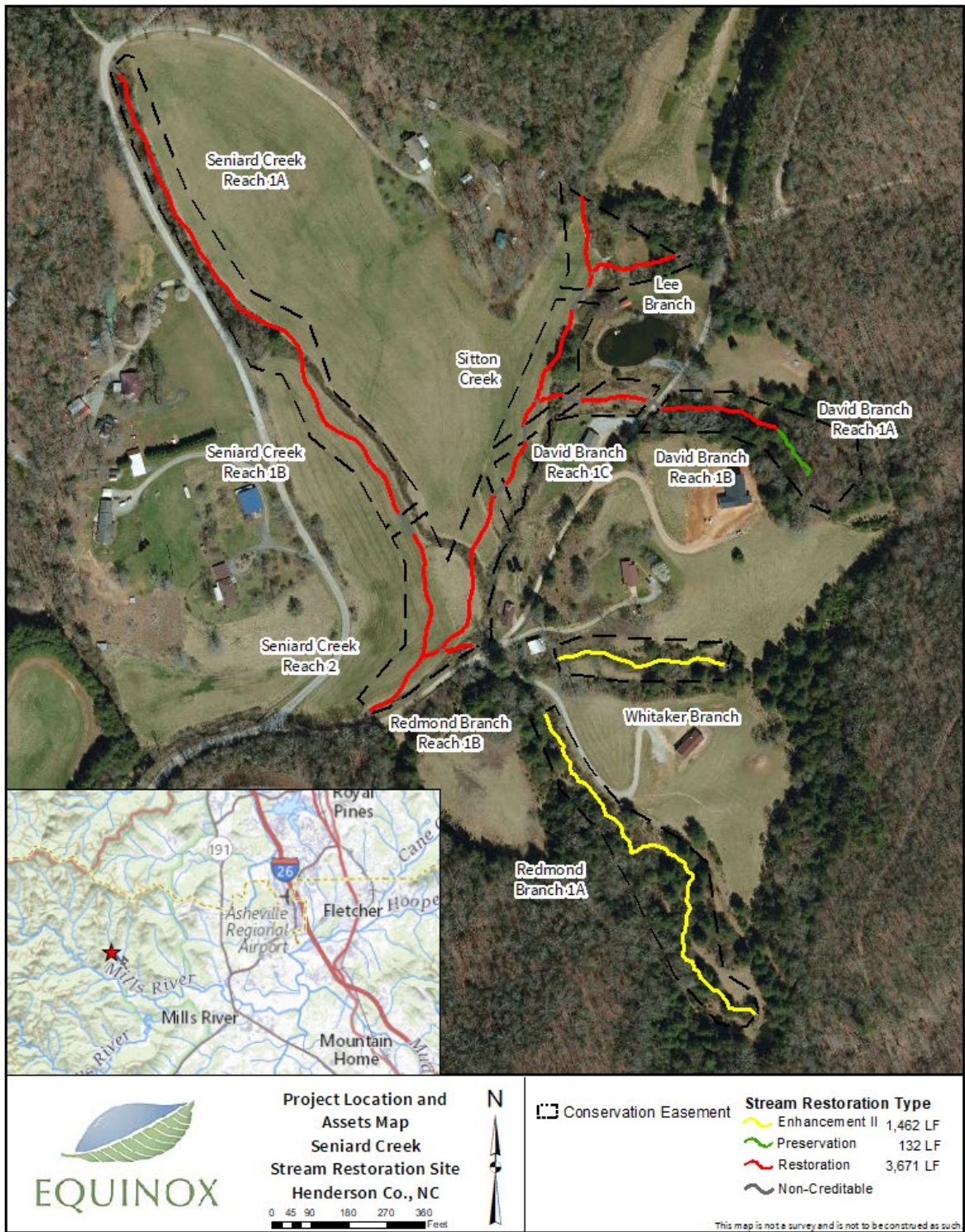
National Integrated Drought information System (Drought.gov). <https://www.drought.gov/states/north-carolina#historical-conditions> Accessed December 8, 2022.

NCDMS Stream and Wetland Mitigation Annual Monitoring Template (October 2020).

NCDMS Veg Table Production Tool, Version (8/23/2021). https://ncdms.shinyapps.io/Veg_Table_Tool/

Stantec Consulting, Inc. 2020. Final Mitigation Plan – Seniard Mitigation Site (May 27, 2020). Prepared for North Carolina Department of Environmental Quality, Division of Mitigation Services. DMS Project No. 100017.

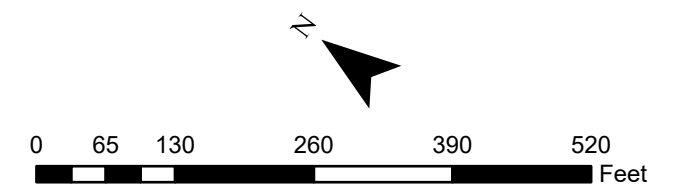
3.0 FIGURE 2. PROJECT LOCATION AND ASSETS MAP



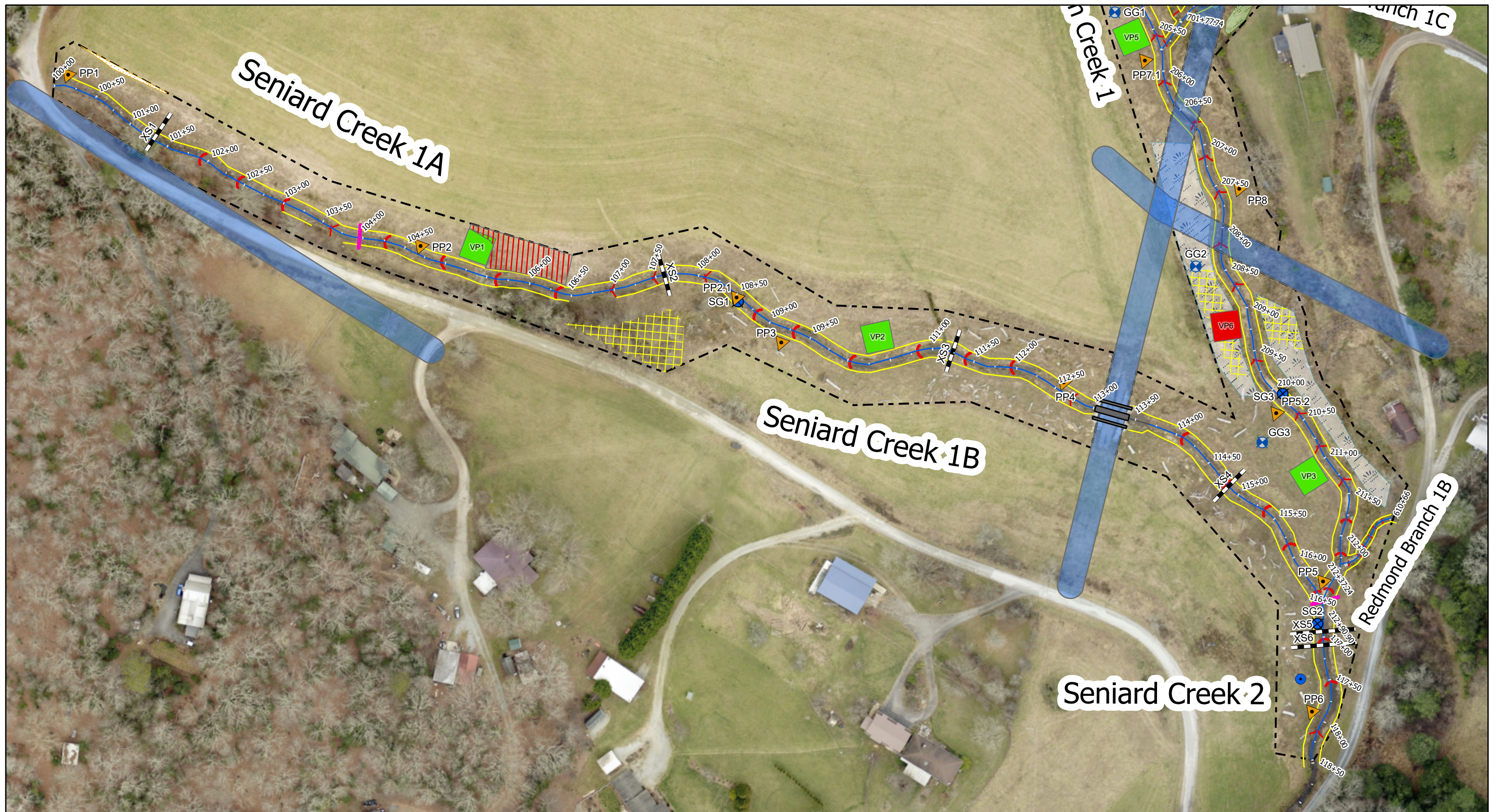


CCPV MY2
 Sheet Key
 Seniard Creek
 Stream Restoration Site
 Henderson Co., NC

Restoration Type	
—	Enhancement II
—	Preservation
—	Restoration
—	No Credit
—	Reach Breaks
	Utility Easement
	Conservation Easement

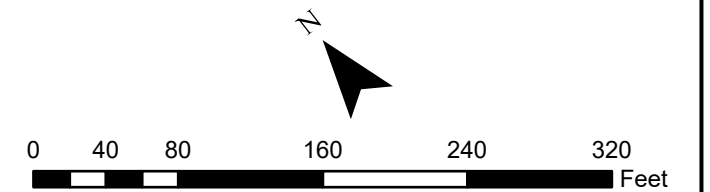


This map is not a survey and is not to be construed as such.

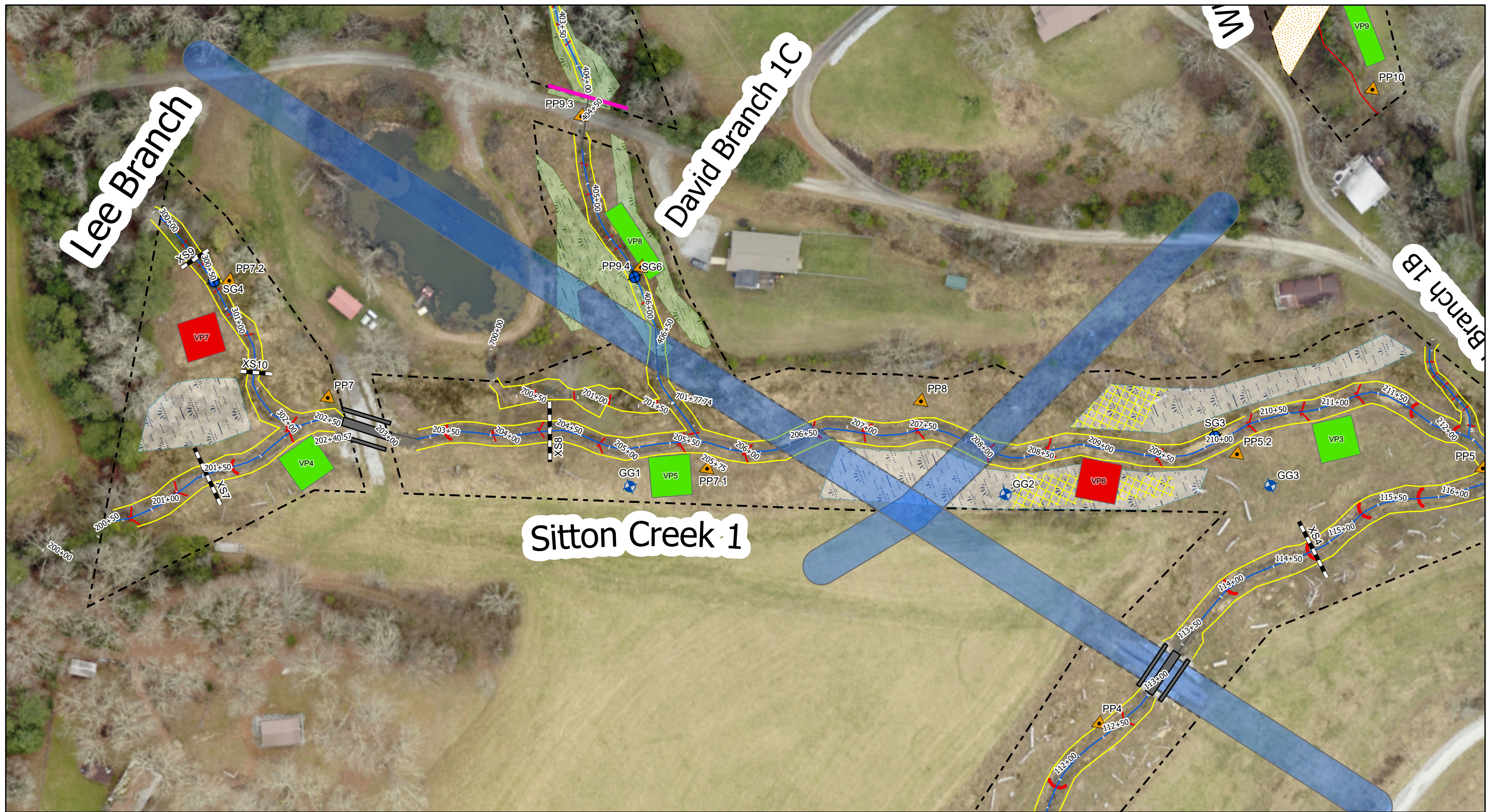


CCPV MY2
 Sheet 1
 Seniard Creek Stream Restoration Site
 Henderson Co., NC
 January 2023

Reach Breaks	Groundwater Gauge	Invasive Vegetation	Preexisting Jurisdictionally Determined Wetlands
Project Installed Culverts	Rain Gauge	Encroachment	Potential Non-Creditable Wetland Restoration Areas
Utility Easement	Cross Section	Restoration	Conservation Easement
Centerline_Stationing	BareAreas_MY2	No Credit	
Photo Stations	Meeting	Top of Bank	
Continuous Stage Recorder	Failing	In-Stream Structures	

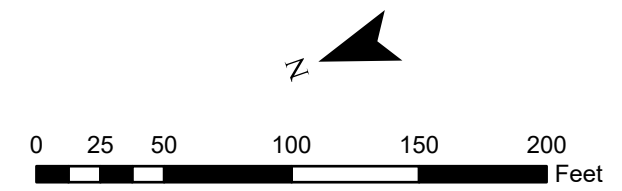


This map is not a survey and is not to be construed as such.




CCPV MY2
 Sheet 2
 Seniard Creek Stream Restoration Site
 Henderson Co., NC
 January 2023

Reach Breaks	Continuous Stage Recorder	Invasive Vegetation	In-Stream Structures
Project Installed Culverts	Groundwater Gauge	Encroachment	Preexisting Jurisdictionally Determined Wetlands
Utility Easement	Cross Section	Restoration Type	Potential Non-Creditable Wetland Restoration Areas
Centerline Stationing	Meeting	Enhancement II	Conservation Easement
Photo Stations	Failing	Restoration	
		No Credit	
		Top of Bank	


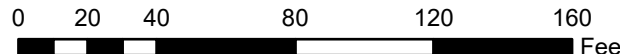


This map is not a survey and is not to be construed as such.




