Hominy Swamp Stream Restoration

2003 Annual Monitoring Report

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Raleigh, NC 27695

March, 2004

Ecosystem Enhancement PROGRAM

NCDENR

NC STATE UNIVERSITY

2003 Hominy Swamp Creek Monitoring Abstract

Hominy Swamp Creek was restored through the North Carolina Wetlands Restoration Program (NCWRP). The objectives of the project are to:

1.) Establish an stable dimension, pattern and profile on 2230 feet of Hominy Swamp Creek
2.) Improve habitat within Hominy Swamp Creek
3.) Establish an riparian buffer along Hominy Swamp Creek
4.) Incorporate this project into a watershed wide management plan

This is the 2nd year of the 5-year monitoring plan for Hominy Swamp Creek.

Table 1A. Background Information

Project Name	Hominy Swamp Creek
Designer's Name	KCI Associates of North Carolina, P.A. Landmark Center II, Suite 200 4601 Six Forks Road Raleigh, NC 27609
Contractor's Name	Unknown
Project County	Wilson County, North Carolina
Directions to Project Site	From Interstate I-264 take business 264 through the City of Wilson. Business 264 is also Raleigh Road continue on raleigh road until you reach Ripley Road. Head North on Ripley Road the site is on the right side (east) as soon as you turn of Raleigh Road.
Drainage Area	5.4 sq. mi.
USGS Hydro Unit	3020203020040
NCDWQ Subbasin	03-04-07 Neuse River Basin
Project Length	2,232 Linear feet
Restoration Approach	2,232 ft of priority 1 Natural Channel Design (dimension, pattern, and profile) with urban constraints
Date of Completion	September, 2001
Monitoring Dates	May, 2002; November, 2003

Results and Discussion

Overall, while the majority of the stream is functioning well and holding grade, the stream has areas of concern and areas of immediate need. Table 2 shows a summary of monitoring measurement results. Overall the project is performing well. Channel dimension, pattern, and profile are similar to as-built conditions with the exceptions of some limited areas of bank slumping. Vegetation is not succeeding to levels required for mitigation credit. Placed structures are holding grade and functioning well.

Table 2. Summary of Channel Conditions

DIMENSION	Hominy Swamp Cross-section #1 Riffle		Hominy Swamp Cross-section #2 Riffle		Hominy Swamp Cross-section #3 Pool		Hominy Swamp Cross-section #4 Pool	
	2002	2003	2002	2003	2002	2003	2002	2003
Bankfull Cross-sectional Area	62.3	87.2	53.1	53.9	76.3	64.9	88.3	107.5
Bankfull Width	25.0	24.6	21.6	18.3	31.8	33.1	23.5	26.8
Bankfull Mean Depth	2.5	3.5	2.5	3.0	2.4	2.0	3.8	4.0
Bankfull Max Depth	3.6	6.8	3.8	4.2	6.0	5.5	6.0	6.8

PATTERN	Hominy Swamp Design			Hominy Swamp As-built 2001			Hominy Swamp 2002			Hominy Swamp 2003		
	Minimum	Maximum	Median	Minimum	Maximum	Median	Minimum	Maximum	Median	Minimum	Maximum	Median
Meander Wave Length	182	255	N/A	Not Reported			Not Reported			115	227	155
Radius of Curvature	47	63	N/A	Not Reported			Not Reported			33	76	56
Beltwidth	N/A	N/A	85	Not Reported			Not Reported			32	69	46

PROFILE	Hominy Swamp Design			Hominy Swamp As-built 2001			Hominy Swamp 2002			Hominy Swamp 2003		
	Minimum	Maximum	Median	Minimum	Maximum	Median	Minimum	Maximum	Median	Minimum	Maximum	Median
Riffle Length	Not Reported			Not Reported			Not Reported			15	53	23
Riffle Slope	N/A	N/A	0.15%	Not Reported			Not Reported			0.02%	0.60%	0.19%
Pool Length	35	49	N/A	Not Reported			Not Reported			30	73	52
Pool to Pool Spacing	91	128	N/A	Not Reported			Not Reported			64	178	107

SUBSTRATE	Hominy Swamp Cross-section #1 Riffle		Hominy Swamp Cross-section #2 Riffle		Hominy Swamp Cross-section #3 Pool		Hominy Swamp Cross-section #3 Pool	
	2002	2003	2002	2003	2002	2003	2002	2003
d50	0.54	0.29	0.20	0.17	0.22	0.26	0.17	0.22
d85	2.00	0.58	0.63	0.49	13.65	5.88	3.74	0.62

VEGETATION	Quad 1 - Hominy		Quad 2 - Hominy		Quad 3 - Hominy		Quad 4 - Hominy		Quad 5 - Hominy	
	Observed	Planted*	Observed	Planted*	Observed	Planted*	Observed	Planted*	Observed	Planted*
Tree Stratum (stems/acre)	4080	520	5520	400	200	200	120	120	3120	200
Shrub Stratum (% cover)	0.5	n/a	7	n/a	56	n/a	1	n/a	37.5	n/a
Herb Stratum (%cover)	147	n/a	78	n/a	24.5	n/a	87	n/a	104	n/a

* Planted value represents number of stems observed alive that were planted.

The following areas of concern should be monitored closely and considered for repair as suggested:

Hominy Swamp Creek

- Easement Limits
  - NCWRP should work with landowners to ensure easement limits are maintained by the park maintenance workers
- Areas with bank slumping
  - Bank slumping has been noted at two locations on the stream on the right bank at STA. 6+50 for approximately 15 ft and on the left bank at STA. 1+10 for approximately 25 ft
  - Overland flow may need to be routed away from areas that show signs of bank erosion and slumping
- Areas lacking stream feature
  - The entire length of restored stream has on four existing riffle features, but as it can be observed from the as-build longitudinal profile there were not may riffles that showed up in the as-build survey
- Vegetation
  - Planting select trees in critical areas where there is localized erosion.
  - The site could benefit from larger containerized trees both for bank stability and aesthetics, although mitigation requirements are currently being met.
  - It is recommended to stake in areas where erosion is problematic, particularly on outside meander bends.
  - Although invasive vegetation has not consumed this project site, there are several species that should be controlled now, most importantly Chinese wisteria and Chinese privet.
  - Mowing should be halted within the specified limits of the riparian buffer.

Photos

The following are photographs of typical sections and areas of concern throughout the project.

Typical Pool

Typical Riffle

Typical Vegetation Plot.

Issue Photo 1. Mowing within easement limits to top of channel bank.

Issue Photo 2. Heavy recreational use within the buffer.

Issue Photo 3. Urban debris blockage.

Issue Photo 4 station XX+XX.
Overland flow resulting in bake erosion.

Issue Photo 5 station XX+XX.
Bank slump

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Tables and Figures

1.0 BACKGROUND INFORMATION

The background information for this report is referenced from previous monitoring reports conducted by KCI, Inc. The following was excerpted from 2002 KCI monitoring report:

> Project planning was initiated in 1999 for the implementation of an urban stream restoration project in Wilson, North Carolina (Figure 1).
>
> Phase I of the project consisted of the detailed analysis of the 5.4 square mile portion of the Hominy Swamp Creek watershed (located within USGS 14-digit Hydrologic Unit Code 03020203020040, NCDWQ Subbasin 03-04-07 of the Neuse River Basin) that contributes drainage to the project site. The watershed analysis, including the assessment of over 7 miles of stream channel, was conducted for the purpose of developing a clear understanding of existing system characteristics. The resulting Watershed Management Plan identified opportunities to improve water quality and overall system functions including targeted strategies such as wetland/riparian buffer preservation, stormwater BMP development/retrofitting, stream restoration, and community education.
>
> Following coordination with local leaders and citizens groups, Phase II of the project was initiated and focused on the restoration of approximately 2,000 linear feet of degraded stream within the Wilson Recreation Park. Detailed environmental assessments and engineering studies were conducted and design plans and documents were prepared to facilitate the stream and riparian buffer restoration. Implementation of the project was completed in September 2001.
>
> The restoration of this portion of Hominy Swamp Creek, located within the Wilson City Recreational Park, was conducted to correct identified system deficiencies including severe bank erosion, channel widening, and the loss of aquatic habitat resulting from stream channelization, the loss of riparian vegetation, and watershed development. The goal of the project was to develop a stable stream channel with reduced bank erosion, efficient sediment transport, enhanced warm water fisheries, and improved overall stream habitat and site aesthetics. Implementation of the project was completed in September 2001.

