Lyle Creek Stream Restoration
Project No. 423
2006 Monitoring Report: Year 4 of 5

March 2007

Submitted to: NCDENR-EEP
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Ecosystem Enhancement Program

NCDENR

JORDAN JONES & GOULDING

Table of Contents

List of Figures

List of Appendices

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EXECUTIVE SUMMARY

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Executive Summary

The following goals for the Lyle Creek stream restoration project were established through the North Carolina Ecosystem Enhancement Program (NCEEP):

1. Restore 2,400 feet of an unnamed tributary (UT) to Lyle Creek,
2. Enhance the riparian area through planting native species, and
3. Exclude cattle access to the UT to Lyle Creek and 800 linear feet of a secondary unnamed tributary.

The Lyle Creek Stream Restoration Project consisted of restoring approximately 1,940 linear feet of an unnamed tributary to Lyle Creek by relocating approximately 1,240 linear feet of existing channel (Restoration, Priority 1) and restoring in-place (Enhancement Level I, Priority 2/3) approximately 700 linear feet of existing channel. The UT's riparian areas were planted with native bare root seedlings and herbaceous cover to enhance the riparian areas and stabilize stream banks. The entire site was fenced to exclude cattle access to the UT and a second UT to Lyle Creek. This report serves as the 4th year of the 5 year monitoring plan for the Lyle Creek stream restoration site.

Results from the 2006 survey indicate the upper, in-place restoration (Reach 1) is maintaining stability and holding grade. There are areas of moderate bank erosion and some signs of stress on one cross-vane within the reach, but no major stressors are apparent. The lower, relocation restoration (Reach 2), is illustrating a trend towards instability. Reach 2 has headcuts migrating through the system causing bedforms to shift and structures to fail. Severe bank erosion is occurring throughout Reach 2, which is causing the stream to over widen and increase the fines within the streambed. The lower three cross-vane structures are either failing or stressed, creating a risk for another headcut. The sill located approximately 150 feet upstream from these structures continues to maintain grade. However, the sill may not maintain stability and hold grade if these structures continue to fail downstream. A remediation plan is being developed by others for the stream restoration portion of the project.

There were three vegetation plots established by EcoScience in 2002. Please refer to the Monitoring Plan View Map (Figure II) for the location of these plots. In addition, four new plots were established by JJG in 2006. Please refer to the Monitoring Plan View Map (Figure II) for the location of these new plots. The plots established by JJG were randomly selected and monitored per the new 2006 North Carolina Ecosystem Enhancement Program protocol. The three previously established plots were also monitored per the new protocol. Planted stems must represent 30% of the stems per acre total under per the new protocol.

The survival rate for woody vegetation monitored for 2006 is 87%. The monitoring data recorded an average of 12 planted stems per plot. The site density is approximately 480 planted stems per acre. The success criterion for these previously established plots requires 260 live stems per acre in monitoring year 4 of 5 (2006). The site has exceeded the vegetation success goal for monitoring year 4 (2006). Furthermore, the natural recruitment woody stems recorded

substantially increases the number of live stems per plot. There is an average of approximately 40 recruitment stems per plot. In total, approximately 50 woody stems per plot were recorded. A review of the planted and natural recruit's monitored indicates a current site density of approximately 2,000 stems per acre.

In conclusion, Reach 1 is stable and functioning as designed. Reach 2 is unstable and is overwidened due the loss or stress of several structures. A remediation plan is being prepared by others for this reach. Vegetation growth has exceeded the success goal of 260 stems per acre with a planted stem density of 480 trees per acre.

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SECTION I

Project Background

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SECTION I
Project Background

The background information provided in this report is referenced from previous reports conducted by EcoScience, Inc., North Carolina State University, and Soil and Environmental Consultants, PA.

1. Location and Setting

The Lyle Creek Mitigation Site was developed by the North Carolina Ecosystem Enhancement Program (NCEEP). The site is located in Catawba County, North Carolina immediately northwest of the intersection of Wyke Road and US-70 (Figure I). The Lyle Creek Stream Restoration Project consisted of restoring approximately 1,940 linear feet of an unnamed tributary (UT) to Lyle Creek by relocating approximately 1,240 linear feet of existing channel (Restoration, Priority 1) and restoring, in-place (Enhancement Level I, Priority 2/3) approximately 700 linear feet of existing channel. The restored channel was designed and constructed as an E-channel. The project also included enhancing the associated riparian zone. The restoration project was completed in July 2002.

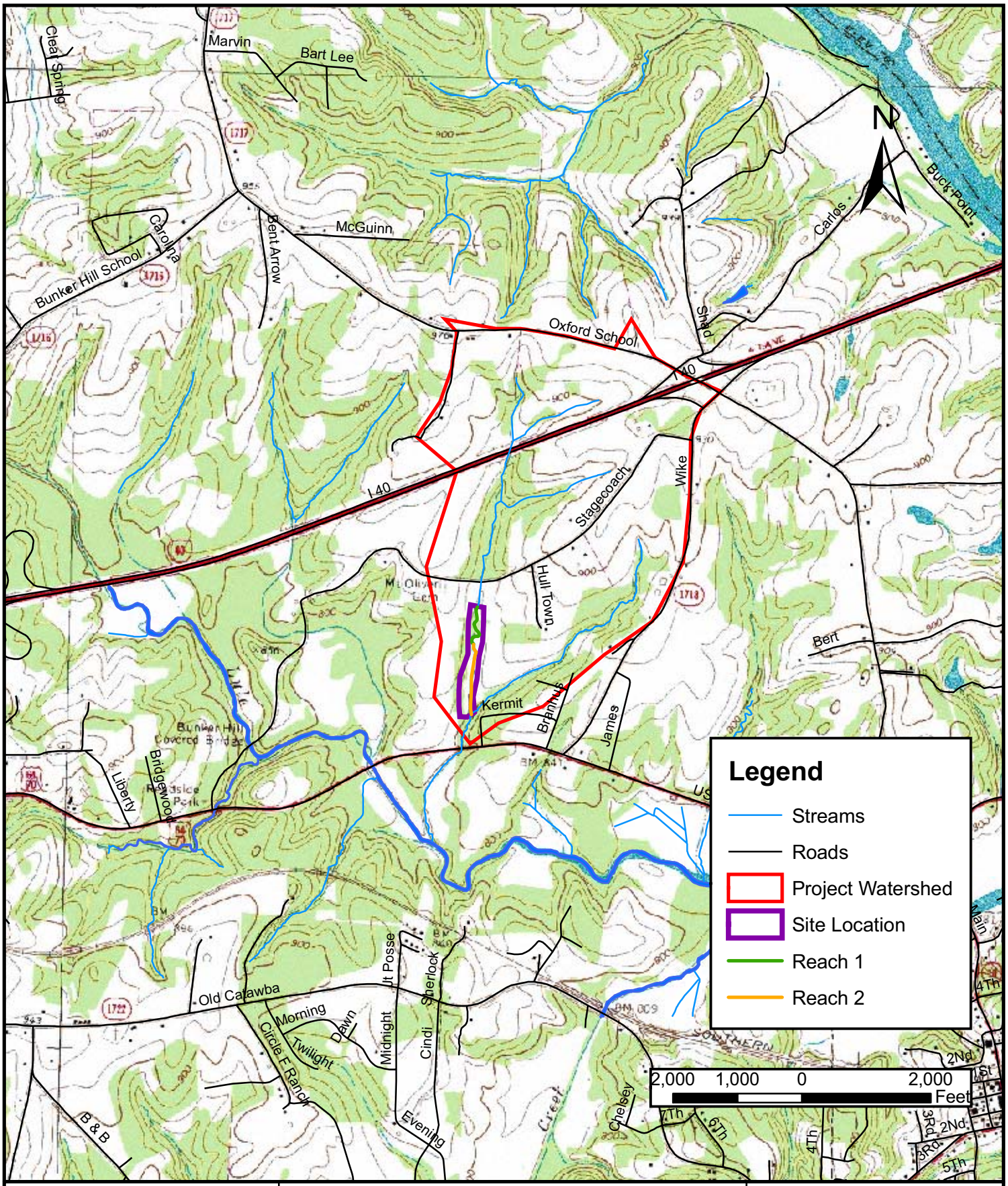
To access site from Interstate 40, take Exit 138 and turn south onto Wyke Road. Turn right onto Stagecoach Road. Continue on Stagecoach Road for approximately 1 mile, at which point the road will cross the UT to Lyle Creek. The restoration project is located approximately 1,000 feet downstream from Stagecoach Road.

2. Mitigation Structure and Objectives

The Lyle Creek stream restoration project was developed as a mitigation site through the NCEEP. The restoration site is located within the northeastern Piedmont region of the Catawba River Basin (HUC 3050101). Historically, the site was utilized for livestock grazing and agricultural hay production. Previous land uses, such as riparian vegetation removal, dredging and straightening, and livestock access contributed to the UTs degraded state. These activities were thought to have inhibited stream stability, producing an incised channel, with a headcut migration occurring through the site.

The following goals for the Lyle Creek stream restoration project were established:

1. Restore 2,400 feet of an UT to Lyle Creek,
2. Enhance the riparian area through planting native species, and
3. Exclude cattle access to the UT to Lyle Creek and 800 linear feet of a secondary unnamed tributary.



Ecosystem Enhancement Program

Jordan Jones & Goulding Incorporated

Figure I. Project Location and Watershed Map
Lyle Creek Stream Restoration
Catawba County, NC
Monitoring Report Year 4 of 5

Project # 423
March 2007

Restoring 2,400 linear feet of the UT to Lyle Creek was implemented by enhancing 700 linear feet (proposed to be 1,055 linear feet) and relocating 1,240 linear feet (proposed to be 1,345 linear feet) within a 12.4 acre plot of the UT to Lyle Creek (Table I). The 700 linear feet of stream enhancement, noted as Reach 1 in this monitoring report, involved an in-place restoration approach. The reach was enhanced using vegetation and bank stabilization structures, such as single arm vanes, cross-vanes, J-hooks, and root wads. The restoration of 1,240 linear feet of the UT, noted as Reach 2 in this monitoring report, involved relocating the channel away from a previously straightened ditch. A sinuous, stable pattern, with riffle-pool bedform was constructed. Cross-vanes, J-hooks, and riffles were installed to provide bank stabilization, habitat, and maintain grade control. On a second unnamed tributary to Lyle Creek, approximately 800 linear feet of stream preservation was implemented by installing fencing to exclude cattle access.

The UT's riparian areas were planted with native bare root seedlings and herbaceous cover to enhance the riparian areas and stabilize streambanks. The entire site was fenced to exclude cattle access to the UT Reach 1 and 2 and the second UT (approximately 800 linear feet) to Lyle Creek.

Table I
Project Mitigation Structure and Objectives

Lyle Creek/Project No. 423					
Segment/Reach	**Mitigation Type**	**Approach**	**Linear Feet**	**Stationing (ft)**	**Comments**
Reach 1 UT to Lyle Creek	EI	P2/3	700	0+00-7+00	Channel restoration, in-place with use of grade control and bank protection structures.
Reach 2 UT to Lyle Creek	R	P1	1,240	7+00-19+40	Channel restoration, relocation with use of grade control and bank protection structures.
2nd UT to Lyle Creek	P	P	800	N/A	Preservation/Enhancement; fenced in stream to exclude cattle.

(EI=Enhancement Level I, R=Restoration, P=Preservation)

3. Project History and Background

The stream enhancement/restoration was designed by EcoScience Corporation and constructed by North State Environmental. Construction activities were completed in 2002. Monitoring has been conducting annually from 2003 to present, with an as-built survey completed in late 2002/early 2003. This report serves as the 4th year of the 5 year monitoring plan for the Lyle Creek stream restoration site. Tables II and III provide detailed project activity, history and contact information for this project. Table IV provides more in-depth watershed/site background for the project.

Table II
Project Activity and Reporting History

Lyle Creek/Project No. 423			
Activity or Report	**Scheduled Completion**	**Data Collection Completed**	**Actual Completion or Delivery**
Restoration Plan	Unknown	Unknown	Unknown
Final Design-90%	Unknown	Unknown	Unknown
Construction	Unknown	2002	July 2002
Temporary S&E mix applied to entire project area	Unknown	2002	2002
Permanent seed mix applied to reach	Unknown	2002	Fall 2002
Mitigation Plan/ As-Built (Year 0 Monitoring)	2002	2002	February 2003
Year 1 Monitoring	2003	November 2003	February 2004
Year 2 Monitoring	2004	July 2004	February 2005
Year 3 Monitoring	October 2005	December 2005	February 2006
Year 4 Monitoring	September 2006	September 2006	November 2006
Year 5 Monitoring	September 2007	TBD	TBD

Table III
Project Contacts

Lyle Creek/Project No. 423	
Designer	EcoScience Corporation 1101 Haynes Street, Suite 101 Raleigh, NC 27604
Contractor's Name	North State Environmental, Inc. 2889 Lowery St., Suite B Winston-Salem, NC 27101
Planting Contractor	Unknown
Seeding Contractor	Unknown
Monitoring Performers	Jordan, Jones, and Goulding, Inc. 9101 Southern Pine Blvd., Suite 160 Charlotte, NC 28273
Stream Monitoring, POC	Dan Rice, 678-333-0457
Vegetation Monitoring, POC	Dan Rice, 678-333-0457

Table IV
Project Background

Lyle Creek/Project No. 423	
Project County	Catawba County, North Carolina
Drainage Area	0.74 sq mi
Drainage impervious cover estimate	~10%
Stream Order	3rd
Physiographic Region	Piedmont
Ecoregion	Piedmont
Rosgen Classification of As-built	E
Cowardin Classification	N/A
Dominant soil types	Cecil-Chewacla
Reference Site ID	Unknown
USGS HUC for Project and Reference	3050101
NCDWQ Sub-basin for Project and Reference	03-08-32
NCDWQ classification for Project and Reference	WS-IV;CA
Any portion of any project segment 303d list?	No
Any portion of any project segment upstream of a 303d listed segment?	No
Reason for 303d listing or stressor?	N/A
% of project easement fenced?	100%

4. Monitoring Plan View

The monitoring plan view map (Figure II) illustrates the location of the longitudinal profile stations, cross-section stations, vegetation plots, and photo points. A total of seven cross-sections were previously established within Reach 1 and 2. Approximately 2,000 linear feet of longitudinal profile was monitored. Three vegetation plots were previously established and four new vegetation plots were established by JJG in 2006. The new plots were established in accordance with NCEEP's revised vegetation monitoring protocol. Photographs were taken upstream and downstream at each cross-section and at existing photo points. No problems occurred that inhibited accurate data assessment.

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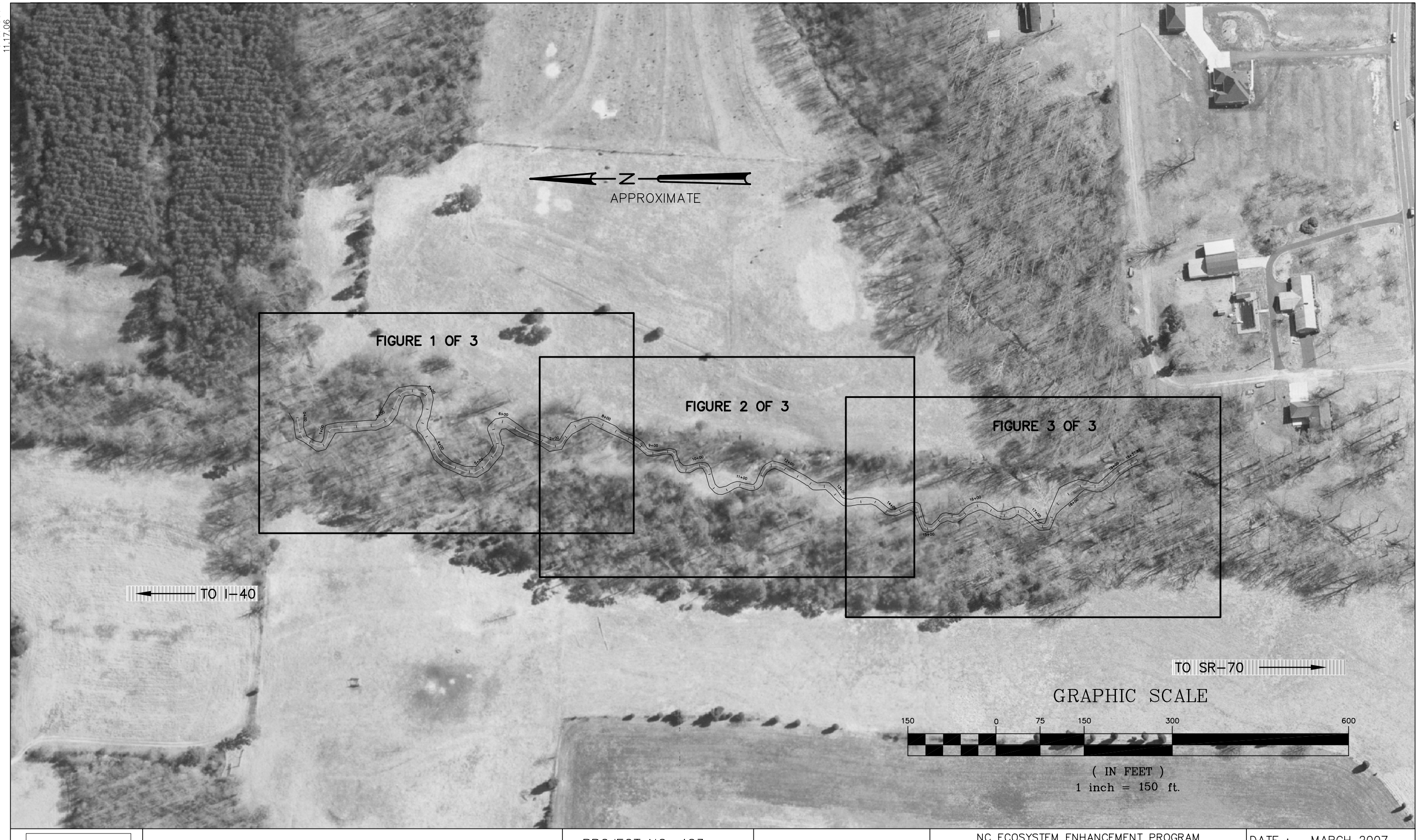

Ecosystem Enhancement PROGRAM

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

FIGURE II
MONITORING PLAN VIEW MAP

DATE : MARCH 2007
SCALE : 1"=150'
JOB NO.: 03060-001

FIGURE KEY

TBMILLER

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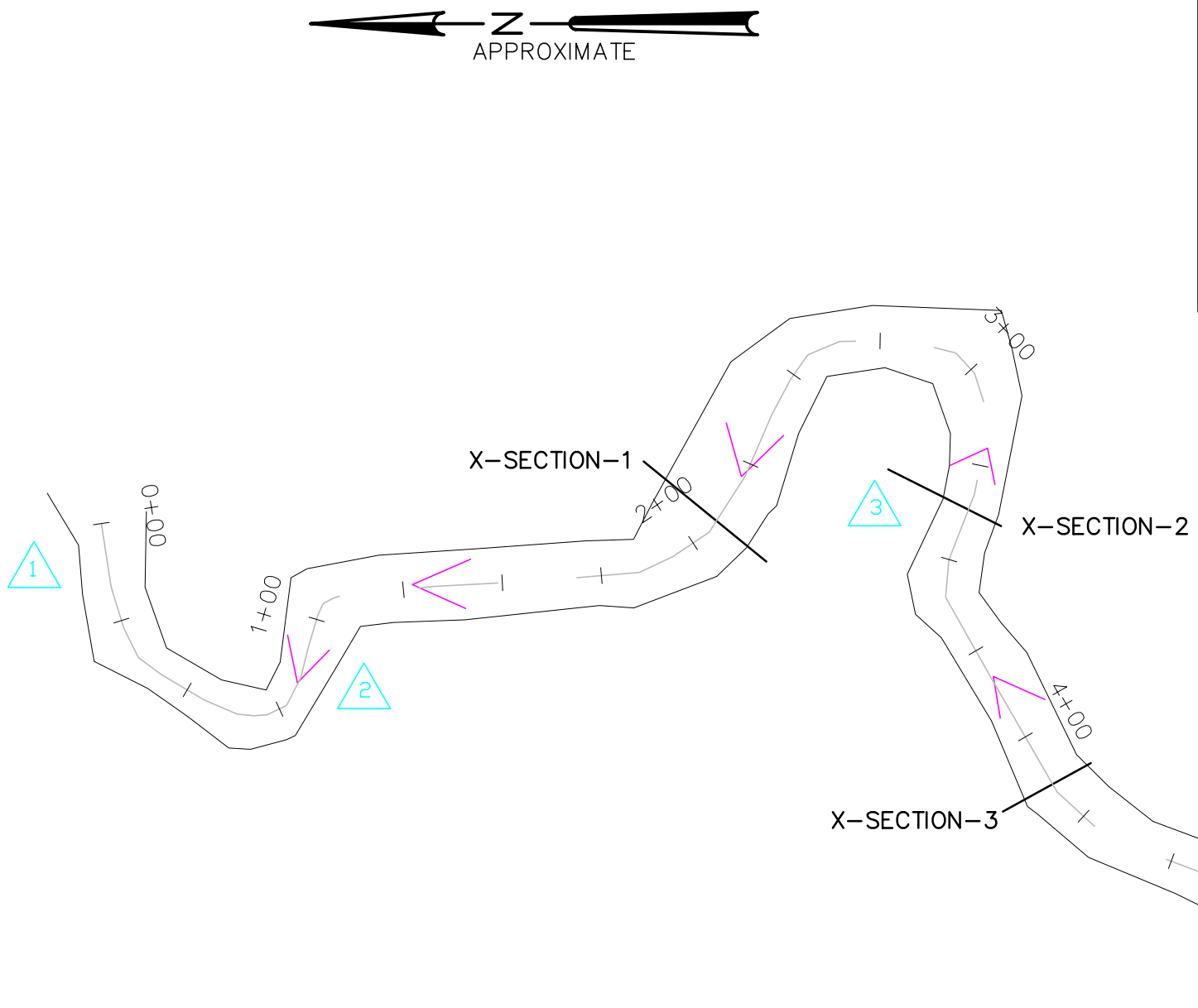

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MATCHLINE STA. 8+25
SEE FIGURE 2 OF 3

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Ecosystem Enhancement PROGRAM

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

FIG II
MONITORING PLAN VIEW MAP

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 1 OF 3

JTHACKSTON

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N
APPROXIMATE

LEGEND

CHANNEL CENTERLINE

BANK FULL

PHOTO POINT

CROSS VANE (CRSV)

J-HOOK VANE (JHV)

VEGETATION PLOT

NEW VEG PLOT 5

VEG PLOT 2

VEG PLOT #

9+00

10+00

12+00

13+00

7

8

9

X-SECTION-4
11+00

X-SECTION-5

X-SECTION-6

MATCHLINE STA. 8+25
SEE FIGURE 1 OF 3

MATCHLINE STA. 13+75
SEE FIGURE 3 OF 3

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

FIGURE II
MONITORING PLAN VIEW MAP

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 2 OF 3

TBMILLER

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MATCHLINE STA. 13+75 SEE FIGURE 2 OF 3

N
APPROXIMATE

X-SECTION-7

14+00

VEG PLOT 1

16+00

17+00

18+00

19+00

19+37.82

NEW VEG PLOT 8

NEW VEG PLOT 7

10

15+00

11

12

LEGEND

- CHANNEL CENTERLINE
- BANK FULL
- # PHOTO POINT
- CROSS VANE (CRSV)
- J-HOOK VANE (JHV)
- VEG PLOT # VEGITATION PLOT

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

FIGURE II
MONITORING PLAN VIEW MAP

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 3 OF 3

TBMILLER

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SECTION II

Project Condition and Monitoring Results

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SECTION II

Project Condition and Monitoring Results

The following monitoring results are from the 2006 (year 4 of 5) survey completed in September, 2006.

A. Vegetative Assessment

Planted zones related to the stream restoration consist of the stream bank and the buffer area adjacent to the stream. The riparian zone begins at the top of bank and proceeds perpendicular to the stream for an average distance of 50 feet. The planted stream bank initiates at base flow elevation and extends to the top of bank. The overall success of these two particular planted zones is good. Live stakes (*Salix nigra* and *Cornus amomum*) and herbaceous species (*Carex* spp. and *Juncus* spp.) along the stream bank are healthy and abundant. The riparian buffer is dominated by a thick herbaceous layer with numerous shrubs and saplings throughout. Natural recruitment vegetation appears to be dominant. This is likely due to the undisturbed forested areas along the right bank of the restoration area causing regeneration of trees.

There were three vegetation plots established by EcoScience in 2002. Please refer to the Monitoring Plan View Map (Figure II) for the location of these plots. The success criterion for these previously established plots requires 260 live stems per acre in monitoring year 4 of 5 (2006). In addition, four new plots were established by JJG in 2006. Please refer to the Monitoring Plan View Map (Figure II) for the location of these new plots. The plots established by JJG were randomly selected and monitored per the new 2006 NCEEP protocol. The three previously established plots were also monitored per the new protocol. Planted stems must represent 30% of the stems per acre total. Please refer to Appendix A for the vegetative survey data table and monitoring plot photos.

1. Soil Data

Lyle Creek is situated within a narrow ridge and valley within the inner Piedmont Belt of the North Carolina Piedmont Physiographic Province. Researchable data indicates that the soils within the project area are those found in alluvial landforms in this physiographic region; however, grading and filling activities during construction likely disturbed the parent soil.