CCPV MY2
Sheet 3
Seniard Creek Stream Restoration Site
Henderson Co., NC
January 2023

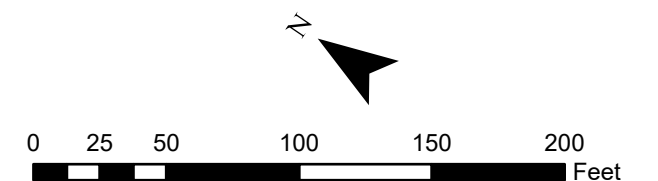
<ul style="list-style-type: none"> — Reach Breaks Project Installed Culverts Utility Easement Centerline_Stationing ▲ Photo Stations 	<ul style="list-style-type: none"> ● Continuous Stage Recorder ● Groundwater Gauge Cross Section ■ Vegetation Plot ■ Meeting 	<ul style="list-style-type: none"> — Restoration Type — Preservation — Restoration — No Credit — Top of Bank — In-Stream Structures 	<ul style="list-style-type: none"> Preexisting Jurisdictionally Determined Wetlands Potential Non-Creditable Wetland Restoration Areas Conservation Easement
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This map is not a survey and is not to be construed as such.



CCPV MY2
 Sheet 4
 Seniard Creek Stream Restoration Site
 Henderson Co., NC
 January 2023

Utility Easement	Vegetation Plot	Restoration	Potential Non-Creditable Wetland Restoration Areas
Centerline Stationing	Meeting	Top of Bank	Conservation Easement
Photo Stations	Failing	In-Stream Structures	
Crest Gauge	Encroachment	Preexisting Jurisdictionally Determined Wetlands	
Cross Section	Restoration Type		
	Enhancement II		



This map is not a survey and is not to be construed as such.

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Appendix A
Visual Assessment Data

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Visual Stream Morphology Stability Assessment										
Table 4. Seniard Mitigation Site - Seniard Reach 1A - Restoration PII										
Assessed Length 396 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, 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. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	4	4			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.	4	4			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	4	4			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment										
Seniard Mitigation Site - Seniard Reach 1B - Restoration PI										
Assessed Length 1274 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	19	19			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	19	19			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	19	19			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.	19	19			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	19	19			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Seniard Reach 2 - Restoration PI Assessed Length 176 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	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 : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Sitton Reach 1 - Restoration PI Assessed Length 1236 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	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	100%
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	96%
Totals					0	0	100%	N/A	N/A	96%
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	22	22			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	22	22			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	22	22			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment										
Seniard Mitigation Site - Lee Reach 1 - Restoration PII										
Assessed Length 226 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, 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. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	8	8			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.	8	8			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	8	8			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment										
Seniard Mitigation Site - David Reach 1A - Preservation										
Assessed Length 132 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.					N/A			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - David Reach 1B - Restoration PI&II Assessed Length 335 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	16	16			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	16	16			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	16	16			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	16	16			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	16	16			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - David Reach 1C - Restoration PI Assessed Length 273 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	7	7			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.	7	7			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Whitaker Reach 1 - Enhancement II Assessed Length 426 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.					N/A			






N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Redmond Reach 1A - Enhancement II Assessed Length 1054 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does <u>NOT</u> exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow.					N/A			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Redmond Reach 1B - Restoration PI Assessed Length 94 feet (Sept 28 and Oct 6, 2022)										
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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	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, calving, or collapse.			0	0	100%	N/A	N/A	N/A
Totals					0	0	100%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	6	6			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	6	6			100%			

N/A - Item does not apply.

Table 5. Vegetation Condition Assessment Seniard Mitigation Site Planted Acreage: 7.4 (Assessed April 6 and October 6, 2022)						
Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres		1	0.09	1.22%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres		0	0	0.00%
Total				1	0.09	1.22%
3. 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 acres	n/a	0	0	0.00%
Cumulative Total				1	0.09	1.22%
Easement Acreage:		11.8				
Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale). High Density	1000 SF		0	0	0.00%
	Areas or points (if too small to render as polygons at map scale). Low Density	1000 SF		3	0.22	1.86%
*5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none		2	0.098	0.83%

* Easement Encroachment Areas were not duplicated in the Low Stem Density Areas category.



Photo Point 1. Facing downstream



Photo Point 2. Facing downstream



Photo Point 2. Facing upstream

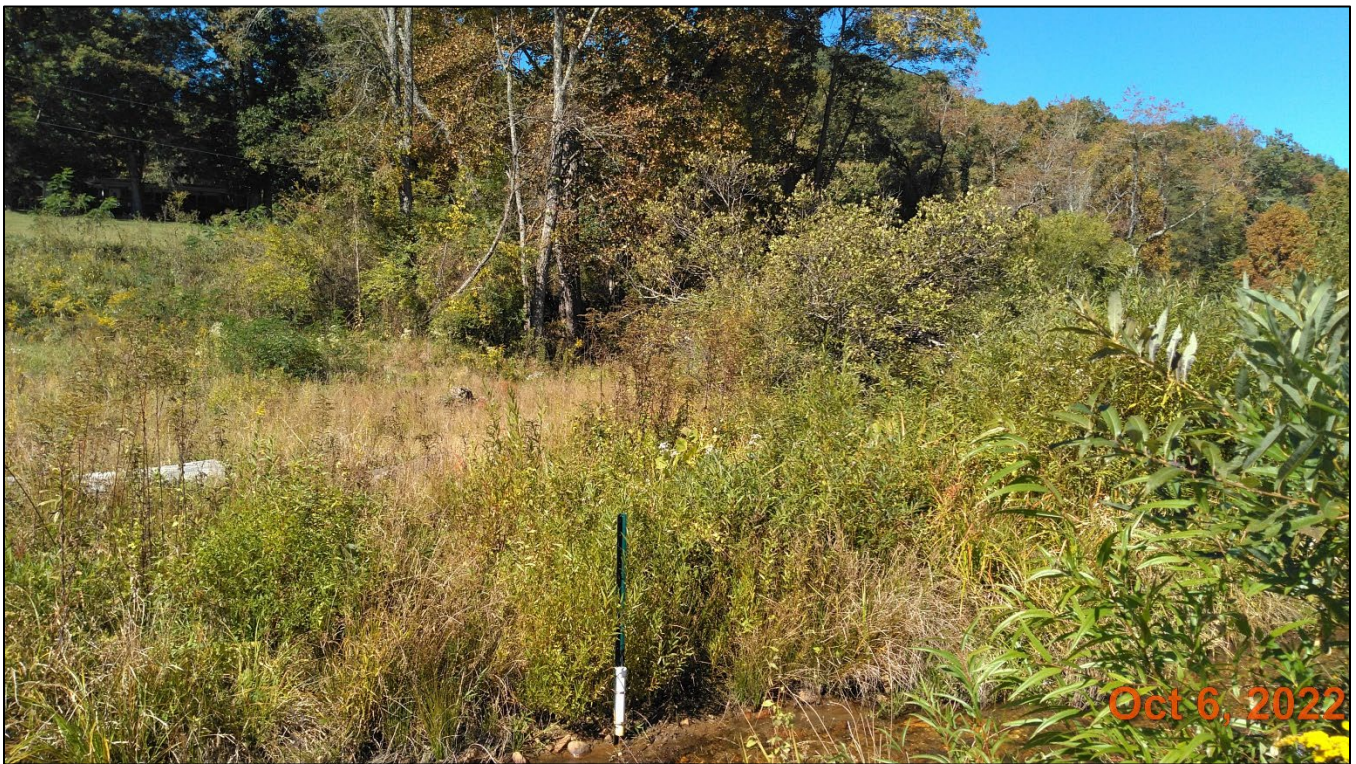


Photo Point 2.1 Seniard Creek Reach 1 Stage Recorder and Pre-existing Wetland.



Photo Point 3. Facing downstream



Photo Point 3. Facing upstream.



Photo Point 4. Facing downstream



Photo Point 4. Facing upstream.



Photo Point 4.1. Facing downstream



Photo Point 4.1. Facing upstream.



Photo Point 5. Facing downstream.



Photo Point 5. Facing upstream Seniard Creek



Photo Point 5. Facing upstream Sitton Creek and Redmond Br.



Photo Point 6. Facing downstream



Photo Point 6. Facing upstream



Photo Point 7. Facing upstream Lee Branch



Photo Point 7. Facing upstream Sitton Creek



Photo Point 7.1 Facing upstream David Branch.



Photo Point 7.2 Facing downstream Lee Branch.



Photo Point 7.2 Stage Recorder Lee Branch.



Photo Point 7.3 Facing downstream Sitton Branch culvert.



Photo Point 7.3 Facing upstream Sitton Branch culvert.



Photo Point 8. Facing downstream



Photo Point 8. Facing upstream



Photo Point 9. Facing downstream



Photo Point 9.1 David Branch 1B DS



Photo Point 9.1 David Branch 1B stage recorder.



Photo Point 9.3 David Branch 1B US.



Photo Point 9.3 David Branch 1B DS.



Photo Point 9.4 Facing downstream, David Branch.



Photo Point 9.4 David Branch 1C Stage Recorder.



Photo Point 10. Facing downstream.



Photo Point 10. Facing upstream.



Photo Point 11. Facing downstream.



Photo Point 12. Facing downstream.



Photo Point 12. Facing upstream.



Cross Section 1, Left descending bank.



Cross Section 1, Right descending bank



Cross Section 2, Left descending bank.



Cross Section 2, Right descending bank.



Cross Section 3, Left descending bank.



Cross Section 3, Right descending bank.



Cross Section 4, Left descending bank.



Cross Section 4, Right descending bank.



Cross Section 5 and 6, Left descending bank.



Cross Section 5 and 6, Right descending bank.



Cross Section 7, Left descending bank.



Cross Section 7, Right descending bank.



Cross Section 8, Left descending bank.



Cross Section 8, Right descending bank.



Cross Section 9, Left descending bank.



Cross Section 9, Right descending bank.



Cross Section 10, Left descending bank.



Cross Section 10, Right descending bank.



Cross Section 11, Left descending bank.



Cross Section 11, Right descending bank.



Cross Section 12, Left descending bank.



Cross Section 12, Right descending bank.



Cross Section 13, Left descending bank.



Cross Section 13, Right descending bank.



Cross Section 14, Left descending bank.



Cross Section 14, Right descending bank.



Cross Section 15, Left descending bank.



Cross Section 15, Right descending bank.



Cross Section 16, Left descending bank.



Cross Section 16, Right descending bank.

Problem Areas



MY1 (2021) Sitton Creek Station 211+25 facing downstream.



MY2 (2022) Sitton Creek Station 211+25 facing upstream.



MY1 (2021) Lee Branch Station 300+25 facing upstream.



MY2 (2022) Lee Branch Station 300+25 facing upstream.

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Appendix B

Vegetation Plot Data

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https://ncdms.shinyapps.io/Veg_Table_Tool/

Planted Acreage	7.4
Date of Initial Plant	2021-02-26
Date(s) of Supplemental Plant(s)	2022-02-25
Date(s) Mowing	N/A
Date of Current Survey	2022-10-06
Plot size (ACRES)	0.0247

**Table 6. Vegetation Plot Data
Seniard Creek Mitigation Site MY2 (2022)**

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot 10 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Alnus serrulata</i>	hazel alder	Tree	OBL	1	1	2	2	2	2	4	4	3	3					4	4			2	6
	<i>Betula nigra</i>	river birch	Tree	FACW	1	1					3	3							2	2	1	1	1	2
	<i>Carpinus caroliniana</i>	American hornbeam	Tree	FAC			2	2					1	1										
	<i>Cornus amomum</i>	silky dogwood	Shrub	FACW											3	3			4	4	1	1		
	<i>Diospyros virginiana</i>	common persimmon	Tree	FAC	1	1	2	2									2	2					1	1
	<i>Hamamelis virginiana</i>	American witchhazel	Tree	FACU	2	2	1	1					1	1										
	<i>Ilex opaca</i>	American holly	Tree	FACU																	2	2		
	<i>Ilex verticillata</i>	common winterberry	Tree	FACW	1	1	1	1	1	1	3	3							1	1				
	<i>Liriodendron tulipifera</i>	tuliptree	Tree	FACU							1	1					3	6			4	4		
	<i>Nyssa sylvatica</i>	blackgum	Tree	FAC													1	1						
	<i>Platanus occidentalis</i>	American sycamore	Tree	FACW	4	4	1	1	2	2			1	1										
	<i>Quercus rubra</i>	northern red oak	Tree	FACU																	2	2		
<i>Quercus sp.</i>								1	1			1	1											
<i>Salix nigra</i>	black willow	Tree	OBL	1	6					1	1			1	11									
<i>Salix sericea</i>	silky willow	Shrub	OBL	1	1	1	1	2	2	1	1	3	3											
Sum	Performance Standard				12	17	10	10	8	8	13	13	10	10	4	14	6	9	11	11	10	10	4	9
Post Mitigation Plan Species	<i>Acer rubrum</i>	red maple	Tree	FAC							1						2		2				1	
	<i>Carya tomentosa</i>	mockernut hickory	Tree													1	1							
	<i>Quercus imbricaria</i>	shingle oak	Tree	FAC			1	1					1	1			2	2						
Sum	Proposed Standard			12	17	11	11	8	8	13	13	11	11	4	14	9	12	11	11	10	10	4	9	
Invasives	<i>Ligustrum sp.</i>																				1			
Mitigation Plan Performance Standard	Current Year Stem Count				17		10		8		13		10		14		9		11		10		9	
	Stems/Acre				688		405		324		526		405		405		364		445		405		324	
	Species Count				8		7		5		6		6		2		3		4		5		3	
	Dominant Species Composition (%)				35		18		25		29		27		79		43		31		36		60	
	Average Plot Height (ft.)				2		1		2		2		2		4		1		2		1		1	
	% Invasives				0		0		0		0		0		0		0		0		9		0	
Post Mitigation Plan Performance Standard	Current Year Stem Count				17		11		8		13		11		14		12		11		10		9	
	Stems/Acre				688		445		324		526		445		405		486		445		405		324	
	Species Count				8		8		5		6		7		2		5		4		5		3	
	Dominant Species Composition (%)				35		18		25		29		27		79		43		31		36		60	
	Average Plot Height (ft.)				2		1		2		2		2		4		1		2		1		1	
	% Invasives				0		0		0		0		0		0		0		0		9		0	

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.

2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded), species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).