1.1 Goals and Objective

The goals and objectives of this project are as follows:

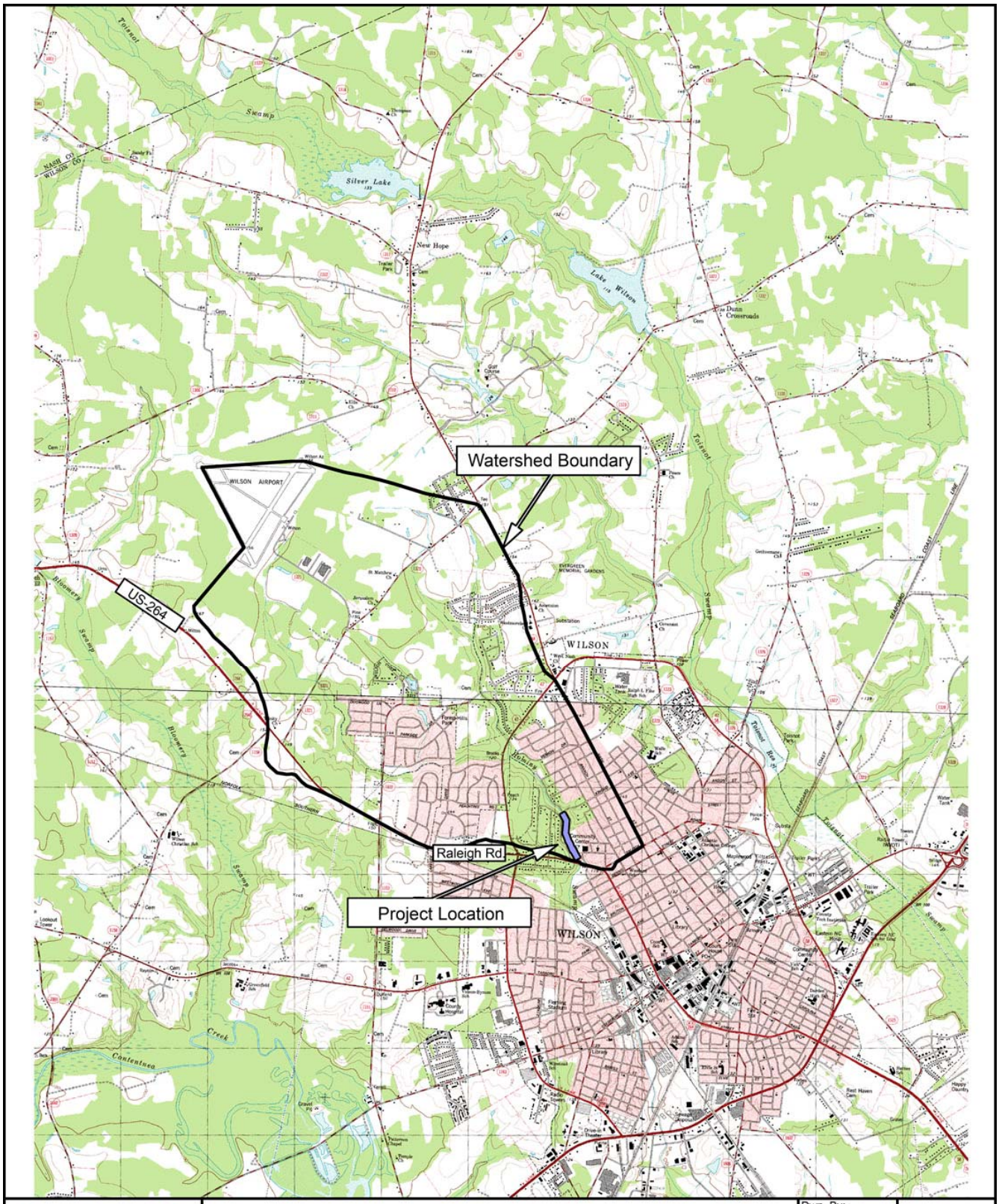
1.) Restore 2,232-linear feet of Hominy Swamp Creek through a priority 1 natural channel design approach.
2.) Establish a riparian zone surrounding restored section of Hominy Swamp Creek.
3.) Improve the habitat within the channel and the riparian zone.
4.) Incorporate this project into a watershed wide management plan.

1.2 Project Location

This project is located within the city limits of Wilson, North Carolina. From Raleigh, follow Interstate I-264 east take business 264 through the City of Wilson. Business 264 is also Raleigh Road continue on Raleigh road until you reach Ripley Road. Head North on Ripley Road the site is on the right side (east) as soon as you turn of Raleigh Road.

1.4 Project Description

A previously straight through the Wilson City Recreational Park, Hominy Swamp Creek was restored using channel dimension, pattern, and profile modifications and the establishment of riparian zone adjacent to the creek. Channel profile is maintained through the use of log and rock cross vanes. Channel pattern is maintained through the use of log single vanes and vegetation along the channel banks. Due to multiple urban constraints, pattern modifications were limited throughout the project.



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Project Location: Hominy Swamp

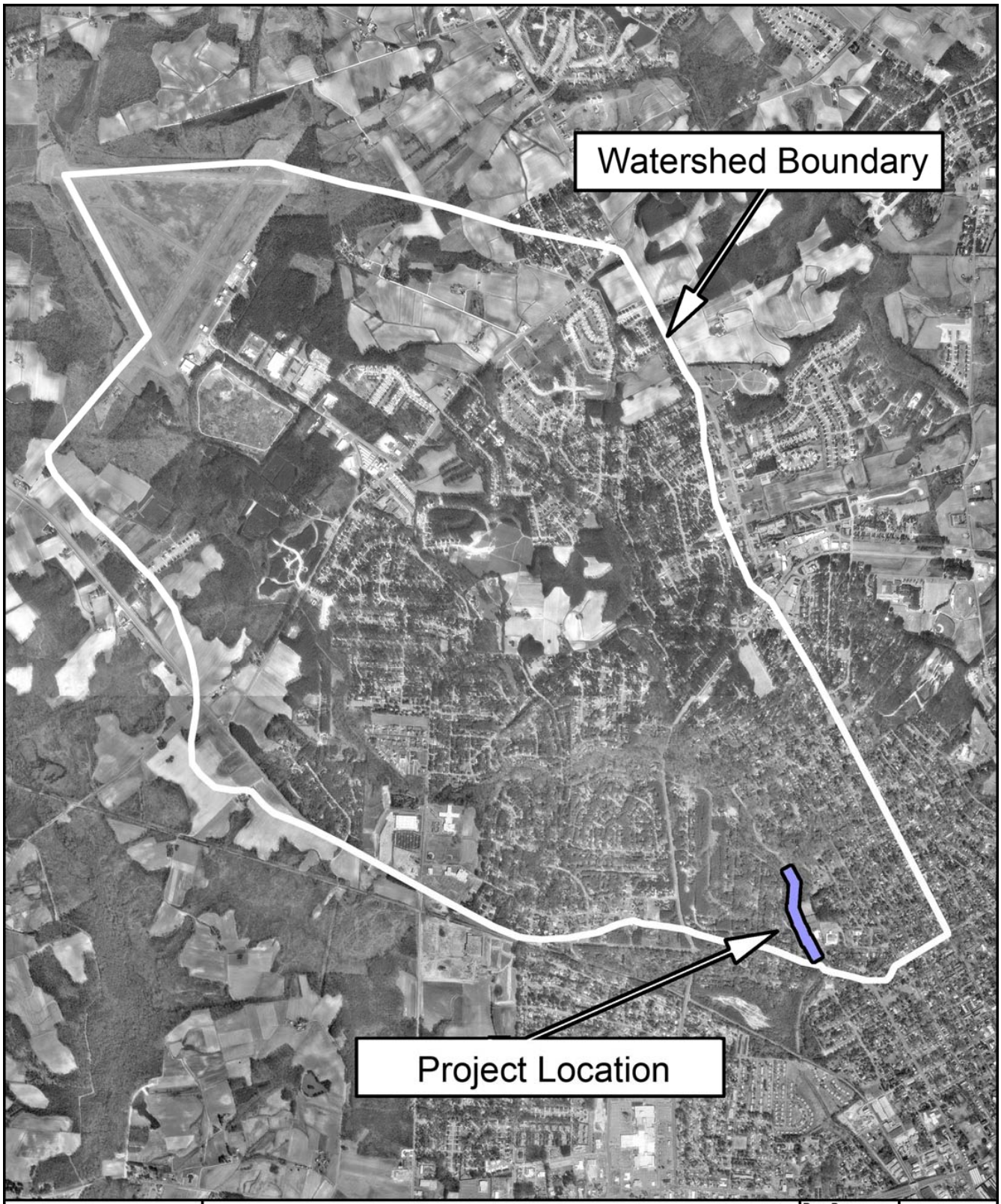
Wilson County, North Carolina

EEP Monitoring Report

SCALE 1:60,000

Dwn. By: MVH
Ckd By: DAB
Date: March 2004

FIGURE 1



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Aerial Watershed Photo: Hominy Swamp
Wilson County, North Carolina

EEP Monitoring Report

SCALE 1:30,000
0 1 MILE
0 1000 2000 3000 4000 5000 FEET

N

Dwn. By: MVH
Ckd By: DAB
Date: March 2004

FIGURE 2

Figure 3. Plan view of As-built conditions
(To be attached)
showing all structures with station numbers
showing vegetation permanent plots
showing permanent cross-sections and benchmarks
showing vegetation plots
showing monitoring gauges

Figure 4. Plan view of 2003 overlain on As-built
(To be attached)

2.0 YEAR 2003 RESULTS AND DISCUSSION

Year 2003 monitoring results are shown for Hominy Swamp Creek Monitoring.

2.1 Vegetation

Using the Draft Vegetation Monitoring Plan for NCWRP Riparian Buffer and Wetland Restoration Projects, 4 vegetation monitoring plots were randomly located within the riparian buffer of the Hominy Swamp project. No reference area was studied; therefore no comparisons could be made to reference conditions.

2.1.1 Results and Discussion

Vegetation within the riparian buffer of Hominy Swamp Creek is overall considered successful. Because the buffer is so narrow on this project, plots were modified linearly. The upper portion of the restoration site was well vegetated with live stakes and naturally regenerating native species. Native herbaceous plants were growing well, although fescue and honeysuckle were prevalent in these areas. Shrubs, especially those from live stakes, were diverse and healthy. Planted bare root trees averaged 460 stems per acre for the upper two plots. Some of the larger planted trees had apparently been j-rooted during initial planting. Several of these trees had fallen over and inspection of the roots revealed that they had been poorly installed. This appeared to have led to root instability and susceptibility to wind throw. Vegetation in the lower portion of the project was healthy, although numbers of planted bare root trees were lower; average was 200 stems per acre. It appeared that much of the buffer in this region had been mowed and the tree mortality was high as a result. Natural regeneration was also a main vegetation component of this area. Shrubs from stakes again were thriving along the streambanks. Herbaceous plants were less diverse but still dense. Extrapolation from the four plots resulted in an overall average of approximately 330 planted trees per acre for this restoration site. If natural regeneration is included with planted trees, the number is increased to an average of approximately 3230 trees per acre. Both of these estimates are based on a diverse mix of species as well. Natural regeneration obviously plays an important role in the restoration of this site.