Review of the North Carolina Soil datamart indicates that three soil series are found within the project limits (Figure III and Table V). These soil series consist of Chewacla (*Hydric Soil of the United States*), Cecil, and Hiawasee. Chewacla soils are generally found along stream corridors. These soils are formed from fine alluvial material and are somewhat poorly drained within the project area. Cecil soils are also found in areas adjacent to the stream. However, these soils are not as prevalent as Chewacla. The Cecil soils within the project area are formed from fine alluvial material and are somewhat poorly drained. The Hiawasee series is generally found on high stream terraces. The undisturbed forested slopes and the surrounding upland consist of this soil type.

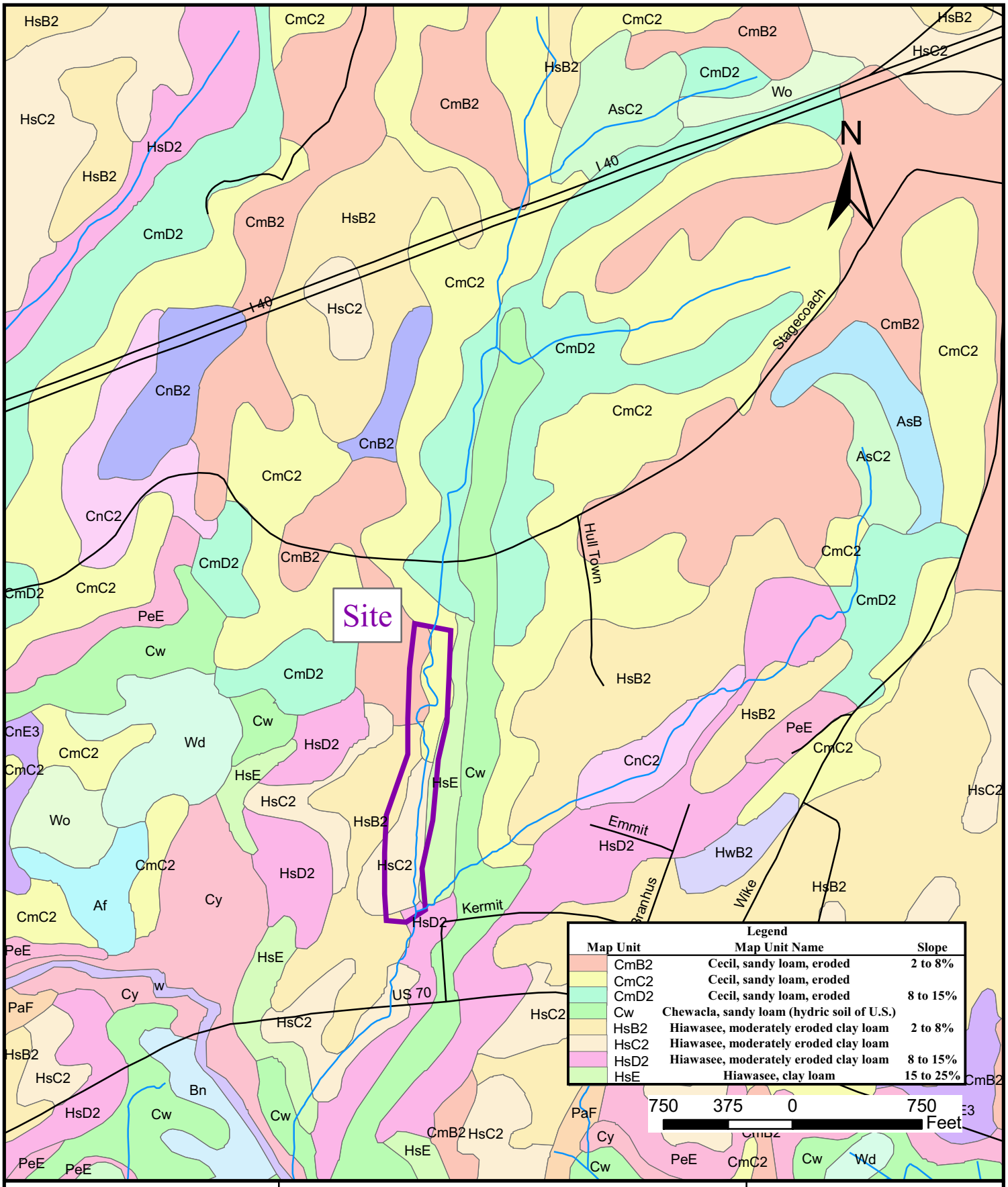

Figure III. SOILS MAP
Lyle Creek Stream Restoration
Catawba County, NC
Monitoring Report Year 4 of 5

Project # 423
March 2007

Table V
Preliminary Soil Data

Series	Max Depth (in)	% Clay of Surface	K factor	T factor	% Organic matter
Chewacla	60	10 - 35	0.28	5	1.0 – 4.0
Cecil	75	5 - 20	0.28	5	0.5 – 1.0
Hiawasee	60 - 80	10 - 35	0.28	5	0.5 – 2.0

2. Vegetative Problem Areas

During the initial assessment conducted in March 2006 as well as the vegetative survey conducted in September 2006, it was noted that some areas of stream bank have suffered localized loss of vegetative cover. In these areas, it is evident that flood events may have caused the bank erosion and the resulting loss of vegetation. Problem areas associated with the riparian buffer zone were also observed. Most notable is the abundance of invasive species such as *Rubus argutus*, *Rosa multiflora*, *Ligustrum sinense*, and *Microstegium virmineum.* Please refer to Table VI for more details on vegetative problem areas. Please refer to Appendix A2 and A3 for photos of these areas.

3. Vegetative Problem Area Plan View

Please refer to Appendix B1 and B2 for location of vegetative problems onsite.

4. Stem Count

JJG conducted the vegetative assessment and vegetative plot analysis on September 27, 2006 and September 28, 2006 per the new NCEEP 2006 protocol. Seven plots were surveyed, three of these were previously established by EcoScience in 2002 and four were newly established plots by JJG in 2006. The vegetative plots established on site were selected randomly and represent the riparian buffer zone.

Trees planted within the plots monitored include overcup oak species (*Quercus lyrata*), river birch (*Betula nigra*), American sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), and silky dogwood (*Cornus amomum*). In addition, natural recruitment vegetation was also monitored within these plots. Species encountered were tulip poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), tag alder (*Alnus serrulata*), black gum (*Nyssa sylvatica*), Eastern red cedar (*Juniperus virginana*), oak species (*Quercus* spp.), and species that were originally planted. Please refer to Table VII for a summary of stem counts.

Table VI
Vegetative Problem Areas

Vegetative Issue	Location	Probable Cause	
Invasive population	Plot 1	existing seed source, storm flows, and land disturbance	
Invasive population	Plot 2	existing seed source, storm flows, and land disturbance	
Invasive population	Plot 3	existing seed source, storm flows, and land disturbance	
Invasive population	Plot 5	existing seed source, storm flows, and land disturbance	
Invasive population	Plot 6	existing seed source, storm flows, and land disturbance	
Invasive population	Plot 7	existing seed source, storm flows, and land disturbance	
Vegetative Issue	**Station**	**Probable Cause**	**Photo Point #**
moderate bank erosion / loss of stream bank vegetation	0+25 to 0+35	storm flows	A2.1
moderate bank erosion / loss of stream bank vegetation	4+25 to 4+50	storm flows	A2.1
severe bank erosion / loss of stream bank vegetation	5+75 to 6+00	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	9+25 to 9+40	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	10+25 to 10+50	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	11+55 to 11+90	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	13+55 to 13+80	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	14+35 to 14+70	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	16+00 to 16+30	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	16+60 to 17+10	storm flows	A2.2
severe bank erosion / loss of stream bank vegetation	17+80 to 18+00	storm flows	A2.2
moderate bank erosion / loss of stream bank vegetation	18+45 to 18+60	storm flows	A2.1
severe bank erosion / loss of stream bank vegetation	18+75 to 19+38	storm flows	A2.2

Table VII
Stem Counts for Planted Species Arranged by Plot – Year 4 of 5 (2006)

Species	Year 3 (2005) Plot Data			Total # of planted stems Year 4 (2006)	Year 4 (2006) Vegetation Plot Data						
	1	2	3		1	2	3	4	5	6	7
Acer rubrum				4							4
Betula nigra	3	5	1	32	1*	5*	1*	2	9	6	8
Fraxinus pennsylvanica	1			4		*		2	1	1	
Nyssa sylvatica				3				1	1		1
Platanus occidentalis			2	18	*		2		2	11	3
Quercus lyrata				1					1		
Salix nigra	1		3	8	1*		2			2	3
Liriodendron tulipifera	6		2	8	6		2	N/A	N/A	N/A	N/A
Alnus serrulata	3			2	2			N/A	N/A	N/A	N/A
Juniperus virginiana		1	2	2			2	N/A	N/A	N/A	N/A
Totals (2006)	**14**	**6**	**10**	**82**	**10**	**5**	**9**	**5**	**14**	**20**	**19**
Initial Totals (2005)	**29**	**6**	**10**	**N/A**	**29**	**6**	**10**	**N/A**	**N/A**	**N/A**	**N/A**
Average # of Stems per plot	**10**			**N/A**	**12**						
Percent Survival (2006)	**48%**	**100%**	**100%**	**N/A**	**35%**	**83%**	**90%**	**100%**	**100%**	**100%**	**100%**

* Species had numerous volunteers counted

The survival rate for the woody vegetation monitored for 2006 is 87%. At this stage in the project and vegetation development, JJG is unable to clearly determine which stems were planted and which stems could be natural recruitment. This is also true for the newly established plots 4 through 7. JJG decided to measure the largest trees as the planted specimens and recorded the smaller stems as natural recruitment. The monitoring data recorded an average of 12 planted stems per plot. The site density is approximately 480 planted stems per acre, which exceeds the year 4 goal of 260 planted stems per acre. Furthermore, the natural recruitment woody stems recorded substantially increases the number of live stems per plot. There is an average of approximately 40 recruitment stems per plot. In total, approximately 50 woody stems per plot were recorded. A review of the planted and natural recruit's monitored indicates a current site density of approximately 2,000 stems per acre. The site density was calculated by dividing the average number of stems by the plot size (0.025 ac). All plots for this project were NCEEP standard of 10m X 10m (100 sq. m).

In conclusion, the vegetation throughout the stream and riparian restoration project meets the success requirements. Although some loss of stream bank vegetation has occurred, the overall growth of the riparian buffer is good. Per the success criterion for year 4 of 5 (2006), the site has exceeded 260 stems per acre.

5. Vegetation Plot Photos

Please refer to Appendix A3 for photographs of the vegetation monitoring plots.

B. Stream Assessment

Stream dimension, pattern, profile and substrate were evaluated within 1,940 linear feet of the stream restoration site. The stream assessment including walking the entire stream reach and monitoring 1,940 linear feet of longitudinal profile and seven pre-established cross-sections. Please refer to Tables VIII, IX, and X for the stability assessments and the as-built morphology and hydraulic summary. Refer to Table XI for monitoring years 2003-2006 morphology and hydraulic summary, and Appendix B for the problem area plan view map, stability assessment, stream photographs, and raw data.

1. Problem Areas Plan View (Stream)

Please refer to Appendix B1 for problem areas plan view map.

2. Problem Areas Table Summary

Table XIII below provides categorical feature issues by station, the suspected cause and denotes a representative photo of the condition, which is located in Appendix B2.

3. Numbered Issues Photo Section

Please refer to Appendix B2 for problem areas plan view photos.

4. Fixed Photo Station Photos

Please refer to Appendix B3 for photo station photos.

Table VIII
Stream Problem Areas
(Please refer to Appendix B2 for photos)

Lyle Creek/Project No.423				
Feature Issue		**Station Numbers**	**Suspected Cause**	**Photo ID**
Bank erosion - moderate	Reach 1	00+25 - 00+45	Erosion under tree root due to excess shear stress	B2.1
		04+20 - 04+50	Moderate bank slumping due to excess shear stress - LB	
	Reach 2	14+75 - 14+90	Bank undercutting due to excess shear stress - RB	
		18+45 - 18+65	Moderate erosion due to shifting of upstream pool to RB	
Bank erosion - severe	Reach 1	05+75 - 06+05	No bank protection on downstream end of bend resulting in severe erosion - LB	B2.2
		09+20 - 09+40	Severe bank erosion and failure due to insufficient channel capacity and excess shear stress - LB	
		10+00 - 10+25	Severe bank erosion and failure due to insufficient channel capacity and excess shear stress - LB	
		11+60 - 11+95	Severe bank erosion and failure due to channel migration and excess shear stress - LB	
		13+55 - 13+85	Bank undercut and failed due to excess shear stress - LB	
	Reach 2	14+35 - 14+70	Bank undercut and failed due to channel migration, downcutting, and excess shear stress - LB	
		15+25 - 15+45	Bank undercutting due to excess shear stress - LB	
		17+80 - 18+00	Severe erosion due to excess shear stress - LB	
		16+00 - 16+30	Stream downcut and channel shifted resulting in severe erosion and tree fall - LB	
		16+70 - 17+10	Severe bank erosion and failure due to upstream structure failure - LB	
		18+75 - 19+05	Severe bank erosion and failure due to upstream structure failure - RB	
		19+10 - 19+40	Severe bank erosion and bank failure below right arm of failed cross vane - RB	

Table VIII Con't.
Stream Problem Areas
(Please refer to Appendix B2 for photos)

Lyle Creek/Project No.423				
Feature Issue		**Station Numbers**	**Suspected Cause**	**Photo ID**
Downcut/lost riffle	Reach 2	08+85 - 09+00	Insufficient channel capacity shifting riffle downstream	B2.3
		10+90 - 11+15	Insufficient channel capacity shifting riffle downstream	
		11+95 - 12+20	Insufficient channel capacity shifting riffle downstream	
		14+10 - 14+30	Insufficient channel capacity shifting riffle downstream into pool	
		15+10 - 15+20	Insufficient channel capacity shifting riffle downstream into pool	
		15+75 - 16+00	Insufficient channel capacity shifting riffle downstream into pool	
Lateral bar	Reach 1	06+60 - 06+80	Stream over widened	B2.4
Mid-channel bar	Reach 2	14+70 - 14+75	Mid-channel bar formed from upstream erosion	B2.5
Structure - failed	Reach 2	14+95	Log vane structure detached from bank and blocking channel due channel erosion under log.	B2.6
		16+70	Right vane arm collapsed due to shifting channel and excess shear stress	
		19+25	Right vane arm eroded and dislodged due total failure of structure and bank	
Structure - stressed	Reach 1	05+00	Erosion at top right vane arm due to insufficient channel capacity	B2.7
	Reach 2	17+50	Erosion under invert & footer rock and stressing right arm	
		18+30	Erosion behind left vane arm due to insufficient channel capacity	
		18+60	Erosion under invert and footer rock	

5. Stability Assessment

The upstream section (Reach 1) of the project consists of Enhancement Level I. The overall pattern, profile, and dimensions of this section appear stable with some isolated signs of moderate erosion. The section of the channel that was relocated (Reach 2) is showing significant signs of instability. The pattern, profile and dimensions of the channel appear to be shifting in Reach 2. A general overview is provided below.

Reach 1: Restored Channel In-Place: Enhancement Level I (700 ft)

There are areas of moderate erosion associated with the outer bank of tight meander bends within Reach 1; however, these banks still appear to be stable. There is one area (Station 05+75 to 06+05) of severe erosion, bank instability, and poor bank protection near the downstream end of this section. This is a tight bend, and there is insufficient bank cover to protect the bank. One

cross-vane (Station 05+00) is showing signs of stress on the right arm, but the bank is stable, and there is sufficient bank cover.

Cross-sections 1, 2 and 3 are located within Reach 1. Cross-section 1 is a pool that was previously filling in. Since then, the pool has deepened; thereby, decreasing the width to depth ratio. Cross-section 2 is a riffle and cross-section 3 is a pool, both have shown slight bankfull width increases, which lead to an increase in width to depth ratio. The reach appears to be maintaining stability with stable structures and minimal bank erosion; however, both the d50 and d84 from the surveyed riffle cross-section have decreased over the monitoring years. The d50 has changed from medium to fine sand and the d84 has significantly changed from medium gravel to coarse sand. The area immediately upstream of Reach 1 is showing signs of bank erosion and instability, which is most likely the source of the sedimentation and fining occurring within Reach 1. Please refer to Tables VIII, IX, X, XI, and Appendix B for detailed stream assessment problem area results.

Reach 2: Relocated Channel: Restoration (1,240 ft)

In several riffle areas, there are indications of an active headcut, in which the stream elevation has dropped, and the riffle material has shifted downstream and deposited immediately upstream of pools. Typically, the bend immediately downstream of these areas is severely eroded and often collapsed. As a result of this instability, the stream is beginning to show signs of pattern migration. Several meander bends are severely eroded with bank failure. The bank erosion is a major source of instream sedimentation. Many of the structures installed to maintain grade and stability have failed or are stressed. For most cross-vanes, the failure or stress is associated with only one vane arm. The one log vane (Station 14+95) installed within Reach 2 has failed and is now lodged as an obstruction in the stream. Upstream of the convergence point, there are three cross-vanes that step the elevation down to the elevation of the adjoining UT of Lyle Creek and the end of the project. The stress and failure level of these structures increase as the stream elevation drops to meet the elevation of the convergence point. The most downstream structure has completely failed, and there is a risk of a head cut formation from the downstream convergence point upstream to an existing sill. The upstream sill is located approximately 150 feet above the downstream end of the project and these vanes. This sill is holding well, and currently there are no signs of headcutting. However, this sill may not hold if the downstream vanes continue to fail and lose grade. Please refer to Table VIII, IX, X, XI, and Appendix B for detailed stream assessment and problem area results.

Reach 2 includes cross-section's 4, 5, 6, and 7. Cross-section 4 is a riffle, which appears to have overwidened and is now building a new bench at innerberm. Cross-section 5 is a riffle that has shifted approximately 5 feet to the left from its original as built station. Cross-section 6 is a pool that has previously downcut and appears to be aggrading. The pool is filling in, which is illustrated by the decrease in its width to depth ratio and mean depth. Cross-section 7 is a pool with an undercut bank. It is very unstable and eventually, will have have bank failure (left). This pool also shifted in 2005 approximately 3 feet from previous survey stations.

In summary, Reach 1 has areas of moderate bank erosion and some signs of stress on one cross-vane within the reach, but no major stressors are apparent. The lower, relocation restoration

(Reach 2), is illustrating a trend towards instability, with headcut formations and severe bank erosion throughout. A maintenance plan is currently being developed by others for Reach 2.

Table IX
Categorical Stream Feature Visual Stability Assessment

Lyle Creek/Project No. 423 Reach 1: Enhancement Level I (700 ft)					
Feature	**As-Built (2002)**	**MY1 (2003)**	**MY2 (2004)**	**MY3 (2005)**	**MY4 (2006)**
A. Riffles	-	-	-	36 %	97.9%
B. Pools	-	-	-	92 %	87.5%
C. Thalweg	-	-	-	92 %	100%
D. Meanders	-	-	-	67 %	93.3%
E. Bed General	-	-	-	86 %	93.7%
F. Vanes/J Hooks, etc	-	-	-	89 %	94.5%
G. Wads and Boulders	-	-	-	N/A	-
H. Bank Performance	-	-	-	-	88.6%
Lyle Creek/Project No. 423 Reach 2: Relocation Restoration (1,240 ft)					
Feature	**As-Built (2002)**	**MY1 (2003)**	**MY2 (2004)**	**MY3 (2005)**	**MY4 (2006)**
A. Riffles	-	-	-	36 %	62.5%
B. Pools	-	-	-	92 %	91.65%
C. Thalweg	-	-	-	92 %	50%
D. Meanders	-	-	-	67 %	46.7%
E. Bed General	-	-	-	86 %	97.43%
F. Vanes/J Hooks, etc	-	-	-	89 %	35.8%
G. Wads and Boulders	-	-	-	N/A	-
H. Bank Performance	-	-	-	-	72.6%

(MY3 data represents data for the entire Reach, and cells noted with a (-), data was not provided).

6. Quantitative Measures Tables

Tables X and XI, display morphological summary data from all monitoring years. The as-built data provided in the previous monitoring reports was not accurately reported between years; therefore, JJG referenced regional curves to verify cross-sectional area to determine which data set to report. The as-built data provided in Table X was taken from the North Carolina State University 2003 monitoring report. Raw survey data can be found in Appendix B.

Table X
Baseline Morphology and Hydraulic As-Built Summary
Lyle Creek/Project No. 423

																As-Built					
	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			Reach 1			Reach 2		
DIMENSION	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Bankfull Width (ft)																11.8	16.3	13.2	10.7	12.8	11.0
Floodprone Width (ft)																	-			-	
Bankfull Cross-sectional Area																15.6	20.8	16.5	15.2	19.6	17.2
Bankfull Mean Depth																1.2	1.4	1.3	1.4	1.6	1.6
Bankfull Max Depth		-			-			-			-			-		2.2	3.1	2.2	2.2	2.8	2.6
Width/Depth Ratio																9.8	11.6	10.2	7.6	8.0	7.1
Entrenchment Ratio																					
Wetted Perimeter (ft)																	-			-	
Hydraulic Radius (ft)																					
Bank Height Ratio																	1.0			1.0	
PATTERN																					
Channel Beltwidth (ft)																33	141	88			
Radius of Curvature (ft)		-			-			-			-			-		14.9	37.5	22.4		-	
Meander Wave Length (ft)																33	114	63			
Meander Width Ratio																	-				
PROFILE																					
Riffle Length (ft)																	-				
Riffle Slope (ft/ft)		-			-			-			-			-		0.0000	0.0364	0.0141		-	
Pool Length (ft)																14	64	27			
Pool to Pool Spacing (ft)																22	161	54			
SUBSTRATE																					
D50 (mm)		-			-			-			0			-		0.09	0.19	0.19	0.09	0.19	0.19
D85 (mm)																0.52	15.91	15.91	0.52	15.91	15.91

ADDITIONAL REACH PARAMETERS	**USGS Gage Data**	**Regional Curve Interval**	**Pre-Existing Condition**	**Project Reference Stream**	**Design**	**As-Built**
Valley Length (ft)	-	-	-	-	-	-
Channel Length (ft)	-	-	-	-	-	-
Sinuosity	-	-	-	-	-	-
Water Surface Slope (ft/ft)	-	-	-	-	-	-
Bankfull Slope (ft/ft)	-	-	-	-	-	-
Rosgen Classification	-	-	-	-	-	-

Cells noted with a (-), data was not provided
*Ranges provided for the as-built dimension, pattern and profile were provided from the previous North Carolina State University monitoring reports from both pool and riffle cross-sections

Table XI
Morphology and Hydraulic Monitoring Summary
Lyle Creek/Project No. 423

	Reach 1 (In Place Restoration)											
DIMENSION	Cross-Section #1-Pool				Cross-Section #2-Riffle				Cross-Section #3-Pool			
	2003	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**
Bankfull Width (ft)	16.50	13.70	18.16	17.60	18.60	18.60	12.79	19.83	16.20	17.10	14.28	17.60
Floodprone Width (ft)	N/A	N/A	50.00	N/A	N/A	N/A	50.00	>100	N/A	N/A	50.00	N/A
Bankfull Cross-sectional Area	14.10	12.50	21.09	18.94	28.07	30.00	13.44	29.19	26.08	27.40	13.65	26.43
Bankfull Mean Depth	0.90	0.90	1.16	1.08	1.50	1.60	1.05	1.47	1.60	1.60	0.96	1.50
Bankfull Max Depth	1.70	1.40	1.97	2.44	2.40	2.40	1.45	2.65	2.00	2.00	1.63	2.55
Width/Depth Ratio	18.33	15.22	15.64	16.30	12.40	11.63	12.16	13.49	10.13	10.69	14.94	11.73
Entrenchment Ratio	N/A	N/A	2.75	N/A	-	-	3.91	>2.2	N/A	N/A	3.50	N/A
Wetted Perimeter (ft)	N/A	N/A	19.02	19.17	-	-	13.48	21.19	N/A	N/A	14.96	19.37
Hydraulic Radius (ft)	N/A	N/A	1.11	0.99	-	-	1.00	1.36	N/A	N/A	0.91	1.36
Bank Height Ratio	-	-	-	1.00	-	-	-	1.00	-	-	-	1.00
SUBSTRATE												
D50 (mm)	0.29	0.33	N/A	0.13	0.29	0.07	N/A	0.18	0.45	0.08	N/A	0.12
D84 (mm)	0.76	0.66	N/A	0.83	13.33	0.31	N/A	0.83	1.01	0.40	N/A	2.00

	Reach 1 (In Place Restoration)											
PATTERN	2003			2004			2005			2006		
	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Channel Beltwidth (ft)	42.04	109.17	54.60	42	109	55	*	*	*	29	110	52
Radius of Curvature (ft)	13.34	48.60	30.91	13.3	48.6	30.9	*	*	*	15	50	29.5
Meander Wave Length (ft)	58.89	177.06	148.76	59	177	149	*	*	*	60	166	148.5
Meander Width Ratio	-	-	-	N/A	N/A	N/A	*	*	*	1.71	6.47	3.06
PROFILE												
Riffle Length (ft)	9	68	21	9	68	21	*	*	*	1.00	33.00	8.75
Riffle Slope (ft/ft)	0.0017	0.0474	0.0212	0.0017	0.0474	0.0212	*	*	*	0.00	0.08	0.01
Pool Length (ft)	11	49	27	11	49	27	*	*	*	7.00	68.40	17.00
Pool to Pool Spacing (ft)	28	140	66	28	140	66	*	*	*	11.60	84.75	36.50