3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

**Table 7. Vegetation Performance Standards Summary Table
Seniard Creek Mitigation Site MY2 (2022)**

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	688		8	0	405		7	0	324		5	0
Monitoring Year 1	526		8	0	405		8	0	364		6	0
Monitoring Year 0	607		10	0	607		9	0	648		9	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	526		6	0	405		6	0	405		2	0
Monitoring Year 1	526		6	0	486		8	0	405		4	0
Monitoring Year 0	526		7	0	688		9	0	567		5	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	364		3	0	445		4	0	405		5	9
Monitoring Year 1	486		4	0	243		3	0	162		3	0
Monitoring Year 0	405		4	0	648		6	0	364		5	0
	Veg Plot 10 F											
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives								
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	324		3	0								
Monitoring Year 1	405		6	0								
Monitoring Year 0	405		6	0								

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Vegetation Plot Photos



Vegetation Monitoring Plot 1



Vegetation Monitoring Plot 2



Vegetation Monitoring Plot 3



Vegetation Monitoring Plot 4



Vegetation Monitoring Plot 5



Vegetation Monitoring Plot 6



Vegetation Monitoring Plot 7



Vegetation Monitoring Plot 8



Vegetation Monitoring Plot 9

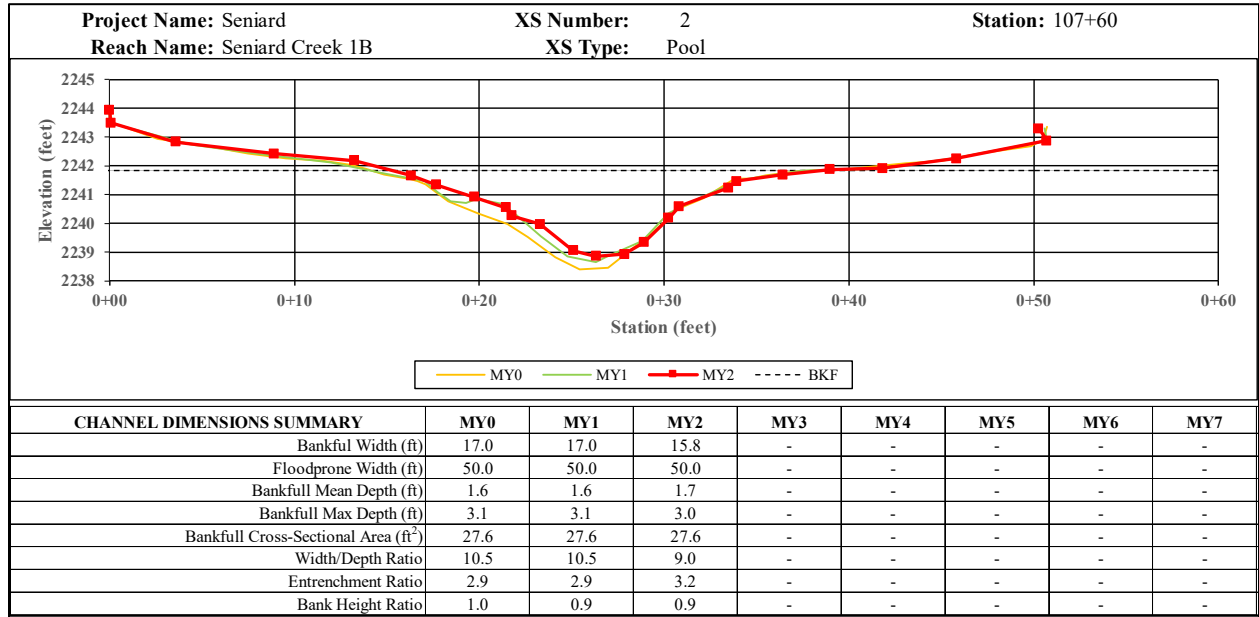
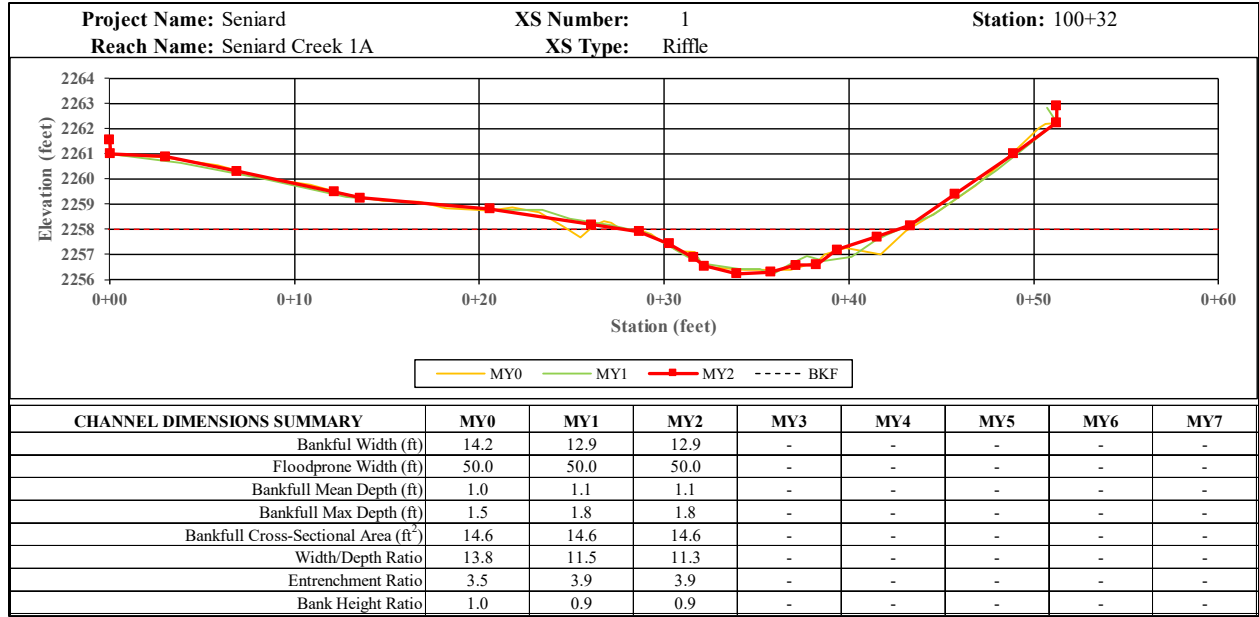


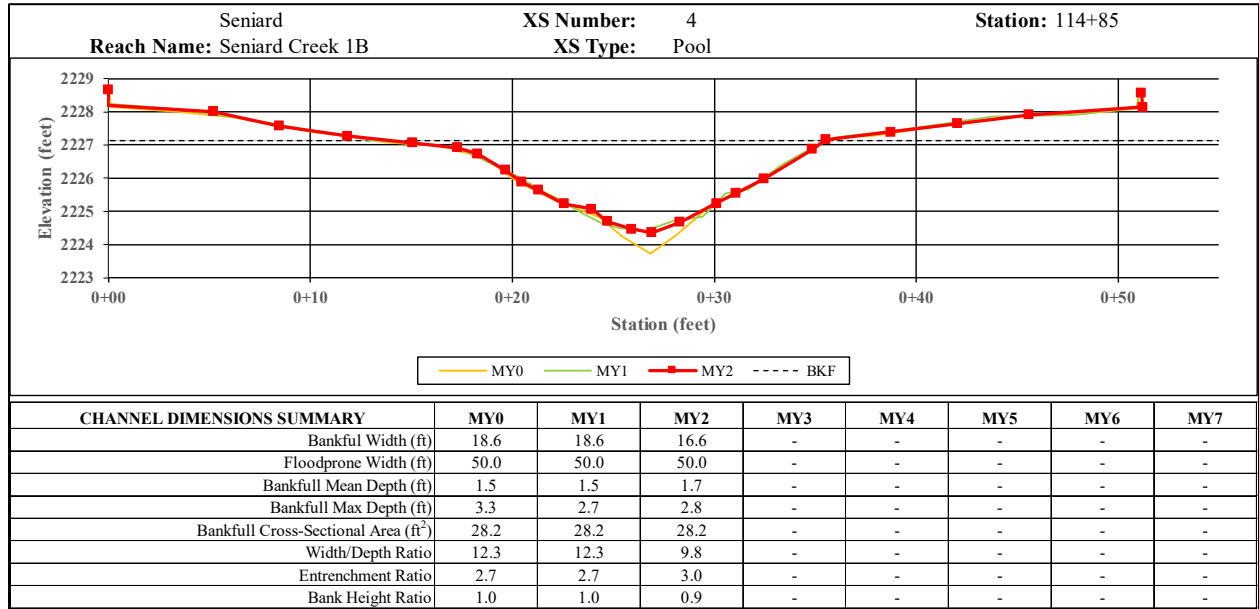
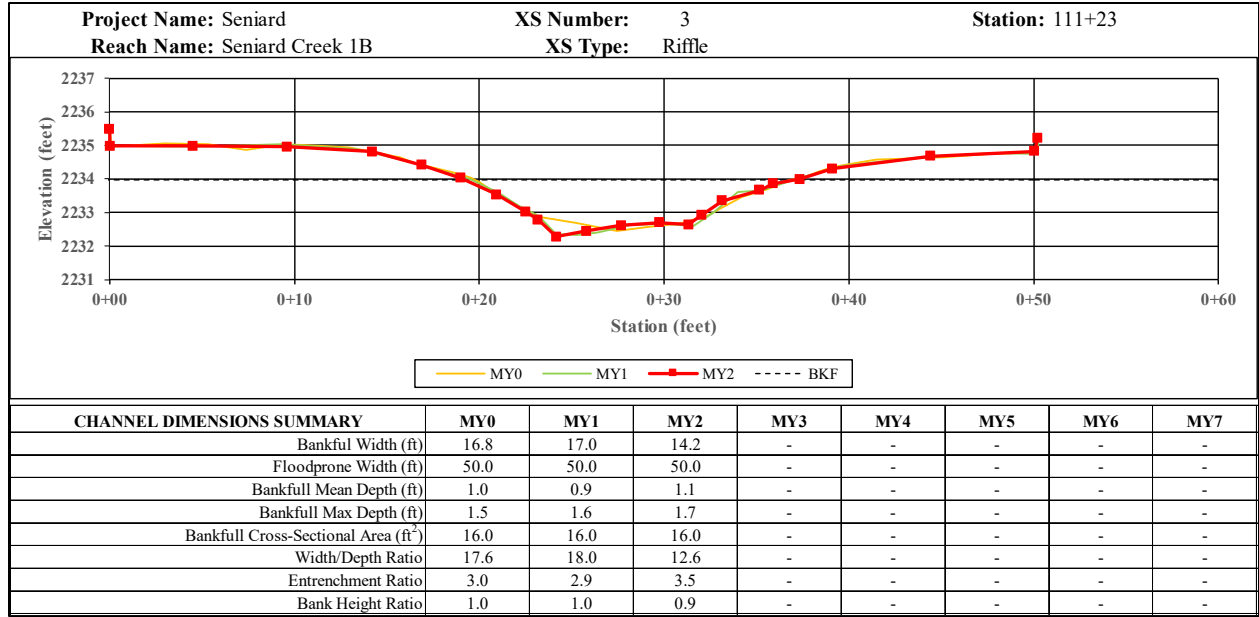
Vegetation Monitoring Plot 10

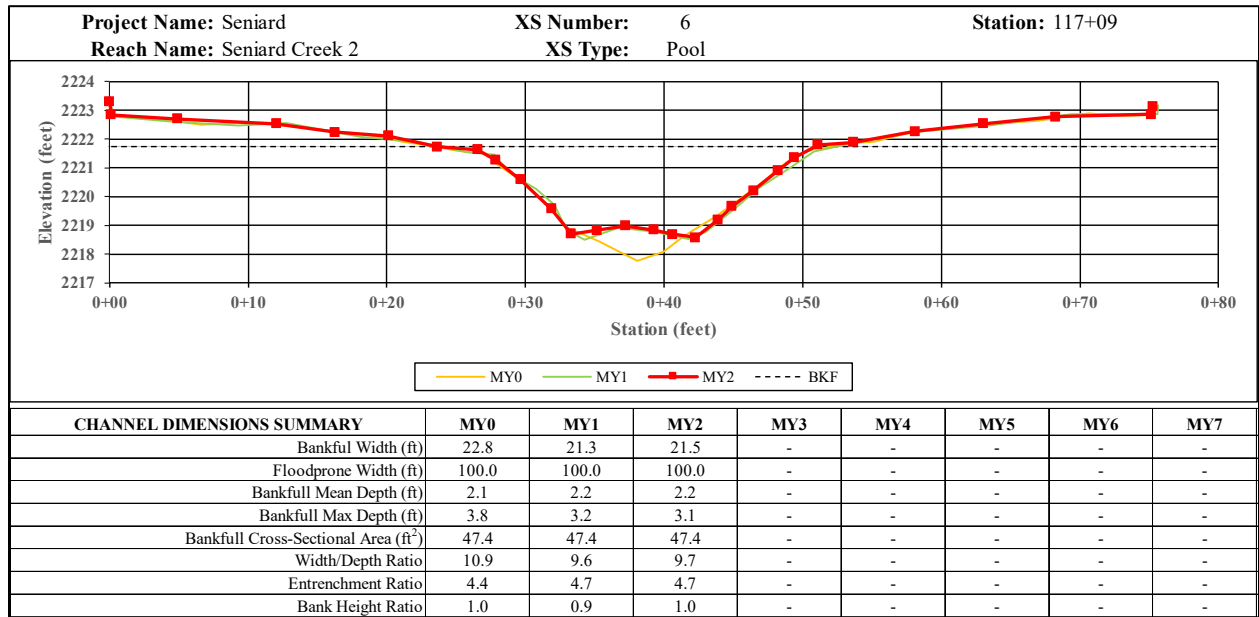
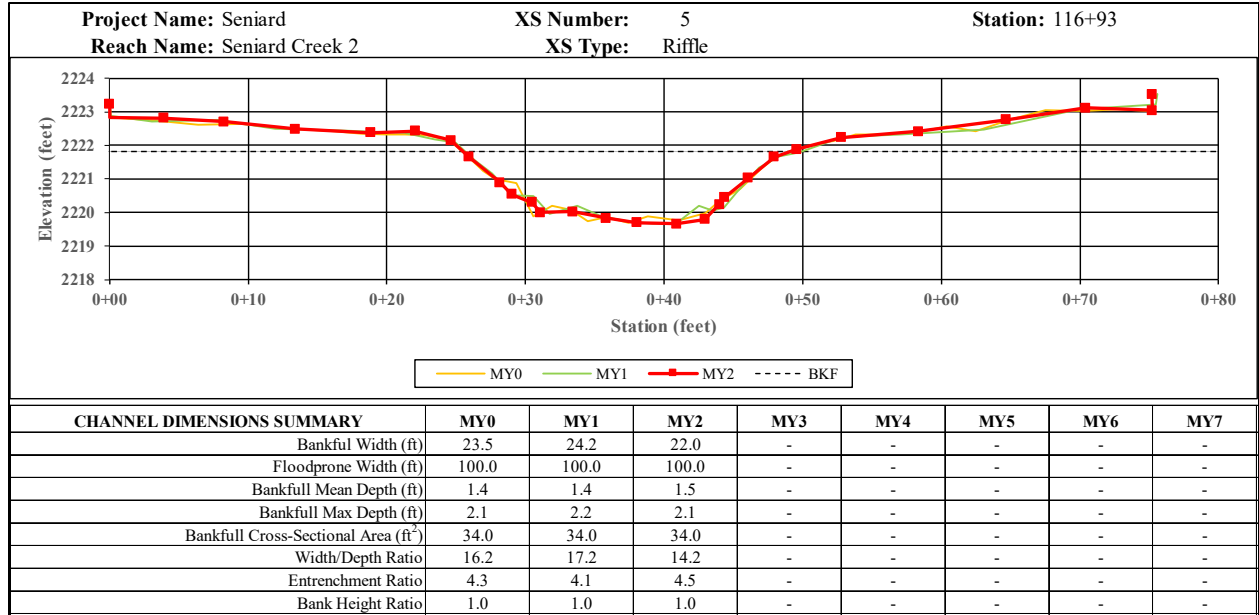
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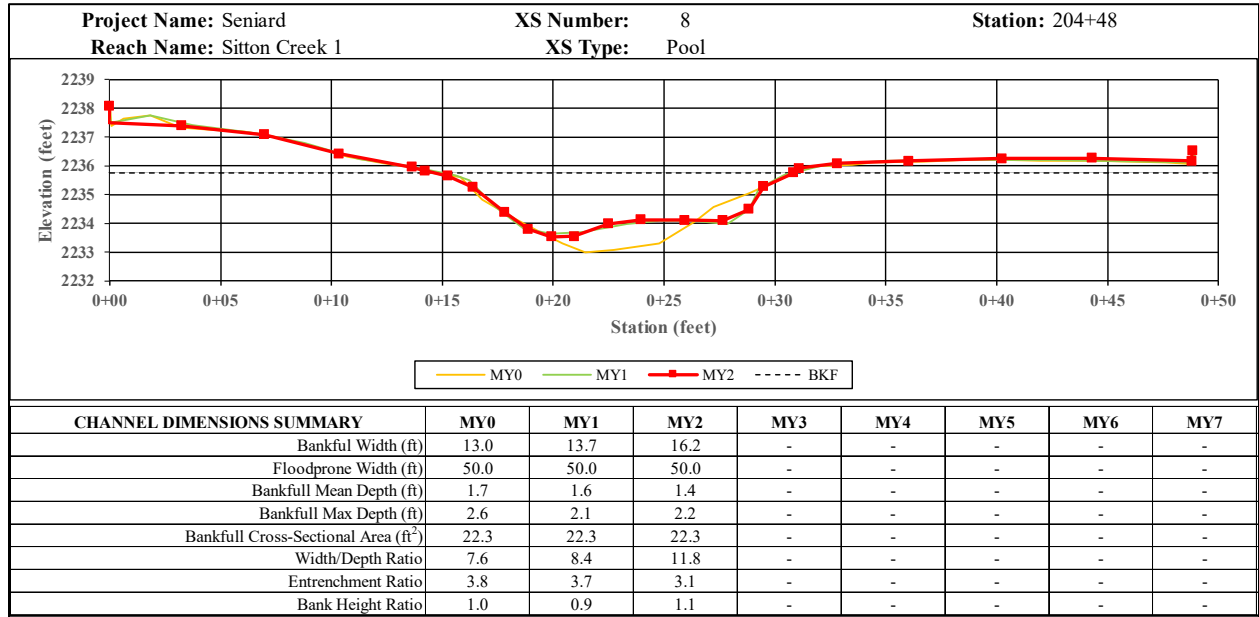
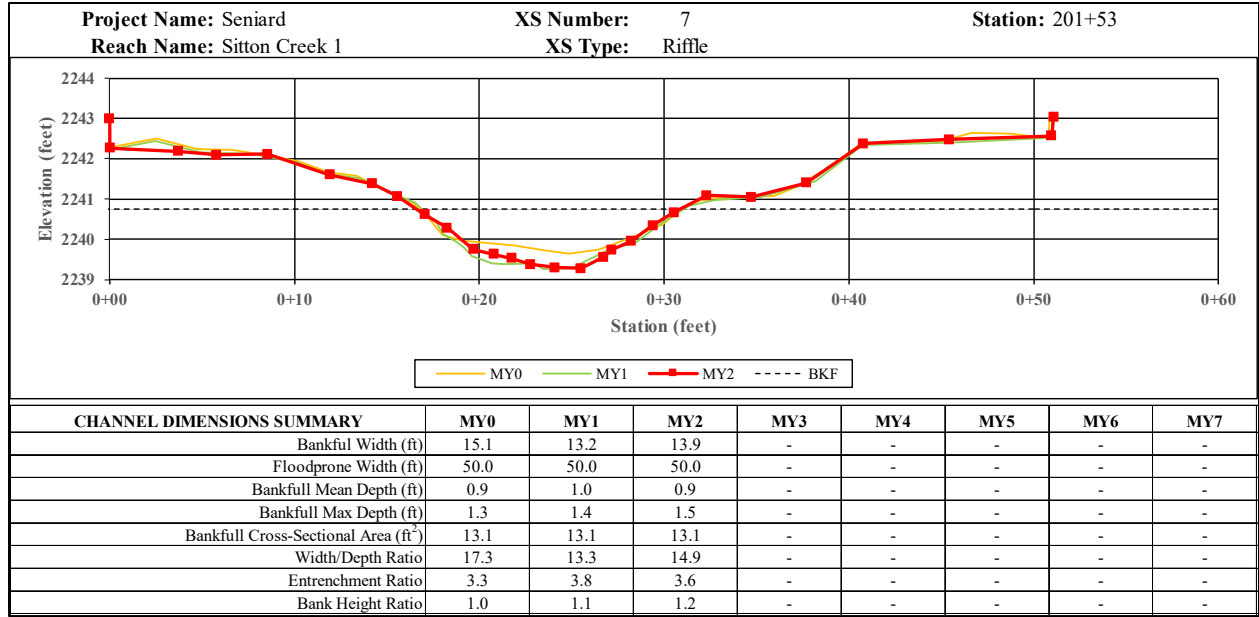
Appendix C
Stream Geomorphology Data