Invasive plant species on the site included *Lonicera japonica* (Japanese honeysuckle), *Wisteria sinensis* (Chinese wisteria), *Ligustrum sinense* (Chinese privet) and *Microstegium vimineum*. Chinese wisteria is choking much of the adjacent forest in the upper portion of the project. Several vines were noted within the riparian corridor. Because this plant spreads extensively by rhizomes, it is only a matter of time before it infests the riparian area. Chinese privet was sporadically spread throughout the area, no where abundant. Japanese honeysuckle and microstegium were prevalent throughout.

Recommendations include planting select trees in critical areas where there is localized erosion. The site could benefit from larger containerized trees both for bank stability and aesthetics, although mitigation requirements are currently being met. It is recommended to stake in areas where erosion is problematic, particularly on outside meander bends. Although invasive vegetation has not consumed this project site, there are several species that should be controlled now, most importantly Chinese wisteria and Chinese privet. Mowing should be halted within the specified limits of the riparian buffer.

2.2 Morphology

Restored channel dimension, pattern, profile and substrate were examined during the 2003 monitoring.

2.2.1 Results and Discussion

Hominy Swamp Creek is sand bed channel and therefore the dune and anti-dune characteristics of sand-bed sediment transport should be considered. The channel profile along Hominy Swamp Creek has not shown any significant changes in between monitoring periods. The channel profile along Hominy Swamp Creek has also not shown any significant changes in between the as-build profile and this year's monitoring. The stream profile of by the monitoring and as-build show very few riffle features in the stream. The Mitigation report mentions that the design was to build a riffle/pool sequence plan form, but this intent was not displayed on the as-build survey. The number of defined riffles in the bedform has decreased from 6 in the 2001 as-build, to 4 in 2003. The average riffle slope has not change and many of the riffles have been transformed into runs which are more defined in low gradient systems.

KCI cross section results were recalculated using NCSU techniques for consistency purposes. Data was examined but field identified features were retained. The same datum was used for bankfull for each year's monitoring results. Cross-sections 1 was not field located; they have been re-established and will be monitored in the re-established location and the original location if it can be field located during future monitoring periods. Channel cross-sections 1 and 2 along Hominy Swamp Creek have not shown any significant change in cross-sectional area, this is partly due to cross-section 1 being relocated. Cross-section 3, a pool, has partially filled in with sediment the cross-sectional area has decreased from 76 to 65 square feet. Cross-section 4, a pool has enlarged from 88 to 107 square feet since construction.

Channel substrate in the riffle sections continue have very little change. The D50 decreased on a average from 0.28mm to 0.23mm over the four cross sections. In riffle 1, the D50 decreased from 0.54mm to 0.29mm, and in riffle 2 the D50 decreased from 0.20mm to 0.17mm. The riffles are maintaining a medium sand substrate. The pool cross-section D50 has increased slightly, from 0.20mm to 0.23mm, but not a significantly. A possible cause of decrease in particle size is measurement technique. It is not know if previous surveyors used similar sampling technique. Future monitoring should better evaluate channel substrate.

Channel pattern appears to have been maintained since construction. A few of the outside meander bends are experiencing slight migration through bank slumping but no excessive migration is evident and no shoot cut-offs are apparent. The pattern aligns closely with the as-build pattern (Figure 4). Channel banks throughout Hominy Swamp Creek remains fairly stable, with the exception of two spot areas of bank slumping. Slumping is likely the result of the lack of deep rooting vegetation, steep stream banks, high stream velocities near the channel toe, and possible overland flow into the channel.

Table 1. Summary of Channel Conditions

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PATTERN	Hominy Swamp Design			Hominy Swamp As-built 2001			Hominy Swamp 2002			Hominy Swamp 2003		
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SUBSTRATE	Hominy Swamp Cross-section #1 Riffle		Hominy Swamp Cross-section #2 Riffle		Hominy Swamp Cross-section #3 Pool		Hominy Swamp Cross-section #3 Pool	
	2002	2003	2002	2003	2002	2003	2002	2003
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VEGETATION	Quad 1 - Hominy		Quad 2 - Hominy		Quad 3 - Hominy		Quad 4 - Hominy		Quad 5 - Hominy	
	Observed	Planted*	Observed	Planted*	Observed	Planted*	Observed	Planted*	Observed	Planted*
Tree Stratum (stems/acre)	4080	520	5520	400	200	200	120	120	3120	200
Shrub Stratum (% cover)	0.5	n/a	7	n/a	56	n/a	1	n/a	37.5	n/a
Herb Stratum (%cover)	147	n/a	78	n/a	24.5	n/a	87	n/a	104	n/a

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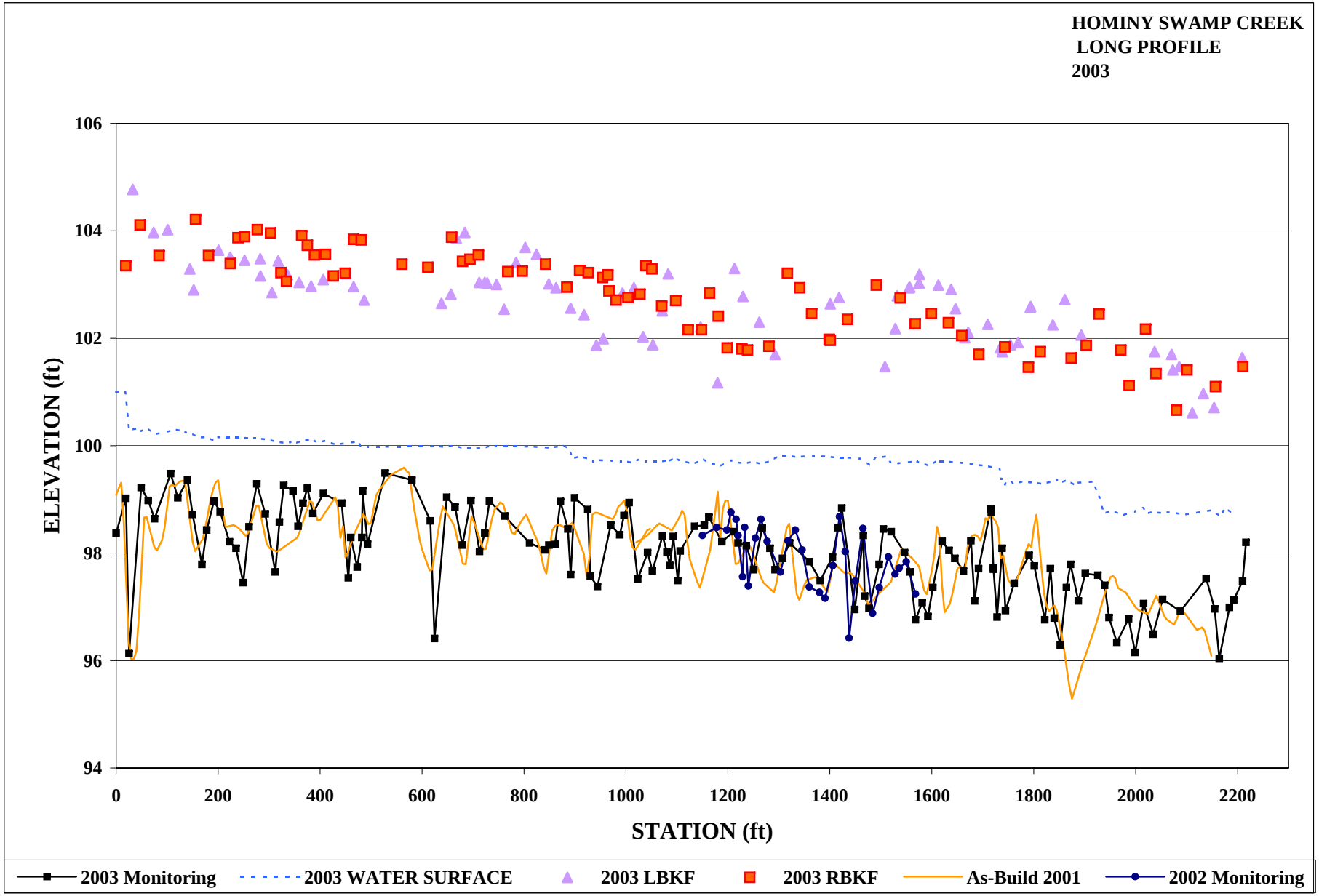
HOMINY SWAMP CREEK
LONG PROFILE
2003
ELEVATION (ft)
106
104
102
100
98
96
94
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
STATION (ft)
2003 Monitoring
2003 WATER SURFACE
2003 LBKF
2003 RBKF
As-Build 2001
2002 Monitoring

2.3 Areas of Concern

The following areas of concern should be monitored closely and considered for repair as suggested:

- Easement Limits
    - NCWRP should work with landowners to ensure easement limits are maintained by the park maintenance workers
- Areas with bank slumping
    - Bank slumping has been noted at two locations on the stream on the right bank at STA. 6+50 for approximately 15 ft and on the left bank at STA. 1+10 for approximately 25 ft
    - Overland flow may need to be routed away from areas that show signs of bank erosion and slumping
- Areas lacking stream feature
    - The entire length of restored stream has on four existing riffle features, but as it can be observed from the as-build longitudinal profile there were not may riffles that showed up in the as-build survey
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    - Although invasive vegetation has not consumed this project site, there are several species that should be controlled now, most importantly Chinese wisteria and Chinese privet.
    - Mowing should be halted within the specified limits of the riparian buffer.