*2005 Survey did not break up stream into separate types of restoration reaches (Reach 1: Inplace Restoration and Reach 2: Relocated Restoration)
Cells noted with a (-), data was not provided
Cells noted with a (N/A), data was not applicable

Table XI cont.
Morphology and Hydraulic Monitoring Summary
Lyle Creek/Project No. 423

	Reach 2 (Relocation Restoration)															
DIMENSION	Cross-Section #4-Riffle				Cross-Section #5-Riffle				Cross-Section #6-Pool				Cross-Section #7-Pool			
	2003	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**
Bankfull Width (ft)	10.80	10.80	9.67	12.00	13.90	13.80	11.95	14.80	13.50	15.70	14.65	17.50	11.20	9.00	11.02	13.94
Floodprone Width (ft)	-	-	50.00	>100	-	-	50.00	>100	N/A	N/A	50.00	N/A	N/A	N/A	50.00	N/A
Bankfull Cross-sectional Area	17.76	17.00	13.51	16.38	20.73	25.20	13.77	20.45	27.31	28.50	21.65	25.72	16.20	18.90	13.66	22.70
Bankfull Mean Depth	1.60	1.60	1.40	1.36	1.50	1.80	1.15	1.40	2.00	1.80	1.48	1.47	1.40	2.10	1.24	1.63
Bankfull Max Depth	2.60	2.80	2.31	2.66	2.60	2.50	1.81	2.57	2.70	2.90	2.34	2.63	2.10	2.40	1.93	2.51
Width/Depth Ratio	6.75	6.75	6.92	8.82	9.27	7.67	10.37	10.72	6.75	8.72	9.91	11.90	8.00	4.29	8.89	8.55
Entrenchment Ratio	-	-	5.17	>2.2	-	-	4.18	>2.2	N/A	N/A	3.41	N/A	N/A	N/A	4.54	N/A
Wetted Perimeter (ft)	-	-	11.01	13.63	-	-	12.84	16.34	N/A	N/A	15.70	18.79	N/A	N/A	12.82	17.87
Hydraulic Radius (ft)	-	-	1.23	1.20	-	-	1.07	1.25	N/A	N/A	1.38	1.37	N/A	N/A	1.07	1.27
Bank Height Ratio	-	-	-	1.00	-	-	-	1.00	-	-	-	1.00	-	-	-	1.00
SUBSTRATE																
D50 (mm)	0.11	0.33	-	0.12	0.33	1.05	-	28.64	0.71	0.26	N/A	14.43	0.34	0.41	N/A	0.10
D84 (mm)	3.11	79.40	-	38.50	17.52	8.64	-	64.00	31.78	19.80	N/A	54.50	3.00	0.71	N/A	0.23

	Reach 2 (Relocation Restoration)											
PATTERN	2003			2004			2005 (entire reach)*			2006		
	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Channel Beltwidth (ft)	22	56	33	32	84	42	26	103	48	15	56	31
Radius of Curvature (ft)	17	39	21	16	47	23	19	51	28	10	40	15
Meander Wave Length (ft)	49	150	71	53	165	82	48	211	115	42	150	67
Meander Width Ratio	-	-	-	-	-	-	2	2	2	1	3	2
PROFILE												
Riffle Length (ft)	7	39	17	7	28	15	-	-	-	3	38	16
Riffle Slope (ft/ft)	0.0056	0.0494	0.0171	0.0065	0.0480	0.0210	0.0000	0.1000	0.0300	0.0000	0.0572	0.0137
Pool Length (ft)	9	41	23	9	41	23	12	79	32	2	56	18
Pool to Pool Spacing (ft)	27	176	46	31	92	43	12	153	70	17	211	56

*2005 Survey did not break up stream into separate types of restoration reaches (Reach 1: Inplace Restoration and Reach 2: Relocated Restoration)
Cells noted with a (-), data was not provided
Cells noted with a (N/A), data was not applicable

Table XI cont.
Morphology and Hydraulic Monitoring Summary
Lyle Creek/Project No. 423

ADDITIONAL REACH PARAMETERS	2003	2004	2005	2006	
				Reach 1	Reach 2
Valley Length (ft)	N/A	N/A	1337	1337	
Channel Length (ft)	N/A	N/A	1940	1940	
Sinuosity	N/A	N/A	1.45	1.45	
Water Surface Slope (ft/ft)	N/A	N/A	Not Reported	0.0067	0.0081
Bankfull Slope (ft/ft)	N/A	N/A	0.01	0.0060	0.0075
Rosgen Classification	N/A	N/A	C4	C4	

7. Hydrologic Criteria

A crest gauge has been installed upstream of cross-section 4. The table below is a verification that one bankfull or greater event occurred within the Lyle Creek restoration project in November 2006. Other indicators such as old wrack lines were observed at the bankfull and greater elevations within the restoration site as well as.

Table XII. Verification of Bankfull Events

Lyle Creek/Project No. 423			
Date of Collection	**Date of Occurrence**	**Method**	**Photo # (if available)**
11/24/06	Unknown	Crest Gauge	N/A

Jordan Jones & Goulding

SECTION III
Methodology

Jordan Jones & Goulding

SECTION III
Methodology

IV. Methodology

Methods employed for the Lyle Creek Stream Restoration Project were a combination of those established by standard regulatory guidance and procedures documents and the North Carolina State University and Soil and Environmental Consultants monitoring reports.

Appendix A
(Click here)

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APPENDIX A

Vegetation Raw Data

1. Vegetation Survey Data Tables*
2. Vegetation Problem Area Photos
3. Problem Monitoring Plot Photos

*Raw data tables have been provided electronically.

SEE ATTACHED .PDF FILE NOTED AS
"VEG DATA SHEETS-2006"
FOR VEGETATION SURVEY DATA TABLES

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix A1. Vegetation Survey Data Tables	Jordan Jones & Goulding Incorporated

Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle ork

Team: JJ6

Plot: 1

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: 9 / 27 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
B Fox	Plot Leader
K Mullinax	Co-leader

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☐ Well drained
☑ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General:

State: NC County: Cabarrus

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

GPS Receiver Location (m):
x= y=

Datum: ☑ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623

(or UTM-N) meters e.g. 3962248

Long: e.g. -125.12413

(or UTM-E) e.g. 710524

Coordinate Accuracy (m radius):
e.g. 30 Sub meter

GPS File Name: lyleork wes plot / (0/10)

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg):

Aspect (deg):

Compass Type: ☐ magnetic ☑ true

Plot Placement

☐ Representative
☐ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

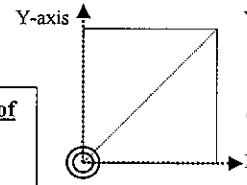
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

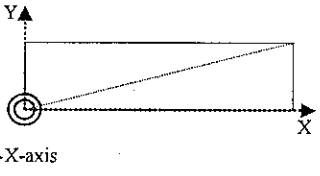
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



●Posts (x,y) (meters)
(0, 0)
(10, 0)
(10, 10)
(0, 10)
(,)

Key
◎ Plot origin (0,0) point
⊗ GPS location point
○→ photo taken, with direction
● posts

Bearing of Plot X-Axis: 90°

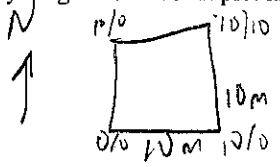
Plot Size (ares, default=1):
(An "are" is 100 m²)

○→ Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

Pt bar of restored Reach
photo pt 10 / aligned along bank

☐ more...

Plot Rationale: (why location was chosen for the plot)

previously established location

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

Rubus argutus, multiflora rosa, chinese privet
4 30+ diameter Tulip poplars in plot

☐ more...

Required Fields in Bold and Underlined. *Definitions and/or values are in the Definitions section of the CVS Field Guide.

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: BRV Project: Lyle Creek Team: JSG Plot: 1 Date: 9/29/06 Page 2 of 6

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh (mm)	Height (cm)	DBH (cm)	Vigor	Damage
American Elm		5.4	2.4	6/16	27		1	
Salix nigra		6.1	7.5		154	1 1/16	4	
Salix nigra		8.0	8.4		144	14/16	4	
Platanus occ.		3.0	7.4	8/16	58		2	
Salix nigra		1.6	9.0	5/16	33		1	
Salix nigra		1.2	7.6	5/16	58		2	
Betula nigra		1.2	6.3	3/16	26		1	
				9.5	66			
					391	2.7		
					366	2.2		
				9.5	147			
				8	84			
				8	147			
				8	66			

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: BH **Project:** Lyle Creek **Team:** JJG **Plot:** Plot 1 **Date:** 9/27/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	TREES — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Quercus falcata				••	•													
Juniperus virg				•	•	•												
Cornus florida				3														
Sambucus can					•													
Liquidambar sty				•	••													
Liriodendron tulip					••													
Carya glabra				••														
Carya #pecan					•													
Diospyros virg				••	•													

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Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Crk

Team: JJG

Plot: 2

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: 9 / 27 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
B Fox	Plot Leader
K Mullinax	co-lead

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☐ Well drained
☑ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General: Stagecoach Rd / I-40

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

GPS Receiver Location (m): x= y=

Datum: ☑ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30 Sub meter

GPS File Name: Lyle crk Veg plot 2 (10/0)

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg): 0-2%

Aspect (deg):

Compass Type: ☐ magnetic ☐ true

Plot Placement

☑ Representative
☐ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

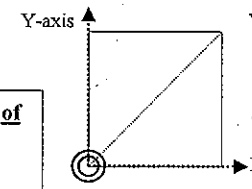
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

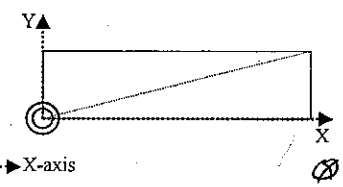
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



Posts (x,y) (meters)
(0, 0)
(10, 0)
(10, 10)
(0, 10)
(,)

Key
- Plot origin (0,0) point
- GPS location point
- photo taken, with direction
- posts

Bearing of Plot X-Axis: 173 °

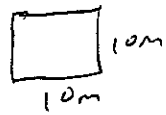
Plot Size (ares, default=1): (An "are" is 100 m²)

Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

left Bank of restored Reach

☐ more...

Plot Rationale: (why location was chosen for the plot)

established previous monitoring period

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

Rubus argutus, carolina nightshade

☐ more...

Required Fields in Bold and Underlined. *Definitions and/or values are in the Definitions section of the CVS Field Guide.

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: BFox Project: Lyle Creek Team: JSG Plot: 2 Date: 9/27/06 Page 2 of 3

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh (in) ~~(mm)~~	Height ~~(cm)~~ in	DBH ~~(cm)~~ in	Vigor	Damage
Betula Nigra		1.0	1.9	10/16	80		~~3~~ 2	
Betula Nigra		1.0	3.2	12/16	87		~~3~~ 2	
Fraxinus Penn		1.0	8.5		113	12/16	4	
Betula Nigra		2.7	2.7		82	10/16	3	
Betula Nigra		3.2	1.6	15/16	97		4	
Acer rubrum		4.0	0.8	15/16	114		4	
Fraxinus pen		4.3	3.3	13/16	97		4	
Betula Nigra		2.2	8.2	14/16	101		4	
Acer Rubrum		5.2	5.3	4/16 = 0.25	37		2	
Betula Nigra		5.8	1.6	13/16	81		3	
Betula Nigra		7.3	2.6	12/16	72		3	
Betula Nigra		6.7	3.3	12/16	80		3	
Betula Nigra		7.7	4.0	10/16	70		2	
Betula nigra		8.0	9.0	17/16	93		3	
				1.6	203			
				1.9	221			
					287	1.9		
					208	2.54		
				2.4	247			
				2.4	290			
				2.2	246			
				2.2	257			
				0.64	94			
				2.2	206			
				1.9	183			
				1.9	203			
				1.6	178			
				2.2	236			

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: BFox **Project:** Lyle Creek **Team:** 556 **Plot:** 2 **Date:** 9/27/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	Trees — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Acer Rubrum				••	••													
Betula Nigra				•	••	••												
Fraxinus pen.																		
Liriodendron Tul.					••	••												
Ulmus alata				•														
Ulmus serotina						••												
Cornus Florida				•														
Sambucus Can					•													

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Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Crk

Team: JJG

Plot: 3

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: Sept / 27 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
Ben Fox	Plot Leader
Kevin Mullaney	Co-lead

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☑ Well drained
☑ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General: Stagecoach Rd/S 140

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner: Unknown

⊗ **GPS Receiver Location** (m): x= y=

Datum: ☐ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30

GPS File Name:

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg):

Aspect (deg):

Compass Type: ☐ magnetic ☑ true

Plot Placement

☐ Representative
☐ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

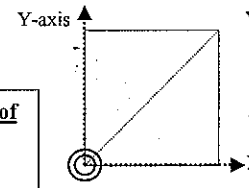
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

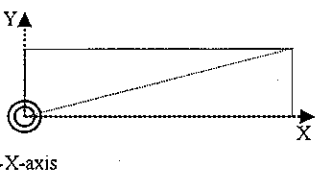
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



Posts (x,y) (meters)
(0, 0)
(0, 10)
(10, 10)
(10, 0)
(0, 0)

Key
- Plot origin (0,0) point
- GPS location point
- photo taken, with direction
- posts

Bearing of Plot X-Axis: 140 °

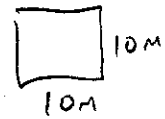
Plot Size (ares, default=1): (An "are" is 100 m²)

Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

Start of open clearing on left Bank

☐ more...

Plot Rationale: (why location was chosen for the plot)

Already established

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

Chinese privet, Japanese Honeysuckle, multiflora Rose, Rubus, Kudzu

☐ more...

Required Fields in Bold and Underlined. *Definitions and/or values are in the Definitions section of the CVS Field Guide.

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: B Fox Project: Lyle Cr Team: JJG Plot: 3 Date: 9/27/06 Page 2 of 2

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh ~~(mm)~~ in	Height ~~(cm)~~ in	DBH ~~(cm)~~ in	Vigor	Damage
Salix Nigra	R	1.55	1.05		148	1 1/16	4	
Betula Nigra	R	3.5	1.95	0.5	57	~~0.5~~	3	
Betula Nigra	R	3.2	1.7	0.25	42	~~0.25~~	3	
Betula Nigra	R	3.5	2.3	0.48	49	~~0.48~~	3	
Betula Nigra	R	4.2	2.65	0.50	53	~~0.5~~	3	
Fraxinus Pensylvan	R	6.3	3.0		144	1.0	4	
Fraxinus Pen.	R	1.5	6.6	0.	115	13/16	4	
Betula Nigra	R	2.6	8.55	15/16	80		3	
Betula Nigra	R	2.4	11.5	14/16	79		3	
Fraxinus Pensyl.	R	0	10	"	110	12/16	3	
Betula Nigra	R	3.7	9.3	9/16	61		4	
Betula Nigra	R	4.0	9.7	12/16	76		3	
Salix Nigra	R	4.0	10.0	11/16	70		3	
Betula Nigra	R	7.0	9.0	12/16	58		3	
Betula Nigra	R	9.0	9.4	13/16	65		3	
Betula Nigra	R	9.5	9.2	11/16	53		3	
					358	2.69		
				12.7	145			
				6.35	107			
				12.2	125			
				12.7	135			
				~	366	2.54		
				~	292	2.02		
				24.2	203			
				22.2	201			
				~	279	1.9		
				14.2	155			
				19	193			
				17	178			
				19	147			
				20	145			
				17	135			

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: BFox **Project:** Lylecrk **Team:** 356 **Plot:** 3 **Date:** 9/27/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☑ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	Trees — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Diospyros (Persimon)			—	2	2		—											
Liriodendron Tulipifera			—	2	3	1	—											
Acer Negundo			—		1	1	—											
Betula Nigra			—	10	10		—											
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 *Module is for Sampling Level 3. ● 1 ⁘ 2 ⁘ 3 ⁘ 4 ⁘ 5 ⁘ 6 ⁘ 7 ⁘ 8 ⁘ 9 ⁘ 10

Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Creek

Team: JS6

Plot: New #4

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: 9 / 27 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
B Fox	Plot Leader
K Mullinax	Co-lead

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☐ Well drained
☑ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General: Sturgeon Rd / S-I-40

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

GPS Receiver Location (m):
x= y=

Datum: ☑ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30

GPS File Name:

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg):

Aspect (deg):

Compass Type: ☐ magnetic ☐ true

Plot Placement

☐ Representative
☑ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

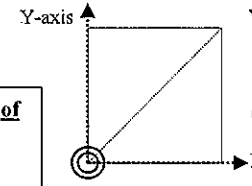
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

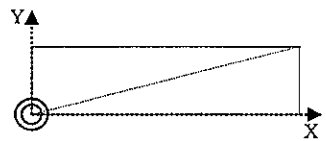
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



●Posts (x,y) (meters)
(0, 0)
(0, 10)
(10, 10)
(10, 0)
(,)

Key
◎ Plot origin (0,0) point
⊗ GPS location point
○→ photo taken, with direction
● posts

Bearing of Plot X-Axis: 135 °

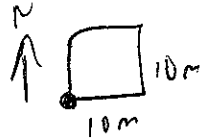
Plot Size (ares, default=1): (An "are" is 100 m²)

○→ Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

SW corner 30 ft off Left Bank of Stream at Triple Barrel Box Culvert Approximately 100' ft south of (Plot 3 old)

☐ more...

Plot Rationale: (why location was chosen for the plot)

Random selection

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

☐ more...

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: B Fox Project: Kyle Creek Team: JSG Plot: _____ Date: 9/27/16 Page 2 of 2

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh (mm/in)	Height (cm/in)	DBH (cm)	Vigor	Damage
Fraxinus Pen		0.70	1.1	14/16	92		3	
Fraxinus Pen		0.70	7.1	14/16	112		4	
Nyssa Aquatica		3.6	7.9	7/16	55		3	
Betula Nigra		4.0	4.9	9/16	54		3	
Betula Nigra		5.0	0.3	12/16	130		4	
				22.2	234			
				22.2	285			
				11	140			
				11	138			
				19	330			

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: BGH **Project:** Lyle cat **Team:** JJB **Plot:** 4 **Date:** 9/29/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	Trees — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Diospyros virg					•													
Acer Rubrum						••												
Liriodendron Tulipifera				•• •	•	•												

 *Module is for Sampling Level 3. • 1 •• 2 •• • 3 •• •• 4 •• •• • 5 •• •• •• 6 •• •• •• • 7 •• •• •• •• 8 •• •• •• •• • 9 •• •• •• •• •• 10

Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Crk

Team: JJG

Plot: New #5

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: 9 / 28 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
Ben Fox	Plot Leader
Stephen Bailey	Co-leader

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

- ☐ Excessively drained
- ☐ Somewhat excessively drained
- ☐ Well drained
- ☑ Moderately well drained
- ☐ Somewhat poorly drained
- ☐ Poorly drained
- ☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General: Stagecoach Rd / S-I-40

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

⊗ **GPS Receiver Location** (m): x= y=

Datum: ☑ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30

GPS File Name: Lyle Crk - New #

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg): 0-10

Aspect (deg):

Compass Type: ☐ magnetic ☑ true

Plot Placement

- ☐ Representative
- ☑ Random
- ☐ Stratified random
- ☐ Transect component
- ☐ Systematic (grid)
- ☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

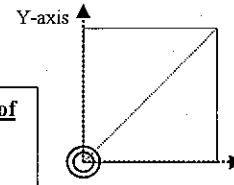
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

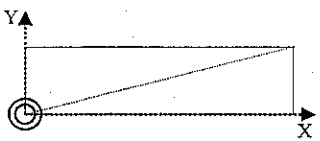
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



Bearing of Plot X-Axis: 100 °

●Posts (x,y) (meters)
(0, 0)
(0, 10)
(10, 10)
(10, 0)
(,)

Key

- ◎ Plot origin (0,0) point
- ⊗ GPS location point
- ○→ photo taken, with direction
- ● posts

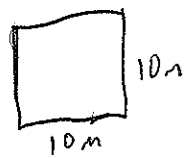
Plot Size (ares, default=1): (An "are" is 100 m²)

○→ Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

Left floodplain approximately 150 ft Southwest of old plot 2

☐ more...

Plot Rationale: (why location was chosen for the plot)

Random selection for new plots

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

multiflora rose, rubus argutus

☐ more...

Required Fields in Bold and Underlined. *Definitions and/or values are in the Definitions section of the CVS Field Guide.

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: Ben Foy Project: Lyle Pk Team: JJG Plot: New #5 Date: 9/28/06 Page 2 of 3

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh in (mm)	Height (cm) in	DBH (cm) in	Vigor	Damage
Platanus occ		0.0	0.6	5/16	58		3	
Platanus occ		0.8	2.3	10/16	72		3	
Betula nigra		0.6	4.5	11/16	71		3	
Betula nigra		0.6	7.1	9/16	67		3	
Fraxinus penn		0.0	10.0		120	9/16	4	
Nyssa aquatica		2.1	10.0	8/16	45		3	
Quercus lyrata		2.5	5.4		113	14/16	4	
Betula nigra		2.9	1.5	7/16	44		3	
Betula nigra		4.9	7.4	12/16	81		3	
Betula nigra		5.0	8.7		102	9/16	4	
Betula nigra		7.5	9.0	14/16	93		3	
Betula nigra		6.0	7.3	14/16	105		3	
Betula nigra		8.0	5.4	10/16	79		3	
Betula nigra		10.0	0.5	9/16	82		3	

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: B Fox **Project:** Lylecox **Team:** JJb **Plot:** New #5 **Date:** 9/28/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	TREES — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Betula nigra				5	2	1												
Liquidambar sty				2														
Cornus amom.				2	1													
Tulip Poplar				2														
Acer sac.				1														
Quercus falcata					1													

Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Creek

Team: JJB

Plot: New #6

☐ Level 1 (planted stems only)
☒ Level 2 (planted and natural stems)

Start Date: 9 / 28 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
Ben Fox	Plot Leader
Stephen Buckley	Co-leader

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☐ Well drained
☒ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 0 cm

Location

General: Stagecoach Rd S-I-28

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

⊗ **GPS Receiver Location** (m): x= y=

Datum: ☒ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30

GPS File Name:

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg):

Aspect (deg):

Compass Type: ☐ magnetic ☐ true

Plot Placement

☐ Representative
☒ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

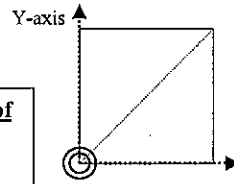
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

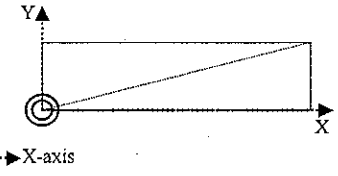
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



Bearing of Plot X-Axis: 100°

●Posts (x,y) (meters)
(0, 0)
(0, 10)
(10, 10)
(10, 0)
(,)

Key
- ◎ Plot origin (0,0) point
- ⊗ GPS location point
- ○→ photo taken, with direction
- ● posts

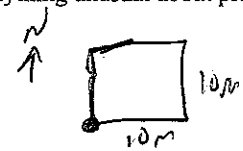
Plot Size (ares, default=1): (An "are" is 100 m²)

○→ Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

Left bank @ mid of Restored Reach
Approximately 25-35 ft from Bank

☐ more...

Plot Rationale: (why location was chosen for the plot)

Random selection for new plot

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

Rubus argutus

☐ more...

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: B Fox Project: Lyle Creek Team: JJ6 Plot: New #6 Date: 9/28/06

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh (mm) in	Height (cm) in	DBH (cm) in	Vigor	Damage
Betula Nigra		0.8	4.6	9/16	83		3	
Platanus occ		0.8	1.0	4/16	40		3	
Platanus occ		1.6	3.6	14/16	89		3	
Platanus occ		2.2	5.0	10/16	97		3	
Platanus occ		2.2	7.4	13/16	118		4	
Platanus occ		3.2	0.8		123	14/16	4	
Betula Nigra		4.2	1.9	14/16	89		3	
Fraxinus pen		4.5	3.8		140	1 1/16	4	
Betula nigra		4.0	8.6	15/16	87		3	
Betula nigra		2.6	9.2	16/16	90		3	
Platanus occ		3.0	9.0		97	8/16	4	
Platanus occ		4.5	7.4		106	10/16	4	
Salix nigra		5.5	6.2	15/16	138		4	
Betula Nigra		5.8	2.9		106	11/16	4	
Platanus occ		6.5	1.6	12/16	71		3	
Platanus occ		6.7	4.0		91	7/16	4	
Betula Nigra		7.4	7.3	7/16	52		3	
Platanus occ		7.4	4.9	9/16	55		3	
Platanus occ		8.4	7.1	11/16	68		3	
Salix nigra		9.0	0.0		136	1 2/16	4	

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing.