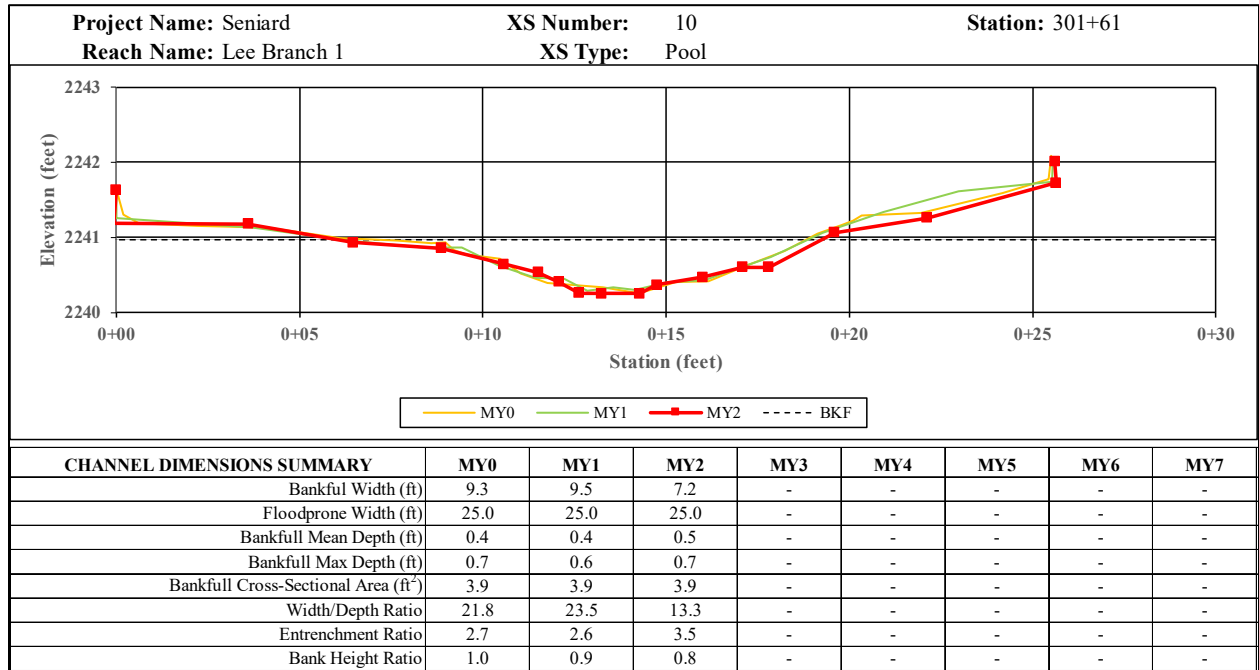
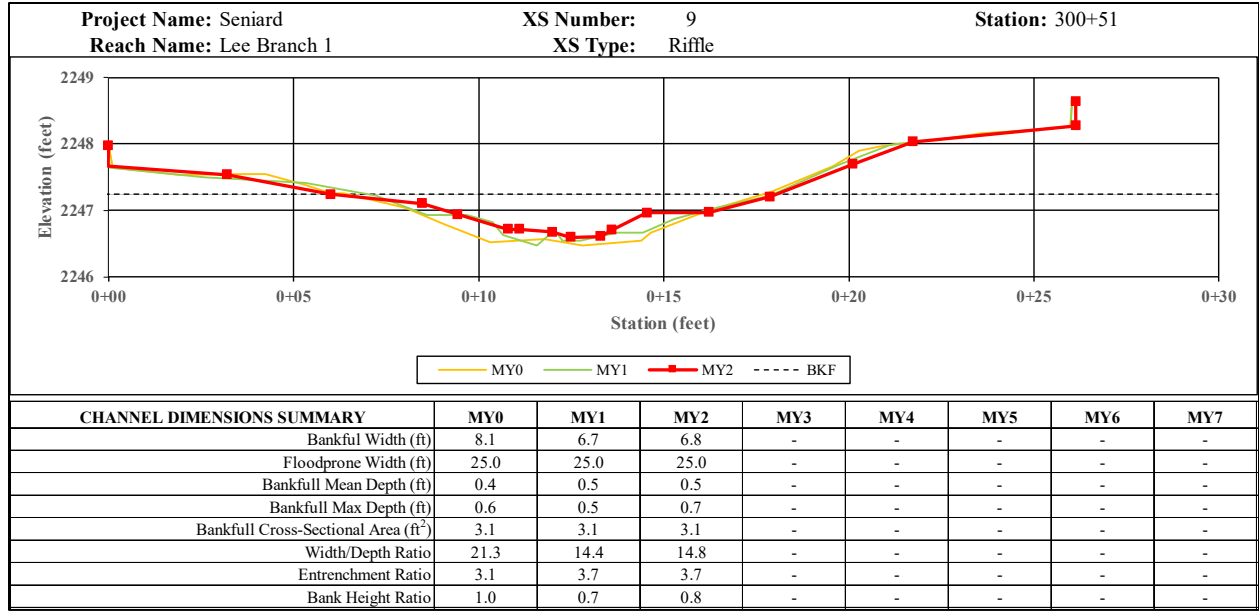
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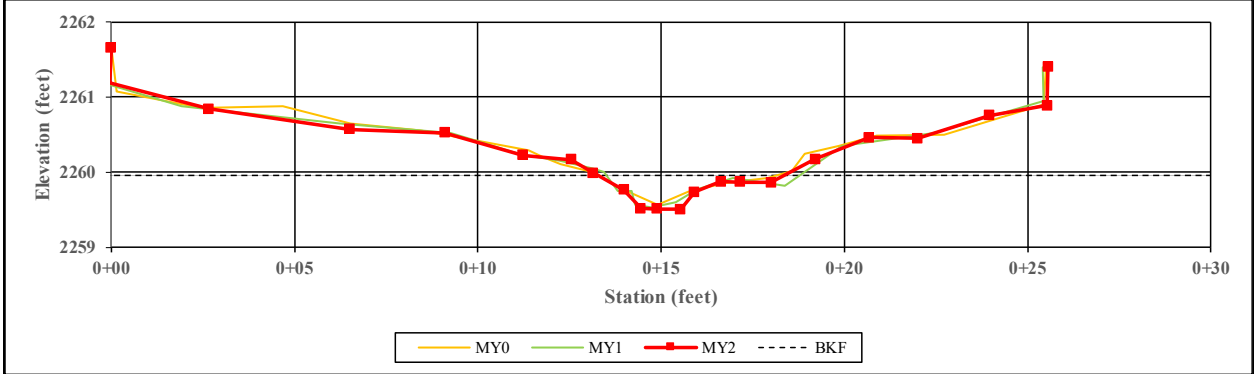






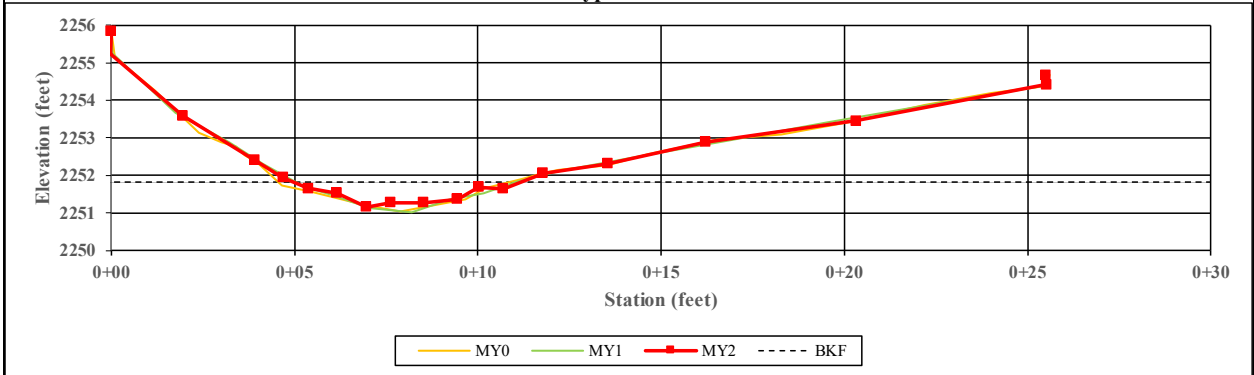


Project Name: Seniard **XS Number:** 11 **Station:** 402+31
Reach Name: David Branch 1B **XS Type:** Riffle



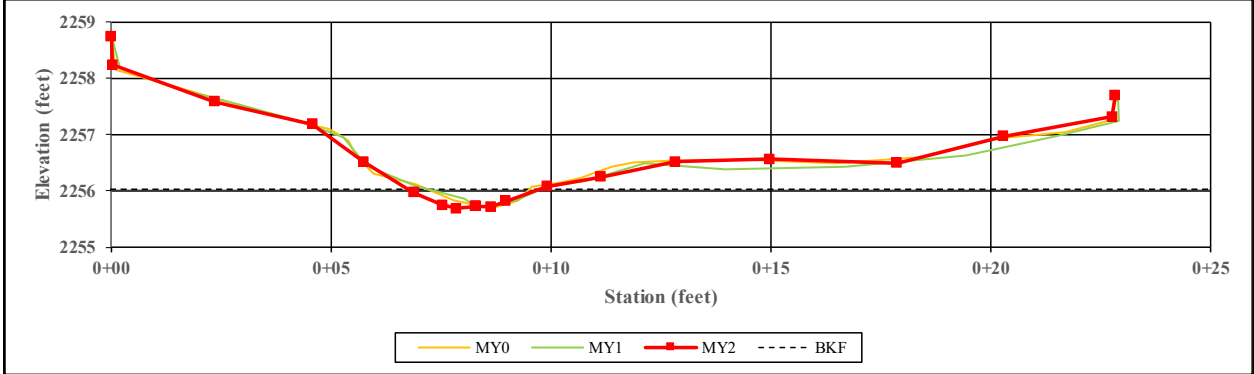
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.7	3.0	4.0	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.2	0.3	0.2	-	-	-	-	-
Bankfull Max Depth (ft)	0.4	0.5	0.5	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	1.0	1.0	1.0	-	-	-	-	-
Width/Depth Ratio	22.2	9.1	16.1	-	-	-	-	-
Entrenchment Ratio	2.1	3.3	2.5	-	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	-	-	-	-	-

Project Name: Seniard **XS Number:** 12 **Station:** 403+24
Reach Name: David Branch 1B **XS Type:** Pool