2.4 Photo Log

Hominy Swamp Photo Log

2002

2003

Location #1 Downstream

Location #2 Upstream

Location #2 Downstream


Location #3 Upstream

Location #3 Downstream

Location #4 Upstream

Location #4 Downstream

Location #5 Upstream

Location #5 Downstream


Location #6 Upstream

Location #6 Downstream

Location #7 Upstream


Location #7 Downstream

Location #8 Upstream

Location #8 Downstream

Location #9 upstream


Location #9 Downstream

Location #10 upstream

Hominy Swamp Stream Restoration
Wilson County, NC

Quad 1

Tree Stratum

Species	Height (cm)	Diameter (mm)	Radius (mm)	Σ X-sec. (mm²)	Rel. x-sec (%)	Density	Rel. Density (%)	Rank (Importance)	Average
Quercus phellos	88	10	5	78.5	**74.9**	**8**	**7.8**	**1**	41.35127
	86	12	6	113.1					
	158	24	12	452.4					
	126	14	7	153.9					
	29	13	6.5	132.7					
	69	12	6	113.1					
	109	18	9	254.5					
	40	12	6	113.1					
Total			**57.5**	**1411.4**					
Pinus taeda	78	12	6	113.1	**6.7**	**70**	**68.6**	**2**	37.64636
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
	13	0.5	0.25	0.2					
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	15	0.5	0.25	0.2					
	15	0.5	0.25	0.2					
	15	0.5	0.25	0.2					
	15	0.5	0.25	0.2					
	15	0.5	0.25	0.2					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	17	1	0.5	0.8					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	22	2	1	3.1					
	19	4	2	12.6					
Total			**36.5**	**125.7**					
Betula nigra	28	3	1.5	7.1	**4.6**	**5**	**4.9**	**5**	4.752584
	23	0.5	0.25	0.2					
	23	0.5	0.25	0.2					

	22	1	0.5	0.8					
	232	10	5	78.5					
Total		3	**7.5**	**86.8**					
Liquidambar styraciflua	10	0.5	0.25	0.2	**0.2**	**11**	**10.8**	**4**	5.511924
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	16	1	0.5	0.8					
	27	1	0.5	0.8					
	27	1	0.5	0.8					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	8	0.5	0.25	0.2					
	8	0.5	0.25	0.2					
	17	1	0.5	0.8					
Total			**3.75**	**4.5**					
Liriodendron tulipifera	12	0.5	0.25	0.2	**0.1**	**5**	**4.9**	**6**	2.492638
	12	0.5	0.25	0.2					
	8	0.5	0.25	0.2					
	17	1	0.5	0.8					
	8	0.5	0.25	0.2					
Total		**3**	**1.5**	**1.6**					
Cercis canadensis	13	0.5	0.25	0.2	**0.0**	**1**	**1.0**	**7**	0.495403
Total			**0.25**	**0.2**					
Fraxinus sp.	27	1	0.5	0.8	**13.5**	**2**	**2.0**	**3**	7.749815
	150	18	9	254.5					
Total			**9.5**	**255.3**					
Overall Total				**1885.3**	**100.0**	**102.0**	**100.0**		

Total Trees per acre	4080
Planted trees per acre	520

Shrub Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Density**	**Rel. Density (%)**	**Rank (Importance)**
Corylus americana	0.5	100.0	1	100	1

Herb Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Rank (Importance)**
Festuca sp.	100	68.0	1
Lonicera japonica	20	13.6	2
Panicum virgatum	2	1.4	5
Polygonum sp.	15	10.2	3
Artemisia sp.	10	6.8	4
Total	**147**	100.0	

Hominy Swamp Stream Restoration
Wilson County, NC

Quad 2

Tree Stratum

Species	Height (cm)	Diameter (mm)	Radius (mm)	Σ X-sec. (mm²)	Rel. x-sec (%)	Density	Rel. Density (%)	Rank (Importance)	Average
Liquidambar styraciflu	38	3	1.5	7.1	**23.7**	**28**	**20.3**	1	22.01771
	37	8	4	50.3					
	34	5	2.5	19.6					
	28	3	1.5	7.1					
	37	5	2.5	19.6					
	30	4	2	12.6					
	19	2	1	3.1					
	19	2	1	3.1					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	20	3	1.5	7.1					
	16	2	1	3.1					
	16	2	1	3.1					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	12	1	0.5	0.8					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	36	7	3.5	38.5					
Total				**184.0**					
Pinus sp.	12	0.5	0.25	0.2	**43.2**	**105**	**76.1**	4	59.66031
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	15	2	1	3.1					
	15	2	1	3.1					
	15	2	1	3.1					
	15	2	1	3.1					
	15	2	1	3.1					
	50	10	5	78.5					
	50	10	5	78.5					
	50	10	5	78.5					
	21	3	1.5	7.1					
	22	3	1.5	7.1					
	22	3	1.5	7.1					
	22	3	1.5	7.1					
	9	0.5	0.25	0.2					
	9	0.5	0.25	0.2					
	9	0.5	0.25	0.2					
	9	0.5	0.25	0.2					
	9	0.5	0.25	0.2					
	9	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	11	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					

	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	12	0.5	0.25	0.2					
	29	4	2	12.6					
	29	4	2	12.6					
	29	4	2	12.6					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
Total				**335.0**					
Liriodendron tulipifera	10	0.5	0.25	0.2	**0.2**	**4**	**2.9**	2	1.537973
	10	0.5	0.25	0.2					
	10	0.5	0.25	0.2					
	15	1	0.5	0.8					
Total				**1.4**					
Platanus occidentalis	256	18	9	254.5	**32.8**	**1**	**0.7**	3	16.78401
Total				**254.5**					
Overall Total				**774.8**	**100.0**	**138.0**	**100.0**		100
Total Trees per acre						5520			
Planted trees per acre						400			

Shrub Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Density**	**Rel. Density (%)**	**Rank (Importance)**
Sambucus canadensi	0.5	7.1	1	3.6	4
Cornus amomum	3	42.9	18	64.3	1
Aronia arbutifolia	0.5	7.1	2	7.1	3
Rosa multiflora	0.5	7.1	2	7.1	3
Ligustrum sinense	0.5	7.1	3	10.7	2
Salix nigra	2	28.6	2	7.1	3
	7	**100**	**28**	**100**	

Herb Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Rank (Importance)**
Unknown	5	6.4	3
Panicum clandestinur	50	64.1	1
Aster sp.	0.5	0.6	6
Polygonum sp.	2	2.6	5
Wisteria sp.	0.5	0.6	6
Lonicera japonica	2	2.6	5
Juncus	15	19.2	2
Panicum virgatum	3	3.8	4
Total	**78**	100.0	

Hominy Swamp Stream Restoration
Wilson County, NC

Quad 3

Tree Stratum

Species	Height (cm)	Diameter (mm)	Radius (mm)	Σ X-sec. (mm²)	Rel. x-sec (%)	Density	Rel. Density (%)	Rank (Importance)	Average
Quercus sp.	146	16	8	201.1	**32.9**	**3**	**60.0**	1	46.46163
	115	9	4.5	63.6					
	129	15	7.5	176.7					
Total				**441.4**					
Nyssa sp.	117	19	9.5	283.5	**21.1**	**1**	**20.0**	3	20.57411
Total				**283.5**					
Betula nigra	221	28	14	615.8	**45.9**	**1**	**20.0**	2	32.96426
Total				**615.8**					
Overall Total				**1340.7**	**100.0**	**5.0**	**100.0**		100
Total Trees per acre						200			
Planted trees per acre						200			

Shrub Stratum

Species	Cover (%)	Rel. cover (%)	Density	Rel. Density (%)	Rank (Importance)
Sambucus canadensi	1	1.8	14	36.8	2
Cornus amomum	30	53.6	15	39.5	1
Salix nigra	25	44.6	9	23.7	3
	56	**100**	**38**	**100**	

Herb Stratum

Species	Cover (%)	Rel. cover (%)	Rank (Importance)
Grass sp.	2	8.2	2
Unknown	2	8.2	2
Polygonum sp.	0.5	2.0	3
Diodia virginiana	20	81.6	1
Total	**24.5**	100.0	

Hominy Swamp Stream Restoration
Wilson County, NC

Quad 4

Tree Stratum

Species	Height (cm)	Diameter (mm)	Radius (mm)	Σ X-sec. (mm²)	Rel. x-sec (%)	Density	Rel. Density (%)	Rank (Importance)	Average
Quercus phellos	145	16	8	201.1	**69.5**	**4**	**5.1**	**2**	37.29868
	125	18	9	254.5					
	13	0.5	0.25	0.2					
	20	5	2.5	19.6					
Total			**19.75**	**475.4**					
Pinus taeda	22	1	0.5	0.8	**0.2**	**58**	**74.4**	**1**	37.29426
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	22	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	24	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	20	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	21	1	0.5	0.8					
	19	1	0.5	0.8					
Total			**29**	**1.6**					