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: B Fox **Project:** Lyle Cork **Team:** SSL **Plot:** Rep #6 **Date:** 9 / 28 / 06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☑ ~~10cm~~ ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	Trees — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Liriodendron Tulipifera				•	5	••												
Acer Rubrum				••	3	••												
Ulmus alata					••	•												
Platanus oc.				4	4 1	•												
Ulmus americana				••	••													
Populus deltoides					•													
Smooth sumac					•										•			
Dahlia Misc				•	2 ••	••												

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Plot Data: CVS Levels 1 & 2

General Information

Project Label:

Project Name: Lyle Creek

Team: 556

Plot: New #17

☐ Level 1 (planted stems only)
☑ Level 2 (planted and natural stems)

Start Date: 9 / 28 / 06
e.g.: JAN / 15 / 2006

End Date (if different): / /

Party	Role**
B Fay	Plot Leader
Stephen Bailey	Co-lead

**Roles: Co-leader, Assistant, Guide, Land owner, Taxonomist, Other

Soil Drainage*

☐ Excessively drained
☐ Somewhat excessively drained
☐ Well drained
☑ Moderately well drained
☐ Somewhat poorly drained
☐ Poorly drained
☐ Very poorly drained

Water

Percent of Plot Submerged: 0 %

Mean Water Depth: 6 cm

Location

General: Stepcouch Rd - SE-ern

State: NC County: Catawba

Quadrangle:

Place Names: 1)

2) 3)

Land Owner:

GPS Receiver Location (m):
x= y=

Datum: ☑ NAD83/WGS84 ☐ NAD27

UTM Zone: if UTMs used

Lat: decimal deg. e.g. 35.16623 **(or UTM-N)** meters e.g. 3962248

Long: e.g. -125.12413 **(or UTM-E)** e.g. 710524

Coordinate Accuracy (m radius): e.g. 30

GPS File Name:

Site Characteristics

Elevation: ± ☐m ☐ft.

Slope (deg): 0

Aspect (deg):

Compass Type: ☐ magnetic ☑ true

Plot Placement

☐ Representative
☑ Random
☐ Stratified random
☐ Transect component
☐ Systematic (grid)
☐ Capture specific feature

Further details of placement can be mentioned in Plot Rationale.

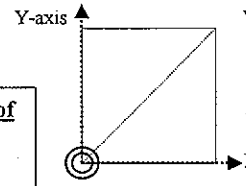
Taxonomic Standard Used for Plant Identification

Authority: Radford, **Publ. Date:**

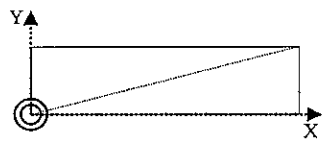
Plot Diagram

Fill in *ONE* of the templates below, using the key to draw GPS location, photos and posts. Edit shape if plot doesn't match one of the templates. Draw any landmarks, such as streams, banks, fences, etc.

Standard 10m x 10m (14.142m diagonal):



Non-standard 5m x 20m (20.616m diagonal):



Bearing of Plot X-Axis: 78 °

Posts (x,y) (meters)
(0, 0)
(0, 10)
(10, 10)
(10, 0)
(,)

Key
- Plot origin (0,0) point
- GPS location point
- photo taken, with direction
- posts

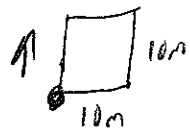
Plot Size (ares, default=1):
(An "are" is 100 m²)

Photo Identifier(s):

Notes

If more space is needed, check the box and use back of datasheets.

Layout: (anything unusual about plot layout and shape)



☐ more...

Plot Location: (directions to plot, landscape content)

35 ft from end of flagged flush on right branch

☐ more...

Plot Rationale: (why location was chosen for the plot)

Random selection for new plots

☐ more...

Other Notes: (invasive species, erosion, disturbances, etc.)

Microstegium vim./ Rubus argutus

☐ more...

Planted Woody Stem Data: CVS Levels 1 & 2

Leader: Ben Fox Project: Lyle Creek Team: JJB Plot: New #7 Date: 9 / 28 / 06

Species Name	Source	Coordinates X (m)	Coordinates Y (m)	ddh (mm)	Height (cm)	DBH (cm)	Vigor	Damage
Acer Rubrum	C	1.2	2.3	5/16	43		2	Deer/INS
Acer Rubrum		1.7	4.7	5/16	37		2	Deer/INS
Platanus occ.		1.7	7.8	7/16	54		2	Deer/INS
Betula nigra		2.0	7.2	5/16	45		2	Deer/INS
Nyssa aquatica		2.5	1.7	8/16	48		3	
Platanus occ.		3.5	8.9	4/16	39		2	Deer/INS
Salix nigra		3.8	9.8	5/16	52		3	
Betula nigra		4.1	9.4	6/16	47		2	Deer/INS
Acer Rubrum		5.5	9.8	3/16	26		1	Deer/INS
Betula nigra		5.7	8.0	3/16	43		2	Deer/INS
Betula nigra		5.7	5.0	3/16	36		1	
Betula nigra		6.0	1.0	4/16	42		2	INS
Salix nigra		6.0	1.6		94	5/16	3	Deer/INS
Betula nigra		6.5	6.0	4/16	37		2	Deer/INS
Platanus occ		7.6	2.2	5/16	45		2	Deer/INS
Betula nigra	↓	8.0	2.8	5/16	38		2	Deer/INS
Betula nigra		8.0	9.0	5/16	44		2	
Acer Rubrum	C	10.0	8.0	5/16	43		3	
Salix nigra	LS	10.0	1.0	9/16	76		3	

Source: Cultivated, Transplant, Live stake, Ball and Burlap, Pot, Bare Root

Vigor: 4=excellent, 3=good, 2=weak, 1=unlikely to survive year, 0=Dead, Missing. ↓

Damage: Removal, Cut, Mowing, Beaver, Deer, Rodents, Insects, Game, Livestock, Other/Unknown Animal, Human Trampled, Site Too Wet, Site Too Dry, Flood, Drought, Storm, Hurricane, Diseased, Vine Strangulation, Unknown, specify other.

Natural Woody Stem Data: CVS Levels 2 & 3

Leader: Bby **Project:** Lyle Cole **Team:** 556 **Plot:** 7 **Date:** 9/28/06 **Ares** (=100m²): 1 Page 3 of 3

Height Cut-Off for Stems (all stems shorter than this height are ignored and not tallied): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Mod*	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5 cm	Trees — DBH: 2.5-	5-	10-	15-	20-	25-	30-	35-	≥40 (write dbh)
Liriodendron				••	2	•												
Liquidambar Sty				••	⊠	•												
Betula nigra				•	••													
Winged elm						•												
Nyssa Sylvatica					••													
Acer Rubrum				••	••													
Platanus occ				•	•													

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1. Bank Erosion: Moderate-3/30/06

2. Bank Erosion: Severe-3/30/06

3. Bank Erosion: Moderate-3/30/06

4. Bank Erosion: Severe-3/30/06

Photos taken during the initial
assessment conducted in March 2006

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix A2. Vegetation Problem Area Photos	Jordan Jones & Goulding Incorporated

1. Monitoring Plot 1

2. Monitoring Plot 2

3. Monitoring Plot 3

4. Monitoring Plot 4

5. Monitoring Plot 5

6. Monitoring Plot 6

7. Monitoring Plot 7

Photos were taken during the vegetation Assessment Conducted September 27-28, 2006

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix A3. Vegetation Monitoring Plot Photos	Jordan Jones & Goulding Incorporated

Appendix B
(Click here)

Jordan Jones & Goulding

APPENDIX B

Geomorphic and Stream Stability Data

1. Problem Area Plan View
2. Representative Stream Problem Area Photos
3. Stream Photo Station Photos
4. Qualitative Visual Stability Assessment
5. Cross-section Plots and Raw Data Tables*
6. Longitudinal Plots and Raw Data Tables*
7. Pebble Count Plots and Raw Data Tables*

*Raw data tables have been provided electronically.

NC10001CS04.dwg
11.21.06

N

APPROXIMATE

FIGURE 1 OF 3

FIGURE 2 OF 3

FIGURE 3 OF 3

TO I-40

TO SR-70

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

JTHACKSTON

Ecosystem Enhancement PROGRAM

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

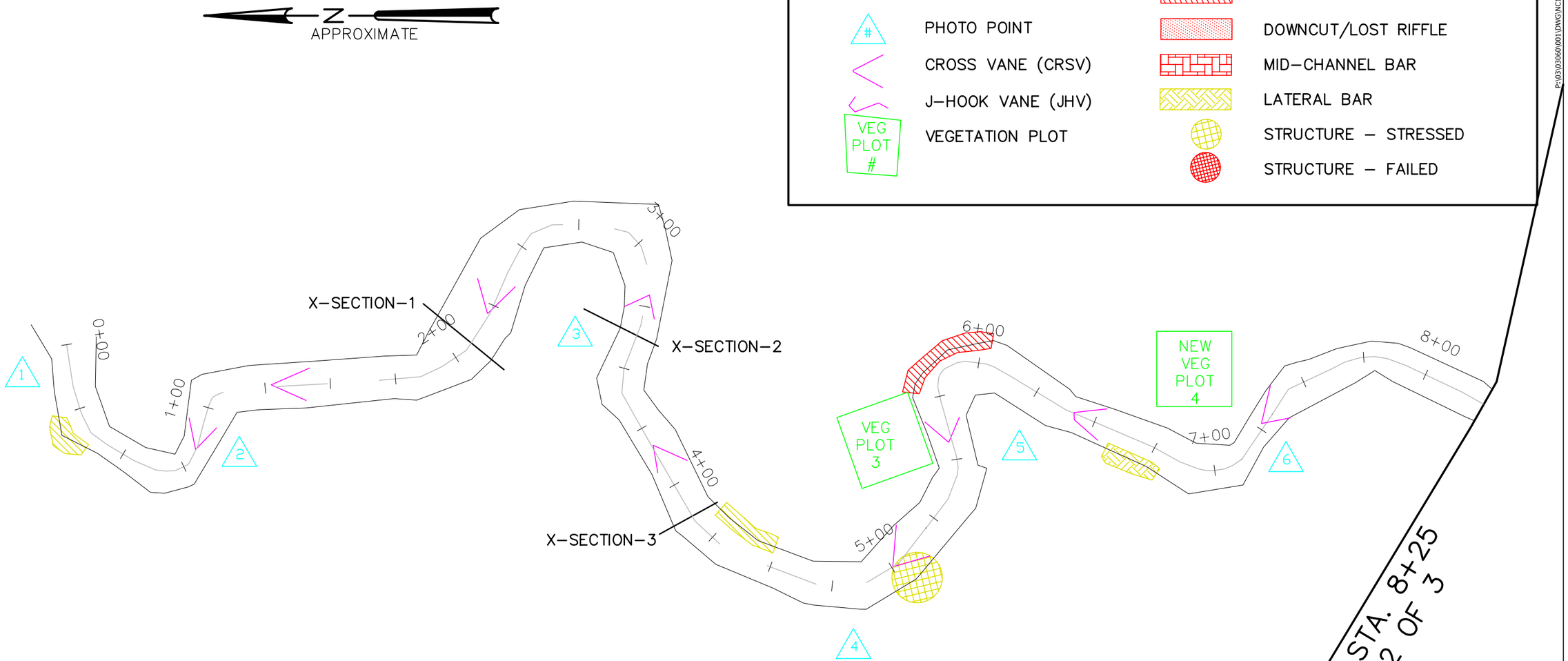
NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

APPENDIX B1
PROBLEM AREAS PLAN VIEW

DATE : MARCH 2007
SCALE : 1"=150'
JOB NO.: 03060-001

FIGURE KEY

NC1001CS01.dwg
03.01.07



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

APPENDIX B1
PROBLEM AREAS PLAN VIEW

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 1 OF 3

JTHACKSTON

P:\03\03060\001\DWG\NC1001CS01.dwg, 3/1/2007 10:13:26 AM

N
APPROXIMATE

LEGEND

- CHANNEL CENTERLINE
- BANK FULL
- PHOTO POINT (#)
- CROSS VANE (CRSV)
- J-HOOK VANE (JHV)
- VEGETATION PLOT (VEG PLOT #)
- BANK EROSION – MODERATE
- BANK EROSION – SEVERE
- DOWNCUT/LOST RIFFLE
- MID-CHANNEL BAR
- LATERAL BAR
- STRUCTURE – STRESSED
- STRUCTURE – FAILED

MATCHLINE STA. 8+25
SEE FIGURE 1 OF 3

NEW VEG PLOT 5

VEG PLOT 2

9+00

10+00

7

11+00

X-SECTION-4

12+00

X-SECTION-6

8

X-SECTION-5

13+00

9

MATCHLINE STA. 13+75
SEE FIGURE 3 OF 3

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Ecosystem Enhancement PROGRAM

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

APPENDIX B2
PROBLEM AREAS PLAN VIEW

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 2 OF 3

NC1001CS03.dwg
11.21.06

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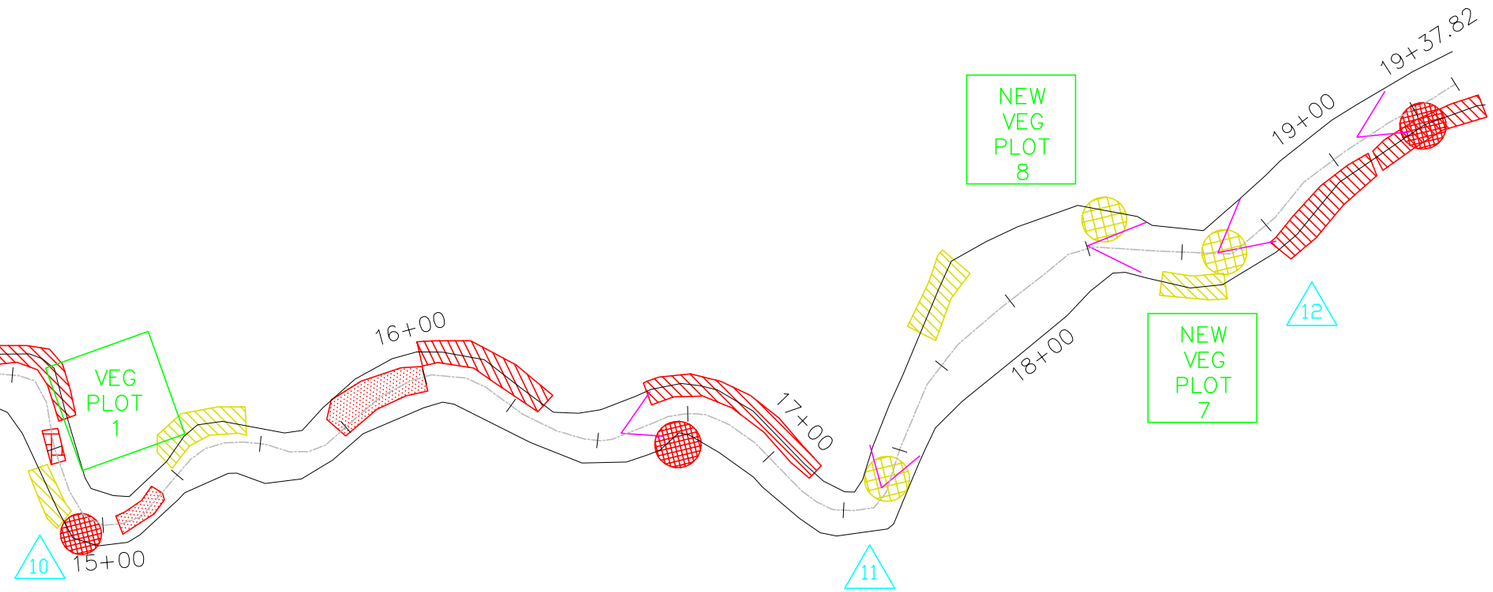
MATCHLINE STA. 13+75 SEE FIGURE 2 OF 3

N
APPROXIMATE



LEGEND

- CHANNEL CENTERLINE
- BANK FULL
- PHOTO POINT (#)
- CROSS VANE (CRSV)
- J-HOOK VANE (JHV)
- VEGITATION PLOT (VEG PLOT #)
- BANK EROSION – MODERATE
- BANK EROSION – SEVERE
- DOWNCUT/LOST RIFFLE
- MID-CHANNEL BAR
- LATERAL BAR
- STRUCTURE – STRESSED
- STRUCTURE – FAILED

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 423
CATAWBA COUNTY
NORTH CAROLINA
MONITORING
YEAR 4 of 5

JORDAN JONES & GOULDING

NC ECOSYSTEM ENHANCEMENT PROGRAM
LYLE CREEK STREAM RESTORATION

APPENDIX B2
PROBLEM AREAS PLAN VIEW

DATE : MARCH 2007
SCALE : 1"=40'
JOB NO.: 03060-001

FIGURE 3 OF 3

JTHACKSTON

1. Bank Erosion: Moderate-3/30/06

2. Bank Erosion: Severe-3/30/06

3. Downcut/Lost Riffle-3/30/06

4. Lateral Bar-3/30/06

5. Mid-Channel Bar-3/30/06

6. Structure failed-3/30/06

7. Structure stressed-3/30/06

Photo Point 1: Upstream-9/25/06

Photo Point 1: Downstream-9/25/06

Photo Point 2: Upstream-9/25/06

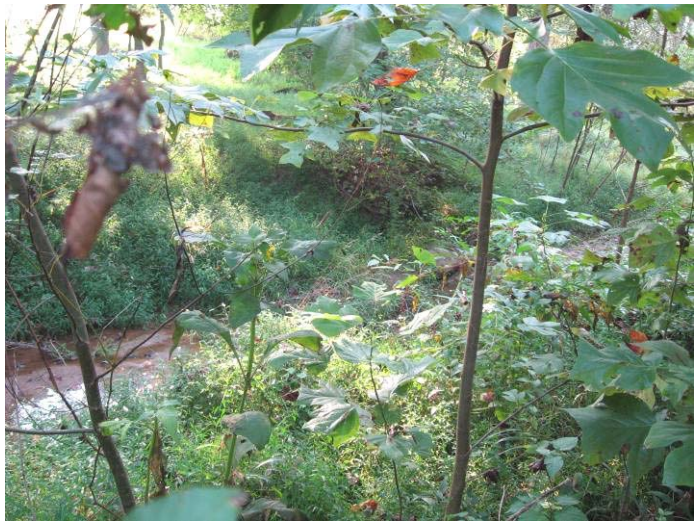


Photo Point 2: Downstream-9/25/06

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix B3. Stream Photo Station Photos	Jordan Jones & Goulding Incorporated

Photo Point 3: Upstream-9/25/06

Photo Point 3: Downstream-9/25/06

Photo Point 4: Upstream-9/25/06

Photo Point 4: Downstream-9/25/06

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix B3. Stream Photo Station Photos	Jordan Jones & Goulding Incorporated

Photo Point 5: Upstream-9/25/06

Photo Point 5: Downstream-9/25/06

Photo Point 6: Upstream-9/25/06

Photo Point 6: Downstream-9/25/06

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix B3. Stream Photo Station Photos	Jordan Jones & Goulding Incorporated

Photo Point 7: Upstream-9/25/06

Photo Point 7: Downstream-9/25/06

Photo Point 8: Upstream-9/25/06

Photo Point 8: Downstream-9/25/06

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix B3. Stream Photo Station Photos	Jordan Jones & Goulding Incorporated

Photo Point 9: Upstream-9/25/06

Photo Point 9: Downstream-9/25/06

Photo Point 10: Upstream-9/25/06

Photo Point 10: Downstream-9/25/06

Prepared For: Ecosystem Enhancement Program	Lyle Creek Stream Restoration Year 4 of 5	Date: March 2007 Project No.: 423
	Appendix B3. Stream Photo Station Photos	Jordan Jones & Goulding Incorporated

Photo Point 11: Upstream-9/25/06

Photo Point 11: Downstream-9/25/06

Photo Point 12: Upstream-9/25/06

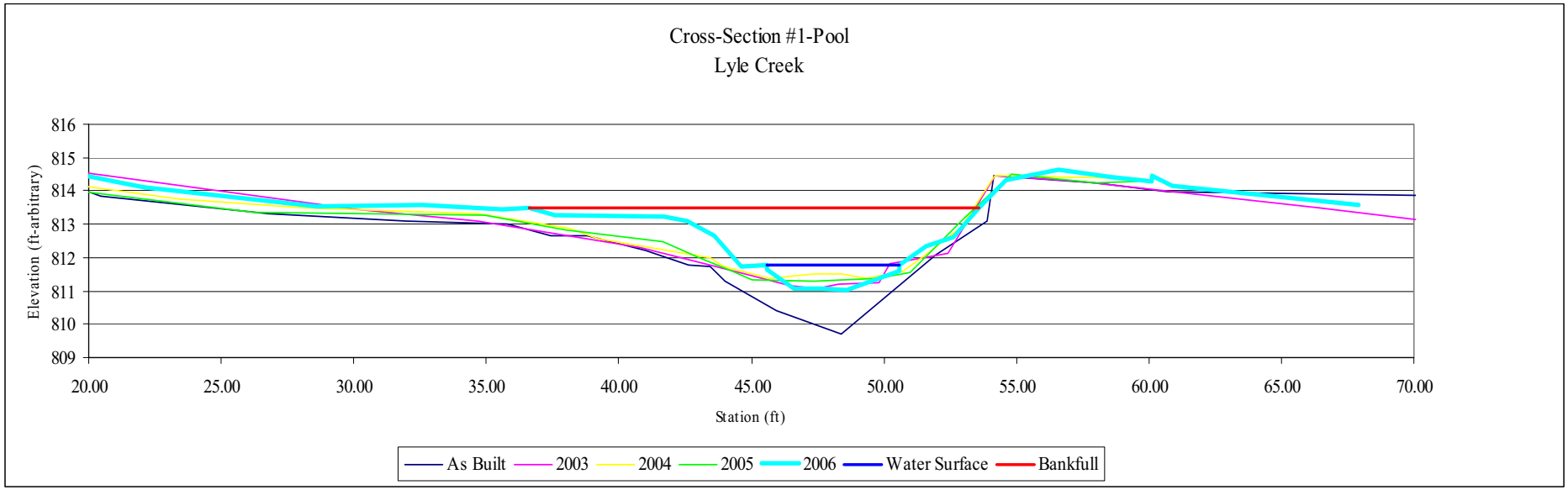
Photo Point 12: Downstream-9/25/06

Lyle Creek/Project No. 423, Reach 1: Enhancement Level I (700 ft) (Cells noted with (-), data was not provided)						
Feature Category		(# Stable) Number Performing as Intended	Total Number assessed per 2006 survey	Total Number/feet in unstable state	% Perform in Stable Condition	Feature Perform Mean or Total
A. Riffles	1. Present?	12	12	0	100%	**97.90%**
	2. Armor Stable?	12		0	100%	
	3. Facet grade appears stable?	12		0	100%	
	4. Minimal evidence of embedding/fining?	11		1	91.60%	
	5. Length appropriate?	-		-	-	
B. Pools	1. Present?	16	16	0	100%	**87.50%**
	2. Sufficiently deep?	12		4	75%	
	3. Length Appropriate?	-		-	-	
C. Thalweg	1. Upstream of meander bend centering?	15	15	0	100%	**100%**
	2. Downstream of meander centering?	15		0	100%	
D. Meanders	1. Outer bend in state of limited/controlled erosion?	12	15	2 moderate 1 severe	80%	**93.30%**
	2. Of those eroding, # w/concomitant point bar formation?	15		0	100%	
	3. Apparent Rc within spec?	-		-	-	
	4. Sufficient floodplain access and relief?	15		0	100%	
E. Bed General	1. General channel bed aggradation areas (bar formation)?	N/A		1/20 ft	87%	**93.70%**
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?			0	100.00%	
F. Vanes	1. Free of back or arm scour?	8	9	1	89%	**94.50%**
	2. Height appropriate?	-	-	-	-	
	3. Angle and geometry appear appropriate?	-	-	-	-	
	4. Free of piping or other structural failures?	9	9	0	100%	
G. Wads/Boulders	1. Free of scour?	N/A				
	2. Footing stable?					
H. Bank Protection	1. Actively eroding, wasting, or slumping bank	N/A	N/A	80/700	89%	**89%**

Lyle Creek /Project No. 423, Reach 2: Relocation Restoration (1240 ft) (Cells noted with (-), insufficient data provided)						
Feature Category		(# Stable) Number Performing as Intended	Total Number assessed per 2006 survey	Total Number/feet in unstable state	% Perform in Stable Condition	Feature Perform Mean or Total
A. Riffles	1. Present?	12	18	6	66.70%	**62.50%**
	2. Armor Stable?	12		6	66.70%	
	3. Facet grade appears stable?	12		6	66.70%	
	4. Minimal evidence of embedding/fining?	9		9	50%	
	5. Length appropriate?	-		-	-	
B. Pools	1. Present?	12	13	0	83.30%	**91.65%**
	2. Sufficiently deep?	13		0	100%	
	3. Length Appropriate?	-		-	-	
C. Thalweg	1. Upstream of meander bend centering?	6	20	14	30%	**50%**
	2. Downstream of meander centering?	14		6	70%	
D. Meanders	1. Outer bend in state of limited/controlled erosion?	4	20	4 Moderate	3%	**46.70%**
	2. Of those eroding, # w/concomitant point bar formation?	4		12 Severe	25.40%	
	3. Apparent Rc within spec?	-		16	20%	
	4. Sufficient floodplain access and relief?	20		-	-	
E. Bed General	1. General channel bed aggradation areas (bar formation)?	N/A		0	100%	**97.43%**
				1/5 ft	99.60%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?			6/90 ft	92.70%	
F. Vanes	1. Free of back or arm scour?	3	7	4	42.90%	**35.80%**
	2. Height appropriate?	-	-	-	-	
	3. Angle and geometry appear appropriate?	-	-	-	-	
	4. Free of piping or other structural failures?	2	7	5	28.60%	
G. Wads/Boulders	1. Free of scour?	N/A				
	2. Footing stable?					
H. Bank Protection	1. Actively eroding, wasting, or slumping bank	N/A	N/A	350/1240	72%	**72%**