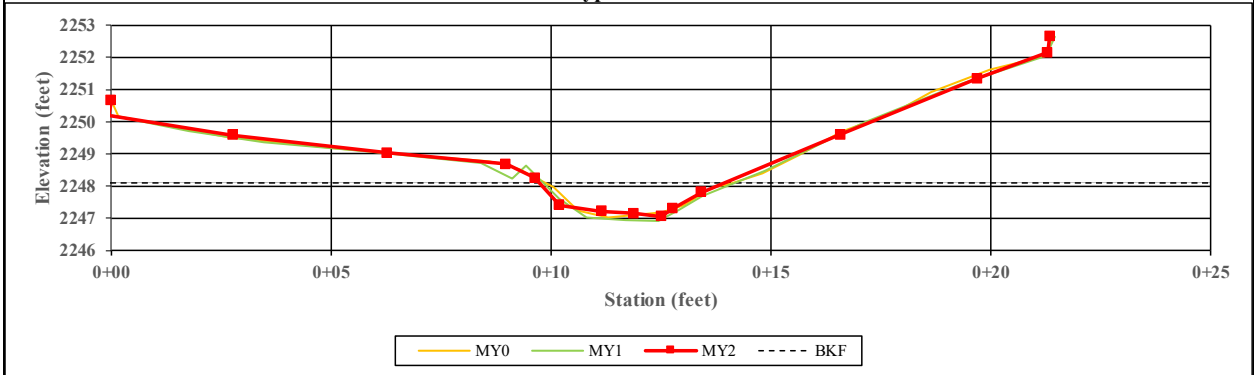
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.8	4.1	4.1	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.5	0.5	-	-	-	-	-
Bankfull Max Depth (ft)	0.6	0.7	0.6	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	1.9	1.9	1.9	-	-	-	-	-
Width/Depth Ratio	12.3	9.0	8.9	-	-	-	-	-
Entrenchment Ratio	2.1	2.4	2.5	-	-	-	-	-
Bank Height Ratio	1.0	1.0	0.8	-	-	-	-	-

Project Name: Seniard **XS Number:** 13 **Station:** 601+41
Reach Name: Whitaker Branch 1 **XS Type:** Riffle



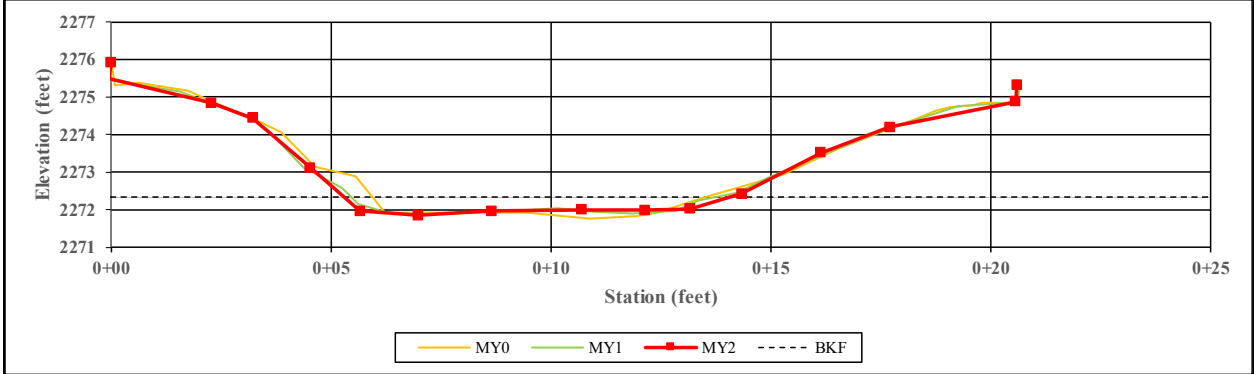
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	1.8	1.8	2.1	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.3	-	-	-	-	-
Bankfull Max Depth (ft)	0.4	0.4	0.3	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	0.5	0.5	0.5	-	-	-	-	-
Width/Depth Ratio	6.1	6.7	8.1	-	-	-	-	-
Entrenchment Ratio	5.6	5.5	4.8	-	-	-	-	-
Bank Height Ratio	1.0	0.9	1.1	-	-	-	-	-

Project Name: Seniard **XS Number:** 14 **Station:** 602+64
Reach Name: Whitaker Branch 1 **XS Type:** Pool



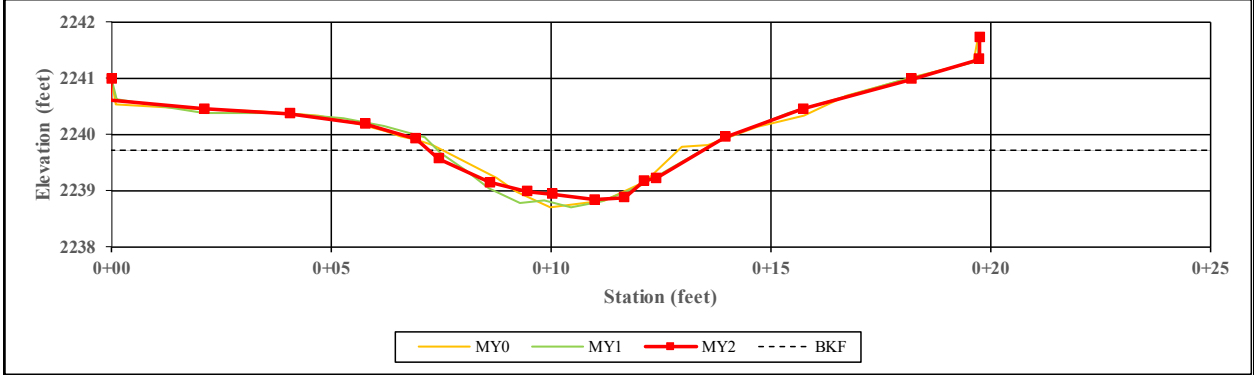
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	3.5	3.3	2.6	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.7	0.9	-	-	-	-	-
Bankfull Max Depth (ft)	0.9	0.9	1.0	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	2.3	2.3	2.3	-	-	-	-	-
Width/Depth Ratio	5.2	4.5	2.9	-	-	-	-	-
Entrenchment Ratio	2.9	3.1	3.9	-	-	-	-	-
Bank Height Ratio	1.0	0.8	0.7	-	-	-	-	-

Project Name: Seniard **XS Number:** 15 **Station:** 702+67
Reach Name: Redmond Branch 1A **XS Type:** Riffle



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.2	7.7	7.5	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	-	-	-	-	-
Bankfull Max Depth (ft)	0.5	0.4	0.5	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	2.8	2.8	2.8	-	-	-	-	-
Width/Depth Ratio	18.7	21.4	20.0	-	-	-	-	-
Entrenchment Ratio	1.4	1.3	1.3	-	-	-	-	-
Bank Height Ratio	1.0	0.8	0.8	-	-	-	-	-

Project Name: Seniard **XS Number:** 16 **Station:** 709+81
Reach Name: Redmond Branch 1A **XS Type:** Pool



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.2	4.5	5.0	-	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	-	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	-	-	-	-	-
Bankfull Max Depth (ft)	1.1	1.0	0.9	-	-	-	-	-
Bankfull Cross-Sectional Area (ft ²)	3.2	3.2	3.2	-	-	-	-	-
Width/Depth Ratio	5.5	6.5	7.6	-	-	-	-	-
Entrenchment Ratio	2.4	2.2	2.0	-	-	-	-	-
Bank Height Ratio	1.0	1.1	1.2	-	-	-	-	-

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Table 9. Baseline Stream Data Summary Seniard Creek - Seniard Creek Reach 1A							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Riffle Only							
*Bankfull Width (ft)	10.7	-	-	13	-	17.4	14.2
*Floodprone Width (ft)	-	-	-	-	-	-	50.0
*Bankfull Mean Depth (ft)	0.8	-	-	1.2	-	1.1	1.0
*Bankfull Max Depth (ft)	-	-	-	-	-	1.4	1.5
*Bankfull Cross Sectional Area (ft ²)	8.3	-	-	15.3	-	18.3	14.6
*Width/Depth Ratio	11.1	-	-	13.8	-	16.5	13.8
*Entrenchment Ratio	1.1	-	-	1.3	-	1.4	3.5
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						G/F	B
Bankfull Discharge (cfs)						68	-
Sinuosity (ft)						1.03	1.03
Water Surface Slope (Channel) (ft/ft)						0.04	0.025
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seniard Creek - Seniard Creek Reach 1B							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Riffle Only							
*Bankfull Width (ft)	8.0	-	-	11.4	-	17.6	16.8
*Floodprone Width (ft)	-	-	-	-	-	-	50.0
*Bankfull Mean Depth (ft)	1.0	-	-	1.3	-	1.1	1.0
*Bankfull Max Depth (ft)	-	-	-	-	-	1.4	1.5
*Bankfull Cross Sectional Area (ft ²)	8.7	-	-	13.7	-	18.7	16.0
*Width/Depth Ratio	6.0	-	-	9.8	-	16.6	17.6
*Entrenchment Ratio	1.0	-	-	1.8	-	1.4	3.0
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						G	B
Bankfull Discharge (cfs)						70	-
Sinuosity (ft)						1.08	1.07
Water Surface Slope (Channel) (ft/ft)						0.022	0.02
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seniard Creek - Seniard Creek Reach 2							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Riffle Only							
*Bankfull Width (ft)	10.0	-	-	10.2	-	22.5	24.2
*Floodprone Width (ft)	-	-	-	-	-	-	100.0
*Bankfull Mean Depth (ft)	1.0	-	-	1.3	-	1.3	1.4
*Bankfull Max Depth (ft)	-	-	-	-	-	1.6	2.2
*Bankfull Cross Sectional Area (ft ²)	10.6	-	-	13.1	-	28.2	34.0
*Width/Depth Ratio	7.6	-	-	9.8	-	17.9	17.2
*Entrenchment Ratio	1.4	-	-	1.6	-	1.1	4.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						G	B
Bankfull Discharge (cfs)						113	-
Sinuosity (ft)						1.13	1.03
Water Surface Slope (Channel) (ft/ft)						0.017	0.013
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Sitton Creek Reach							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
*Bankfull Width (ft)	6.4	-	-	11.4	2	15.6	15.1
*Floodprone Width (ft)	11	-	-	21	2	-	50.0
*Bankfull Mean Depth (ft)	0.8	-	-	1.1	2	1.0	0.9
*Bankfull Max Depth (ft)	0.7	-	-	1.2	2	1.3	1.3
*Bankfull Cross Sectional Area (ft ²)	7.2	-	-	8.9	2	15.3	13.1
*Width/Depth Ratio	5.7	-	-	14.6	2	16.0	17.3
*Entrenchment Ratio	1.7	-	-	1.8	2	2.0	3.3
*Bank Height Ratio	3.6	-	-	5.9	2	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						G	B
Bankfull Discharge (cfs)						55	-
Sinuosity (ft)						1.09	1.07
Water Surface Slope (Channel) (ft/ft)						0.018	0.015
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Lee Branch Reach							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
*Bankfull Width (ft)	1.8	-	-	1.8	-	7.8	8.1
*Floodprone Width (ft)	-	-	-	-	-	-	25.0
*Bankfull Mean Depth (ft)	0.8	-	-	0.8	-	0.3	0.4
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.6
*Bankfull Cross Sectional Area (ft ²)	1.3	-	-	1.3	-	2.4	3.1
*Width/Depth Ratio	2.5	-	-	2.5	-	25.8	21.3
*Entrenchment Ratio	1.8	-	-	1.8	-	1.5	3.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						G	B
Bankfull Discharge (cfs)						3	-
Sinuosity (ft)						1.04	1.07
Water Surface Slope (Channel) (ft/ft)						0.048	0.029
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1A							
Parameter	Pre-Existing Condition (if applicable)					Design	Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
Bankfull Width (ft)	-	-	-	-	-	7.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Cross Sectional Area (ft ²)	-	-	-	-	-	2.4	-
Width/Depth Ratio	-	-	-	-	-	25.8	-
Entrenchment Ratio	-	-	-	-	-	1.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						B	-
Bankfull Discharge (cfs)						-	-
Sinuosity (ft)						1.08	1.08
Water Surface Slope (Channel) (ft/ft)						0.135	-
Other						-	-

" - " denotes information is either not available or not applicable

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1B							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
*Bankfull Width (ft)	6	-	-	8.4	-	7.8	4.7
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	0.5	-	-	0.6	-	0.3	0.2
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.4
*Bankfull Cross Sectional Area (ft ²)	2.9	-	-	4.7	-	2.4	1.0
*Width/Depth Ratio	12.6	-	-	15.2	-	25.8	22.2
*Entrenchment Ratio	1.8	-	-	2.0	-	1.9	2.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	1					-	-
Sinuosity (ft)	1.04					1.03	1.02
Water Surface Slope (Channel) (ft/ft)	0.05					0.07	0.08
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1C							
Parameter	Pre-Existing Condition (if applicable)					Design	Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
Bankfull Width (ft)	7.8	-	-	7.8	-	7.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	0.3	-	-	0.3	-	0.3	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Cross Sectional Area (ft ²)	2.6	-	-	2.6	-	2.4	-
Width/Depth Ratio	23.3	-	-	23.3	-	25.8	-
Entrenchment Ratio	1.3	-	-	1.3	-	1.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	4					-	-
Sinuosity (ft)	1.03					1.1	1.05
Water Surface Slope (Channel) (ft/ft)	0.058					0.051	0.052
Other						-	-

" - " denotes information is either not available or not applicable

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Whitaker Branch Reach 1A							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Rifle Only							
*Bankfull Width (ft)	-	-	-	-	-	7.8	1.8
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	0.3
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.4
*Bankfull Cross Sectional Area (ft ²)	-	-	-	-	-	2.4	0.5
*Width/Depth Ratio	-	-	-	-	-	25.8	6.1
*Entrenchment Ratio	-	-	-	-	-	1.5	5.6
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						B	B
Bankfull Discharge (cfs)						-	-
Sinuosity (ft)						1.0	1.05
Water Surface Slope (Channel) (ft/ft)						0.082	
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Redmond Branch Reach 1A							
Parameter	Pre-Existing Condition (if applicable)					Design	*Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Riffle Only							
*Bankfull Width (ft)	-	-	-	-	-	7.8	7.2
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	0.4
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.5
*Bankfull Cross Sectional Area (ft ²)	-	-	-	-	-	2.4	2.8
*Width/Depth Ratio	-	-	-	-	-	25.8	18.7
*Entrenchment Ratio	-	-	-	-	-	2.6	1.4
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						B	B
Bankfull Discharge (cfs)						-	-
Sinuosity (ft)						1.2	1.2
Water Surface Slope (Channel) (ft/ft)						0.05	
Other						-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Redmond Branch Reach 1B							
Parameter	Pre-Existing Condition (if applicable)					Design	Monitoring Baseline (MY0)
	Min	Mean	Med	Max	n		
Riffle Only							
Bankfull Width (ft)	-	-	-	-	-	6.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.8	-
Bankfull Cross Sectional Area (ft ²)	-	-	-	-	-	3.6	-
Width/Depth Ratio	-	-	-	-	-	12.8	-
Entrenchment Ratio	-	-	-	-	-	2.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification						B	-
Bankfull Discharge (cfs)						-	-
Sinuosity (ft)						1.06	1.08
Water Surface Slope (Channel) (ft/ft)						0.05	0.040
Other						-	-