Hominy Swamp Stream Restoration
Wilson County, NC
Quad 4 Continued

Platanus occidentalis	117	15	7.5	176.7	**29.2**	**3**	**3.8**	**4**	16.49983
	37	2	1	3.1					
	79	5	2.5	19.6					
Total		15	**11**	**199.5**					
Liquidambar styraciflua	22	1	0.5	0.8	**0.5**	**8**	**10.3**	**5**	5.372108
	7	0.5	0.25	0.2					
	7	0.5	0.25	0.2					
	17	1	0.5	0.8					
	14	0.5	0.25	0.2					
	14	0.5	0.25	0.2					
	14	0.5	0.25	0.2					
	21	1	0.5	0.8					
Total			**2.75**	**3.3**					
Liriodendron tulipifera	5	0.5	0.25	0.2	**0.1**	**3**	**3.8**	**6**	1.966119
	8	0.5	0.25	0.2					
	4	0.5	0.25	0.2					
Total		**1.5**	**0.75**	**0.6**					
Taxodium distichum	32	1	0.5	0.8	**0.1**	**1**	**1.3**	**7**	0.698414
Total			**0.5**	**0.8**					
Acer rubrum	33	2	1	3.1	**0.5**	**1**	**1.3**	**3**	0.870581
Total			**1**	**3.1**					
Overall Total				**684.3**	**100.0**	**78.0**	**100.0**		

Total Trees per acre	3120
Planted trees per acre	200

Shrub Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Density**	**Rel. Density (%)**	**Rank (Importance)**
Cornus amomum	20	53.3	41	52.6	1
Salix nigra	15	40.0	18	23.1	2
Sambucus canadensis	2	5.3	8	10.3	4
Aronia arbutifolia	0.5	1.3	11	14.1	3
total	**37.5**	**100**	**78**	**100**	

Herb Stratum

Species	**Cover (%)**	**Rel. cover (%)**	**Rank (Importance)**
Unknown grass	90	86.5	1
Aster sp.	1	1.0	3
Krigia sp.	12	11.5	2
Sorghastrum nutans	1	1.0	3
Total	**104**	100.0	

Appendices

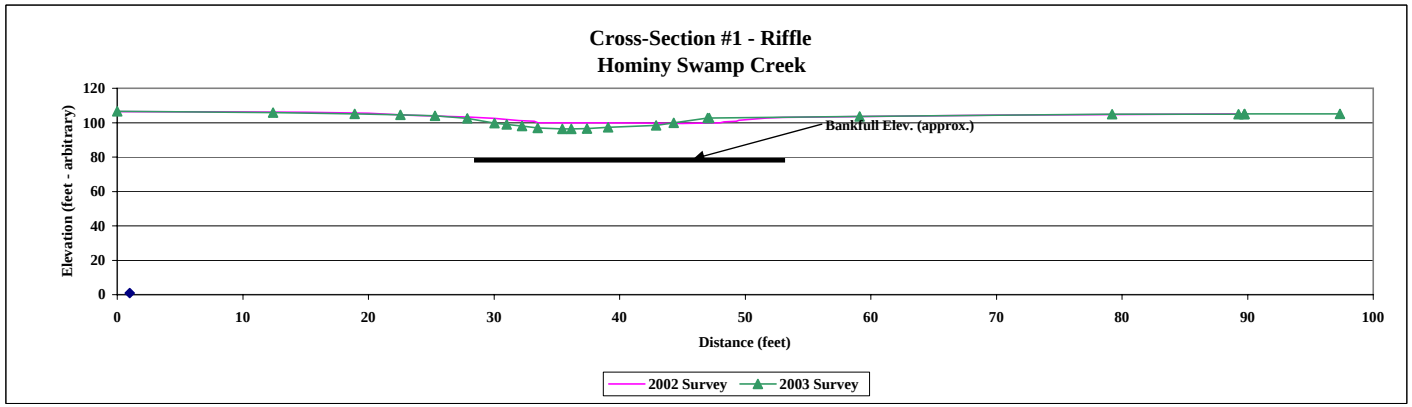
A. Methods
    1. Vegetation
    2. Morphology
B. Vegetation data
    1. Listed by plot
    2. Species, number and age
    3. Analysis of planted vs. natural recruitment
C. Morphology Data
    1. Cross-section data and plotted (DONE)
    2. Longitudinal data and plotted (DONE)
    3. Pebble count data and plotted (DONE)
    4. Pattern (DONE)

Project Name	Hominy Swamp Creek
Cross Section	#1
Feature	Riffle
Date	11/3/03
Crew	Shaffer, Bidelspach, Clinton

2002			2003		
2002 Survey			2003 Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
0	106.4		0	106.52	
10	106.29		12.4	105.79	
15	106.09		18.9	105.14	
20	105.42		22.55	104.65	Left Pin
23	104.43	BKF	25.31	104.05	BKF
28	103.23		27.88	102.58	
30	102.42		30.03	99.64	
32	101.21		31	98.91	
33.2	100.8		32.24	97.99	
33.5	99.94		33.47	96.9	
36	99.93		35.45	96.38	
39	99.85		36.15	96.41	
42.8	99.68		37.39	96.65	
45	99.52		39.08	97.23	
46.3	99.66		42.9	98.33	
48	99.99		44.3	99.88	
48.3	100.49		47.0	102.65	
49.3	100.84		47.1	102.78	
49.5	101.32		59.1	103.7	
51.7	102.73		79.2	105.02	
53	103.16		89.3	105.01	
60	103.57	BKF	89.7	105.01	
70	104.38		89.8	105.04	BKF Field
90	105.06		97.4	105.07	
					BKF
					Right Pin

Photo of Cross-Section #1 - Looking Downstream

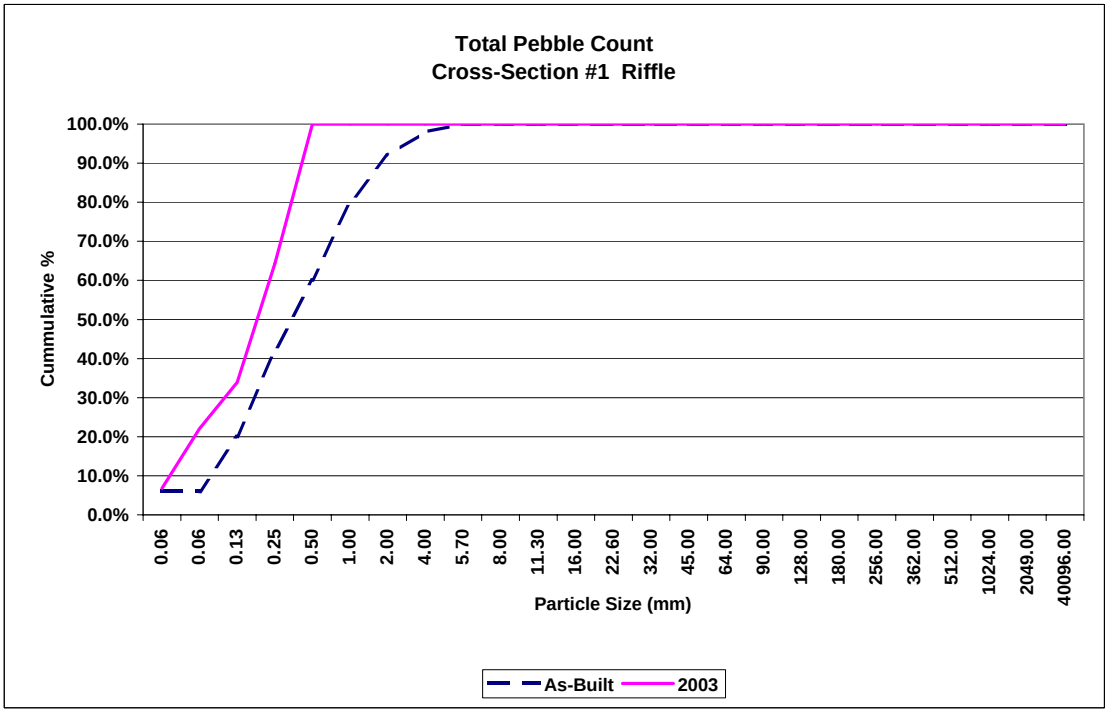
	2002	**2003**
Area	62.3	87.2
Width	25.0	24.6
Mean Depth	2.5	3.5
Max Depth	3.6	6.8



Project Name	Hominy Swamp Creek
Cross Section	#1
Feature	Riffle
Date	1/14/04
Crew	Shaffer, Bidelspach

			As-Built			2003			
Description	**Material**	**Size (mm)**	**Riffle - Bed**	**%**	**Cum %**	**Riffle - Bed**	**Riffle - Bank**	**%**	**Cum %**
Silt/Clay	silt/clay	0.061	3	6.0%	6.0%	0	4	6.8%	6.8%
Sand	very fine sand	0.062	0	0.0%	6.0%	3	6	15.3%	22.0%
	fine sand	0.125	7	14.0%	20.0%	1	6	11.9%	33.9%
	medium sand	0.25	11	22.0%	42.0%	16	2	30.5%	64.4%
	course sand	0.50	9	18.0%	60.0%	21	0	35.6%	100.0%
	very course sand	1.0	10	20.0%	80.0%	0	0	0.0%	100.0%
G r a v e l	very fine gravel	2.0	6	12.0%	92.0%	0	0	0.0%	100.0%
	fine gravel	4.0	3	6.0%	98.0%	0	0	0.0%	100.0%
	fine gravel	5.7	1	2.0%	100.0%	0	0	0.0%	100.0%
	medium gravel	8.0	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium gravel	11.3	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	16.0	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	22.6	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	32	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	45	0	0.0%	100.0%	0	0	0.0%	100.0%
Cobble	small cobble	64	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium cobble	90	0	0.0%	100.0%	0	0	0.0%	100.0%
	large cobble	128	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large cobble	180	0	0.0%	100.0%	0	0	0.0%	100.0%
Boulder	small boulder	256	0	0.0%	100.0%	0	0	0.0%	100.0%
	small boulder	362	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium boulder	512	0	0.0%	100.0%	0	0	0.0%	100.0%
	large boulder	1024	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large boulder	2049	0	0.0%	100.0%	0	0	0.0%	100.0%
Bedrock	bedrock	40096	0	0.0%	100.0%	0	0	0.0%	100.0%
TOTAL / %of whole count			50	100.0%		41	18	100.0%	

	d16	**d35**	**d50**	**d85**	**d95**
As-Built	0.16	0.32	0.54	2.00	3.93
2003	0.08	0.19	0.29	0.58	0.70