Project Name: Lyle Creek
Cross-Section: 1
Feature: Pool

2002			2003			2004			2005			2006		
As Built			Nov-03									Sep-06		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
1.00	816.76		0.00	816.81		19.64	814.25	LP	19.60	814.15	x1 lp	17.60	814.79	
5.93	815.11		4.32	815.44		19.75	814.14		19.85	813.98	x1	22.10	814.10	
9.77	814.73		13.76	814.80		23.44	813.76		26.20	813.35	x1	28.60	813.55	
17.99	814.53		16.98	814.86		28.17	813.47		34.95	813.29	x1	32.60	813.57	
20.45	813.86		30.11	813.45		34.70	813.32	BKF	38.00	812.82	x1	35.60	813.43	
26.75	813.32		34.70	813.10		38.13	812.87		41.64	812.47	x1	36.60	813.47	BKF/tob
31.96	813.08		40.82	812.28		39.21	812.56		43.02	811.97	x1	37.60	813.27	
35.79	812.99		43.22	811.80		43.43	811.98		44.25	811.60	x1 lew	41.70	813.23	
37.44	812.65		44.95	811.47		43.93	811.73		45.02	811.34	x1	42.60	813.09	
38.81	812.65		46.45	811.17		45.68	811.37		47.38	811.31	x1	43.60	812.66	
41.00	812.21		47.47	811.06		47.39	811.50		49.74	811.36	x1	44.60	811.72	
42.64	811.78		48.31	811.22		48.40	811.53		51.00	811.54	x1 rew	45.60	811.77	lew-ws
43.47	811.73		49.84	811.25		49.34	811.37		53.04	813.18	x1	45.60	811.64	
44.01	811.29		50.21	811.82		50.74	811.58		54.81	814.50	x1	46.60	811.08	
45.93	810.42		52.43	812.14		51.67	812.12		57.98	814.24	x1	47.60	811.09	
48.40	809.70		54.22	814.46		52.94	812.90		59.56	814.28	x1 rp	48.60	811.03	
51.96	812.07		57.40	814.30		54.15	814.42					50.60	811.59	rew
53.88	813.08		66.43	813.48		54.20	814.46	RP				50.60	811.77	ws
54.15	814.44		71.96	812.96		59.69	814.37					51.60	812.36	
57.99	814.24		80.76	812.94								52.60	812.60	
60.73	813.95		91.07	812.96								53.60	813.47	BKF/tob
75.79	813.81											54.60	814.34	
85.93	814.20											56.60	814.64	
98.81	814.63											58.60	814.42	
102.92	813.66											60.10	814.30	rpin-grd
109.77	811.29											60.10	814.46	rpin-top-bm
117.99	811.82											60.90	814.15	wood stake
125.93	814.82											67.90	813.58	
133.60	815.84													



2006 Summary Data	
Bankfull Cross-Sectional Area	18.9
Bankfull Width	17.6
Bankfull Mean Depth	1.1
Bankfull Max Depth	2.4
Width/Depth Ratio	16.3
Entrenchment Ratio	N/A

Cross-Section # 1 Pool: Upstream-9/25/06

Cross-Section # 1 Pool: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

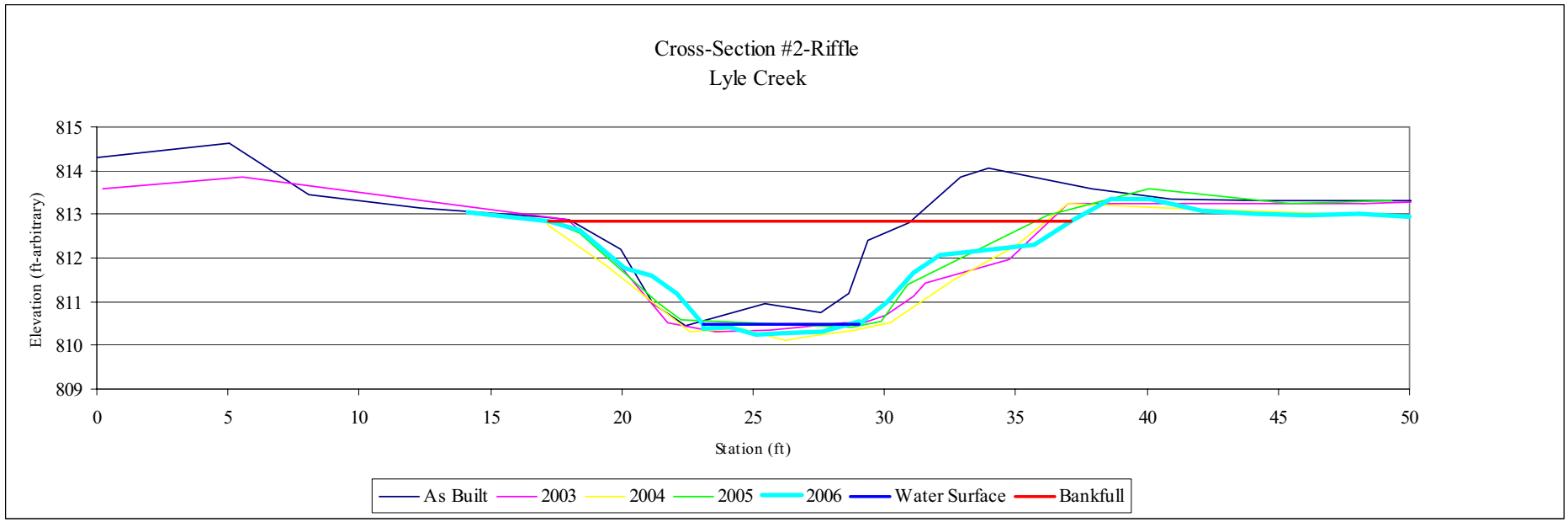
Lyle Creek Stream Restoration
Year 4 of 5

Appendix B5. Cross-Section Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek														
Cross-Section: 2														
Feature: Riffle														
2002			2003			2004			2005			2006		
As Built			Nov-03									Sep-06		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-28	812.58		0.23	813.59		17.11	812.83	LP	17.10	812.88		14.11	813.06	
-13.08	813.4576667		5.54	813.87		17.20	812.73	BKF	18.41	812.57		17.21	812.83	BKF
5.037333333	814.627875		17.92	812.88		19.38	811.84		21.41	810.96		18.41	812.63	ltob-
8.057	813.4576667		20.01	811.75		22.57	810.31		22.27	810.59		20.11	811.75	
12.31966667	813.135875		21.76	810.53		24.57	810.37		28.73	810.42		21.11	811.58	
16.938	812.9603333		23.53	810.33		26.26	810.11		29.90	810.54		22.11	811.18	
18.00366667	812.8725417		25.64	810.34		26.51	810.13		30.91	811.40		23.11	810.47	LEW
19.95733333	812.1997083		26.77	810.43		27.26	810.20		36.19	812.96		23.11	810.39	
21.20066667	810.9709583		28.46	810.52		28.89	810.34		40.10	813.58		24.11	810.42	
22.444	810.444375		29.20	810.51		30.21	810.52		45.47	813.26		25.11	810.25	
25.46366667	810.9417083		30.07	810.67		32.60	811.49		49.35	813.31		26.11	810.27	
27.595	810.7661667		31.12	811.12		34.95	812.27					27.61	810.32	
28.66066667	811.17575		31.56	811.43		37.00	813.25					29.01	810.56	
29.37133333	812.4044583		34.77	811.95		40.76	813.15					29.01	810.47	REW
30.96966667	812.8140417		36.99	813.25		48.85	812.99					30.11	810.98	
32.92366667	813.838		48.26	813.24		49.01	813.05	RP				31.11	811.67	
33.98933333	814.0427917		55.11	813.37								32.11	812.06	
37.897	813.5747083		59.50	813.34								33.61	812.18	
40.91666667	813.3406667											35.71	812.32	
44.469	813.311375											37.11	812.83	BKF/tob
59.03366667	813.311375											38.61	813.36	
												40.11	813.34	
												42.11	813.07	
												44.11	813.01	
												46.11	812.97	
												48.11	813.00	
												50.01	812.93	



2006 Summary Data	
Bankfull Cross-Sectional Area	29.2
Bankfull Width	19.8
Bankfull Mean Depth	1.5
Bankfull Max Depth	2.6
Width/Depth Ratio	13.5
Entrenchment Ratio	>2.2

Cross-Section # 2 Riffle: Upstream-9/25/06

Cross-Section # 2 Riffle: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

Lyle Creek Stream Restoration
Year 4 of 5

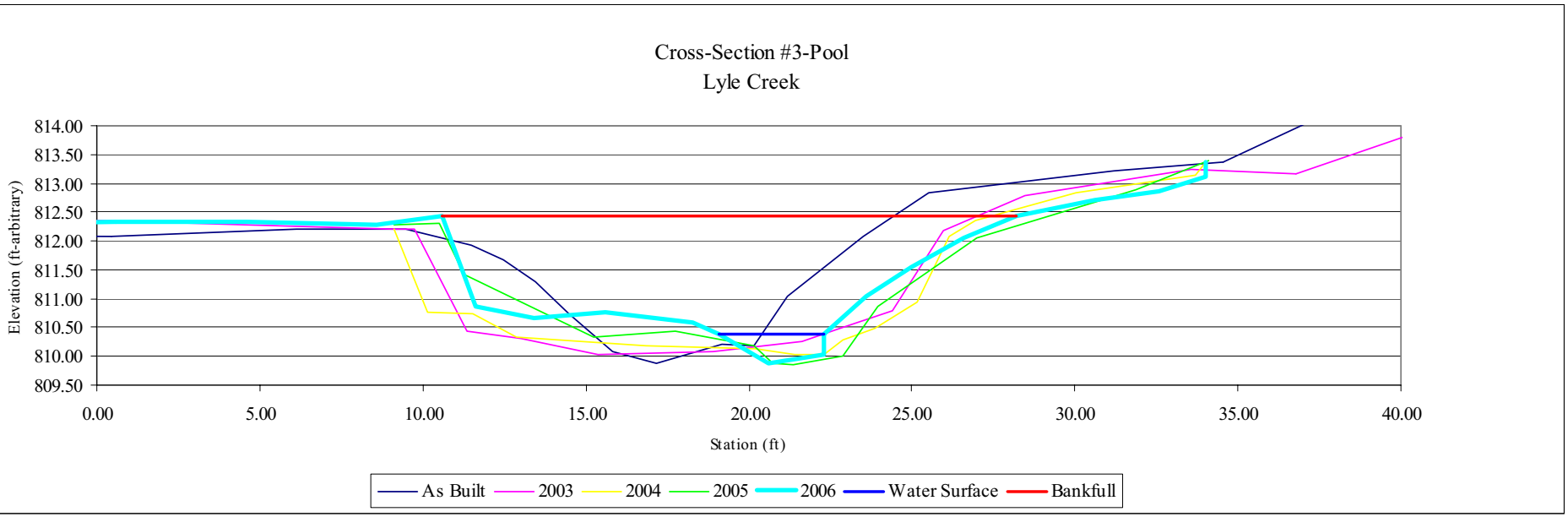
Date: March 2007
Project No.: 423

Appendix B5. Cross-Section Plots and Raw Data Tables

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek
Cross-Section: 3
Feature: Pool

2002			2003			2004			2005			2006		
As Built			Nov-03									Sep-06		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-48.40	812.54		0.00	812.35		9.10	812.20	LP	9.10	812.29		-2.40	812.30	
-34.35	812.15		9.07	812.21		10.16	810.76		10.52	812.30		0.60	812.32	
0.43	812.07		9.75	812.20		11.55	810.75		11.26	811.43		4.60	812.34	
6.12	812.20		11.33	810.44		12.86	810.33		15.24	810.33		8.60	812.27	wood stake-ground
9.46	812.20		13.02	810.31		16.84	810.18		17.73	810.43		10.60	812.42	BKF/tob
11.47	811.94		15.38	810.04		20.19	810.14		20.17	810.18		11.60	810.87	back of point bar
12.47	811.68		18.91	810.07		21.41	810.04		20.75	809.89		13.40	810.66	
13.47	811.29		21.63	810.25		21.51	810.04		21.38	809.84		15.60	810.77	
14.48	810.73		22.80	810.48		22.29	810.03		22.86	810.00		18.30	810.58	
15.81	810.09		24.42	810.79		22.88	810.29		23.95	810.86		19.10	810.38	lew
17.15	809.87		25.95	812.17		23.87	810.49		26.99	812.05		19.10	810.38	lew-ws
19.16	810.22		28.46	812.78		25.15	810.95		31.87	812.90		20.60	809.87	
20.16	810.17		33.55	813.24		26.15	812.09	BKF	34.10	813.38		22.30	810.04	
21.17	811.03		36.80	813.17		26.96	812.35					22.30	810.38	rew-ws
23.51	812.07		41.87	814.14		30.02	812.84					23.60	811.04	
25.51	812.84		53.17	815.21		33.71	813.14					25.00	811.54	
31.20	813.23					34.00	813.36	RP				26.60	812.06	
34.54	813.36											28.20	812.42	BKF/tob
38.56	814.43											30.60	812.70	
												32.60	812.86	
												34.00	813.12	rpin-ground
												34.00	813.38	rpin-top



2006 Summary Data	
Bankfull Cross-Sectional Area	26.4
Bankfull Width	17.6
Bankfull Mean Depth	1.5
Bankfull Max Depth	2.6
Width/Depth Ratio	11.7
Entrenchment Ratio	N/A

Cross-Section # 3 Pool: Upstream-9/25/06

Cross-Section # 3 Pool: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

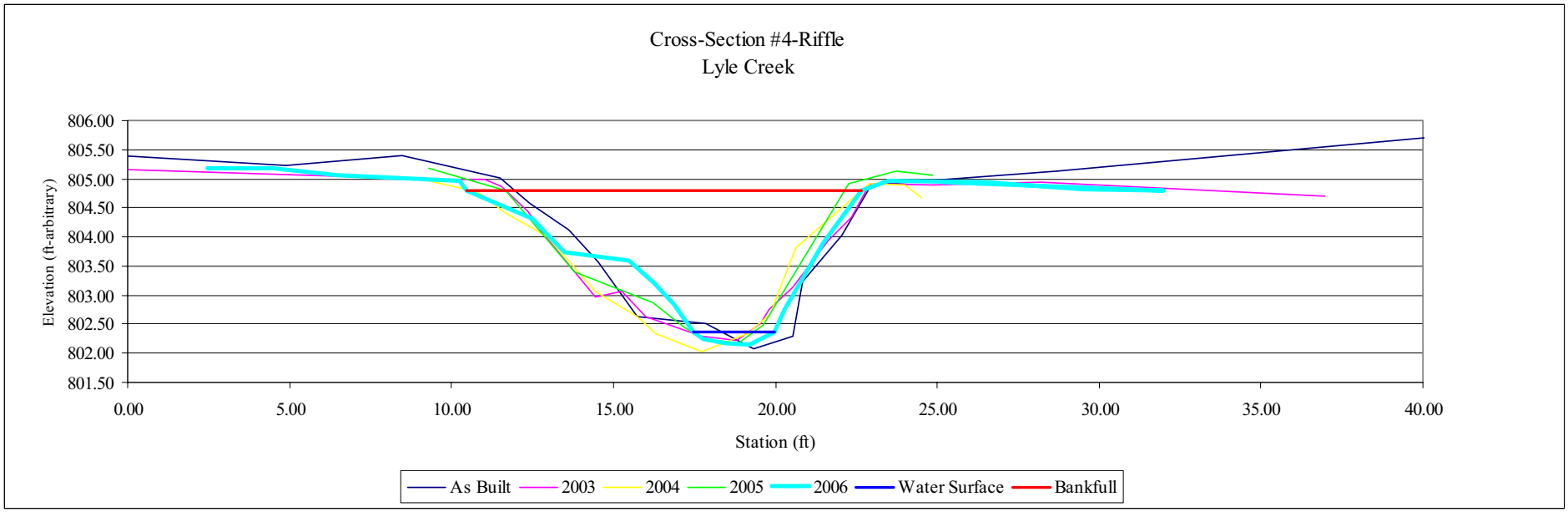
Lyle Creek Stream Restoration
Year 4 of 5

Date: March 2007
Project No.: 423

Appendix B5. Cross-Section Plots and Raw Data Tables

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek														
Cross-Section: 4														
Feature: Riffle														
2002			2003			2004			2005			2006		
As Built			Nov-03									Sep-06		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-90.40	808.12		0.00	805.16		9.28	804.97	LP	9.28	805.18	x4 lp	2.48	805.18	
-85.58	806.93		9.56	805.00		10.81	804.78		11.69	804.79	x4	4.48	805.17	
-80.45	806.16		11.04	804.98		11.67	804.41		13.77	803.41	x4	6.48	805.05	
-58.44	805.61		11.53	804.87		12.98	804.00		16.21	802.87	x4	10.23	804.97	lpin-ground
-34.62	805.65		12.38	804.43		14.45	803.06		17.19	802.44	x4	10.48	804.8	BKF/tob
-26.48	804.84		12.85	804.06		15.75	802.63		17.88	802.24	x4 lew	12.48	804.31	
-9.60	804.84		14.44	802.97		16.30	802.35		18.85	802.18	x4	13.48	803.73	
-2.36	805.48		15.26	803.07		17.75	802.03		19.63	802.50	x4	15.48	803.60	
4.88	805.23		16.02	802.62		19.17	802.35		22.28	804.92	x4	16.28	803.20	
8.49	805.40		17.73	802.29		19.83	802.68		23.73	805.13	x4	16.88	802.84	
11.51	805.01		18.82	802.23		20.63	803.80		24.88	805.05	x4 rp	17.48	802.37	lew-ws
12.41	804.59		19.55	802.51		22.90	804.92	BKF				17.78	802.24	
13.62	804.12		19.82	802.75		23.98	804.90					18.48	802.17	
14.52	803.57		20.52	803.13		24.50	804.67	RP				19.18	802.14	tw
15.73	802.63		21.61	803.92								19.98	802.37	rew-ws
17.84	802.50		22.36	804.35								20.28	802.75	
19.35	802.08		22.94	804.92								21.48	803.91	
20.55	802.29		24.88	804.89								22.65	804.80	BKF/tob
20.86	803.23		28.18	804.93								23.48	804.97	
22.06	804.03		36.98	804.69								26.48	804.94	wd stake
22.97	804.89											29.48	804.83	
28.70	805.14											31.98	804.80	
42.56	805.82											25.18	804.93	
67.59	808.21													



2006 Summary Data	
Bankfull Cross-Sectional Area	16.4
Bankfull Width	12.0
Bankfull Mean Depth	1.4
Bankfull Max Depth	2.7
Width/Depth Ratio	8.8
Entrenchment Ratio	>2.2

Cross-Section # 4 Riffle: Upstream-9/25/06

Cross-Section # 4 Riffle: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

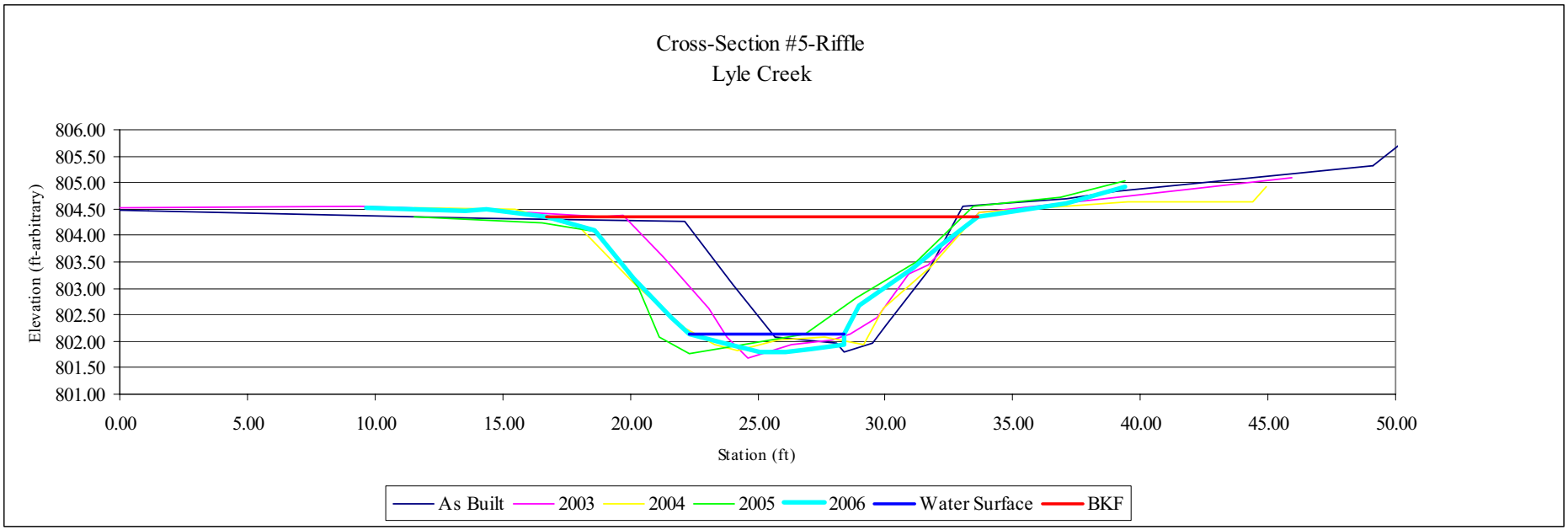
Lyle Creek Stream Restoration
Year 4 of 5

Date: March 2007
Project No.: 423

Appendix B5. Cross-Section Plots and Raw Data Tables

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek														
Cross-Section: 5														
Feature: Riffle														
2002			**2003**			**2004**			**2005**			**2006**		
As Built			**Nov-03**									**Sep-06**		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
-82.00	807.34		0.00	804.51		11.57	804.52	LP	11.57	804.36	x5 lp	9.65	804.52	
-77.91	806.24		9.43	804.54		15.46	804.50		16.52	804.23	x5	13.55	804.48	lpin-top
-70.01	805.47		14.94	804.48		18.02	804.16	BKF	18.72	804.07	x5	14.39	804.50	lpin-ground
-52.02	804.85		18.90	804.35		20.18	803.07		20.34	803.03	x5	16.71	804.36	BKF/tob
-38.93	805.09		19.75	804.37		22.13	802.25		21.14	802.08	x5 lew	18.60	804.09	ltob
-29.94	804.70		21.32	803.59		23.33	801.93		22.34	801.78	x5	20.13	803.20	
-16.04	804.66		23.11	802.61		24.21	801.83		24.43	801.94	x5	21.62	802.46	
1.13	804.46		23.78	802.09		25.78	802.03		26.85	802.12	x5 rew	22.32	802.14	lew-ws
14.22	804.32		24.59	801.68		27.64	802.08		28.88	802.81	x5	23.70	801.96	
22.12	804.27		26.30	801.95		29.14	801.94		31.21	803.49	x5	25.10	801.80	
24.03	803.08		27.90	802.01		29.89	802.63		33.46	804.55	x5	26.10	801.79	tw
25.67	802.07		28.64	802.14		31.79	803.42		36.87	804.71	x5	27.10	801.86	
28.12	801.98		29.68	802.45		33.70	804.45		39.40	805.02	x5 rp	28.40	801.94	
28.39	801.78		30.93	803.27		39.53	804.65					28.40	802.14	rew-ws
29.48	801.98		31.70	803.45		44.41	804.64					29.00	802.69	
30.03	802.31		33.68	804.45		44.91	804.91	RP				31.10	803.38	
31.66	803.32		39.08	804.72								32.10	803.79	
33.03	804.56		45.92	805.10								33.60	804.36	BKF/tob
37.11	804.70											37.10	804.62	
39.02	804.85											39.40	804.91	rpin-top
49.11	805.33													
59.19	809.16													



2006 Summary Data	
Bankfull Cross-Sectional Area	20.5
Bankfull Width	14.8
Bankfull Mean Depth	1.4
Bankfull Max Depth	2.6
Width/Depth Ratio	10.7
Entrenchment Ratio	>2.2

Cross-Section # 5 Riffle: Upstream-9/25/06

Cross-Section # 5 Riffle: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

Lyle Creek Stream Restoration
Year 4 of 5

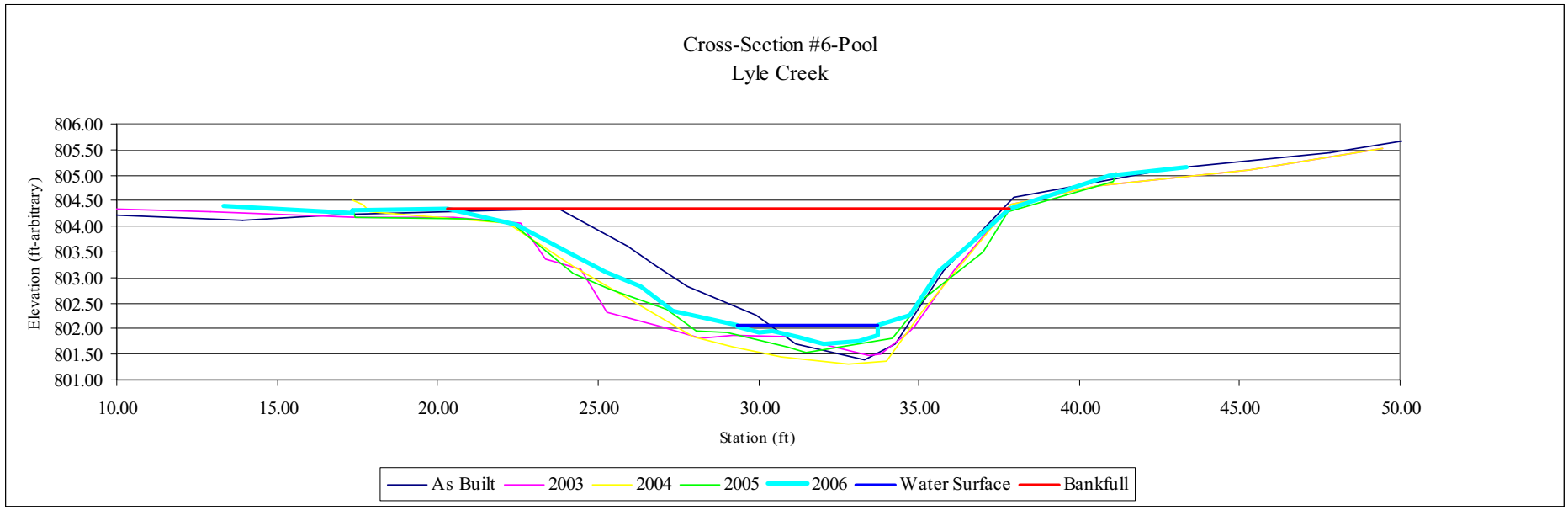
Appendix B5. Cross-Section Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek
Cross-Section: 6
Feature: Pool