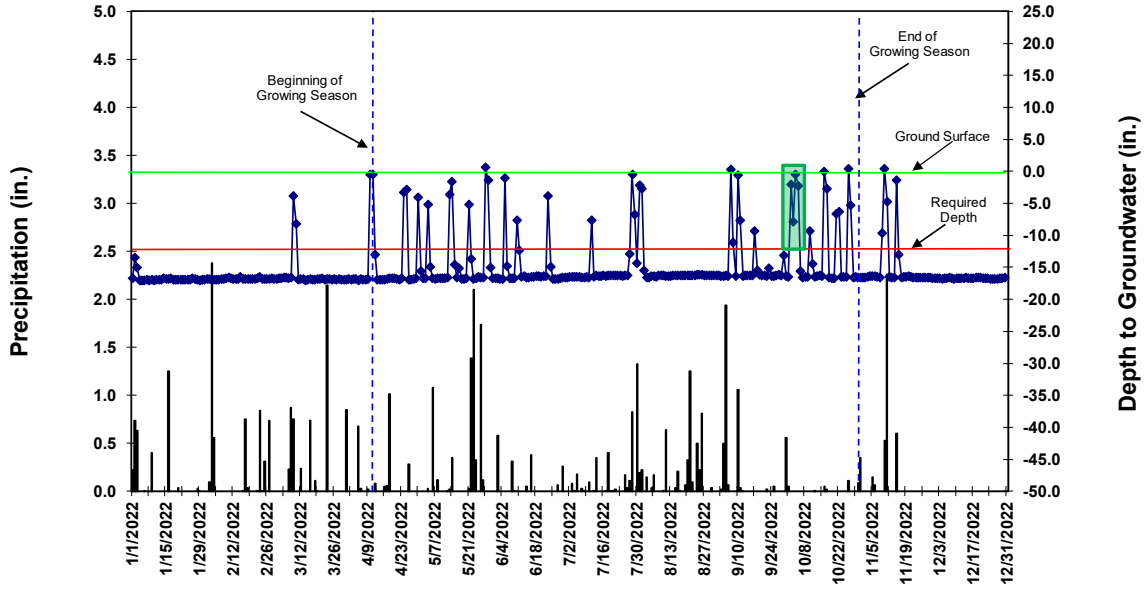
" - " denotes information is either not available or not applicable

Appendix D

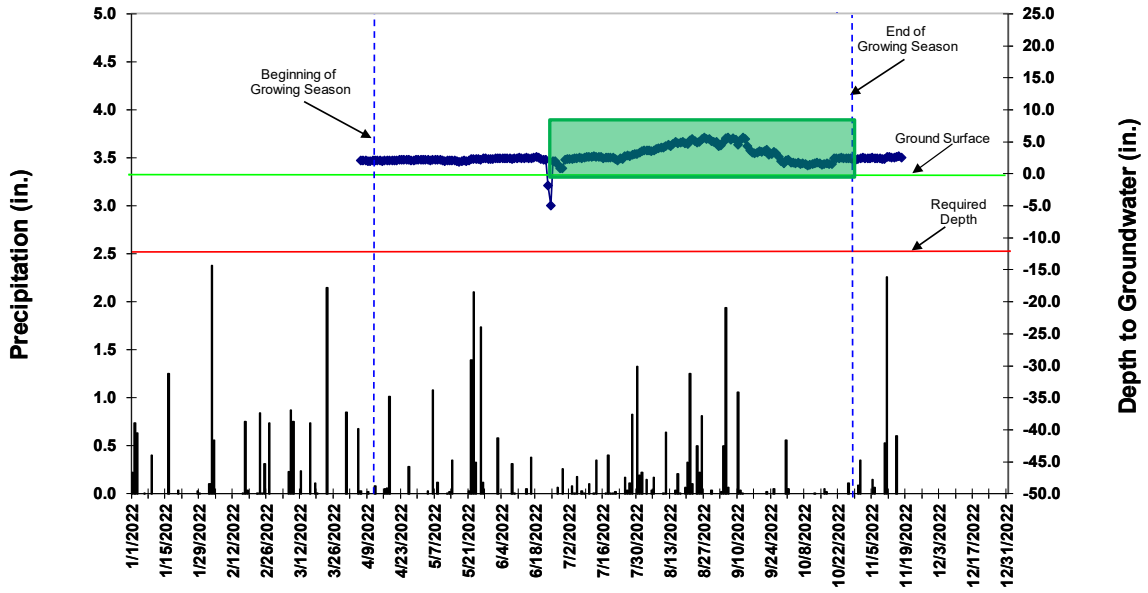
Hydrologic Data

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Gauge ID: **GG1** Reported Growing Season Days: 201
 Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **4** 10/02-10/05
 Percentage of Growing Season Water Table within 12 inches of Soil Surface: **2%**



Gauge ID: **GG2** Reported Growing Season Days: 201
 Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **201** 07/10-10/26
 Percentage of Growing Season Water Table within 12 inches of Soil Surface: **100%**



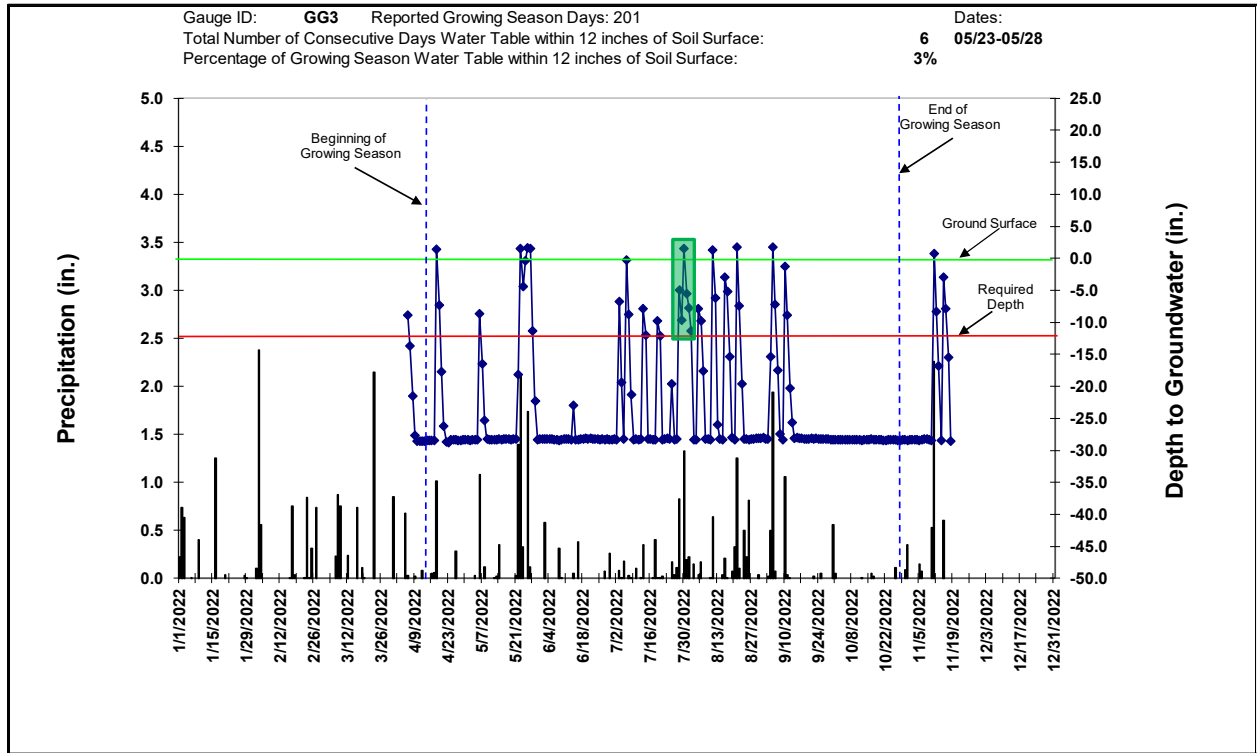


Table 10. Groundwater Gage Summary Table.

Monitoring Gauge	Typical Performance Standard: 12 % WETS Station: Asheville 13S Growing Season: 4/9 to 10/26 (201 days) Max. Consecutive Hydroperiod (%) and number of consecutive days (n)													
	MY-1 (2021)		MY-2 (2022)		MY-3 (2023)		MY-4 (2024)		MY-5 (2025)		MY-6 (2026)		MY-7 (2027)	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
GG-1	4	9	2	4	-	-	-	-	-	-	-	-	-	-
GG-2	55	110	100	201	-	-	-	-	-	-	-	-	-	-
GG-3	5	10	3	6	-	-	-	-	-	-	-	-	-	-

* Typical performance standard for groundwater gauges is 12 percent (24 days), however wetland credits are not a part of this project.

Exceeds requirements by 10%	Fails to meet requirements, by less than 10%
Exceeds requirements, but by less than 10%	Fails to meet requirements by more than 10%