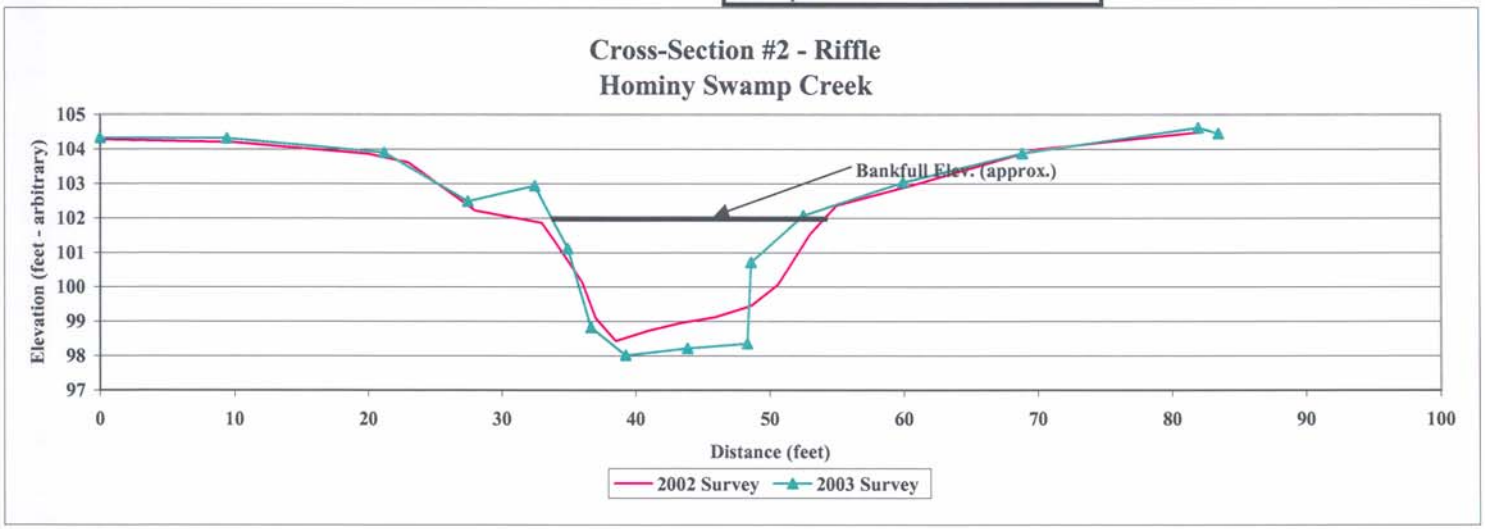
Project Name	Hominy Swamp Creek
Cross Section	#2
Feature	Riffle
Date	11/3/03
Crew	Shaffer, Bidelspach, Clinton

2002		
2002 Survey		
Station	**Elevation**	**Notes**
0	104.27	
10	104.19	
20	103.86	
23	103.61	
28	102.22	BKF
33	101.86	
34	101.31	
36	100.14	
37	99.09	
38.5	98.43	
41	98.74	
43.5	98.97	
45.9	99.12	
48.6	99.45	
50.6	100.07	
53	101.54	
55	102.36	BKF
61	102.99	
70	104	
82	104.49	

2003		
2003 Survey		
Station	**Elevation**	**Notes**
0.0	104.33	
9.4	104.32	
21.2	103.91	
27.45	102.49	BKF
32.45	102.94	
34.92	101.12	
36.65	98.83	
39.24	98.02	
43.87	98.22	
48.31	98.36	
48.6	100.72	
52.51	102.08	
59.96	103.04	
68.85	103.89	
81.97	104.63	
83.47	104.47	

Photo of Cross-Section #2 - Looking Downstream

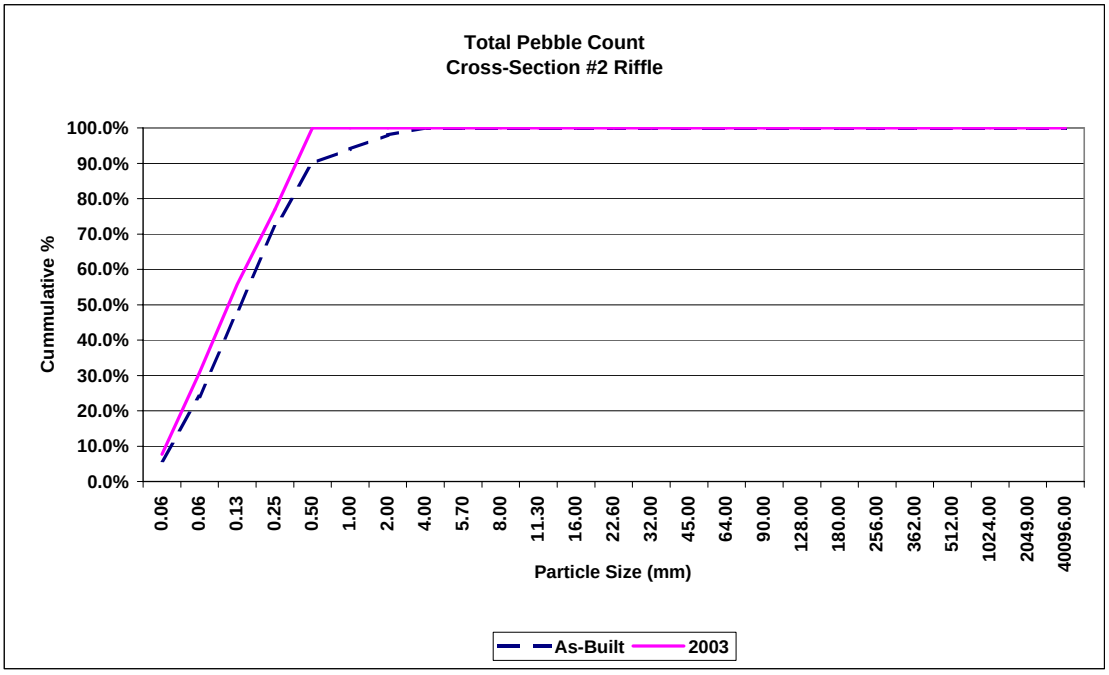
	2002	2003
Area	53.1	54.0
Width	21.6	18.3
Mean Depth	2.5	3.0
Max Depth	3.8	4.2



Project Name	Hominy Swamp Creek
Cross Section	#2
Feature	Riffle
Date	1/14/04
Crew	Shaffer, Bidelspach

			As-Built			2003			
Description	**Material**	**Size (mm)**	**Riffle - Bed**	**%**	**Cum %**	**Riffle - Bed**	**Riffle - Bank**	**%**	**Cum %**
Silt/Clay	silt/clay	0.061	3	6.0%	6.0%	0	4	7.7%	7.7%
Sand	very fine sand	0.062	9	18.0%	24.0%	5	7	23.1%	30.8%
	fine sand	0.125	12	24.0%	48.0%	6	7	25.0%	55.8%
	medium sand	0.25	12	24.0%	72.0%	9	2	21.2%	76.9%
	course sand	0.50	9	18.0%	90.0%	11	1	23.1%	100.0%
	very course sand	1.0	2	4.0%	94.0%	0	0	0.0%	100.0%
G r a v e l	very fine gravel	2.0	2	4.0%	98.0%	0	0	0.0%	100.0%
	fine gravel	4.0	1	2.0%	100.0%	0	0	0.0%	100.0%
	fine gravel	5.7	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium gravel	8.0	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium gravel	11.3	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	16.0	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	22.6	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	32	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	45	0	0.0%	100.0%	0	0	0.0%	100.0%
Cobble	small cobble	64	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium cobble	90	0	0.0%	100.0%	0	0	0.0%	100.0%
	large cobble	128	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large cobble	180	0	0.0%	100.0%	0	0	0.0%	100.0%
Boulder	small boulder	256	0	0.0%	100.0%	0	0	0.0%	100.0%
	small boulder	362	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium boulder	512	0	0.0%	100.0%	0	0	0.0%	100.0%
	large boulder	1024	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large boulder	2049	0	0.0%	100.0%	0	0	0.0%	100.0%
Bedrock	bedrock	40096	0	0.0%	100.0%	0	0	0.0%	100.0%
TOTAL / %of whole count			50	100.0%		31	21	100.0%	

	d16	**d35**	**d50**	**d85**	**d95**
As-Built	0.08	0.14	0.20	0.63	1.88
2003	0.07	0.11	0.17	0.49	0.67