2002			2003			2004			2005			2006		
As Built			Nov-03									Sep-06		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-81.33	807.30		0.15	804.51		17.33	804.51	LP	17.33	804.34	x6lp	13.33	804.39	
-77.33	806.22		12.94	804.29		17.68	804.42		17.42	804.17	x6	17.33	804.27	lpin-ground
-69.31	805.48		17.50	804.17		17.89	804.28		20.90	804.14	x6	17.33	804.31	lpin-top
-51.13	804.83		20.50	804.18		22.16	804.06	BKF	22.32	804.06	x6	20.33	804.34	ltob-bkf
-38.18	805.09		22.58	804.06		24.22	803.22		24.21	803.09	x6	22.43	804.03	
-29.24	804.70		23.38	803.35		27.06	802.18		25.36	802.77	x6	24.03	803.51	
-15.07	804.61		24.47	803.17		27.97	801.83		27.14	802.37	x6	25.23	803.10	
1.89	804.43		25.29	802.31		29.18	801.64		28.06	801.95	x6	26.33	802.82	
13.91	804.13		26.95	802.03		30.71	801.46		29.01	801.92	x6lew	27.33	802.36	
16.99	804.22		28.18	801.81		32.80	801.31		30.89	801.65	x6	29.33	802.07	lew-ws
23.77	804.35		29.18	801.86		34.01	801.36		31.50	801.52	x6	29.33	802.03	
25.93	803.61		31.06	801.84		35.07	802.33		32.29	801.63	x6	30.03	801.94	
26.85	803.22		33.45	801.48		37.89	804.42		34.16	801.81	x6rew	30.43	801.95	
27.78	802.83		33.81	801.50		40.58	804.78		35.16	802.60	x6	31.23	801.85	
29.93	802.26		34.67	801.92		45.30	805.09		37.02	803.50	x6	32.03	801.71	tw
31.17	801.70		34.85	802.03		49.46	805.51	RP	37.77	804.29	x6	33.13	801.77	
33.32	801.39		36.11	803.14					41.04	804.88	x6	33.73	801.88	
34.25	801.70		37.89	804.42					41.13	805.04	x6rp	33.73	802.07	rew-ws
35.79	803.13		40.58	804.78								34.73	802.27	
37.95	804.57		45.30	805.09								35.63	803.14	
42.88	805.13		49.46	805.51								36.33	803.51	
47.81	805.43											37.83	804.34	BKF
58.91	806.57											40.93	804.98	
												43.33	805.15	



2006 Summary Data	
Bankfull Cross-Sectional Area	25.7
Bankfull Width	17.5
Bankfull Mean Depth	1.5
Bankfull Max Depth	2.6
Width/Depth Ratio	11.9
Entrenchment Ratio	N/A

Cross-Section # 6 Pool: Upstream-9/25/06

Cross-Section # 6 Pool: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

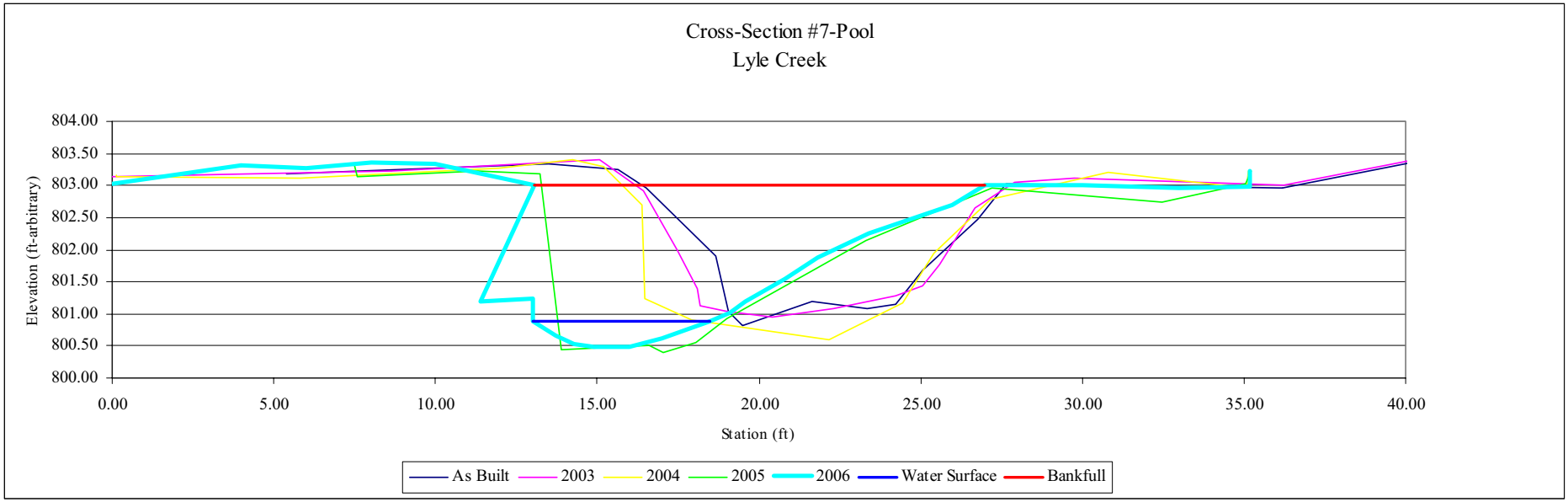
Lyle Creek Stream Restoration
Year 4 of 5

Appendix B5. Cross-Section Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding Incorporated

Project Name: Lyle Creek														
Cross-Section: 7														
Feature: Pool														
2002			**2003**			**2004**			**2005**			**2006**		
As Built			**Nov-03**									**Sep-06**		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
5.37	803.18		0.00	803.14		0.12	803.16		7.50	803.32	lp			
13.51	803.35		8.62	803.22		0.14	803.13	LP	7.57	803.14		0.00	803.02	
15.65	803.24		15.09	803.39		5.81	803.11	LP	11.29	803.23		4.00	803.32	
16.50	802.97		16.45	802.91		11.98	803.28		13.25	803.19		6.00	803.28	
18.64	801.89		17.50	801.99		14.22	803.41		13.88	800.45		8.00	803.35	
19.07	801.03		18.10	801.38		15.22	803.30		16.61	800.50		10.00	803.34	
19.50	800.82		18.16	801.12		16.37	802.69		17.05	800.40		13.04	803.01	BKF
21.64	801.20		19.01	801.03		16.48	801.23	W	18.05	800.55		11.40	801.19	
23.35	801.09		20.42	800.95		17.90	800.90		19.00	800.92	rew	13.00	801.23	lew
24.21	801.14		22.31	801.07		22.16	800.60	T	21.61	801.66		13.00	800.88	ws
25.06	801.68		24.22	801.28		24.45	801.18	EW	23.31	802.14		13.70	800.66	
26.78	802.49		25.08	801.44		25.41	801.94		27.22	802.96		14.30	800.53	
27.63	803.02		25.57	801.77		27.16	802.78	BKF	32.49	802.75		14.90	800.49	
36.19	802.97		26.70	802.65		30.80	803.20		35.06	803.02		16.00	800.49	
41.76	803.51		27.91	803.05		34.71	802.99		35.24	803.22	rp	17.00	800.62	
53.75	804.31		29.76	803.12		35.10	803.03					18.47	800.88	rew-ws
68.73	804.42		36.22	803.00		35.15	803.22	RP				19.08	801.02	
76.86	804.47		42.75	803.64								19.60	801.20	
86.71	805.39											20.83	801.54	
												21.81	801.88	
												23.40	802.26	
												26.00	802.69	
												27.00	803.01	BKF
												30.00	803.00	
												33.00	802.97	
												35.20	802.98	rpin-ground
												35.20	803.22	rpin-top



2006 Summary Data	
Bankfull Cross-Sectional Area	22.7
Bankfull Width	13.9
Bankfull Mean Depth	1.6
Bankfull Max Depth	2.5
Width/Depth Ratio	8.6
Entrenchment Ratio	N/A

Cross-Section # 7 Pool: Upstream-9/25/06

Cross-Section # 7 Pool: Downstream-9/25/06

Prepared For:

Ecosystem Enhancement Program

Lyle Creek Stream Restoration
Year 4 of 5

Appendix B5. Cross-Section Plots and Raw Data Tables

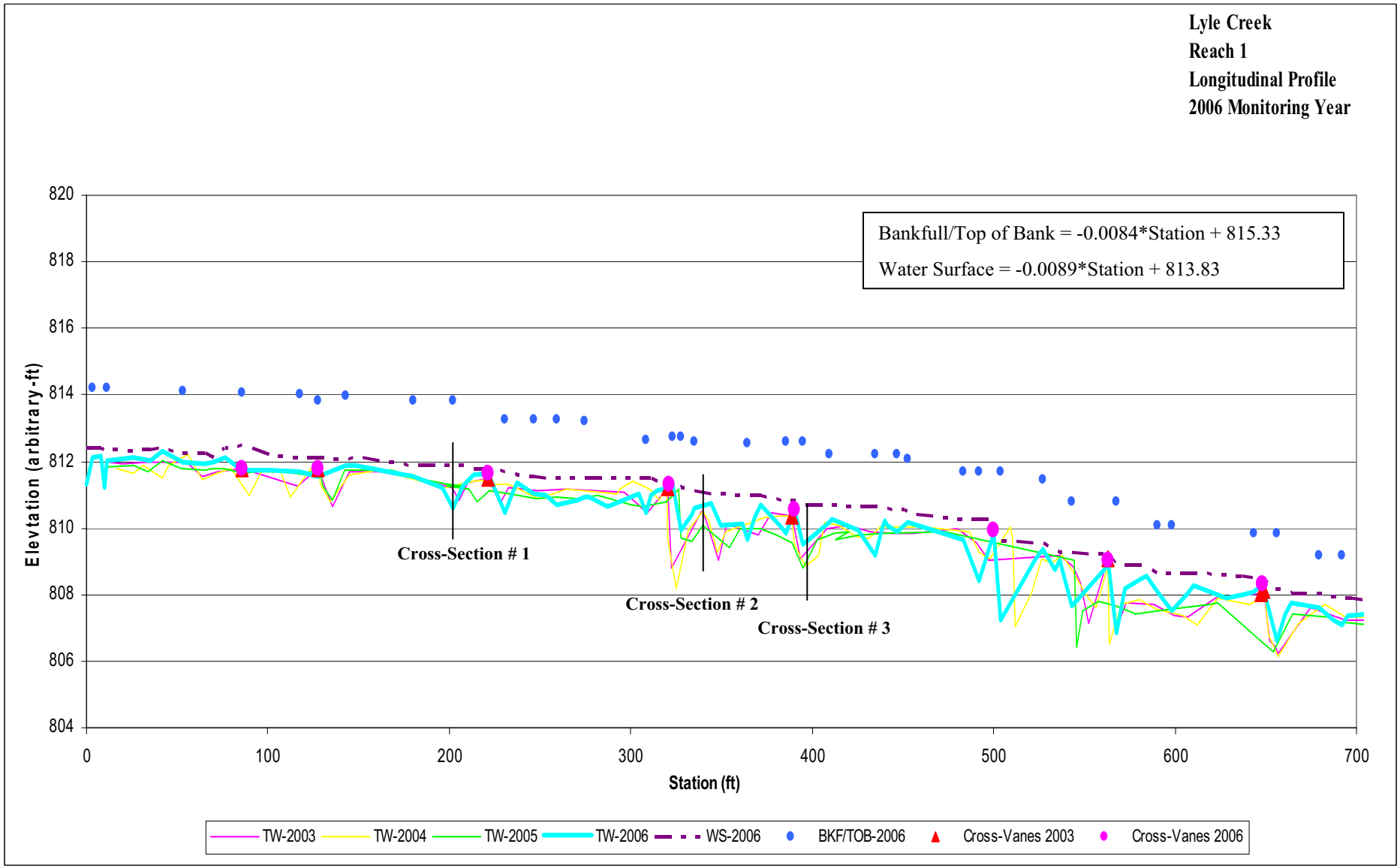
Date: March 2007
Project No.: 423

Jordan Jones & Goulding Incorporated

2006									
Station	TW-2006	WS-2006	BKF-2006	Notes	Station	TW-2006	WS-2006	BKF-2006	Notes
0.00	811.30	812.39			304.40	811.02	811.50		
3.00	812.13	812.39	0.26	pool	308.40	810.46	811.50		
8.00	812.15	812.40			311.40	810.96	811.50		
10.00	811.20	812.30			314.40	811.12	811.40		glide
11.00	812.02	812.35			315.30	811.24	811.35		riffle
26.00	812.10	812.32			320.90	811.33	811.44		x-vane invert
35.00	812.03	812.35			327.90	809.92	811.22	1.30	max pool
42.00	812.30	812.39			333.90	810.42	811.17		glide
53.00	812.00	812.28		riffle	334.90	810.62	811.10		riffle
65.00	811.95	812.24			344.40	810.76	811.01		run
70.00	812.00	812.10			349.40	810.10	811.01		run
76.20	812.10	812.39			361.40	810.11	811.00		pool
86.00	811.75	812.50		invert cross-vane	364.40	809.64	811.00	1.36	max pool
100.09	811.76	812.23			368.40	810.30	810.98		glide
117.65	811.70	812.12	0.42	max pool	371.40	810.68	810.96		
127.40	811.55	812.12		invert-cross vane	382.90	810.01	810.86		
143.20	811.88	812.04			385.40	809.82	810.86		
148.40	811.90	812.15		riffle	390.00	810.53	810.82		invert x-vane
180.40	811.55	811.87		run	394.90	809.51	810.71	1.20	max pool
195.80	811.23	811.86		pool	409.80	810.18	810.68		glide
202.40	810.59	811.86	1.27	max pool	411.10	810.25	810.68		run
207.40	811.26	811.86		glide	425.40	809.92	810.65		pool
210.40	811.44	811.84		run	434.80	809.18	810.64	1.46	maxpool2
213.40	811.60	811.80		riffle	438.90	810.01	810.63		glide
221.40	811.64	811.80		iinvert	440.40	810.22	810.60		rf
230.40	810.44	811.69			441.40	810.08	810.58		run/pool
235.40	811.11	811.66		glide	446.40	809.87	810.57	0.70	maxpool
237.40	811.35	811.62		riffle	450.40	810.07	810.57		glide
246.90	811.04	811.56		run	452.60	810.18	810.48		rf
253.40	810.96	811.52		pool/tree down	483.40	809.67	810.27		pool
259.40	810.70	811.52	0.82	max pool	491.70	808.42	810.26	1.84	max pool
270.40	810.85	811.50		pool	499.40	809.68	810.26		glide
274.40	810.92	811.50		glide	500.00	810.00	810.26		x-vane invert
277.40	810.93	811.50	0.57	run/oool,compound	503.60	807.21	809.58	2.37	max pool
287.40	810.67	811.50							

2006									
Station	TW-2006	WS-2006	BKF-2006	Notes	Station	TW-2006	WS-2006	BKF-2006	Notes
523.40	809.08	809.57		glide	781.47	806.54	807.44	0.90	max pool
527.40	809.36	809.56		riffle	786.47	806.52	807.44		glide
533.50	808.76	809.35		pool	791.47	806.76	807.40		riffle
536.40	809.04	809.28		run	804.47	807.12	807.40		run
542.90	807.65	809.25	1.60	max pool	821.27	806.43	806.56		riffle
561.40	808.78	809.24		glide	834.07	805.96	806.50		pool
563.00	809.02	809.22		x-vane invert	843.97	805.34	806.44	1.10	max pool
567.40	806.85	808.88	2.03	max pool	851.47	805.93	806.43		glide
572.50	808.19	808.88			855.47	805.95	806.43		run
580.90	808.48	808.87		glide	874.91	806.34	806.43		x-vane invert
584.10	808.54	808.84		riffle	883.71	805.06	805.98		pool
590.40	808.07	808.67		pool	895.41	803.75	805.95		
598.40	807.52	808.67	1.15	max pool	901.71	805.41	805.95		glide
606.80	808.03	808.66		glide	905.71	805.71	805.88		riffle
610.00	808.29	808.65		run/shallow pool	932.71	804.99	805.51		run/pool
628.40	807.90	808.60			936.71	804.57	805.41	0.84	max
636.80	808.01	808.56		glide	938.71	805.23	805.41		glide
643.50	808.07	808.53		riffle	940.71	804.81	805.39		run
648.10	808.32	808.48		x-vane invert	964.71	805.14	805.30		riffle
656.00	806.63	808.19	1.56	max pool	972.71	804.68	805.04		run
660.90	807.42	808.18		glide	975.71	804.39	804.97		pool
664.40	807.74	808.04		riffle	978.71	803.99	804.97	0.98	max pool
679.40	807.61	808.03		run	981.21	804.51	804.95		glide
687.40	807.24	807.92		pool	994.71	804.37	804.94		run
691.80	807.07	807.92	0.85	max pool	1002.71	804.61	804.92		riffle
695.60	807.36	807.88		glide	1007.71	804.35	804.81		pool
697.40	807.36	807.88		riffle	1014.71	803.74	804.81	1.07	max
705.90	807.44	807.84		run	1016.71	804.21	804.61		run
712.40	807.00	807.81		pool	1022.71	803.91	804.59		
718.40	805.90	807.81	1.91	max pool	1029.11	804.20	804.29		riffle
727.40	807.00	807.80		glide	1052.71	803.68	804.12		pool
730.20	807.20	807.80		riffle	1063.21	802.80	804.12	1.32	max pool
733.17	807.21	807.63		x-vane invert	1803.48	796.46	797.94	1.48	max pool
738.47	806.17	807.47	1.30	max pool	1814.48	797.05	797.68		glide
743.77	806.98	807.46		glide	1817.48	797.19	797.68		
746.47	806.85	807.46		run	1831.48	797.25	797.67		
776.47	806.80	807.46		pool					

2006									
Station	TW-2006	WS-2006	BKF-2006	Notes	Station	TW-2006	WS-2006	BKF-2006	Notes
1068.71	803.30	804.06		glide	1458.98	800.42	800.81		glide
1070.71	803.28	804.04		run/pool	1463.28	800.77	800.81		mcb
1078.71	803.75	804.03		riffle	1474.48	800.07	800.81		pool
1096.71	802.45	803.74			1478.78	800.72	800.76		run
1103.00	803.71	803.73			1485.28	800.27	800.76		pool
1109.71	802.76	803.18		run	1489.48	799.47	800.61		
1111.80	802.72	803.15			1496.48	800.52	800.61		riffle
1118.71	802.70	803.07		riffle	1509.48	800.11	800.60		
1128.71	802.51	803.00			1529.08	799.46	800.11		pool
1133.21	802.03	802.98		pool	1535.48	799.13	799.69		
1140.71	802.20	802.96		glide	1541.48	799.50	799.69		glide
1144.71	802.54	802.86		riffle	1545.48	799.55	799.67		run
1167.11	802.51	802.79		run	1573.48	799.14	799.61		riffle
1174.71	802.35	802.76		pool	1577.48	798.80	799.43		pool
1181.71	800.93	802.73	1.80	max pool	1584.48	798.13	799.38	1.25	max pool
1188.11	801.89	802.73		glide	1588.48	798.96	799.38		glide
1196.50	802.21	802.41		run	1591.48	799.04	799.38		run
1222.01	802.04	802.48			1616.48	799.08	799.38		
1248.71	802.15	802.33		riffle	1627.48	799.11	799.38		pool
1256.71	802.06	802.40			1643.48	798.56	799.22		
1259.50	801.63	802.23			1662.10	796.79	799.22		glide
1266.20	801.83	802.04			1662.93	798.51	799.22		invert
1269.80	801.56	802.03		j-hook invert	1664.00	798.53	799.21		riffle
1302.48	799.99	802.01			1688.48	797.46	799.16		
1317.48	801.53	801.99		glide	1698.48	797.93	798.68		run
1322.48	801.96	801.99		riffle	1706.48	798.26	798.41		invert
1341.48	801.54	801.98		run	1708.48	798.10	798.38		run
1348.48	800.83	801.64			1721.18	798.00	798.24		
1362.48	800.97	801.64			1727.48	797.95	798.19		riffle
1374.48	801.64	801.64			1736.78	797.59	798.13		run
1387.48	801.32	801.61		pool	1746.60	797.76	798.00		invert
1392.48	800.25	801.25	1.00	max pool	1750.48	797.61	797.99		
1419.48	801.07	801.25		riffle	1774.48	797.60	797.97		pool
1429.48	800.66	801.15			1786.48	796.70	797.97	1.27	max pool
1439.48	800.58	800.92		run	1788.78	797.97	797.94		x-vane invert
1444.48	800.36	800.84		pool					
1452.48	800.35	800.84							



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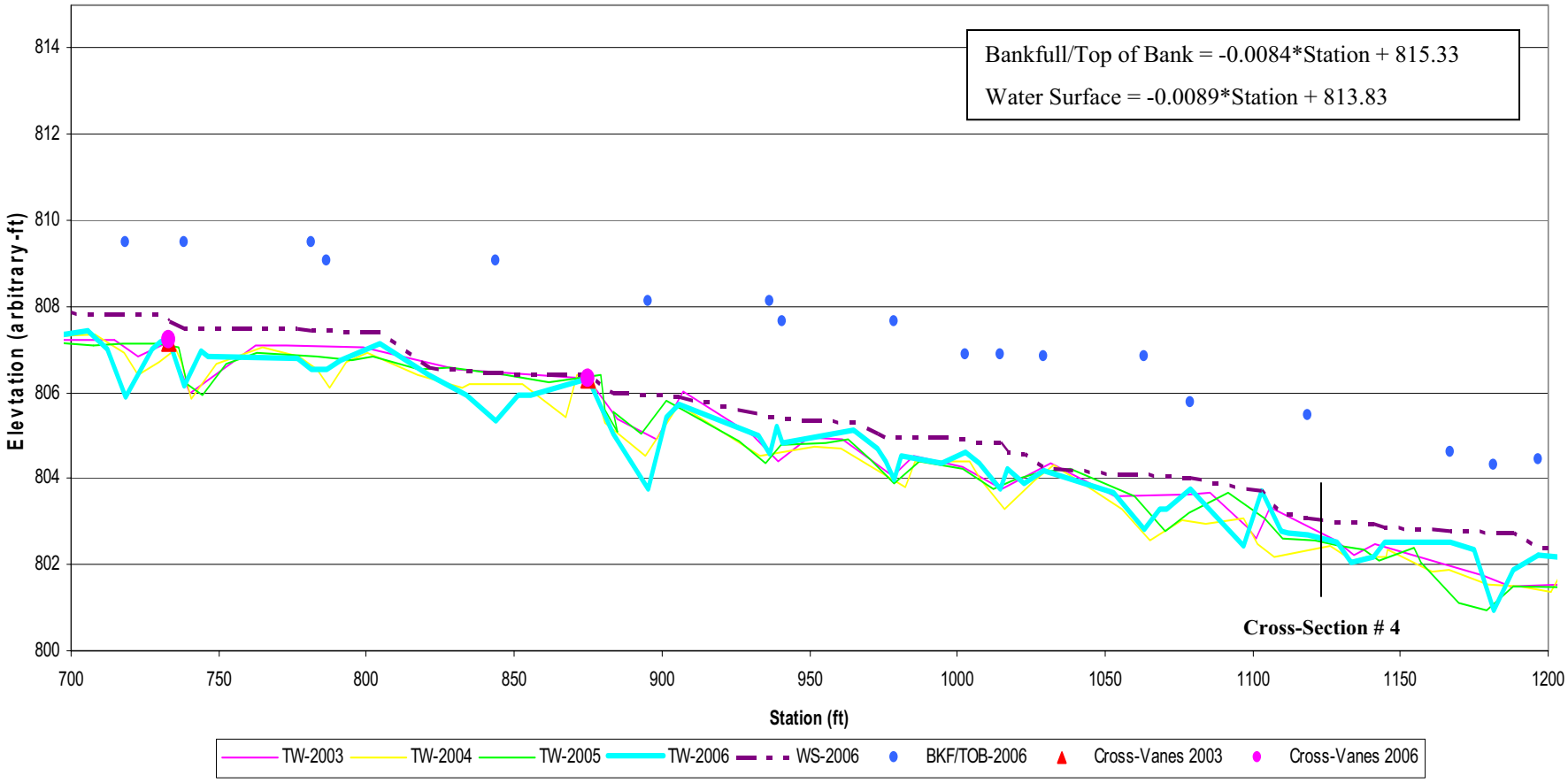
Lyle Creek Stream Restoration
Year 4 of 5