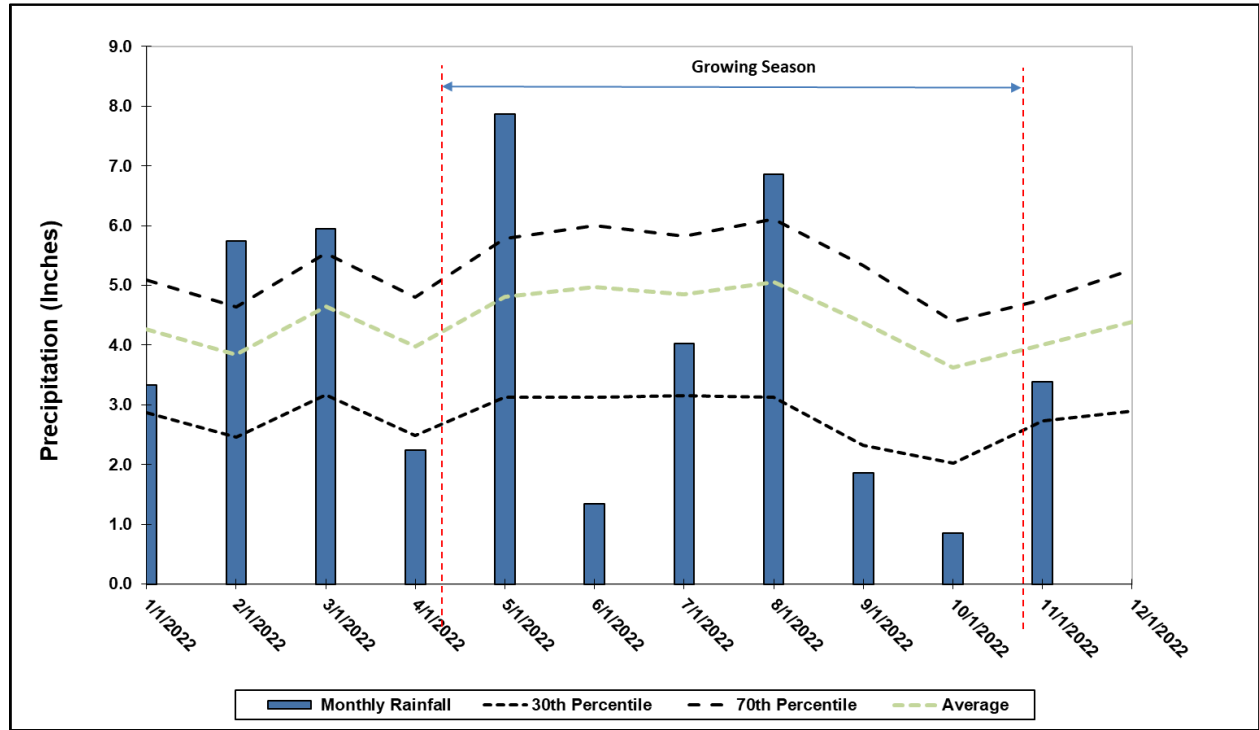
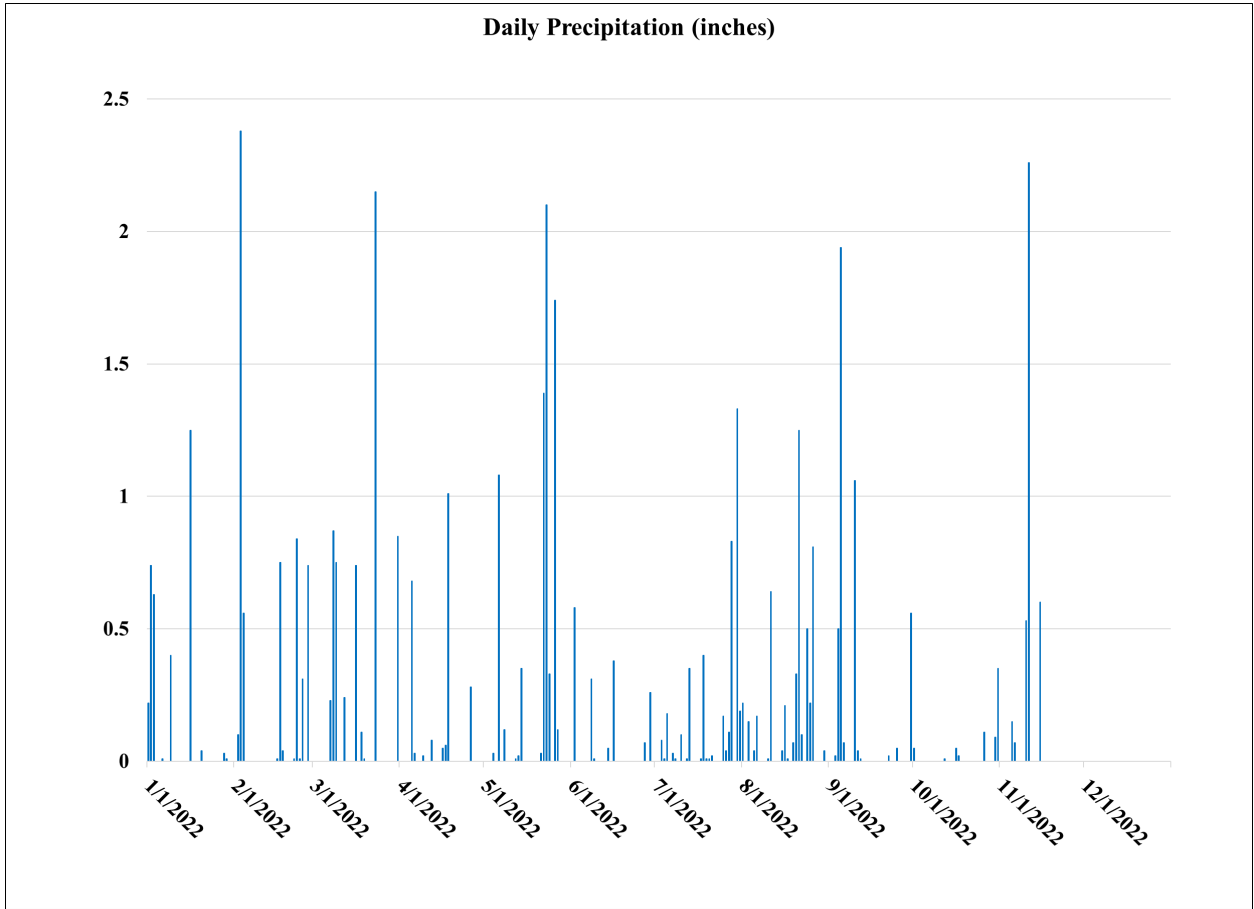
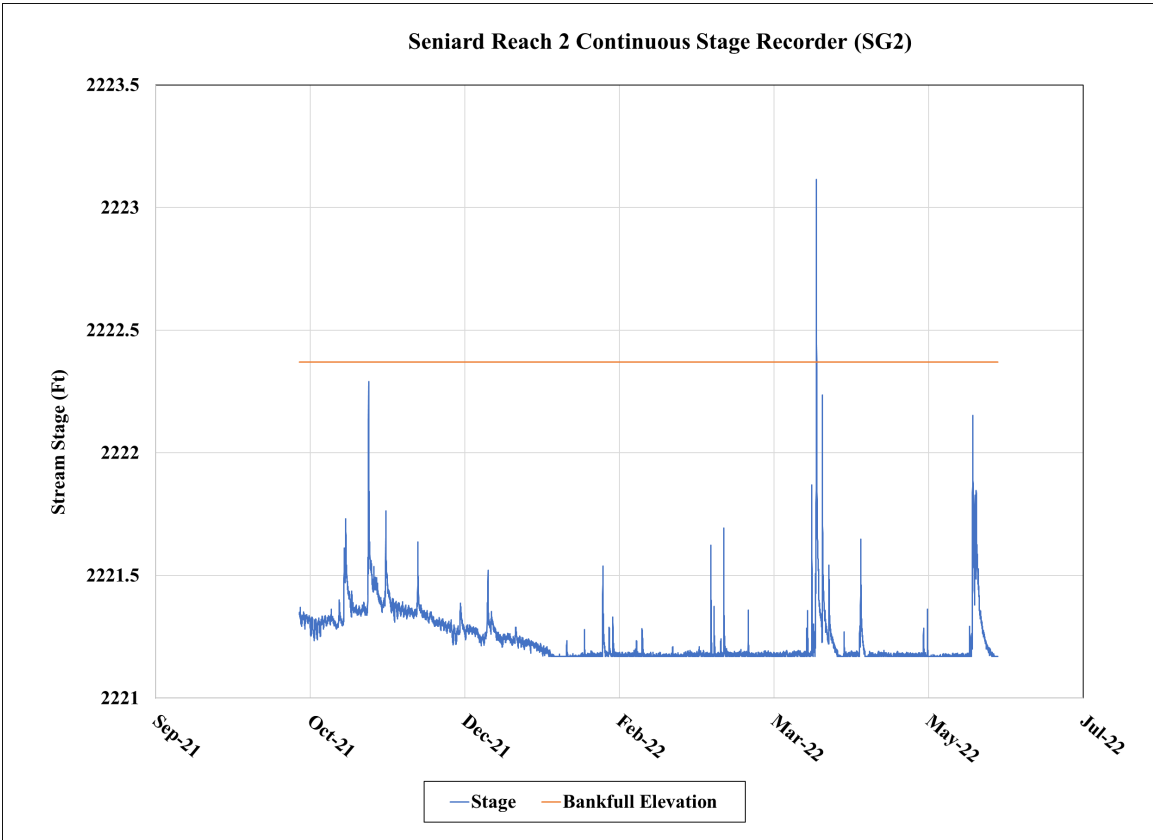
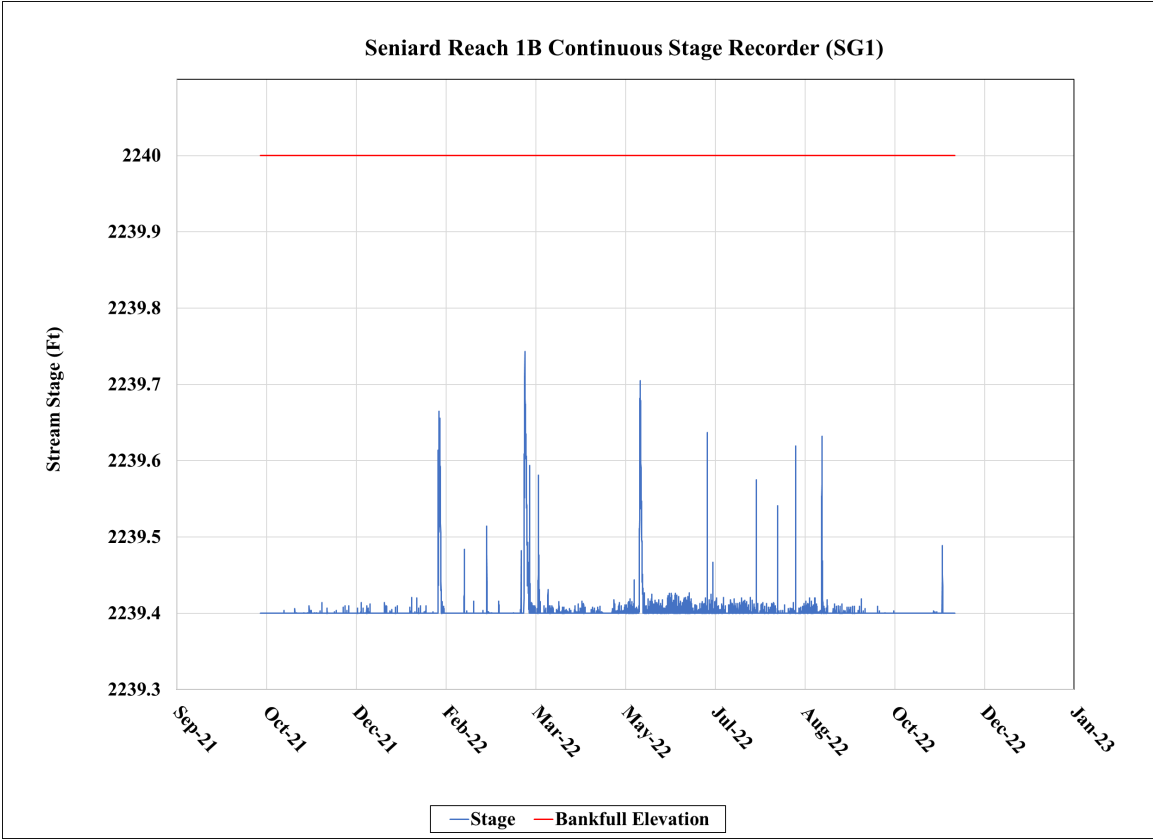
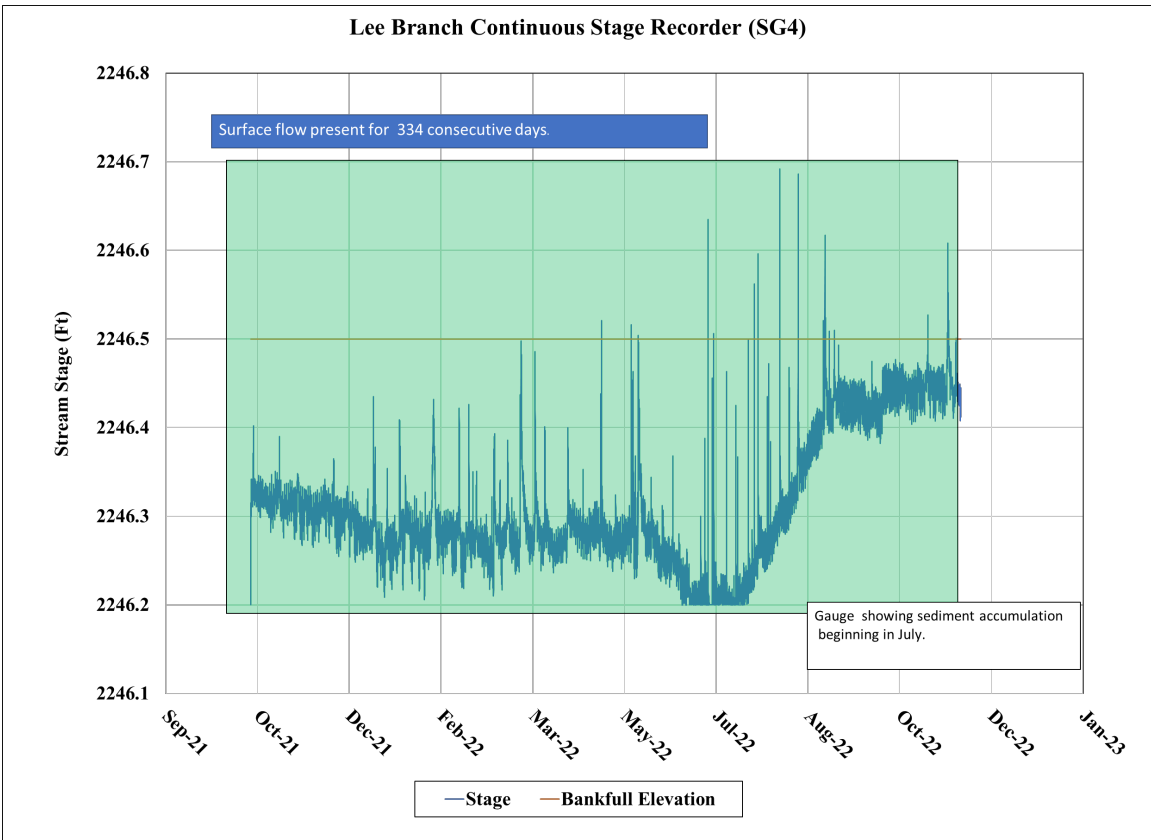
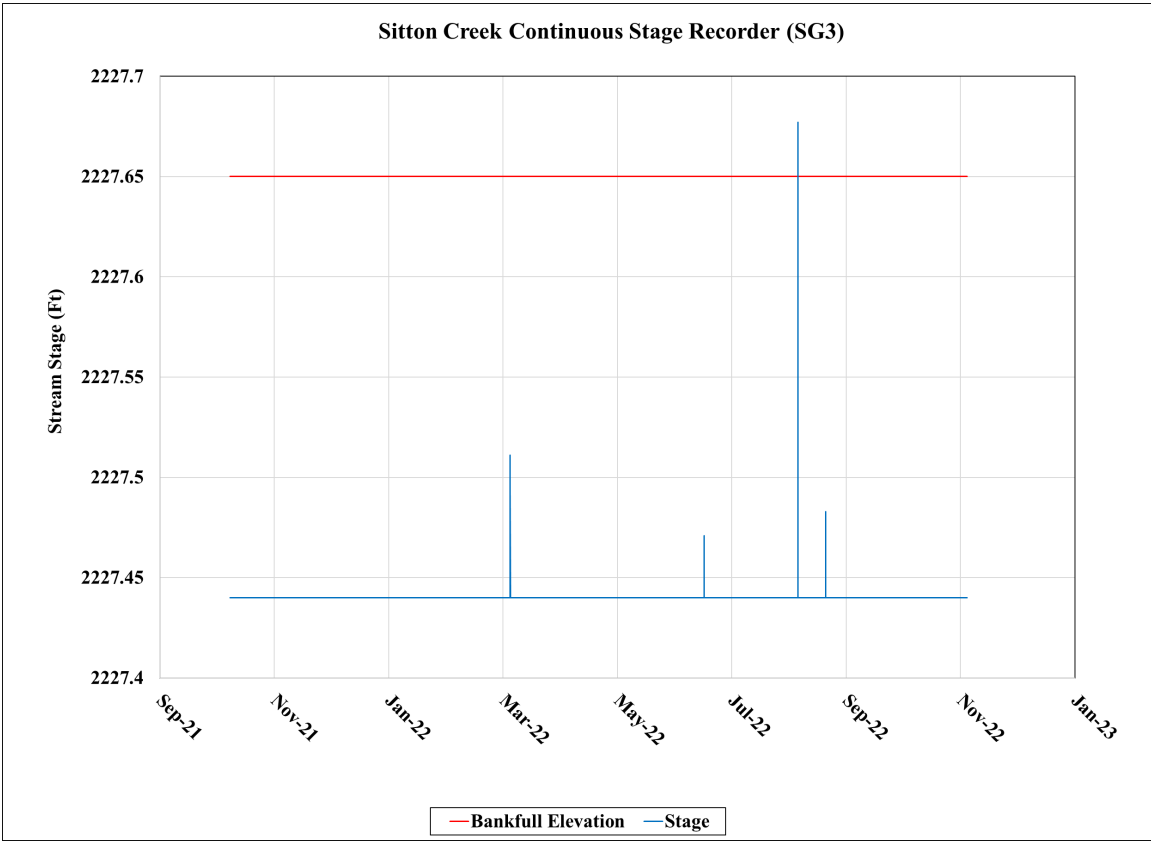
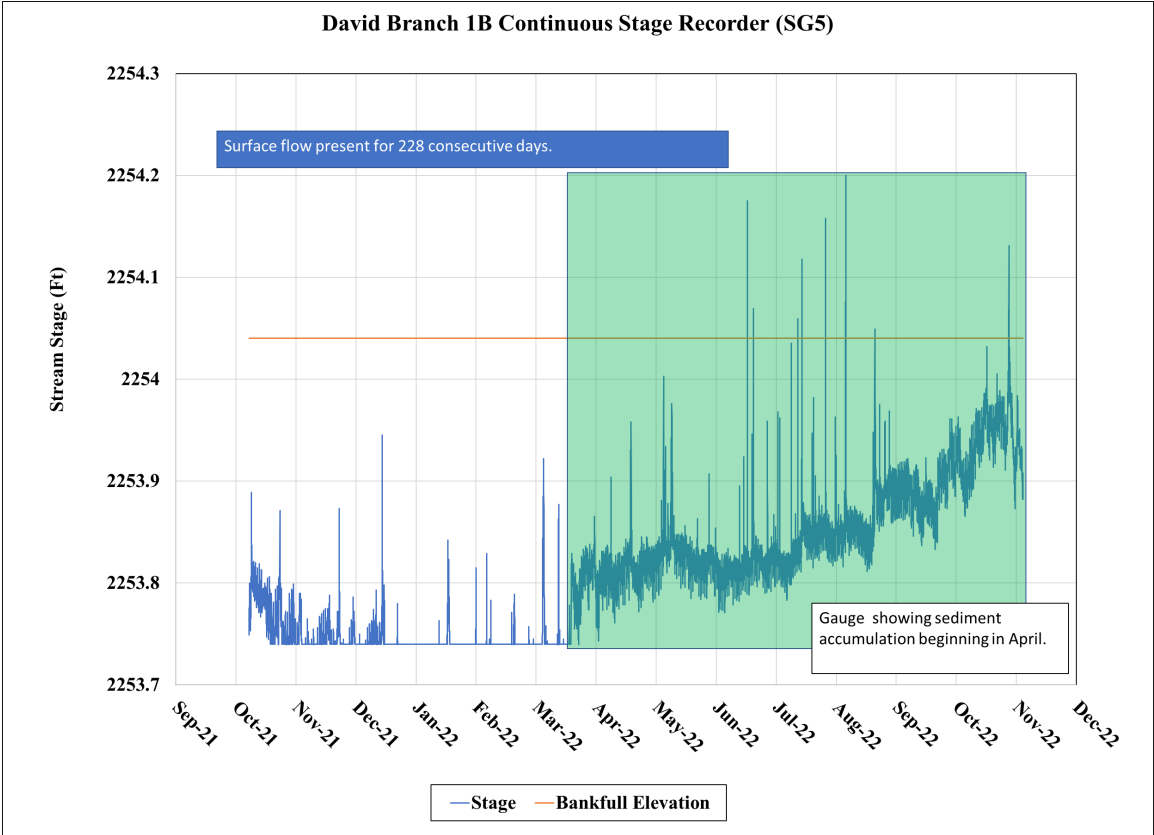


Table 11. Verification of Bankfull Events Seniard Creek Mitigation Project				
Date of Data Collection	Date of Occurrence	Measurement location or Gage ID	Feet Above Bankfull Elevation	Photo # (if available)
Seniard Reach 1B				
10/27/2021	8/17/2021	Stage Recorder (SG1)	0.19	n/a
Seniard Reach 2				
10/27/2021	8/17/2021	Stage Recorder (SG2)	0.75	n/a
1/20/2023	4/12/2022	Stage Recorder (SG2)	0.80	n/a
Sitton Reach				
10/27/2021	8/17/2021	Wrack Lines	Unknown	1 & 2
10/27/2021	10/7/2021	Stage Recorder (SG3)	0.09	n/a
1/20/2023	8/21/2022	Stage Recorder (SG3)	0.02	n/a
Lee Branch Reach				
10/27/2021	3/25/2021	Stage Recorder (SG4)	0.09	n/a
10/27/2021	7/18/2021	Stage Recorder (SG4)	0.07	n/a
10/27/2021	8/17/2021	Stage Recorder (SG4)	0.20	n/a
10/27/2021	10/7/2021	Stage Recorder (SG4)	0.09	n/a
01/20/2023	7/5/2022	Stage Recorder (SG4)	0.10	n/a
David Branch Reach 1B				
10/27/2021	3/25/2021	Stage Recorder (SG5)	0.05	n/a
10/27/2021	8/17/2021	Stage Recorder (SG5)	0.16	n/a
10/27/2021	10/7/2021	Stage Recorder (SG5)	0.06	n/a
01/20/2023	7/3/2022	Stage Recorder (SG5)	Unknown	n/a
David Branch Reach 1C				
10/27/2021	3/25/2021	Stage Recorder (SG6)	0.09	n/a
10/27/2021	7/18/2021	Stage Recorder (SG6)	0.05	n/a
10/27/2021	8/17/2021	Stage Recorder (SG6)	0.31	n/a
10/27/2021	10/7/2021	Stage Recorder (SG6)	0.04	n/a
01/20/2023	5/6/2022	Stage Recorder (SG6)	0.02	n/a
Whitaker Branch Reach				
Redmond Branch Reach				