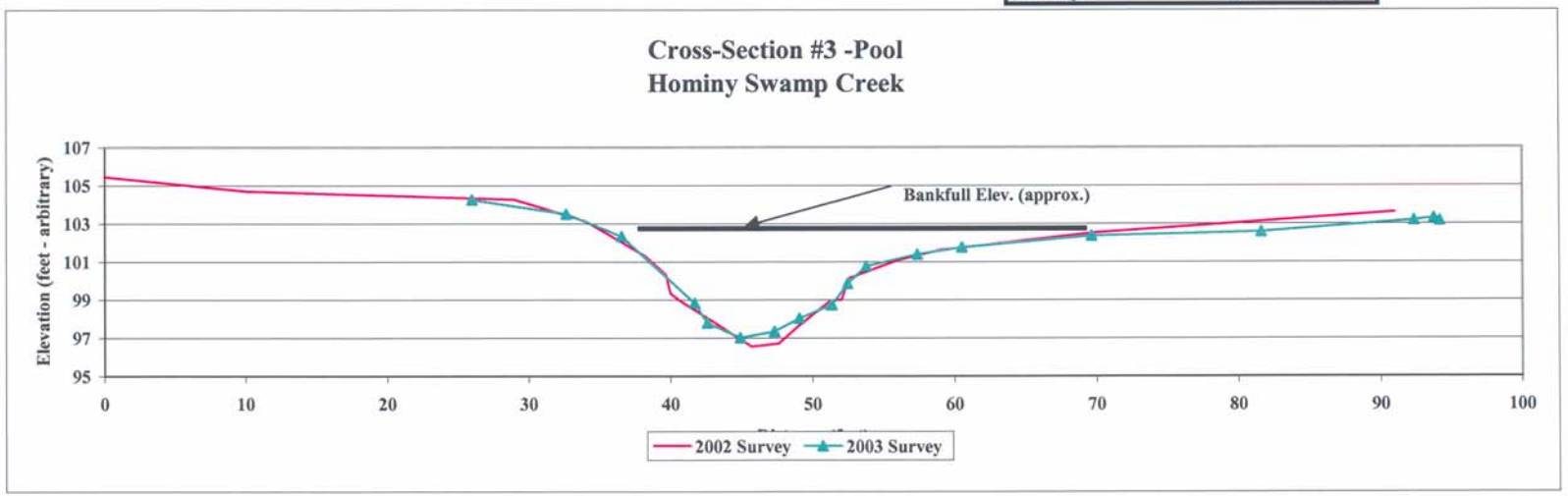
Project Name	Hominy Swamp Creek
Cross Section	#3
Feature	Pool
Date	11/3/03
Crew	Shaffer, Bidelspach, Clinton

2002		
2002 Survey		
Station	**Elevation**	**Notes**
0	105.46	
10	104.7	
29	104.26	
34	103.14	
38.2	101.32	
39.7	100.3	
40	99.34	
40.6	98.99	
43	97.87	
45.7	96.56	
47.6	96.71	
49	97.62	
51.3	98.98	
52	99	
52.5	100.13	
56	101.07	
59	101.63	
70	102.53	BKF
80	103.03	
91	103.6	

2003		
2003 Survey		
Station	**Elevation**	**Notes**
26.0	104.27	
32.7	103.51	
36.58	102.35	
41.71	98.85	
42.6	97.8	
44.92	97.04	
47.33	97.36	
49.07	98.05	
51.34	98.75	
52.44	99.87	
53.76	100.78	
57.38	101.4	
60.52	101.78	
69.67	102.38	
81.63	102.59	BKF
92.4	103.19	
93.8	103.3	
94.2	103.17	

Photo of Cross-Section #3 - Looking Downstream

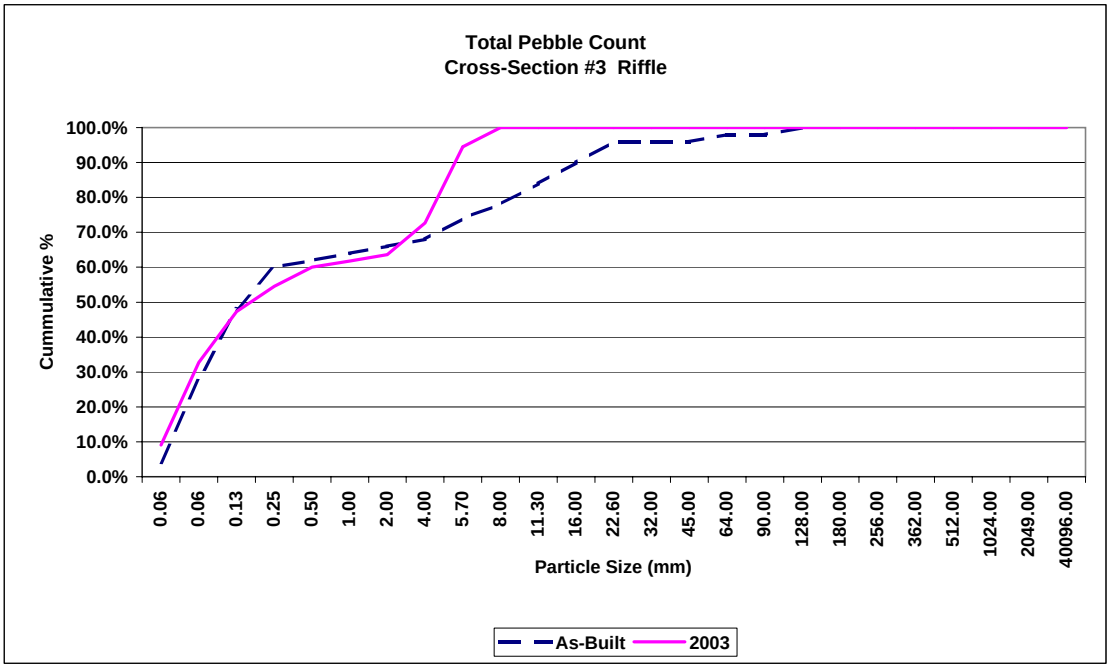
	2002	2003
Area	76.3	64.9
Width	31.8	33.1
Mean Depth	2.4	2.0
Max Depth	6.0	5.5



Project Name	Hominy Swamp Creek
Cross Section	#3
Feature	Pool
Date	1/14/04
Crew	Shaffer, Bidelspach

			As-Built			2003			
Description	**Material**	**Size (mm)**	**Riffle - Bed**	**%**	**Cum %**	**Riffle - Bed**	**Riffle - Bank**	**%**	**Cum %**
Silt/Clay	silt/clay	0.061	2	4.0%	4.0%	0	5	9.1%	9.1%
Sand	very fine sand	0.062	12	24.0%	28.0%	6	7	23.6%	32.7%
	fine sand	0.125	10	20.0%	48.0%	4	4	14.5%	47.3%
	medium sand	0.25	6	12.0%	60.0%	4	0	7.3%	54.5%
	course sand	0.50	1	2.0%	62.0%	3	0	5.5%	60.0%
	very course sand	1.0	1	2.0%	64.0%	1	0	1.8%	61.8%
Gravel	very fine gravel	2.0	1	2.0%	66.0%	1	0	1.8%	63.6%
	fine gravel	4.0	1	2.0%	68.0%	5	0	9.1%	72.7%
	fine gravel	5.7	3	6.0%	74.0%	12	0	21.8%	94.5%
	medium gravel	8.0	2	4.0%	78.0%	3	0	5.5%	100.0%
	medium gravel	11.3	3	6.0%	84.0%	0	0	0.0%	100.0%
	course gravel	16.0	3	6.0%	90.0%	0	0	0.0%	100.0%
	course gravel	22.6	3	6.0%	96.0%	0	0	0.0%	100.0%
	very course gravel	32	0	0.0%	96.0%	0	0	0.0%	100.0%
	very course gravel	45	0	0.0%	96.0%	0	0	0.0%	100.0%
Cobble	small cobble	64	1	2.0%	98.0%	0	0	0.0%	100.0%
	medium cobble	90	0	0.0%	98.0%	0	0	0.0%	100.0%
	large cobble	128	1	2.0%	100.0%	0	0	0.0%	100.0%
	very large cobble	180	0	0.0%	100.0%	0	0	0.0%	100.0%
Boulder	small boulder	256	0	0.0%	100.0%	0	0	0.0%	100.0%
	small boulder	362	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium boulder	512	0	0.0%	100.0%	0	0	0.0%	100.0%
	large boulder	1024	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large boulder	2049	0	0.0%	100.0%	0	0	0.0%	100.0%
Bedrock	bedrock	40096	0	0.0%	100.0%	0	0	0.0%	100.0%
TOTAL / %of whole count			50	100.0%		39	16	100.0%	

	d16	**d35**	**d50**	**d85**	**d95**
As-Built	0.08	0.13	0.22	13.65	25.97
2003	0.07	0.11	0.26	5.88	7.08