Appendix B6. Longitudinal Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding

Lyle Creek
Reach 2
Longitudinal Profile
2006 Monitoring Year



Prepared For:

Ecosystem Enhancement Program

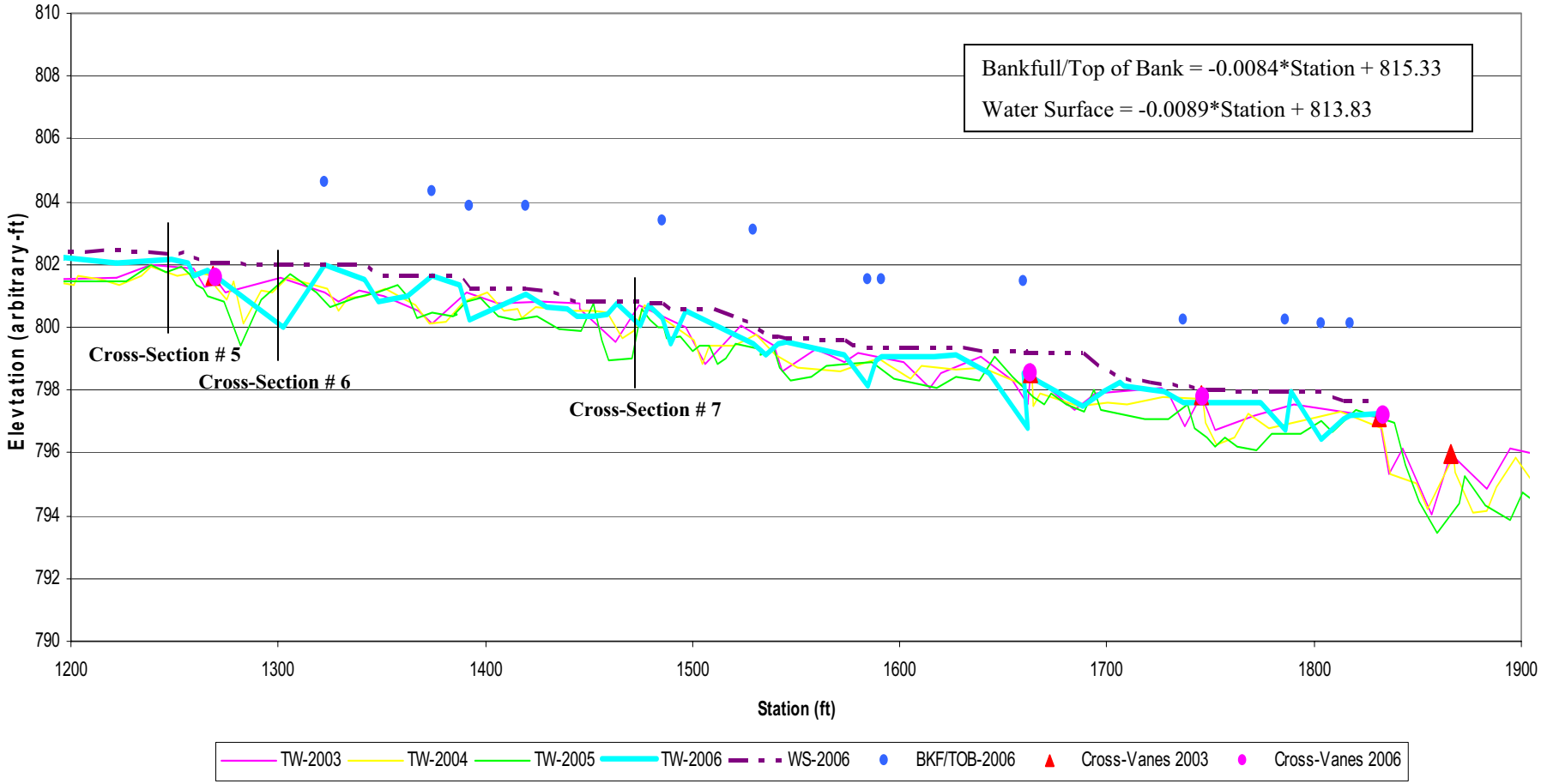
Lyle Creek Stream Restoration
Year 4 of 5

Appendix B6. Longitudinal Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding

Lyle Creek
Reach 2 Cont.
Longitudinal Profile
2006 Monitoring Year



Prepared For:

Ecosystem Enhancement Program

Lyle Creek Stream Restoration
Year 4 of 5

Appendix B6. Longitudinal Plots and Raw Data Tables

Date: March 2007
Project No.: 423

Jordan Jones & Goulding

Project Name: Lyle Creek				
Riffle Slope				
Reach 1				
Riffle Station (ft)	Length (ft)	Water Elevation (ft)	Change	Slope (ft/ft)
53		812.5		
86	33	812.3	0.2	0.61%
148.4		812.15		
180.4	32	811.87	0.28	0.87%
213.4		811.8		
221.4	8	811.8	0	0.00%
237.4		811.62		
246.9	9.5	811.56	0.06	0.63%
320.9		811.4		
323.3	2.4	811.2	0.2	8.33%
334.9		811.1		
344.4	9.5	811.01	0.09	0.95%
440.4		810.6		
441.4	1	810.58	0.02	2.00%
452.6		810.48		
483.4	30.8	810.27	0.21	0.68%
527.4		809.56		
533.5	6.1	809.35	0.21	3.44%
584.1		808.84		
590.4	6.3	808.67	0.17	2.70%
643.5		808.53		
648.1	4.6	808.48	0.05	1.09%
664.4		808.04		
679.4	15	808.03	0.01	0.07%
697.4		807.88		

Project Name: Lyle Creek				
Riffle Slope				
Reach 2				
Riffle Station (ft)	Length (ft)	Water Elevation (ft)	Change	Slope (ft/ft)
705.9	8.5	807.84	0.04	0.47%
730.2		807.8		
733.17	2.97	807.63	0.17	5.72%
791.47		807.4		
804.47	13	807.4	0	0.00%
821.27		806.56		
834.07	12.8	806.5	0.06	0.47%
905.71		805.88		
932.71	27	805.51	0.37	1.37%
964.71		805.3		
972.71	8	805.04	0.26	3.25%
1002.71		804.92		
1007.71	5	804.81	0.11	2.20%
1029.11		804.29		
1052.71	23.6	804.12	0.17	0.72%
1078.71		804.03		
1109.71	31	803.18	0.85	2.74%
1118.71		803.07		
1133.21	14.5	802.98	0.09	0.62%
1144.71		802.86		
1167.11	22.4	802.79	0.07	0.31%
1248.71		802.33		
1266.2	17.49	802.04	0.29	1.66%
1322.48		801.99		
1341.48	19	801.98	0.01	0.05%
1419.48		801.25		
1439.48	20	800.92	0.33	1.65%
1496.48		800.61		
1529.08	32.6	800.11	0.5	1.53%
1573.48		799.61		
1577.48	4	799.43	0.18	4.50%
1660		799.21		
1698.48	38.48	798.68	0.53	1.38%
1727.48		798.19		
1736.78	9.3	798.13	0.06	0.65%

Project Name: Lyle Creek	
Pool Spacing	
Reach 1	
Station (ft)	Spacing (ft)
67	
95	28
124	29
202.5	78.5
239	36.5
269.5	30.5
309.4	39.9
321	11.6
366.3	45.3
391.2	24.9
430.5	39.3
455	24.5
486	31
549.6	63.6
585.4	35.8
612	26.6
643	31
686	43

Project Name: Lyle Creek	
Pool Spacing	
Reach 2	
Station (ft)	Spacing (ft)
748.5	
795.7	47.2
837	41.3
879	42
915	36
963.5	48.5
1133.5	170
1182	48.5
1280	98
1370	90
1430	60
1467	37
1513	46
1562	49
1621	59
1764	143
1781	17

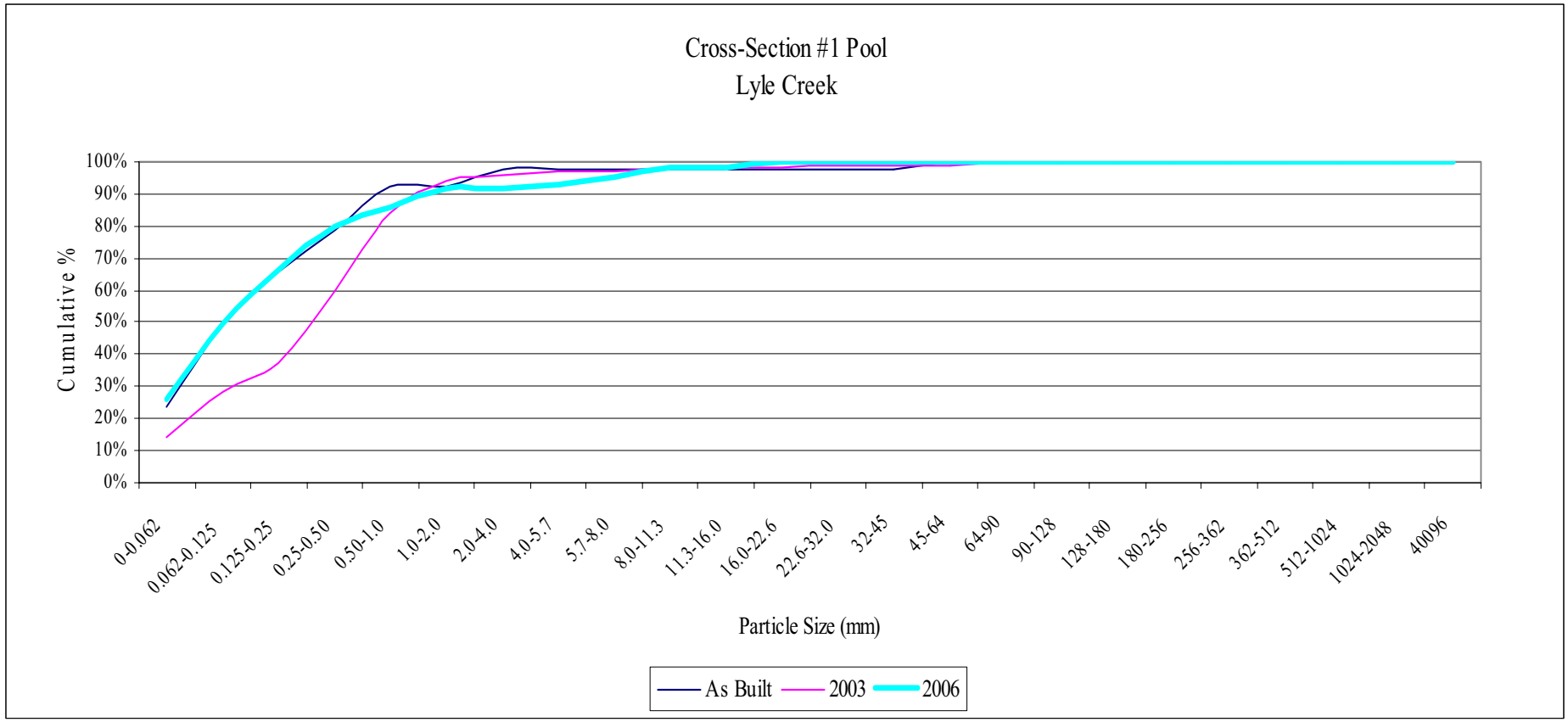
Project Name: Lyle Creek			
Pool Length			
Reach 1			
Station (ft)	**Length (ft)**	**Station (ft)**	**Length (ft)**
3		390	
53	50	411.1	21.1
86		425.4	
127.4	41.4	440.4	15
195.8	68.4	483.4	
210.4	14.6	500	16.6
221.4		527.4	27.4
237.4	16	533.5	
253.4		563	29.5
270.4	17	584.1	21.1
277.4	7	590.4	
320.9	43.5	648.1	38.1
323.4		664.4	16.3
334.9	11.5	687.4	
361.4		697.4	10
371.4	10		

Project Name: Lyle Creek			
Pool Length			
Reach 2			
Station (ft)	**Length (ft)**	**Station (ft)**	**Length (ft)**
712.4		1174.71	
730.2	17.8	1196.5	21.79
733.17		1266.2	
746.47	13.3	1322.48	56.28
776.47		1387.48	
791.47	15	1419.48	32
834.07		1444.48	
855.47	21.4	1478.78	34.3
874.91		1485.28	
905.71	30.8	1496.48	11.2
932.71		1529.08	
940.71	8	1545.48	16.4
975.71		1577.48	
994.71	19	1591.48	14
1007.71		1627.48	
1016.71	9	1660	32.52
1052.71		1706.48	
1070.71	18	1708.48	2
1133.21		1774.48	
1167.11	33.9	1788.78	14.3

Project Name: Lyle Creek			
Pattern Measurements			
	Meander Wavelength (Lm)	Radius of Curvature (Rc)	Channel Beltwidth (Wblt)
Reach 1	161	15	29
	145	18	110
	166	25	80
	60	40	94
	105	25	43
	108	31	47
	123	38.9	47
	124	21	47
	153	42	52
	153	31	59
	152	25	61
	156	29	61
		33	81
		43	50
		50	48
		21	
		30	
		28	
Min	**60**	**15**	**29**
Max	**166**	**50**	**110**
Median	**148.5**	**29.5**	**52**

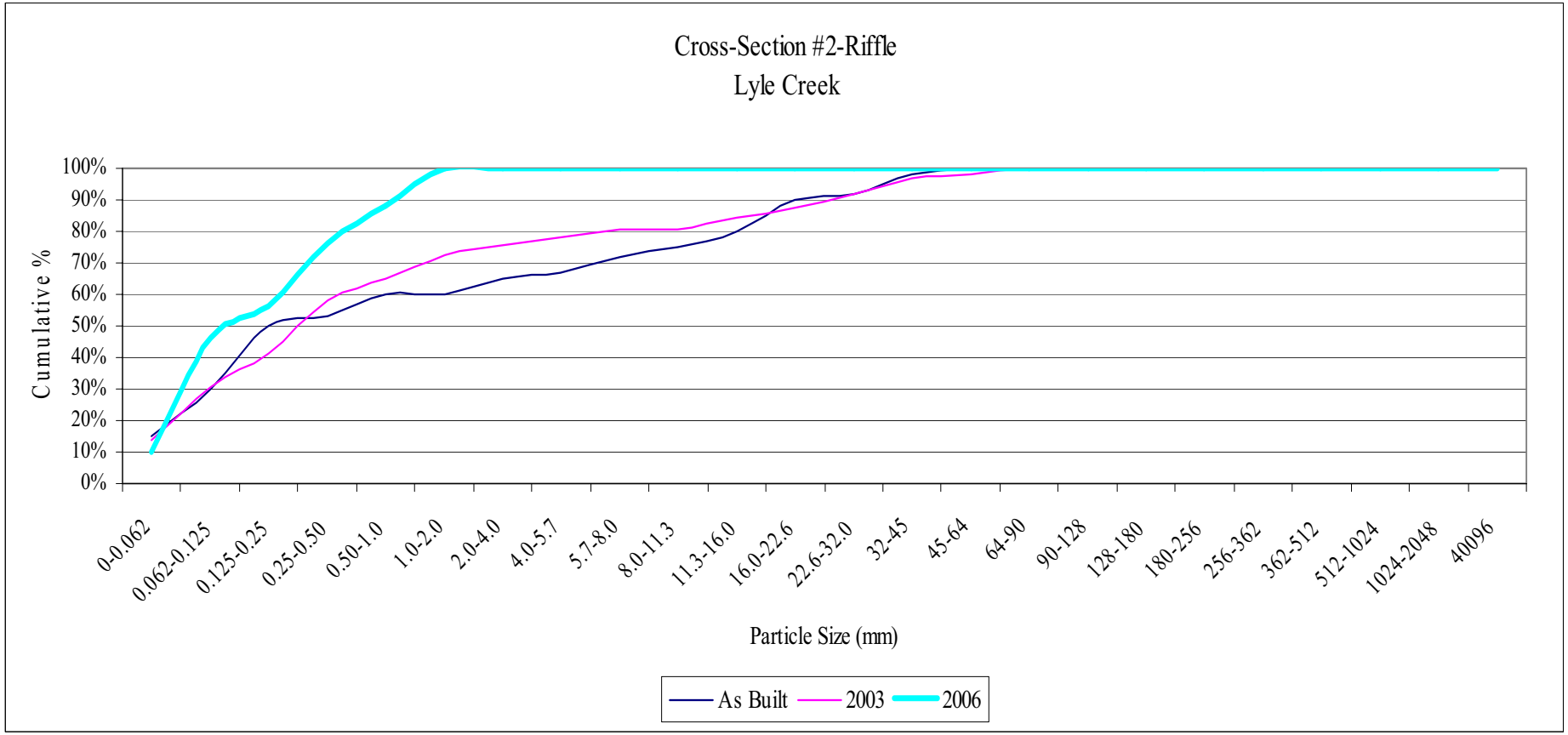
Project Name: Lyle Creek			
Pattern Measurements			
	Meander Wavelength (Lm)	Radius of Curvature (Rc)	Channel Beltwidth (Wblt)
Reach 2	61	13	27
	64	10	31
	60	12	34
	118	14	38
	81	13	30
	49	14	15
	68	21	30
	67	17	39
	80	21	23
	101	12.5	22
	118	21	28
	150	17	22
	62	16	40
	63	16	56
	48	17	32
	53	10	31
	42	15	23
	75	25	31
	79	15	49
	78	12	40
	65	40	40
Min	**42**	**10**	**15**
Max	**150**	**40**	**56**
Median	**67**	**15**	**31**

Project Name: Lyle Creek											
Cross-Section: 1											
Feature: Pool											
			As Built			2003			2006		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0-0.062	9	24%	24%	14	14%	14%	26	26%	26%
Sand	very fine sand	0.062-0.125	10	26%	50%	14	14%	28%	24	24%	50%
	fine sand	0.125-0.25	6	16%	66%	9	9%	37%	16	16%	66%
	medium sand	0.25-0.50	5	13%	79%	22	22%	60%	14	14%	80%
	coarse sand	0.50-1.0	5	13%	92%	24	24%	84%	6	6%	86%
	very coarse sand	1.0-2.0	0	0%	92%	10	10%	94%	6	6%	92%
Gravel	very fine gravel	2.0-4.0	2	5%	97%	2	2%	96%	0	0%	92%
	fine gravel	4.0-5.7	0	0%	97%	1	1%	97%	1	1%	93%
	fine gravel	5.7-8.0	0	0%	97%	0	0%	97%	2	2%	95%
	medium gravel	8.0-11.3	0	0%	97%	1	1%	98%	3	3%	98%
	medium gravel	11.3-16.0	0	0%	97%	0	0%	98%	0	0%	98%
	course gravel	16.0-22.6	0	0%	97%	0	0%	98%	2	2%	100%
	course gravel	22.6-32.0	0	0%	97%	1	1%	99%	0	0%	100%
	very coarse gravel	32-45	0	0%	97%	0	0%	99%	0	0%	100%
	very coarse gravel	45-64	1	3%	100%	0	0%	99%	0	0%	100%
Cobble	small cobble	64-90	0	0%	100%	1	1%	100%	0	0%	100%
	medium cobble	90-128	0	0%	100%	0	0%	100%	0	0%	100%
	large cobble	128-180	0	0%	100%	0	0%	100%	0	0%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			38	100%	100%	99	100%	100%	100	100%	100%



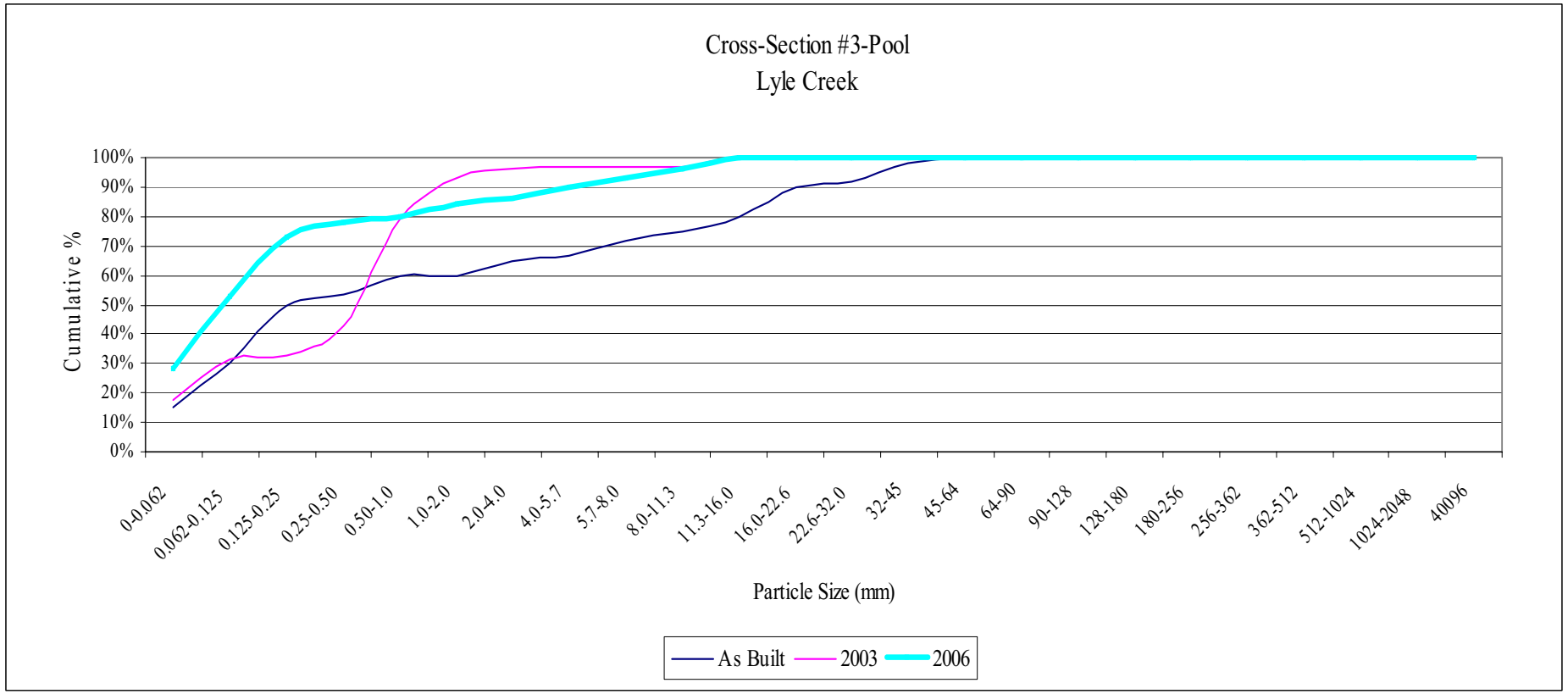
	d16	d35	d50	d84	d95	d100
As Built	0.00	0.08	0.09	0.52	2.33	64.00
2003	0.07	0.16	0.29	0.76	2.29	90.00
2006	0.04	0.09	0.13	0.83	8.00	22.60

Project Name: Lyle Creek											
Cross-Section: 2											
Feature: Riffle											
			As Built			2003			2006		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0-0.062	9	15%	15%	14	14%	14%	10	10%	10%
Sand	very fine sand	0.062-0.125	9	15%	30%	17	17%	30%	36	36%	46%
	fine sand	0.125-0.25	12	20%	50%	11	11%	41%	10	10%	56%
	medium sand	0.25-0.50	2	3%	53%	17	17%	58%	20	20%	76%
	coarse sand	0.50-1.0	4	7%	60%	7	7%	65%	12	12%	88%
	very coarse sand	1.0-2.0	0	0%	60%	8	8%	73%	12	12%	100%
G r a v e l	very fine gravel	2.0-4.0	3	5%	65%	3	3%	75%	0	0%	100%
	fine gravel	4.0-5.7	1	2%	67%	3	3%	78%	0	0%	100%
	fine gravel	5.7-8.0	3	5%	72%	2	2%	80%	0	0%	100%
	medium gravel	8.0-11.3	2	3%	75%	0	0%	80%	0	0%	100%
	medium gravel	11.3-16.0	3	5%	80%	4	4%	84%	0	0%	100%
	course gravel	16.0-22.6	6	10%	90%	3	3%	87%	0	0%	100%
	course gravel	22.6-32.0	1	2%	92%	5	5%	92%	0	0%	100%
	very coarse gravel	32-45	4	7%	98%	5	5%	97%	0	0%	100%
	very coarse gravel	45-64	1	2%	100%	1	1%	98%	0	0%	100%
Cobble	small cobble	64-90	0	0%	100%	2	2%	100%	0	0%	100%
	medium cobble	90-128	0	0%	100%	0	0%	100%	0	0%	100%
	large cobble	128-180	0	0%	100%	0	0%	100%	0	0%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			60	100%	100%	102	100%	100%	100	100%	100%