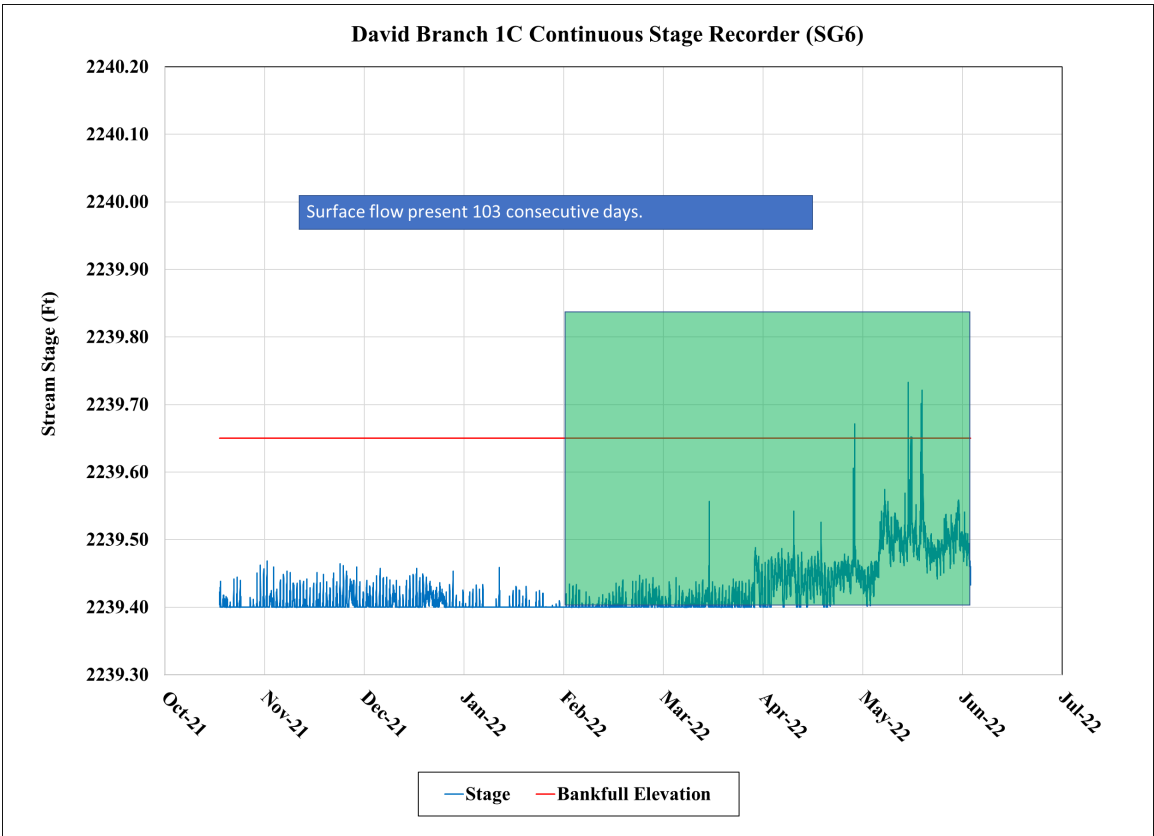




Minimum detectability = 0.81 inch



Minimum detectability = 0.81 inch



Minimum detectability = 0.81 inch

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Appendix E
Project Timeline and Contact Info

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Table 12. Project Activity and Timeline Seniard Creek Mitigation Site		
Activity or Report	Data Collection Complete	Completion or Delivery
Mitigation Plan	Dec - 2019	May - 2020
Mitigation Plan Addendum	-	-
Final Design - Construction Plans	-	Dec - 2020
Construction	-	Dec 5, 2020
Temporary S&E Mix Applied	-	Dec 5, 2020
Permanent Seed Mix Applied	-	Dec 5, 2020
Bare Root and Live Stake Plantings	-	Feb 25, 2021
Baseline Monitoring Document (Year 0 Monitoring - Baseline)		July - 2021
Stream Assessment	April 2, 2021	-
Vegetation Assessment	March 30, 2021	-
Invasive Vegetation Treatment	-	Jan - 2021
Year 1 Monitoring	-	Dec - 2021
Stream Assessment	October - 2021	-
Vegetation Assessment	November - 2021	-
Invasive Vegetation Treatment	January-June 2021	-
Year 2 Monitoring	-	Jan - 2023
Supplemental planting	February - 2022	-
Initial Site Assessment	April - 2022	May - 2022
Stream Assessment	Jan - 2023	-
Vegetation Assessment	Oct - 2022	-
Invasive Vegetation Treatment	June - 2022	-

Table 12 cont. Project Contacts Seniard Mitigation Site	
Prime Contractor David Tuch (828) 253-6856	EW Solutions 37 Haywood Street, Suite 100 Asheville, NC 28801
Designer Grant Ginn (828) 449-1930	Stantec Consulting, Inc 56 College Street, Suite 201 Asheville NC, 28801
Construction Contractor Charles Baker (828) 668-5060	Baker Construction 1000 Bat Cave Rd, Old Fort NC 28762
Seeding Contractor Charles Baker (828) 668-5060	Baker Construction 1000 Bat Cave Rd, Old Fort NC 28762
Planting Contractor Owen Carson (828) 253-6856	Equinox Environmental 37 Haywood Street, Suite 100 Asheville, NC 28801
As-built Surveys Brad Kee (828) 575-9021	Kee Mapping 88 Central Ave Asheville, NC 28801
Seeding Mix Source (800) 873-3321	Ernst Conservation Seeds 8884 Mercer Pike Meadsville, PA 16335
Woody Stem Source Cole Williams (706) 483-3397	Native Forest Nursery 11306 Hwy 411 S Chatsworth, Ga 30705
Live Stakes Carla Scholl (919) 742-1200	Mellow Marsh Farms 1312 Woody Store Rd Siler City, NC 27344
Monitoring Performers (MY2)- 2022 Danvey Walsh (828) 253-6856 ext 201	Equinox Environmental 37 Haywood Street, Suite 100 Asheville, NC 28801

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Appendix F

Other Data

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On June 22, 2022, the MY2 single pass electrofishing survey was conducted on Seniard Creek to monitor relative abundance of fish species upstream and downstream of the culvert at the project boundary. A total of thirty-six fish were collected from Seniard Creek on the downstream side of the culvert, representing eight species. Young-of-year were observed only within sculpin. Upstream of the previously hanging culvert, seven fishes were collected within this reach, representing five species. One young-of-year was collected, representing creek chub.

Eight species of fish were collected during MY2 surveys, compared to five in both the pre-construction and MY1 surveys. River chub, creek chub, and gulf darter were collected in the downstream reach during MY2. River chub was represented in Pre-construction data. Alternately, both creek chub and gulf darter were newly observed to the reach indicating migration and colonization of new habitat created within the restored reach. A similar trend was observed in the upstream reach. Three new species were collected in the upstream reach: creek chub, gulf darter, and central stoneroller. While overall density remains low, the increase in species observed upstream of the previously hanging culvert is indicative of connectivity within the downstream portion of the system. Future surveys will provide more clarity regarding the fisheries assemblage and distributional data.

Seniard Creek fish sampling summary										
		Pre Construction			MY1			MY2		
Downstream of culvert										
Common Name	Binomial Name	YOY	J	A	YOY	J	A	YOY	J	A
River Chub	<i>Nocomis micropogon</i>			1						1
Central Stoneroller	<i>Camptostoma anomalum</i>			1	1				5	
Mottled Sculpin	<i>Cottus bairdii</i>			2	2		2	1	10	4
Rosyside Dace*	<i>Clinostomus funduloides</i>			1						
Blacknose dace	<i>Rhinichthys atratulus</i>				1				1	
Rainbow Trout	<i>Oncorhynchus mykiss</i>	1			5	4	1		3	4
Brown Trout	<i>Salmo trutta</i>					2			3	
Gilt Darter	<i>Percina evides</i>									2
Creek Chub	<i>Semotilus atromaculatus</i>								2	
Sum		6			18			36		
Upstream of culvert										
Rainbow Trout	<i>Oncorhynchus mykiss</i>				2		1		1	
Brown Trout	<i>Salmo trutta</i>						1			
Mottled Sculpin	<i>Cottus bairdii</i>			1		1			3	
Creek Chub	<i>Semotilus atromaculatus</i>							1		
Gilt Darter	<i>Percina evides</i>									1
Central Stoneroller	<i>Camptostoma anomalum</i>								1	
Sum		1			5			7		

YOY - young of year, J - Juvenile, A - Adult

Species = 5

Species = 5

Species = 8

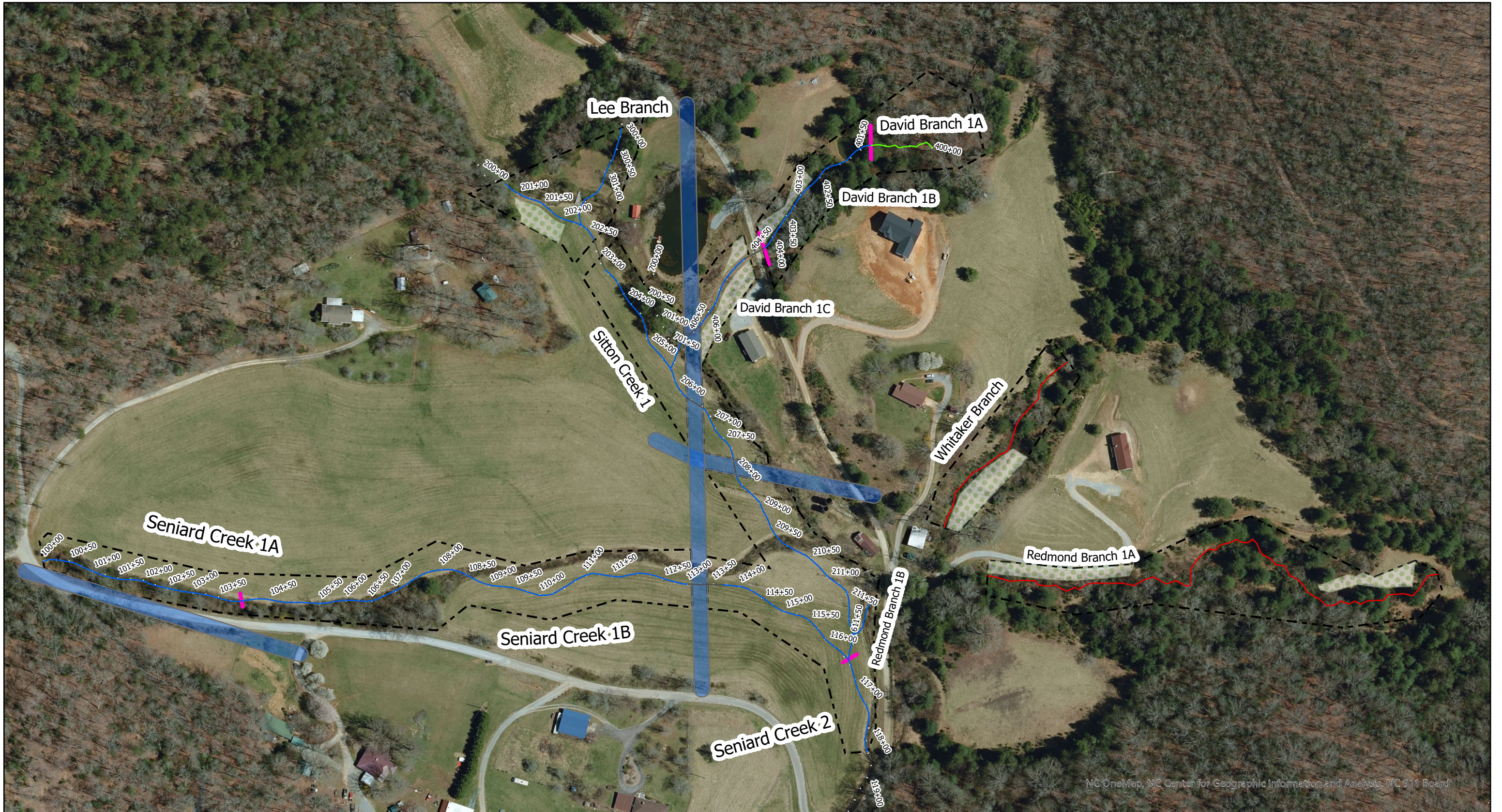
* Likely misidentified saffron shiner

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Seniard MY2 Supplemental Planting Summary			
Scientific Name	Common Name	Material	Relative Percentage
Alnus serrulata	Tag alder	bareroot	5
Cornus amomum	Silky dogwood	bareroot	10
Liriodendron tulipifera	Tulip poplar	bareroot	35
Oxydendrum arboreum	Sourwood	bareroot	15
Quercus rubra	Northern red oak	bareroot	25
Sassafras albidum	Sassafras	bareroot	10
Salix nigra	Black willow	live stake	50
Salix sericea	Silky willow	live stake	50

* Supplemental planting was conducted on February 25, 2022. Additional livestakes were installed along the easement violation and the bank scour along Sitton Creek. Bare root stems were installed the easement violation along the right descending bank of Sitton Creek; the easement violation at Whitaker Branch; along David Branch 1C and 1B; and within the field at Redmond Branch 1A.









Date	Start / End Time	Certified Applicator #	Site & Target Species	Herbicide	Concentration (%)	Volume Herbicide Concentration Used (oz)	Volume Mixture Used (gal)	Weather (Temp/Wind)	Site Notes
6/22/2022	10:00-14:00	C. Lawson 26-38261	Seniard Mitigation Site Whitaker/Redmond Br.	Tryclopypyr	3	45	15	80+/light var	Retreatment residual pockets of multiflora rose, barberry, bittersweet, and privet.

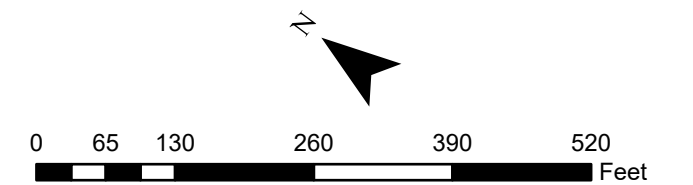


NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board



Replanted Areas MY2
Seniard Creek
Stream Restoration Site
Henderson Co., NC

 Replanted Areas	Restoration Type	 Conservation Easement
 Utility Easement	 Enhancement II	
 Reach Breaks	 Preservation	
	 Restoration	
	 No Credit	



This map is not a survey and is not to be construed as such.

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