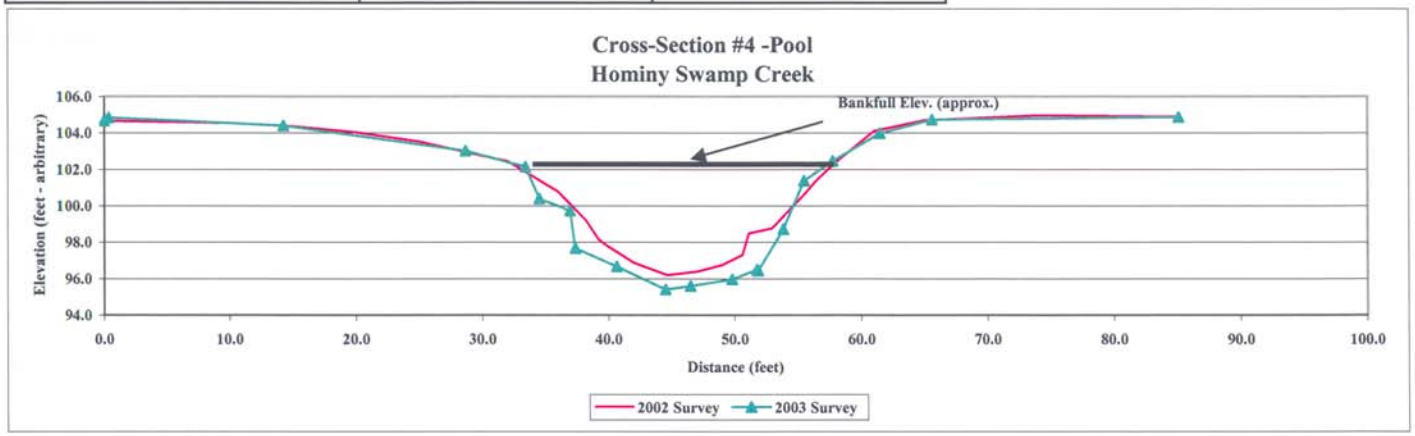


Project Name	Hominy Swamp Creek
Cross Section	#4
Feature	Pool
Date	11/3/03
Crew	Shaffer, Bidelspach, Clinton

2002 Survey			2003 Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
0	104.67		0.0	104.67	
10	104.55		0.4	104.84	
15	104.38		14.3	104.4	
20	104.04		28.7	103.03	
25	103.54		33.42	102.16	
30	102.75		34.5	100.41	
32	102.46	BKF	36.9	99.74	
36	100.78		37.36	97.67	
38.2	99.22		40.64	96.67	
39.2	98.16		44.51	95.41	
39.8	97.84		46.5	95.61	
42	96.89		49.79	95.97	
44.63	96.21		51.74	96.5	
47	96.4		51.85	96.45	
49	96.77		53.8	98.72	
50.6	97.31		55.46	101.38	
51.1	98.5		57.73	102.46	BKF
52.9	98.77		61.47	103.99	
55.5	100.66		65.6	104.74	
56.5	101.45		85.1	104.88	
58	102.41	BKF			
61	104.11				
65	104.7				
74	104.97				
85	104.9				

Photo of Cross-Section #4 - Looking Downstream

	2002	**2003**
Area	88.3	107.5
Width	23.5	26.8
Mean Depth	3.8	4.0
Max Depth	6.0	6.8

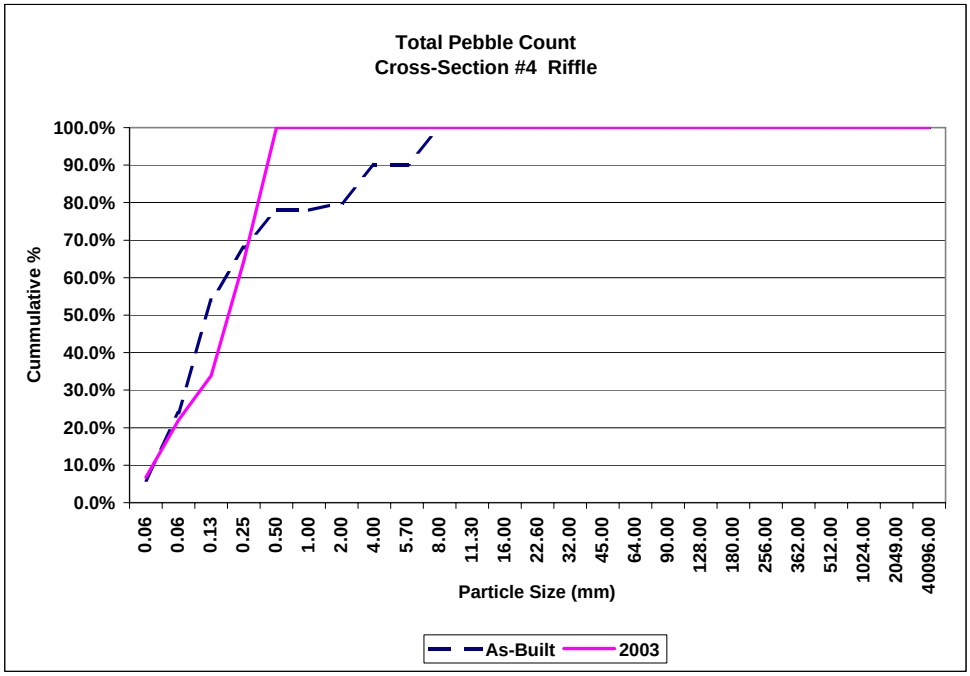


Project Name	Hominy Swamp Creek
Cross Section	#4
Feature	Pool
Date	1/14/04
Crew	Shaffer, Bidelspach

Cross Section #1
Brush Creek

			As-Built			2003			
Description	**Material**	**Size (mm)**	**Riffle - Bed**	**%**	**Cum %**	**Riffle - Bed**	**Riffle - Bank**	**%**	**Cum %**
Silt/Clay	silt/clay	0.061	3	6.0%	6.0%	1	0	2.0%	2.0%
Sand	very fine sand	0.062	9	18.0%	24.0%	0	6	11.8%	13.7%
	fine sand	0.125	15	30.0%	54.0%	4	12	31.4%	45.1%
	medium sand	0.25	7	14.0%	68.0%	11	3	27.5%	72.5%
	course sand	0.50	5	10.0%	78.0%	9	0	17.6%	90.2%
	very course sand	1.0	0	0.0%	78.0%	5	0	9.8%	100.0%
Gravel	very fine gravel	2.0	1	2.0%	80.0%	0	0	0.0%	100.0%
	fine gravel	4.0	5	10.0%	90.0%	0	0	0.0%	100.0%
	fine gravel	5.7	0	0.0%	90.0%	0	0	0.0%	100.0%
	medium gravel	8.0	5	10.0%	100.0%	0	0	0.0%	100.0%
	medium gravel	11.3	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	16.0	0	0.0%	100.0%	0	0	0.0%	100.0%
	course gravel	22.6	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	32	0	0.0%	100.0%	0	0	0.0%	100.0%
	very course gravel	45	0	0.0%	100.0%	0	0	0.0%	100.0%
Cobble	small cobble	64	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium cobble	90	0	0.0%	100.0%	0	0	0.0%	100.0%
	large cobble	128	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large cobble	180	0	0.0%	100.0%	0	0	0.0%	100.0%
Boulder	small boulder	256	0	0.0%	100.0%	0	0	0.0%	100.0%
	small boulder	362	0	0.0%	100.0%	0	0	0.0%	100.0%
	medium boulder	512	0	0.0%	100.0%	0	0	0.0%	100.0%
	large boulder	1024	0	0.0%	100.0%	0	0	0.0%	100.0%
	very large boulder	2049	0	0.0%	100.0%	0	0	0.0%	100.0%
Bedrock	bedrock	40096	0	0.0%	100.0%	0	0	0.0%	100.0%
TOTAL / %of whole count			50	100.0%		30	21	100.0%	

	d16	**d35**	**d50**	**d85**	**d95**
As-Built	0.08	0.13	0.17	3.74	8.25
2003	0.10	0.16	0.22	0.62	1.12



Project Nam	Hominy Swamp Creek
Task	Channel Pattern Measurements
Date	11/13/03
Crew	Shaffer, Bidelspach, Clinton

Hominy Swamp Creek			
Radius of Curvature	**Meander Wavelength**	**Channel Beltwidth**	
33.1	115.1	31.2	
36.3	123.5	32.1	
38.1	123.6	33.9	
40.3	129.2	34.0	
51.4	138.1	35.8	
53.4	145.6	38.4	
53.4	146.3	40.3	
54.6	152.4	45.6	
54.8	155.4	45.7	
55.5	157.1	45.8	
57.8	158.5	51.7	
58.5	163.3	52.0	
58.9	191.3	52.7	
59.1	199.2	63.4	
60.1	204.9	65.3	
63.5	222.0	66.0	
67.2	227.0	68.7	
69.0			
76.2			
108.7			
33.1	115.1	31.2	***min***
76.2	227.0	68.7	***max***
55.5	155.4	45.7	***median***

Project Name	Hominy Swamp
Task	Feature Slope and Length Calculations
Date	11/13/04
Crew	Shaffer, Bidelspach, Clinton

2003 Data

Hominy Swamp Creek

Riffle Station	Change	Bed elevation	Water elevation	change	slope
349		97.66	100.07		
368	18.82	97.56	100.04	0.03	0.16%
549		99.49	99.98		
600	51.11	99.36	99.97	0.01	0.020%
908		99.03	99.8		
930	21.9	98.81	99.75	0.05	0.228%
1519		98.45	99.8		
1534	15.09	98.4	99.71	0.09	0.60%

Pool	length	p-p spacing
25		
55	30	143
168		
219	51	79
247		
299	52	64
311		
371	60	162
473		
504	31	151
624		
669	45	82
706		
754	48	81
832		
885	53	93
925		
990	65	106
1260		
1332	72	178
1568		
1641	73	107
1744		
1775	31	135

	min	max	median				
Length	15	51	20				
Slope	0.02%	0.60%	0.19%				
Length	30.0	73.0	51.5				
Spacing	64	178	107				

PROFILE	Hominy Swamp Creek As-built - 2001			Hominy Swamp Creek 2003		
	Minimum	Maximum	Median	Minimum	Maximum	Median
Riffle Length	Not Reported			15	51	20
Riffle Slope	N/A	N/A	0.15%	0.02%	0.60%	0.19%
Pool Length	35	49	N/A	30.0	73.0	51.5
Pool to Pool Spacing	91	128	N/A	64	178	107