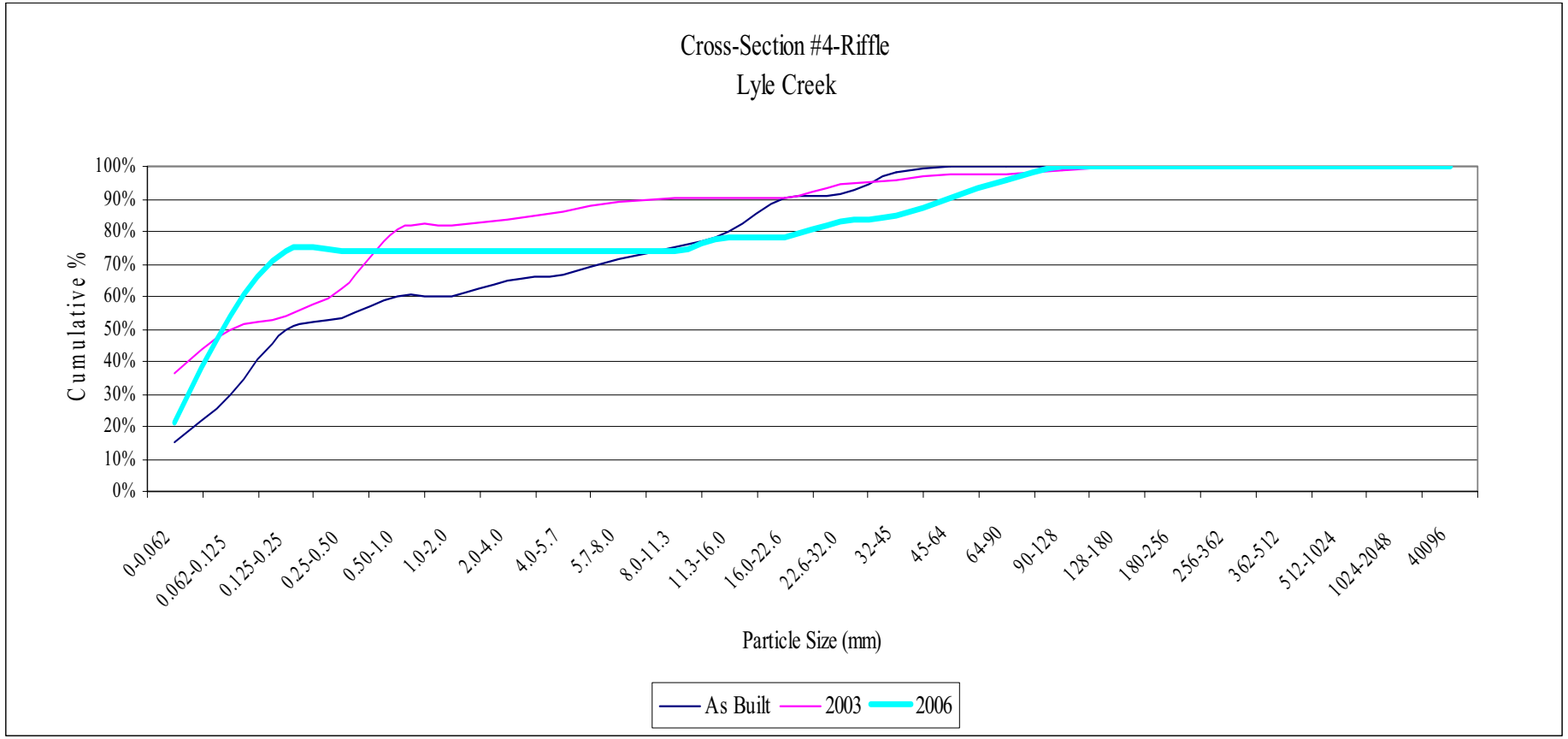
	d16	d35	d50	d84	d95	d100
As Built	0.06	0.12	0.19	15.91	32.90	
2003	0.07	0.13	0.29	13.33	33.80	
2006	0.07	0.11	0.18	0.83	1.58	2.00

Project Name: Lyle Creek											
Cross-Section: 3											
Feature: Pool											
			As Built			2003			2006		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0-0.062	9	15%	15%	18	18%	18%	28	28%	28%
Sand	very fine sand	0.062-0.125	9	15%	30%	14	14%	32%	25	25%	53%
	fine sand	0.125-0.25	12	20%	50%	1	1%	33%	20	20%	73%
	medium sand	0.25-0.50	2	3%	53%	10	10%	43%	5	5%	78%
	coarse sand	0.50-1.0	4	7%	60%	37	37%	79%	2	2%	80%
	very coarse sand	1.0-2.0	0	0%	60%	14	14%	93%	4	4%	84%
Gravel	very fine gravel	2.0-4.0	3	5%	65%	3	3%	96%	2	2%	86%
	fine gravel	4.0-5.7	1	2%	67%	1	1%	97%	4	4%	90%
	fine gravel	5.7-8.0	3	5%	72%	0	0%	97%	3	3%	93%
	medium gravel	8.0-11.3	2	3%	75%	0	0%	97%	3	3%	96%
	medium gravel	11.3-16.0	3	5%	80%	3	3%	100%	4	4%	100%
	course gravel	16.0-22.6	6	10%	90%	0	0%	100%	0	0%	100%
	course gravel	22.6-32.0	1	2%	92%	0	0%	100%	0	0%	100%
	very coarse gravel	32-45	4	7%	98%	0	0%	100%	0	0%	100%
	very coarse gravel	45-64	1	2%	100%	0	0%	100%	0	0%	100%
Cobble	small cobble	64-90	0	0%	100%	0	0%	100%	0	0%	100%
	medium cobble	90-128	0	0%	100%	0	0%	100%	0	0%	100%
	large cobble	128-180	0	0%	100%	0	0%	100%	0	0%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			60	100%	100%	101	100%	100%	100	100%	100%



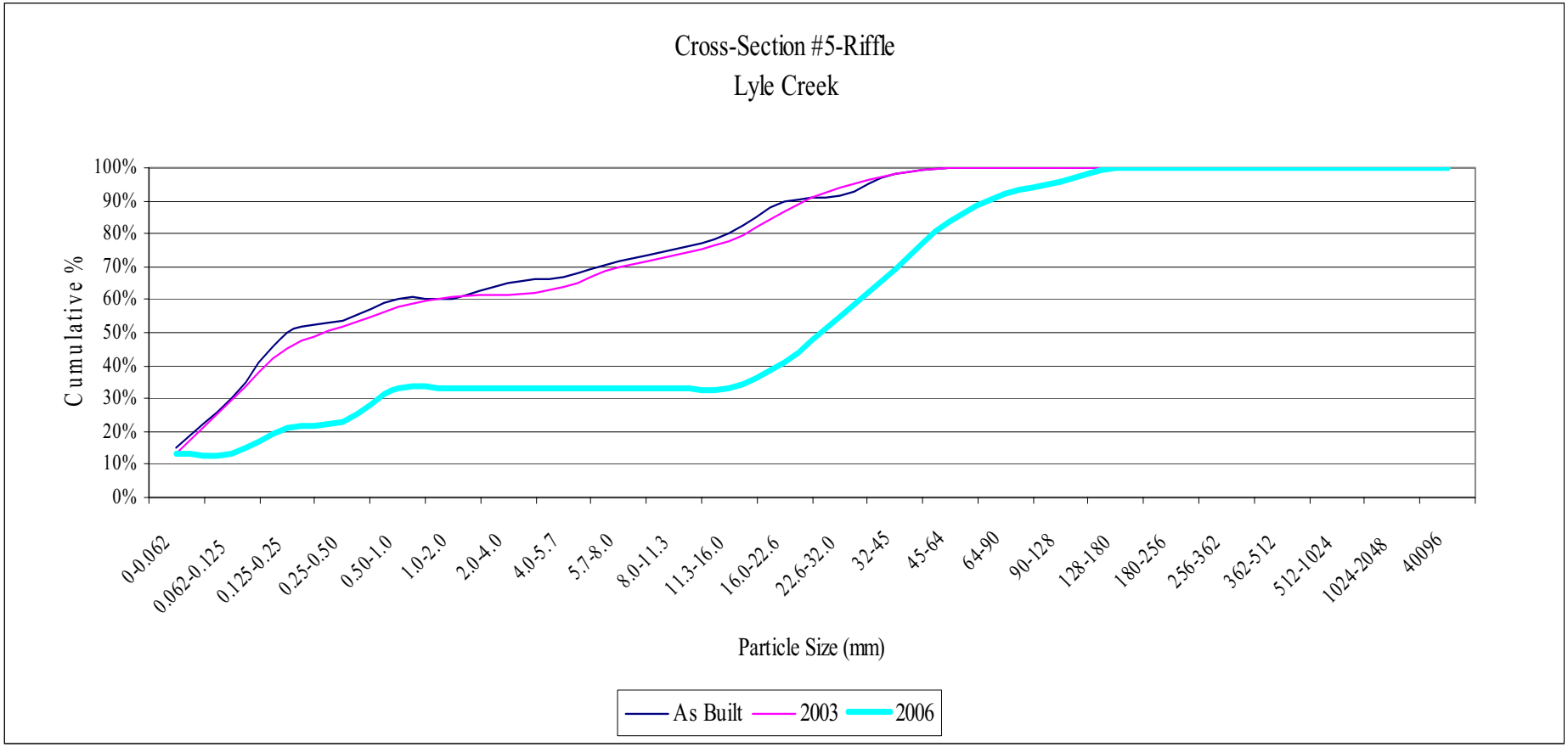
	d16	d35	d50	d84	d95	d100
As Built	0.06	0.12	0.19	15.91	32.90	
2003	0.00	0.23	0.45	1.01	2.47	
2006	0.04	0.08	0.12	2.00	10.20	16.00

Project Name: Lyle Creek											
Cross-Section: 4											
Feature: Riffle											
			As Built			2003			2006		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0-0.062	9	15%	15%	34	37%	37%	21	21%	21%
Sand	very fine sand	0.062-0.125	9	15%	30%	12	13%	49%	33	33%	54%
	fine sand	0.125-0.25	12	20%	50%	4	4%	54%	20	20%	74%
	medium sand	0.25-0.50	2	3%	53%	8	9%	62%	0	0%	74%
	coarse sand	0.50-1.0	4	7%	60%	17	18%	81%	0	0%	74%
	very coarse sand	1.0-2.0	0	0%	60%	1	1%	82%	0	0%	74%
Gravel	very fine gravel	2.0-4.0	3	5%	65%	2	2%	84%	0	0%	74%
	fine gravel	4.0-5.7	1	2%	67%	2	2%	86%	0	0%	74%
	fine gravel	5.7-8.0	3	5%	72%	3	3%	89%	0	0%	74%
	medium gravel	8.0-11.3	2	3%	75%	1	1%	90%	0	0%	74%
	medium gravel	11.3-16.0	3	5%	80%	0	0%	90%	4	4%	78%
	course gravel	16.0-22.6	6	10%	90%	0	0%	90%	0	0%	78%
	course gravel	22.6-32.0	1	2%	92%	4	4%	95%	5	5%	83%
	very coarse gravel	32-45	4	7%	98%	1	1%	96%	2	2%	85%
	very coarse gravel	45-64	1	2%	100%	2	2%	98%	5	5%	90%
Cobble	small cobble	64-90	0	0%	100%	0	0%	98%	6	6%	96%
	medium cobble	90-128	0	0%	100%	1	1%	99%	4	4%	100%
	large cobble	128-180	0	0%	100%	1	1%	100%	0	0%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			60	100%	100.00%	93	100%	100%	100	100%	100%



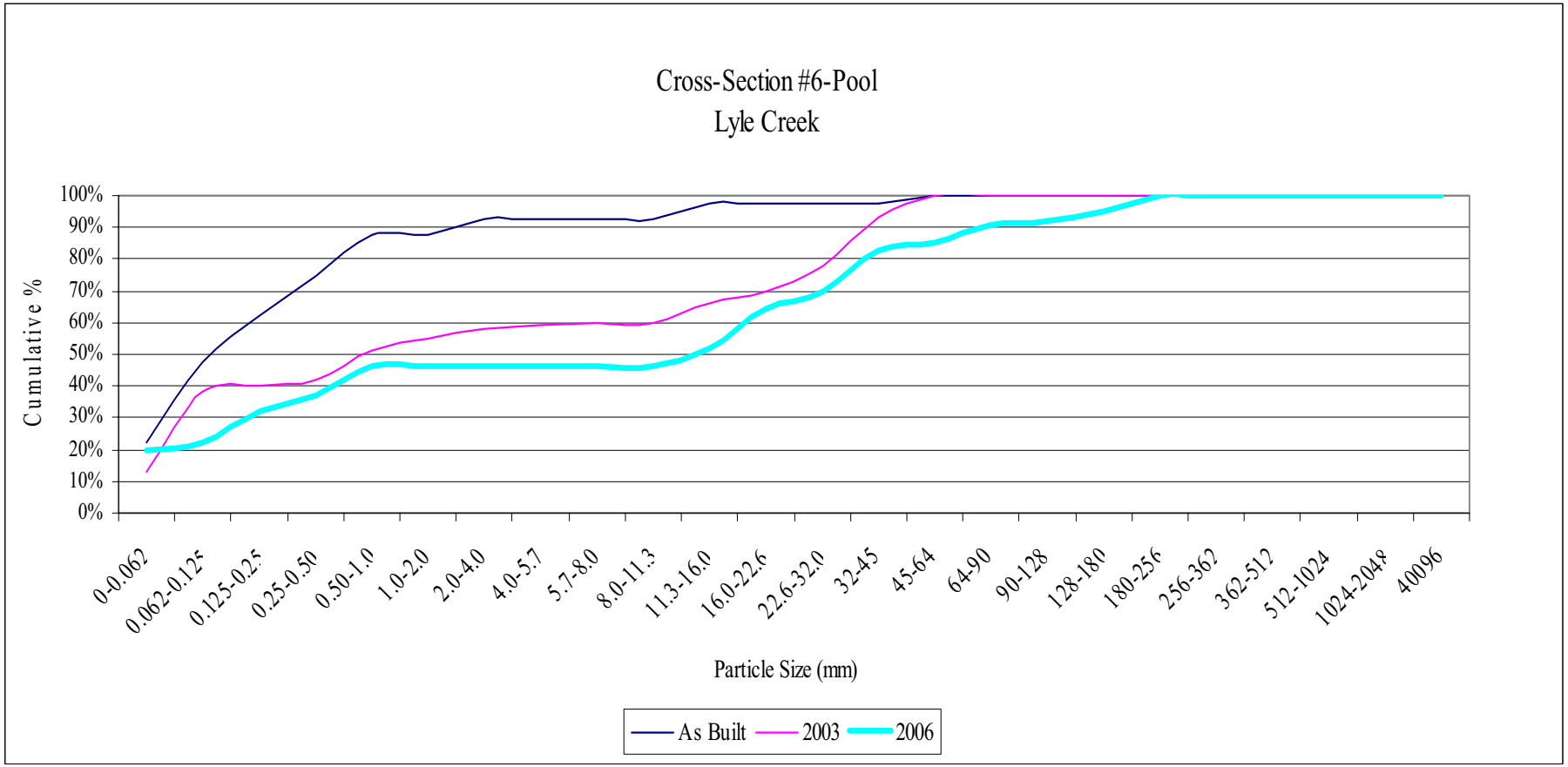
	d16	d35	d50	d84	d95	d100
As Built	0.06	0.12	0.19	15.91	32.90	
2003	0.00	0.00	0.11	3.11	31.22	
2006	0.05	0.09	0.12	38.50	85.67	128.00

Project Name: Lyle Creek											
Cross-Section: 5											
Feature: Riffle											
			As Built			2003			2006		
Description	**Material**	**Size (mm)**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**	**Total #**	**Item %**	**Cum %**
Silt/Clay	silt/clay	0-0.062	9	15%	15%	13	13%	13%	13	13%	13%
Sand	very fine sand	0.062-0.125	9	15%	30%	16	16%	29%	0	0%	13%
	fine sand	0.125-0.25	12	20%	50%	16	16%	45%	8	8%	21%
	medium sand	0.25-0.50	2	3%	53%	6	6%	52%	2	2%	23%
	coarse sand	0.50-1.0	4	7%	60%	6	6%	58%	10	10%	33%
	very coarse sand	1.0-2.0	0	0%	60%	3	3%	61%	0	0%	33%
G r a v e l	very fine gravel	2.0-4.0	3	5%	65%	1	1%	62%	0	0%	33%
	fine gravel	4.0-5.7	1	2%	67%	2	2%	64%	0	0%	33%
	fine gravel	5.7-8.0	3	5%	72%	6	6%	70%	0	0%	33%
	medium gravel	8.0-11.3	2	3%	75%	4	4%	74%	0	0%	33%
	medium gravel	11.3-16.0	3	5%	80%	4	4%	78%	0	0%	33%
	course gravel	16.0-22.6	6	10%	90%	9	9%	87%	8	8%	41%
	course gravel	22.6-32.0	1	2%	92%	7	7%	94%	14	14%	55%
	very coarse gravel	32-45	4	7%	98%	4	4%	98%	14	14%	69%
	very coarse gravel	45-64	1	2%	100%	2	2%	100%	15	15%	84%
Cobble	small cobble	64-90	0	0%	100%	0	0%	100%	8	8%	92%
	medium cobble	90-128	0	0%	100%	0	0%	100%	4	4%	96%
	large cobble	128-180	0	0%	100%	0	0%	100%	4	4%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			60	100%	100%	99	100%	100%	100	100%	100%



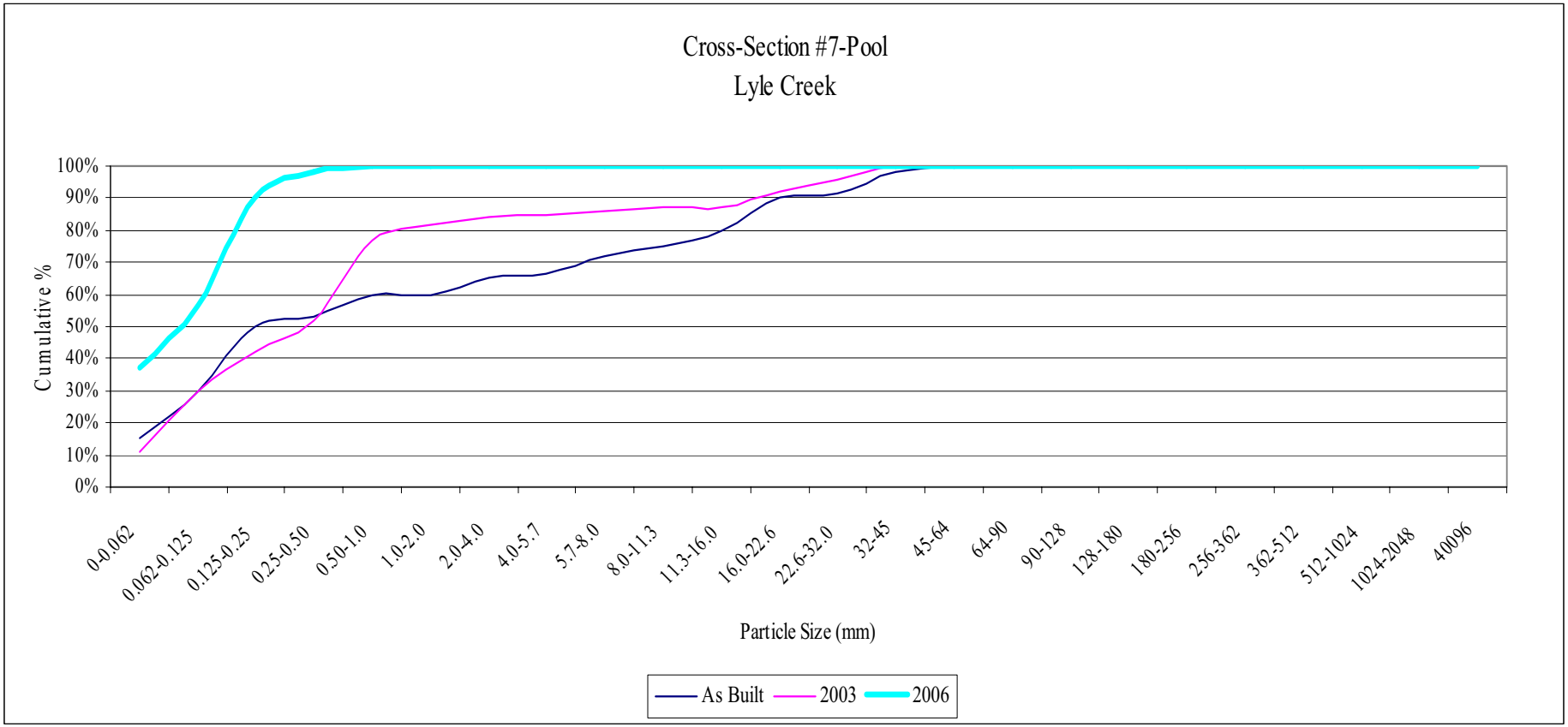
	d16	d35	d50	d84	d95	d100
As Built	0.06	0.12	0.19	15.91	32.90	
2003	0.07	0.13	0.33	17.52	30.24	
2006	0.17	17.65	28.64	64.00	118.50	180.00

Project Name: Lyle Creek											
Cross-Section: 6											
Feature: Pool											
			As Built			2003			2006		
Description	Material	Size (mm)	Total #	Item %	Cum %	Total #	Item %	Cum %	Total #	Item %	Cum %
Silt/Clay	silt/clay	0-0.062	9	23%	23%	13	13%	13%	20	20%	20%
Sand	very fine sand	0.062-0.125	10	25%	48%	25	25%	38%	2	2%	22%
	fine sand	0.125-0.25	6	15%	63%	2	2%	40%	10	10%	32%
	medium sand	0.25-0.50	5	13%	75%	2	2%	42%	5	5%	37%
	coarse sand	0.50-1.0	5	13%	88%	9	9%	51%	9	9%	46%
	very coarse sand	1.0-2.0	0	0%	88%	4	4%	55%	0	0%	46%
Gravel	very fine gravel	2.0-4.0	2	5%	93%	3	3%	58%	0	0%	46%
	fine gravel	4.0-5.7	0	0%	93%	1	1%	59%	0	0%	46%
	fine gravel	5.7-8.0	0	0%	93%	1	1%	60%	0	0%	46%
	medium gravel	8.0-11.3	0	0%	93%	0	0%	60%	0	0%	46%
	medium gravel	11.3-16.0	2	5%	98%	6	6%	66%	6	6%	52%
	course gravel	16.0-22.6	0	0%	98%	4	4%	70%	12	12%	64%
	course gravel	22.6-32.0	0	0%	98%	8	8%	78%	6	6%	70%
	very coarse gravel	32-45	0	0%	98%	15	15%	93%	13	13%	83%
	very coarse gravel	45-64	1	3%	100%	7	7%	100%	2	2%	85%
Cobble	small cobble	64-90	0	0%	100%	0	0%	100%	6	6%	91%
	medium cobble	90-128	0	0%	100%	0	0%	100%	1	1%	92%
	large cobble	128-180	0	0%	100%	0	0%	100%	3	3%	95%
	very large cobble	180-256	0	0%	100%	0	0%	100%	5	5%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			40	100%	100.00%	100	100%	100%	100	100%	100%



	d16	d35	d50	d84	d95
As Built	0.00	0.08	0.11	0.65	11.65
2003	0.07	0.09	0.71	31.78	43.07
2006	0.05	0.40	14.43	54.50	180.00

Project Name: Lyle Creek											
Cross-Section: 7											
Feature: Pool											
			As Built			2003			2006		
Description	Material	Size (mm)	Total #	Item %	Cum %	Total #	Item %	Cum %	Total #	Item %	Cum %
Silt/Clay	silt/clay	0-0.062	9	15%	15%	11	11%	11%	37	37%	37%
Sand	very fine sand	0.062-0.125	9	15%	30%	19	19%	30%	20	20%	57%
	fine sand	0.125-0.25	12	20%	50%	12	12%	42%	33	33%	90%
	medium sand	0.25-0.50	2	3%	53%	10	10%	52%	8	8%	98%
	coarse sand	0.50-1.0	4	7%	60%	25	25%	77%	2	2%	100%
	very coarse sand	1.0-2.0	0	0%	60%	5	5%	82%	0	0%	100%
Gravel	very fine gravel	2.0-4.0	3	5%	65%	2	2%	84%	0	0%	100%
	fine gravel	4.0-5.7	1	2%	67%	1	1%	85%	0	0%	100%
	fine gravel	5.7-8.0	3	5%	72%	1	1%	86%	0	0%	100%
	medium gravel	8.0-11.3	2	3%	75%	1	1%	87%	0	0%	100%
	medium gravel	11.3-16.0	3	5%	80%	0	0%	87%	0	0%	100%
	course gravel	16.0-22.6	6	10%	90%	5	5%	92%	0	0%	100%
	course gravel	22.6-32.0	1	2%	92%	4	4%	96%	0	0%	100%
	very coarse gravel	32-45	4	7%	98%	4	4%	100%	0	0%	100%
	very coarse gravel	45-64	1	2%	100%	0	0%	100%	0	0%	100%
Cobble	small cobble	64-90	0	0%	100%	0	0%	100%	0	0%	100%
	medium cobble	90-128	0	0%	100%	0	0%	100%	0	0%	100%
	large cobble	128-180	0	0%	100%	0	0%	100%	0	0%	100%
	very large cobble	180-256	0	0%	100%	0	0%	100%	0	0%	100%
Boulder	small boulder	256-362	0	0%	100%	0	0%	100%	0	0%	100%
	small boulder	362-512	0	0%	100%	0	0%	100%	0	0%	100%
	medium boulder	512-1024	0	0%	100%	0	0%	100%	0	0%	100%
	large boulder	1024-2048	0	0%	100%	0	0%	100%	0	0%	100%
Bedrock	bedrock	40096	0	0%	100%	0	0%	100%	0	0%	100%
TOTAL/%of whole count			60	100%	100%	100	100%	100%	100	100%	100%



	d16	d35	d50	d84	d95
As Built	0.06	0.12	0.19	15.91	32.90
2003	0.07	0.13	0.34	3.00	25.30
2006	0.03	0.06	0.10	0.23	0.41